

GW - 294

MONITORING REPORTS

DATE:

1999-1998

**ADDITIONAL SUBSURFACE INVESTIGATION REPORT
AND
MODIFIED STAGE 2 ABATEMENT PLAN**

**EOTT ENERGY CORP
TOWNSEND SITE
LOVINGTON, NEW MEXICO**

Prepared For:
EOTT Energy Corp
5805 East Highway 80
Midland, Texas 79701

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Environmental Technology Group, Inc. Project No. EOT1019C

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Midland, Texas 79703

November 1999

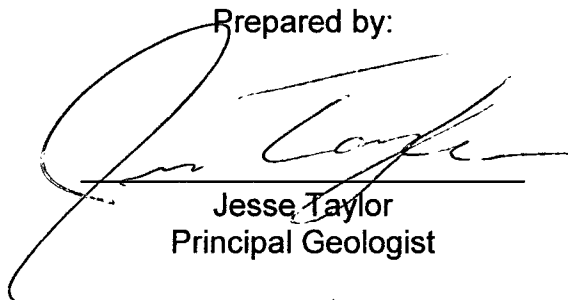
A Report Prepared for:

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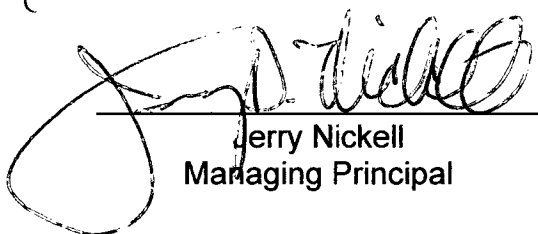
Additional Subsurface Investigation Report
And
Modified Stage 2 Abatement Plan

Environmental Technology Group, Inc. Project No. EOT1016C

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November 1999

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	INITIAL AND CURRENT SITE CONDITIONS	2
3.0	EXISTING ABATEMENT SYSTEM EVALUATION	3
4.0	ABATEMENT OPTIONS	4
	4.1 Soil Remediation	4
	4.2 Ground Water Remediation	5
5.0	REMEDIAL RECOMMENDATIONS	7
	5.1 Free Product Removal	7
	5.2 Soil Remediation	7
6.0	MONITORING PROGRAM	8
7.0	QA/QC PROCEDURES	9
	7.1 Soil Sampling	9
	7.2 Ground Water Sampling	9
	7.3 Decontamination Of Equipment	10
	7.4 Laboratory Protocol	10
8.0	SCHEDULE OF ACTIVITIES	10
9.0	LIMITATIONS	11
	DISTRIBUTION	

TABLES

TABLE 1:	Soil Analytical Results
TABLE 2	Recent Ground Water Elevations
TABLE 3:	Recent Ground Water Chemistry

FIGURES

- FIGURE 1: Site Location Map
- FIGURE 2: Inferred Ground Water Elevations 7/19/99
- FIGURE 3: Isopach PSH Thickness 7/19/99
- FIGURE 4: Inferred Ground Water Elevations 10/10/99
- FIGURE 5: Isopach PSH Thickness 10/10/99

APPENDIX

- APPENDIX A: Soil Boring Logs
- APPENDIX B: Laboratory Analytical Data

1.0 INTRODUCTION

The site is located approximately two miles west of the town of Lovington, New Mexico in Section 16, Township 11 South, Range 35 East. A site location map is provided as Figure 1. A 500 barrel crude oil tank, a 210 barrel diesel tank, the existing remediation system and the site monitoring wells are depicted on all of the site maps beginning with Figure 2.

Two subsurface crude pipelines cross the site, east to west, at a point approximately 30 feet south of the containment area. One line is a six-inch line that is currently out of service. The second line is a four-inch crude line from which a release occurred in 1997. During the initial release response, the most highly impacted soil was removed from the release point down to a depth of 12 feet below grade. The four inch line was repaired and placed back into service.

Subsurface investigations were conducted in June, September and December of 1997. Beginning in January of 1998, phase separated hydrocarbons (PSH) and impacted groundwater was removed from the subsurface via a submersible pump installed in recovery well RW-1. From January through May of 1998, approximately 190 barrels of PSH was recovered from the subsurface utilizing the submersible pump.

In March and April of 1998, the existing GeoVac system and thermal oxidizer were installed at the site and tested. These systems were started in May of 1998 and were intermittently operational until July of 1999. A review of existing records indicate that the system was operational for less than 50 % of the time during this period. Further documentation of the subsurface investigations and system operations are provided in the following reports:

- Subsurface Investigation Report, KEI, September 22, 1997;
- Discharge Plan for the Abatement of Ground Water Impacts, KEI, January 20, 1998;
- Subsurface Investigation Report, KEI, February 12, 1998;
- Compliance Test Report, KEI, September 23, 1998; and
- Annual Monitoring Report, KEI, March 31, 1998.

The system was not in operation throughout August 1999, during which time the system was overhauled and all media and worn parts were replaced. The system was started again on September 7, 1999 and was operational until October 19, 1999. On that date, a tank overfill occurred resulting in the release of approximately 30 barrels of oil from the 500 gallon tank. An estimated 25 barrels of oil was recovered during the response activities. The system has not been operational since the spill date.

During the year in which the system was operational prior to July 1999, an estimated 105 barrels of oil was recovered from the subsurface, with the bulk of that amount recovered during the last three months of 1998. During the month of operation ending in October 1999, the system operated continuously at maximum operational capacity. However, only an estimated 3/4 barrel of oil was removed from the subsurface.

In August 1999, three additional monitoring wells and three soil borings were installed at the site to more fully delineate the extent of impacted soil and PSH in the release area. Details regarding the integration of these data with the existing site data are provided in the subsequent section.

2.0 INITIAL AND CURRENT SITE CONDITIONS

A review of the 1997 and 1998 reports, documenting the subsurface investigations, indicate the following;

- A significant portion of the subsurface is composed of caliche, limestone and partially indurated sandstone;
- Impacted soil, in the unsaturated zone is limited to the area between MW-5 and RW-1;
- The presence of dissolved phase benzene, BTEX or TPH, above regulatory limits, was limited to one monitoring well, MW-8;
- A significant amount of PSH, as much as 8 feet in the case of monitoring wells MW-3 and MW-5, was present in five wells, including MW-2, MW-3, MW-4, MW-5 and MW-9;

These subsurface conditions describe a very limited lateral extent of impacted soil in the unsaturated zone given the high concentrations detected in the soil borings. In addition, the limited lateral extent of PSH and the dissolved phase plume is unusual given the thickness of free product in the impacted wells.

Given the subsurface conditions, the above parameters appear to be a function of fracturing in the various rock types and carbonate precipitates in the sand, which inhibits porosity and permeability. It appears that the released oil was confined to a limited area near or on the surface. The migration of the unrecovered oil to the water table appears to have been greatly facilitated by the fracturing. The limited lateral extent of PSH and the dissolved phase plume appears to be a function of the poor porosity and permeability in the sand in the smear zone.

By July 1999, one additional well, MW-6, had become impacted by PSH. Given the southeast ground water gradient and the southerly position of monitoring well MW-1, the down-gradient extent of PSH and the dissolved phase plume could not be confirmed. In addition, the increasing thickness of PSH in monitoring well MW-2 indicated the possible presence of an additional source to the north of the release area. In order to mitigate these concerns, three additional wells (MW-13, MW-14 and MW-15) were advanced at the site to further define the extent of the product and dissolved phase plume. In addition, three soil borings were advanced at the site to further define the extent of soil impact in the unsaturated zone. The monitoring well and soil boring locations are depicted on the site maps. The soil boring logs and monitoring well details are included in Appendix A. The soil analytical data for samples collected from the borings are included as Table 1 and the laboratory report is included as Appendix B.

The recently installed wells were included in the third quarter monitoring activities, conducted on September 19, 1999. The ground water elevation data for this event, and two additional recent events, are included on Table 2. The ground water chemistry for the latest event are included as Table 3 and the laboratory report for the ground water data is

included in Appendix B.

A review of the soil boring logs indicate that the extent of soil impact in the unsaturated zone is limited to the area defined by the previously installed monitoring wells. There is no impacted soil associated with possible additional sources, cross gradient to the area of current remediation, as demonstrated by soil borings SB-1 and SB-2. Historical data, associated with the excavation of the infiltration gallery, indicate that there is no soil impact upgradient to the current area of remediation.

Therefore, the area of soil impact has been defined and is confined to the area around monitoring well MW-5 and recovery well RW-1. The extent of PSH, and associated impacted soil in the smear zone, appears to be defined and is limited to the area within the fence line and does not extend into the parking area as defined by monitoring well MW-15 and soil boring SB-3.

A review of the ground water chemistry data indicates that only one ground water sample, collected from monitoring well MW-14, has dissolved phase hydrocarbons present. Wells containing phase separated hydrocarbons (PSH) were not sampled as per standard protocol. The data indicate that the area of ground water impact is essentially limited to the area in which PSH is present.

3.0 EXISTING ABATEMENT SYSTEM EVALUATION

The GeoVac system is designed as multi-phase remedial approach. The vacuum system can facilitate the removal of petroleum vapors from the unsaturated zone, which in turn can decrease the adsorbed phase concentrations. A reduction of the adsorbed phase concentrations in the capillary fringe can facilitate a reduction of dissolved phase petroleum constituents in the ground water. Finally, the vacuum is capable of removing PSH and impacted ground water.

During the site investigation, it became apparent that a pronounced ground water high was present under the remedial system. It was hypothesized that the remediation system was responsible for the feature as historical ground water data, collected prior to the system operations, did not indicate it's presence. To evaluate this possibility, two gauging events were conducted at the site. The first event was conducted on August 19, 1999. The ground water contours and an isopach of PSH thickness during this event are provided as Figures 2 and 3, respectively. Prior to this event, the system had not been operational for approximately one month.

The second event was conducted on October 10, 1999. Prior to this event, the system had been operational for approximately one month. The ground water contours and an isopach of PSH thickness during this event are provided as Figures 4 and 5, respectively. A review of the ground water contours indicate that the mounding feature is more pronounced subsequent to the period of system operations. Also, a mounding feature, which appears to be associated with the infiltration gallery, was observed during the second gauging event.

A comparison of the PSH isopach maps indicates that PSH is advected toward the

southeast and northeast, along the flanks of the ground water high, during system operations. This is evidenced by the significant increase of PSH thickness in monitoring wells MW-2 and MW-6. In addition, PSH, present in monitoring well MW-9, may be advected toward the northwest, or up regional gradient as a function of the mounding associated with the infiltration gallery.

The data indicate that the continued operation of the system is counter productive to the removal of PSH from the site. In fact, operation of the system appears to facilitate the lateral movement of the PSH plume and increase impact to the smear zone along the flank of the plume. Given the limited extent of impact to the unsaturated zone and the limited extent of the dissolved phase plume, any benefit the system may have in this area is offset by the negative influence on the PSH. For these reasons, ETGI recommends that system operations be discontinued at this time.

4.0 ABATEMENT OPTIONS

4.1 Soil Remediation

Abatement of impacted soil at the site is technically feasible using the following technologies:

- Excavation and Disposal
- Soil Vapor Extraction

The most highly impacted soils at the site were excavated during the initial response and subsequent remedial activities. The remaining area of impacted soil is confined laterally to the area around monitoring well MW-5 and recovery well RW-1. Given that the surface soils and rock in this area were excavated to a depth of 12 feet bgs, the vertical extent of impacted soil is limited to between the depth of 12 and 50 feet bgs.

The GeoVac system is designed to mitigate adsorbed oil in the unsaturated zone and the distribution of system wells is concentrated in the inferred area of unsaturated zone impact. Therefore, past system operations should have decreased the volume of oil in this zone to some degree. In any event, the total volume of oil remaining in the unsaturated zone should be limited.

Soil Vapor Extraction (SVE) systems are designed to remove hydrocarbons adsorbed to the soil, volatilized hydrocarbons in the pore spaces and dissolved hydrocarbons in soil moisture in the unsaturated zone. This technology would use a similar well layout and piping system utilized in the existing GeoVac system. However, the imposed vacuum is significantly less and only vapors would be removed from the subsurface. This technology, utilizing some of the existing subsurface remediation system structures, may be capable of the remediation of adsorbed hydrocarbons in the unsaturated and smear zones.

After the free product has been removed from the subsurface, the degree of hydrocarbons remaining in the smear zone should be assessed. It should be noted that the specific gravity of PSH at the site is approximately 0.85. Therefore, only 15% of the smear zone affected by the presence of PSH will be above the natural water table as measured by the

historical water table high, subsequent to the release. If it is determined that the remaining amount of hydrocarbons in this zone require abatement, the existing system could be modified to vent this zone. However, SVE is most effective in the unsaturated zone and would have relatively limited effect on the impacted soil below the water table. In order for SVE to effectively treat this zone, the water table would have to be artificially lowered, resulting again in the need for ex-situ treatment of impacted water.

If a SVE system is installed to treat the smear zone and unsaturated zone, the need for off gas control of the modified system would probably not be required. This assumption is based on the known emissions from the existing system, the known permit levels and the anticipated reduction of emissions associated with the modified system.

The estimated cost of modification of the existing system to a SVE system is approximately \$14,000.00. Monthly O&M costs of the modified system should be approximately \$700.00.

4.2 Ground Water Remediation

The subsurface data indicate that the primary impact to the site's ground water is the presence of PSH in the release area. The data also indicate that the existing abatement system is exacerbating this condition and inhibits the efficient removal of the remaining PSH. For this reason, ETGI recommends the installation of active oil skimmer systems in the wells with PSH.

These systems are commercially available and remove the PSH without adversely affecting the ground water gradient profile. The oil skimmers can be installed in the existing wells and run on a timer based on the PSH recharge rate of each well. The PSH would be stored in a bermed tank and hauled off-site at the required intervals. The minor amount of water produced by the system would be characterized and disposed of at an off-site, permitted facility as needed.

The estimated cost of installing oil skimmer pumps and the gathering and storage system at the site is approximately \$15,000.00, assuming that some of the existing system's equipment can be utilized. The expected O&M costs for the skimmer system is approximately \$800.00 per month.

The removal of dissolved phase COCs is technically feasible using the following technologies:

- Pump and Treat
- Air Sparging
- Natural Attenuation

Past experience with pump and treat systems, including the present abatement system, has been disappointing. The volume of water required to control the water table and facilitate the advection of impacted ground water toward the recovery well(s) in any material is significant. One of two scenarios typically develop when employing this technique. Either the volume of water moved is inadequate to control the water table and the dissolved phase plume is not completely addressed, or the required amount of water is moved and the volume of water overwhelms the treatment system. The existing system

further complicates the removal process by applying a strong vacuum to the subsurface and re-injecting the treated water immediately upgradient. The result is a strong mounding in the water table that appears to disperse the PSH rather than concentrate at the removal points.

It is estimated that the cost of installing and maintaining the existing system was approximately \$300,000.00. The system has removed PSH and hydrocarbon vapors from the subsurface. However, continued operation of the existing system is counter-productive in regard to the remediation of the impacted ground water and should be discontinued.

Air sparging (AS) is commonly utilized in conjunction with SVE systems. This would be a technically feasible combination at the site. However, the low volatility of the COC at this site requires a relatively long operational period. It is estimated that the addition of AS to the SVE system described above, would add approximately \$60,000.00 to the total cost over the life of the project.

Given the past remediation of impacted soil, limited extent of the dissolved phase plume and the removal of PSH as recommended above, it is expected that the rate of natural degradation of dissolved phase COCs in the ground water should exceed the rate of COC advection. If this is the case, current down gradient monitoring wells, not impacted by the COC should remain clean. In addition, the combination of molecular destruction (through bio-degradation, volatilization and other mechanisms) and dispersion should result in a decrease in concentration levels in the currently impacted wells.

It is estimated that given favorable conditions, COCs in the ground water may degrade to concentrations below regulatory limits naturally over a period of approximately three years. There is no significant up-front cost associated with this option, however, the costs of an extended period of ground water monitoring must be taken into consideration.

5.0 REMEDIAL RECOMMENDATIONS

5.1 Free Product Removal

ETGI recommends that submersible skimmer pumps be installed in monitoring wells MW-2, MW-5, MW-6 and MW-9. As the mounding effect of the existing system dissipates, the appearance of PSH in monitoring wells MW-3 and MW-4 should be monitored. If PSH appears in these wells, additional skimmer pumps should be installed as needed. A gathering system, from each well, to a storage tank would be installed and an overflow protection device would be installed in the tank. The tank would be placed in a lined, bermed area to mitigate any possibility of an uncontrolled release. The pumps are pneumatic and require an air compressor for operation. Generally, one compressor can drive two skimmer pumps. Therefore, the required number of compressors would range between two and three, depending on the number of wells containing PSH. Assuming that three compressors and six skimmer pumps are required, the installation cost is estimated to be approximately \$15,000.00 and the O&M costs are estimated to be \$800.00 per month.

If the above activities are successful in removing the free phase product, the natural attenuation of dissolved phase hydrocarbons may exceed the rate of COC advection. If this is the case, current down gradient monitoring wells, not impacted by the COC should remain clean. In addition, the combination of molecular destruction and dispersion should result in a decrease in concentration levels in the currently impacted wells.

Once the removal of free phase product is complete and the COCs in the unsaturated zone have been reduced to below regulatory limits, ETGI recommends that the extent of dissolved phase hydrocarbons should be monitored at the site on a quarterly basis. If any additional down gradient wells become impacted over time, the active abatement of the dissolved phase hydrocarbons in the groundwater should be considered at that time.

5.2 Soil Remediation

As described above, the majority of the impacted soil in the unsaturated zone has either been excavated and removed or, at least partially, remediated by past operation of the GeoVac system. The current site conditions indicate that the only significant area of remaining impact to the soil is in the smear zone. This is a function of the remaining PSH observed in the release area. Since the specific gravity of the PSH is approximately 0.85, it can be assumed that only 15% of the smear zone is above the historical ground water elevation high point. Therefore, the column of impacted soil above the natural water table will be limited once the PSH has been removed. In order to treat the remaining portion of the smear zone with SVE, the water table would have to be artificially lowered by pumping. Again, this would result in the need for the ex-situ treatment of recovered ground water. Given the problematic nature of such systems, the limited extent of the impacted smear zone and the apparently slow transport rate of the PSH, ETGI recommends against this option.

As discussed above, ETGI also recommends against active remediation of the ground water. The recommended monitoring of the downgradient wells will monitor not only the advection rate of hydrocarbons in the dissolved phase, but will also monitor the rate of desorption of hydrocarbons in the smear zone to the dissolved phase. Given the position of monitoring well MW-12, it is well placed to document the desorption rate, combined with the advection rate, of the dissolved phase plume, as compared to the natural degradation rate.

For this reason, ETGI recommends that no active remediation of soil in the smear zone should be undertaken until this ratio has been established by ground water monitoring.

6.0 MONITORING PROGRAM

During and subsequent to the recommended remedial activities, the ground water elevations in all site monitoring wells will be gauged and monitored for the presence of PSH on a monthly basis. All of the site monitoring wells will be sampled quarterly and the samples will be submitted for the analysis of BTEX (EPA Method 8020, 5030) and TPH (EPA Method 8015, modified for DRO and GRO). An annual report will be provided with a summary of all field activities and data results. The following developments at the site will warrant timely notification interim to the annual report:

- The detection of COCs in currently non-impacted monitoring wells for two consecutive monitoring periods;
- The detection of PSH in any well in which PSH has not been present previously;
- The recurrence of PSH in any well in which PSH was removed during remedial activities.

The monitoring plan will continue until such time that site closure is granted by the appropriate regulatory agency. Significant trends in COC concentrations or other significant developments at the site may have a bearing on the timing of a closure request.

7.0 QA/QC PROCEDURES

7.1 Soil Sampling

Samples of subsurface soils will be obtained utilizing either a split spoon sampler (air rotary drilling rig) or a two inch, continuous sampling tube with a clean polybuterate liner (geoprobe). Representative soil samples will be divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample will be placed in a disposable sample bag. The bag will be labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample will be allowed to volatilize for approximately thirty minutes at ambient temperature prior to conducting the analysis.

The other portion of the soil sample will be placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container will be filled to capacity to limit the amount of head-space present. Each container will be labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler will be sealed for shipment to the laboratory. Proper chain-of-custody documentation will be maintained throughout the sampling process.

Soil samples will be delivered to Environmental Lab of Texas, Inc. in Midland, Texas for BTEX and TPH analyses using the methods described below. Soil samples will be analyzed for BTEX and TPH-DRO within fourteen days following the collection date.

The soil samples will be analyzed as follows:

- BTEX concentrations in accordance with EPA Method 8020, 5030
- TPH concentrations in accordance with modified EPA Method 8015-GRO/DRO

7.2 Ground Water Sampling

Monitoring wells will be developed and purged with a clean PVC bailer. The bailer will be cleaned prior to each use with Liqui-Nox detergent and rinsed with distilled water. Monitoring wells with sufficient recharge will be purged by removing a minimum of three well volumes. Monitoring wells that do not recharge sufficiently will be purged until no

additional ground water can be obtained.

After purging the wells, ground water samples will be collected with a disposable Teflon sampler and polyethylene line by personnel wearing clean, disposable gloves. Ground water sample containers will be filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers will be filled first and PAH containers second).

Ground water samples collected for BTEX analysis will be placed in 40 ml glass VOA vials equipped with Teflon-lined caps. The containers will be provided by the analytical laboratory. The vials will be filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles.

Ground water samples collected for PAH analysis will be filled to capacity in sterile, 1 liter glass containers equipped with Teflon-lined caps. Ground water samples collected for metals analysis will be filled to capacity in sterile, 1 liter plastic containers equipped with Teflon-lined caps. The containers will be provided by the analytical laboratory.

The filled containers will be labeled and placed on ice in an insulated cooler. The cooler will be sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation will be maintained throughout the sampling process.

The ground water samples will be analyzed as follows:

- BTEX concentrations in accordance with EPA Method 8020, 5030
- TPH concentrations in accordance with modified EPA Method 8015-GRO/DRO

7.3 Decontamination Of Equipment

Cleaning of drilling equipment will be the responsibility of the drilling company. In general, the cleaning procedures will consist of using high pressure steam to wash the drilling and sampling equipment prior to drilling and prior to starting each hole. Prior to use, the sampling equipment will be cleaned with Liqui-Nox detergent and rinsed with distilled water.

7.4 Laboratory Protocol

The laboratory will be responsible for proper QA/QC procedures. These procedures will either be transmitted with the laboratory reports or on file at the laboratory.

8.0 SCHEDULE OF ACTIVITIES

The removal of free phase product at the site will be initiated within 14 days of approval of the abatement plan. Monitoring of the reduction of PSH at the site and system operations will be conducted on a weekly basis. Quarterly monitoring of the site ground water monitoring wells and annual reporting will continue regardless of the status of this plan.

9.0 LIMITATIONS

Environmental Technology Group, Inc. has prepared this Additional Subsurface Investigation Report and Stage 2 Abatement Plan to the best of its ability. No other warranty, expressed or implied, is made or intended.

Environmental Technology Group, Inc. has examined and relied upon documents referenced in the report and has relied on oral statements made by certain individuals. Environmental Technology Group, Inc. has not conducted an independent examination of the facts contained in referenced materials and statements. We have presumed the genuineness of the documents and that the information provided in documents or statements is true and accurate. Environmental Technology Group, Inc. has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Environmental Technology Group, Inc. also notes that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of EOTT Energy Corp. The information contained in this report including all exhibits and attachments, may not be used by any other party without the express consent of Environmental Technology Group, Inc. and/or EOTT Energy Corp.

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4600 West Wall Street
Midland, Texas 79703

Copy 4 to: Environmental Technology Group, Inc.
1776 Woodstead Court
Suite 117
The Woodlands, Texas 77380

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FIGURES



FIGURE 1

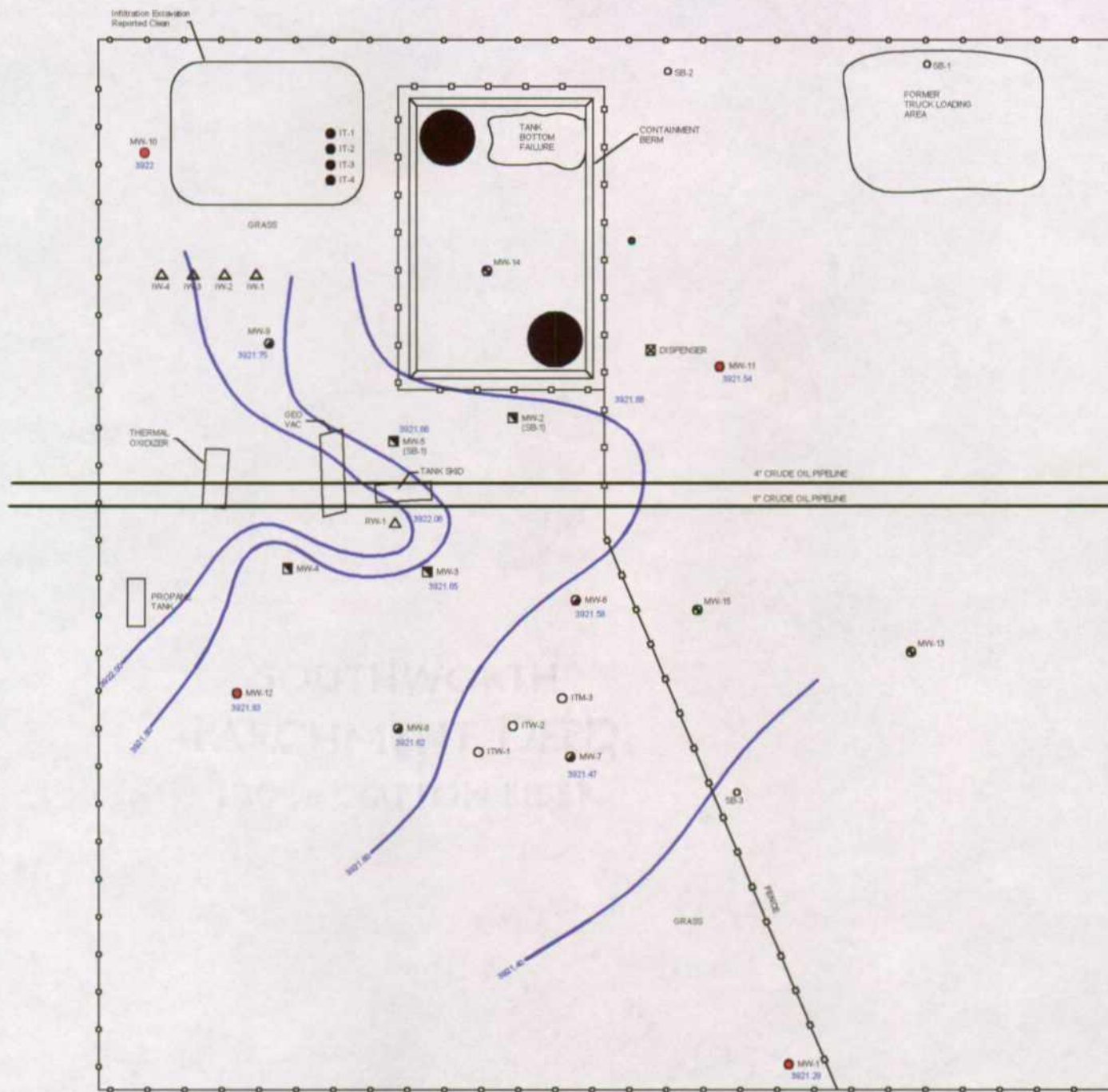
Site Location Map

Environmental
Technology Group, Inc.

Not To Scale

Townsend Release Site
Lovington, NM

11 - 16 - 99 RS



LEGEND:

- Infiltration gallery risers installed by KEI on 2-17, 1997.
- Infiltration test well installed by KEI on 12-13-97.
- Monitoring well installed by KEI on 8-27/28-97, 9-2-97.
- Monitoring well installed by KEI on 12-10/12/14-97.
- ETGI Monitoring well drilled 8-30/31-99

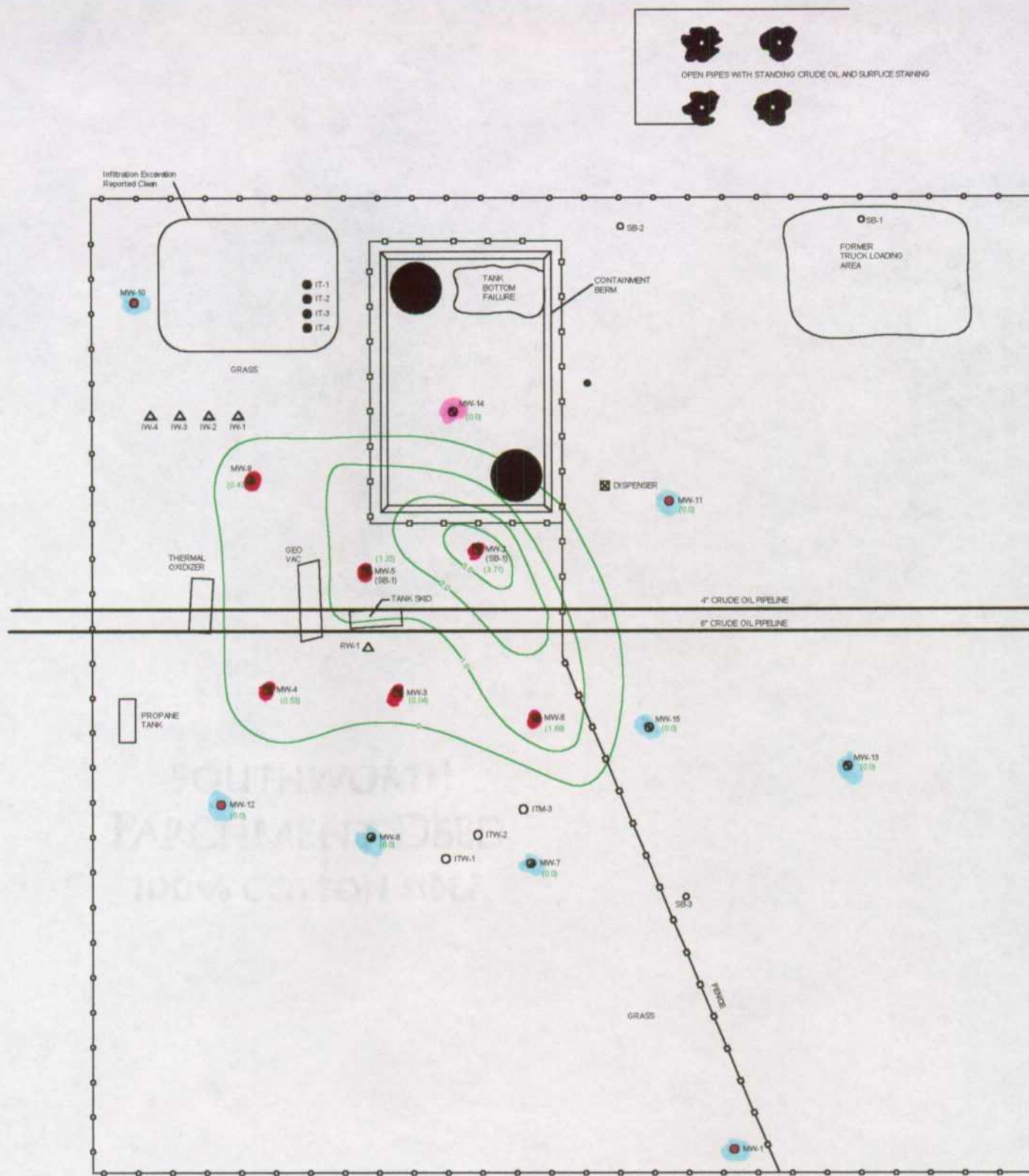
- △ Recovery well installed by KEI 8-20/25-97.
- ETGI proposed boring location 8-17-99.
- △ Injection well installed by KEI on 2-11-97.
- Monitoring well installed by KEI on 6-3/4-97.
- GW Elevations
- SOIL Boring-drilled 6-31-99

Figure 2
Inferred Ground Water
Contours 7 / 19 / 99

Townsend Release Site
Lovington, NM

Environmental Technology
Group, INC.

Scale: 1" = 25'	Prep By: RS	Checked By: JT
August 19, 1999	Project # EOT 1016C	



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- Monitoring well installed by KEI on 6-3/4-97.
- PSH Contours
- SOIL Boring-drilled 8-31-99

Figure 3
Inferred Distribution of
PSH 7 / 19 / 99

Townsend Release Site
Lovington, NM

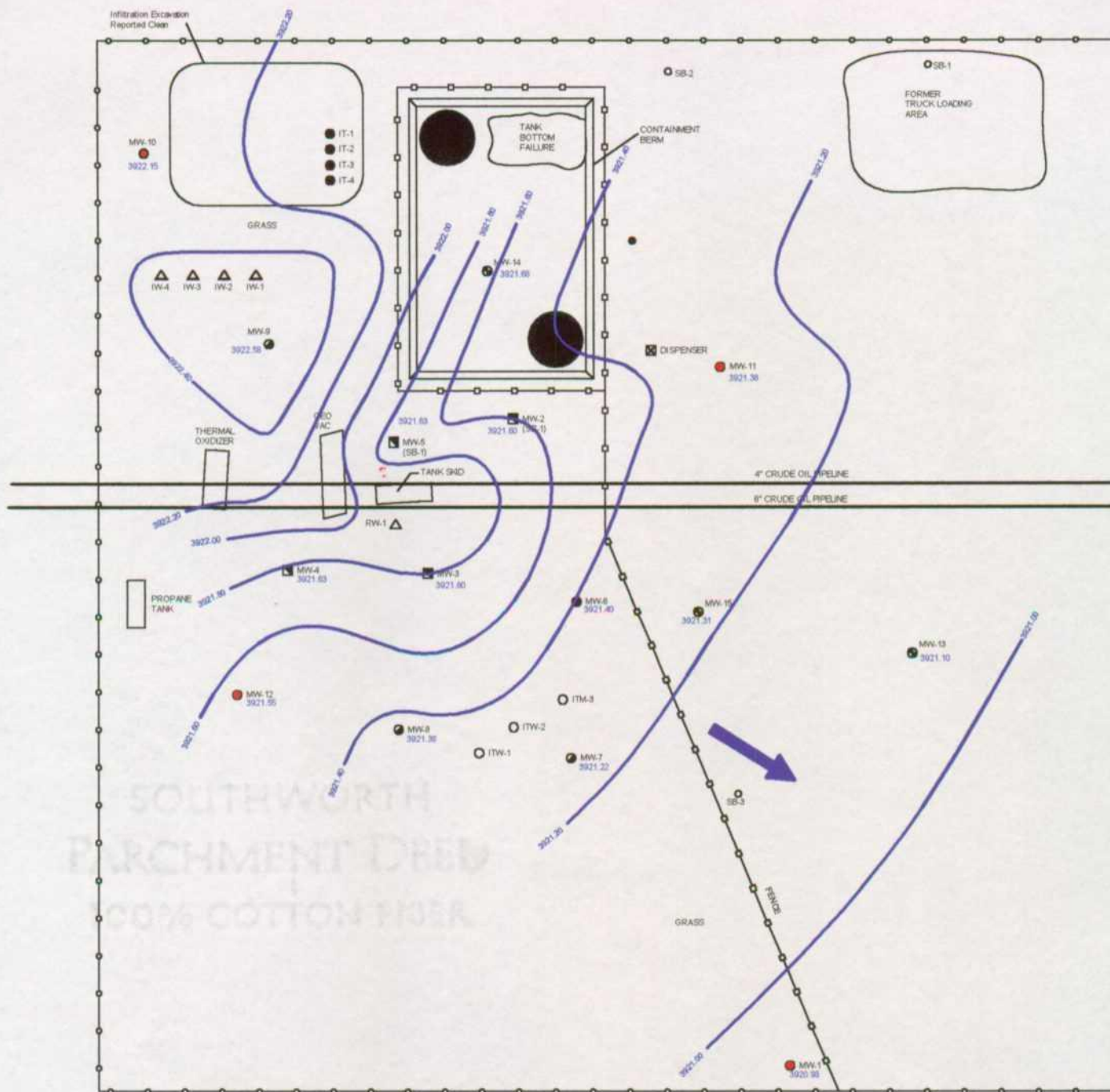
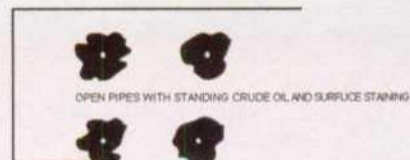
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Scale: 1" = 25'
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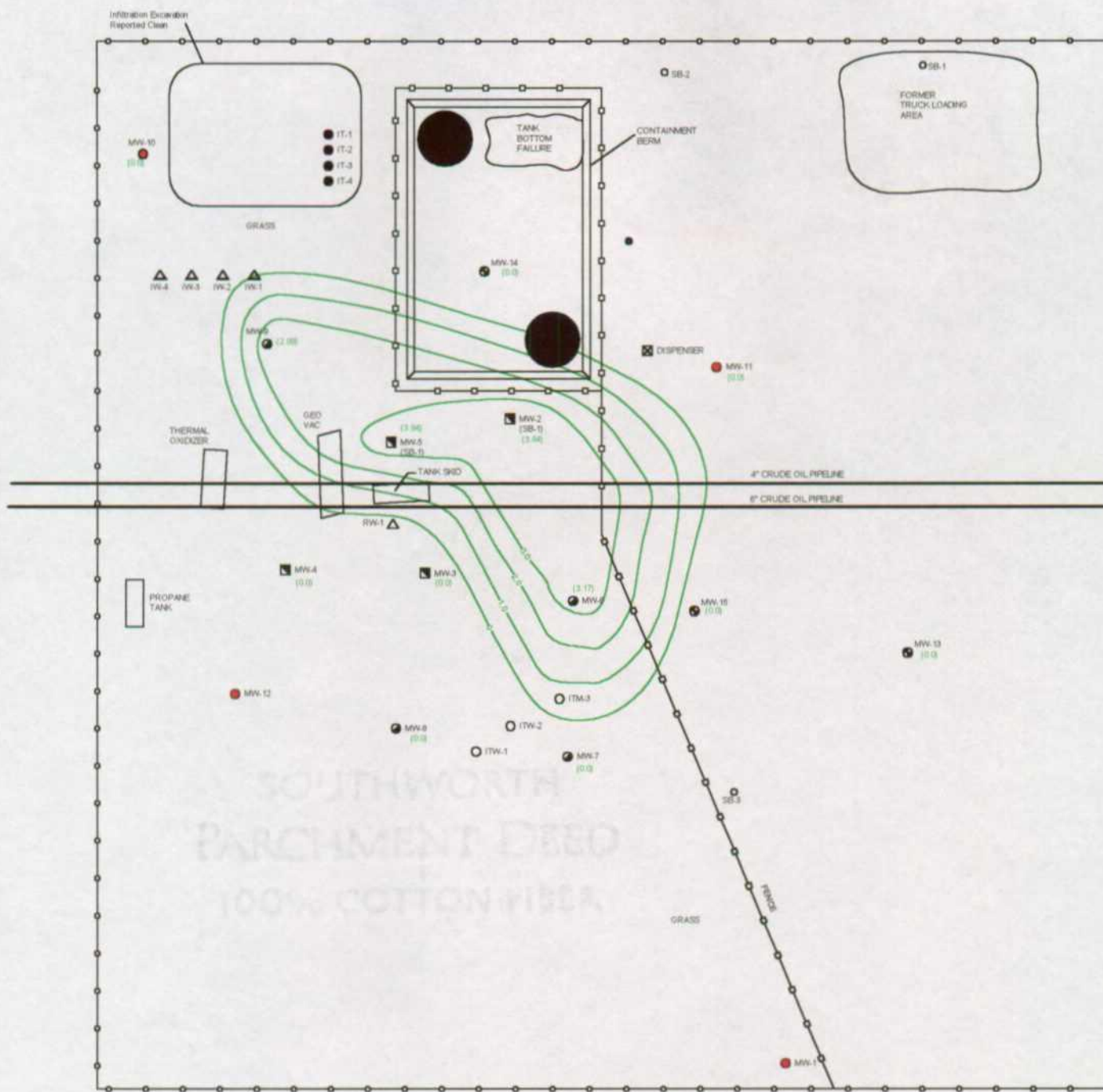
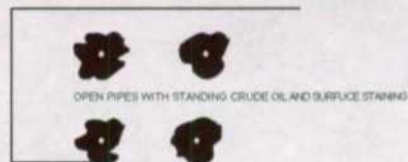
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- GW Elevations
- SOIL Boring-drilled 8-31-99

Figure 4
Inferred Ground water
Contours 10 / 10 / 99

Townsend Release Site
Lovington, NM

**Environmental Technology
Group, INC.**

Scale: 1" = 25'	Prep By: RS	Checked By: JT
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- ⊙ Monitoring well installed by KEI on 8-27/28-97, 9-2-97.
- Monitoring well installed by KEI on 12-10/12/14-97.
- ⊙ ETGI Monitoring well- drilled 8-30/31-99

- △ Recovery well installed by KEI 8-20/25-97.
- ETGI proposed boring location 8-17-99.
- △ Injection well installed by KEI on 2-11-97.
- ⊙ Monitoring well installed by KEI on 6-3/4-97.
- GW Elevations
- SOIL Boring-drilled 8-31-99

Figure 5
Inferred Distribution of
PSH 10 / 10 / 99

Townsend Release Site
Lovington, NM

Environmental Technology
Group, INC.

Scale: 1" = 25'	Prep By: RS	Checked By: JT
August 19, 1999	Project # EOT 1016C	

TABLES

Table 1
Lovington Townsend Site Assessment
Soil Analytical Results
ETGI Project # EOT1014C

SAMPLE	SAMPLE DEPTH	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES	GRO C6-C10 (mg/kg)	DRO >C10-C25 (mg/kg)
MW-13	48'-50'	08/30/99	<0.100	<0.100	<0.100	<0.100	<10	<10
MW-14	45'47'	08/30/99	<0.100	0.198	0.126	0.333	<10	<10
MW15	48'-50'	08/31/99	<0.100	<0.100	<0.100	<0.100	<10	<10
B-1	48'-50'	08/31/99	<0.100	<0.100	<0.100	<0.100	<10	<10
B-2	48'-50'	08/31/99	<0.100	<0.100	<0.100	<0.100	<10	<10
B-3	48'-50'	08/31/99	<0.100	<0.100	<0.100	<0.100	<10	13
Comp. 1		08/31/99	<0.100	<0.100	<0.100	<0.100	<10	16

Methods: EPA SW 846-8020, 5030
EPA SW 846-8015m GRO/DRO

Table 2
Lovington Townsend Site Assessment
Recent Ground Water Elevations
ETGI Project # EOT1014C

WELL NUMBER	CASING ELEVATION	DATE	DTP	DTW	PRODUCT THICKNESS	CORRECTED GW ELEVATION
MW-1	3974.19	7/19/99	N/A	52.90	0.00	3921.29
		9/13/99	N/A	52.98	0.00	3921.21
		10/10/99	N/A	52.95	0.00	3920.93
MW-2	3974.65	7/19/99	52.41	56.12	3.71	3921.68
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	52.47	56.31	3.84	3921.60
MW-3	3974.63	7/19/99	52.97	53.01	0.04	3921.65
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	N/A	52.83	0.00	3921.80
MW-4	3974.55	7/19/99	52.69	53.22	0.53	3921.78
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	N/A	52.92	0.00	3921.63
MW-5	3974.31	7/19/99	52.47	53.70	1.23	3921.66
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	52.47	56.31	3.84	3921.26
MW-6	3974.73	7/19/99	52.90	54.59	1.69	3921.58
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	52.85	56.02	3.17	3921.40
MW-7	3974.66	7/19/99	N/A	53.19	0.00	3921.47
		9/13/99	N/A	53.25	0.00	3921.41
		10/10/99	N/A	53.44	0.00	3921.22
MW-8	3974.48	7/19/99	N/A	N/A	N/A	N/A
		9/13/99	N/A	52.97	0.00	3921.51
		10/10/99	N/A	53.10	0.00	3921.38
MW-9	3975.80	7/19/99	53.98	54.45	0.47	3921.75
		9/13/99	N/A	N/A	N/A	N/A
		10/10/99	52.91	55.00	2.09	3922.58
MW-10	3975.02	7/19/99	N/A	53.02	0.00	3922.00
		9/13/99	N/A	53.08	0.00	3921.94
		10/10/99	N/A	52.87	0.00	3922.15
MW-11	3975.30	7/19/99	N/A	53.76	0.00	3921.54
		9/13/99	N/A	53.83	0.00	3921.47
		10/10/99	N/A	53.92	0.00	3921.38

Table 2
Lovington Townsend Site Assessment
Recent Ground Water Elevations
ETGI Project # EOT1014C

WELL NUMBER	CASING ELEVATION	DATE	DTP	DTW	PRODUCT THICKNESS	CORRECTED GW ELEVATION
MW-12	3974.55	7/19/99	N/A	52.72	0.00	3921.83
		9/13/99	N/A	52.82	0.00	3921.73
		10/10/99	N/A	53.00	0.00	3921.55
MW-13	3975.05	7/19/99	N/A	N/A	0.00	N/A
		9/13/99	N/A	53.80	0.00	3921.25
		10/10/99	N/A	53.95	0.00	3921.10
MW-14	3976.17	7/19/99	N/A	N/A	0.00	N/A
		9/13/99	N/A	54.49	0.00	3921.68
		10/10/99	N/A	54.49	0.00	3921.68
MW-15	3974.72	7/19/99	N/A	N/A	0.00	N/A
		9/13/99	N/A	53.34	0.00	3921.38
		10/10/99	N/A	53.41	0.00	3921.31

NOTES:

N/A = Not Applicable

Table 3
Lovington Townsend Site Assessment
Recent Ground Water Chemistry
ETGI Project # EOT1014C

WELL NUMBER	DATE	BENZENE (mg/L) Det. Limit 0.001	TOLUENE (mg/L) Det. Limit 0.001	ETHYLBENZENE (mg/L) Det. Limit 0.001	XYLENES (mg/L) Det. Limit 0.001
MW-1	7/19/99	ND	ND	ND	ND
MW-2	7/19/99	ND	ND	ND	ND
MW-3	7/19/99	ND	ND	ND	ND
MW-4	7/19/99	ND	ND	ND	ND
MW-5	7/19/99	ND	ND	ND	ND
MW-6	7/19/99	ND	ND	ND	ND
MW-7	7/19/99	ND	ND	ND	ND
MW-8	7/19/99	ND	ND	ND	ND
MW-9	7/19/99	ND	ND	ND	ND
MW-10	7/19/99	ND	ND	ND	ND
MW-11	7/19/99	ND	ND	ND	ND
MW-12	7/19/99	ND	ND	ND	ND
MW-13	7/19/99	ND	ND	ND	ND
MW-14	7/19/99	0.02	0.02	0.00	0.01
MW-15	7/19/99	ND	ND	ND	ND

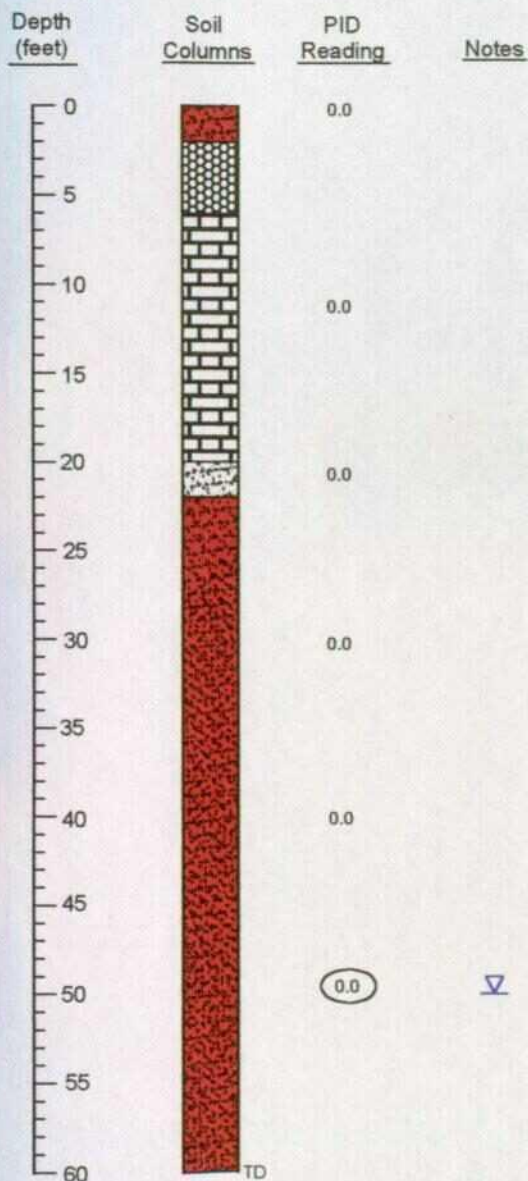
NOTES:

N/A = Not Applicable

N/D = Non Detect

APPENDIX A

Monitoring Well MW-13



Monitoring Well Details

Date Drilled	10 - 30 - 99
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20 ft
Depth of PVC Well	60 ft
Depth of Exploratory Well	60 ft
Depth to Ground Water	52 ft

○ Indicates samples selected for laboratory analysis.



Grout Surface Seal



Bentonite Pellet Seal



Sand Pack



Screen

Legend



Sand - (SW) - White, Tan, coarse grained, well graded, grading to gravel in parts



Sand - (SP) - Light Brown, very fine grained, silty, well sorted, calcaceous with caliche nodules



Limestone - Light Brown, Brown hard dense microcrystalline, grading to micrite in part



Caliche



Indicates the PSH level measured on date.



Indicates the ground water level measured on date.



PID Head-space reading in ppm obtained with a photo-ionization detector.



ND Indicates the constituent was not detected

Legend

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.010 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked slick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 13

EOTT Energy Corp. TMN 97 - 04 Loveington, NM

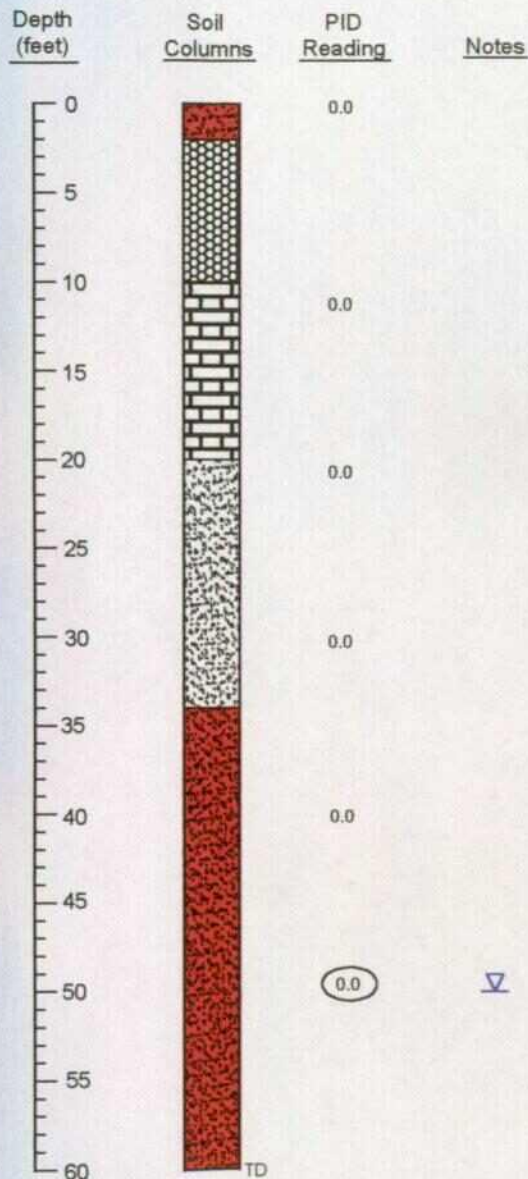


Environmental Technology Group, Inc.

Scale: NTS Prep By: RS Checked By: JT

November 12, 1999 ETGI Project # EOT 1016C

Monitoring Well MW-14



Monitoring Well Details

Date Drilled	10 - 30 - 99
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20 ft
Depth of PVC Well	60 ft
Depth of Exploratory Well	60 ft
Depth to Ground Water	52 ft

○ Indicates samples selected for laboratory analysis.

▽ Indicates Grout Surface Seal

▨ Indicates Bentonite Pellet Seal

□ Indicates Sand Pack

▤ Indicates Screen

Legend

- Sand - (SW) - White, Tan, coarsegrained, well graded, grading to gravel in parts
- Sand - (SP) - Light Brown, very fine grained, silty, well sorted, calcareous with caliche nodules
- Limestone - Light Brown, Brown hard dense microcrystalline, grading to micrite in part
- Caliche

▽ Indicates the PSH level measured on date.

⚡ Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

ND Indicates the constituent was not detected

Legend

- The monitoring well was installed on date using air rotary drilling techniques.
- The well was constructed with 2" ID, 0.010 inch factory slotted, threaded joint, schedule 40 PVC pipe.
- The well is protected with a locked slick up steel cover and a compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 14

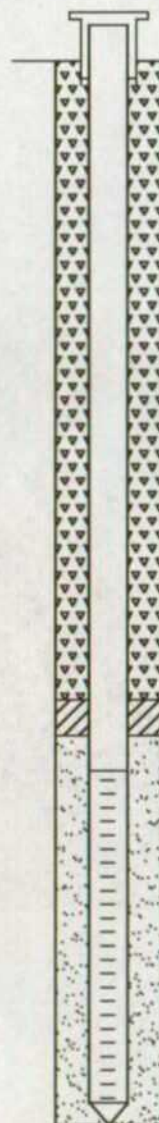
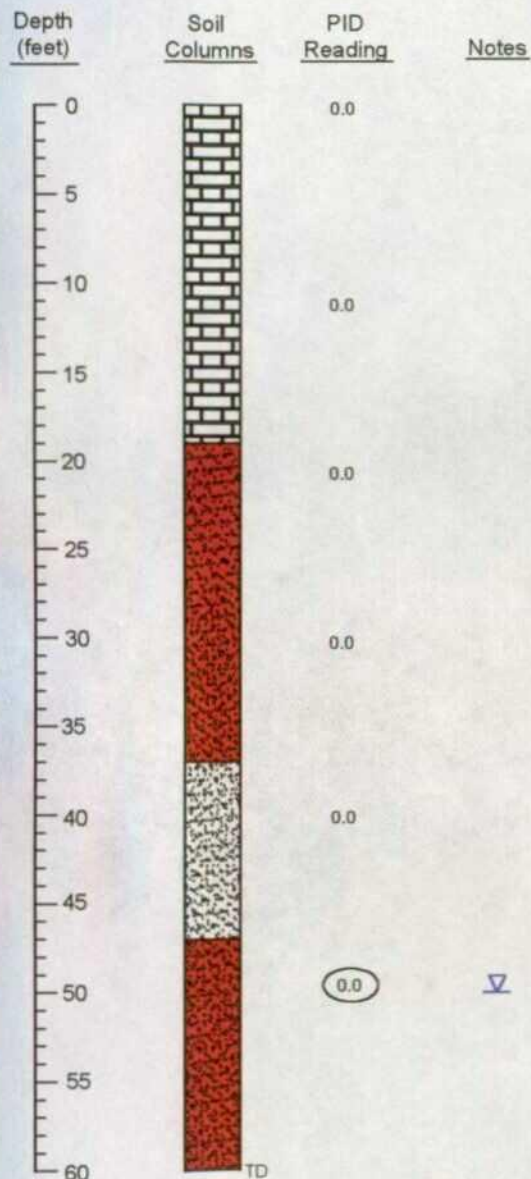
EOTT Energy Corp. TMN 97 - 04 Loveington, NM



**Environmental Technology
Group, Inc.**

Scale: NTS	Prep By: RS	Checked By: JT
November 12, 1999 ETGI Project # EOT 1016C		

Monitoring Well MW-15



Monitoring Well Details

Date Drilled	10 - 30 - 99
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20 ft
Depth of PVC Well	60 ft
Depth of Exploratory Well	60 ft
Depth to Ground Water	52 ft

○ Indicates samples selected for laboratory analysis.

▽ Grout Surface Seal

▨ Bentonite Pellet Seal

□ Sand Pack

▤ Screen

Legend

- Sand - (SW) - White, Tan, coarsegrained, well graded, grading to gravel in parts
- Sand - (SP) - Light Brown, very fine grained, silty, well sorted, calcareous with caliche nodules
- Limestone - Light Brown, Brown hard dense microcrystalline, grading to micrite in part
- Caliche

▽ Indicates the PSH level measured on date.

▽ Indicates the ground water level measured on date.

PID Head-space reading in ppm obtained with a photo-ionization detector.

ND Indicates the constituent was not detected

Legend

- The monitoring well was installed on date using air rotary drilling techniques.
- The well was constructed with 2" ID, 0.010 inch factory slotted, threaded joint, schedule 40 PVC pipe.
- The well is protected with a locked slick up steel cover and a compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 15

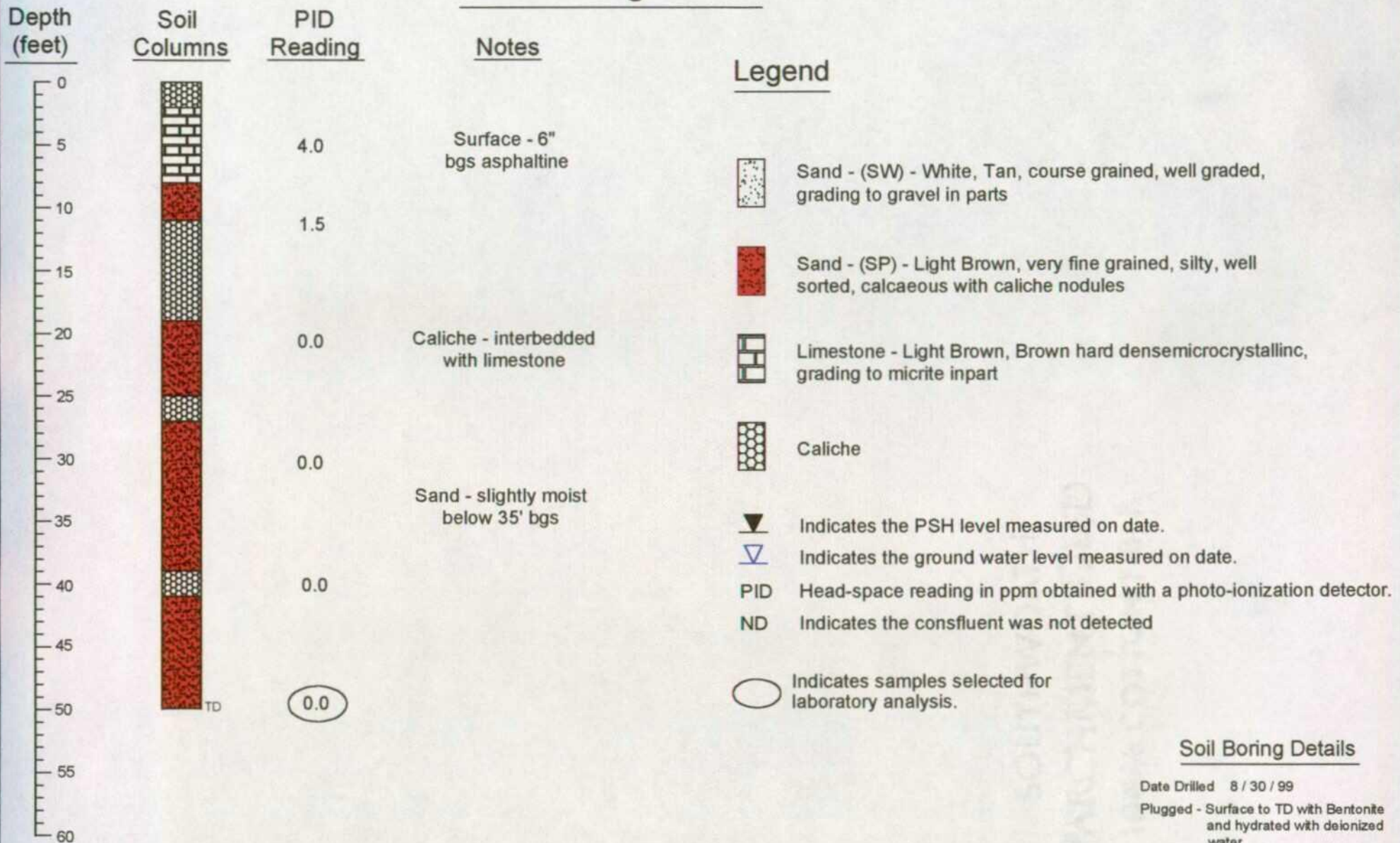
EOTT Energy Corp. TMN 97 - 04 Loveington, NM



**Environmental Technology
Group, Inc.**

Scale: NTS	Prep By: RS	Checked By: JT
November 12, 1999		ETGI Project # EOT 1016C

Soil Boring SB - 1



Soil Boring Details

Date Drilled 8 / 30 / 99

Plugged - Surface to TD with Bentonite and hydrated with deionized water

Soil Boring Log Details

Soil Boring SB - 1

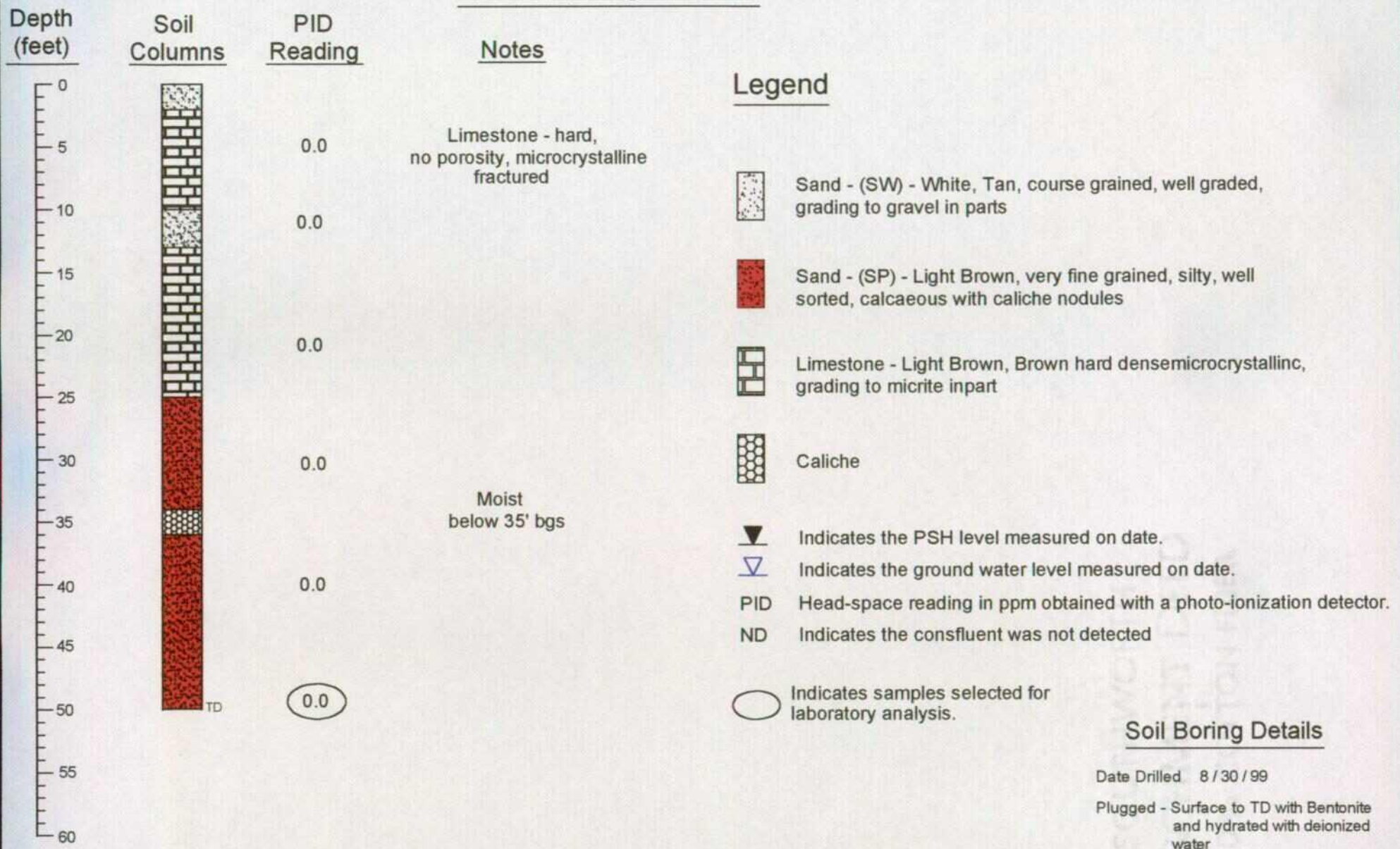
EOTT Energy Corp. TMN 97 - 04 Loveington, NM



Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JT
November 12, 1999		ETGI Project # EOT 1016C

Soil Boring SB - 2



Soil Boring Log Details

Soil Boring SB - 2

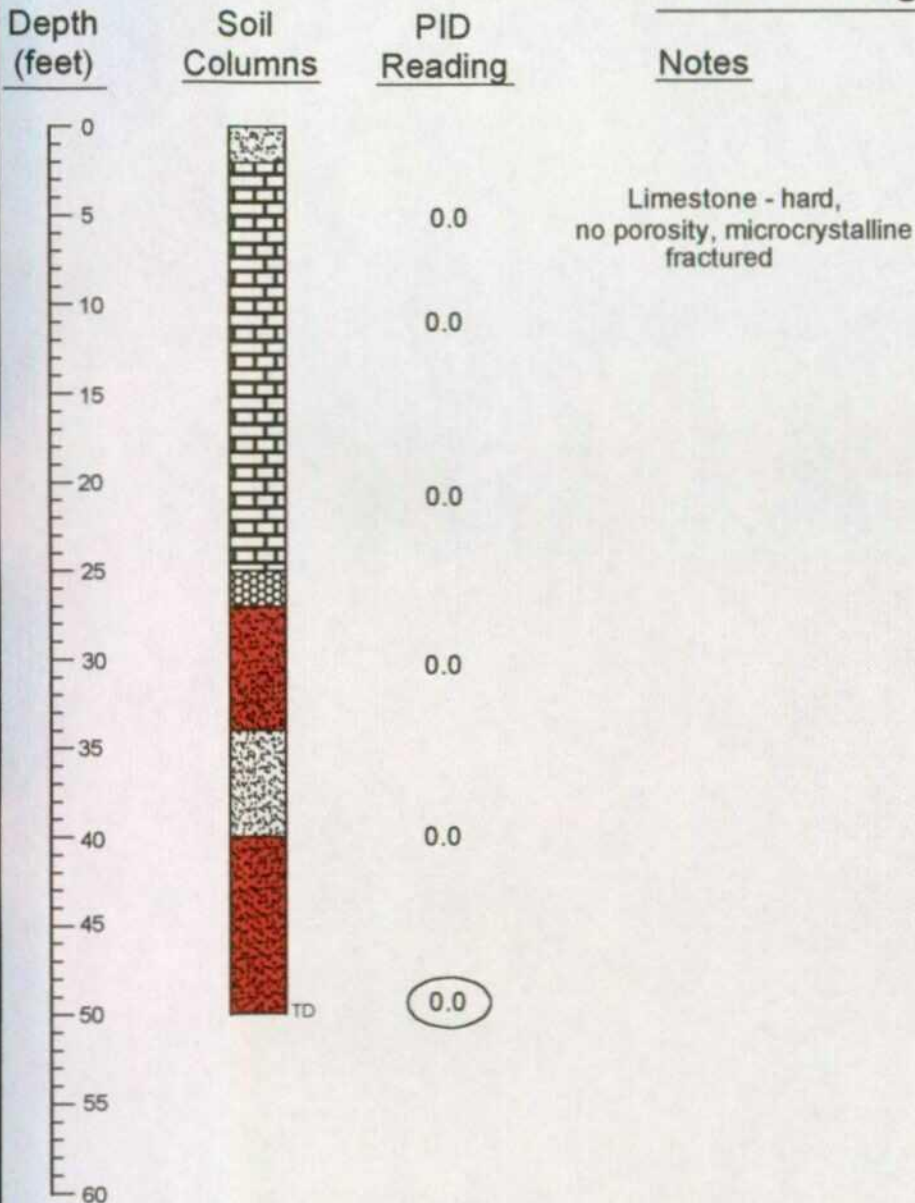
EOTT Energy Corp. TMN 97 - 04 Loveington, NM



Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JT
November 12, 1999	ETGI Project # EOT 1015C	

Soil Boring SB - 3



Legend



Sand - (SW) - White, Tan, coarse grained, well graded, grading to gravel in parts



Sand - (SP) - Light Brown, very fine grained, silty, well sorted, calcaeous with caliche nodules



Limestone - Light Brown, Brown hard dense microcrystalline, grading to micrite in part



Caliche



Indicates the PSH level measured on date.



Indicates the ground water level measured on date.

PID

Head-space reading in ppm obtained with a photo-ionization detector.

ND

Indicates the consfluent was not detected



Indicates samples selected for laboratory analysis.

Soil Boring Details

Date Drilled 8 / 30 / 99

Plugged - Surface to TD with Bentonite and hydrated with deionized water

Soil Boring Log Details

Soil Boring SB - 3

EOTT Energy Corp. TMN 97 - 04 Loveington, NM



Environmental Technology Group, Inc.

Scale: NTS Prep By: RS Checked By: JT
November 12, 1999 ETGI Project # EOT 1016C

APPENDIX B

P. 01

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

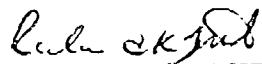
Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: EOT 1014C
Project Name: Lovington/ Townsend Site Assessment
Project Location: None Given

Sampling Date: See Below
Receiving Date: 09/09/99
Analysis Date: 09/09/99

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)	Sample Date
19887	MW-13-48'-50'	<0.100	<0.100	<0.100	<0.100	<0.100	8/30/99
19888	MW-14-45'-47'	<0.100	0.198	0.128	0.229	0.104	8/30/99
19889	MW-15-48'-50'	<0.100	<0.100	<0.100	<0.100	<0.100	8/31/99
19890	B-1-48'-50'	<0.100	<0.100	<0.100	<0.100	<0.100	8/31/99
19891	B-2-48'-50'	<0.100	<0.100	<0.100	<0.100	<0.100	8/31/99
19892	B-3-48'-50'	<0.100	<0.100	<0.100	<0.100	<0.100	8/31/99
19893	Comp. 1	<0.100	<0.100	<0.100	<0.100	<0.100	8/31/99

% IA	96	91	92	92	91
% EA	97	98	89	94	91
BLANK	<0.100	<0.100	<0.100	<0.100	<0.100

METHODS: EPA SW 846-8020.5030


Randal K. Tuttle

9-10-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

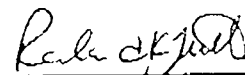
Sample Type: Soil
Sample Condition: Intact/Iced
Project #: EOT 1014C
Project Name: Lovington/ Townsend Site Assessment
Project Location: None Given

Sampling Date: See Below
Receiving Date: 09/09/99
Analysis Date: 09/09/99

ELT#	FIELD CODE	GRO	DRO	Sample Date
		C6-C10 (mg/kg)	>C10-C25 (mg/kg)	
19887	MW-13-48'-50'	<10	<10	8/30/99
19888	MW-14-45'-47'	<10	<10	8/30/99
19889	MW-15-48'-50'	<10	<10	8/31/99
19890	B-1-48'-50'	<10	<10	8/31/99
19891	B-2-48'-50'	<10	<10	8/31/99
19892	B-3-48'-50'	<10	13	8/31/99
19893	Comp. 1	<10	16	8/31/99

%INSTRUMENT ACCURACY	112	112
% EXTRACTION ACCURACY	112	112
BLANK	<10	<10

Methods: EPA SW 846-8015M GRO/DRO


Raland K. Tuttle

9-13-99
Date

ENVIRONMENTAL LAB OF , Inc.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310
FAX: 970-461-1058

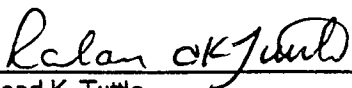
Sample Type: Water
Sample Condition: Intact/ Iced/HCl
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.

Sampling Date: 09/14/99
Receiving Date: 09/15/99
Analysis Date: 09/15/99

ELT#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)
20012	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
20013	MW-10	<0.001	<0.001	<0.001	<0.001	<0.001
20014	MW-11	<0.001	<0.001	<0.001	<0.001	<0.001
20015	MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
20016	MW-13	<0.001	<0.001	<0.001	<0.001	<0.001
20017	MW-14	0.019	0.016	0.003	0.008	0.004
20018	MW-15	<0.001	<0.001	<0.001	<0.001	<0.001

% IA	96	92	92	90	91
% EA	99	93	94	94	94
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8020,5030


Raland K. Tuttle

9-27-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

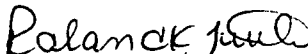
Sample Type: Water
Sample Condition: Intact/ Iced/HCl
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.

Sampling Date: 09/16/99
Receiving Date: 09/17/99
Analysis Date: 09/17/99

ELT#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)
20096	MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
20097	MW-8	<0.001	<0.001	<0.001	<0.001	<0.001

% IA	101	95	96	95	94
% EA	94	90	91	90	89
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8020,5030


Raland K. Tuttle

9-23-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

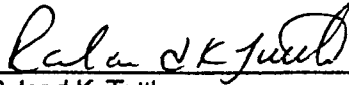
Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.

Sampling Date: 09/14/99
Receiving Date: 09/15/99
Analysis Date: See Below

ELT#	FIELD CODE	Sulfate mg/L	Chloride mg/L	Carbonate mg/L	Bicarbonate mg/L	TDS mg/L
20016	MW-13	120	53	0	150	451
20017	MW-14	121	35	0	225	473
20018	MW-15	134	53	0	175	458

QUALITY CONTROL	55.1	5052	*	*	*
TRUE VALUE	50.0	5000	*	*	*
% PRECISION	110	101	*	*	*
ANALYSIS DATE	9/21/99	9/17/99	9/21/99	9/21/99	9/20/99

METHODS: EPA 375.4, 325.3, 310, 160.1


Raland K. Tuttle

9-27-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.
Field Code: MW-15

Sampling Date: 09/14/99
Receiving Date: 09/15/99
Extraction Date: 09/20/99
Analysis Date: 09/23/99

EPA SW846 8270 (mg/l)	REPORT LIMIT	ELT# 20018	RPD	%EA	%IA
Naphthalene	0.005	ND			86
Acenaphthylene	0.005	ND			88
Acenaphthene	0.005	ND	5.41	36	86
Fluorene	0.005	ND			86
Phenanthrene	0.005	ND			88
Anthracene	0.005	ND			86
Fluoranthene	0.005	ND			90
Pyrene	0.005	ND	3.08	32	82
Benzo[a]anthracene	0.005	ND			86
Chrysene	0.005	ND			90
Benzo[b]fluoranthene	0.005	ND			80
Benzo[k]fluoranthene	0.005	ND			88
Benzo [a]pyrene	0.005	ND			86
Indeno[1,2,3-cd]pyrene	0.005	ND			96
Dibenz[a,h]anthracene	0.005	ND			108
Benzo[g,h,i]perylene	0.005	ND			96

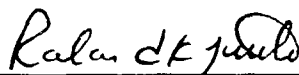
% RECOVERY

Nitrobenzene-d5 SURR
2-Fluorobiphenyl SURR
Terphenyl-d14 SURR

56
59
34

ND= NOT DETECTED

Method: EPA SW 846 8270C , 3510


Raland K. Tuttle

9-27-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.
Field Code: MW-14

Sampling Date: 09/14/99
Receiving Date: 09/15/99
Extraction Date: 09/20/99
Analysis Date: 09/23/99

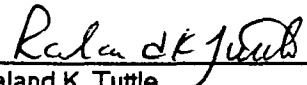
EPA SW846 8270 (mg/l)	REPORT LIMIT	ELT# 20017	RPD	%EA	%IA
Naphthalene	0.005	ND			86
Acenaphthylene	0.005	ND			88
Acenaphthene	0.005	ND	5.41	36	86
Fluorene	0.005	ND			86
Phenanthrene	0.005	ND			88
Anthracene	0.005	ND			86
Fluoranthene	0.005	ND			90
Pyrene	0.005	ND	3.08	32	82
Benzo[a]anthracene	0.005	ND			86
Chrysene	0.005	ND			90
Benzo[b]fluoranthene	0.005	ND			80
Benzo[k]fluoranthene	0.005	ND			88
Benzo[a]pyrene	0.005	ND			86
Indeno[1,2,3-cd]pyrene	0.005	ND			96
Dibenz[a,h]anthracene	0.005	ND			108
Benzo[g,h,i]perylene	0.005	ND			96

% RECOVERY

Nitrobenzene-d5 SURR 55
2-Fluorobiphenyl SURR 58
Terphenyl-d14 SURR 36

ND= NOT DETECTED

Method: EPA SW 846 8270C . 3510


Randal K. Tuttle

9-27-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.
Field Code: MW-13

Sampling Date: 09/14/99
Receiving Date: 09/15/99
Extraction Date: 09/20/99
Analysis Date: 09/23/99

EPA SW846 8270 (mg/l)	REPORT LIMIT	ELT# 20016	RPD	%EA	%IA
Naphthalene	0.005	ND			86
Acenaphthylene	0.005	ND			88
Acenaphthene	0.005	ND	5.41	36	86
Fluorene	0.005	ND			86
Phenanthrene	0.005	ND			88
Anthracene	0.005	ND			86
Fluoranthene	0.005	ND			90
Pyrene	0.005	ND	3.08	32	82
Benzo[a]anthracene	0.005	ND			86
Chrysene	0.005	ND			90
Benzo[b]fluoranthene	0.005	ND			80
Benzo[k]fluoranthene	0.005	ND			88
Benzo [a]pyrene	0.005	ND			86
Indeno[1,2,3-cd]pyrene	0.005	ND			96
Dibenz[a,h]anthracene	0.005	ND			108
Benzo[g,h,i]perylene	0.005	ND			96

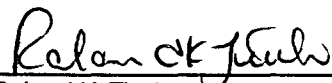
% RECOVERY

Nitrobenzene-d5 SURR
2-Fluorobiphenyl SURR
Terphenyl-d14 SURR

46
49
42

ND= NOT DETECTED

Method: EPA SW 846 8270C, 3510


Raland K. Tuttle

9-27-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310

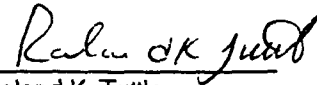
Sample Type: Water
Sample Condition: Intact/Iced/HCl
Project #: TNM 97-04
Project Name: Townsend
Project Location: Lea County, N.M.

Sample Date: 09/14/99
Receiving Date: 09/15/99
Analysis Date: 09/21/99
Analysis Date: Hg 9/17/99
Analysis Date: Mo,Sn,B,Sr 9/29/99

Analyte (mg/L)	MW-13 20016	MW-14 20017	MW-15 20018	Reporting Limit	%IA	%EA	BLANK	RPD
Aluminum	0.6510	0.2960	10.70	0.0500	94	99	<0.0500	17.10
Arsenic	0.0060	ND	0.0070	0.0050	98	102	<0.0050	0.00
Barium	0.0840	0.0760	0.5530	0.0100	85	93	<0.0100	0.52
Beryllium	ND	ND	ND	0.0040	90	100	<0.0040	0.00
Cadmium	ND	ND	ND	0.0010	90	98	<0.0010	0.00
Calcium	81.40	89.20	282.0	1.000	*	*	<1.000	0.42
Chromium	ND	ND	0.0190	0.0050	92	101	<0.0050	0.49
Cobalt	ND	ND	ND	0.0200	88	95	<0.0200	0.21
Copper	ND	ND	ND	0.0100	86	92	<0.0100	0.00
Iron	0.3100	0.1430	6.370	0.0500	90	105	<0.0500	53.38
Lead	ND	ND	ND	0.0030	94	108	<0.0030	3.64
Magnesium	12.00	14.40	18.80	1.000	*	*	<1.000	0.90
Manganese	0.0320	0.0470	0.1680	0.0150	91	100	<0.0150	8.44
Mercury	ND	ND	ND	0.00020	102	108	<0.00020	5.71
Molybdenum	ND	ND	ND	0.050	101	*	<0.050	N/A
Nickel	ND	ND	0.0120	0.0100	91	98	<0.0100	0.41
Potassium	2.850	2.300	4.160	1.000	*	*	<1.000	N/A
Selenium	0.0070	0.0060	ND	0.0050	104	104	<0.0050	3.92
Silver	ND	ND	ND	0.0050	80	82	<0.0050	2.41
Sodium	52.90	29.60	42.70	1.000	*	*	<1.000	0.32
Tin	ND	ND	ND	0.0500	90	*	<0.0500	N/A
Vanadium	0.0310	0.0350	0.0740	0.0200	85	93	<0.0200	0.21
Zinc	ND	ND	0.0790	0.0200	91	96	<0.0200	3.15
Boron	0.154	0.124	0.237	0.050	97	*	<0.050	N/A
Strontium	0.439	0.622	0.709	0.050	89	*	<0.050	N/A

ND = Below Reporting Limit

METHOD: EPA SW846-6010B, 7470


Raland K. Tuttle

9-30-99
Date

Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

POC: 018

Project Manager:

Phone #: (915) 664-9166

FAX #:

JESSE TAYLOR

ANALYSIS REQUEST

Company Name & Address:

ETGI

P.O. Box 4845 MIDLAND, TX 79704

Project #:

TNM 97-04

Project Name:

TOWNSEND

Project Location:

LEA COUNTY NM

Sampler Signature:

Ken Dutton

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX					PRESERVATIVE METHOD					SAMPLING		DATE	TIME	BTX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	PAH (8100 or 8270)	TDS (1601)	ANIONS (300)	CATIONS (6010)	HEAVY METALS (ICP SCAP)	(6010)
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	1999																	
20012	MW-1	2	V	X					X	X				9-14	1555	X															
20013	MW-10	2	V												1525																
20014	MW-11	2	V												1645																
20015	MW-12	2	V												1545																
20016	MW-13	7	V-5							X					1620										X	X	X	X	X		
20017	MW-14	7													1535																
20018	MW-15	7													1610																

Relinquished by:

Ken Dutton

Date:

15 SEP 99

Time:

1045

Received by:

Received by:

Received by Laboratory:

REMARKS

RESULTS:

KEN DUTTON
1606 W. CALLE SUR, APT B
HOBBBS, NM 88240-0985

Relinquished by:

Date:

Time:

10:45

Celia Keene

INVOICE: LENNAH FROST 1015M

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

COC: 021

Phone #: (915) 664-9166

ANALYSIS REQUEST

ETGI

P.O. Box 4845 MIDLAND, TX 79704

Project Name :

TNM 97-04

TOWNSEND

Sampler Signatures:

LEA COUNTY NM

Sampler Signature: 

BTX 812075030

TPH 418.1

TCLP Metals Ag As Ba Cd Cr Pb Hg Se

Total Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TTCLP Semi Volatiles

TDS

RCI

[illegible]

9-17-99

1500

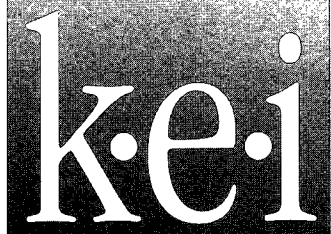
Rule of K-point

Received by:

Received by Laboratory

KEN DUTTON
1606 W. CALLE SUR, APT B
140385, NM 88240 - 0785

INVOICE: LENNY FROM PO# 101579



RECEIVED

APR 05 1999

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

ANNUAL MONITORING REPORT

TNM-97-04

**UNIT I, SEC. 11, TOWNSHIP 16 SOUTH, RANGE 35 EAST
TEXAS - NEW MEXICO PIPE LINE COMPANY
LOVINGTON, LEA COUNTY, NEW MEXICO**



5309 Wurzbach, Suite 100
San Antonio, Texas 78238
(210) 680-3767
(210) 680-3763 FAX

ANNUAL MONITORING REPORT

**TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04**

**UNIT I, SEC. 11, TOWNSHIP 16 SOUTH, RANGE 35 EAST
LOVINGTON, LEA COUNTY, NEW MEXICO**

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY
P. O. Box 1030
Jal, New Mexico 88252

Mr. Tony Savoie

PREPARED BY:

KEI

T. Shawn White
Project Manager

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Project Manager

Michael J. Lewis, P.E.

TABLE OF CONTENTS

INTRODUCTION	1
CHRONOLOGY OF EVENTS	1
GROUND WATER MONITORING	4
FIELD ACTIVITIES	
LABORATORY RESULTS	
GROUND WATER GRADIENT	
REMEDATION SYSTEM MONITORING	5
BELOW GRADE LINE TESTING	6
SUMMARY	6

FIGURES

- FIG. 1 - SITE DETAILS
- FIG. 2 - GROUND WATER CONTOURS MAP-MARCH 1998
- FIG. 3 - GROUND WATER CONTOURS MAP-JUNE 1998
- FIG. 4 - GROUND WATER CONTOURS MAP-SEPTEMBER 1998
- FIG. 5 - GROUND WATER CONTOURS MAP-DECEMBER 1998
- FIG. 6 - PSH THICKNESS MAP - MARCH 1998
- FIG. 7 - PSH THICKNESS MAP - JUNE 1998
- FIG. 8 - PSH THICKNESS MAP - SEPTEMBER 1998
- FIG. 9 - PSH THICKNESS MAP - DECEMBER 1998
- FIG. 10 - BENZENE CONCENTRATION MAP - MARCH 1998
- FIG. 11 - BENZENE CONCENTRATION MAP - DECEMBER 1998
- FIG. 12 - BTEX CONCENTRATION MAP - MARCH 1998
- FIG. 13 - BTEX CONCENTRATION MAP - DECEMBER 1998
- FIG. 14 - GENERALIZED GEOVAC™ SCHEMATIC
- FIG. 15 - INFILTRATION GALLERY DETAILS
- FIG. 16 - MONTHLY AND CUMULATIVE RECOVERY
- FIG. 17 - CRUDE OIL REMOVED
- FIG. 18 - VOLUME OF TREATED REINJECTED GROUND WATER

TABLES

- GENERAL NOTES
- TABLE I - SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX/PAH
- TABLE II - SUMMARY OF GROUND WATER LABORATORY RESULTS - METALS
- TABLE III - SUMMARY OF GROUND WATER MONITORING
- TABLE IV - SUMMARY OF REMEDIATION SYSTEM LABORATORY RESULTS
- TABLE V - SUMMARY OF MONTHLY AND CUMULATIVE RECOVERY
- TABLE VI - SUMMARY OF REMEDIATION SYSTEM EFFLUENT DATA
- TABLE VII - SUMMARY OF INFLUENT REMEDIATION SYSTEM MONITORING PARAMETERS

TABLE OF CONTENTS

APPENDICES

- APPENDIX A - GROUND WATER ASSESSMENT
Certified Laboratory Reports & Chain-of-Custody Documentation
- APPENDIX B - SYSTEM SAMPLING DATA
Certified Laboratory Reports & Chain-of-Custody Documentation
QA/QC Procedures
- APPENDIX C - WASTE MANIFESTS
- APPENDIX D - BELOW GRADE LINE TESTING RESULTS

INTRODUCTION

This annual report has been prepared in compliance with the New Mexico Oil Conservation Division (OCD) letter of May 28, 1998, requiring submittal of an annual report by April 1 of each year. The report presents results of ground water monitoring and remediation monitoring activities conducted for the Texas - New Mexico Pipe Line Company (TNMPL) Townsend Site TNM-97-04, located approximately 2 miles west of Lovington in Lea County, New Mexico, in Unit I, Section 11, Township 16 South, Range 35 East.

This report addresses all activities conducted for the annual period of 1998. Ground water monitoring was conducted during four quarterly events in 1998 to assess the levels and extent of petroleum hydrocarbon constituents, total metals, polycyclic aromatic hydrocarbons (PAH) and mercury in ground water. The ground water monitoring events consisted of measuring static water levels in the monitoring wells, checking for the presence of phase-separate hydrocarbons (PSH), and purging and sampling of each well exhibiting sufficient recharge. Monitoring wells containing measurable levels of PSH were not sampled.

This report also presents a brief operational summary of the ground water recovery and treatment remediation system operated at the site during the annual period. The GeoVacTM vacuum withdrawal system was installed to recover PSH and contaminated ground water from monitoring wells MW-2 through MW-6, MW-9, and recovery well RW-1. The system is equipped with a treatment unit that removes contaminant concentrations from ground water prior to discharging the treated water through a 500 bbl tank to a series of injection wells to the subsurface in accordance with 20 NMAC 6.2.

CHRONOLOGY OF EVENTS

A chronological listing of significant events and activities is presented below.

1997

- 06/03-05/97 Installed monitoring well MW-1 through MW-5.
- 06/18/97 Performed a ground water monitoring and sampling event.
- 08/25 - 09/02/97 Installed MW-6 through MW-9 and recovery well RW-1.
- 09/10/97 Performed a ground water monitoring and sampling event.
- 12/04/97 Performed a ground water monitoring and sampling event.
- 12/10-14/97 Installed MW-10 through MW-12 and injection wells ITW-1 through ITW-3.
Performed a ground water monitoring and sampling event.
- 12/18/97 Performed a ground water monitoring and sampling event.

1998

- 01/6-10/98 Performed Operation and Maintenance procedures on the remediation system (O&M). Weekly gauging of all monitoring/recovery wells and the 500 bbl tank. Approximately 13.86 bbl of crude oil pumped into 500 bbl tank. Installed a Hammerhead pump in RW-1. Performed 5 ground water gauging events.

01/20/98 Removed 23.1 bbl of oil and 319.1 bbl of water from 500 bbl tank.

01/27/98 Performed O&M, and weekly gauging of all monitoring/recovery wells and the 500 bbl tank. Removed all crude oil and water from 55-gallon drums to the 500 bbl tank on site. Approximately 1.98 bbl of crude oil was pumped into the tank, making the total volume of 31.68 bbl.

01/30/98 Removed 38.61 bbl of oil and 318.25 bbl of water from 500 bbl tank.

02/11/98 Performed O&M and weekly gauging of all monitoring/recovery wells. Shut down Hammerhead pump in RW-1.

03/98 Installed a GeoVacTM vacuum withdrawal system and began closed-loop testing.

03/05/98 Performed a ground water monitoring and sampling event.

03/25/98 Weekly gauging of all monitoring wells. Approximately 0.30 bbl of crude oil was pumped into the 500 bbl tank. Approximately 54.75 bbl of crude oil was pumped back into the pipeline.

04/16/98 Weekly gauging of all monitoring wells. Pumped 14.29 bbl of crude oil back into pipeline from RW-1. Approximately 14.29 bbl of crude oil was collected during closed-loop testing and pumped into pipeline.

04/23/98 Installed zeolite and carbon filters on the GeoVacTM system and ran final closed-loop test.

04/28/98 Weekly gauging of all monitoring wells. Started up GeoVacTM system.

04/29 - 05/01/98 Gauged MW-2 through MW-5 and MW-9 to test GeoVacTM system.

05/05/98 Sampled GeoVacTM effluent and system water for BTEX, PAH and phenols.

05/13/98 Sampled GeoVacTM effluent and system water for BTEX, PAH and phenols.

05/18/98 Weekly gauging of all monitoring wells and injection wells. O&M on GeoVacTM system. System was down due to zeolite vessel. GeoVacTM system down from May 18 through May 21.

05/27/98 Weekly gauging of all monitoring wells and 500 bbl tank. System was down due to zeolite vessel. System down through May 28, 1998.

05/28/98 Built zeolite drum filter to replace zeolite vessel. Hooked-up clay/carbon filter and zeolite drum and restarted system.

05/29/98 Performed O&M. Sampled GeoVacTM effluent and system water for BTEX, PAH, and phenols.

06/01/98 Weekly gauging of all monitoring wells and 500 bbl tank. Crude oil broke through clay/carbon filter. Shut system down.

06/10/98 New shipment of zeolite arrived. Refilled vessel with 2,000 pounds of zeolite.

06/12/98 Two 500 bbl frac tanks delivered to site and plumbing started into GeoVacTM system. System is still offline.

06/17/98 EPCON changed burner and made adjustments to the Thermal Oxidizer.

06/24/98 Performed a ground water monitoring and sampling event.

06/29/98 EPCON personnel adjusted settings on Thermal Oxidizer. Set chart to read Lower Explosive Limit (LEL) not in percentage but in milliamps.

06/30/98 Started remediation system again.

07/01/98 Weekly gauging of MW-1, MW-3 through MW-12 and 500 bbl tank. GeoVac™ System was offline upon arrival. It shut itself off because of high LEL readings. Restarted system.

07/02/98 GeoVac™ system offline upon arrival. Vein switch was activated. Performed O&M. KEI personnel adjusted 6-inch Automax valve from 16% to 19%. Restarted system.

07/06/98 Weekly gauging of all monitoring wells and 500 bbl tank. Performed O&M. Moisture in the compressor is preventing proper operation of the dilution valve. GeoVac™ system continues to shut down operation.

07/12/98 GeoVac™ system is offline. The vein switch was activated. Performed O&M. Changed chart and restarted GeoVac™ system.

07/13/98 Weekly gauging of all monitoring wells except MW-2. Performed O&M. GeoVac™ system offline because the vein switch was activated. Opened 6-inch valve on the Thermal Oxidizer to 25% and removed the plug from the air/water knockout tank.

07/22/98 Changed the 2 Automax valves on the Thermal Oxidizer. Valves are functioning properly.

07/26/98 Wilden pump shut down and the GeoVac™ system is offline.

07/27/98 Weekly gauging of all monitoring wells except MW-5. Gauged RW-1 and 500 bbl tank. Performed O&M. GeoVac™ system offline because crude oil filtered into Zeolite vessel.

08/03/98 Weekly gauging of all monitoring wells. Replaced zeolite and turned system back on.

08/05/98 GeoVac™ system offline upon arrival. Three blown fuses and the Thermal Oxidizer had no power.

08/10/98 Weekly gauging of all monitoring wells (except MW-5) and 500 bbl tank. Installed Yamada pump in lieu of Wilden pump. Placed Wilden pump on the discharge side of the 800 gallon oil/water separator.

08/12/98 KEI installed new card in Thermal Oxidizer and flow returned to chart.

08/19/98 Sampled the effluent carbon, effluent zeolite, effluent air stripper and after Frac tank #69.

09/09/98 Performed tests on wells and GeoVac™ system. Weekly gauging of all monitoring wells.

09/10/98 Performed O&M. Installed pitot tube on 12-inch dilution valve.

09/17/98 Performed ground water monitoring and sampling event.

12/14-15/98 Crude Oil and water removed and placed back pipeline. Weekly gauging of all monitoring/recovery wells and the 500 bbl tank.

12/29/98 Performed ground water monitoring and sampling event.

GROUND WATER MONITORING

FIELD ACTIVITIES

Ground water samples were obtained during four quarterly events from the monitoring wells during the annual period in accordance with OCD requirements. Locations of the monitoring wells are indicated on FIG. 1. All monitoring wells were gauged and checked for the presence of PSH. During each sampling event, the monitoring wells designated to be sampled were purged of approximately 3 well volumes of water or until the wells were dry using a PVC bailer. Ground water was allowed to recharge and samples were obtained using disposable Teflon samplers. Monitoring wells with a measurable presence of PSH were not sampled. Water samples were stored in clean, glass containers provided by the laboratory and placed on ice in the field. Purged water collected during each event was stored in sealed 55-gallon drums on site until disposed by Gandy Corp. of Tatum, New Mexico.

LABORATORY RESULTS

Water samples obtained during each event were mailed to Xenco Laboratories in San Antonio, Texas for determination of benzene, toluene, ethylbenzene and total xylenes (BTEX) concentrations by EPA Method SW846-8020 and 8021B. Ground water samples collected during the first and second quarters of 1998 were also submitted for determination of PAH concentrations by EPA Method 8270. Samples collected in the second quarter were submitted for analysis of total mercury by EPA Method 7470 and New Mexico Water Quality Control Commission (WQCC) metals by ICP EPA Method 6010.

Laboratory results for ground water samples obtained during the 1998 annual period indicated the following concentration ranges:

PARAMETER	CONCENTRATION RANGE (mg/L)
Benzene	ND to 7.5
BTEX	ND to 10.0
Naphthalene	ND to 0.037
Barium	0.08 to 0.11
Boron	0.11 to 0.20
Calcium	102 to 151
Magnesium	14.9 to 18.5
Potassium	1.58 to 2.80
Silicon	20.2 to 22.0
Sodium	28.1 to 42.3
Strontium	0.75 to 0.80

All metals and PAH constituents not listed above were non-detectable (ND) by laboratory methods.

During the most recent monitoring event conducted in December 1998, Benzene and BTEX concentrations were ND.

All metals that were tested during 1998 had concentrations below the New Mexico WQCC standards.

Historical laboratory results are summarized in TABLES I and II. Benzene and BTEX isopleths from the 1st and 4th quarter monitoring events are presented on FIGs. 10 - 13. Copies of the certified laboratory reports and chain-of-custody documentation are presented in APPENDIX A.

GROUND WATER GRADIENT

Ground water elevation contours generated from the quarterly events of 1998 water level measurements indicated a general gradient of approximately 0.002 ft/ft to the southeast. The depth to ground water averaged 54.79 feet below top of casing for the annual period and ranged from 52.93 to 57.34 feet below the top of casing on December 29, 1998. This data is generally consistent with previous information obtained at the site. PSH was detected in MW-2 through MW-6 and MW-9 during the annual period with a thickness ranging from 0.02 to 4.16 feet. Ground water elevation contours were generated for each of the four quarterly events by correcting the gauged ground water elevation for measured thickness of PSH. Ground water contours are presented on FIGs. 2 through 5. PSH thickness maps are presented as FIGs. 6 - 9. Historical ground water measurements are summarized on TABLE III.

REMEDIATION SYSTEM MONITORING

During the annual monitoring period, the ground water recovery and treatment system was operational for approximately 142 days since startup on April 28, 1998. The location and details of the infiltration and remediation system are shown on FIG. 1. The schematic drawing of the GeoVacTM remediation system is presented as FIG. 14. A typical infiltration well detail is presented as FIG. 15. The volume of PSH and water recovered from the site during the annual period is presented below.

PARAMETER	VOLUME (bbl)
Vapor-phase Recovery	218.6
Liquid-phase Recovery	259.8
Total Oil Recovery	478.413
Treated Water Rejected	20,452.1
Water Hauled Off-site	515

Copies of the waste manifests are in APPENDIX C. The GeoVacTM system is connected to RW-1, MW-3, MW-4, and MW-5 on a continuous basis (one of the MWs is disconnected each week on a rotating basis) and MW-2, MW-6, and MW-9 are connected for 15 minutes each week to remove accumulated oil. Cumulative and monthly crude oil recovery values are presented on FIGs. 16 and 17 and TABLE V. The volume of treated water which was reinjected into the ground is presented on FIG. 18 and TABLE VI.

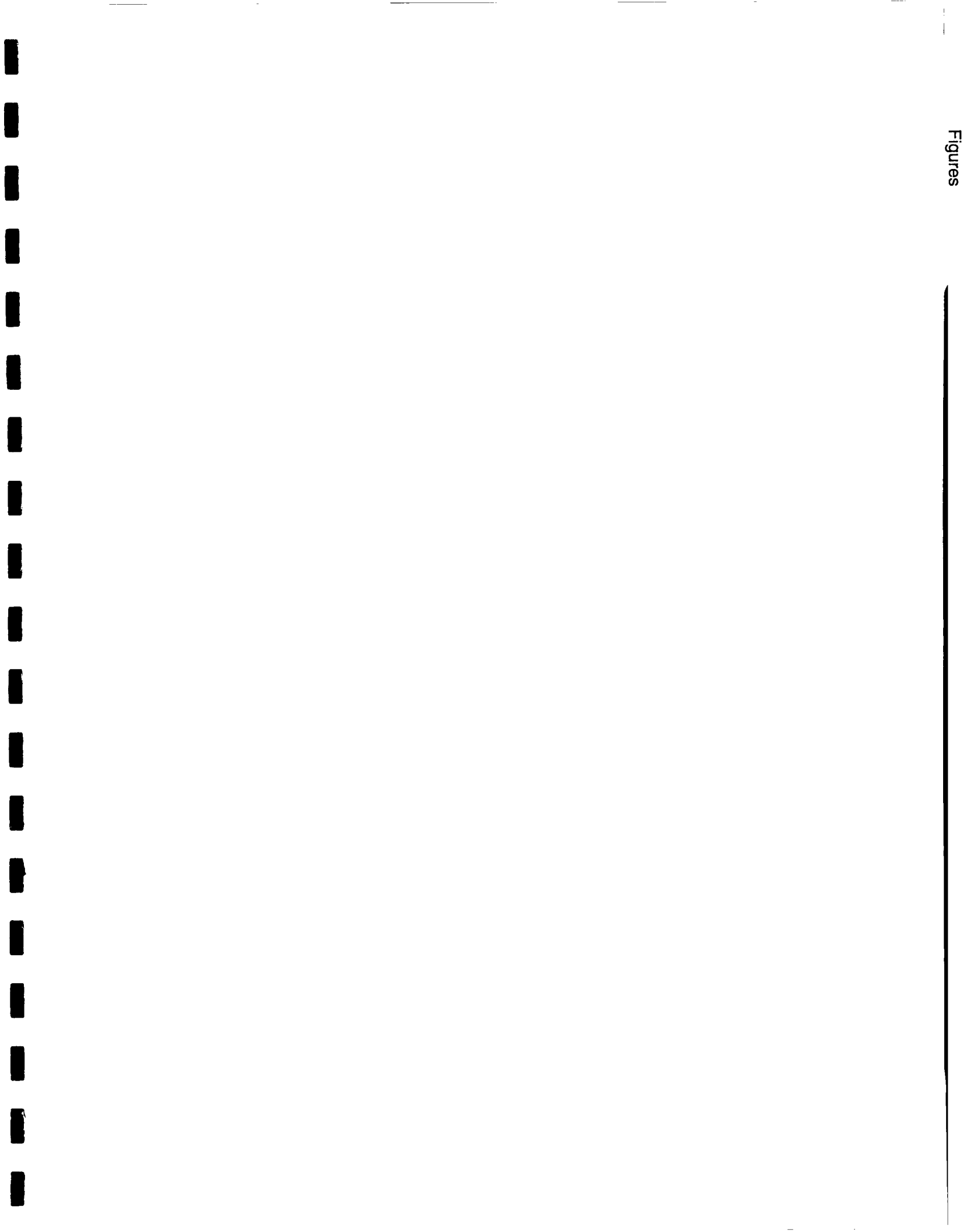
Effluent samples were obtained from the remediation system on the downstream side of the carbon treatment unit per the requirements outlined in the OCD letter dated May 28, 1998, and shipped to Xenco Laboratories in San Antonio, Texas for determination of BTEX, PAH and phenols. The system was not operational during November or December 1998 due to air permitting issues and therefore not sampled. Historical effluent laboratory results are summarized in TABLE IV. Copies of the certified laboratory reports, chain-of-custody documentation, and QA/QC procedures are presented in APPENDIX B.

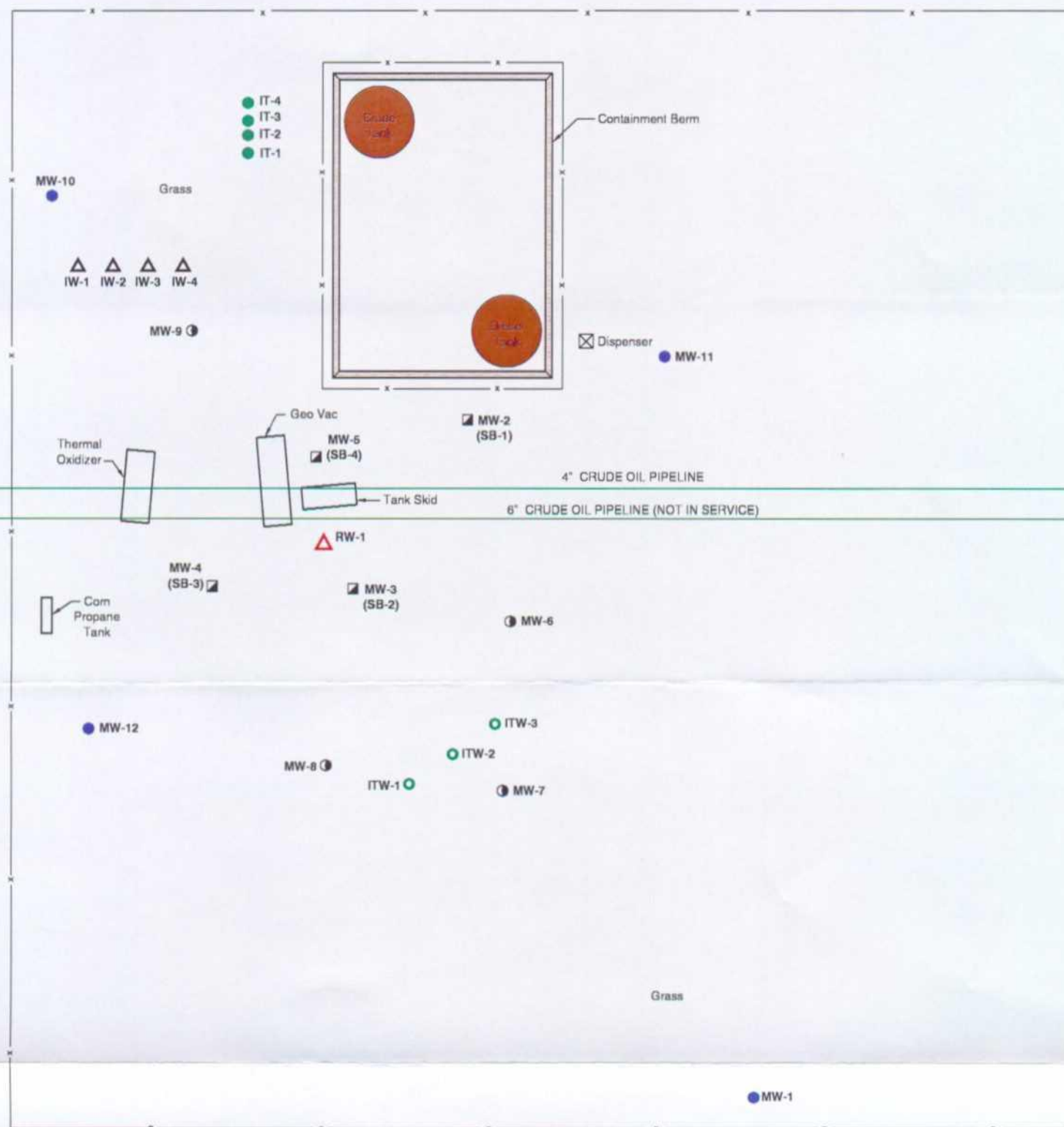
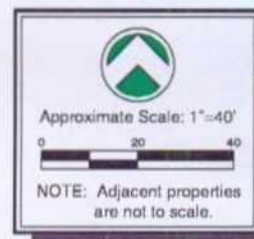
BELOW GRADE LINE TESTING

On August 25, 1998, one line below surface grade was tested for leaks. The section of pipe was between the 1,000 gallon poly tank and the 500 bbl tank on site. The pipe is made of 2 inch poly and is 130 feet in length. The test medium used was oil. The test had a duration of 1 hour and the line was under 50 psi. No leaks were discovered and no oil was released from the line during testing. The line leak detection test passed and the pipe remained in place. The testing report is included as APPENDIX D.

SUMMARY

This report presents the results of monitoring and remediation activities for the annual monitoring period of calendar year 1998. Benzene levels in ground water remained stable or had very minor fluctuations. The thickness of PSH has generally remained stable or declined. Approximately 478 total barrels of crude oil have been recovered to date from TNM-97-04. The BTEX constituents in the effluent have also demonstrated a decline in concentrations as observed in TABLE IV. All of this data demonstrates the efficacy of the GeoVacTM system to control and remove crude oil and dissolved-phase constituents.





LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
- Infiltration test well installed by KEI on December 13, 1997.
- △ Injection well installed by KEI on February 17, 1997.
- Monitoring well installed by KEI on December 10, 12, and 14, 1997.
- △ Recovery well installed by KEI on August 20 and 25, 1997.
- Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
- Monitoring well installed by KEI on June 3-4, 1997.

03/16/99-RM GAS/SEMENT/27116NEWS



SITE DETAILS

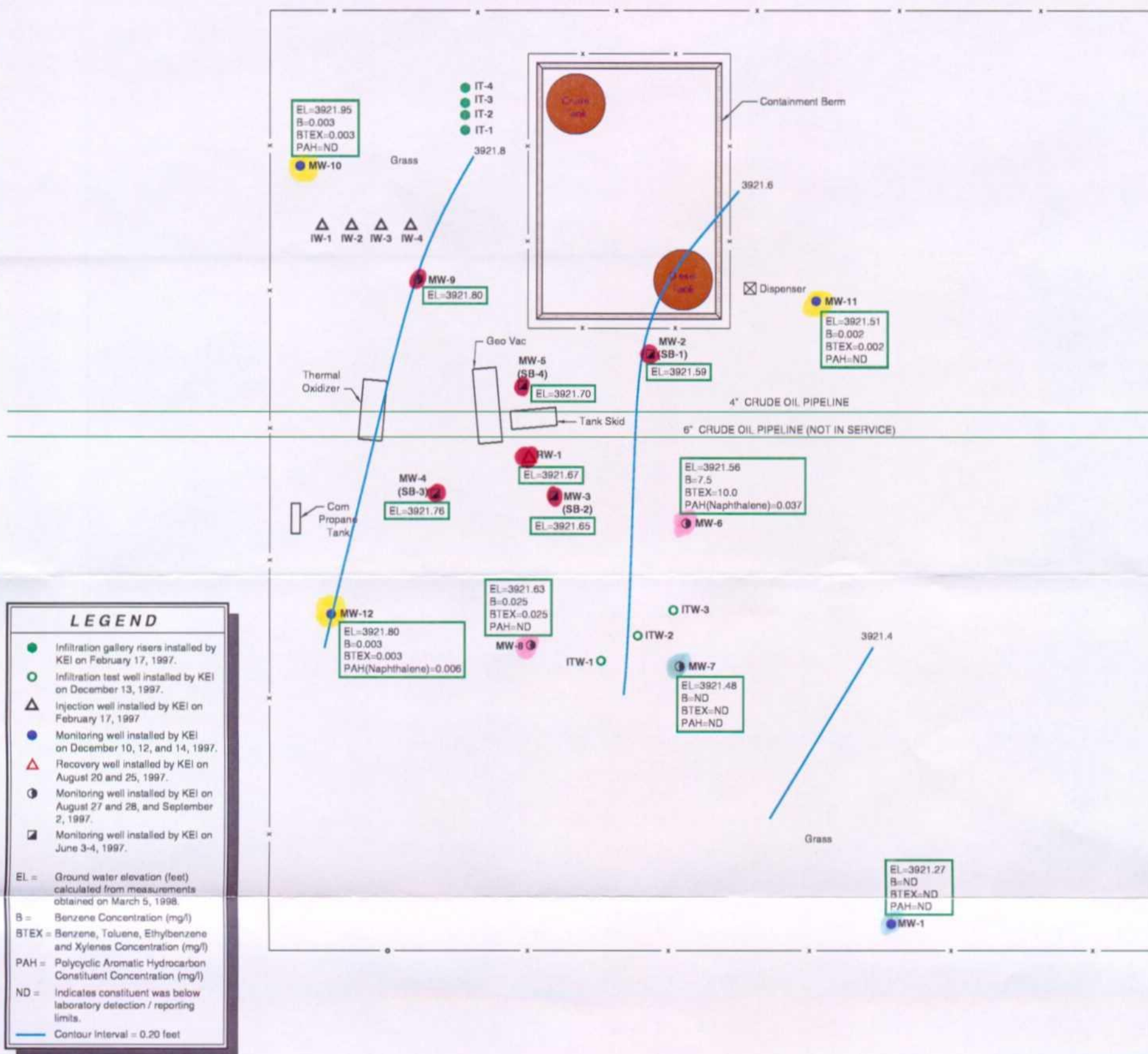
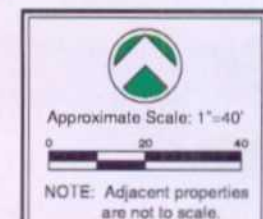
TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016

FIG 1

NOTES:

1. The ground water elevation in wells containing PSH was corrected using a factor of 0.814.
2. Ground water samples were collected on March 5, 1998.
3. Monitoring wells MW-2 through MW-9 were not sampled due to the presence of PSH.



03/16/98 PM 03:42:17 PROJECTS\TMP\UT100\98MONITOR\2103W.MXD



GROUND WATER CONTOURS / CONCENTRATIONS - MARCH 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

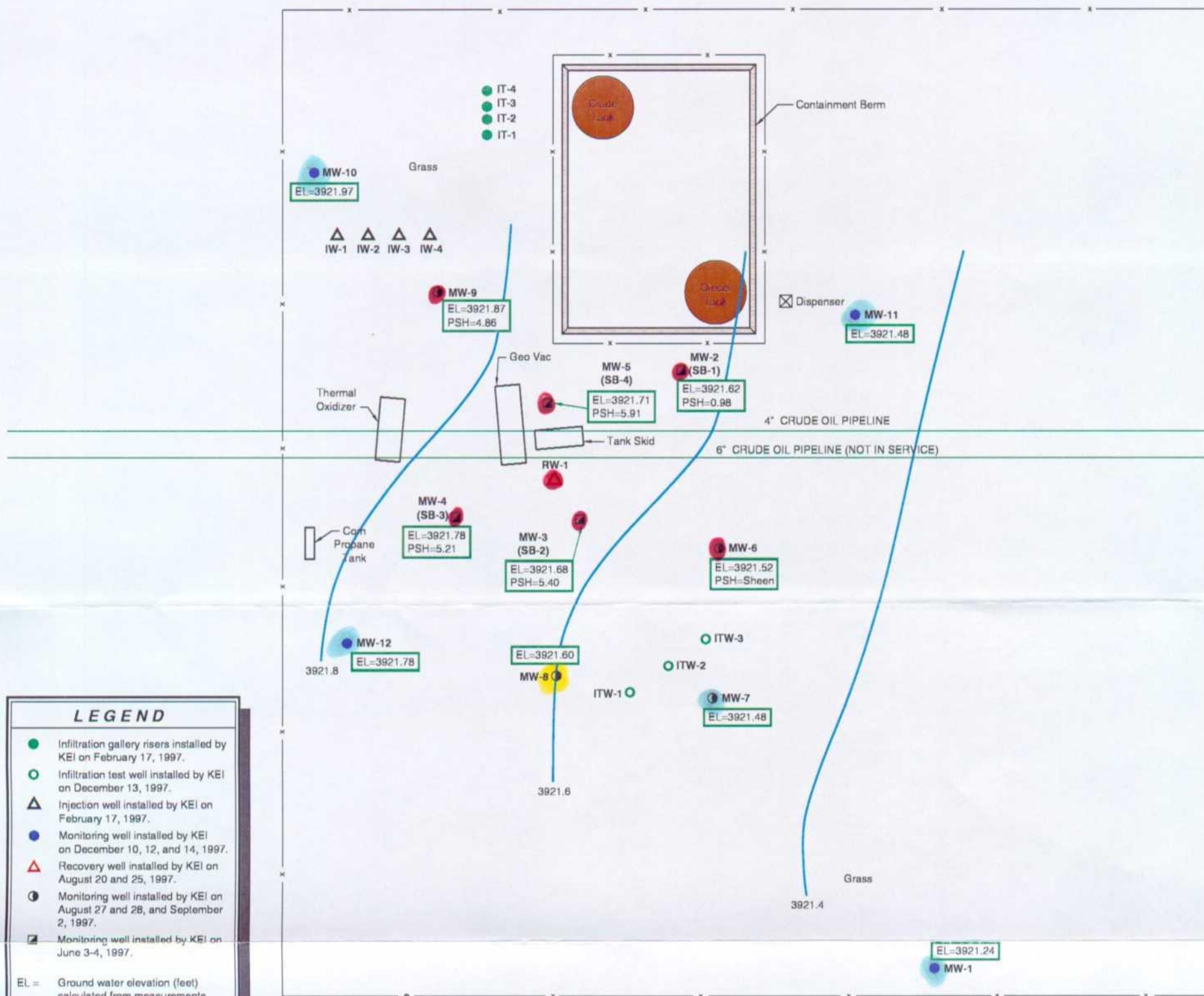
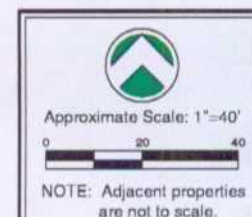
LOVINGTON, NEW MEXICO

710016

FIG 2

NOTES:

1. The elevation in wells containing PSH was corrected using a factor of 0.814.
2. RW-1 is piped to the remediation system and therefore cannot be gauged.



LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
 - Infiltration test well installed by KEI on December 13, 1997.
 - ▲ Injection well installed by KEI on February 17, 1997.
 - Monitoring well installed by KEI on December 10, 12, and 14, 1997.
 - ▲ Recovery well installed by KEI on August 20 and 25, 1997.
 - Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
 - Monitoring well installed by KEI on June 3-4, 1997.
- EL = Ground water elevation (feet) calculated from measurements obtained on June 9, 1998.
- PSH = Phase-Separated hydrocarbons thickness (feet) measured on June 9, 1998.
- Contour Interval = 0.20 feet

002496-UB-GCSADFTPROJECTS\TMPL\071006\MONTHLY (GW-JUNE)



GROUND WATER CONTOURS - JUNE 1998

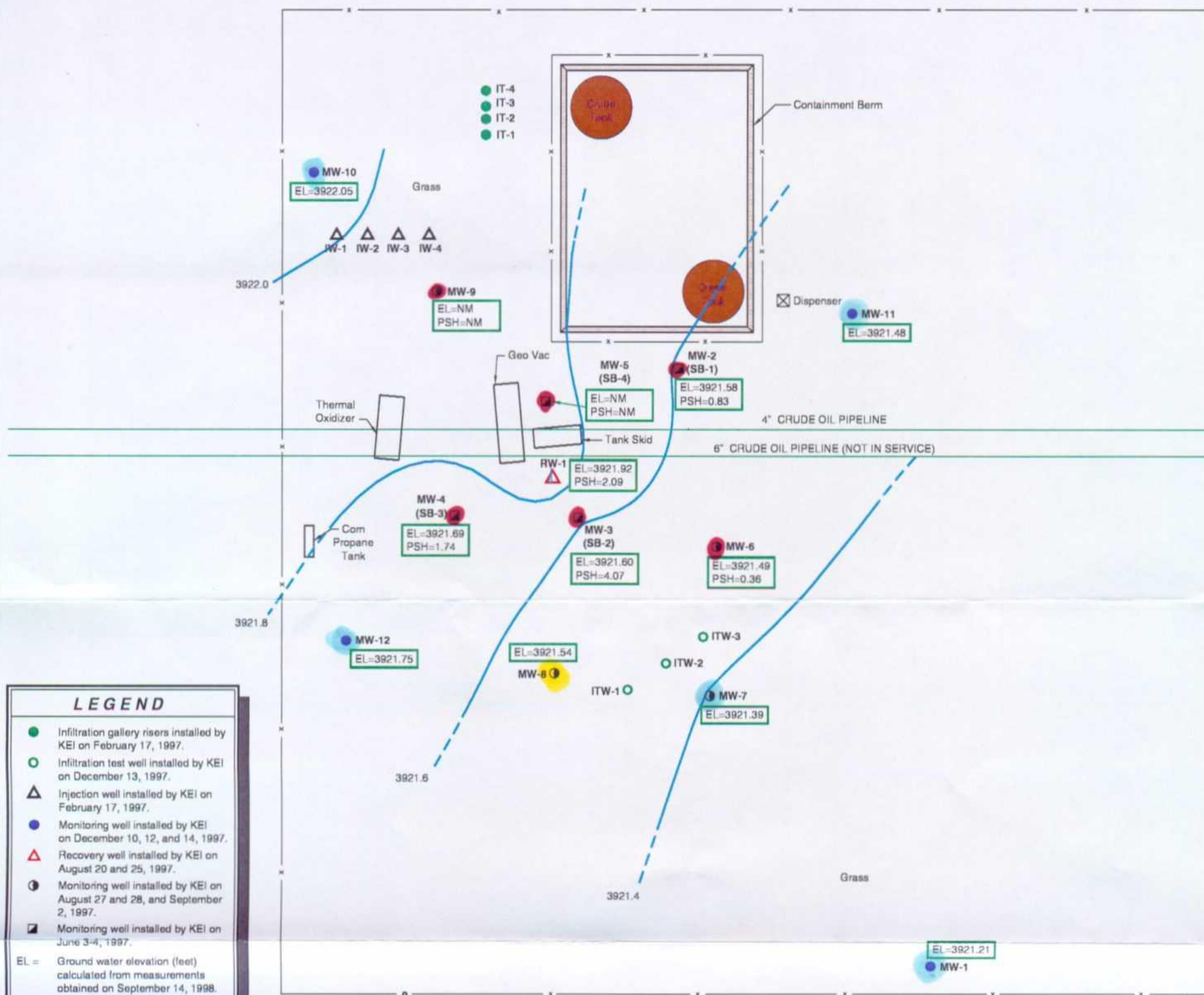
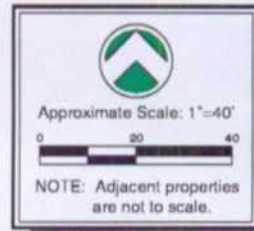
TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016

FIG 3

NOTES:

1. The elevation in wells containing PSH was corrected using a factor of 0.814.
2. MW-5 and MW-9 are piped to the remediation system and therefore cannot be gauged.



LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
- Infiltration test well installed by KEI on December 13, 1997.
- △ Injection well installed by KEI on February 17, 1997.
- Monitoring well installed by KEI on December 10, 12, and 14, 1997.
- △ Recovery well installed by KEI on August 20 and 25, 1997.
- Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
- Monitoring well installed by KEI on June 3-4, 1997.

EL = Ground water elevation (feet) calculated from measurements obtained on September 14, 1998.

PSH = Phase-Separated hydrocarbons thickness (feet) measured on September 14, 1998.

NM = Not Measured

— Contour Interval = 0.20 feet

03/24/99-JB-G:\SADFT\PROJECTS\TNM\UT1007\MONTHLY\GNW-SEP98



GROUND WATER CONTOURS - SEPTEMBER 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

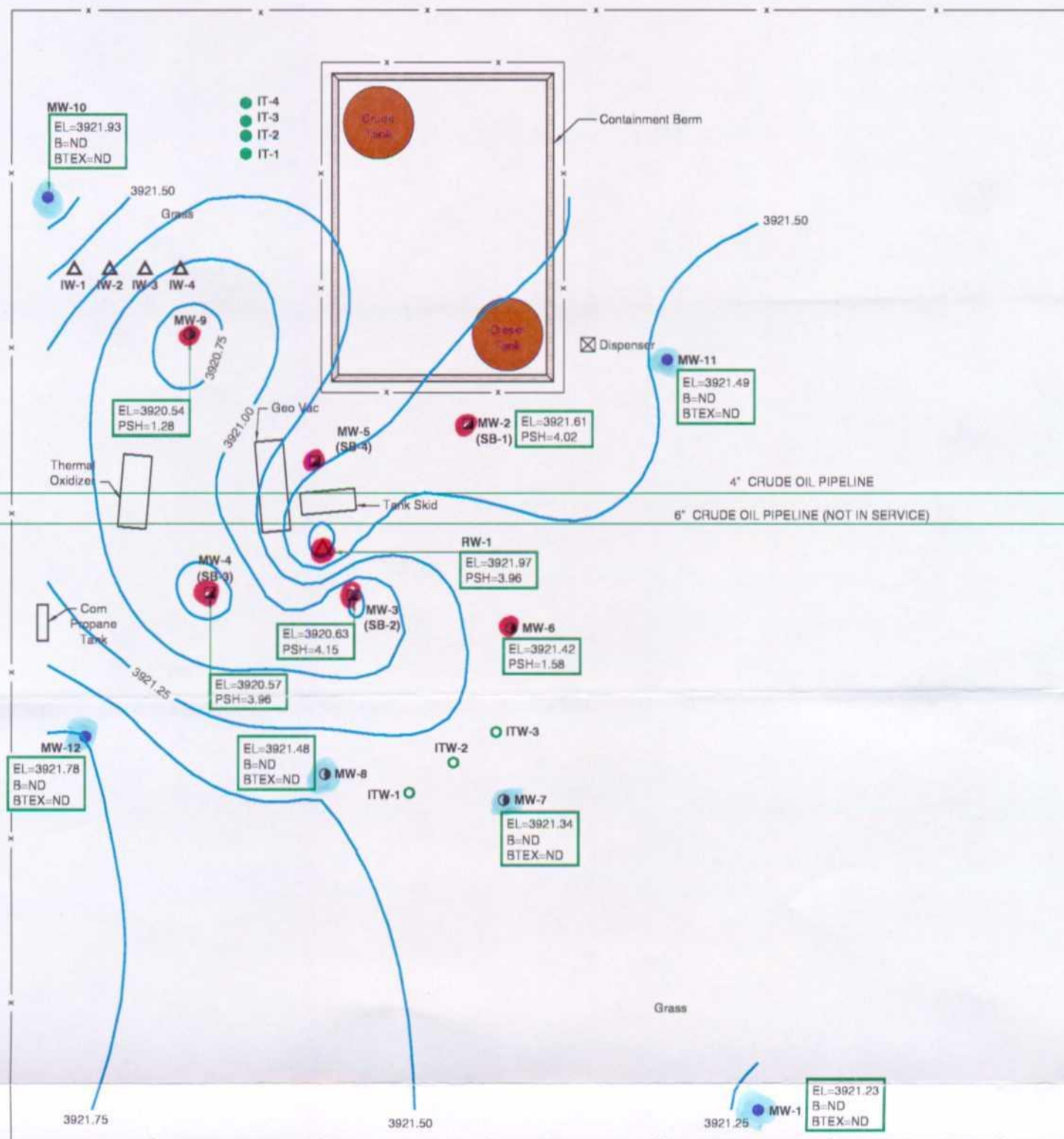
LOVINGTON, NEW MEXICO

710016

FIG 4

NOTES:

1. The elevation in wells containing PSH was corrected using a factor of 0.814.
2. The system was not operational when measurements were obtained.
3. MW-5 is piped to the remediation system and therefore cannot be gauged.
4. Wells were sampled on December 29, 1998.



002459-PM GUSADT/PROJECT/STAMP/UT1016/MONTHLY/GW-DEC98

kei

GROUND WATER CONTOURS / CONCENTRATION MAP - DECEMBER 1998

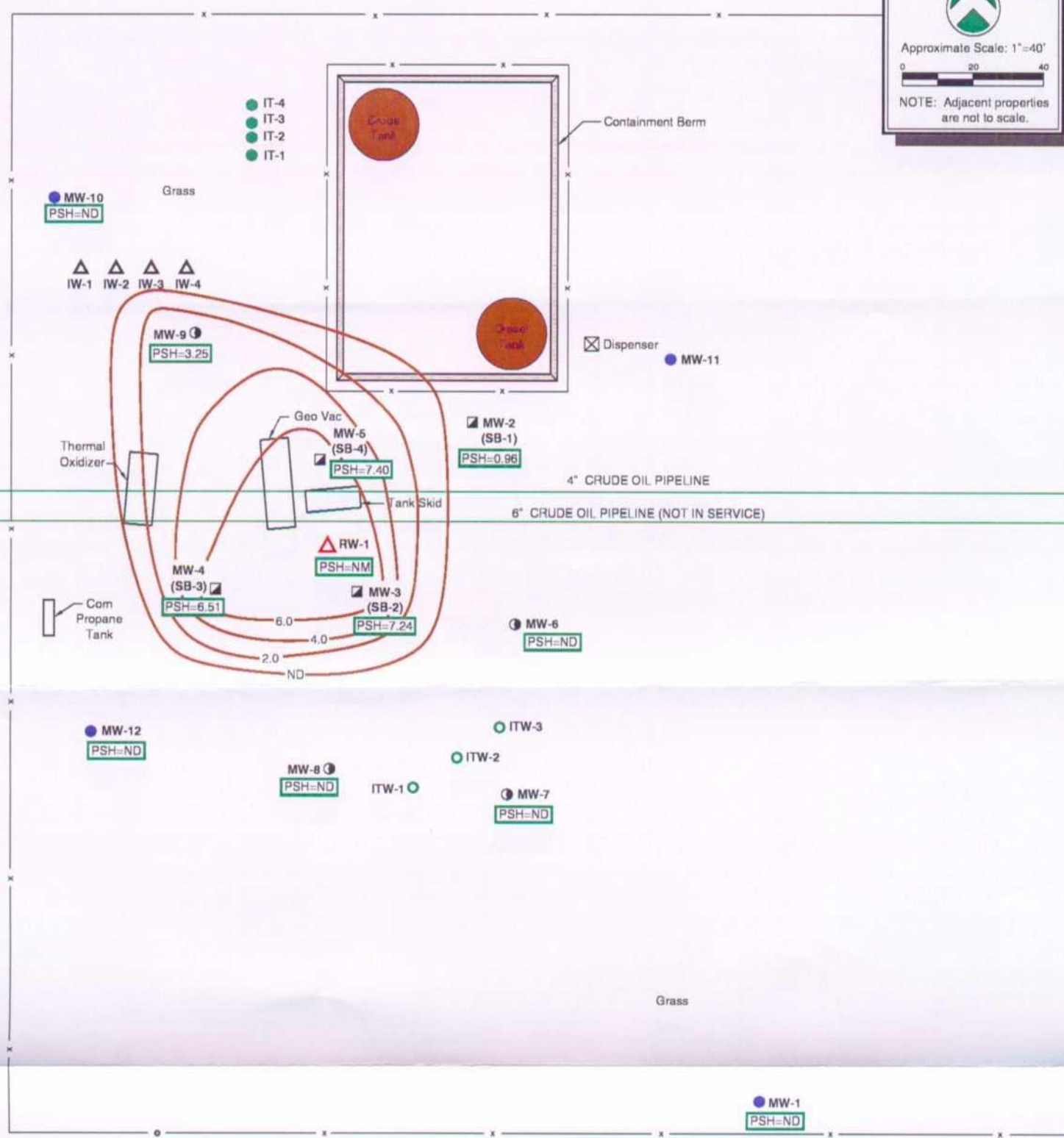
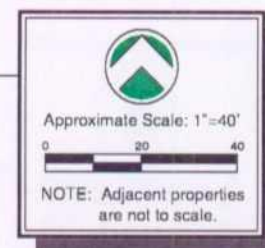
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016-1-0

FIG 5



LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
- Infiltration test well installed by KEI on December 13, 1997.
- △ Injection well installed by KEI on February 17, 1997.
- Monitoring well installed by KEI on December 10, 12, and 14, 1997.
- △ Recovery well installed by KEI on August 20 and 25, 1997.
- Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
- Monitoring well installed by KEI on June 3-4, 1997.
- Contour Interval = 2.0 feet
- PSH = Phase-separate hydrocarbon thickness (feet) measured on March 5, 1998.
- ND = Not Detected
- NOTE: RW-1 is not accessible due to the remediation system.

03/15/98-RM G3/ADFT/PROJECTS/TNM/PL710018/MONITOR/71P1SHM286



PSH THICKNESS MAP - MARCH 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

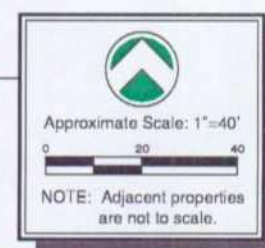
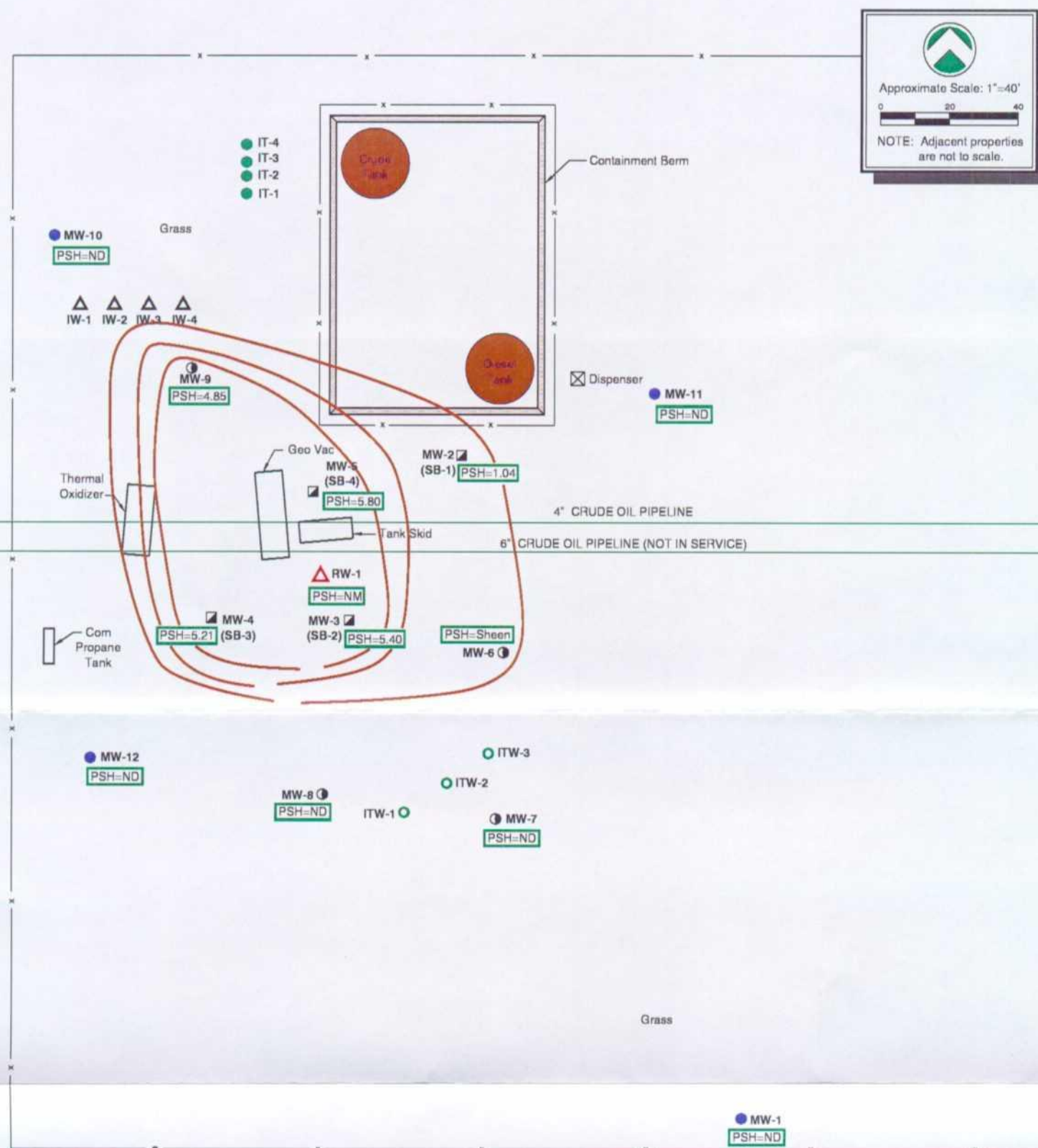
710016

FIG 6

0024799-FRM G:\SADFT\PROJECTS\TNM\PLY10078 MONITOR\PSH June 1998

LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
 - Infiltration test well installed by KEI on December 13, 1997.
 - △ Injection well installed by KEI on February 17, 1997.
 - Monitoring well installed by KEI on December 10, 12, and 14, 1997.
 - △ Recovery well installed by KEI on August 20 and 25, 1997.
 - Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
 - Monitoring well installed by KEI on June 3-4, 1997.
 - Contour Interval = 2.0 feet
 - PSH = Phase-separate hydrocarbon thickness (feet) measured on June 15 and 22, 1998.
 - ND = Not Detected
 - NM = Not Measured
- NOTE:
RW-1 is not accessible due to the remediation system.



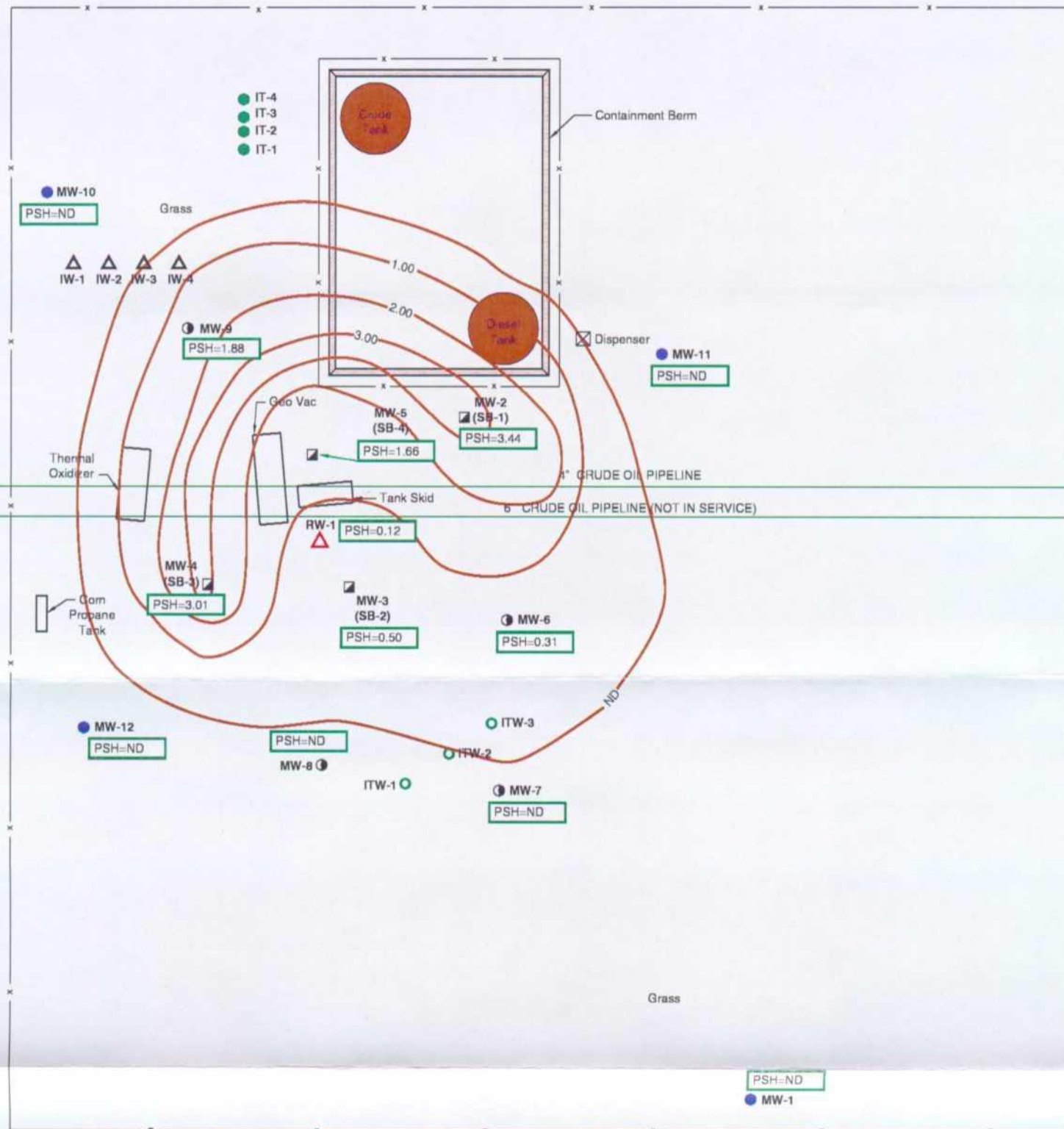
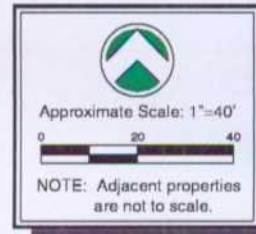
PSH THICKNESS MAP - JUNE 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016

FIG 7

NOTE:
MW-5 and MW-8 are piped to the remediation system
and therefore cannot be gauged.



LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1997.
 - Infiltration test well installed by KEI on December 13, 1997.
 - △ Injection well installed by KEI on February 17, 1997.
 - Monitoring well installed by KEI on December 10, 12, and 14, 1997.
 - △ Recovery well installed by KEI on August 20 and 25, 1997.
 - Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
 - Monitoring well installed by KEI on June 3-4, 1997.
- PSH = Phase-Separated hydrocarbons thickness (feet) measured on September 14, 1998.
- NM = Not Measured
- Contour Interval = 1.0 foot

0024/99-JB G:\SAGTV\PROJECTS\TNM\PLT\1001\MONTHLY\PSHSEP98

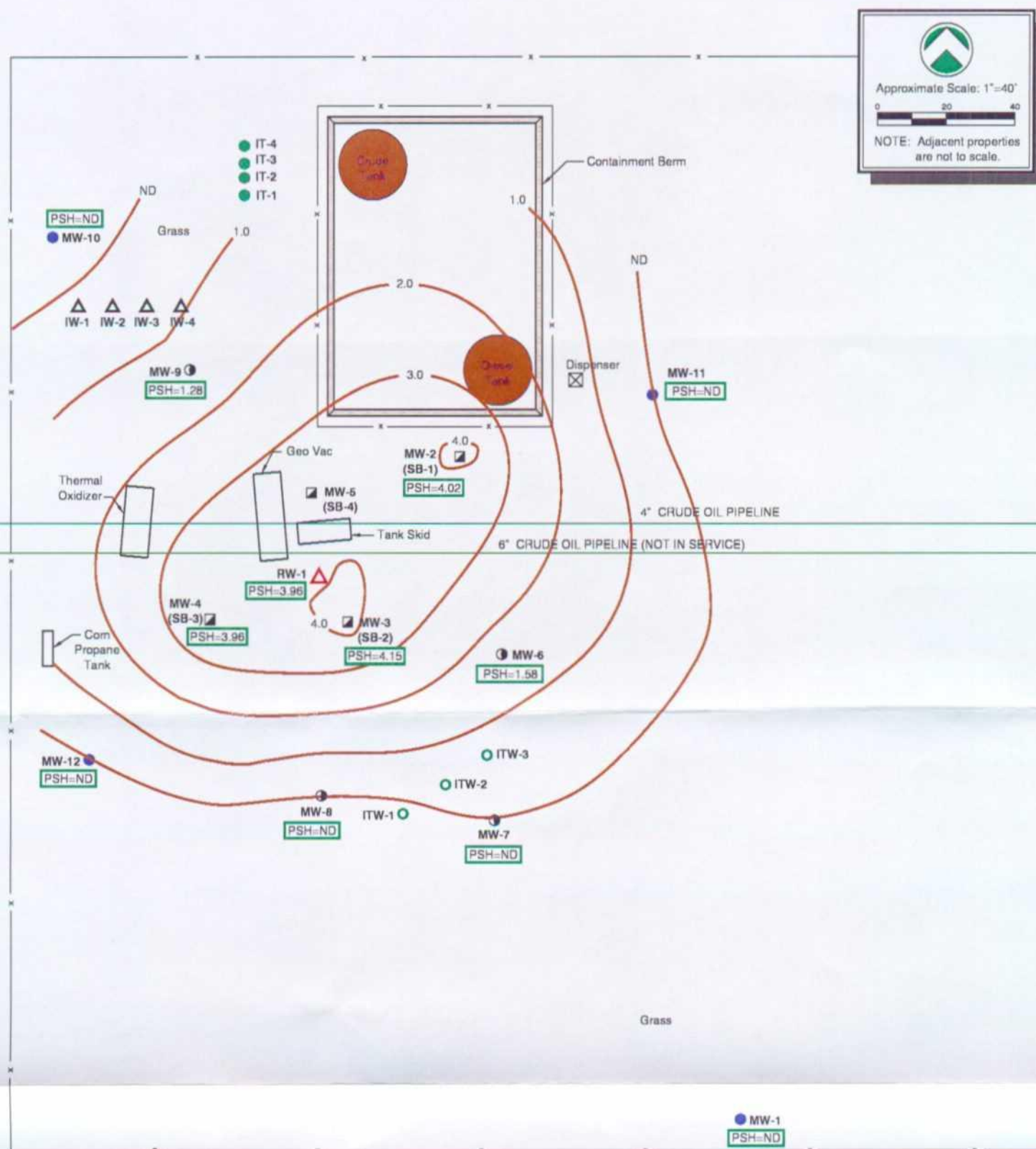
kei

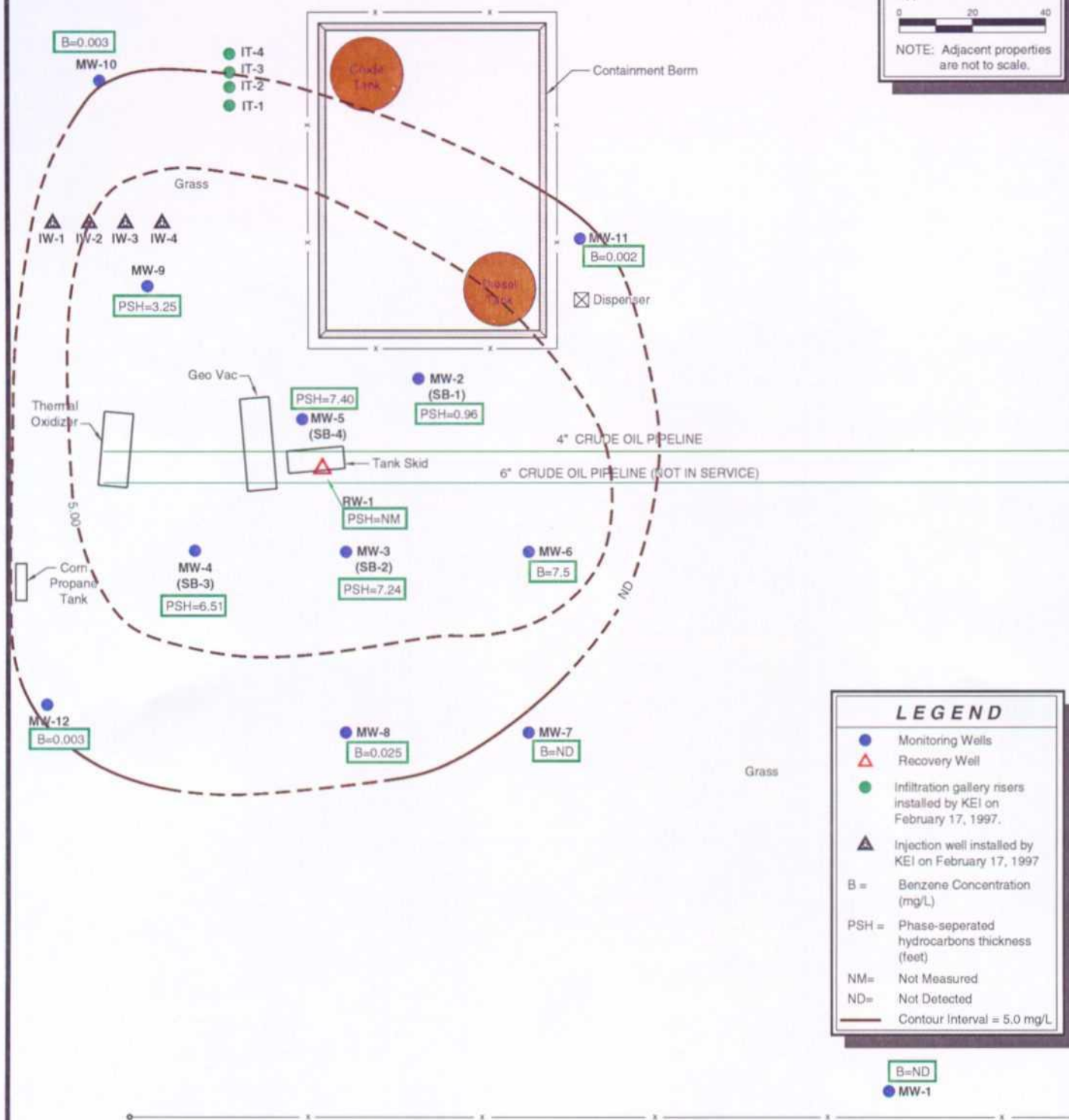
PSH THICKNESS MAP - SEPTEMBER 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016-1-0

FIG 8



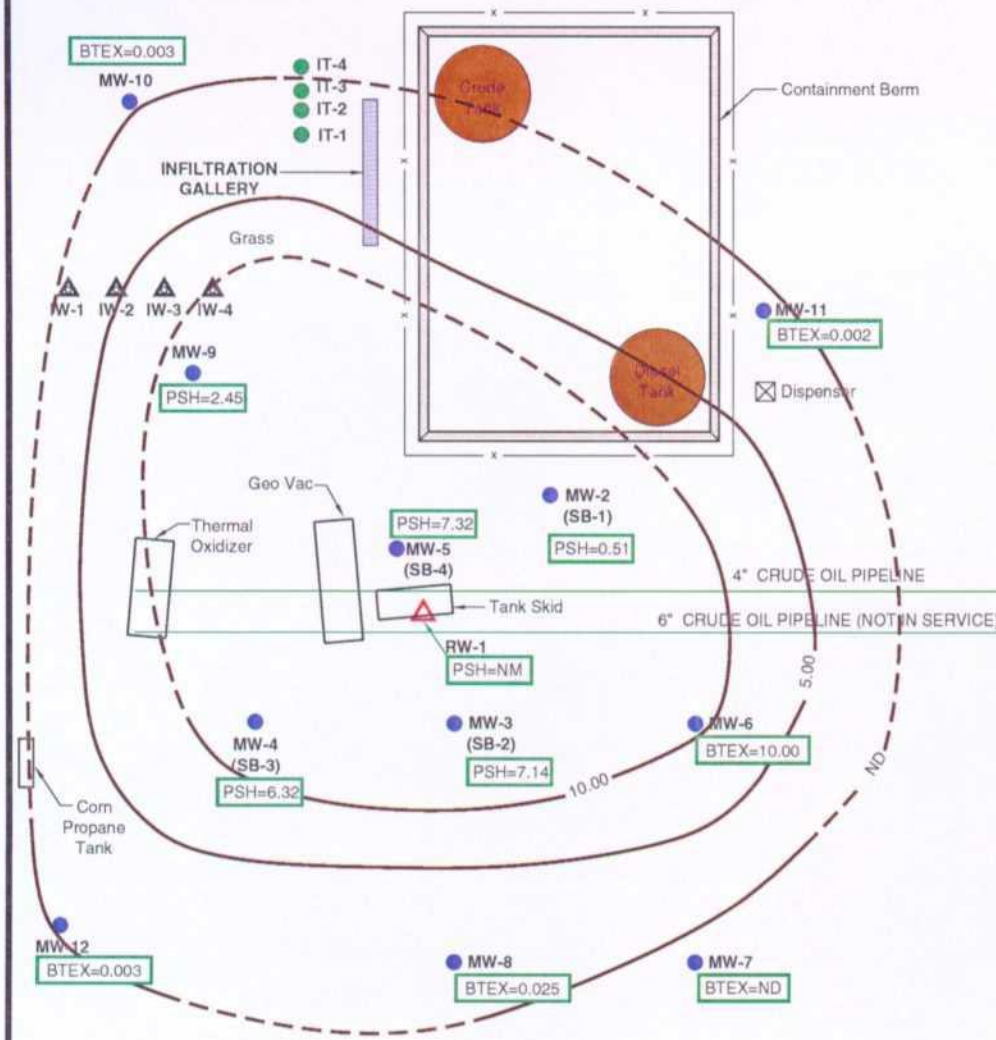
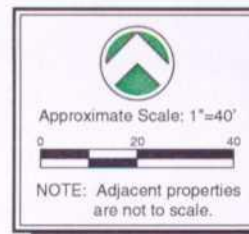


LEGEND

- Monitoring Wells
- ▲ Recovery Well
- Infiltration gallery risers installed by KEI on February 17, 1997.
- ▲ Injection well installed by KEI on February 17, 1997
- B = Benzene Concentration (mg/L)
- PSH = Phase-separated hydrocarbons thickness (feet)
- NM= Not Measured
- ND= Not Detected
- Contour Interval = 5.0 mg/L

NOTE:
Ground water samples were not obtained from wells containing PSH.





LEGEND

- Monitoring Wells
- △ Recovery Well
- Infiltration gallery risers installed by KEI on February 17, 1997.
- △ Injection well installed by KEI on February 17, 1997

BTEX = Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentrations (mg/L)

PSH = Phase-separate hydrocarbon thickness (feet)

NM= Not Measured

ND= Not Detected

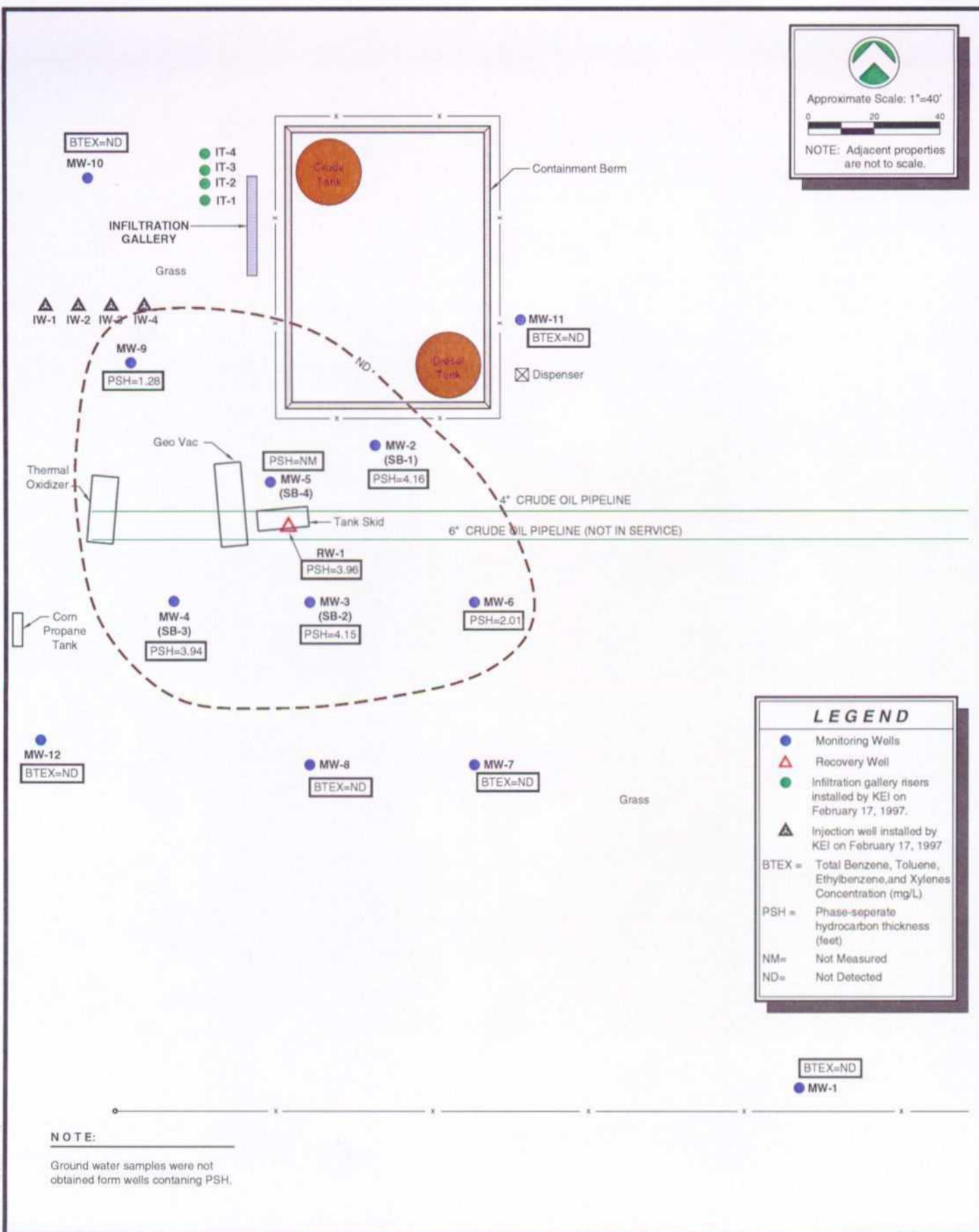
— Contour interval = 5.0 mg/L

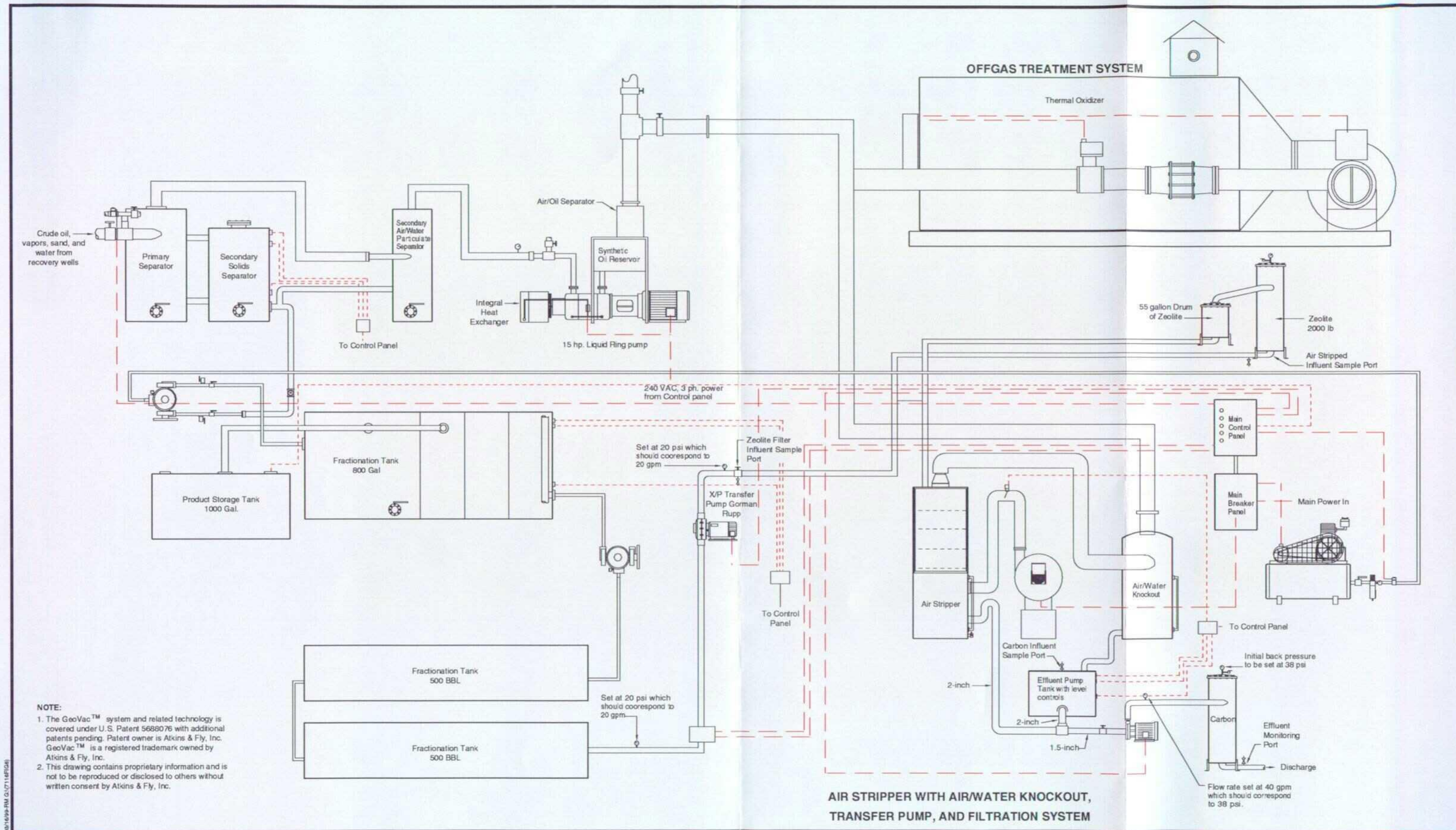
NOTE:
Ground water samples were not obtained from wells containing PSH.

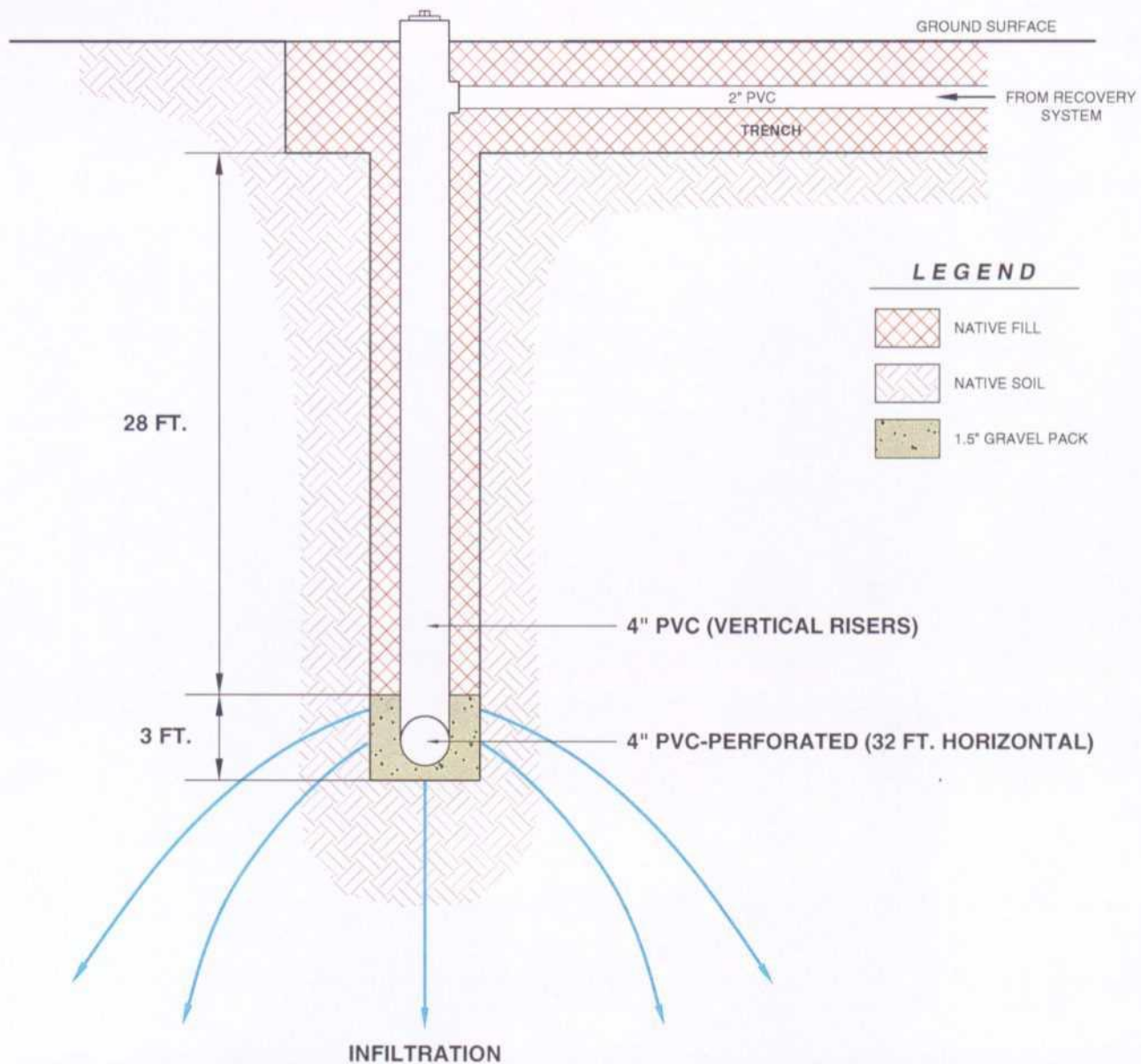
BTEX=ND
● MW-1

03/16/99 RM G:\BTEX\Map98









NOT TO SCALE

06/29/98 RM G.V.7118(MFL)

k.e.i.

TYPICAL INFILTRATION GALLERY DETAILS

TEXAS-NEW MEXICO PIPE LINE COMPANY TMN-97-04 LOVINGTON, NEW MEXICO

710016

FIG 15

FIGURE 16
MONTHLY AND CUMULATIVE RECOVERY

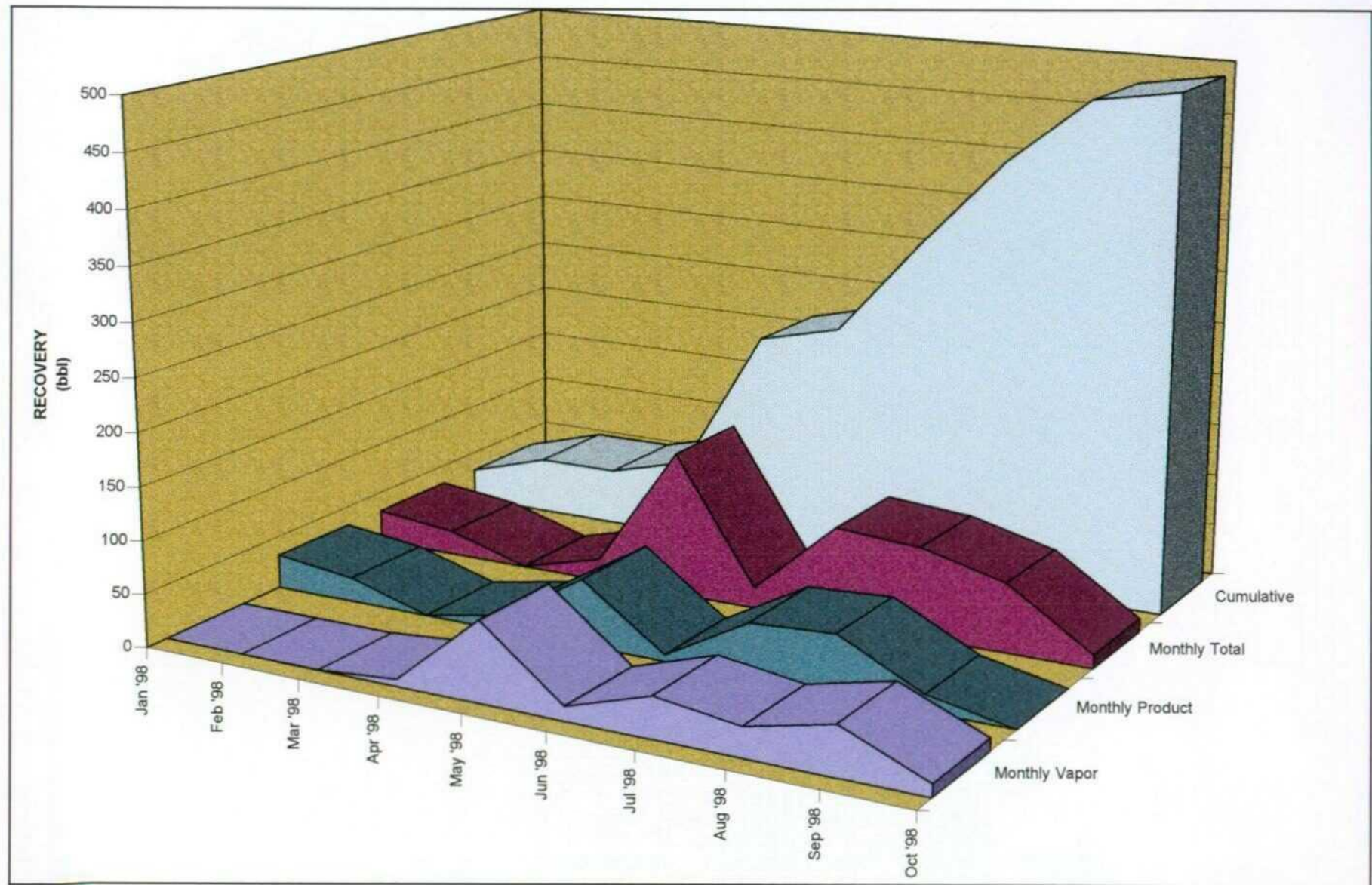


FIGURE 17
CRUDE OIL REMOVED

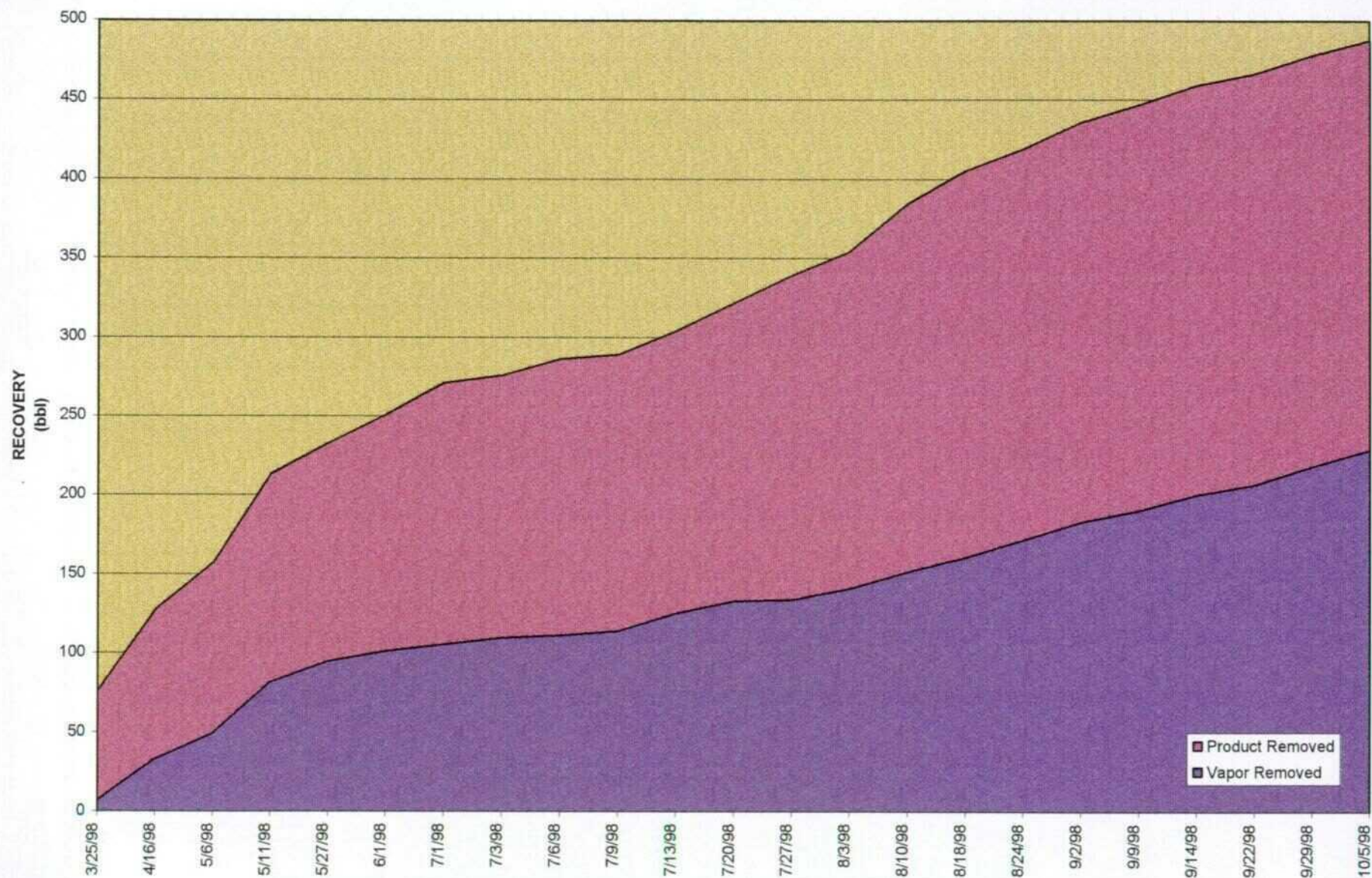
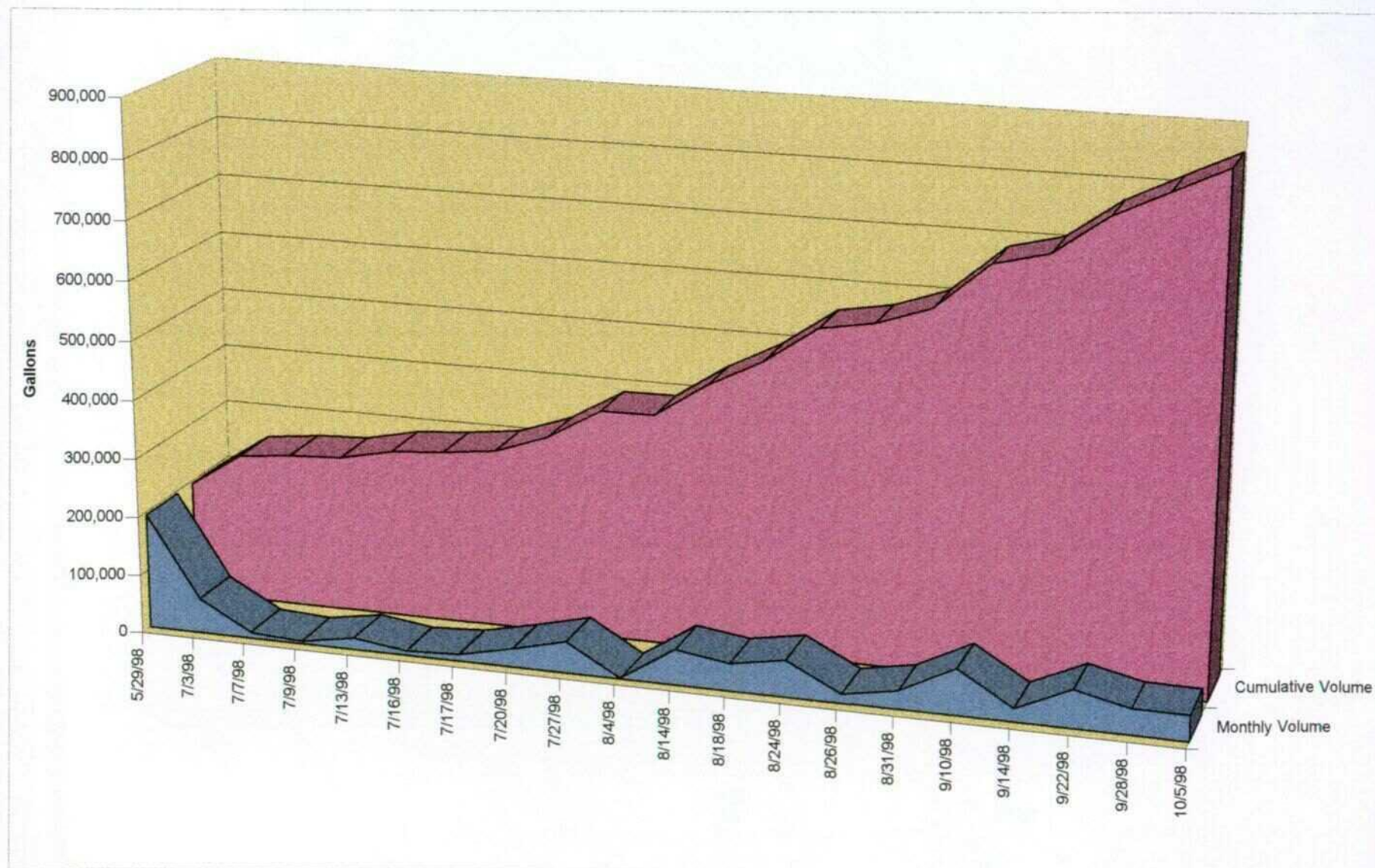


FIGURE 18
VOLUME OF TREATED REINJECTED GROUND WATER



Tables

GENERAL NOTES

- ND - Indicates constituent was not detected above the method or reporting detection limits.
- - Indicates no PSH present and no corrected ground water elevation required (TABLE IV).

Method detection limits:

BTEX	- 0.001 to 0.002 mg/L
PAH	- 0.002 mg/L
Metals	- 0.0011 to 0.5 mg/L

Laboratory test methods:

BTEX	- EPA Method SW846-8020 and 8021B
PAH	- EPA Method 8270
Metals	- EPA Method 6010
Mercury	- EPA Method 7470
Phenols	- EPA Method 420.1

TABLE I

**SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX/PAH
TEXAS - NEW MEXICO PIPE LINE COMPANY**

TNM-97-04

LOVINGTON, NEW MEXICO

SAMPLING LOCATION	DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL- BENZENE (mg/L)	XYLENES (mg/L)	BTEX (mg/L)
MW-01	06/18/97	ND	ND	ND	ND	ND
MW-01	09/10/97	ND	ND	ND	ND	ND
MW-01	12/18/97	ND	ND	ND	ND	ND
MW-01	03/05/98	ND	ND	ND	ND	ND
MW-01	06/24/98	ND	ND	ND	ND	ND
MW-01	09/17/98	ND	ND	ND	ND	ND
MW-01	12/29/98	ND	ND	ND	ND	ND
MW-02	06/18/97	0.044	0.014	0.004	0.008	0.07
MW-02	09/10/97	18.25	9.7	0.61	3.1	31.66
MW-04	06/18/97	0.155	0.106	0.007	0.023	0.291
MW-06	09/10/97	0.003	ND	ND	ND	0.003
MW-06	12/18/97	0.363	0.241	0.015	0.092	0.711
MW-06	03/05/98	7.5	1.8	0.2	0.5	10.0
MW-07	09/10/97	0.002	0.001	ND	ND	0.003
MW-07	12/18/97	ND	ND	ND	ND	ND
MW-07	03/05/98	ND	ND	ND	ND	ND
MW-07	06/24/98	ND	ND	ND	ND	ND
MW-07	09/17/98	ND	ND	ND	ND	ND
MW-07	12/29/98	ND	ND	ND	ND	ND
MW-08	09/10/97	0.012	ND	ND	ND	0.012
MW-08	12/18/97	ND	ND	ND	ND	ND
MW-08	03/05/98	0.025	ND	ND	ND	0.025
MW-08	06/24/98	0.001	0.001	ND	ND	0.002
MW-08	09/17/98	0.009	0.006	0.001	0.004	0.020
MW-08	12/29/98	ND	ND	ND	ND	ND
MW-09	09/10/97	0.055	0.014	ND	ND	0.069
MW-10	12/18/97	ND	ND	ND	ND	ND
MW-10	03/05/98	0.003	ND	ND	ND	0.003
MW-10	06/24/98	ND	ND	ND	ND	ND
MW-10	09/17/98	ND	ND	ND	ND	ND

TABLE I**SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX/PAH
TEXAS - NEW MEXICO PIPE LINE COMPANY****TNM-97-04****LOVINGTON, NEW MEXICO**

SAMPLING LOCATION	DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL- BENZENE (mg/L)	XYLENES (mg/L)	BTEX (mg/L)
MW-10	12/29/98	ND	ND	ND	ND	ND
MW-11	12/18/97	ND	ND	0.003	ND	0.003
MW-11	03/05/98	0.002	ND	ND	ND	0.002
MW-11	06/24/98	ND	ND	ND	ND	ND
MW-11	09/17/98	ND	ND	ND	ND	ND
MW-11	12/29/98	ND	ND	ND	ND	ND
MW-12	12/18/97	ND	ND	ND	ND	ND
MW-12	03/05/98	0.003	ND	ND	ND	0.003
MW-12	06/24/98	ND	ND	ND	ND	ND
MW-12	09/17/98	ND	ND	ND	ND	ND
MW-12	12/29/98	ND	ND	ND	ND	ND

SAMPLE LOCATION	MW-6	MW-12
DATE SAMPLED	03/05/98	03/05/98
PARAMETER	CONCENTRATION (mg/L)	
Naphthalene	0.037	0.006

NOTE: All Constituents not listed above are ND.

TABLE II

SUMMARY OF GROUND WATER RESULTS - METALS
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98	6/24/98
PARAMETER	CONCENTRATION (mg/l)												
Aluminum	0.61	0.82	0.32	0.41	1.33	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.058	0.079	0.084	0.072	0.18	0.10	0.073	0.10	0.09	0.08	0.09	0.09	0.11
Boron	ND	ND	ND	ND	0.18	0.15	ND	0.19	0.20	0.13	0.17	0.13	0.11
Calcium	69.4	88.5	118	98.5	306	121	91.6	140	102	ND	118	143	151
Iron	0.40	0.47	0.19	0.23	2.03	0.13	ND	ND	ND	ND	ND	ND	ND
Magnesium	10.1	13.3	17.1	13.7	12.6	14.0	14.7	15.2	15.4	16.1	18.1	14.9	18.5
Potassium	1.48	1.60	2.07	1.94	3.84	2.75	2.83	1.71	1.64	1.58	2.34	1.95	2.80
Silicon	20.8	21.0	20.8	21.1	21.1	17.6	17.5	20.8	21.6	22.1	22.0	20.2	21.9
Sodium	18.6	33.9	32.1	31.9	46.7	29.5	37.6	38.4	40.5	30.6	42.3	28.1	33.8
Strontium	0.53	0.60	0.75	0.62	0.63	0.61	0.50	0.75	0.75	0.77	0.8	0.8	0.8
Tin	ND	ND	ND	ND	1.01	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	0.067	ND	ND	ND	ND	ND	ND	ND	0.05
Zinc	ND	ND	ND	ND	1.19	0.22	0.12	ND	ND	ND	0.16	0.11	0.10

TABLE III

MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.19	53.15	3,921.04	---		---	---
07/29/97	3,974.19	53.05	3,921.14	---		---	---
09/10/97	3,974.19	52.99	3,921.20	---		---	---
10/22/97	3,974.19	52.98	3,921.21	---		---	---
10/29/97	3,974.19	52.98	3,921.21	---		---	---
11/04/97	3,974.19	52.97	3,921.22	---		---	---
11/11/97	3,974.19	52.97	3,921.22	---		---	---
12/04/97	3,974.19	52.97	3,921.22	---		---	---
12/10/97	3,974.19	52.99	3,921.20	---		---	---
12/18/97	3,974.18	52.97	3,921.21	---		---	---
12/23/97	3,974.18	52.96	3,921.22	---		---	---
12/31/97	3,974.18	52.96	3,921.22	---		---	---
01/06/98	3,974.18	52.96	3,921.22	---		---	---
01/06/98	3,974.18	52.96	3,921.22	---		---	---
01/07/98	3,974.18	52.97	3,921.21	---		---	---
01/15/98	3,974.18	52.96	3,921.22	---		---	---
01/23/98	3,974.18	52.98	3,921.20	---		---	---
01/27/98	3,974.18	52.97	3,921.21	---		---	---
02/03/98	3,974.18	52.95	3,921.23	---		---	---
02/11/98	3,974.18	52.97	3,921.21	---		---	---
02/17/98	3,974.18	52.95	3,921.23	---		---	---
02/25/98	3,974.18	52.93	3,921.25	---		---	---
03/05/98	3,974.18	52.91	3,921.27	---		---	---
03/11/98	3,974.18	52.94	3,921.24	---		---	---
03/16/98	3,974.18	52.93	3,921.25	---		---	---
03/25/98	3,974.18	52.92	3,921.26	---		---	---
03/31/98	3,974.18	52.90	3,921.28	---		---	---
04/09/98	3,974.18	52.96	3,921.22	---		---	---
04/16/98	3,974.18	52.95	3,921.23	---		---	---
04/21/98	3,974.18	52.96	3,921.22	---		---	---
04/28/98	3,974.18	52.94	3,921.24	---		---	---
05/04/98	3,974.18	52.95	3,921.23	---		---	---
05/11/98	3,974.18	52.97	3,921.21	---		---	---
05/18/98	3,974.18	52.99	3,921.19	---		---	---

TABLE III

MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
05/27/98	3,974.18	52.98	3,921.20	---		---	---
06/01/98	3,974.18	53.02	3,921.16	---		---	---
06/09/98	3,974.18	52.94	3,921.24	---		---	---
06/15/98	3,974.18	53.94	3,920.24	---		---	---
06/22/98	3,974.18	52.99	3,921.19	---		---	---
06/24/98	3,974.18	52.96	3,921.22	---		---	---
07/01/98	3,974.18	53.01	3,921.17	---		---	---
07/06/98	3,974.18	52.98	3,921.20	---		---	---
07/13/98	3,974.18	53.00	3,921.18	---		---	---
07/20/98	3,974.18	53.03	3,921.15	---		---	---
07/27/98	3,974.18	53.07	3,921.11	---		---	---
08/03/98	3,974.18	52.98	3,921.20	---		---	---
08/10/98	3,974.18	53.07	3,921.11	---		---	---
08/17/98	3,974.18	53.09	3,921.09	---		---	---
08/24/98	3,974.18	53.08	3,921.10	---		---	---
09/02/98	3,974.18	53.04	3,921.14	---		---	---
09/09/98	3,974.18	53.02	3,921.16	---		---	---
09/14/98	3,974.18	52.97	3,921.21	---		---	---
09/22/98	3,974.18	53.02	3,921.16	---		---	---
09/30/98	3,974.18	53.02	3,921.16	---		---	---
10/05/98	3,974.18	53.02	3,921.16	---		---	---
10/14/98	3,974.18	52.96	3,921.22	---		---	---
10/30/98	3,974.18	52.95	3,921.23	---		---	---
11/16/98	3,974.18	52.94	3,921.24	---		---	---
12/02/98	3,974.18	52.94	3,921.24	---		---	---
12/08/98	3,974.18	52.95	3,921.23	---		---	---
12/14/98	3,974.18	52.95	3,921.23	---		---	---
12/29/98	3,974.18	52.95	3,921.23	---		---	---

TABLE III

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.65	53.24	3,921.41	---		---	---
07/29/97	3,974.65	53.14	3,921.51	---		---	---
09/10/97	3,974.65	53.11	3,921.54	---	53.11	3,921.54	SHEEN
10/22/97	3,974.65	53.20	3,921.45	3,921.60	53.02	3,921.63	0.18
10/29/97	3,974.65	53.24	3,921.41	3,921.60	53.02	3,921.63	0.22
11/04/97	3,974.65	53.26	3,921.39	3,921.60	53.01	3,921.64	0.25
11/11/97	3,974.65	53.30	3,921.35	3,921.61	53.00	3,921.65	0.30
12/04/97	3,974.65	53.45	3,921.20	3,921.60	52.98	3,921.67	0.47
12/10/97	3,974.65	53.47	3,921.18	3,921.62	52.95	3,921.70	0.52
12/18/97	3,974.62	53.51	3,921.11	3,921.37	53.21	3,921.41	0.30
12/23/97	3,974.62	53.52	3,921.10	3,921.61	52.92	3,921.70	0.60
12/31/97	3,974.62	53.58	3,921.04	3,921.59	52.93	3,921.69	0.65
01/06/98	3,974.62	53.58	3,921.04	3,921.63	52.89	3,921.73	0.69
01/06/98	3,974.62	53.57	3,921.05	3,921.64	52.88	3,921.74	0.69
01/06/98	3,974.62	53.60	3,921.02	3,921.62	52.90	3,921.72	0.70
01/06/98	3,974.62	53.59	3,921.03	3,921.62	52.90	3,921.72	0.69
01/06/98	3,974.62	53.61	3,921.01	3,921.61	52.90	3,921.72	0.71
01/07/98	3,974.62	53.66	3,920.96	3,921.56	52.95	3,921.67	0.71
01/08/98	3,974.62	53.65	3,920.97	3,921.61	52.90	3,921.72	0.75
01/09/98	3,974.62	53.64	3,920.98	3,921.61	52.90	3,921.72	0.74
01/10/98	3,974.62	53.70	3,920.92	3,921.56	52.95	3,921.67	0.75
01/12/98	3,974.62	53.67	3,920.95	3,921.60	52.91	3,921.71	0.76
01/15/98	3,974.62	53.68	3,920.94	3,921.59	52.91	3,921.71	0.77
01/23/98	3,974.62	53.78	3,920.84	3,921.55	52.94	3,921.68	0.84
01/27/98	3,974.62	53.80	3,920.82	3,921.55	52.94	3,921.68	0.86
02/03/98	3,974.62	53.77	3,920.85	3,921.55	52.91	3,921.71	0.86
02/11/98	3,974.62	53.88	3,920.74	3,921.53	52.91	3,921.71	0.97
02/17/98	3,974.62	53.80	3,920.82	3,921.57	52.88	3,921.74	0.92
02/25/98	3,974.62	53.78	3,920.84	3,921.59	52.86	3,921.76	0.92
03/05/98	3,974.62	53.82	3,920.80	3,921.58	52.86	3,921.76	0.96
03/11/98	3,974.62	53.87	3,920.75	3,921.57	52.86	3,921.76	1.01
03/16/98	3,974.62	53.85	3,920.77	3,921.58	52.85	3,921.77	1.00
03/25/98	3,974.62	53.93	3,920.69	3,921.60	52.81	3,921.81	1.12
03/31/98	3,974.62	53.42	3,921.20	3,921.62	52.91	3,921.71	0.51

TABLE III

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
04/09/98	3,974.62	53.79	3,920.83	3,921.46	53.02	3,921.60	0.77
04/16/98	3,974.62	53.60	3,921.02	3,921.58	52.91	3,921.71	0.69
04/21/98	3,974.62	53.65	3,920.97	3,921.58	52.90	3,921.72	0.75
04/28/98	3,974.62	53.70	3,920.92	3,921.58	52.89	3,921.73	0.81
04/29/98	3,974.62	53.99	3,920.63	3,921.42	53.02	3,921.60	0.97
04/30/98	3,974.62	53.94	3,920.68	3,921.45	52.99	3,921.63	0.95
05/01/98	3,974.62	53.92	3,920.70	3,921.47	52.97	3,921.65	0.95
05/04/98	3,974.62	53.66	3,920.96	3,921.62	52.85	3,921.77	0.81
05/11/98	3,974.62	53.93	3,920.69	3,921.50	52.94	3,921.68	0.99
05/13/98	3,974.62	53.80	3,920.82	3,921.59	52.85	3,921.77	0.95
05/18/98	3,974.62	53.84	3,920.78	3,921.55	52.90	3,921.72	0.94
05/27/98	3,974.62	53.88	3,920.74	3,921.55	52.88	3,921.74	1.00
06/01/98	3,974.62	53.91	3,920.71	3,921.54	52.89	3,921.73	1.02
06/09/98	3,974.62	53.80	3,920.82	3,921.62	52.82	3,921.80	0.98
06/15/98	3,974.62	53.86	3,920.76	3,921.61	52.82	3,921.80	1.04
07/03/98	3,974.62	57.32	3,917.30	3,920.25	53.70	3,920.92	3.62
07/06/98	3,974.62	57.57	3,917.05	3,920.41	53.44	3,921.18	4.13
07/13/98	3,974.62	58.24	3,916.38	3,920.34	53.37	3,921.25	4.87
07/20/98	3,974.62	55.58	3,919.04	3,919.13	55.47	3,919.15	0.11
07/27/98	3,974.62	58.02	3,916.60	3,919.06	55.00	3,919.62	3.02
08/03/98	3,974.62	56.88	3,917.74	3,921.61	52.13	3,922.49	4.75
08/10/98	3,974.62	57.50	3,917.12	3,921.40	52.24	3,922.38	5.26
08/17/98	3,974.62	57.65	3,916.97	3,921.37	52.25	3,922.37	5.40
08/24/98	3,974.62	54.31	3,920.31	3,921.38	53.00	3,921.62	1.31
09/02/98	3,974.62	55.45	3,919.17	3,921.48	52.61	3,922.01	2.84
09/09/98	3,974.62	56.12	3,918.50	3,921.30	52.68	3,921.94	3.44
09/14/98	3,974.62	53.72	3,920.90	3,921.58	52.89	3,921.73	0.83
09/22/98	3,974.62	53.68	3,920.94	3,921.47	53.03	3,921.59	0.65
09/30/98	3,974.62	53.48	3,921.14	3,921.56	52.96	3,921.66	0.52
10/05/98	3,974.62	53.80	3,920.82	3,921.46	53.01	3,921.61	0.79
10/14/98	3,974.62	53.88	3,920.74	3,921.59	52.83	3,921.79	1.05
10/30/98	3,974.62	54.50	3,920.12	3,921.59	52.70	3,921.92	1.80
11/16/98	3,974.62	55.44	3,919.18	3,921.58	52.49	3,922.13	2.95
12/02/98	3,974.62	56.19	3,918.43	3,921.60	52.30	3,922.32	3.89
12/08/98	3,974.62	56.25	3,918.37	3,921.59	52.30	3,922.32	3.95

TABLE III

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/14/98	3,974.62	56.29	3,918.33	3,921.60	52.27	3,922.35	4.02
12/29/98	3,974.62	56.40	3,918.22	3,921.61	52.24	3,922.38	4.16

TABLE III

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.63	60.08	3,914.55	3,921.94	51.39	3,923.24	8.69
06/23/97	3,974.63	60.08	3,914.55	3,921.96	51.36	3,923.27	8.72
06/23/97	3,974.63	53.30	3,921.33	3,921.56	53.03	3,921.60	0.27
06/23/97	3,974.63	53.78	3,920.85	3,921.71	52.77	3,921.86	1.01
06/25/97	3,974.63	59.85	3,914.78	3,921.99	51.37	3,923.26	8.48
06/25/97	3,974.63	55.50	3,919.13	3,921.72	52.45	3,922.18	3.05
06/25/97	3,974.63	56.34	3,918.29	3,921.78	52.24	3,922.39	4.10
06/25/97	3,974.63	53.29	3,921.34	---		---	---
06/27/97	3,974.63	59.99	3,914.64	3,921.96	51.38	3,923.25	8.61
06/27/97	3,974.63	56.68	3,917.95	3,921.60	52.39	3,922.24	4.29
07/01/97	3,974.63	59.99	3,914.64	3,921.96	51.38	3,923.25	8.61
07/03/97	3,974.63	60.04	3,914.59	3,921.98	51.35	3,923.28	8.69
07/03/97	3,974.63	55.22	3,919.41	3,921.75	52.47	3,922.16	2.75
07/29/97	3,974.63	60.03	3,914.60	3,921.96	51.37	3,923.26	8.66
07/29/97	3,974.63	54.47	3,920.16	3,921.90	52.42	3,922.21	2.05
09/10/97	3,974.63	59.81	3,914.82	3,921.96	51.41	3,923.22	8.40
09/16/97	3,974.63	59.86	3,914.77	3,921.95	51.41	3,923.22	8.45
09/23/97	3,974.63	59.84	3,914.79	3,921.96	51.40	3,923.23	8.44
10/22/97	3,974.63	59.78	3,914.85	3,921.96	51.41	3,923.22	8.37
10/29/97	3,974.63	59.75	3,914.88	3,921.96	51.42	3,923.21	8.33
11/04/97	3,974.63	59.73	3,914.90	3,921.96	51.42	3,923.21	8.31
11/11/97	3,974.63	59.70	3,914.93	3,921.97	51.42	3,923.21	8.28
12/04/97	3,974.63	59.64	3,914.99	3,921.95	51.45	3,923.18	8.19
12/10/97	3,974.63	59.56	3,915.07	3,921.97	51.44	3,923.19	8.12
12/18/97	3,974.60	59.56	3,915.04	3,921.93	51.45	3,923.15	8.11
12/23/97	3,974.60	59.52	3,915.08	3,921.95	51.44	3,923.16	8.08
12/31/97	3,974.60	59.47	3,915.13	3,921.93	51.47	3,923.13	8.00
01/06/98	3,974.60	59.48	3,915.12	3,921.95	51.44	3,923.16	8.04
01/06/98	3,974.60	59.53	3,915.07	3,921.92	51.47	3,923.13	8.06
01/06/98	3,974.60	59.45	3,915.15	3,921.89	51.52	3,923.08	7.93
01/06/98	3,974.60	59.49	3,915.11	3,921.88	51.52	3,923.08	7.97
01/06/98	3,974.60	59.48	3,915.12	3,921.89	51.52	3,923.08	7.96
01/07/98	3,974.60	59.54	3,915.06	3,921.84	51.56	3,923.04	7.98
01/08/98	3,974.60	59.44	3,915.16	3,921.86	51.56	3,923.04	7.88
01/09/98	3,974.60	59.58	3,915.02	3,921.82	51.58	3,923.02	8.00

TABLE III

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
01/10/98	3,974.60	59.35	3,915.25	3,921.81	51.63	3,922.97	7.72
01/12/98	3,974.60	59.22	3,915.38	3,921.85	51.61	3,922.99	7.61
01/15/98	3,974.60	59.18	3,915.42	3,921.84	51.63	3,922.97	7.55
01/23/98	3,974.60	58.98	3,915.62	3,921.77	51.74	3,922.86	7.24
01/27/98	3,974.60	58.89	3,915.71	3,921.79	51.74	3,922.86	7.15
02/03/98	3,974.60	58.83	3,915.77	3,921.54	51.74	3,922.86	7.09
02/11/98	3,974.60	58.67	3,915.93	3,921.52	51.80	3,922.80	6.87
02/17/98	3,974.60	58.74	3,915.86	3,921.63	51.65	3,922.95	7.09
02/25/98	3,974.60	58.85	3,915.75	3,921.65	51.60	3,923.00	7.25
03/05/98	3,974.60	58.85	3,915.75	3,921.64	51.61	3,922.99	7.24
03/11/98	3,974.60	58.87	3,915.73	3,921.64	51.61	3,922.99	7.26
03/16/98	3,974.60	58.86	3,915.74	3,921.65	51.60	3,923.00	7.26
03/25/98	3,974.60	58.87	3,915.73	3,921.66	51.58	3,923.02	7.29
03/31/98	3,974.60	58.74	3,915.86	3,921.67	51.60	3,923.00	7.14
04/09/98	3,974.60	59.13	3,915.47	3,921.05	52.27	3,922.33	6.86
04/16/98	3,974.60	58.48	3,916.12	3,921.64	51.70	3,922.90	6.78
04/21/98	3,974.60	58.52	3,916.08	3,921.65	51.68	3,922.92	6.84
04/28/98	3,974.60	58.45	3,916.15	3,921.64	51.71	3,922.89	6.74
04/29/98	3,974.60	58.91	3,915.69	3,921.01	52.38	3,922.22	6.53
04/30/98	3,974.60	58.63	3,915.97	3,921.09	52.34	3,922.26	6.29
05/01/98	3,974.60	58.55	3,916.05	3,921.02	52.45	3,922.15	6.10
05/04/98	3,974.60	57.92	3,916.68	3,921.65	51.81	3,922.79	6.11
05/11/98	3,974.60	57.82	3,916.78	3,921.14	52.46	3,922.14	5.36
05/13/98	3,974.60	58.13	3,916.47	3,921.17	52.35	3,922.25	5.78
05/18/98	3,974.60	57.16	3,917.44	3,921.44	52.25	3,922.35	4.91
05/27/98	3,974.60	57.78	3,916.82	3,921.30	52.28	3,922.32	5.50
06/01/98	3,974.60	57.01	3,917.59	3,921.46	52.25	3,922.35	4.76
06/09/98	3,974.60	57.32	3,917.28	3,921.68	51.92	3,922.68	5.40
06/15/98	3,974.60	57.42	3,917.18	3,921.67	51.91	3,922.69	5.51
06/22/98	3,974.60	57.42	3,917.18	3,921.58	52.02	3,922.58	5.40
07/01/98	3,974.60	57.85	3,916.75	3,921.11	52.49	3,922.11	5.36
07/06/98	3,974.60	57.85	3,916.75	3,921.13	52.47	3,922.13	5.38
07/13/98	3,974.60	57.67	3,916.93	3,921.15	52.48	3,922.12	5.19
07/20/98	3,974.60	57.52	3,917.08	3,920.97	52.74	3,921.86	4.78
07/27/98	3,974.60	57.71	3,916.89	3,920.78	52.93	3,921.67	4.78
08/03/98	3,974.60	56.96	3,917.64	3,921.63	52.06	3,922.54	4.90

TABLE III

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
08/10/98	3,974.60	57.59	3,917.01	3,920.87	52.85	3,921.75	4.74
08/17/98	3,974.60	57.30	3,917.30	3,920.87	52.92	3,921.68	4.38
08/24/98	3,974.60	54.07	3,920.53	3,920.89	53.63	3,920.97	0.44
09/09/98	3,974.60	54.10	3,920.50	3,920.91	53.60	3,921.00	0.50
09/14/98	3,974.60	56.32	3,918.28	3,921.59	52.25	3,922.35	4.07
09/22/98	3,974.60	56.61	3,917.99	3,920.99	52.92	3,921.68	3.69
09/30/98	3,974.60	55.11	3,919.49	3,921.20	53.01	3,921.59	2.10
10/05/98	3,974.60	55.44	3,919.16	3,921.04	53.13	3,921.47	2.31
10/14/98	3,974.60	57.02	3,917.58	3,920.65	53.25	3,921.35	3.77
10/30/98	3,974.60	57.22	3,917.38	3,920.64	53.21	3,921.39	4.01
11/16/98	3,974.60	57.25	3,917.35	3,920.64	53.21	3,921.39	4.04
12/02/98	3,974.60	57.32	3,917.28	3,920.63	53.20	3,921.40	4.12
12/08/98	3,974.60	57.33	3,917.27	3,920.63	53.20	3,921.40	4.13
12/14/98	3,974.60	57.35	3,917.25	3,920.61	53.22	3,921.38	4.13
12/29/98	3,974.60	57.34	3,917.26	3,920.64	53.19	3,921.41	4.15

TABLE III

**MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.55	52.96	3,921.59	---		---	---
07/29/97	3,974.55	52.92	3,921.63	---		---	---
09/10/97	3,974.55	54.53	3,920.02	3,921.80	52.44	3,922.11	2.09
09/16/97	3,974.55	54.38	3,920.17	3,921.80	52.46	3,922.09	1.92
09/23/97	3,974.55	54.45	3,920.10	3,921.81	52.44	3,922.11	2.01
10/22/97	3,974.55	57.92	3,916.63	3,922.00	51.60	3,922.95	6.32
10/29/97	3,974.55	57.29	3,917.26	3,921.96	51.76	3,922.79	5.53
11/04/97	3,974.55	56.75	3,917.80	3,921.92	51.90	3,922.65	4.85
11/11/97	3,974.55	57.63	3,916.92	3,921.98	51.68	3,922.87	5.95
12/04/97	3,974.55	58.53	3,916.02	3,922.01	51.48	3,923.07	7.05
12/10/97	3,974.55	58.25	3,916.30	3,922.04	51.50	3,923.05	6.75
12/18/97	3,974.53	58.57	3,915.96	3,922.00	51.46	3,923.07	7.11
12/23/97	3,974.53	58.17	3,916.36	3,922.00	51.54	3,922.99	6.63
12/31/97	3,974.53	58.36	3,916.17	3,922.01	51.49	3,923.04	6.87
01/06/98	3,974.53	58.48	3,916.05	3,922.05	51.42	3,923.11	7.06
01/06/98	3,974.53	58.48	3,916.05	3,922.03	51.45	3,923.08	7.03
01/06/98	3,974.53	58.50	3,916.03	3,922.01	51.46	3,923.07	7.04
01/06/98	3,974.53	58.47	3,916.06	3,922.01	51.47	3,923.06	7.00
01/06/98	3,974.53	58.47	3,916.06	3,922.01	51.47	3,923.06	7.00
01/07/98	3,974.53	58.53	3,916.00	3,921.97	51.51	3,923.02	7.02
01/08/98	3,974.53	58.54	3,915.99	3,921.98	51.49	3,923.04	7.05
01/09/98	3,974.53	58.53	3,916.00	3,921.98	51.50	3,923.03	7.03
01/10/98	3,974.53	58.51	3,916.02	3,921.94	51.54	3,922.99	6.97
01/12/98	3,974.53	58.51	3,916.02	3,921.93	51.56	3,922.97	6.95
01/15/98	3,974.53	58.47	3,916.06	3,921.98	51.51	3,923.02	6.96
01/23/98	3,974.53	58.37	3,916.16	3,921.94	51.57	3,922.96	6.80
01/27/98	3,974.53	58.31	3,916.22	3,921.93	51.59	3,922.94	6.72
02/03/98	3,974.53	58.20	3,916.33	3,921.70	51.60	3,922.93	6.60
02/11/98	3,974.53	58.13	3,916.40	3,921.68	51.64	3,922.89	6.49
02/17/98	3,974.53	58.11	3,916.42	3,921.74	51.57	3,922.96	6.54
02/25/98	3,974.53	58.09	3,916.44	3,921.76	51.55	3,922.98	6.54
03/05/98	3,974.53	58.07	3,916.46	3,921.76	51.56	3,922.97	6.51
03/11/98	3,974.53	58.05	3,916.48	3,921.75	51.58	3,922.95	6.47
03/16/98	3,974.53	58.11	3,916.42	3,921.76	51.55	3,922.98	6.56
03/25/98	3,974.53	58.10	3,916.43	3,921.77	51.54	3,922.99	6.56

TABLE III

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
03/31/98	3,974.53	57.88	3,916.65	3,921.79	51.56	3,922.97	6.32
04/09/98	3,974.53	58.28	3,916.25	3,921.50	51.83	3,922.70	6.45
04/16/98	3,974.53	57.89	3,916.64	3,921.76	51.60	3,922.93	6.29
04/21/98	3,974.53	57.82	3,916.71	3,921.76	51.62	3,922.91	6.20
04/28/98	3,974.53	57.83	3,916.70	3,921.75	51.63	3,922.90	6.20
04/29/98	3,974.53	58.28	3,916.25	3,921.43	51.92	3,922.61	6.36
04/30/98	3,974.53	58.12	3,916.41	3,921.46	51.92	3,922.61	6.20
05/01/98	3,974.53	58.09	3,916.44	3,921.49	51.88	3,922.65	6.21
05/04/98	3,974.53	57.64	3,916.89	3,921.77	51.64	3,922.89	6.00
05/11/98	3,974.53	57.71	3,916.82	3,921.54	51.91	3,922.62	5.80
05/13/98	3,974.53	57.63	3,916.90	3,921.63	51.82	3,922.71	5.81
05/18/98	3,974.53	57.24	3,917.29	3,921.65	51.88	3,922.65	5.36
05/27/98	3,974.53	57.30	3,917.23	3,921.61	51.92	3,922.61	5.38
06/01/98	3,974.53	57.02	3,917.51	3,921.66	51.92	3,922.61	5.10
06/09/98	3,974.53	56.99	3,917.54	3,921.78	51.78	3,922.75	5.21
06/15/98	3,974.53	56.99	3,917.54	3,921.77	51.79	3,922.74	5.20
06/22/98	3,974.53	57.08	3,917.45	3,921.69	51.87	3,922.66	5.21
07/01/98	3,974.53	57.21	3,917.32	3,921.54	52.02	3,922.51	5.19
07/06/98	3,974.53	57.15	3,917.38	3,921.60	51.96	3,922.57	5.19
07/13/98	3,974.53	57.10	3,917.43	3,921.55	52.04	3,922.49	5.06
07/20/98	3,974.53	57.00	3,917.53	3,921.45	52.18	3,922.35	4.82
07/27/98	3,974.53	57.17	3,917.36	3,921.31	52.32	3,922.21	4.85
08/03/98	3,974.53	56.67	3,917.86	3,921.74	51.90	3,922.63	4.77
08/10/98	3,974.53	57.00	3,917.53	3,921.36	52.29	3,922.24	4.71
08/17/98	3,974.53	56.94	3,917.59	3,921.32	52.36	3,922.17	4.58
08/24/98	3,974.53	56.66	3,917.87	3,921.39	52.33	3,922.20	4.33
09/02/98	3,974.53	56.01	3,918.52	3,920.31	53.81	3,920.72	2.20
09/09/98	3,974.53	57.43	3,917.10	3,919.55	54.42	3,920.11	3.01
09/14/98	3,974.53	54.26	3,920.27	3,921.69	52.52	3,922.01	1.74
09/22/98	3,974.53	54.17	3,920.36	3,921.43	52.85	3,921.68	1.32
09/30/98	3,974.53	54.15	3,920.38	3,921.57	52.69	3,921.84	1.46
10/05/98	3,974.53	54.37	3,920.16	3,921.44	52.80	3,921.73	1.57
10/14/98	3,974.53	56.26	3,918.27	3,920.36	53.69	3,920.84	2.57
10/30/98	3,974.53	56.99	3,917.54	3,920.36	53.53	3,921.00	3.46
11/16/98	3,974.53	57.34	3,917.19	3,920.38	53.42	3,921.11	3.92
12/02/98	3,974.53	57.32	3,917.21	3,920.44	53.35	3,921.18	3.97

TABLE III

**MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/08/98	3,974.53	57.23	3,917.30	3,920.52	53.28	3,921.25	3.95
12/14/98	3,974.53	57.19	3,917.34	3,920.56	53.23	3,921.30	3.96
12/29/98	3,974.53	57.11	3,917.42	3,920.63	53.17	3,921.36	3.94

TABLE III

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.31	60.85	3,913.46	3,922.41	50.32	3,923.99	10.53
06/23/97	3,974.31	58.09	3,916.22	3,922.08	51.20	3,923.11	6.89
06/23/97	3,974.31	56.57	3,917.74	3,922.38	51.11	3,923.20	5.46
06/23/97	3,974.31	59.18	3,915.13	3,921.32	51.90	3,922.41	7.28
06/23/97	3,974.31	59.74	3,914.57	3,922.08	50.91	3,923.40	8.83
06/23/97	3,974.31	54.91	3,919.40	3,921.88	51.99	3,922.32	2.92
06/25/97	3,974.31	60.47	3,913.84	3,922.02	50.85	3,923.46	9.62
06/25/97	3,974.31	58.47	3,915.84	3,921.99	51.23	3,923.08	7.24
06/25/97	3,974.31	59.49	3,914.82	3,922.01	51.03	3,923.28	8.46
06/25/97	3,974.31	53.42	3,920.89	3,921.94	52.19	3,922.12	1.23
06/25/97	3,974.31	55.95	3,918.36	3,921.90	51.79	3,922.52	4.16
06/25/97	3,974.31	58.50	3,915.81	3,922.02	51.20	3,923.11	7.30
06/25/97	3,974.31	52.46	3,921.85	3,921.87	52.44	3,921.87	0.02
06/25/97	3,974.31	51.81	3,922.50	---	51.81	3,922.50	SHEEN
06/27/97	3,974.31	60.46	3,913.85	3,922.06	50.80	3,923.51	9.66
06/27/97	3,974.31	57.47	3,916.84	3,922.00	51.40	3,922.91	6.07
07/01/97	3,974.31	60.45	3,913.86	3,922.01	50.86	3,923.45	9.59
07/01/97	3,974.31	56.40	3,917.91	3,921.94	51.66	3,922.65	4.74
07/03/97	3,974.31	60.41	3,913.90	3,922.01	50.87	3,923.44	9.54
07/03/97	3,974.31	57.53	3,916.78	3,921.98	51.41	3,922.90	6.12
07/29/97	3,974.31	60.19	3,914.12	3,922.02	50.90	3,923.41	9.29
07/29/97	3,974.31	57.69	3,916.62	3,920.97	52.57	3,921.74	5.12
09/10/97	3,974.31	59.88	3,914.43	3,922.00	50.97	3,923.34	8.91
09/16/97	3,974.31	59.85	3,914.46	3,922.00	50.98	3,923.33	8.87
09/23/97	3,974.31	59.79	3,914.52	3,922.01	50.98	3,923.33	8.81
10/22/97	3,974.31	59.60	3,914.71	3,922.01	51.01	3,923.30	8.59
10/29/97	3,974.31	59.56	3,914.75	3,921.99	51.04	3,923.27	8.52
11/04/97	3,974.31	59.54	3,914.77	3,922.00	51.04	3,923.27	8.50
11/11/97	3,974.31	59.48	3,914.83	3,922.00	51.04	3,923.27	8.44
12/04/97	3,974.31	59.38	3,914.93	3,921.99	51.08	3,923.23	8.30
12/10/97	3,974.31	59.31	3,915.00	3,922.00	51.07	3,923.24	8.24
12/10/97	3,974.31	59.31	3,915.00	3,922.00	51.07	3,923.24	8.24
12/18/97	3,974.28	59.28	3,915.00	3,921.98	51.07	3,923.21	8.21
12/23/97	3,974.28	59.25	3,915.03	3,921.99	51.06	3,923.22	8.19
12/31/97	3,974.28	59.23	3,915.05	3,921.96	51.10	3,923.18	8.13
12/31/97	3,974.28	59.23	3,915.05	3,921.96	51.10	3,923.18	8.13

TABLE III

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
01/06/98	3,974.28	59.19	3,915.09	3,921.98	51.08	3,923.20	8.11
01/06/98	3,974.28	59.21	3,915.07	3,921.98	51.08	3,923.20	8.13
01/06/98	3,974.28	59.20	3,915.08	3,921.95	51.12	3,923.16	8.08
01/06/98	3,974.28	59.19	3,915.09	3,921.94	51.13	3,923.15	8.06
01/06/98	3,974.28	59.17	3,915.11	3,921.96	51.11	3,923.17	8.06
01/07/98	3,974.28	59.23	3,915.05	3,921.90	51.17	3,923.11	8.06
01/08/98	3,974.28	59.17	3,915.11	3,921.94	51.13	3,923.15	8.04
01/09/98	3,974.28	59.14	3,915.14	3,921.85	51.25	3,923.03	7.89
01/10/98	3,974.28	59.16	3,915.12	3,921.89	51.20	3,923.08	7.96
01/12/98	3,974.28	59.06	3,915.22	3,921.93	51.17	3,923.11	7.89
01/15/98	3,974.28	59.03	3,915.25	3,921.92	51.18	3,923.10	7.85
01/23/98	3,974.28	58.90	3,915.38	3,921.87	51.26	3,923.02	7.64
01/27/98	3,974.28	58.83	3,915.45	3,921.87	51.28	3,923.00	7.55
02/03/98	3,974.28	58.74	3,915.54	3,921.61	51.28	3,923.00	7.46
02/11/98	3,974.28	58.60	3,915.68	3,921.60	51.33	3,922.95	7.27
02/17/98	3,974.28	58.59	3,915.69	3,921.68	51.23	3,923.05	7.36
02/25/98	3,974.28	58.63	3,915.65	3,921.70	51.20	3,923.08	7.43
03/05/98	3,974.28	58.61	3,915.67	3,921.69	51.21	3,923.07	7.40
03/11/98	3,974.28	58.60	3,915.68	3,921.68	51.23	3,923.05	7.37
03/16/98	3,974.28	58.58	3,915.70	3,921.70	51.21	3,923.07	7.37
03/25/98	3,974.28	58.57	3,915.71	3,921.70	51.21	3,923.07	7.36
03/31/98	3,974.28	58.52	3,915.76	3,921.72	51.20	3,923.08	7.32
04/09/98	3,974.28	58.69	3,915.59	3,921.31	51.66	3,922.62	7.03
04/16/98	3,974.28	58.33	3,915.95	3,921.69	51.28	3,923.00	7.05
04/21/98	3,974.28	58.33	3,915.95	3,921.70	51.27	3,923.01	7.06
04/28/98	3,974.28	58.29	3,915.99	3,921.68	51.30	3,922.98	6.99
04/29/98	3,974.28	58.41	3,915.87	3,921.32	51.71	3,922.57	6.70
04/30/98	3,974.28	58.29	3,915.99	3,921.31	51.76	3,922.52	6.53
05/01/98	3,974.28	58.11	3,916.17	3,921.38	51.71	3,922.57	6.40
05/04/98	3,974.28	57.96	3,916.32	3,921.72	51.33	3,922.95	6.63
05/11/98	3,974.28	57.80	3,916.48	3,921.44	51.71	3,922.57	6.09
05/13/98	3,974.28	57.88	3,916.40	3,921.54	51.57	3,922.71	6.31
05/18/98	3,974.28	57.33	3,916.95	3,921.60	51.62	3,922.66	5.71
05/27/98	3,974.28	57.67	3,916.61	3,921.51	51.65	3,922.63	6.02
06/01/98	3,974.28	57.14	3,917.14	3,921.60	51.66	3,922.62	5.48
06/09/98	3,974.28	57.38	3,916.90	3,921.71	51.47	3,922.81	5.91
06/15/98	3,974.28	57.39	3,916.89	3,921.70	51.48	3,922.80	5.91

TABLE III

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/22/98	3,974.28	57.38	3,916.90	3,921.62	51.58	3,922.70	5.80
07/01/98	3,974.28	54.27	3,920.01	3,921.23	52.77	3,921.51	1.50
07/06/98	3,974.28	58.84	3,915.44	3,921.20	51.76	3,922.52	7.08
07/13/98	3,974.28	57.27	3,917.01	3,921.42	51.85	3,922.43	5.42
07/20/98	3,974.28	56.94	3,917.34	3,921.39	51.96	3,922.32	4.98
08/03/98	3,974.28	56.56	3,917.72	3,921.68	51.69	3,922.59	4.87
09/09/98	3,974.28	54.29	3,919.99	3,921.34	52.63	3,921.65	1.66
10/14/98	3,974.28	56.21	3,918.07	3,920.89	52.74	3,921.54	3.47

TABLE III

MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,974.72	53.29	3,921.43	---		---	---
10/22/97	3,974.72	53.30	3,921.42	---		---	---
10/29/97	3,974.72	53.30	3,921.42	---		---	---
11/04/97	3,974.72	53.29	3,921.43	---		---	---
11/11/97	3,974.72	53.30	3,921.42	---		---	---
12/04/97	3,974.72	53.26	3,921.46	---		---	---
12/10/97	3,974.72	53.25	3,921.47	---		---	---
09/10/97	3,974.73	53.29	3,921.44	---		---	---
10/22/97	3,974.73	53.30	3,921.43	---		---	---
10/29/97	3,974.73	53.30	3,921.43	---		---	---
11/04/97	3,974.73	53.29	3,921.44	---		---	---
11/11/97	3,974.73	53.30	3,921.43	---		---	---
12/04/97	3,974.73	53.26	3,921.47	---		---	---
12/10/97	3,974.73	53.25	3,921.48	---		---	---
12/18/97	3,974.72	53.30	3,921.42	---		---	---
12/23/97	3,974.72	53.24	3,921.48	---		---	---
12/31/97	3,974.72	53.23	3,921.49	---		---	---
01/06/98	3,974.72	53.25	3,921.47	---		---	---
01/06/98	3,974.72	53.24	3,921.48	---		---	---
01/07/98	3,974.72	53.25	3,921.47	---		---	---
01/15/98	3,974.72	53.26	3,921.46	---		---	---
01/23/98	3,974.72	53.28	3,921.44	---		---	---
01/27/98	3,974.72	53.27	3,921.45	---		---	---
02/03/98	3,974.72	53.24	3,921.48	---		---	---
02/11/98	3,974.72	53.27	3,921.45	---		---	---
02/17/98	3,974.72	53.23	3,921.49	---		---	---
02/25/98	3,974.72	53.20	3,921.52	---		---	---
03/05/98	3,974.72	53.16	3,921.56	---		---	---
03/11/98	3,974.72	53.23	3,921.49	---		---	---
03/16/98	3,974.72	53.20	3,921.52	---		---	---
03/25/98	3,974.72	53.19	3,921.53	---		---	---
03/31/98	3,974.72	53.18	3,921.54	---		---	---
04/09/98	3,974.72	53.33	3,921.39	---		---	---
04/16/98	3,974.72	53.21	3,921.51	---		---	---
04/21/98	3,974.72	53.23	3,921.49	---		---	---
04/28/98	3,974.72	53.21	3,921.51	---		---	---

TABLE III

**MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
05/04/98	3,974.72	53.21	3,921.51	---		---	---
05/11/98	3,974.72	53.32	3,921.40	---		---	---
05/18/98	3,974.72	53.32	3,921.40	---		---	---
05/27/98	3,974.72	53.28	3,921.44	---		---	---
06/01/98	3,974.72	53.33	3,921.39	---		---	---
06/09/98	3,974.72	53.20	3,921.52	---	53.20	3921.52	SHEEN
06/15/98	3,974.72	53.19	3,921.53	---	53.19	3921.53	SHEEN
06/22/98	3,974.72	53.26	3,921.46	---	53.26	3921.46	SHEEN
07/01/98	3,974.72	53.35	3,921.37	3,921.39	53.33	3921.39	0.02
07/06/98	3,974.72	53.26	3,921.46	3,921.48	53.24	3921.48	0.02
07/13/98	3,974.72	53.33	3,921.39	3,921.42	53.29	3921.43	0.04
07/20/98	3,974.72	53.43	3,921.29	3,921.35	53.36	3921.36	0.07
07/27/98	3,974.72	53.58	3,921.14	3,921.23	53.47	3921.25	0.11
08/03/98	3,974.72	53.34	3,921.38	3,921.49	53.20	3921.52	0.14
08/10/98	3,974.72	53.62	3,921.10	3,921.24	53.45	3921.27	0.17
08/17/98	3,974.72	53.64	3,921.08	3,921.23	53.45	3921.27	0.19
08/24/98	3,974.72	53.63	3,921.09	3,921.29	53.39	3921.33	0.24
09/02/98	3,974.72	53.66	3,921.06	3,921.28	53.39	3921.33	0.27
09/09/98	3,974.72	53.51	3,921.21	3,921.46	53.20	3921.52	0.31
09/14/98	3,974.72	53.53	3,921.19	3,921.48	53.17	3921.55	0.36
09/22/98	3,974.72	53.84	3,920.88	3,921.23	53.41	3921.31	0.43
09/30/98	3,974.72	53.68	3,921.04	3,921.42	53.21	3921.51	0.47
10/05/98	3,974.72	53.88	3,920.84	3,921.32	53.29	3921.43	0.59
10/14/98	3,974.72	53.41	3,921.31	3,921.49	53.19	3921.53	0.22
10/30/98	3,974.72	53.66	3,921.06	3,921.49	53.13	3921.59	0.53
11/16/98	3,974.72	53.97	3,920.75	3,921.48	53.07	3921.65	0.90
12/02/98	3,974.72	54.36	3,920.36	3,921.42	53.06	3921.66	1.30
12/08/98	3,974.72	54.48	3,920.24	3,921.40	53.05	3921.67	1.43
12/14/98	3,974.72	54.59	3,920.13	3,921.42	53.01	3921.71	1.58
12/29/98	3,974.72	54.94	3,919.78	3,921.42	52.93	3921.79	2.01
01/04/99	3,974.73	55.08	3,919.64	3,921.37	52.92	3921.81	2.16
01/14/99	3,974.73	55.38	3,919.34	3,921.26	52.99	3921.74	2.39
01/19/99	3,974.73	55.50	3,919.22	3,921.18	53.06	3921.67	2.44
02/02/99	3,974.73	53.79	3,920.93	3,921.49	53.09	3921.64	0.70
02/09/99	3,974.73	53.78	3,920.94	3,921.34	53.28	3921.45	0.50
02/16/99	3,974.73	53.77	3,920.95	3,921.52	53.06	3921.67	0.71

TABLE III

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,974.66	53.21	3,921.45	---		---	---
10/22/97	3,974.66	53.23	3,921.43	---		---	---
10/29/97	3,974.66	53.24	3,921.42	---		---	---
11/04/97	3,974.66	53.23	3,921.43	---		---	---
11/11/97	3,974.66	53.23	3,921.43	---		---	---
12/04/97	3,974.66	53.17	3,921.49	---		---	---
12/10/97	3,974.66	53.19	3,921.47	---		---	---
12/18/97	3,974.60	53.16	3,921.44	---		---	---
12/23/97	3,974.60	53.16	3,921.44	---		---	---
12/31/97	3,974.60	53.17	3,921.43	---		---	---
01/06/98	3,974.60	53.18	3,921.42	---		---	---
01/06/98	3,974.60	53.17	3,921.43	---		---	---
01/07/98	3,974.60	53.19	3,921.41	---		---	---
01/15/98	3,974.60	53.17	3,921.43	---		---	---
01/23/98	3,974.60	53.20	3,921.40	---		---	---
01/27/98	3,974.60	53.19	3,921.41	---		---	---
02/03/98	3,974.60	53.16	3,921.44	---		---	---
02/11/98	3,974.60	53.19	3,921.41	---		---	---
02/17/98	3,974.60	53.15	3,921.45	---		---	---
02/25/98	3,974.60	53.13	3,921.47	---		---	---
03/05/98	3,974.60	53.12	3,921.48	---		---	---
03/11/98	3,974.60	53.14	3,921.46	---		---	---
03/16/98	3,974.60	53.12	3,921.48	---		---	---
03/25/98	3,974.60	53.11	3,921.49	---		---	---
03/31/98	3,974.60	53.12	3,921.48	---		---	---
04/09/98	3,974.60	53.21	3,921.39	---		---	---
04/16/98	3,974.60	53.14	3,921.46	---		---	---
04/21/98	3,974.60	53.16	3,921.44	---		---	---
04/28/98	3,974.60	53.14	3,921.46	---		---	---
05/04/98	3,974.60	53.14	3,921.46	---		---	---
05/11/98	3,974.60	53.21	3,921.39	---		---	---
05/18/98	3,974.60	53.24	3,921.36	---		---	---
05/27/98	3,974.60	53.18	3,921.42	---		---	---
06/01/98	3,974.60	53.23	3,921.37	---		---	---

TABLE III

**MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/09/98	3,974.60	53.12	3,921.48	---		---	---
06/15/98	3,974.60	53.13	3,921.47	---		---	---
06/22/98	3,974.60	53.20	3,921.40	---		---	---
06/24/98	3,974.60	53.23	3,921.37	---		---	---
07/01/98	3,974.60	53.25	3,921.35	---		---	---
07/06/98	3,974.60	53.18	3,921.42	---		---	---
07/13/98	3,974.60	53.22	3,921.38	---		---	---
07/20/98	3,974.60	53.29	3,921.31	---		---	---
07/27/98	3,974.60	53.41	3,921.19	---		---	---
08/03/98	3,974.60	53.21	3,921.39	---		---	---
08/10/98	3,974.60	53.39	3,921.21	---		---	---
08/17/98	3,974.60	53.42	3,921.18	---		---	---
08/24/98	3,974.60	53.39	3,921.21	---		---	---
09/02/98	3,974.60	53.36	3,921.24	---		---	---
09/09/98	3,974.60	53.30	3,921.30	---		---	---
09/14/98	3,974.60	53.21	3,921.39	---		---	---
09/22/98	3,974.60	53.03	3,921.57	---		---	---
09/30/98	3,974.60	53.01	3,921.59	---		---	---
10/05/98	3,974.60	53.33	3,921.27	---		---	---
10/14/98	3,974.60	53.18	3,921.42	---		---	---
10/30/98	3,974.60	53.19	3,921.41	---		---	---
11/16/98	3,974.60	53.18	3,921.42	---		---	---
12/02/98	3,974.60	53.26	3,921.34	---		---	---
12/08/98	3,974.60	53.19	3,921.41	---		---	---
12/14/98	3,974.60	53.26	3,921.34	---		---	---
12/29/98	3,974.60	53.15	3,921.45	---		---	---
01/04/99	3,974.66	53.29	3,921.37				
01/14/99	3,974.66	53.37	3,921.29				
01/19/99	3,974.66	53.44	3,921.22				
02/02/99	3,974.66	53.12	3,921.54				
02/09/99	3,974.66	53.32	3,921.34				
02/16/99	3,974.66	53.12	3,921.54				

TABLE III

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,974.52	52.97	3,921.55	---		---	---
10/22/97	3,974.52	52.98	3,921.54	---		---	---
10/29/97	3,974.52	53.02	3,921.50	---		---	---
11/04/97	3,974.52	53.01	3,921.51	---		---	---
11/11/97	3,974.52	53.03	3,921.49	---		---	---
12/04/97	3,974.52	52.92	3,921.60	---		---	---
12/10/97	3,974.52	52.92	3,921.60	---		---	---
12/18/97	3,974.48	53.03	3,921.45	---		---	---
12/23/97	3,974.48	52.91	3,921.57	---		---	---
12/31/97	3,974.48	52.91	3,921.57	---		---	---
01/06/98	3,974.48	52.90	3,921.58	---		---	---
01/06/98	3,974.48	52.90	3,921.58	---		---	---
01/07/98	3,974.48	52.92	3,921.56	---		---	---
01/15/98	3,974.48	52.93	3,921.55	---		---	---
01/23/98	3,974.48	52.94	3,921.54	---		---	---
01/27/98	3,974.48	52.94	3,921.54	---		---	---
02/03/98	3,974.48	52.91	3,921.57	---		---	---
02/11/98	3,974.48	52.94	3,921.54	---		---	---
02/17/98	3,974.48	52.89	3,921.59	---		---	---
02/25/98	3,974.48	52.87	3,921.61	---		---	---
03/05/98	3,974.48	52.85	3,921.63	---		---	---
03/11/98	3,974.48	52.88	3,921.60	---		---	---
03/16/98	3,974.48	52.88	3,921.60	---		---	---
03/25/98	3,974.48	52.87	3,921.61	---		---	---
03/31/98	3,974.48	52.84	3,921.64	---		---	---
04/09/98	3,974.48	52.98	3,921.50	---		---	---
04/16/98	3,974.48	52.89	3,921.59	---		---	---
04/21/98	3,974.48	52.88	3,921.60	---		---	---
04/28/98	3,974.48	52.89	3,921.59	---		---	---
05/04/98	3,974.48	52.88	3,921.60	---		---	---
05/11/98	3,974.48	52.99	3,921.49	---		---	---
05/18/98	3,974.48	53.02	3,921.46	---		---	---
05/27/98	3,974.48	52.94	3,921.54	---		---	---
06/01/98	3,974.48	53.01	3,921.47	---		---	---

TABLE III

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/09/98	3,974.48	52.88	3,921.60	---		---	---
06/15/98	3,974.48	52.88	3,921.60	---		---	---
06/22/98	3,974.48	52.95	3,921.53	---		---	---
06/24/98	3,974.48	52.89	3,921.59	---		---	---
07/01/98	3,974.48	53.01	3,921.47	---		---	---
07/06/98	3,974.48	52.93	3,921.55	---		---	---
07/13/98	3,974.48	52.97	3,921.51	---		---	---
07/20/98	3,974.48	53.08	3,921.40	---		---	---
07/27/98	3,974.48	53.10	3,921.38	---		---	---
08/03/98	3,974.48	52.94	3,921.54	---		---	---
08/10/98	3,974.48	53.17	3,921.31	---		---	---
08/17/98	3,974.48	53.19	3,921.29	---		---	---
08/24/98	3,974.48	53.16	3,921.32	---		---	---
09/02/98	3,974.48	53.12	3,921.36	---		---	---
09/09/98	3,974.48	53.06	3,921.42	---		---	---
09/14/98	3,974.48	52.94	3,921.54	---		---	---
09/22/98	3,974.48	53.09	3,921.39	---		---	---
09/30/98	3,974.48	52.98	3,921.50	---		---	---
10/05/98	3,974.48	53.17	3,921.31	---		---	---
10/14/98	3,974.48	52.92	3,921.56	---		---	---
10/30/98	3,974.48	52.92	3,921.56	---		---	---
11/16/98	3,974.48	52.92	3,921.56	---		---	---
12/02/98	3,974.48	52.98	3,921.50	---		---	---
12/08/98	3,974.48	53.02	3,921.46	---		---	---
12/14/98	3,974.48	53.00	3,921.48	---		---	---
12/29/98	3,974.48	52.93	3,921.55	---		---	---

TABLE III

**MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,975.80	53.29	3,922.51	---		---	---
10/22/97	3,975.80	53.34	3,922.46	---		---	---
10/29/97	3,975.80	53.36	3,922.44	---		---	---
11/04/97	3,975.80	53.35	3,922.45	---		---	---
11/11/97	3,975.80	53.32	3,922.48	---		---	---
12/04/97	3,975.80	53.37	3,922.43	3,922.49	53.30	3,922.50	0.07
12/10/97	3,975.80	53.38	3,922.42	3,922.55	53.23	3,922.57	0.15
12/18/97	3,975.06	53.53	3,921.53	3,922.04	52.93	3,922.13	0.60
12/23/97	3,975.06	53.57	3,921.49	3,921.81	53.19	3,921.87	0.38
12/31/97	3,975.06	53.70	3,921.36	3,921.79	53.19	3,921.87	0.51
01/06/98	3,975.06	53.79	3,921.27	3,921.84	53.12	3,921.94	0.67
01/06/98	3,975.06	53.81	3,921.25	3,921.85	53.10	3,921.96	0.71
01/06/98	3,975.06	53.80	3,921.26	3,921.83	53.13	3,921.93	0.67
01/06/98	3,975.06	53.81	3,921.25	3,921.83	53.13	3,921.93	0.68
01/06/98	3,975.06	53.81	3,921.25	3,921.83	53.13	3,921.93	0.68
01/07/98	3,975.06	53.86	3,921.20	3,921.78	53.18	3,921.88	0.68
01/08/98	3,975.06	53.85	3,921.21	3,921.82	53.13	3,921.93	0.72
01/09/98	3,975.06	53.88	3,921.18	3,921.83	53.12	3,921.94	0.76
01/10/98	3,975.06	53.94	3,921.12	3,921.77	53.17	3,921.89	0.77
01/12/98	3,975.06	53.96	3,921.10	3,921.81	53.12	3,921.94	0.84
01/15/98	3,975.06	53.98	3,921.08	3,921.82	53.11	3,921.95	0.87
01/23/98	3,975.06	54.33	3,920.73	3,921.78	53.09	3,921.97	1.24
01/27/98	3,975.06	54.47	3,920.59	3,921.79	53.06	3,922.00	1.41
02/03/98	3,975.06	54.72	3,920.34	3,921.76	52.97	3,922.09	1.75
02/11/98	3,975.06	55.05	3,920.01	3,921.74	52.93	3,922.13	2.12
02/17/98	3,975.06	55.23	3,919.83	3,921.78	52.83	3,922.23	2.40
02/25/98	3,975.06	55.57	3,919.49	3,921.81	52.72	3,922.34	2.85
03/05/98	3,975.06	55.90	3,919.16	3,921.81	52.65	3,922.41	3.25
03/11/98	3,975.06	56.14	3,918.92	3,921.79	52.61	3,922.45	3.53
03/16/98	3,975.06	56.35	3,918.71	3,921.82	52.53	3,922.53	3.82
03/25/98	3,975.06	56.68	3,918.38	3,921.83	52.44	3,922.62	4.24
03/31/98	3,975.06	55.22	3,919.84	3,921.83	52.77	3,922.29	2.45
04/09/98	3,975.06	55.88	3,919.18	3,921.71	52.77	3,922.29	3.11
04/16/98	3,975.06	56.16	3,918.90	3,921.82	52.57	3,922.49	3.59
04/21/98	3,975.06	56.43	3,918.63	3,921.83	52.50	3,922.56	3.93

TABLE III

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
04/28/98	3,975.06	56.77	3,918.29	3,921.81	52.44	3,922.62	4.33
04/29/98	3,975.06	56.83	3,918.23	3,921.79	52.46	3,922.60	4.37
04/30/98	3,975.06	56.61	3,918.45	3,922.02	52.22	3,922.84	4.39
05/01/98	3,975.06	56.63	3,918.43	3,922.04	52.19	3,922.87	4.44
05/04/98	3,975.06	56.89	3,918.17	3,921.92	52.28	3,922.78	4.61
05/11/98	3,975.06	56.98	3,918.08	3,921.93	52.25	3,922.81	4.73
05/13/98	3,975.06	57.04	3,918.02	3,921.90	52.27	3,922.79	4.77
05/18/98	3,975.06	56.83	3,918.23	3,922.12	52.05	3,923.01	4.78
05/27/98	3,975.06	57.05	3,918.01	3,921.93	52.23	3,922.83	4.82
06/01/98	3,975.06	56.92	3,918.14	3,922.08	52.08	3,922.98	4.84
06/09/98	3,975.06	57.14	3,917.92	3,921.88	52.28	3,922.78	4.86
06/15/98	3,975.06	57.15	3,917.91	3,921.86	52.30	3,922.76	4.85
07/01/98	3,975.06	55.42	3,919.64	3,920.02	54.95	3,920.11	0.47
07/03/98	3,975.06	54.93	3,920.13	3,920.70	54.23	3,920.83	0.70
07/06/98	3,975.06	55.41	3,919.65	3,920.44	54.44	3,920.62	0.97
07/20/98	3,975.06	56.57	3,918.49	3,919.02	55.92	3,919.14	0.65
07/27/98	3,975.06	57.05	3,918.01	3,918.97	55.87	3,919.19	1.18
08/03/98	3,975.06	54.29	3,920.77	3,921.42	53.49	3,921.57	0.80
08/10/98	3,975.06	54.14	3,920.92	3,921.69	53.19	3,921.87	0.95
08/17/98	3,975.06	54.74	3,920.32	3,921.45	53.35	3,921.71	1.39
08/24/98	3,975.06	54.64	3,920.42	3,921.70	53.07	3,921.99	1.57
09/02/98	3,975.06	55.03	3,920.03	3,921.44	53.30	3,921.76	1.73
09/09/98	3,975.06	56.54	3,918.52	3,920.05	54.66	3,920.40	1.88
09/22/98	3,975.06	54.85	3,920.21	3,920.87	54.04	3,921.02	0.81
10/05/98	3,975.06	54.24	3,920.82	3,920.85	54.20	3,920.86	0.04
10/14/98	3,975.06	54.61	3,920.45	3,920.59	54.44	3,920.62	0.17
10/30/98	3,975.06	54.65	3,920.41	3,920.56	54.47	3,920.59	0.18
11/16/98	3,975.06	55.08	3,919.98	3,920.54	54.39	3,920.67	0.69
12/02/98	3,975.06	55.34	3,919.72	3,920.56	54.31	3,920.75	1.03
12/08/98	3,975.06	55.48	3,919.58	3,920.53	54.31	3,920.75	1.17
12/14/98	3,975.06	55.56	3,919.50	3,920.54	54.28	3,920.78	1.28
12/29/98	3,975.06	54.51	3,920.55	3,920.57	54.49	3,920.57	0.02

TABLE III

**MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,975.02	53.10	3,921.92	---		---	---
12/23/97	3,975.02	53.11	3,921.91	---		---	---
12/31/97	3,975.02	53.10	3,921.92	---		---	---
01/06/98	3,975.02	53.11	3,921.91	---		---	---
01/06/98	3,975.02	53.11	3,921.91	---		---	---
01/07/98	3,975.02	53.12	3,921.90	---		---	---
01/15/98	3,975.02	53.12	3,921.90	---		---	---
01/23/98	3,975.02	53.12	3,921.90	---		---	---
01/27/98	3,975.02	53.13	3,921.89	---		---	---
02/03/98	3,975.02	53.09	3,921.93	---		---	---
02/11/98	3,975.02	53.13	3,921.89	---		---	---
02/17/98	3,975.02	53.11	3,921.91	---		---	---
02/25/98	3,975.02	53.08	3,921.94	---		---	---
03/05/98	3,975.02	53.07	3,921.95	---		---	---
03/11/98	3,975.02	53.10	3,921.92	---		---	---
03/16/98	3,975.02	53.08	3,921.94	---		---	---
03/25/98	3,975.02	53.07	3,921.95	---		---	---
03/31/98	3,975.02	53.05	3,921.97	---		---	---
04/09/98	3,975.02	53.13	3,921.89	---		---	---
04/16/98	3,975.02	53.09	3,921.93	---		---	---
04/21/98	3,975.02	53.09	3,921.93	---		---	---
04/28/98	3,975.02	53.09	3,921.93	---		---	---
05/04/98	3,975.02	53.01	3,922.01	---		---	---
05/11/98	3,975.02	52.95	3,922.07	---		---	---
05/18/98	3,975.02	52.89	3,922.13	---		---	---
05/27/98	3,975.02	53.01	3,922.01	---		---	---
06/01/98	3,975.02	52.95	3,922.07	---		---	---
06/09/98	3,975.02	53.05	3,921.97	---		---	---
06/15/98	3,975.02	53.08	3,921.94	---		---	---
06/22/98	3,975.02	53.15	3,921.87	---		---	---
06/24/98	3,975.02	53.02	3,922.00	---		---	---
07/01/98	3,975.02	53.11	3,921.91	---		---	---
07/06/98	3,975.02	53.05	3,921.97	---		---	---
07/13/98	3,975.02	53.02	3,922.00	---		---	---

TABLE III

**MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
07/20/98	3,975.02	52.83	3,922.19	---		---	---
07/27/98	3,975.02	52.90	3,922.12	---		---	---
08/03/98	3,975.02	53.09	3,921.93	---		---	---
08/10/98	3,975.02	52.82	3,922.20	---		---	---
08/17/98	3,975.02	52.99	3,922.03	---		---	---
08/24/98	3,975.02	52.78	3,922.24	---		---	---
09/02/98	3,975.02	52.93	3,922.09	---		---	---
09/09/98	3,975.02	52.91	3,922.11	---		---	---
09/14/98	3,975.02	52.97	3,922.05	---		---	---
09/22/98	3,975.02	52.86	3,922.16	---		---	---
09/30/98	3,975.02	52.84	3,922.18	---		---	---
10/05/98	3,975.02	52.90	3,922.12	---		---	---
10/14/98	3,975.02	53.04	3,921.98	---		---	---
10/30/98	3,975.02	53.09	3,921.93	---		---	---
11/16/98	3,975.02	53.06	3,921.96	---		---	---
12/02/98	3,975.02	53.09	3,921.93	---		---	---
12/08/98	3,975.02	53.10	3,921.92	---		---	---
12/14/98	3,975.02	53.09	3,921.93	---		---	---
12/29/98	3,975.02	53.11	3,921.91	---		---	---

TABLE III

**MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,975.30	53.85	3,921.45	---		---	---
12/23/97	3,975.30	53.85	3,921.45	---		---	---
12/31/97	3,975.30	53.84	3,921.46	---		---	---
01/06/98	3,975.30	53.83	3,921.47	---		---	---
01/06/98	3,975.30	53.85	3,921.45	---		---	---
01/07/98	3,975.30	53.86	3,921.44	---		---	---
01/15/98	3,975.30	53.85	3,921.45	---		---	---
01/23/98	3,975.30	53.89	3,921.41	---		---	---
01/27/98	3,975.30	53.87	3,921.43	---		---	---
02/03/98	3,975.30	53.83	3,921.47	---		---	---
02/11/98	3,975.30	53.86	3,921.44	---		---	---
02/17/98	3,975.30	53.82	3,921.48	---		---	---
02/25/98	3,975.30	53.81	3,921.49	---		---	---
03/05/98	3,975.30	53.79	3,921.51	---		---	---
03/11/98	3,975.30	53.83	3,921.47	---		---	---
03/16/98	3,975.30	53.81	3,921.49	---		---	---
03/25/98	3,975.30	53.80	3,921.50	---		---	---
03/31/98	3,975.30	53.78	3,921.52	---		---	---
04/09/98	3,975.30	53.86	3,921.44	---		---	---
04/16/98	3,975.30	53.82	3,921.48	---		---	---
04/21/98	3,975.30	53.82	3,921.48	---		---	---
04/28/98	3,975.30	53.83	3,921.47	---		---	---
05/04/98	3,975.30	53.80	3,921.50	---		---	---
05/11/98	3,975.30	53.83	3,921.47	---		---	---
05/18/98	3,975.30	53.85	3,921.45	---		---	---
05/27/98	3,975.30	53.83	3,921.47	---		---	---
06/01/98	3,975.30	53.87	3,921.43	---		---	---
06/09/98	3,975.30	53.82	3,921.48	---		---	---
06/15/98	3,975.30	53.81	3,921.49	---		---	---
06/22/98	3,975.30	53.88	3,921.42	---		---	---
06/24/98	3,975.30	53.81	3,921.49	---		---	---
07/01/98	3,975.30	53.91	3,921.39	---		---	---
07/06/98	3,975.30	53.82	3,921.48	---		---	---
07/13/98	3,975.30	53.85	3,921.45	---		---	---

TABLE III

**MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
07/20/98	3,975.30	53.89	3,921.41	---		---	---
07/27/98	3,975.30	53.96	3,921.34	---		---	---
08/03/98	3,975.30	53.83	3,921.47	---		---	---
08/10/98	3,975.30	53.93	3,921.37	---		---	---
08/17/98	3,975.30	53.96	3,921.34	---		---	---
08/24/98	3,975.30	53.92	3,921.38	---		---	---
09/02/98	3,975.30	53.89	3,921.41	---		---	---
09/09/98	3,975.30	53.86	3,921.44	---		---	---
09/14/98	3,975.30	53.82	3,921.48	---		---	---
09/22/98	3,975.30	53.82	3,921.48	---		---	---
09/30/98	3,975.30	53.83	3,921.47	---		---	---
10/05/98	3,975.30	53.87	3,921.43	---		---	---
10/14/98	3,975.30	53.79	3,921.51	---		---	---
10/30/98	3,975.30	53.83	3,921.47	---		---	---
11/16/98	3,975.30	53.79	3,921.51	---		---	---
12/02/98	3,975.30	53.82	3,921.48	---		---	---
12/08/98	3,975.30	53.83	3,921.47	---		---	---
12/14/98	3,975.30	53.81	3,921.49	---		---	---
12/29/98	3,975.30	53.83	3,921.47	---		---	---

TABLE III

**MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,974.55	52.80	3,921.75	---		---	---
12/23/97	3,974.55	52.80	3,921.75	---		---	---
12/31/97	3,974.55	52.80	3,921.75	---		---	---
01/06/98	3,974.55	52.80	3,921.75	---		---	---
01/06/98	3,974.55	52.79	3,921.76	---		---	---
01/07/98	3,974.55	52.82	3,921.73	---		---	---
01/15/98	3,974.55	52.81	3,921.74	---		---	---
01/23/98	3,974.55	52.83	3,921.72	---		---	---
01/27/98	3,974.55	52.23	3,922.32	---		---	---
02/03/98	3,974.55	52.79	3,921.76	---		---	---
02/11/98	3,974.55	52.82	3,921.73	---		---	---
02/17/98	3,974.55	52.78	3,921.77	---		---	---
02/25/98	3,974.55	52.77	3,921.78	---		---	---
03/05/98	3,974.55	52.75	3,921.80	---		---	---
03/11/98	3,974.55	52.78	3,921.77	---		---	---
03/16/98	3,974.55	52.76	3,921.79	---		---	---
03/25/98	3,974.55	52.75	3,921.80	---		---	---
03/31/98	3,974.55	52.74	3,921.81	---		---	---
04/09/98	3,974.55	52.85	3,921.70	---		---	---
04/16/98	3,974.55	52.79	3,921.76	---		---	---
04/21/98	3,974.55	52.77	3,921.78	---		---	---
04/28/98	3,974.55	52.79	3,921.76	---		---	---
05/04/98	3,974.55	52.75	3,921.80	---		---	---
05/11/98	3,974.55	52.83	3,921.72	---		---	---
05/18/98	3,974.55	52.85	3,921.70	---		---	---
05/27/98	3,974.55	52.81	3,921.74	---		---	---
06/01/98	3,974.55	52.86	3,921.69	---		---	---
06/09/98	3,974.55	52.77	3,921.78	---		---	---
06/15/98	3,974.55	52.77	3,921.78	---		---	---
06/22/98	3,974.55	52.83	3,921.72	---		---	---
06/24/98	3,974.55	52.79	3,921.76	---		---	---
07/01/98	3,974.55	52.88	3,921.67	---		---	---
07/06/98	3,974.55	52.80	3,921.75	---		---	---
07/13/98	3,974.55	52.83	3,921.72	---		---	---

TABLE III

**MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
07/20/98	3,974.55	52.89	3,921.66	---		---	---
07/27/98	3,974.55	52.98	3,921.57	---		---	---
08/03/98	3,974.55	52.80	3,921.75	---		---	---
08/10/98	3,974.55	52.96	3,921.59	---		---	---
08/17/98	3,974.55	52.99	3,921.56	---		---	---
08/24/98	3,974.55	52.93	3,921.62	---		---	---
09/02/98	3,974.55	52.92	3,921.63	---		---	---
09/09/98	3,974.55	52.86	3,921.69	---		---	---
09/14/98	3,974.55	52.80	3,921.75	---		---	---
09/22/98	3,974.55	52.89	3,921.66	---		---	---
09/30/98	3,974.55	52.80	3,921.75	---		---	---
10/05/98	3,974.55	52.87	3,921.68	---		---	---
10/14/98	3,974.55	52.77	3,921.78	---		---	---
10/30/98	3,974.55	52.78	3,921.77	---		---	---
11/16/98	3,974.55	52.78	3,921.77	---		---	---
12/02/98	3,974.55	52.77	3,921.78	---		---	---
12/08/98	3,974.55	52.79	3,921.76	---		---	---
12/14/98	3,974.55	52.77	3,921.78	---		---	---
12/29/98	3,974.55	52.79	3,921.76	---		---	---

TABLE III

RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	Unknown	56.36	Unknown	Unknown	47.48	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	47.50	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	47.50	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	47.55	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	47.56	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	47.54	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	47.55	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	47.59	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	47.57	Unknown	8.30
12/18/97	3,970.79	55.84	3,914.95	3,921.97	47.58	3,923.21	8.26
12/22/97	3,970.79	55.80	3,914.99	3,921.98	47.57	3,923.22	8.23
12/31/97	3,970.79	55.79	3,915.00	3,921.96	47.60	3,923.19	8.19
01/06/98	3,970.79	55.18	3,915.61	3,921.95	47.72	3,923.07	7.46
01/06/98	3,970.79	49.50	3,921.29	---		---	---
01/06/98	3,970.79	49.50	3,921.29	---		---	---
01/06/98	3,970.79	49.51	3,921.28	---		---	---
01/06/98	3,970.79	55.18	3,915.61	3,921.95	47.72	3,923.07	7.46
01/06/98	3,970.79	49.50	3,921.29	---		---	---
01/06/98	3,970.79	49.50	3,921.29	---		---	---
01/06/98	3,970.79	49.51	3,921.28	---		---	---
01/06/98	3,970.79	49.63	3,921.16	3,921.69	49.00	3,921.79	0.63
01/07/98	3,970.79	49.58	3,921.21	---		---	---
01/08/98	3,970.79	49.50	3,921.29	---		---	---
01/09/98	3,970.79	49.58	3,921.21	3,921.23	49.55	3,921.24	0.03
01/10/98	3,970.79	49.64	3,921.15	3,921.17	49.61	3,921.18	0.03
01/12/98	3,970.79	49.62	3,921.17	---	49.62	3,921.17	SHEEN
01/15/98	3,970.79	49.63	3,921.16	---	49.63	3,921.16	SHEEN
01/23/98	3,970.79	49.67	3,921.12	3,921.16	49.62	3,921.17	0.05
01/27/98	3,970.79	49.68	3,921.11	3,921.13	49.65	3,921.14	0.03
02/03/98	3,970.79	49.69	3,921.10	3,921.12	49.66	3,921.13	0.03
02/11/98	3,970.79	49.69	3,921.10	3,921.12	49.67	3,921.12	0.02
06/16/98	3,970.79	53.32	3,917.47	3,922.03	47.72	3,923.07	5.60
07/03/98	3,970.79	14.40	3,956.39	3,958.77	11.47	3,959.32	2.93
09/09/98	3,970.79	49.10	3,921.69	3,921.79	48.98	3,921.81	0.12
09/14/98	3,970.79	50.57	3,920.22	3,921.92	48.48	3,922.31	2.09

TABLE III

**RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
10/14/98	3,970.79	50.92	3,919.87	3,921.98	48.33	3,922.46	2.59
10/14/98	3,970.79	50.92	3,919.87	3,921.98	48.33	3,922.46	2.59
10/30/98	3,970.79	51.80	3,918.99	3,921.95	48.16	3,922.63	3.64
11/16/98	3,970.79	51.95	3,918.84	3,921.95	48.13	3,922.66	3.82
12/02/98	3,970.79	52.07	3,918.72	3,921.97	48.08	3,922.71	3.99
12/08/98	3,970.79	52.05	3,918.74	3,921.99	48.06	3,922.73	3.99
12/14/98	3,970.79	52.04	3,918.75	3,921.97	48.08	3,922.71	3.96
12/29/98	3,970.79	51.97	3,918.82	3,921.97	48.10	3,922.69	3.87

TABLE IV

**SUMMARY OF REMEDIATION SYSTEM
LABORATORY RESULTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLING POINT	DATE	PARAMETER	CONCENTRATION
Carbon Discharge	05/05/98	All Constituents	ND
Carbon Discharge	05/05/98	pH, Electrometric	8.15 S.U.
Carbon Discharge	05/05/98	TDS	382 mg/L
Carbon Discharge	05/13/98	All Constituents	ND
Carbon Discharge	07/17/98	All Constituents	ND
Carbon Discharge	08/19/98	All Constituents	ND
Carbon Discharge	09/28/98	Dibenz (a,h) anthracene	0.002 mg/L

NOTE: All Constituents not listed above are ND.

TABLE V

**SUMMARY OF MONTHLY AND CUMULATIVE RECOVERY
TEXAS-NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE	MONTHLY VAPOR (bbls)	MONTHLY PRODUCT (bbls)	MONTHLY TOTAL (bbls)	CUMULATIVE (bbls)
January-1998	0	31.680	31.680	31.680
February-1998	0	22.770	22.770	22.770
March-1998	0	0.330	0.330	23.100
April-1998	6.810	14.260	21.070	44.170
May-1998	74.756	62.700	137.456	181.625
June-1998	13.171	6.270	19.441	201.066
July-1998	38.418	50.820	89.238	290.305
August-1998	27.871	55.440	83.311	373.616
September-1998	45.849	15.510	61.359	434.974
October-1998	11.759	0.000	11.759	446.733

TABLE VI

**SUMMARY OF REMEDIATION SYSTEM EFFLUENT DATA
GROUND WATER
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE	ELAPSED TIME (hours)	CALCULATED AVERAGE FLOW RATE (gpm)	MONTHLY VOLUME (gallons)	CUMULATIVE VOLUME (gallons)
05/29/98	614.70	---	194,814	194,814
07/03/98	849.90	---	57,939	252,753
07/07/98	---	---	9,787	262,540
07/09/98	---	5.69	4,344	266,884
07/13/98	957.80	---	19,209	286,093
07/16/98	1,012.80	2.13	7,027	293,120
07/17/98	1,038.30	7.28	11,134	304,254
07/20/98	1,109.70	7.35	31,473	335,727
07/27/98	1,218.60	8.10	52,908	388,635
08/04/98	1,230.80	5.27	765	389,400
08/14/98	1,385.70	6.37	59,230	448,630
08/18/98	1,481.20	8.14	46,617	495,247
08/24/98	1,614.30	7.75	61,866	557,113
08/26/98	1,662.50	5.52	15,975	573,088
08/31/98	1,737.00	7.11	31,780	604,868
09/10/98	1,954.20	5.83	78,402	683,270
09/14/98	2,050.90	3.96	22,989	706,259
09/22/98	2,221.40	6.35	64,979	771,238
09/28/98	2,335.20	6.45	44,009	815,247
10/05/98	2,469.80	5.80	43,741	858,988

TABLE VII

**SUMMARY OF INFLUENT REMEDIATION SYSTEM
MONITORING PARAMETERS
TNM-97-04
TEXAS-NEW MEXICO PIPE LINE COMPANY
LOVINGTON, NEW MEXICO**

SAMPLING POINT	DATE	PARAMETER	CONCENTRATION
Zeolite (1)	05/05/98	Benzene	20.00
		Toluene	15.02
		Ethylbenzene	1.61
		Total Xylenes	4.30
		2-Methylnaphthalene	0.057
		1-Methylnaphthalene	0.030
		Naphthalene	0.111
		Phenolics, Total	0.2
Zeolite (1)	05/13/98	Benzene	16.25
		Toluene	13.45
		Ethylbenzene	1.21
		Total Xylenes	3.28
Frac Tank (2)	07/17/98	Benzene	9.04
		Toluene	9.15
		Ethylbenzene	1.65
		Total Xylenes	3.91
		Fluorene	0.02
		2-Methylnaphthalene	0.30
		1-Methylnaphthalene	0.18
		Naphthalene	0.25
		Phenanthrene	0.03
Air Stripper (3)	07/17/98	Benzene	0.062
		Toluene	0.064
		Ethylbenzene	0.008
		Total Xylenes	0.030
		2-Methylnaphthalene	0.021
		1-Methylnaphthalene	0.017
		Naphthalene	0.042
Zeolite (1)	07/17/98	Benzene	9.50
		Toluene	8.90
		Ethylbenzene	1.05
		Total Xylenes	3.10

TABLE VII

SUMMARY OF INFLUENT REMEDIATION SYSTEM

MONITORING PARAMETERS

TNM-97-04

TEXAS-NEW MEXICO PIPE LINE COMPANY

LOVINGTON, NEW MEXICO

SAMPLING POINT	DATE	PARAMETER	CONCENTRATION
		2-Methylnaphthalene	0.062
		1-Methylnaphthalene	0.041
		Naphthalene	0.128
Frac Tank (2)	08/19/98	Benzene	9.40
		Toluene	8.30
		Ethylbenzene	0.50
		Total Xylenes	1.40
		Fluorene	0.01
		2-Methylnaphthalene	0.20
		1-Methylnaphthalene	0.13
		Naphthalene	0.24
		Phenanthrene	0.01
Air Stripper (3)	08/19/98	Benzene	0.042
		Toluene	0.090
		Ethylbenzene	0.004
		Total Xylenes	0.021
		Fluorene	0.002
		2-Methylnaphthalene	0.021
		1-Methylnaphthalene	0.019
		Naphthalene	0.045
Zeolite (1)	08/19/98	Benzene	10.10
		Toluene	8.10
		Ethylbenzene	0.52
		Total Xylenes	2.30
		2-Methylnaphthalene	0.10
		1-Methylnaphthalene	0.07
		Naphthalene	0.19
Frac Tank (2)	09/28/98	Benzene	2.12
		Toluene	2.74
		Ethylbenzene	0.39
		Total Xylenes	2.03
		Dibenz (a,h) anthracene	0.02
		2-Methylnaphthalene	0.21

TABLE VII

**SUMMARY OF INFLUENT REMEDIATION SYSTEM
MONITORING PARAMETERS
TNM-97-04
TEXAS-NEW MEXICO PIPE LINE COMPANY
LOVINGTON, NEW MEXICO**

SAMPLING POINT	DATE	PARAMETER	CONCENTRATION
		1-Methylnaphthalene	0.11
		Naphthalene	0.21
Air Stripper (3)	09/28/98	Dibenz (a,h) anthracene	0.002
		Fluorene	0.007
		2-Methylnaphthalene	0.040
		1-Methylnaphthalene	0.027
		Naphthalene	0.032
		Phenanthrene	0.009
Zeolite (1)	09/28/98	Benzene	2.28
		Toluene	3.06
		Ethylbenzene	0.31
		Total Xylenes	2.47
		Dibenz (a,h) anthracene	0.02
		2-Methylnaphthalene	0.17
		1-Methylnaphthalene	0.09
		Naphthalene	0.22

NOTE: All Constituents not listed above are ND.

1. Zeolite sampling port indicates Air Stripper Influent Concentration.
2. Frac Tank sampling port indicates influent Zeolite Filter Concentration.
3. Air Stripper sampling port indicates influent Carbon filter concentration.

/

Appendix A

ANALYTICAL REPORT 1-80855

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: Lovington

Project Id: 710016

March 12, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

March 12, 1998

Project Manager: Theresa Nix
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-80855**
Project Name: Lovington
Project ID: 710016
Project Address: Lovington, NM

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-80855. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-80855 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,


Eddie Yonemoto, Ph.D.
Technical Director

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

CERTIFICATE OF ANALYSIS SUMMARY 1-80855

Project ID: 710016

K.E.I. Consultants, Inc.
 Project Name: Lovington

Date Received in Lab : Mar 6, 1998 09:30

Project Manager: Theresa Nix

Date Report Faxed: Mar 12, 1998

Project Location: Lovington, NM


XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180855 001 MW-1 Liquid 03/05/98 13:47	180855 002 MW-6 Liquid 03/05/98 14:23	180855 003 MW-7 Liquid 03/05/98 13:57	180855 004 MW-8 Liquid 03/05/98 14:08	180855 005 MW-10 Liquid 03/05/98 14:37	180855 006 MW-11 Liquid 03/05/98 15:00
	Analyzed: Units:	03/06/98 ppm	03/06/98 ppm	03/06/98 ppm	03/06/98 ppm	03/06/98 ppm	03/06/98 ppm
BTEX EPA 8020		R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Benzene		< 0.001 (0.001)	7.5 (0.1)	< 0.001 (0.001)	0.025 (0.001)	0.003 (0.001)	0.002 (0.001)
Toluene		< 0.001 (0.001)	1.8 (0.1)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	0.2 (0.1)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylenes		< 0.002 (0.002)	0.3 (0.2)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	0.2 (0.1)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	10.0	N.D.	0.025	0.003	0.002
PAHs by GC-MS (610 List) EPA 8270	Analyzed: Units:	03/12/98 mg/L	03/12/98 mg/L	03/12/98 mg/L	03/12/98 mg/L	03/12/98 mg/L	03/12/98 mg/L
Acenaphthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Acenaphthylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(b)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(g,h,i)perylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(k)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Chrysene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Dibenzo(a,h)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluorene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Naphthalene		< 0.002 (0.002)	0.037 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Phenanthrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Edward J. Yonemoto, Ph.D.
 Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80855

Project ID: 710016 Project Manager: Theresa Nix Project Location: Lovington, NM		K.E.I. Consultants, Inc. Project Name: Lovington		Date Received in Lab : Mar 6, 1998 09:30 Date Report Faxed: Mar 12, 1998 XENCO contact : Carlos Castro/Edward Yonemoto			
Analysis Requested	Lab ID:	180855 001	180855 002	180855 003	180855 004	180855 005	180855 006
	Field ID:	MW-1	MW-6	MW-7	MW-8	MW-10	MW-11
	Depth:						
	Matrix:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	Sampled:	03/05/98 13:47	03/05/98 14:23	03/05/98 13:57	03/05/98 14:08	03/05/98 14:37	03/05/98 15:00
EPA 8270	Analyzed:	03/12/98 R.L.	03/12/98 R.L.	03/12/98 R.L.	03/12/98 R.L.	03/12/98 R.L.	03/12/98 R.L.
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
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 Edward H. Yonemoto, Ph.D. Technical Director							

CERTIFICATE OF ANALYSIS SUMMARY 1-80855

Project ID: 710016

K.E.I. Consultants, Inc.

Project Name: Lovington

Date Received in Lab : Mar 6, 1998 09:30

Project Manager: Theresa Nix

Date Report Faxed: Mar 12, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested		Lab ID: 180855 007 Field ID: MW-12 Depth: Matrix: Liquid Sampled: 03/05/98 14:48					
BTEX EPA 8020		Analyzed: 03/06/98 R.L. Units: ppm					
Benzene		0.003 (0.001)					
Toluene		< 0.001 (0.001)					
Ethylbenzene		< 0.001 (0.001)					
m,p-Xylenes		< 0.002 (0.002)					
o-Xylene		< 0.001 (0.001)					
Total BTEX		0.003					
PAHs by GC-MS (610 List) EPA 8270		Analyzed: 03/12/98 R.L. Units: mg/L					
Acenaphthene		< 0.002 (0.002)					
Acenaphthylene		< 0.002 (0.002)					
Anthracene		< 0.002 (0.002)					
Benzo(a)anthracene		< 0.002 (0.002)					
Benzo(a)pyrene		< 0.002 (0.002)					
Benzo(b)fluoranthene		< 0.002 (0.002)					
Benzo(g,h,i)perylene		< 0.002 (0.002)					
Benzo(k)fluoranthene		< 0.002 (0.002)					
Chrysene		< 0.002 (0.002)					
Dibenzo(a,h)anthracene		< 0.002 (0.002)					
Fluoranthene		< 0.002 (0.002)					
Fluorene		< 0.002 (0.002)					
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)					
Naphthalene		0.006 (0.002)					
Phenanthrene		< 0.002 (0.002)					

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 Edward H. Yonemoto, Ph.D.
 Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80855

Project ID: 710016

Project Manager: Theresa Nix

Project Location: Lovington, NM

K.E.I. Consultants, Inc.

Project Name: Lovington

Date Received in Lab : Mar 6, 1998 09:30

Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	180855 007					
	Field ID:	MW-12					
	Depth:						
	Matrix:	Liquid					
	Sampled:	03/05/98 14:48					
EPA 8270	Analyzed:	03/12/98	R.L.				
	Units:	mg/L					
Pyrene		< 0.002 (0.002)					

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Edward K. Yonemoto, Ph.D.
Technical Director

SW- 846 5030/8020 BTEX
Date Validated: Mar 9, 1998 11:00

Analyst: HL

Date Analyzed: Mar 6, 1998 09:32

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1080	0.1000	0.0010	108.0	65-135	
Toluene	< 0.0010	0.1010	0.1000	0.0010	101.0	65-135	
Ethylbenzene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
m,p-Xylenes	< 0.0020	0.2110	0.2000	0.0020	105.5	65-135	
o-Xylene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 Technical Director

SW846-8270 PAHs by GC-MS (610 List)

Date Validated: Mar 12, 1998 12:40

Date Analyzed: Mar 12, 1998 08:28

QA/QC Manager: Sunil Ajai, M.S.

Analyst: LC

Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Acenaphthene	< 0.0040	0.0996	0.0996	0.1000	0.0040	31.0	0.0	99.6	99.6	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0890	0.0828	0.1000	0.0040	42.0	7.2	89.0	82.8	23-97	
2-Chlorophenol	< 0.0040	0.0868	0.0834	0.1000	0.0040	40.0	4.0	86.8	83.4	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0938	0.0920	0.1000	0.0040	28.0	1.9	93.8	92.0	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0796	0.0780	0.1000	0.0040	38.0	2.0	79.6	78.0	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0808	0.0760	0.1000	0.0080	38.0	6.1	80.8	76.0	41-116	
4-Nitrophenol	< 0.0080	0.0298	0.0236	0.1000	0.0080	50.5	23.2	29.8	23.6	10-80	
Pentachlorophenol	< 0.0020	0.0582	0.0586	0.1000	0.0020	50.0	0.7	58.2	58.6	9-103	
Phenol	< 0.0020	0.0408	0.0384	0.1000	0.0020	42.0	6.1	40.8	38.4	12-89	
Pyrene	< 0.0040	0.1012	0.1002	0.1000	0.0040	31.0	1.0	101.2	100.2	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0900	0.0922	0.1000	0.0020	28.0	2.4	90.0	92.2	39-98	

 Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

 Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

 B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Honemoto, Ph.D.
 Technical Director

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

XENCO COC#: 1-80855
Date Received in Lab: Mar 6, 1998 09:30 by LY
XENCO contact : Carlos Castro/Edward Yonemoto

 Project ID: 710016
 Project Manager: Theresa Nix
 Project Location: Lovington, NM

Project Name: Lovington

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	180855-001	BTEX	SW-846	ppm	Standard	Mar 5, 1998 13:47		Mar 6, 1998 by HL	Mar 6, 1998 14:38 by HL
2			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 13:47		Mar 10, 1998 by RK	Mar 12, 1998 00:39 by LC
3	MW-6	180855-002	BTEX	SW-846	ppm	Standard	Mar 5, 1998 14:23		Mar 6, 1998 by HL	Mar 6, 1998 16:52 by HL
4			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 14:23		Mar 10, 1998 by RK	Mar 12, 1998 01:25 by LC
5	MW-7	180855-003	BTEX	SW-846	ppm	Standard	Mar 5, 1998 13:57		Mar 6, 1998 by HL	Mar 6, 1998 17:31 by HL
6			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 13:57		Mar 10, 1998 by RK	Mar 12, 1998 02:11 by LC
7	MW-8	180855-004	BTEX	SW-846	ppm	Standard	Mar 5, 1998 14:08		Mar 6, 1998 by HL	Mar 6, 1998 15:36 by HL
8			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 14:08		Mar 10, 1998 by RK	Mar 12, 1998 02:56 by LC
9	MW-10	180855-005	BTEX	SW-846	ppm	Standard	Mar 5, 1998 14:37		Mar 6, 1998 by HL	Mar 6, 1998 15:55 by HL
10			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 14:37		Mar 10, 1998 by RK	Mar 12, 1998 04:43 by LC
11	MW-11	180855-006	BTEX	SW-846	ppm	Standard	Mar 5, 1998 15:00		Mar 6, 1998 by HL	Mar 6, 1998 16:14 by HL
12			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 15:00		Mar 10, 1998 by RK	Mar 12, 1998 05:28 by LC
13	MW-12	180855-007	BTEX	SW-846	ppm	Standard	Mar 5, 1998 14:48		Mar 6, 1998 by HL	Mar 6, 1998 16:33 by HL
14			PAHs	SW846-8270	mg/L	Standard	Mar 5, 1998 14:48		Mar 10, 1998 by RK	Mar 12, 1998 06:13 by LC



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 180855-8A

Contractor: <u>K.E.I. Consultants</u>		Phone <u>(210) 680-3767</u>		No. coolers this shipment:		Contractor COC #			
Address: <u>5309 Wurzbach, Suite 100, San Antonio, TX</u>		Project Director: <u>Mike Hawthorne</u>		Carrier: <u>UPS</u>		Quote #:			
Project Name: <u>Louington</u>		Project Manager: <u>Theresa Nix</u>		Airbill No.		P.O. No: <u>8053</u>			
Project Location: <u>Louington, NM</u>		Project No.: <u>710016</u>		No. of Containers: <u>3</u>		Turn-around: • ASAP • 24 hrs • 48 hrs <u>Standard</u>		LAB ONLY ID #	
Sampler Signature: <u>[Signature]</u>		Preservative:							
SAMPLE CHARACTERIZATION				Unl Dies Ker Unknown		Please Hold		Remarks	
Field ID	Date	Time	DEPTH SOIL WATER COMP GRAB	Container Size Type P, G	Waste Oil PIT No: Tank No: Sample Description				
1 MW-1	3-5-98	13:47	/	/	/	1			
2 MW-6		14:23	/	/	/	2			
3 MW-7		13:57	/	/	/	3			
4 MW-8		14:08	/	/	/	4			
5 MW-10		14:37	/	/	/	5			
6 MW-11		15:00	/	/	/	6			
7 MW-12		14:48	/	/	/	7			
8						8			
9						9			
10						10			
Relinquished by: (Signature) <u>[Signature]</u>				DATE <u>3-5-98</u> TIME <u>1600</u>		Received by: (Signature) <u>[Signature]</u>			
Received For Laboratory by: <u>[Signature]</u>				DATE <u>3/6/98</u> TIME <u>930</u>		Remarks: <u>Fax Analytical to Theresa Nix</u> <u>210 680-3763</u>			

Print (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services

ANALYTICAL REPORT 1-82357

for

K.E.I. Consultants, Inc.

Project Manager: T. Nix / J. Mosley

Project Name: Lovington

Project Id: 710016-1-0

July 13, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

July 13, 1998

Project Manager: T. Nix / J. Mosley
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-82357**
Project Name: Lovington
Project ID: 710016-1-0
Project Address: Lovington, NM

Dear T. Nix / J. Mosley:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-82357. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-82357 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,

Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

CERTIFICATE OF ANALYSIS SUMMARY 1-82357

Project ID: 710016-1-0

K.E.I. Consultants, Inc.
 Project Name: Lovington

Date Received in Lab : Jun 25, 1998 09:50

Project Manager: T. Nix / J. Mosley

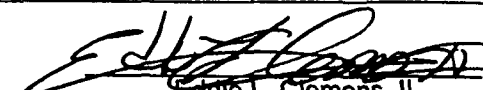
Date Report Faxed: Jul 13, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:						
	Sampled:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
		06/24/98 08:52	06/24/98 09:08	06/24/98 09:36	06/24/98 10:09	06/24/98 09:20	06/24/98 09:47
Metals by ICP EPA 6010	Analyzed:	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Aluminum		< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)
Arsenic		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)
Barium		0.10 (0.04)	0.09 (0.04)	0.08 (0.04)	0.09 (0.04)	0.09 (0.04)	0.11 (0.04)
Beryllium		< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)
Boron		0.19 (0.10)	0.20 (0.10)	0.13 (0.10)	0.17 (0.10)	0.13 (0.10)	0.11 (0.10)
Cadmium		< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)
Calcium		140 (0.5)	102 (0.5)	105 (0.5)	118 (0.5)	143 (0.5)	151 (0.5)
Chromium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Cobalt		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Copper		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Iron		< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)
Lead		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Magnesium		15.2 (0.3)	15.4 (0.3)	16.1 (0.3)	18.1 (0.3)	14.9 (0.3)	18.5 (0.3)
Manganese		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.05 (0.05)	< 0.10 (0.10)	< 0.10 (0.10)
Molybdenum		< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)
Nickel		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)
Potassium		1.71 (0.50)	1.64 (0.50)	1.58 (0.50)	2.34 (0.50)	1.95 (0.50)	2.80 (0.50)
Selenium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Silicon		20.8 (0.5)	21.6 (0.5)	22.1 (0.5)	22.0 (0.5)	20.2 (0.5)	21.9 (0.5)
Silver		< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)
Sodium		38.4 (0.5)	40.5 (0.5)	30.6 (0.5)	42.3 (0.5)	28.1 (0.5)	33.8 (0.5)
Strontium		0.75 (0.20)	0.75 (0.20)	0.77 (0.20)	0.82 (0.20)	0.75 (0.20)	0.78 (0.20)
Tin		< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)
Vanadium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	0.05 (0.05)

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 Eddie L. Clemons, II
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-82357

Project ID: 710016-1-0

Project Manager: T. Nix / J. Mosley

Project Location: Lovington, NM

K.E.I. Consultants, Inc.
 Project Name: Lovington


Date Received in Lab : Jun 25, 1998 09:50

Date Report Faxed: Jul 13, 1998

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	Sampled:	06/24/98 08:52	06/24/98 09:08	06/24/98 09:36	06/24/98 10:09	06/24/98 09:20	06/24/98 09:47
EPA 6010	Analyzed:	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Zinc		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	0.16 (0.05)	0.11 (0.05)	0.10 (0.05)
Total Mercury	Analyzed:	07/06/98	07/06/98	07/06/98	07/06/98	07/06/98	07/06/98
EPA 7470	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Mercury		< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)
BTEX	Analyzed:	06/27/98	06/27/98	06/27/98	06/27/98	06/27/98	06/27/98
EPA 8020	Units:	ppm	ppm	ppm	ppm	ppm	ppm
Benzene		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylenes		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	N.D.	0.002	N.D.	N.D.	N.D.
PAHs by GC-MS	Analyzed:	07/01/98	07/01/98	07/01/98	07/02/98	07/02/98	07/02/98
EPA 8270	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Acenaphthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Acenaphthylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(b)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(g,h,i)perylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(k)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)


This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Eddie L. Clemons, II
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-82357
K.E.I. Consultants, Inc.
Project Name: Lovington
Date Received in Lab : Jun 25, 1998 09:50
Project ID: 710016-1-0
Project Manager: T. Nix / J. Mosley
Date Report Faxed: Jul 13, 1998
Project Location: Lovington, NM
XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:						
	Sampled:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
		06/24/98 08:52	06/24/98 09:08	06/24/98 09:36	06/24/98 10:09	06/24/98 09:20	06/24/98 09:47
EPA 8270	Analyzed:	07/01/98	07/01/98	07/01/98	07/02/98	07/02/98	07/02/98
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Chrysene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Dibenzo(a,h)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluorene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Naphthalene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Phenanthrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Eddie L. Clemons, II
 QA/QC Manager



Certificate Of Quality Control for Batch : 18A29C80

SW- 846 5030/3020 BTEX and MTBE

Date Validated: Jun 30, 1998 09:00

Analyst: OR

Date Analyzed: Jun 27, 1998 17:49

Matrix: Liquid

BLANK SPIKE ANALYSIS

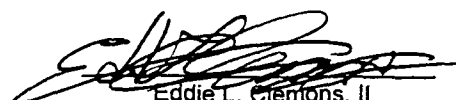
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1130	0.1000	0.0010	113.0	75-125	
Toluene	< 0.0010	0.1190	0.1000	0.0010	119.0	75-125	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	75-125	
MTBE	< 0.0200	1.0560	1.0000	0.0200	105.6	75-125	
m,p-Xylenes	< 0.0020	0.2070	0.2000	0.0020	103.5	75-125	
o-Xylene	< 0.0010	0.1060	0.1000	0.0010	106.0	75-125	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemmons, II
QA/QC Manager

Certificate Of Quality Control for Batch : 18A29C80
SW- 846 5030/8020 BTEX and MTBE
Date Validated: Jun 30, 1998 09:00

Analyst: OR

Date Analyzed: Jun 27, 1998 22:53

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 182344- 004	[A] Sample Result mg/L	[B] Matrix Spike Result mg/L	[C] Matrix Spike Duplicate Result mg/L	[D] Matrix Spike Amount mg/L	[E] Detection Limit mg/L	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC Spike Relative Difference %	QC Matrix Spike Recovery %	QC M.S.D. Recovery %	Matrix Spike Recovery Range %	
Parameter											
Benzene	< 0.0010	0.1140	0.1200	0.1000	0.0010	20.0	5.1	114.0	120.0	75-125	
Toluene	< 0.0010	0.1180	0.1240	0.1000	0.0010	20.0	5.0	118.0	124.0	75-125	
Ethylbenzene	< 0.0010	0.1000	0.1050	0.1000	0.0010	20.0	4.9	100.0	105.0	75-125	
MTBE	< 0.0200	1.1510	1.2440	1.0000	0.0200	20.0	7.8	115.1	124.4	75-125	
m,p-Xylenes	< 0.0020	0.2010	0.2110	0.2000	0.0020	20.0	4.9	100.5	105.5	75-125	
o-Xylene	< 0.0010	0.1050	0.1100	0.1000	0.0010	20.0	4.7	105.0	110.0	75-125	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$


 Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

SW846- 7470 Total Mercury

Date Validated: Jul 7, 1998 08:53

Analyst: AO

Date Analyzed: Jul 6, 1998 17:13

Matrix: Liquid

BLANK SPIKE ANALYSIS

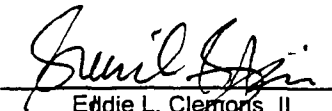
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Mercury	< 0.0011	0.0020	0.0028	0.0011	71.4	70-120	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemmons, II
QA/QC Manager

Certificate Of Quality Control for Batch : 18A05C23

SW846- 7470 Total Mercury

Date Validated: Jul 7, 1998 08:53

Analyst: AO

Date Analyzed: Jul 6, 1998 17:19

Matrix: Liquid

Q.C. Sample ID 182357- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Detection Limit mg/L	[D]	[E]	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[J] Qualifier
				QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Mercury	< 0.0011	< 0.0011	0.0011	N.C	15.0	0.0022	0.0028	78.6	70-120	

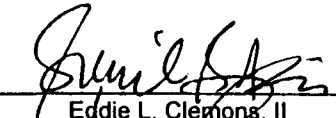
Relative Difference [D] = $200 \times (B-A)/(B+A)$

Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemons, II
QA/QC Manager



Certificate Of Quality Control for Batch : 18A34C60

SW846-8270 PAHs by GC-MS

Date Validated: Jul 2, 1998 12:07

Analyst: LC

Date Analyzed: Jul 1, 1998 20:09

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 0-BKS	[A] Sample Result mg/L	[B] Matrix Spike Result mg/L	[C] Matrix Spike Duplicate Result mg/L	[D] Matrix Spike Amount mg/L	[E] Detection Limit mg/L	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC Spike Relative Difference %	QC Matrix Spike Recovery %	QC M.S.D. Recovery %	Matrix Spike Recovery Range %	
Parameter											
Acenaphthene	< 0.0040	0.0868	0.0876	0.1000	0.0040	31.0	0.9	86.8	87.6	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0736	0.0776	0.1000	0.0040	42.0	5.3	73.6	77.6	23-97	
2-Chlorophenol	< 0.0040	0.0710	0.0778	0.1000	0.0040	40.0	9.1	71.0	77.8	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0780	0.0828	0.1000	0.0040	28.0	6.0	78.0	82.8	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0812	0.0826	0.1000	0.0040	38.0	1.7	81.2	82.6	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0622	0.0624	0.1000	0.0080	38.0	0.3	62.2	62.4	41-116	
4-Nitrophenol	< 0.0080	0.0404	0.0410	0.1000	0.0080	50.5	1.5	40.4	41.0	10-80	
Pentachlorophenol	< 0.0020	0.0756	0.0766	0.1000	0.0020	50.0	1.3	75.6	76.6	9-103	
Phenol	< 0.0020	0.0476	0.0520	0.1000	0.0020	42.0	8.8	47.6	52.0	12-89	
Pyrene	< 0.0040	0.1110	0.1112	0.1000	0.0040	31.0	0.2	111.0	111.2	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0756	0.0826	0.1000	0.0020	28.0	8.8	75.6	82.6	39-98	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

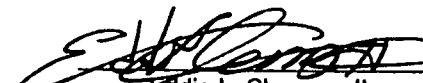
Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Eddie L. Clemons, II
QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:13

Matrix: Liquid

BLANK SPIKE ANALYSIS

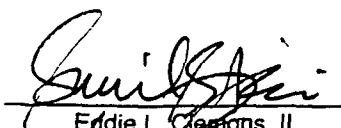
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.100	1.073	1.000	0.100	107.3	70-125	
Arsenic	< 0.100	0.982	1.000	0.100	98.2	70-125	
Barium	< 0.010	0.507	0.500	0.010	101.4	70-125	
Beryllium	< 0.010	0.223	0.200	0.010	111.5	70-125	
Cadmium	< 0.020	0.223	0.200	0.020	111.5	70-125	
Calcium	< 0.03	2.17	2.00	0.03	108.5	70-125	
Chromium	< 0.050	0.509	0.500	0.050	101.8	70-125	
Cobalt	< 0.010	0.504	0.500	0.010	100.8	70-125	
Copper	< 0.015	0.508	0.500	0.015	101.6	70-125	
Iron	0.389	2.560	2.000	0.050	108.6	70-125	
Lead	< 0.050	1.022	1.000	0.050	102.2	70-125	
Magnesium	< 0.025	2.127	2.000	0.025	106.4	70-125	
Manganese	< 0.013	1.067	1.000	0.013	106.7	70-125	
Nickel	< 0.050	0.549	0.500	0.050	109.8	70-125	
Potassium	< 0.050	2.096	2.000	0.050	104.8	70-125	
Selenium	< 0.100	0.983	1.000	0.100	98.3	70-125	
Silicon	< 0.100	1.824	2.000	0.100	91.2	70-125	
Silver	< 0.020	0.808	0.800	0.020	101.0	70-125	
Sodium	< 0.050	6.700	7.500	0.050	89.3	70-125	
Strontium	< 0.050	1.096	1.000	0.050	109.6	70-125	
Vanadium	< 0.015	0.492	0.500	0.015	98.4	70-125	
Zinc	< 0.015	0.519	0.500	0.015	103.8	70-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemens, II
 QC/QC Manager

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:40

Matrix: Liquid

Q.C. Sample ID 182357- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Aluminum	< 0.500	< 0.500	0.500	N.C	25.0	2.904	2.00	131.0	70-125	B
Arsenic	< 0.100	< 0.100	0.100	N.C	25.0	0.970	1.00	97.0	70-125	
Barium	0.104	0.110	0.010	5.6	25.0	0.582	0.50	95.6	70-125	
Beryllium	< 0.010	< 0.010	0.010	N.C	25.0	0.211	0.20	105.5	70-125	
Cadmium	< 0.020	< 0.020	0.020	N.C	25.0	0.203	0.20	101.5	70-125	
Calcium	140	145	0.03	3.5	25.0	142	2.0	100.0	70-125	
Chromium	< 0.050	< 0.050	0.050	N.C	25.0	0.474	0.50	94.8	70-125	
Cobalt	< 0.010	< 0.010	0.010	N.C	25.0	0.455	0.50	91.0	70-125	
Copper	< 0.015	< 0.015	0.015	N.C	25.0	0.472	0.50	94.4	70-125	
Iron	< 0.500	< 0.500	0.500	N.C	25.0	1.551	2.00	77.5	70-125	
Lead	< 0.050	< 0.050	0.050	N.C	25.0	0.938	1.00	93.8	70-125	
Magnesium	15.20	16.12	0.03	5.9	25.0	17.36	2.0	108.0	70-125	
Manganese	< 0.013	< 0.013	0.013	N.C	25.0	0.967	1.00	96.7	70-125	

(A) High analyte concentration affects spike recovery.

(B) Post-digestion spike within acceptance limits.

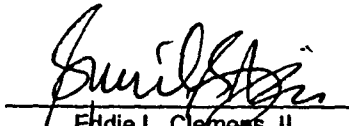
 Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

 Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemens, II
 QC Manager

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:40

Matrix: Liquid

		MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS					
Q.C. Sample ID 182357- 001	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]		
	Sample Result	Duplicate Result	Detection Limit	QC	LIMITS			Matrix Spike Result	Matrix Spike Amount		QC	LIMITS
				Relative Difference	Relative Difference						Matrix Spike Recovery	Recovery Range
				mg/L	mg/L						mg/L	%
Parameter												
Nickel	< 0.050	< 0.050	0.050	N.C	25.0	0.470	0.50	94.0	70-125			
Potassium	1.713	1.804	0.050	5.2	25.0	3.718	2.00	100.3	70-125			
Selenium	< 0.100	< 0.100	0.100	N.C	25.0	0.980	1.00	98.0	70-125			
Silicon	20.76	22.03	0.10	5.9	25.0	26.96	2.0	310.0	70-125	A,B		
Silver	< 0.020	< 0.020	0.020	N.C	25.0	0.023	0.40	5.8	70-125	B		
Sodium	38.43	40.65	0.05	5.6	25.0	43.86	2.0	271.5	70-125	A,B		
Strontium	0.751	0.790	0.050	5.1	25.0	1.772	2.00	51.1	70-125	B		
Vanadium	0.044	0.046	0.015	4.4	25.0	0.501	0.50	91.4	70-125			
Zinc	0.027	0.029	0.015	7.1	25.0	0.521	0.50	98.8	70-125			

(A) High analyte concentration affects spike recovery.

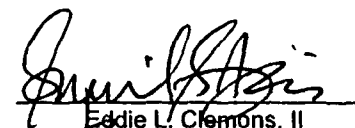
(B) Post-digestion spike within acceptance limits.

 $\text{Relative Difference [D]} = 200 \cdot (B-A)/(B+A)$
 $\text{Matrix Spike Recovery [H]} = 100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016-1-0
Project Manager: T. Nix / J. Mosley
Project Location: Lovington, NM

Project Name: Lovington

XENCO COC#: 1-82357
Date Received In Lab: Jun 25, 1998 09:50 by LY
XENCO contact : Carlos Castro/Eddie Clemons

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	182357-001	BTEX	SW-846	ppm	10 days	Jun 24, 1998 08:52		Jun 27, 1998 by OR	Jun 27, 1998 18:27 by OR
2			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 08:52		Jun 29, 1998 by RK	Jul 1, 1998 21:57 by LC
3			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 08:52		Jul 1, 1998 by AO	Jul 9, 1998 20:31 by CG
4			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 08:52		Jul 1, 1998 by AO	Jul 6, 1998 17:18 by AO
5	MW-7	182357-002	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:08		Jun 27, 1998 by OR	Jun 27, 1998 18:46 by OR
6			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:08		Jun 29, 1998 by RK	Jul 1, 1998 22:45 by LC
7			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:08		Jul 1, 1998 by AO	Jul 9, 1998 20:58 by CG
8			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:08		Jul 1, 1998 by AO	Jul 6, 1998 17:21 by AO
9	MW-8	182357-003	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:36		Jun 27, 1998 by OR	Jun 27, 1998 19:05 by OR
10			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:36		Jun 29, 1998 by RK	Jul 1, 1998 23:31 by LC
11			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:36		Jul 1, 1998 by AO	Jul 9, 1998 21:07 by CG
12			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:36		Jul 1, 1998 by AO	Jul 6, 1998 17:22 by AO
13	MW-10	182357-004	BTEX	SW-846	ppm	10 days	Jun 24, 1998 10:09		Jun 27, 1998 by OR	Jun 27, 1998 19:24 by OR
14			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 10:09		Jun 29, 1998 by RK	Jul 2, 1998 00:18 by LC
15			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 10:09		Jul 1, 1998 by AO	Jul 9, 1998 21:16 by CG
16			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 10:09		Jul 1, 1998 by AO	Jul 6, 1998 17:22 by AO
17	MW-11	182357-005	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:20		Jun 27, 1998 by OR	Jun 27, 1998 19:43 by OR
18			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:20		Jun 29, 1998 by RK	Jul 2, 1998 01:04 by LC
19			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:20		Jul 1, 1998 by AO	Jul 9, 1998 21:26 by CG
20			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:20		Jul 1, 1998 by AO	Jul 6, 1998 17:23 by AO
21	MW-12	182357-006	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:47		Jun 27, 1998 by OR	Jun 27, 1998 20:02 by OR
22			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:47		Jun 29, 1998 by RK	Jul 2, 1998 01:49 by LC
23			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:47		Jul 1, 1998 by AO	Jul 9, 1998 21:35 by CG
24			Mercury, Tot	SW846-7470	mg/L	Standard	Jun 24, 1998 09:47		Jul 1, 1998 by AO	Jul 6, 1998 17:24 by AO



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

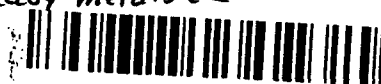
Page / of /

Lab. Batch # 182357-9A

Contractor K.E. Consultants		Phone (210) 680-3767		No. coolers this shipment:		Contractor COC # 147										
Address 5309 Wurzbach, Ste. 100 San Antonio, TX 78238		Project Director Mike Hawthorne		Carrier: UPS		Quote #:										
Project Name Lovington		Project Manager Theresa Nix / Jim Mosley		Airbill No.		P.O. No: 8951										
Project Location Lovington, NM		Project No. 710016-1-0		SAMPLER SIGNATURE Stanley J. Hoover Jr.		Turn-around • ASAP • 24 hrs 48 hrs <u>Standard</u>										
SAMPLE CHARACTERIZATION		Preservative		Unl Dies Ker Unknown		LAB ONLY ID #										
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type P.G	Ice	Other	Waste Oil	PIT No:	Tank No:	Sample Description	Remarks	LAB ONLY ID #
MW-1	24 June 98	8:52						1 Liter 40 mL 500 mL		HEL HNO3					Call Theresa Nix for Analysis if needed.	1
MW-2															Did not sample	2
MW-7		9:08														3
MW-8		9:36														4
MW-10		10:09														5
MW-11		9:20														6
MW-12		9:47														7
																8
																9
																10
Relinquished by: (Signature)		DATE		TIME		Received by: (Signature)		DATE		TIME		Remarks		Fax Results to Theresa Nix at 210-680-3763		
Stanley J. Hoover Jr.		6-24-98		1300		LPS		6/25/98		950		• BTEX: 5030/8020-8020 • PAH: 8100 or 8270 • Heavy metals: (ICP SCAN) 6010				
Received For Laboratory by						LPS										

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended



Services

ANALYTICAL REPORT 1-83649

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: Lovington

Project Id: 710016-1-0

September 22, 1998



11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

September 22, 1998

Project Manager: Theresa Nix
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-83649**
Project Name: Lovington
Project ID: 710016-1-0
Project Address: Lovington, NM.

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-83649. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.


All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-83649 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,


Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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CERTIFICATE OF ANALYSIS SUMMARY 1-83649

K.E.I. Consultants, Inc.

Project Name: Lovington

Date Received in Lab : Sep 19, 1998 10:15

Project ID: 710016-1-0

Project Manager: Theresa Nix

Date Report Faxed: Sep 22, 1998

Project Location: Lovington, NM.

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	183649 001	183649 002	183649 003	183649 004	183649 005	183649 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:						
	Sampled:	09/17/98 14:30	09/17/98 14:40	09/17/98 14:45	09/17/98 14:55	09/17/98 15:10	09/17/98 15:05
BTEX	Analyzed:	09/21/98	09/21/98	09/21/98	09/21/98	09/21/98	09/21/98
EPA 8021B	Units:	ppm	ppm	ppm	ppm	ppm	ppm
		R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Benzene		< 0.001 (0.001)	< 0.001 (0.001)	0.009 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	0.006 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylenes		< 0.002 (0.002)	< 0.002 (0.002)	0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	0.002 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	N.D.	0.020	N.D.	N.D.	N.D.

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Eddie L. Clemons, II
 QA/QC Manager

SW- 346 5030/3021B BTEX

Date Validated: Sep 21, 1998 15:45

Analyst: HL

Date Analyzed: Sep 21, 1998 11:57

Matrix: Liquid

BLANK SPIKE ANALYSIS

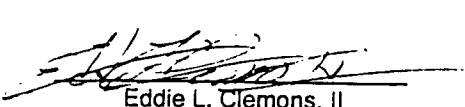
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1040	0.1000	0.0010	104.0	65-135	
Toluene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2080	0.2000	0.0020	104.0	65-135	
o-Xylene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	

 Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. = Not calculated, data below detection limit

B.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A25D35
SW- 846 5030/802IB BTEX

Date Validated: Sep 21, 1998 15:45

Analyst: HL

Date Analyzed: Sep 21, 1998 12:34

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 183649- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1170	0.1200	0.1000	0.0010	20.0	2.5	117.0	120.0	65-135	
Toluene	< 0.0010	0.1170	0.1200	0.1000	0.0010	20.0	2.5	117.0	120.0	65-135	
Ethylbenzene	< 0.0010	0.1160	0.1190	0.1000	0.0010	20.0	2.6	116.0	119.0	65-135	
m,p-Xylenes	< 0.0020	0.2370	0.2430	0.2000	0.0020	20.0	2.5	118.5	121.5	65-135	
o-Xylene	< 0.0010	0.1180	0.1230	0.1000	0.0010	20.0	4.1	118.0	123.0	65-135	


 $\text{Spike Relative Difference [F]} = 200 \cdot (B-C)/(B+C)$
 $\text{Matrix Spike Recovery [G]} = 100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 $\text{M.S.D. Recovery [H]} = 100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: Lovington

XENCO COC#: 1-83649

Date Received in Lab: Sep 19, 1998 10:15 by JO

XENCO contact : Carlos Castro/Eddie Clemons

Project ID: 710016-1-0

Project Manager: Theresa Nix

Project Location: Lovington, NM.

Project Location:

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	183649-001	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:30		Sep 21, 1998 by HL	Sep 21, 1998 12:34 by HL
2	MW-7	183649-002	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:40		Sep 21, 1998 by HL	Sep 21, 1998 13:30 by HL
3	MW-8	183649-003	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:45		Sep 21, 1998 by HL	Sep 21, 1998 13:48 by HL
4	MW-10	183649-004	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:55		Sep 21, 1998 by HL	Sep 21, 1998 14:07 by HL
5	MW-11	183649-005	BTEX	SW-846	ppm	10 days	Sep 17, 1998 15:10		Sep 21, 1998 by HL	Sep 21, 1998 14:45 by HL
6	MW-12	183649-006	BTEX	SW-846	ppm	10 days	Sep 17, 1998 15:05		Sep 21, 1998 by HL	Sep 21, 1998 14:26 by HL



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☒ 5309 Wurzbach Road, Suite 104, San Antonio, TX 78238 210-509-3334
☐ 11078 Morrison Road, Suite D, Dallas, TX 75229 972-481-9999

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD
On-LINE Help & Technical Services at XENCO.com

10065

Company COC No: 180 Work Order No: 710016-1-0 Page 1 of 1

Company KEI		Phone (210) 680-3767		Lab Only: 183649-SA		Lab Only Additions																		
Project Name LOVINGTON		<input checked="" type="checkbox"/> Previously done at XENCO Project ID 710016-1-0		TAT: 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d Standard TAT is 10 Working Days unless otherwise agreed in writing. But often reported in 5-7 Working Days																				
Location LOVINGTON NM		Project Manager (PM) T. NIX		Project Director (PD) M. Hawthorne		Remarks																		
Fax Results to <input checked="" type="checkbox"/> PM and / or		Fax (512) 364-3556																						
Invoice to <input type="checkbox"/> Accounting <input type="checkbox"/> Include Invoice with Final Report Attn PM <input type="checkbox"/> Invoice must have a P.O. Bill to:		Quote No. 710016-1-0		P.O. No. <input type="checkbox"/> Call for a P.O.																				
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)		Specifications																						
Sampler Name Ken Dutton		Signature <i>Ken Dutton</i>																						
Sample ID	Sampling Date	Time	Depth ft' in" m	Matrix AP SW	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020	8021	8260	602	624	Other	TAT 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d	Addn: PAH above mg/L W. mg/Kg s Highest Hit	Hold Analysis	From: Date	Rcv by: Date	From: Date	Rcv by: Date	
1 MW-1	17 SEP 98	1430					2	V	GA	H														
2 MW-7		1440																						
3 MW-8		1445																						
4 MW-10		1455																						
5 MW-11		1510																						
6 MW-12		1505																						
7																								
8																								
9																								
10																								
Relinquished by (Initials and Signature) <i>AD Ken Dutton</i>		Relinquished to (Initials and Signature) <i>Johnny Orma</i>		Date & Time 12 Sep 98 / 1630		Total Containers per COC: 12		Rush TATs Fax Due:		Final Fax Due:		Final Report Data Package Due Date:		Rush Charges are Pre-Approved upon Requesting them. All Terms Apply										

Preservatives - Various (V), HCl pH<2 (H), H2SO4 pH<2 (S), HNO4 pH<2 (N), NaOH+Asbc Acid (NAA), ZnAc+NaOH (ZA), (Cool,<4C) (C4), None (N), See Label (SL), Other (O)
SIZE: 4oz (4), 8oz (8), 32oz (32), 40ml VOA (V), 1L (1), 500ml (.5), Teflar Bag (B), Wipe (W), Other TYPE Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O)

ANALYTICAL REPORT 1-85039

for

KEI Consultants, Inc.

Project Manager: S. Grover

Project Name: Lovington

Project Id: 710016-1-0

January 5, 1999



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
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Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

January 5, 1999

Project Manager: S. Grover
KEI Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-85039**
Project Name: Lovington
Project ID: 710016-1-0
Project Address: Lea Co, NM

Dear S. Grover:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-85039. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-85039 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,

Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

KEI Consultants, Inc.

Project Name: Lovington

Project ID: 710016-1-0

Project Manager: S. Grover

Project Location: Lea Co, NM

XENCO COC#: 1-85039

Date Received in Lab: Dec 30, 1998 09:50 by SE


XENCO contact : Carlos Castro/Karen Olson

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 MW-1	185039-001	BTEX	SW-846	ppm	10 days	Dec 29, 1998 11:30		Jan 4, 1999 by HL	Jan 4, 1999 20:28 by HL
2 MW-7	185039-002	BTEX	SW-846	ppm	10 days	Dec 29, 1998 12:00		Jan 4, 1999 by HL	Jan 4, 1999 20:47 by HL
3 MW-8	185039-003	BTEX	SW-846	ppm	10 days	Dec 29, 1998 12:15		Jan 4, 1999 by HL	Jan 4, 1999 21:05 by HL
4 MW-10	185039-004	BTEX	SW-846	ppm	10 days	Dec 29, 1998 12:45		Jan 4, 1999 by HL	Jan 4, 1999 21:24 by HL
5 MW-11	185039-005	BTEX	SW-846	ppm	10 days	Dec 29, 1998 11:45		Jan 4, 1999 by HL	Jan 4, 1999 21:43 by HL
6 MW-12	185039-006	BTEX	SW-846	ppm	10 days	Dec 29, 1998 12:30		Jan 4, 1999 by HL	Jan 4, 1999 22:01 by HL

CERTIFICATE OF ANALYSIS SUMMARY 1-85039
KEI Consultants, Inc.
Project Name: Lovington
Date Received in Lab : Dec 30, 1998 09:50
Date Report Faxed: Jan 5, 1999
XENCO contact : Carlos Castro/Karen Olson
Project ID: 710016-1-0
Project Manager: S. Grover
Project Location: Lea Co, NM

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	185039 001 MW-1	185039 002 MW-7	185039 003 MW-8	185039 004 MW-10	185039 005 MW-11	185039 006 MW-12
		Liquid 12/29/98 11:30	Liquid 12/29/98 12:00	Liquid 12/29/98 12:15	Liquid 12/29/98 12:45	Liquid 12/29/98 11:45	Liquid 12/29/98 12:30
BTEX EPA 8021B	Analyzed: Units:	01/04/99 R.L. ppm	01/04/99 R.L. ppm	01/04/99 R.L. ppm	01/04/99 R.L. ppm	01/04/99 R.L. ppm	01/04/99 R.L. ppm
Benzene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of KEI Consultants, Inc..
 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Eddie L. Clemons, II
QA/QC Manager

SW- 846 5030/8021B BTEX

Date Validated: Jan 5, 1999 14:45

Analyst: HL

Date Analyzed: Jan 4, 1999 11:25

Matrix: Liquid

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0980	0.1000	0.0010	98.0	65-135	
Toluene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Ethylbenzene	< 0.0010	0.1010	0.1000	0.0010	101.0	65-135	
m,p-Xylene	< 0.0020	0.2050	0.2000	0.0020	102.5	65-135	
o-Xylene	< 0.0010	0.1010	0.1000	0.0010	101.0	65-135	

 Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager



Certificate Of Quality Control for Batch : 19A25A04

SW- 846 5030/8021B BTEX

Date Validated: Jan 5, 1999 14:45

Analyst: HL

Date Analyzed: Jan 4, 1999 17:21

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 185050- 007	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1140	0.1150	0.1000	0.0010	20.0	0.9	114.0	115.0	65-135	
Toluene	< 0.0010	0.1120	0.1110	0.1000	0.0010	20.0	0.9	112.0	111.0	65-135	
Ethylbenzene	< 0.0010	0.1100	0.1110	0.1000	0.0010	20.0	0.9	110.0	111.0	65-135	
m,p-Xylene	< 0.0020	0.2240	0.2240	0.2000	0.0020	20.0	0.0	112.0	112.0	65-135	
o-Xylene	< 0.0010	0.1120	0.1120	0.1000	0.0010	20.0	0.0	112.0	112.0	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$


Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Eddie L. Clemons, II
QA/QC Manager



- ☐ 11381 Meadowglen, Suite L, Houston TX 77082 281-589-0692
☒ 5309 Wurzbach Road, Suite 104, San Antonio, TX 78238 210-509-3334
☐ 11078 Morrison Road, Suite D, Dallas, TX 75229 972-481-9999

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

On-LINE Help & Technical Services at XENCO.com

13278

Company COC No: 224 Work Order No: 710016-1-0 Page 1 of 1

Company KET		Phone (210) 680-3767		Lab Only: 185039-SA										Lab Only Additions												
Project Name Levington		<input checked="" type="checkbox"/> Previously done at XENCO		Project ID 710016-1-0		TAT: 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d Standard TAT is 10 Working Days unless otherwise agreed in writing. But often reported in 5-7 Working Days																				
Location Lea Co. NM		Project Manager (PM) S. GROVER		Project Director (PD) M. HAWTHORNE		Remarks QUESTIONS: S. GROVER (210) 680-3767																				
Fax Results to <input checked="" type="checkbox"/> PM and / or (210) 680-3763		Fax (210) 680-3763		Fax																						
Invoice to <input type="checkbox"/> Accounting <input type="checkbox"/> Include Invoice with Final Report Attn PM <input type="checkbox"/> Invoice must have a P.O. Bill to:		Quote No. 710016-1-0		P.O. No. <input type="checkbox"/> Call for a P.O.																						
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)		Specifications		Sampler Name Ken Dutton		Signature Ken Dutton																				
Sample ID	Sampling Date	Time	Depth ft in" m	Matrix A PSW	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020	BTEX-MTBE by 8020	TPH by TX1005 418.1	8015GRO 8015DRO 8015JefF	PAHs by 8270 8100 8310	METALS by 6010 8RCRA Tot Pb TCLP8 13PP 23TAL See List	VOAs by 8260 624 BTEX MTBE PPs TCL See List Call PM	SVOAs by 8270 625 PAHs Bn&A TCL PPs See List Call PM	TAT 5h 12h 20h 24h 48h 3d 5d 7d 10d 14d 21d	Addn: PAH above mg/L W. mg/Kg s Highest Hit	Hold Analysis	From: Rev by: Date				
1 MW-1	12-29-98	1130				X	2	V	GA	V	X															
2 MW-7		1200																								
3 MW-8		1215																								
4 MW-10		1245																								
5 MW-11		1145																								
6 MW-12		1237																								
7																										
8																										
9																										
10																										
Relinquished by (Initials and Signature) KD KEN Dutton		Relinquished to (Initials and Signature)		Date & Time 29 Dec 98 / 1430		Total Containers per COC: 12		Rush TATs Fax Due: Final Fax Due:																		
Lab: Stacy Smith		12/30/98 09:50		Rush Charges are Pre-Approved upon Requesting them. All Terms Apply																						

Preservatives - Various (V), HCl pH<2 (H), H2SO4 pH<2 (S), HNO3 pH<2 (N), NaOH+Asbc Acid (NAA), ZnAc+NaOH (ZA), (Cool,<4C) (C4), None (N), See Label (SL), Other (O)

SIZE: 4oz (4), 8oz (8), 32oz (32), 40ml VOA (V), 1L (1), 500ml (.5), Tedlar Bag (B), Wipe (W), Other TYPE Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O)

/

Appendix B



ANALYTICAL REPORT 1-81707

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix/Jim Mosley

Project Name: Lovington

Project Id: 710016-1-0-0

May 18, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

May 18, 1998

Project Manager: Theresa Nix/Jim Mosley
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-81707**
Project Name: Lovington
Project ID: 710016-1-0-0
Project Address: Lovington, NM

Dear Theresa Nix/Jim Mosley:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-81707. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-81707 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,

Sunil Ajai, M.S.
Technical Director

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

K.E.I. Consultants, Inc.
Project Name: Lovington
Project ID: 710016-1-0-0
Project Manager: Theresa Nix/Jim Mosley
Project Location: Lovington, NM
Date Received in Lab : May 6, 1998 09:40
Date Report Faxed: May 18, 1998
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	181707 001 Zeo-Out Lite		181707 002 Carbon Out	
		Liquid 05/05/98		Liquid 05/05/98	
BTEX EPA 8020	Analyzed: Units:	05/07/98 ppm	R.L.	05/07/98 ppm	R.L.
Benzene		20.00	(0.05)	< 0.001	(0.001)
Toluene		15.02	(0.05)	< 0.001	(0.001)
Ethylbenzene		1.61	(0.05)	< 0.001	(0.001)
m,p-Xylenes		2.89	(0.10)	< 0.002	(0.002)
o-Xylene		1.41	(0.05)	< 0.001	(0.001)
Total BTEX		40.930		N.D.	
PAHs by GC-MS (610 List) EPA 8270	Analyzed: Units:	05/06/98 mg/L	R.L.	05/06/98 mg/L	R.L.
Acenaphthene		< 0.002	(0.002)	< 0.002	(0.002)
Acenaphthylene		< 0.002	(0.002)	< 0.002	(0.002)
Anthracene		< 0.002	(0.002)	< 0.002	(0.002)
Benzo(a)anthracene		< 0.002	(0.002)	< 0.002	(0.002)
Benzo(a)pyrene		< 0.002	(0.002)	< 0.002	(0.002)
Benzo(b)fluoranthene		< 0.002	(0.002)	< 0.002	(0.002)
Benzo(g,h,i)perylene		< 0.002	(0.002)	< 0.002	(0.002)
Benzo(k)fluoranthene		< 0.002	(0.002)	< 0.002	(0.002)
Chrysene		< 0.002	(0.002)	< 0.002	(0.002)
Dibenzo(a,h)anthracene		< 0.002	(0.002)	< 0.002	(0.002)
Fluoranthene		< 0.002	(0.002)	< 0.002	(0.002)
Fluorene		< 0.002	(0.002)	< 0.002	(0.002)
Indeno(1,2,3-cd)pyrene		< 0.002	(0.002)	< 0.002	(0.002)
2-Methylnaphthalene		0.057	(0.002)	< 0.002	(0.002)
1-Methylnaphthalene		0.030	(0.002)	< 0.002	(0.002)
Naphthalene		0.111	(0.002)	< 0.002	(0.002)
Phenanthrene		< 0.002	(0.002)	< 0.002	(0.002)
Pyrene		< 0.002	(0.002)	< 0.002	(0.002)
bis [2-Ethylhexyl] phthalate		< 0.020	(0.020)	< 0.020	(0.020)
pH, Electrometric EPA 150.1	Analyzed: Units:	05/06/98 S.U.	R.L.	05/06/98 S.U.	R.L.
pH, Electrometric		7.32	(0.00)	8.15	(0.00)
Total Dissolved Solids EPA 160.1	Analyzed: Units:	05/08/98 mg/L	R.L.	05/08/98 mg/L	R.L.
Total Dissolved Solids		404	(5.0)	382	(5.0)

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..

The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Sunil Aja, M.S.
 Technical Director

K.E.I. Consultants, Inc.**Project Name: Lovington****Project ID: 710016-1-0-0****Project Manager: Theresa Nix/Jim Mosley****Project Location: Lovington, NM****Date Received in Lab : May 6, 1998 09:40****Date Report Faxed: May 18, 1998****XENCO contact : Carlos Castro/Edward Yonemoto**

Analysis Requested	Lab ID:	181707 001	181707 002		
	Field ID:	Zeo-Out Lite	Carbon Out		
	Depth:				
	Matrix:	Liquid	Liquid		
	Sampled:	05/05/98	05/05/98		
Total Suspended Solids EPA 160.2	Analyzed:	05/07/98	05/07/98		
	Units:	R.L. mg/L	R.L. mg/L		
Total Suspended Solids		< 5.0 (5.0)	< 5.0 (5.0)		
Phenolics, Total EPA 420.1	Analyzed:	05/07/98	05/07/98		
	Units:	R.L. mg/L	R.L. mg/L		
Phenolics, Total		0.2 (0.1)	< 0.1 (0.1)		

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Sunil Agar, M.S.
Technical Director

SW- 846 5030/3020 BTEX and MTBE

Date Validated: May 8, 1998 14:27

Analyst: RL

Date Analyzed: May 7, 1998 08:40

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike		Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Benzene	< 0.0010	0.0970	0.1000	0.0010	97.0	75-125	
Toluene	< 0.0010	0.0993	0.1000	0.0010	99.3	75-125	
Ethylbenzene	< 0.0010	0.1055	0.1000	0.0010	105.5	75-125	
MTBE	< 0.0200	0.9304	1.0000	0.0200	93.0	75-125	
m,p-Xylenes	< 0.0020	0.2064	0.2000	0.0020	103.2	75-125	
o-Xylene	< 0.0010	0.1028	0.1000	0.0010	102.8	75-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

B.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.

JQA: Technical Director

Certificate Of Quality Control for Batch : 18A36A83
SW- 846 5030/8020 BTX and MTBE

Date Validated: May 8, 1998 14:27

Analyst: RL

Date Analyzed: May 7, 1998 10:12

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 181709- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	mg/L	mg/L	mg/L	mg/L	mg/L	%	%	%	%	%	
Benzene	< 0.0010	0.0978	0.0949	0.1000	0.0010	20.0	3.0	97.8	94.9	75-125	
Toluene	< 0.0010	0.0982	0.0965	0.1000	0.0010	20.0	1.7	98.2	96.5	75-125	
Ethylbenzene	< 0.0010	0.1033	0.1062	0.1000	0.0010	20.0	2.8	103.3	106.2	75-125	
MTBE	< 0.0200	1.0316	0.9366	1.0000	0.0200	20.0	9.7	103.2	93.7	75-125	
m,p-Xylenes	< 0.0020	0.2009	0.2013	0.2000	0.0020	20.0	0.2	100.5	100.7	75-125	
o-Xylene	< 0.0010	0.1005	0.0994	0.1000	0.0010	20.0	1.1	100.5	99.4	75-125	

$$\text{Spike Relative Difference [F]} = 200 \cdot (B-C)/(B+C)$$

$$\text{Matrix Spike Recovery [G]} = 100 \cdot (B-A)/[D]$$

M.S.D. = Matrix Spike Duplicate

$$\text{M.S.D. Recovery [H]} = 100 \cdot (C-A)/[D]$$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 Technical Director



Certificate Of Quality Control for Batch : 18A34B83

SW846-8270 PAHs by GC-MS (610 List)

Date Validated: May 7, 1998 13:04

Analyst: LC

Date Analyzed: May 6, 1998 18:53

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank	[F]	[G]	[H]	[I]	[J]
	Blank Result mg/L	Blank Spike Result mg/L	Blank Spike Duplicate Result mg/L	Blank Spike Amount mg/L	Detection Limit mg/L	Limit Relative Difference %	QC	QC	QC	Blank Spike Recovery Range %	Qualifier
							Spike Relative	Blank Spike	B.S.D.		
							Difference %	Recovery %	Recovery %		
Acenaphthene	< 0.0040	0.0796	0.0820	0.1000	0.0040	31.0	3.0	79.6	82.0	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0816	0.0856	0.1000	0.0040	42.0	4.8	81.6	85.6	23-97	
2-Chlorophenol	< 0.0040	0.0746	0.0780	0.1000	0.0040	40.0	4.5	74.6	78.0	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0734	0.0740	0.1000	0.0040	28.0	0.8	73.4	74.0	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0800	0.0806	0.1000	0.0040	38.0	0.7	80.0	80.6	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0888	0.0908	0.1000	0.0080	38.0	2.2	88.8	90.8	41-116	
4-Nitrophenol	< 0.0080	0.0220	0.0168	0.1000	0.0080	50.5	26.8	22.0	16.8	10-80	
Pentachlorophenol	< 0.0020	0.0408	0.0166	0.1000	0.0020	50.0	84.3	40.8	16.6	9-103	A
Phenol	< 0.0020	0.0374	0.0396	0.1000	0.0020	42.0	5.7	37.4	39.6	12-89	
Pyrene	< 0.0040	0.0882	0.0906	0.1000	0.0040	31.0	2.7	88.2	90.6	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0840	0.0820	0.1000	0.0020	28.0	2.4	84.0	82.0	39-98	

(A) Result outside of QC limits, however compound not in reported list.

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.

Technical Director

EPA 150.1 pH, Electrometric

Date Validated: May 6, 1998 16:35

Analyst: OG

Date Analyzed: May 6, 1998 11:40

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

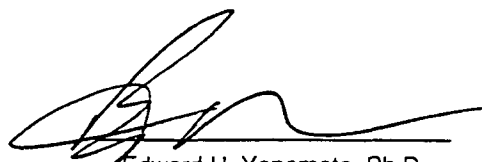
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 181707- 001	[A]	[B]	[C]	[D]	[E]	[F]
	Sample	Duplicate	Detection	QC	LIMITS	Qualifier
	Result	Result		Relative	Relative	
Parameter	S.U.	S.U.	Limit	Difference	Difference	
	S.U.	S.U.	S.U.	%	%	
pH. Electrometric	7.320	7.301	0 - 14	0.3	3.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated. data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A19B62

EPA 160.1 Total Dissolved Solids

Date Validated: May 8, 1998 12:25

Analyst: EZ

Date Analyzed: May 8, 1998 11:10

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

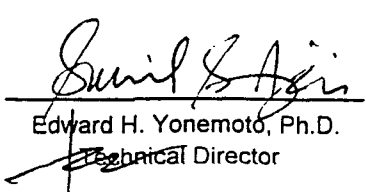
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 181707- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC	[E] LIMITS	[F] Qualifier
	mg/L	mg/L	mg/L	Relative Difference	Relative Difference	
				%	%	
Parameter						
Total Dissolved Solids	404	398	4.00	1.5	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A19B60

EPA 160.2 Total Suspended Solids

Date Validated: May 7, 1998 13:17

Analyst: EZ

Date Analyzed: May 7, 1998 12:40

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

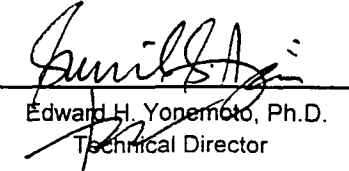
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 181707- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit mg/L	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Qualifier
	Parameter mg/L	mg/L				
Total Suspended Solids	< 4.00	< 4.00	4.00	N.C	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director

EPA 420.1 Phenolics, Total

Date Validated: May 7, 1998 16:27

Analyst: IF

Date Analyzed: May 7, 1998 15:15

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike		Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Phenolics, Total	< 0.10	0.49	0.50	0.10	98.0	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Sunil S. Ajai
Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A12B06

EPA 420.1 Phenolics, Total

Date Validated: May 7, 1998 16:27

Analyst: IF

Date Analyzed: May 7, 1998 15:35

Matrix: Liquid

QA/QC Manager: Sunil Ajai, M.S.

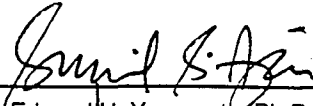
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 181707- 002	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Detection Limit mg/L	[D]	[E]	[F] Qualifier
				QC Relative Difference %	LIMITS Relative Difference %	
Parameter						
Phenolics, Total	< 0.10	< 0.10	0.10	N.C	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016-1-0-0

Project Name: Lovington

XENCO COC#: 1-81707

Project Manager: Theresa Nix/Jim Mosley

Date Received in Lab: May 6, 1998 09:40 by AS

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Edward Yonemoto

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 Zeo-Out Lite System Water	181707-001	BTEX	SW-846	ppm	Standard	May 5, 1998		May 7, 1998 by RL	May 7, 1998 15:17 by RL
2		Phenolics	EPA 420.1	mg/L	Standard	May 5, 1998		May 7, 1998 by IF	May 7, 1998 15:30 by IF
3		TDS	EPA 160.1	mg/L	Standard	May 5, 1998		May 7, 1998 by EZ	May 8, 1998 11:10 by EZ
4		TSS	EPA 160.2	mg/L	Standard	May 5, 1998		May 7, 1998 by EZ	May 7, 1998 12:40 by EZ
5		pH	EPA 150.1	S.U.	Standard	May 5, 1998		May 6, 1998 by OG	May 6, 1998 11:35 by OG
6		PAHs	SW846-8270	mg/L	Standard	May 5, 1998		May 6, 1998 by SS	May 6, 1998 22:54 by LC
7 Carbon Out	181707-002	BTEX	SW-846	ppm	Standard	May 5, 1998		May 7, 1998 by RL	May 7, 1998 15:48 by RL
8		Phenolics	EPA 420.1	mg/L	Standard	May 5, 1998		May 7, 1998 by IF	May 7, 1998 15:35 by IF
9		TDS	EPA 160.1	mg/L	Standard	May 5, 1998		May 7, 1998 by EZ	May 8, 1998 11:20 by EZ
10		TSS	EPA 160.2	mg/L	Standard	May 5, 1998		May 7, 1998 by EZ	May 7, 1998 12:50 by EZ
11		pH	EPA 150.1	S.U.	Standard	May 5, 1998		May 6, 1998 by OG	May 6, 1998 11:45 by OG
12		PAHs	SW846-8270	mg/L	Standard	May 5, 1998		May 6, 1998 by SS	May 6, 1998 23:42 by LC

ANALYTICAL REPORT 1-81828

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix / Jim Mosley

Project Name: Lovington

Project Id: 710016-1-0-0

May 19, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

May 19, 1998

Project Manager: Theresa Nix / Jim Mosley
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-81828**
Project Name: Lovington
Project ID: 710016-1-0-0
Project Address: Lovington, NM

Dear Theresa Nix / Jim Mosley:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-81828. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

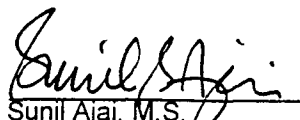
All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-81828 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,


Sunil Ajai, M.S.
Technical Director

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

K.E.I. Consultants, Inc.**Project Name: Lovington****Project ID: 710016-1-0-0****Project Manager: Theresa Nix / Jim Mosley****Project Location: Lovington, NM****Date Received in Lab : May 14, 1998 09:45****Date Report Faxed: May 19, 1998****XENCO contact : Carlos Castro/Edward Yonemoto**

Analysis Requested	<i>Lab ID:</i>	181828 001	181828 002		
	<i>Field ID:</i>	Zeo Lite	Carbon		
	<i>Depth:</i>				
	<i>Matrix:</i>	Liquid	Liquid		
	<i>Sampled:</i>	05/13/98	05/13/98		
BTEX	<i>Analyzed:</i>	05/15/98	05/15/98		
EPA 8020	<i>Units:</i>	R.L. ppm	R.L. ppm		
Benzene		16.25 (0.05)	< 0.001 (0.001)		
Toluene		13.45 (0.05)	< 0.001 (0.001)		
Ethylbenzene		1.21 (0.05)	< 0.001 (0.001)		
m,p-Xylenes		2.22 (0.10)	< 0.002 (0.002)		
o-Xylene		1.06 (0.05)	< 0.001 (0.001)		
Total BTEX		34.19	N.D.		

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..

The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Sunil Ajai, M.S.
Technical Director



Certificate Of Quality Control for Batch : 18A25B46

SW- 846 5030/8020 BTEX

Date Validated: May 18, 1998 11:45

Analyst: HL

Date Analyzed: May 15, 1998 10:12

Matrix: Liquid

QA/QC Manager: Eddie Clemons, B.S.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike		Blank Spike	Recovery	
	ppm	ppm	Amount	Limit	Recovery	Range	
			ppm	ppm	%	%	
Benzene	< 0.0010	0.0970	0.1000	0.0010	97.0	65-135	
Toluene	< 0.0010	0.0957	0.1000	0.0010	95.7	65-135	
Ethylbenzene	< 0.0010	0.0979	0.1000	0.0010	97.9	65-135	
m,p-Xylenes	< 0.0020	0.2010	0.2000	0.0020	100.5	65-135	
o-Xylene	< 0.0010	0.0981	0.1000	0.0010	98.1	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Sunil Agar, M.S.
Technical Director



Certificate Of Quality Control for Batch : 18A25B46

SW- 846 5030/8020 BTEx

Date Validated: May 18, 1998 11:45

Analyst: HL

Date Analyzed: May 15, 1998 10:51

Matrix: Liquid

QA/QC Manager: Eddie Clemons, B.S.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 181807- 002	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC	[G] QC	[H] QC	[I] Matrix Spike Recovery	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	Spike Relative Difference %	Matrix Spike Recovery %	M.S.D. Recovery %	Recovery Range %	
Benzene	0.0673	0.1600	0.1650	0.1000	0.0010	20.0	3.1	92.7	97.7	65-135	
Toluene	0.0088	0.1080	0.1130	0.1000	0.0010	20.0	4.5	99.2	104.2	65-135	
Ethylbenzene	0.0023	0.1020	0.1060	0.1000	0.0010	20.0	3.8	99.7	103.7	65-135	
m,p-Xylenes	< 0.0020	0.2030	0.2120	0.2000	0.0020	20.0	4.3	101.5	106.0	65-135	
o-Xylene	< 0.0010	0.0997	0.1040	0.1000	0.0010	20.0	4.2	99.7	104.0	65-135	

Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

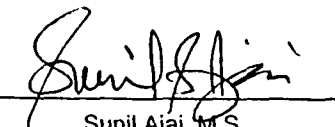
Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Sunil Ajai, M.S.
Technical Director

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: Lovington

XENCO COC#: 1-81828

Date Received in Lab: May 14, 1998 09:45 by DH

XENCO contact : Carlos Castro/Edward Yonemoto

Project ID: 710016-1-0-0

Project Manager: Theresa Nix / Jim Mosley

Project Location: Lovington, NM

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	Zeo Lite System Water	181828-001	BTEX	SW-846	ppm	3 days	May 13, 1998		May 15, 1998 by HL	May 15, 1998 20:19 by HL
2	Carbon Effluent	181828-002	BTEX	SW-846	ppm	3 days	May 13, 1998		May 15, 1998 by HL	May 15, 1998 19:28 by HL



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 181828 *sis*

Contractor K.E.I.		Phone (210) 680-3767		No. coolers this shipment:		Contractor COC # 141				
Address 5309 Wuerzbach Suite 100 SAN ANTONIO TX 78238				Carrier: UPS		Quote #:				
Project Name Louington				Airbill No.		P.O. No: 9014				
Project Director Mike Hawthorne				<div style="display: flex; justify-content: space-between;"><div style="writing-mode: vertical-rl; transform: rotate(180deg);">CONTAINERS</div><div style="text-align: center;">Turn-around • ASAP • 24 hrs • 48 hrs <u>Standard</u></div><div style="writing-mode: vertical-rl; transform: rotate(180deg);">LAB ONLY ID #</div></div>						
Project Location Louington N.M.										
Project Manager Theresa Nix / Jim Mosley										
Sampler Signature KEN DUKKON				Project No. 710016-1-0-0						
SAMPLE CHARACTERIZATION										
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type P.G	Preservative Ice Other	Unl Dies Ker Unknown Waste Oil PTT No: Tank No: Sample Description
1 ZEO LITE	5-13-98				/	/				HCL System WATER
2 CARBON	5-13-98				/	/				HCL EFFLUENT
3										
4										
5										
6										
7										
8										
9										
10										
Relinquished by: <i>[Signature]</i> DATE: 5-13-98 TIME: Received by: <i>[Signature]</i> DATE: 5/14/98 TIME: 09:45										Remarks: FAX ANALYTICAL RESULTS TO Jim Mosley 512-272-5686 AND TO THERESA NIX AT 210-680-3763 (Via UPS)
Received For Laboratory by: <i>[Signature]</i> DATE: 5/14/98 TIME: 09:45										

ANALYTICAL REPORT 1-82729

for

K.E.I. Consultants, Inc.

Project Manager: J. Mosley/T. Nix

Project Name: TNMPL

Project Id: 710016-1-0-0

July 24, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

July 24, 1998

Project Manager: J. Mosley/T. Nix
K.E.I. Consultants, Inc.
5309 Wurzbach Rd., Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-82729**
Project Name: TNMPL
Project ID: 710016-1-0-0
Project Address: Lovington, NM

Dear J. Mosley/T. Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-82729. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.


All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-82729 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,


Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.


A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

CERTIFICATE OF ANALYSIS SUMMARY 1-82729
K.E.I. Consultants, Inc.
Project Name: TNMPL
Project ID: 710016-1-0-0
Project Manager: J. Mosley/T. Nix
Project Location: Lovington, NM
Date Received in Lab : Jul 18, 1998 09:50
Date Report Faxed: Jul 24, 1998
XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182729 001	182729 002	182729 003	182729 004
	Field ID:	Effluent Frac Tank	Effluent Air Strpr.	Effluent Carbon	Effluent Zeolite
	Depth:				
	Matrix:				
	Sampled:				
		Liquid	Liquid	Liquid	Liquid
		07/17/98 07:30	07/17/98 07:35	07/17/98 07:40	07/17/98 07:45
BTEX	Analyzed:	07/21/98	07/21/98	07/22/98	07/22/98
EPA 8020	Units:	ppm	ppm	ppm	ppm
		R.L.	R.L.	R.L.	R.L.
Benzene		9.04 (0.05)	0.062 (0.001)	< 0.001 (0.001)	9.50 (0.02)
Toluene		9.15 (0.05)	0.064 (0.001)	< 0.001 (0.001)	8.90 (0.02)
Ethylbenzene		1.65 (0.05)	0.008 (0.001)	< 0.001 (0.001)	1.05 (0.02)
m,p-Xylenes		2.64 (0.10)	0.017 (0.002)	< 0.002 (0.002)	2.03 (0.05)
o-Xylene		1.27 (0.05)	0.013 (0.001)	< 0.001 (0.001)	1.07 (0.02)
Total BTEX		23.75	0.164	N.D.	22.55
PAHs by GC-MS (610 List)	Analyzed:	07/21/98	07/20/98	07/21/98	07/21/98
EPA 8270	Units:	mg/L	mg/L	mg/L	mg/L
		R.L.	R.L.	R.L.	R.L.
Acenaphthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Acenaphthylene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Anthracene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)anthracene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(b)fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(g,h,i)perylene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(k)fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Chrysene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Dibenzo(a,h)anthracene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluorene		0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Indeno(1,2,3-cd)pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
2-Methylnaphthalene		0.30 (0.02)	0.021 (0.002)	< 0.002 (0.002)	0.062 (0.002)
1-Methylnaphthalene		0.18 (0.02)	0.017 (0.002)	< 0.002 (0.002)	0.041 (0.002)
Naphthalene		0.25 (0.02)	0.042 (0.002)	< 0.002 (0.002)	0.128 (0.002)
Phenanthrene		0.03 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
bis [2-Ethylhexyl] phthalate		< 0.20 (0.20)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)
Phenolics, Total	Analyzed:	07/20/98		07/20/98	
EPA 420.1	Units:	mg/L		mg/L	
		R.L.		R.L.	
Phenolics, Total		0.14 (0.05)		< 0.05 (0.05)	

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..

The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Eddie L. Clemons, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A36B97
SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jul 23, 1998 12:40

Analyst: RL

Date Analyzed: Jul 22, 1998 10:06

Matrix: Liquid

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike	Limit	Blank Spike	Recovery	
	mg/L	mg/L	Amount	mg/L	Recovery	Range	
			mg/L		%	%	
Benzene	< 0.0010	0.1078	0.1000	0.0010	107.8	75-125	
Toluene	< 0.0010	0.0931	0.1000	0.0010	93.1	75-125	
Ethylbenzene	< 0.0010	0.0924	0.1000	0.0010	92.4	75-125	
MTBE	< 0.0200	0.8992	1.0000	0.0200	89.9	75-125	
m,p-Xylenes	< 0.0020	0.1679	0.2000	0.0020	84.0	75-125	
o-Xylene	< 0.0010	0.0891	0.1000	0.0010	89.1	75-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A36B97
SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jul 23, 1998 12:40

Analyst: RL

Date Analyzed: Jul 22, 1998 15:55

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 182772- 005	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	mg/L	mg/L	mg/L	mg/L	mg/L	%	%	%	%	%	
Benzene	< 0.0010	0.1118	0.1105	0.1000	0.0010	20.0	1.2	111.8	110.5	75-125	
Toluene	< 0.0010	0.0964	0.0950	0.1000	0.0010	20.0	1.5	96.4	95.0	75-125	
Ethylbenzene	< 0.0010	0.0971	0.0948	0.1000	0.0010	20.0	2.4	97.1	94.8	75-125	
MTBE	< 0.0200	0.8805	0.8753	1.0000	0.0200	20.0	0.6	88.1	87.5	75-125	
m,p-Xylenes	< 0.0020	0.1754	0.1722	0.2000	0.0020	20.0	1.8	87.7	86.1	75-125	
o-Xylene	< 0.0010	0.0931	0.0913	0.1000	0.0010	20.0	2.0	93.1	91.3	75-125	

 Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$


 Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager



Certificate Of Quality Control for Batch : 18A36B95

SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jul 23, 1998 09:10

Analyst: RL

Date Analyzed: Jul 21, 1998 10:05

Matrix: Liquid

BLANK SPIKE ANALYSIS


Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E]	[F]	[G] Qualifier
					QC	LIMITS	
					Blank Spike Recovery	Recovery Range	
					%	%	
Benzene	< 0.0010	0.1176	0.1000	0.0010	117.6	75-125	
Toluene	< 0.0010	0.0994	0.1000	0.0010	99.4	75-125	
Ethylbenzene	< 0.0010	0.0981	0.1000	0.0010	98.1	75-125	
MTBE	< 0.0200	0.9479	1.0000	0.0200	94.8	75-125	
m,p-Xylenes	< 0.0020	0.1789	0.2000	0.0020	89.5	75-125	
o-Xylene	< 0.0010	0.0943	0.1000	0.0010	94.3	75-125	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemmons, II
QA/QC Manager

Certificate Of Quality Control for Batch : 18A36B95
SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jul 23, 1998 09:10

Analyst: RL

Date Analyzed: Jul 21, 1998 14:13

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 182642- 002	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC	[G] QC	[H] QC	[I] Matrix Spike	[J] Qualifier
	mg/L	mg/L	mg/L	mg/L	mg/L	%	Spike Relative Difference %	Matrix Spike Recovery %	M.S.D. Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1219	0.1127	0.1000	0.0010	20.0	7.8	121.9	112.7	75-125	
Toluene	< 0.0010	0.1039	0.0959	0.1000	0.0010	20.0	8.0	103.9	95.9	75-125	
Ethylbenzene	< 0.0010	0.1067	0.0957	0.1000	0.0010	20.0	10.9	106.7	95.7	75-125	
MTBE	0.0526	0.9114	0.9422	1.0000	0.0200	20.0	3.3	85.9	89.0	75-125	
m,p-Xylenes	< 0.0020	0.1899	0.1739	0.2000	0.0020	20.0	8.8	95.0	87.0	75-125	
o-Xylene	< 0.0010	0.1004	0.0916	0.1000	0.0010	20.0	9.2	100.4	91.6	75-125	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

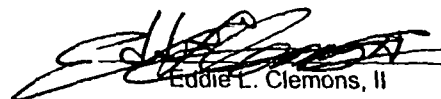
 Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A34C99
SW846- 8270 PAHs by GC- MS

Date Validated: Jul 22, 1998 13:02

Analyst: LC

Date Analyzed: Jul 20, 1998 19:29

Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY											
Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Recovery Range %	
Acenaphthene	< 0.0040	0.0790	0.0758	0.1000	0.0040	31.0	4.1	79.0	75.8	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0774	0.0806	0.1000	0.0040	42.0	4.1	77.4	80.6	23-97	
2-Chlorophenol	< 0.0040	0.0738	0.0654	0.1000	0.0040	40.0	12.1	73.8	65.4	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0900	0.0672	0.1000	0.0040	28.0	29.0	90.0	67.2	36-97	A
2,4-Dinitrotoluene	< 0.0040	0.0772	0.0804	0.1000	0.0040	38.0	4.1	77.2	80.4	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0718	0.0720	0.1000	0.0080	38.0	0.3	71.8	72.0	41-116	
4-Nitrophenol	< 0.0080	0.0336	0.0382	0.1000	0.0080	50.5	12.8	33.6	38.2	10-80	
Pentachlorophenol	< 0.0020	0.0462	0.0480	0.1000	0.0020	50.0	3.8	46.2	48.0	9-103	
Phenol	< 0.0020	0.0378	0.0362	0.1000	0.0020	42.0	4.3	37.8	36.2	12-89	
Pyrene	< 0.0040	0.1008	0.1128	0.1000	0.0040	31.0	11.2	100.6	112.6	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0840	0.0668	0.1000	0.0020	28.0	22.8	84.0	66.8	39-98	

(A) BS/BSD values are within acceptance range however, RPD greater than 20%.

 Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

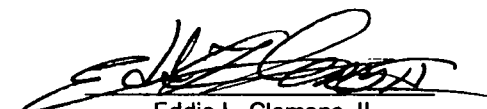
 Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

 B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

EPA 420.1 Phenolics, Total

Date Validated: Jul 21, 1998 10:54

Analyst: IF

Date Analyzed: Jul 20, 1998 15:00

Matrix: Liquid

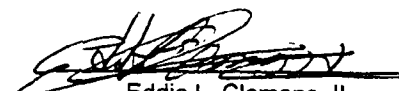
BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike	Limit	Blank Spike	Recovery	
	mg/L	mg/L	Amount	mg/L	Recovery	Range	
			mg/L		%	%	
Phenolics, Total	< 0.100	0.496	0.500	0.100	99.2	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager



Certificate Of Quality Control for Batch : 18A12C22

EPA 420.1 Phenolics, Total

Date Validated: Jul 21, 1998 10:54

Analyst: IF

Date Analyzed: Jul 20, 1998 15:25

Matrix: Liquid

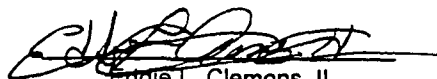
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 182729- 003	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Parameter						
Phenolics, Total	< 0.100	< 0.100	0.100	N.C	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemons, II
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

XENCO COC#: 1-82729

Project ID: 710016-1-0-0
Project Manager: J. Mosley/T. Nix
Project Location: Lovington, NM

Project Name: TNMPL

Date Received in Lab: Jul 18, 1998 09:50 by AS

XENCO contact : Carlos Castro/Eddie Clemons

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 Effluent Frac Tank	182729-001	BTEX	SW-846	ppm	5 days	Jul 17, 1998 07:30		Jul 21, 1998 by RL	Jul 21, 1998 18:21 by RL
2		Phenolics	EPA 420.1	mg/L	5 days	Jul 17, 1998 07:30		Jul 20, 1998 by IF	Jul 20, 1998 15:15 by IF
3		PAHs	SW846-8270	mg/L	5 days	Jul 17, 1998 07:30		Jul 20, 1998 by SS	Jul 21, 1998 18:45 by LC
4 Effluent Air Strpr.	182729-002	BTEX	SW-846	ppm	5 days	Jul 17, 1998 07:35		Jul 21, 1998 by RL	Jul 21, 1998 18:52 by RL
5		PAHs	SW846-8270	mg/L	5 days	Jul 17, 1998 07:35		Jul 20, 1998 by SS	Jul 20, 1998 22:44 by LC
6 Effluent Carbon	182729-003	BTEX	SW-846	ppm	5 days	Jul 17, 1998 07:40		Jul 22, 1998 by RL	Jul 22, 1998 22:11 by RL
7		Phenolics	EPA 420.1	mg/L	5 days	Jul 17, 1998 07:40		Jul 20, 1998 by IF	Jul 20, 1998 15:20 by IF
8		PAHs	SW846-8270	mg/L	5 days	Jul 17, 1998 07:40		Jul 20, 1998 by SS	Jul 21, 1998 17:05 by LC
9 Effluent Zeolite	182729-004	BTEX	SW-846	ppm	5 days	Jul 17, 1998 07:45		Jul 22, 1998 by RL	Jul 22, 1998 22:45 by RL
10		PAHs	SW846-8270	mg/L	5 days	Jul 17, 1998 07:45		Jul 20, 1998 by SS	Jul 21, 1998 17:55 by LC

ANALYTICAL REPORT 1-83217

for

K.E.I. Consultants, Inc.

Project Manager: T.Nix/J.Mosley

Project Name: Lovington

Project Id: 710016-1-0

September 2, 1998



HOUSTON - DALLAS - SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

September 2, 1998

Project Manager: T.Nix/J.Mosley
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-83217**
Project Name: Lovington
Project ID: 710016-1-0
Project Address: Lovington, NM

Dear T.Nix/J.Mosley:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-83217. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

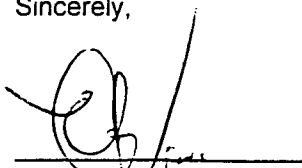
All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-83217 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,



Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

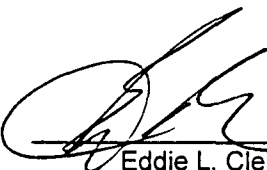
Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

K.E.I. Consultants, Inc.**Project Name: Lovington****Project ID: 710016-1-0****Project Manager: T.Nix/J.Mosley****Project Location: Lovington, NM****Date Received in Lab : Aug 20, 1998 09:30****Date Report Faxed: Sep 2, 1998****XENCO contact : Carlos Castro/Eddie Clemons**

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	183217 001 Effluent Carbon		183217 002 Effluent Zeolite		183217 003 After Air Stripper		183217 004 After Frac Tank #69	
		Liquid 08/19/98 07:45		Liquid 08/19/98 07:55		Liquid 08/19/98 08:10		Liquid 08/19/98 08:20	
BTEX EPA 8021B	Analyzed: Units:	08/24/98 ppm	R.L.	08/24/98 ppm	R.L.	08/24/98 ppm	R.L.	08/24/98 ppm	R.L.
Benzene		< 0.004 (0.004)		10.10 (0.05)		0.042 (0.004)		9.4 (0.1)	
Toluene		< 0.004 (0.004)		8.10 (0.05)		0.090 (0.004)		8.3 (0.1)	
Ethylbenzene		< 0.004 (0.004)		0.52 (0.05)		0.004 (0.004)		0.5 (0.1)	
m,p-Xylenes		< 0.008 (0.008)		1.52 (0.10)		0.012 (0.008)		0.9 (0.2)	
o-Xylene		< 0.004 (0.004)		0.78 (0.05)		0.009 (0.004)		0.5 (0.1)	
Total BTEX		N.D.		21.02		0.157		19.6	
PAHs by GC-MS (610 List) EPA 8270	Analyzed: Units:	08/27/98 mg/L	R.L.	08/27/98 mg/L	R.L.	08/28/98 mg/L	R.L.	08/28/98 mg/L	R.L.
Acenaphthene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Acenaphthylene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Anthracene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Benz(a)anthracene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Benzo(a)pyrene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Benzo(b)fluoranthene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Benzo(g,h,i)perylene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Benzo(k)fluoranthene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Chrysene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Dibenz(a,h)anthracene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Fluoranthene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
Fluorene		< 0.001 (0.001)		< 0.01 (0.01)		0.002 (0.001)		0.01 (0.01)	
Indeno(1,2,3-cd)pyrene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
2-Methylnaphthalene		< 0.001 (0.001)		0.10 (0.01)		0.021 (0.001)		0.20 (0.01)	
1-Methylnaphthalene		< 0.001 (0.001)		0.07 (0.01)		0.019 (0.001)		0.13 (0.01)	
Naphthalene		< 0.001 (0.001)		0.19 (0.01)		0.045 (0.001)		0.24 (0.01)	
Phenanthrene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		0.01 (0.01)	
Pyrene		< 0.001 (0.001)		< 0.01 (0.01)		< 0.001 (0.001)		< 0.01 (0.01)	
bis(2-Ethylhexyl) phthalate		< 0.010 (0.010)		< 0.10 (0.10)		< 0.010 (0.010)		< 0.10 (0.10)	
Phenolics, Total EPA 420.1	Analyzed: Units:	08/24/98 mg/L	R.L.						
Phenolics, Total		< 0.05 (0.05)							

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.



Eddie L. Clemons, II
QA/QC Manager

Certificate Of Quality Control for Batch : 18A25C91
SW- 846 5030/8021B BTX
Date Validated: Aug 25, 1998 10:10

Analyst: HL

Date Analyzed: Aug 24, 1998 12:27

Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Detection Limit		QC	QC	QC	Blank Spike Recovery	
	ppm	ppm	ppm	ppm	ppm		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Blank Spike Recovery Range %	
Benzene	< 0.0010	0.1080	0.1030	0.1000	0.0010	20.0	4.7	107.8	102.8	65-135	
Toluene	< 0.0010	0.1010	0.0991	0.1000	0.0010	20.0	1.9	100.7	99.1	65-135	
Ethylbenzene	< 0.0010	0.0995	0.0977	0.1000	0.0010	20.0	1.8	99.5	97.7	65-135	
m,p-Xylenes	< 0.0020	0.2060	0.2040	0.2000	0.0020	20.0	1.0	102.8	101.8	65-135	
o-Xylene	< 0.0010	0.1020	0.1010	0.1000	0.0010	20.0	1.0	101.8	100.8	65-135	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$


 Blank Spike Recovery [G] = $100 \times (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

 B.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

**Certificate of Quality Control for Batch: 18A12C79****EPA 420.1 Phenolics, Total**

Date Validated: Aug 25, 1998 09:23

Analyst: IF

Date Analyzed: Aug 24, 1998 16:00

Matrix: Liquid

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result mg/L	Blank Spike Result mg/L	Blank Spike Amount mg/L	Detection Limit mg/L	QC	LIMITS	
					Blank Spike Recovery %	Recovery Range %	
Phenolics, Total	< 0.050	0.478	0.500	0.050	95.6	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Eddie L. Clemons, II
QA/QC Manager

EPA 420.1 Phenolics, Total

Date Validated: Aug 25, 1998 09:23

Analyst: IF

Date Analyzed: Aug 24, 1998 16:20

Matrix: Liquid

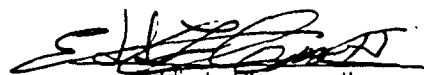
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 183217- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit mg/L	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Qualifier
	mg/L	mg/L				
Parameter						
Phenolics, Total	< 0.050	< 0.050	0.050	N.C	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemons, II
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: Lovington

XENCO COC#: 1-83217

Date Received in Lab: Aug 20, 1998 09:30 by DH

XENCO contact : Carlos Castro/Karen Olson

Project ID: 710016-1-0

Project Manager: T.Nix/J.Mosley

Project Location: Lovington, NM

Date and Time

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	Effluent Carbon	183217-001	BTEX	SW-846	ppm	10 days	Aug 19, 1998 07:45		Aug 24, 1998 by HL	Aug 24, 1998 18:20 by HL
2			PAHs	SW846-8270	mg/L	10 days	Aug 19, 1998 07:45		Aug 21, 1998 by SS	Aug 27, 1998 22:14 by LC
3			Phenolics	EPA 420.1	mg/L	10 days	Aug 19, 1998 07:45		Aug 24, 1998 by IF	Aug 24, 1998 16:20 by IF
4	Effluent Zeolite	183217-002	BTEX	SW-846	ppm	10 days	Aug 19, 1998 07:55		Aug 24, 1998 by HL	Aug 24, 1998 19:50 by HL
5			PAHs	SW846-8270	mg/L	10 days	Aug 19, 1998 07:55		Aug 21, 1998 by SS	Aug 27, 1998 23:02 by LC
6	After the Air Stripper	183217-003	BTEX	SW-846	ppm	10 days	Aug 19, 1998 08:10		Aug 24, 1998 by HL	Aug 24, 1998 20:06 by HL
7			PAHs	SW846-8270	mg/L	10 days	Aug 19, 1998 08:10		Aug 21, 1998 by SS	Aug 28, 1998 02:06 by LC
8	After Frac Tank # 69	183217-004	BTEX	SW-846	ppm	10 days	Aug 19, 1998 08:20		Aug 24, 1998 by HL	Aug 24, 1998 19:24 by HL
9			PAHs	SW846-8270	mg/L	10 days	Aug 19, 1998 08:20		Aug 21, 1998 by SS	Aug 28, 1998 00:34 by LC

SIZE: 4oz (4), 8oz (8), 32oz (32), 40ml VOA (V), 1L (1), 500ml (.5), Tedlar Bag (B), Wipe (W), Other _____ **TYPE** Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O)

ANALYTICAL REPORT 1-83809

for

K.E.I. Consultants, Inc.

Project Manager: T. Nix, J. Mosley

Project Name: Geovac 710016-1-0

Project Id: 710016-1-0

October 7, 1998



HOUSTON • DALLAS • SAN ANTONIO

11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
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(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

October 7, 1998

Project Manager: T. Nix, J. Mosley
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-83809**
Project Name: Geovac 710016-1-0
Project ID: 710016-1-0
Project Address: Lovington, NM.

Dear T. Nix, J. Mosley:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-83809. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.

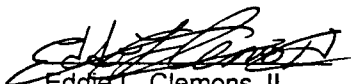
All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-83809 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,


Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY!

K.E.I. Consultants, Inc.

Project Name: Geovac 710016-1-0

Project ID: 710016-1-0

Project Manager: T. Nix, J. Mosley

Project Location: Lovington, NM.

Date Received in Lab : Sep 29, 1998 11:10


Date Report Faxed: Oct 7, 1998

XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	Lab ID:	183809 001	183809 002	183809 003	183809 004
	Field ID:	Frac Tank - 69	Air Stripper	Zeolite Vessel	Carbon Vessel
	Depth:				
	Matrix:				
	Sampled:	Liquid	Liquid	Liquid	Liquid
		09/28/98 08:15	09/28/98 08:20	09/28/98 08:25	09/28/98 08:30
BTEX	Analyzed:	09/30/98	09/30/98	09/30/98	09/30/98
EPA 8021B	Units:	R.L.	R.L.	R.L.	R.L.
		ppm	ppm	ppm	ppm
Benzene		2.12 (0.02)	< 0.004 (0.004)	2.28 (0.02)	< 0.004 (0.004)
Toluene		2.74 (0.02)	< 0.004 (0.004)	3.06 (0.02)	< 0.004 (0.004)
Ethylbenzene		0.39 (0.02)	< 0.004 (0.004)	0.31 (0.02)	< 0.004 (0.004)
m,p-Xylenes		1.35 (0.04)	< 0.008 (0.008)	1.61 (0.04)	< 0.008 (0.008)
o-Xylene		0.68 (0.02)	< 0.004 (0.004)	0.86 (0.02)	< 0.004 (0.004)
Total BTEX		7.280	N.D.	8.120	N.D.
PAHs by GC-MS (610 List)	Analyzed:	10/01/98	10/01/98	10/02/98	10/01/98
EPA 8270	Units:	R.L.	R.L.	R.L.	R.L.
		mg/L	mg/L	mg/L	mg/L
Acenaphthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Acenaphthylene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Anthracene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Benz(a)anthracene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Benzo(a)pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Benzo(b)fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Benzo(g,h,i)perylene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Benzo(k)fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Chrysene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Dibenz(a,h)anthracene		0.02 (0.02)	0.002 (0.002)	0.02 (0.02)	0.002 (0.002)
Fluoranthene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Fluorene		< 0.02 (0.02)	0.007 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Indeno(1,2,3-cd)pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
2-Methylnaphthalene		0.21 (0.02)	0.040 (0.002)	0.17 (0.02)	< 0.002 (0.002)
1-Methylnaphthalene		0.11 (0.02)	0.027 (0.002)	0.09 (0.02)	< 0.002 (0.002)
Naphthalene		0.21 (0.02)	0.032 (0.002)	0.22 (0.02)	< 0.002 (0.002)
Phenanthrene		< 0.02 (0.02)	0.009 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
Pyrene		< 0.02 (0.02)	< 0.002 (0.002)	< 0.02 (0.02)	< 0.002 (0.002)
bis(2-Ethylhexyl) phthalate		< 0.20 (0.20)	< 0.020 (0.020)	< 0.20 (0.20)	< 0.020 (0.020)
Phenolics, Total	Analyzed:				10/05/98
EPA 420.1	Units:				R.L.
					mg/L
Phenolics, Total					< 0.05 (0.05)

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..

The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Eddie L. Clemons, II
QA/QC Manager

Certificate Of Quality Control for Batch : 18A02C67

SW846-8270 PAHs by GC-MS

Date Validated: Oct 5, 1998 13:00

Analyst: LC

Date Analyzed: Sep 30, 1998 23:49

Matrix: Liquid

Parameter	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Recovery Range %	
Acenaphthene	< 0.0020	0.0487	0.0497	0.0500	0.0020	31.0	2.0	97.4	99.4	46-118	
4-Chloro-3-methylphenol	< 0.0020	0.0509	0.0494	0.0500	0.0020	42.0	3.0	101.8	98.8	23-97	
2-Chlorophenol	< 0.0020	0.0440	0.0459	0.0500	0.0020	40.0	4.2	88.0	91.8	27-123	
1,4-Dichlorobenzene	< 0.0020	0.0422	0.0478	0.0500	0.0020	28.0	12.4	84.4	95.6	36-97	
2,4-Dinitrotoluene	< 0.0020	0.0498	0.0493	0.0500	0.0020	38.0	1.0	99.6	98.6	24-96	
N-Nitrosodi-n-propylamine	< 0.0040	0.0511	0.0534	0.0500	0.0040	38.0	4.4	102.2	106.8	41-116	
4-Nitrophenol	< 0.0040	0.0206	0.0153	0.0500	0.0040	50.5	29.5	41.2	30.6	10-80	
Pentachlorophenol	< 0.0010	0.0469	0.0393	0.0500	0.0010	50.0	17.6	93.8	78.6	9-103	
Phenol	< 0.0010	0.0207	0.0197	0.0500	0.0010	42.0	5.0	41.4	39.4	12-89	
Pyrene	< 0.0020	0.0613	0.0617	0.0500	0.0020	31.0	0.7	122.6	123.4	26-127	
1,2,4-Trichlorobenzene	< 0.0010	0.0450	0.0481	0.0500	0.0010	28.0	6.7	90.0	96.2	39-98	

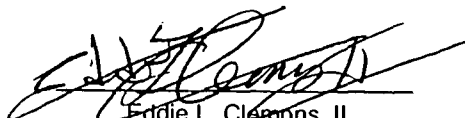
 $\text{Spike Relative Difference [F]} = 200 \cdot (\text{B}-\text{C}) / (\text{B}+\text{C})$
 $\text{Blank Spike Recovery [G]} = 100 \cdot (\text{B}-\text{A}) / [\text{D}]$

B.S.D. = Blank Spike Duplicate

 $\text{B.S.D. Recovery [H]} = 100 \cdot (\text{C}-\text{A}) / [\text{D}]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemmons, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A25D42
SW- 846 5030/8021B BTEX

Date Validated: Oct 1, 1998 16:00

Date Analyzed: Sep 30, 1998 10:23

Analyst: HL

Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank	[F]	[G]	[H]	[I]	[J]
	Blank	Blank Spike	Blank Spike	Blank	Detection	Limit	QC	QC	QC	Blank Spike	Qualifier
	Result	Result	Duplicate	Spike	Limit	Relative	Spike Relative	Blank Spike	B.S.D.	Recovery	
	ppm	ppm	Result	Amount	ppm	Difference	Difference	Recovery	Recovery	Range	
			ppm	ppm		%	%	%	%	%	
Benzene	< 0.0010	0.1060	0.1060	0.1000	0.0010	20.0	0.0	105.9	105.9	65-135	
Toluene	< 0.0010	0.1060	0.1060	0.1000	0.0010	20.0	0.0	105.9	105.9	65-135	
Ethylbenzene	< 0.0010	0.1060	0.1050	0.1000	0.0010	20.0	0.9	105.9	104.9	65-135	
m,p-Xylenes	< 0.0020	0.2150	0.2140	0.2000	0.0020	20.0	0.5	107.5	107.0	65-135	
o-Xylene	< 0.0010	0.1090	0.1080	0.1000	0.0010	20.0	0.9	108.9	107.9	65-135	

 Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

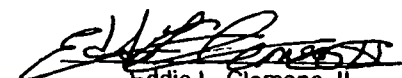
 Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

 B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

EPA 420.1 Phenolics, Total

Date Validated: Oct 6, 1998 08:30

Analyst: IF

Date Analyzed: Oct 5, 1998 14:00

Matrix: Liquid

BLANK SPIKE ANALYSIS

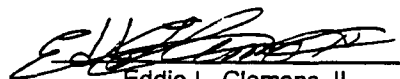
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Phenolics, Total	< 0.050	0.461	0.500	0.050	92.2	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemons, II
QA/QC Manager

EPA 420.1 Phenolics, Total

Date Validated: Oct 6, 1998 08:30

Analyst: IF

Date Analyzed: Oct 5, 1998 14:15

Matrix: Liquid


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 183809- 004	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC	[E] LIMITS	[F] Qualifier
	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	
Phenolics, Total	< 0.050	< 0.050	0.050	N.C	25.0	

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Eddie L. Clemons, II
QA/QC Manager

ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

XENCO COC#: 1-83809

Project ID: 710016-1-0

Project Name: Geovac 710016-1-0

Date Received in Lab: Sep 29, 1998 11:10 by JO

Project Manager: T. Nix, J. Mosley

Project Location: Lovington, NM.

XENCO contact : Carlos Castro/Karen Olson

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 Frac Tank - 69	183809-001	BTEX	SW-846	ppm	10 days	Sep 28, 1998 08:15		Sep 30, 1998 by HL	Sep 30, 1998 16:17 by HL
2		PAHs	SW846-8270	mg/L	10 days	Sep 28, 1998 08:15		Sep 30, 1998 by SS	Oct 1, 1998 23:55 by LC
3 Air Stripper	183809-002	BTEX	SW-846	ppm	10 days	Sep 28, 1998 08:20		Sep 30, 1998 by HL	Sep 30, 1998 19:42 by HL
4		PAHs	SW846-8270	mg/L	10 days	Sep 28, 1998 08:20		Sep 30, 1998 by SS	Oct 1, 1998 03:35 by LC
5 Zeolite Vessel	183809-003	BTEX	SW-846	ppm	10 days	Sep 28, 1998 08:25		Sep 30, 1998 by HL	Sep 30, 1998 16:54 by HL
6		PAHs	SW846-8270	mg/L	10 days	Sep 28, 1998 08:25		Sep 30, 1998 by SS	Oct 2, 1998 00:42 by LC
7 Carbon Vessel	183809-004	BTEX	SW-846	ppm	10 days	Sep 28, 1998 08:30		Sep 30, 1998 by HL	Sep 30, 1998 19:23 by HL
8		PAHs	SW846-8270	mg/L	10 days	Sep 28, 1998 08:30		Sep 30, 1998 by SS	Oct 1, 1998 06:06 by LC
9		Phenolics	EPA 420.1	mg/L	10 days	Sep 28, 1998 08:30		Oct 5, 1998 by IF	Oct 5, 1998 14:15 by IF



QA/QC PROCEDURES

GROUND WATER SAMPLING

Monitoring, recovery and injection wells were developed and purged with a clean PVC bailer. The bailer was cleaned prior to each use with Liqui-Nox detergent and rinsed with distilled water. Wells with sufficient recharge were purged by removing a minimum of 3 well volumes. Wells that did not recharge sufficiently were purged until no additional ground water could be obtained.

After purging the wells, ground water samples were collected with a disposable Teflon sampler and polyethylene line by personnel wearing clean, disposable gloves. Ground water sample containers were filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers were filled first and PAH containers second).

Ground water samples collected for BTEX analysis were placed in 40 ml glass VOA vials equipped with Teflon-lined caps. The containers provided were pre-preserved with HCl by the analytical laboratory. The vials were filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles.

Ground water samples collected for PAH analyses were filled to capacity in sterile, 1 liter glass containers equipped with Teflon-lined caps. Ground water samples collected for metals analysis were filled to capacity in 1 liter plastic containers pre-preserved with HNO_3 and equipped with Teflon-lined caps. The containers were provided by the analytical laboratory.

The filled containers were labeled and placed on ice in an insulated cooler. The cooler was sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

The ground water samples were analyzed in accordance with the methods as follows:

- BTEX concentrations in accordance with EPA Method SW846-8021B
- Metals concentrations in accordance with EPA ICP Method 6010
- PAH concentrations in accordance with EPA Method 8270
- Mercury concentration in accordance with EPA Method 7470

LABORATORY PROTOCOL

The laboratory was responsible for proper QA/QC procedures. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

Appendix C

Pump out at Livingston

TEXACO NON-HAZARDOUS WASTE MANIFEST

	COMPANY NAME	FACILITY NAME	ADDRESS	PHONE NUMBER
GENERATOR	TNMPL Co.	Townsend TNM-97-04	PO Box 60028 San Angelo TX	1-915-949-9000
TRANSPORTER 1	Gandy Corp.	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Artesia Hwy Livingston N.M.	505-316-4945
TRANSPORTER 2		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
DISPOSAL SITE				

U.S. DOT DESCRIPTION (including Proper Shipping Name, Hazard Class, ID Number, and Packaging Group from DOT Table); If not DOT regulated, check here _____ and enter an accurate waste description in the space below (e.g. Crude Oil Production Tank Bottom Liquids)	CONTAINERS No. & Type	TOTAL QUANTITY	UNITS (WT. or VOL.)
RECOVERED H ₂ O - NON HAZARDOUS	Truck	240	BBL's

This is to certify that the above-named materials are properly classified, described, and packaged, and are in proper condition for transportation and disposal according to the applicable regulations of the Department of Transportation.

GENERATOR	NAME (Print)	SIGNATURE	DATE
TNMPL Co.	Bobby R. Blackwood	Bobby R. Blackwood	1-20-98
TRANSPORTER 1			
Gandy Corp.	Martin Leyva	Martin Leyva	1-20-98
TRANSPORTER 2			

DISPOSAL FACILITY OWNER OR OPERATOR CERTIFICATION OF RECEIPT				DISPOSAL SITE COMMENTS / EXCEPTIONS
FACILITY NAME	NAME (Print)	SIGNATURE	DATE	

ADDITIONAL INFORMATION
Non-Hazardous - Based on Analytical Results.

TEXACO NON-HAZARDOUS WASTE MANIFEST

	COMPANY NAME	FACILITY NAME	ADDRESS	PHONE NUMBER
GENERATOR	TNMP/LCO	TOWNSEND TNM 97-04	PO Box 60028 SAN ANGELO TX	1-915-949-9000
TRANSPORTER 1	BANDY CORP.	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	REFS: A.H. 1/1 LIVINGSTON N.A.	305-896-4948
TRANSPORTER 2		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
DISPOSAL SITE				

U.S. DOT DESCRIPTION (Including Proper Shipping Name, Hazard Class, ID Number, and Packaging Group from DOT Table); If not DOT regulated, check here _____ and enter an accurate waste description in the space below (e.g. Crude Oil Production Tank Bottom Liquids)	CONTAINERS No. & Type	TOTAL QUANTITY	UNITS (WT. or VOL.)
RECOVERED H ₂ O - NON HAZARDOUS	TRUCK	240	BARLS
710016			

This is to certify that the above-named materials are properly classified, described, and packaged, and are in proper condition for transportation and disposal according to the applicable regulations of the Department of Transportation.

GENERATOR	NAME (Print)	SIGNATURE	DATE
	Bobby R. Blackwood	Bobby R. Blackwood	1-29-78
TRANSPORTER 1	Alton L. Bishop	Alton L. Bishop	1-29-78
TRANSPORTER 2			

DISPOSAL FACILITY OWNER OR OPERATOR CERTIFICATION OF RECEIPT				DISPOSAL SITE COMMENTS / EXCEPTIONS
FACILITY NAME	NAME (Print)	SIGNATURE	DATE	


<p>ADDITIONAL INFORMATION</p> <p>NON HAZARDOUS - BASED ON ANALYTICAL RESULTS</p>
--

TEXACO NON-HAZARDOUS WASTE MANIFEST

	COMPANY NAME	FACILITY NAME	ADDRESS	PHONE NUMBER
GENERATOR	TNMPL		MIDLAND, TEXAS	505-396-3341
TRANSPORTER 1	GANDY	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	109 E. BROADWAY BOX 827 TATUM, ADA 88267	505-396-4948
TRANSPORTER 2		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
DISPOSAL SITE				

U.S. DOT DESCRIPTION (including Proper Shipping Name, Hazard Class, ID Number, and Packaging Group from DOT Table; if not DOT regulated, check here and enter an accurate waste description in the space below (eg. Crude Oil Production Tank Bottom Liquids)	CONTAINER No. & Type	TOTAL QUANTITY	UNITS (GAL. or VOL.)
Recovered H ₂ O NON-HAZARDOUS	OIL/WATER SEPARATOR and SKID	35	BBLs
REF JOB # 710016-1-0			

This is to certify that the above-named materials are properly classified, described, and packaged, and are in proper condition for transportation and disposal according to the applicable regulations of the Department of Transportation.

GENERATOR	NAME(Print)	SIGNATURE	DATE
TN MPL	Justin Taylor		10/13/98
TRANSPORTER 1			
GARDY	K. Smith		10-13-98
TRANSPORTER 2			

DISPOSAL FACILITY OWNER OR OPERATOR CERTIFICATION OF RECEIPT				DISPOSAL SITE COMMENTS /EXCEPTIONS
FACILITY NAME	NAME (PRINT)	SIGNATURE	DATE	

ADDITIONAL INFORMATION

NON-HAZARDOUS

PIPE LINE TEST REPORT

Date of Test 8-25-98

Location TOWNSEND STATION TNM 97-04

County LEA

Inventory Map Number _____

*Section of Line Tested Between 1000 gal poly tk. & 500 gal tk.

Pipe Size 2" Poly

Total Feet Tested 130'

Test Medium ☒ Oil ☐ Water (Circle One)

Test Pressure 50 PSI Length of Test 1 Hr.

Number of Leaks During Test 0 (Internal External)

Oil Lost While Testing 0 Bbls.

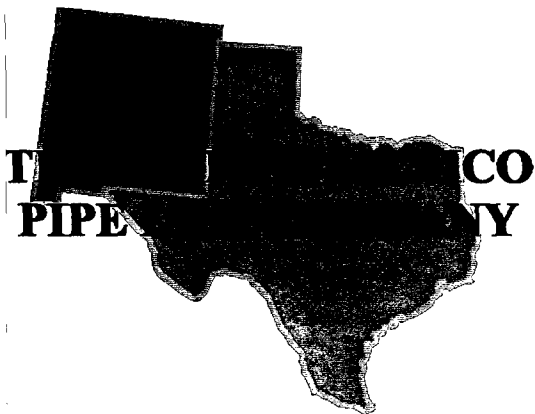
Pipe Replaced Because of Test 0

Remarks _____

*Note: If section of line is difficult to describe, a brief sketch will be required.

Signed LA. Blackwood

LA. Conley



RECEIVED

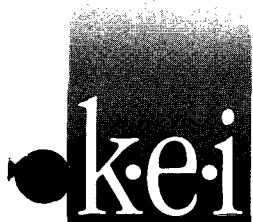
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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

GROUND WATER MONITORING REPORT

**TNM-97-04
LOVINGTON, NEW MEXICO**

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GROUND WATER MONITORING REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

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TABLE OF CONTENTS

INTRODUCTION	1
---------------------	----------

PURPOSE AND SCOPE	1
--------------------------	----------

FIELD AND REPORTING PROTOCOLS	1
--------------------------------------	----------

- GROUND WATER MONITORING AND SAMPLING
- LABORATORY RESULTS
- GROUND WATER GRADIENT
- PSH MONITORING

TABLES

GENERAL NOTES

TABLE I - SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH

TABLE II - SUMMARY OF GROUND WATER RESULTS - PAH

TABLE III - SUMMARY OF GROUND WATER MONITORING

DATED TABS

FIG. 1 - GROUND WATER CONTOURS/CONCENTRATIONS

FIG. 2 - PSH THICKNESS MAP

FIG. 3 - MONTHLY AND CUMULATIVE PSH RECOVERY (Beginning 98 QTR 1)

CERTIFIED LABORATORY REPORTS

CHAIN-OF-CUSTODY DOCUMENTATION

INTRODUCTION

This binder presents results of ground water monitoring events conducted for Texas - New Mexico Pipe Line Company (TNMPL) site TNM-97-04 located two miles west of Lovington, New Mexico from the second quarter of 1997 to present. Ground water monitoring is conducted to assess the concentrations and extent of petroleum hydrocarbon constituents in ground water. The monitoring events consist of some or all of the following:

- measuring static water levels in the monitoring wells
- checking for the presence of phase-separate hydrocarbons (PSH)
- purging and sampling each well exhibiting sufficient recharge

PURPOSE AND SCOPE

This binder presents results of ground water events conducted for TNMPL site TNM-97-04. The scope of this binder includes all sampling events conducted at this site since the second quarter of 1997, and historical ground water levels and PSH thicknesses. Site details are presented on FIG. 1.

FIELD AND REPORTING PROTOCOLS

GROUND WATER MONITORING AND SAMPLING

During sampling events, monitoring wells that do not contain PSH are purged of approximately three well volumes of water. Purging equipment is cleaned prior to each use with Liqui-Nox detergent and rinsed with water. After purging the wells, ground water sample containers are filled in the order of decreasing volatility (i.e., benzene, toluene, ethylbenzene, and xylenes (BTEX) containers are filled first and other containers which may be required are filled second).

Ground water samples collected for BTEX analyses are placed in sterile, 40 ml glass VOA vials equipped with Teflon-lined caps. Ground water samples collected for polycyclic aromatic hydrocarbon (PAH) analyses are placed in sterile one liter glass containers equipped with Teflon-lined caps. Ground water samples collected for ICP heavy metals analysis are placed in 500 ml containers preserved with nitric acid equipped with Teflon-lined caps. The containers are typically provided by the analytical laboratory. The vials are filled to a positive meniscus, sealed, and visually checked for the presence of air bubbles.

The filled containers are labeled and placed on ice in an insulated cooler. The cooler is sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation is maintained throughout the sampling process.

Purged water collected during each event is stored in 500 bbl tank on-site pending disposal.

LABORATORY RESULTS

Laboratory results for ground water samples obtained during each event are delivered to a qualified environmental analytical laboratory for determination of BTEX concentrations by EPA Method SW846-8020 and polycyclic aromatic hydrocarbon (PAH) concentrations by EPA Method 8100 or 8270. Ground water samples collected during the second quarter of 1997 were submitted for TPH concentrations by EPA Method 418.1.

Laboratory results for each event are summarized in TABLES I and II and BTEX concentrations are graphically presented on FIG. 1. Copies of certified laboratory reports and chain-of-custody documentation are also attached. The figures, the certified laboratory reports, and chain-of-custody documentation for each event are presented behind the corresponding dated tabs.

GROUND WATER GRADIENT

Ground water elevation contours generated from the water level measurements collected from each event are presented on FIG. 1. Historical ground water measurements are summarized in TABLE III. These items are presented behind the corresponding dated tabs.

PSH MONITORING

PSH thickness is gauged and removed regularly. The recovered PSH is placed back into the pipeline. PSH thickness across the site for each gauging event is graphically presented on FIG. 2. Monthly and cumulative PSH recovery is graphically presented on FIG. 3.

TABLES

1

GENERAL NOTES

- ND - Indicates constituent was not detected above the method detection limit.
- PSH - Phase-separate hydrocarbons.
- - Indicates the constituent was not analyzed (TABLE I) or PSH was not detected and a corrected ground water elevation was not required (TABLE III).
- SHEEN - Indicates a visible phase separation with a thickness less than 0.01 feet.

Depth to water is referenced from the top of PVC elevation.

Ground water elevations in monitoring wells containing PSH have been corrected for PSH density. (Correction Factor = 0.85 prior to December of 1997, Correction Factor = 0.814 as of December of 1997)

Method detection/reporting limits:

- BTEX - 0.001 to 0.008 mg/l
- TPH - 0.001 to 1 mg/l
- PAH - 0.002 mg/l

Laboratory test methods:

- BTEX - EPA Method SW846-8020, 5030
- TPH - EPA Method 418.1
- PAH - EPA Method 8100 or 8270

TABLE I

SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-1	06/18/97	ND	ND	ND	ND	ND	ND
MW-1	09/10/97	ND	ND	ND	ND	ND	---
MW-1	12/18/97	ND	ND	ND	ND	ND	---
MW-1	03/05/98	ND	ND	ND	ND	ND	---
MW-2	06/18/97	0.044	0.014	0.004	0.008	0.070	2
MW-2	09/10/97	18.25	9.70	0.61	3.10	31.66	---
MW-4	06/18/97	0.155	0.106	0.007	0.023	0.291	2
MW-6	09/10/97	0.003	ND	ND	ND	0.003	---
MW-6	12/18/97	0.363	0.241	0.015	0.092	0.711	---
MW-6	03/05/98	7.5	1.8	0.2	0.5	10.0	---
MW-7	09/10/97	0.002	0.001	ND	ND	0.003	---
MW-7	12/18/97	ND	ND	ND	ND	ND	---
MW-7	03/05/98	ND	ND	ND	ND	ND	---
MW-8	09/10/97	0.012	ND	ND	ND	0.012	---
MW-8	12/18/97	ND	ND	ND	ND	ND	---
MW-8	03/05/98	0.025	ND	ND	ND	0.025	---
MW-9	09/10/97	0.055	0.014	ND	ND	0.069	---
MW-10	12/18/97	ND	ND	ND	ND	ND	---
MW-10	03/05/98	0.003	ND	ND	ND	0.003	---
MW-11	12/18/97	ND	ND	0.003	ND	0.003	---
MW-11	03/05/98	0.002	ND	ND	ND	0.002	---
MW-12	12/18/97	ND	ND	ND	ND	ND	---
MW-12	03/05/98	0.003	ND	ND	ND	0.003	---
LOV-1 (crude)	11/07/97	---	---	---	---	---	9.3

TABLE II

**SUMMARY OF GROUND WATER RESULTS - PAH
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-6	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED:	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	03/05/98	03/05/98	03/05/98	03/05/98	03/05/98	03/05/98	03/05/98
PARAMETER:	CONCENTRATION (mg/l)															
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	0.006	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.616	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.013	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	0.021	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.070	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	0.027	0.094	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	---	0.122	---	---	---	---	---	---	---	---
Naphthalene	ND	0.071	ND	ND	ND	ND	ND	0.028	0.237	ND	0.037	ND	ND	ND	ND	0.006
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	0.003	0.054	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---
Benzo(j)fluoranthene	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---
7H-Dibenzo(c,g)carbazole	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---
Dibenzo(a,h)pyrene	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---
Dibenzo(a,i)pyrene	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---

TABLE III

**MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.19	53.15	3921.04	---	---
07/29/97	3,974.19	53.05	3921.14	---	---
09/10/97	3,974.19	52.99	3921.20	---	---
10/22/97	3,974.19	52.98	3921.21	---	---
10/29/97	3,974.19	52.98	3921.21	---	---
11/04/97	3,974.19	52.97	3921.22	---	---
11/11/97	3,974.19	52.97	3921.22	---	---
12/04/97	3,974.19	52.97	3921.22	---	---
12/10/97	3,974.19	52.99	3921.20	---	---
12/18/97	3,974.18	52.97	3921.21	---	---
12/23/97	3,974.18	52.96	3921.22	---	---
12/31/97	3,974.18	52.96	3921.22	---	---
01/06/98	3,974.18	52.96	3921.22	---	---
01/06/98	3,974.18	52.96	3921.22	---	---
01/07/98	3,974.18	52.97	3921.21	---	---
01/15/98	3,974.18	52.96	3921.22	---	---
01/23/98	3,974.18	52.98	3921.20	---	---
01/27/98	3,974.18	52.97	3921.21	---	---
02/03/98	3,974.18	52.95	3921.23	---	---
02/11/98	3,974.18	52.97	3921.21	---	---
02/17/98	3,974.18	52.95	3921.23	---	---
02/25/98	3,974.18	52.93	3921.25	---	---
03/05/98	3,974.18	52.91	3921.27	---	---
03/11/98	3,974.18	52.94	3921.24	---	---
03/16/98	3,974.18	52.93	3921.25	---	---
03/25/98	3,974.18	52.92	3921.26	---	---
03/31/98	3,974.18	52.90	3921.28	---	---
04/09/98	3,974.18	52.96	3921.22	---	---

TABLE III
(continued)

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.65	53.24	3921.41	---		---	---
07/29/97	3,974.65	53.14	3921.51	---		---	---
09/10/97	3,974.65	53.11	3921.54	---	53.11	3921.54	SHEEN
10/22/97	3,974.65	53.20	3921.45	3921.60	53.02	3921.63	0.18
10/29/97	3,974.65	53.24	3921.41	3921.60	53.02	3921.63	0.22
11/04/97	3,974.65	53.26	3921.39	3921.60	53.01	3921.64	0.25
11/11/97	3,974.65	53.30	3921.35	3921.61	53.00	3921.65	0.30
12/04/97	3,974.65	53.45	3921.20	3921.58	52.98	3921.67	0.47
12/10/97	3,974.65	53.47	3921.18	3921.60	52.95	3921.70	0.52
12/18/97	3,974.62	53.51	3921.11	3921.36	53.21	3921.41	0.30
12/23/97	3,974.62	53.52	3921.10	3921.59	52.92	3921.70	0.60
12/31/97	3,974.62	53.58	3921.04	3921.57	52.93	3921.69	0.65
01/06/98	3,974.62	53.58	3921.04	3921.61	52.89	3921.73	0.69
01/06/98	3,974.62	53.57	3921.05	3921.62	52.88	3921.74	0.69
01/06/98	3,974.62	53.60	3921.02	3921.59	52.90	3921.72	0.70
01/06/98	3,974.62	53.59	3921.03	3921.60	52.90	3921.72	0.69
01/06/98	3,974.62	53.61	3921.01	3921.59	52.90	3921.72	0.71
01/07/98	3,974.62	53.66	3920.96	3921.54	52.95	3921.67	0.71
01/08/98	3,974.62	53.65	3920.97	3921.58	52.90	3921.72	0.75
01/09/98	3,974.62	53.64	3920.98	3921.59	52.90	3921.72	0.74
01/10/98	3,974.62	53.70	3920.92	3921.53	52.95	3921.67	0.75
01/12/98	3,974.62	53.67	3920.95	3921.57	52.91	3921.71	0.76
01/15/98	3,974.62	53.68	3920.94	3921.57	52.91	3921.71	0.77
01/23/98	3,974.62	53.78	3920.84	3921.53	52.94	3921.68	0.84
01/27/98	3,974.62	53.80	3920.82	3921.52	52.94	3921.68	0.86
02/03/98	3,974.62	53.77	3920.85	3921.55	52.91	3921.71	0.86
02/11/98	3,974.62	53.88	3920.74	3921.53	52.91	3921.71	0.97
02/17/98	3,974.62	53.80	3920.82	3921.57	52.88	3921.74	0.92
02/25/98	3,974.62	53.78	3920.84	3921.59	52.86	3921.76	0.92
03/05/98	3,974.62	53.82	3920.80	3921.59	52.86	3921.76	0.96
03/11/98	3,974.62	53.87	3920.75	3921.58	52.86	3921.76	1.01
03/16/98	3,974.62	53.85	3920.77	3921.59	52.85	3921.77	1.00
03/25/98	3,974.62	53.93	3920.69	3921.61	52.81	3921.81	1.12
03/31/98	3,974.62	53.42	3921.20	3921.62	52.91	3921.71	0.51
04/09/98	3,974.62	53.79	3920.83	3921.46	53.02	3921.60	0.77

TABLE III
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.63	60.08	3914.55	3921.94	51.39	3923.24	8.69
06/23/97	3,974.63	60.08	3914.55	3921.96	51.36	3923.27	8.72
06/23/97	3,974.63	53.30	3921.33	3921.56	53.03	3921.60	0.27
06/23/97	3,974.63	53.78	3920.85	3921.71	52.77	3921.86	1.01
06/25/97	3,974.63	59.85	3914.78	3921.99	51.37	3923.26	8.48
06/25/97	3,974.63	55.50	3919.13	3921.72	52.45	3922.18	3.05
06/25/97	3,974.63	56.34	3918.29	3921.78	52.24	3922.39	4.10
06/25/97	3,974.63	53.29	3921.34	---		---	---
06/27/97	3,974.63	59.99	3914.64	3921.96	51.38	3923.25	8.61
06/27/97	3,974.63	56.68	3917.95	3921.60	52.39	3922.24	4.29
07/01/97	3,974.63	59.99	3914.64	3921.96	51.38	3923.25	8.61
07/03/97	3,974.63	60.04	3914.59	3921.98	51.35	3923.28	8.69
07/03/97	3,974.63	55.22	3919.41	3921.75	52.47	3922.16	2.75
07/29/97	3,974.63	60.03	3914.60	3921.96	51.37	3923.26	8.66
07/29/97	3,974.63	54.47	3920.16	3921.90	52.42	3922.21	2.05
09/10/97	3,974.63	59.81	3914.82	3921.96	51.41	3923.22	8.40
09/16/97	3,974.63	59.86	3914.77	3921.95	51.41	3923.22	8.45
09/23/97	3,974.63	59.84	3914.79	3921.96	51.40	3923.23	8.44
10/22/97	3,974.63	59.78	3914.85	3921.96	51.41	3923.22	8.37
10/29/97	3,974.63	59.75	3914.88	3921.96	51.42	3923.21	8.33
11/04/97	3,974.63	59.73	3914.90	3921.96	51.42	3923.21	8.31
11/11/97	3,974.63	59.70	3914.93	3921.97	51.42	3923.21	8.28
12/04/97	3,974.63	59.64	3914.99	3921.66	51.45	3923.18	8.19
12/10/97	3,974.63	59.56	3915.07	3921.68	51.44	3923.19	8.12
12/18/97	3,974.60	59.56	3915.04	3921.64	51.45	3923.15	8.11
12/23/97	3,974.60	59.52	3915.08	3921.66	51.44	3923.16	8.08
12/31/97	3,974.60	59.47	3915.13	3921.65	51.47	3923.13	8.00
01/06/98	3,974.60	59.48	3915.12	3921.67	51.44	3923.16	8.04
01/06/98	3,974.60	59.53	3915.07	3921.63	51.47	3923.13	8.06
01/06/98	3,974.60	59.45	3915.15	3921.61	51.52	3923.08	7.93
01/06/98	3,974.60	59.49	3915.11	3921.60	51.52	3923.08	7.97
01/06/98	3,974.60	59.48	3915.12	3921.60	51.52	3923.08	7.96
01/07/98	3,974.60	59.54	3915.06	3921.56	51.56	3923.04	7.98
01/08/98	3,974.60	59.44	3915.16	3921.58	51.56	3923.04	7.88
01/09/98	3,974.60	59.58	3915.02	3921.54	51.58	3923.02	8.00
01/10/98	3,974.60	59.35	3915.25	3921.54	51.63	3922.97	7.72

TABLE III
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
01/12/98	3,974.60	59.22	3915.38	3921.58	51.61	3922.99	7.61
01/15/98	3,974.60	59.18	3915.42	3921.57	51.63	3922.97	7.55
01/23/98	3,974.60	58.98	3915.62	3921.52	51.74	3922.86	7.24
01/27/98	3,974.60	58.89	3915.71	3921.53	51.74	3922.86	7.15
02/03/98	3,974.60	58.83	3915.77	3921.54	51.74	3922.86	7.09
02/11/98	3,974.60	58.67	3915.93	3921.53	51.80	3922.80	6.87
02/17/98	3,974.60	58.74	3915.86	3921.63	51.65	3922.95	7.09
02/25/98	3,974.60	58.85	3915.75	3921.65	51.60	3923.00	7.25
03/05/98	3,974.60	58.85	3915.75	3921.65	51.61	3922.99	7.24
03/11/98	3,974.60	58.87	3915.73	3921.64	51.61	3922.99	7.26
03/16/98	3,974.60	58.86	3915.74	3921.65	51.60	3923.00	7.26
03/25/98	3,974.60	58.87	3915.73	3921.67	51.58	3923.02	7.29
03/31/98	3,974.60	58.74	3915.86	3921.68	51.60	3923.00	7.14
04/09/98	3,974.60	59.13	3915.47	3921.06	52.27	3922.33	6.86

TABLE III
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
06/18/97	3,974.31	60.85	3913.46	3922.41	50.32	3923.99	10.53
06/23/97	3,974.31	58.09	3916.22	3922.08	51.20	3923.11	6.89
06/23/97	3,974.31	56.57	3917.74	3922.38	51.11	3923.20	5.46
06/23/97	3,974.31	59.18	3915.13	3921.32	51.90	3922.41	7.28
06/23/97	3,974.31	59.74	3914.57	3922.08	50.91	3923.40	8.83
06/23/97	3,974.31	54.91	3919.40	3921.88	51.99	3922.32	2.92
06/25/97	3,974.31	60.47	3913.84	3922.02	50.85	3923.46	9.62
06/25/97	3,974.31	58.47	3915.84	3921.99	51.23	3923.08	7.24
06/25/97	3,974.31	59.49	3914.82	3922.01	51.03	3923.28	8.46
06/25/97	3,974.31	53.42	3920.89	3921.94	52.19	3922.12	1.23
06/25/97	3,974.31	55.95	3918.36	3921.90	51.79	3922.52	4.16
06/25/97	3,974.31	58.50	3915.81	3922.02	51.20	3923.11	7.30
06/25/97	3,974.31	52.46	3921.85	3921.87	52.44	3921.87	0.02
06/25/97	3,974.31	51.81	3922.50	3922.50	51.81	3922.50	0.00
06/27/97	3,974.31	60.46	3913.85	3922.06	50.80	3923.51	9.66
06/27/97	3,974.31	57.47	3916.84	3922.00	51.40	3922.91	6.07
07/01/97	3,974.31	60.45	3913.86	3922.01	50.86	3923.45	9.59
07/01/97	3,974.31	56.40	3917.91	3921.94	51.66	3922.65	4.74
07/03/97	3,974.31	60.41	3913.90	3922.01	50.87	3923.44	9.54
07/03/97	3,974.31	57.53	3916.78	3921.98	51.41	3922.90	6.12
07/29/97	3,974.31	60.19	3914.12	3922.02	50.90	3923.41	9.29
07/29/97	3,974.31	57.69	3916.62	3920.97	52.57	3921.74	5.12
09/10/97	3,974.31	59.88	3914.43	3922.00	50.97	3923.34	8.91
09/16/97	3,974.31	59.85	3914.46	3922.00	50.98	3923.33	8.87
09/23/97	3,974.31	59.79	3914.52	3922.01	50.98	3923.33	8.81
10/22/97	3,974.31	59.60	3914.71	3922.01	51.01	3923.30	8.59
10/29/97	3,974.31	59.56	3914.75	3921.99	51.04	3923.27	8.52
11/04/97	3,974.31	59.54	3914.77	3922.00	51.04	3923.27	8.50
11/11/97	3,974.31	59.48	3914.83	3922.00	51.04	3923.27	8.44
12/04/97	3,974.31	59.38	3914.93	3921.69	51.08	3923.23	8.30
12/10/97	3,974.31	59.31	3915.00	3921.71	51.07	3923.24	8.24
12/18/97	3,974.28	59.28	3915.00	3921.69	51.07	3923.21	8.21
12/23/97	3,974.28	59.25	3915.03	3921.70	51.06	3923.22	8.19
12/31/97	3,974.28	59.23	3915.05	3921.67	51.10	3923.18	8.13

TABLE III
(continued)

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/31/97	3,974.28	59.23	3915.05	3921.67	51.10	3923.18	8.13
01/06/98	3,974.28	59.19	3915.09	3921.70	51.08	3923.20	8.11
01/06/98	3,974.28	59.21	3915.07	3921.69	51.08	3923.20	8.13
01/06/98	3,974.28	59.20	3915.08	3921.66	51.12	3923.16	8.08
01/06/98	3,974.28	59.19	3915.09	3921.66	51.13	3923.15	8.06
01/06/98	3,974.28	59.17	3915.11	3921.68	51.11	3923.17	8.06
01/07/98	3,974.28	59.23	3915.05	3921.62	51.17	3923.11	8.06
01/08/98	3,974.28	59.17	3915.11	3921.66	51.13	3923.15	8.04
01/09/98	3,974.28	59.14	3915.14	3921.57	51.25	3923.03	7.89
01/10/98	3,974.28	59.16	3915.12	3921.60	51.20	3923.08	7.96
01/12/98	3,974.28	59.06	3915.22	3921.65	51.17	3923.11	7.89
01/15/98	3,974.28	59.03	3915.25	3921.64	51.18	3923.10	7.85
01/23/98	3,974.28	58.90	3915.38	3921.60	51.26	3923.02	7.64
01/27/98	3,974.28	58.83	3915.45	3921.60	51.28	3923.00	7.55
02/03/98	3,974.28	58.74	3915.54	3921.62	51.28	3923.00	7.46
02/11/98	3,974.28	58.60	3915.68	3921.60	51.33	3922.95	7.27
02/17/98	3,974.28	58.59	3915.69	3921.69	51.23	3923.05	7.36
02/25/98	3,974.28	58.63	3915.65	3921.70	51.20	3923.08	7.43
03/05/98	3,974.28	58.61	3915.67	3921.70	51.21	3923.07	7.40
03/11/98	3,974.28	58.60	3915.68	3921.68	51.23	3923.05	7.37
03/16/98	3,974.28	58.58	3915.70	3921.70	51.21	3923.07	7.37
03/25/98	3,974.28	58.57	3915.71	3921.71	51.21	3923.07	7.36
03/31/98	3,974.28	58.52	3915.76	3921.72	51.20	3923.08	7.32
04/09/98	3,974.28	58.69	3915.59	3921.32	51.66	3922.62	7.03

TABLE III
(continued)

**MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.73	53.29	3921.44	---	---
10/22/97	3,974.73	53.30	3921.43	---	---
10/29/97	3,974.73	53.30	3921.43	---	---
11/04/97	3,974.73	53.29	3921.44	---	---
11/11/97	3,974.73	53.30	3921.43	---	---
12/04/97	3,974.73	53.26	3921.47	---	---
12/10/97	3,974.73	53.25	3921.48	---	---
12/18/97	3,974.72	53.30	3921.42	---	---
12/23/97	3,974.72	53.24	3921.48	---	---
12/31/97	3,974.72	53.23	3921.49	---	---
01/06/98	3,974.72	53.23	3921.49	---	---
01/06/98	3,974.72	53.23	3921.49	---	---
01/07/98	3,974.72	53.23	3921.49	---	---
01/15/98	3,974.72	53.23	3921.49	---	---
01/23/98	3,974.72	53.28	3921.44	---	---
01/27/98	3,974.72	53.27	3921.45	---	---
02/03/98	3,974.72	53.24	3921.48	---	---
02/11/98	3,974.72	53.27	3921.45	---	---
02/17/98	3,974.72	53.23	3921.49	---	---
02/25/98	3,974.72	53.20	3921.52	---	---
03/05/98	3,974.72	53.16	3921.56	---	---
03/11/98	3,974.72	53.23	3921.49	---	---
03/16/98	3,974.72	53.20	3921.52	---	---
03/25/98	3,974.72	53.19	3921.53	---	---
03/31/98	3,974.72	53.18	3921.54	---	---
04/09/98	3,974.72	53.33	3921.39	---	---

TABLE III
(continued)

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.66	53.21	3921.45	---	---
10/22/97	3,974.66	53.23	3921.43	---	---
10/29/97	3,974.66	53.24	3921.42	---	---
11/04/97	3,974.66	53.23	3921.43	---	---
11/11/97	3,974.66	53.23	3921.43	---	---
12/04/97	3,974.66	53.17	3921.49	---	---
12/10/97	3,974.66	53.19	3921.47	---	---
12/18/97	3,974.60	53.16	3921.44	---	---
12/23/97	3,974.60	53.16	3921.44	---	---
12/31/97	3,974.60	53.17	3921.43	---	---
01/06/98	3,974.60	53.18	3921.42	---	---
01/06/98	3,974.60	53.17	3921.43	---	---
01/07/98	3,974.60	53.19	3921.41	---	---
01/15/98	3,974.60	53.17	3921.43	---	---
01/23/98	3,974.60	53.20	3921.40	---	---
01/27/98	3,974.60	53.19	3921.41	---	---
02/03/98	3,974.60	53.16	3921.44	---	---
02/11/98	3,974.60	53.19	3921.41	---	---
02/17/98	3,974.60	53.15	3921.45	---	---
02/25/98	3,974.60	53.13	3921.47	---	---
03/05/98	3,974.60	53.12	3921.48	---	---
03/11/98	3,974.60	53.14	3921.46	---	---
03/16/98	3,974.60	53.12	3921.48	---	---
03/25/98	3,974.60	53.11	3921.49	---	---
03/31/98	3,974.60	53.12	3921.48	---	---
04/09/98	3,974.60	53.21	3921.39	---	---

TABLE III
(continued)

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.52	52.97	3921.55	---	---
10/22/97	3,974.52	52.98	3921.54	---	---
10/29/97	3,974.52	53.02	3921.50	---	---
11/04/97	3,974.52	53.01	3921.51	---	---
11/11/97	3,974.52	53.03	3921.49	---	---
12/04/97	3,974.52	52.92	3921.60	---	---
12/10/97	3,974.52	52.92	3921.60	---	---
12/18/97	3,974.48	53.03	3921.45	---	---
12/23/97	3,974.48	52.91	3921.57	---	---
12/31/97	3,974.48	52.91	3921.57	---	---
01/06/98	3,974.48	52.90	3921.58	---	---
01/06/98	3,974.48	52.90	3921.58	---	---
01/07/98	3,974.48	52.92	3921.56	---	---
01/15/98	3,974.48	52.93	3921.55	---	---
01/23/98	3,974.48	52.94	3921.54	---	---
01/27/98	3,974.48	52.94	3921.54	---	---
02/03/98	3,974.48	52.91	3921.57	---	---
02/11/98	3,974.48	52.94	3921.54	---	---
02/17/98	3,974.48	52.89	3921.59	---	---
02/25/98	3,974.48	52.87	3921.61	---	---
03/05/98	3,974.48	52.85	3921.63	---	---
03/11/98	3,974.48	52.88	3921.60	---	---
03/16/98	3,974.48	52.88	3921.60	---	---
03/25/98	3,974.48	52.87	3921.61	---	---
03/31/98	3,974.48	52.84	3921.64	---	---
04/09/98	3,974.48	52.98	3921.50	---	---

TABLE III
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,975.80	53.29	3922.51	---		---	---
10/22/97	3,975.80	53.34	3922.46	---		---	---
10/29/97	3,975.80	53.36	3922.44	---		---	---
11/04/97	3,975.80	53.35	3922.45	---		---	---
11/11/97	3,975.80	53.32	3922.48	---		---	---
12/04/97	3,975.80	53.37	3922.43	3922.49	53.30	3922.50	0.07
12/10/97	3,975.80	53.38	3922.42	3922.54	53.23	3922.57	0.15
12/18/97	3,975.06	53.53	3921.53	3922.02	52.93	3922.13	0.60
12/23/97	3,975.06	53.57	3921.49	3921.80	53.19	3921.87	0.38
12/31/97	3,975.06	53.70	3921.36	3921.77	53.19	3921.87	0.51
01/06/98	3,975.06	53.79	3921.27	3921.81	53.12	3921.94	0.67
01/06/98	3,975.06	53.81	3921.25	3921.83	53.10	3921.96	0.71
01/06/98	3,975.06	53.80	3921.26	3921.80	53.13	3921.93	0.67
01/06/98	3,975.06	53.81	3921.25	3921.80	53.13	3921.93	0.68
01/06/98	3,975.06	53.81	3921.25	3921.80	53.13	3921.93	0.68
01/07/98	3,975.06	53.86	3921.20	3921.75	53.18	3921.88	0.68
01/08/98	3,975.06	53.85	3921.21	3921.79	53.13	3921.93	0.72
01/09/98	3,975.06	53.88	3921.18	3921.80	53.12	3921.94	0.76
01/10/98	3,975.06	53.94	3921.12	3921.74	53.17	3921.89	0.77
01/12/98	3,975.06	53.96	3921.10	3921.78	53.12	3921.94	0.84
01/15/98	3,975.06	53.98	3921.08	3921.79	53.11	3921.95	0.87
01/23/98	3,975.06	54.33	3920.73	3921.74	53.09	3921.97	1.24
01/27/98	3,975.06	54.47	3920.59	3921.73	53.06	3922.00	1.41
02/03/98	3,975.06	54.72	3920.34	3921.76	52.97	3922.09	1.75
02/11/98	3,975.06	55.05	3920.01	3921.73	52.93	3922.13	2.12
02/17/98	3,975.06	55.23	3919.83	3921.78	52.83	3922.23	2.40
02/25/98	3,975.06	55.57	3919.49	3921.81	52.72	3922.34	2.85
03/05/98	3,975.06	55.90	3919.16	3921.80	52.65	3922.41	3.25
03/11/98	3,975.06	56.14	3918.92	3921.79	52.61	3922.45	3.53
03/16/98	3,975.06	56.35	3918.71	3921.82	52.53	3922.53	3.82
03/25/98	3,975.06	56.68	3918.38	3921.83	52.44	3922.62	4.24
03/31/98	3,975.06	55.22	3919.84	3921.83	52.77	3922.29	2.45
04/09/98	3,975.06	55.88	3919.18	3921.71	52.77	3922.29	3.11

TABLE III
(continued)

**MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-94
LOVINGTON, NEW MEXICO**

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,975.02	53.10	3921.92	---		---	---
12/23/97	3,975.02	53.11	3921.91	---		---	---
12/31/97	3,975.02	53.10	3921.92	---		---	---
01/06/98	3,975.02	53.11	3921.91	---		---	---
01/06/98	3,975.02	53.11	3921.91	---		---	---
01/07/98	3,975.02	53.12	3921.90	---		---	---
01/15/98	3,975.02	53.12	3921.90	---		---	---
01/23/98	3,975.02	53.12	3921.90	---		---	---
01/27/98	3,975.02	53.13	3921.89	---		---	---
02/03/98	3,975.02	53.09	3921.93	---		---	---
02/11/98	3,975.02	53.13	3921.89	---		---	---
02/17/98	3,975.02	53.11	3921.91	---		---	---
02/25/98	3,975.02	53.08	3921.94	---		---	---
03/05/98	3,975.02	53.07	3921.95	---		---	---
03/11/98	3,975.02	53.10	3921.92	---		---	---
03/16/98	3,975.02	53.08	3921.94	---		---	---
03/25/98	3,975.02	53.07	3921.95	---		---	---
03/31/98	3,975.02	53.05	3921.97	---		---	---
04/09/98	3,975.02	53.13	3921.89	---		---	---

TABLE III
(continued)

MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,975.30	53.85	3921.45	---		---	---
12/23/97	3,975.30	53.85	3921.45	---		---	---
12/31/97	3,975.30	53.84	3921.46	---		---	---
01/06/98	3,975.30	53.83	3921.47	---		---	---
01/06/98	3,975.30	53.85	3921.45	---		---	---
01/07/98	3,975.30	53.86	3921.44	---		---	---
01/15/98	3,975.30	53.85	3921.45	---		---	---
01/23/98	3,975.30	53.89	3921.41	---		---	---
01/27/98	3,975.30	53.87	3921.43	---		---	---
02/03/98	3,975.30	53.83	3921.47	---		---	---
02/11/98	3,975.30	53.86	3921.44	---		---	---
02/17/98	3,975.30	53.82	3921.48	---		---	---
02/25/98	3,975.30	53.81	3921.49	---		---	---
03/05/98	3,975.30	53.79	3921.51	---		---	---
03/11/98	3,975.30	53.83	3921.47	---		---	---
03/16/98	3,975.30	53.81	3921.49	---		---	---
03/25/98	3,975.30	53.80	3921.50	---		---	---
03/31/98	3,975.30	53.78	3921.52	---		---	---
04/09/98	3,975.30	53.86	3921.44	---		---	---

TABLE III
(continued)

MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
12/18/97	3,974.55	52.80	3921.75	---		---	---
12/23/97	3,974.55	52.80	3921.75	---		---	---
12/31/97	3,974.55	52.80	3921.75	---		---	---
01/06/98	3,974.55	52.80	3921.75	---		---	---
01/06/98	3,974.55	52.79	3921.76	---		---	---
01/07/98	3,974.55	52.82	3921.73	---		---	---
01/15/98	3,974.55	52.81	3921.74	---		---	---
01/23/98	3,974.55	52.83	3921.72	---		---	---
01/27/98	3,974.55	52.23	3922.32	---		---	---
02/03/98	3,974.55	58.79	3915.76	---		---	---
02/11/98	3,974.55	52.82	3921.73	---		---	---
02/17/98	3,974.55	52.78	3921.77	---		---	---
02/25/98	3,974.55	52.77	3921.78	---		---	---
03/05/98	3,974.55	52.75	3921.80	---		---	---
03/11/98	3,974.55	52.78	3921.77	---		---	---
03/16/98	3,974.55	52.76	3921.79	---		---	---
03/25/98	3,974.55	52.75	3921.80	---		---	---
03/31/98	3,974.55	52.74	3921.81	---		---	---
04/09/98	3,974.55	52.85	3921.70	---		---	---

TABLE III
(continued)

RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

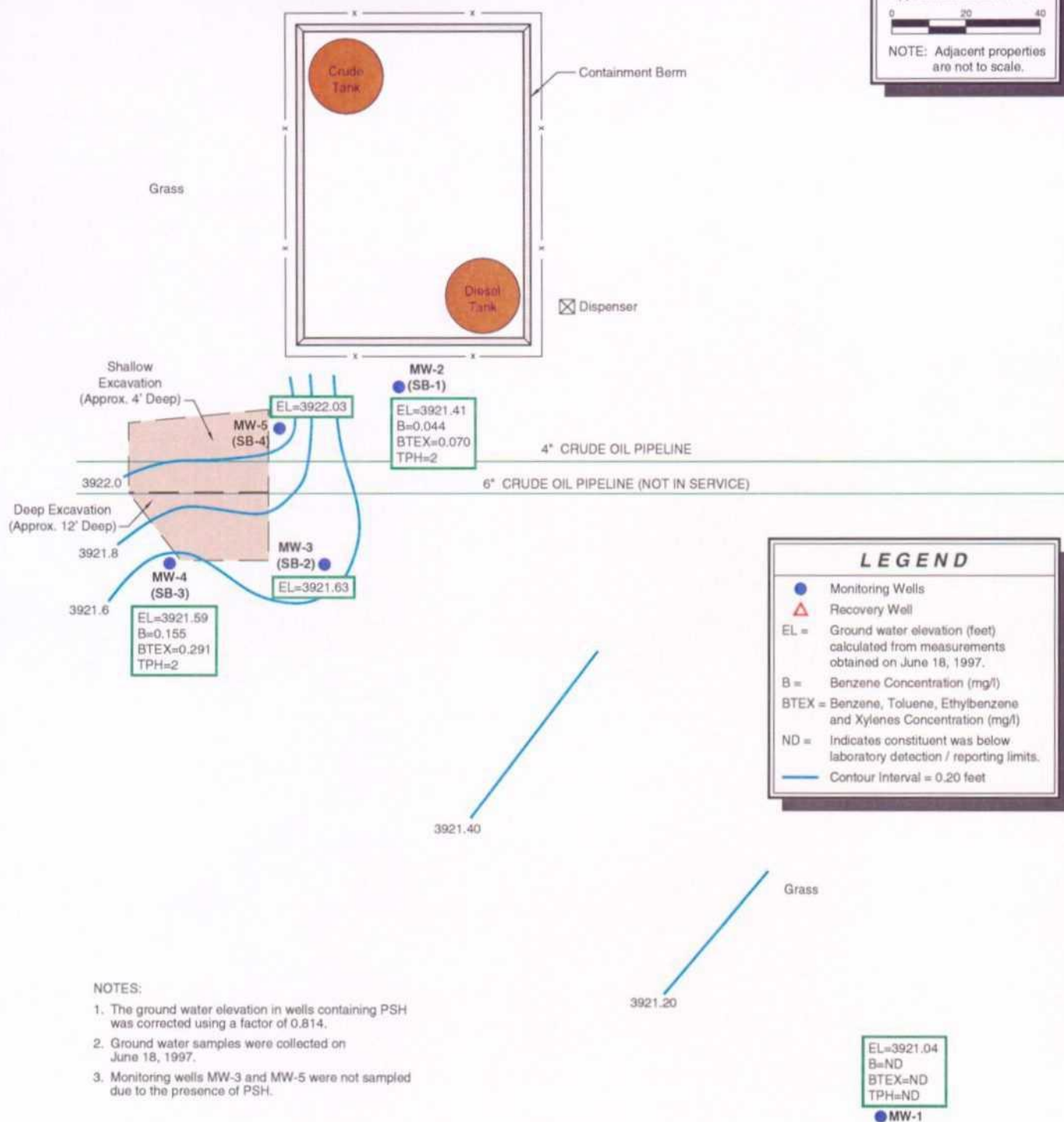
DATE EASURE	PVC LEVATIO (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	Unknown	56.36	Unknown	Unknown	47.48	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	47.50	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	47.50	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	47.55	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	47.56	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	47.54	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	47.55	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	47.59	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	47.57	Unknown	8.30
12/18/97	3,970.79	55.84	3914.95	3921.67	47.58	3923.21	8.26
12/22/97	3,970.79	55.80	3914.99	3921.69	47.57	3923.22	8.23
12/31/97	3,970.79	55.79	3915.00	3921.67	47.60	3923.19	8.19
01/06/98	3,970.79	55.18	3915.61	3921.68	47.72	3923.07	7.46
01/06/98	3,970.79	49.50	3921.29	—		—	—
01/06/98	3,970.79	49.50	3921.29	—		—	—
01/06/98	3,970.79	49.51	3921.28	—		—	—
01/06/98	3,970.79	49.63	3921.16	3921.67	49.00	3921.79	0.63
01/07/98	3,970.79	49.58	3921.21	—		—	—
01/08/98	3,970.79	49.50	3921.29	—		—	—
01/09/98	3,970.79	49.58	3921.21	3921.23	49.55	3921.24	0.03
01/10/98	3,970.79	49.64	3921.15	3921.17	49.61	3921.18	0.03
01/12/98	3,970.79	49.62	3921.17	—	49.62	—	sheen
01/15/98	3,970.79	49.63	3921.16	—	49.63	—	sheen
01/23/98	3,970.79	49.67	3921.12	3921.16	49.62	3921.17	0.05
01/27/98	3,970.79	49.68	3921.11	3921.13	49.65	3921.14	0.03
02/03/98	3,970.79	49.69	3921.10	3921.12	49.66	3921.13	0.03
02/11/98	3,970.79	49.69	3921.10	3921.12	49.67	3921.12	0.02

TABLE III

SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

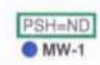
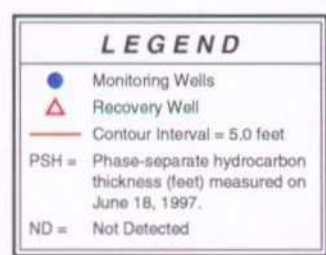
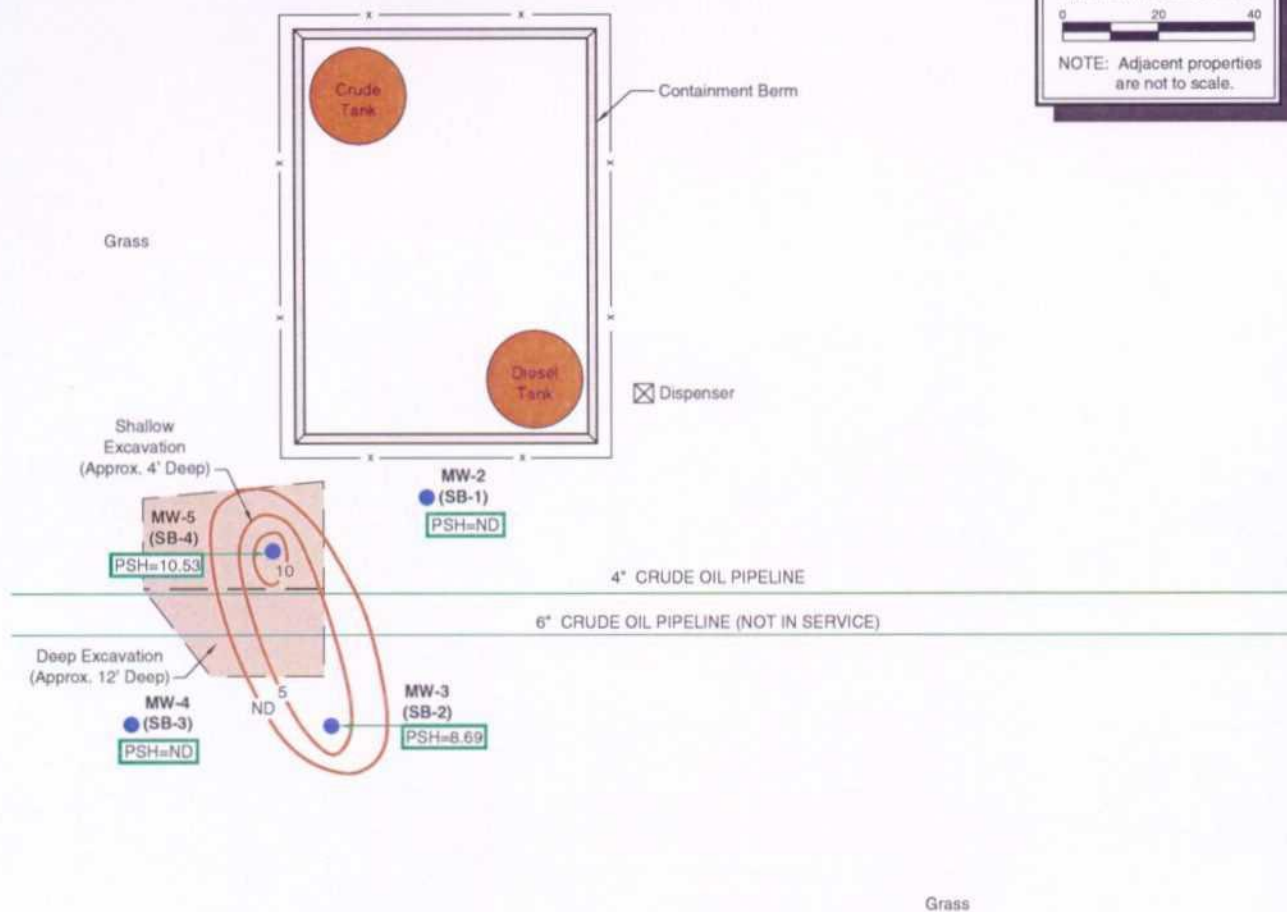
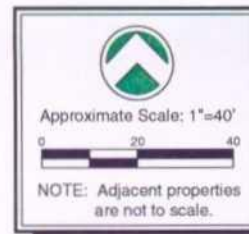
WELL NO.	DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
				Actual	Corrected	
MW-1	06/18/97	3,974.19	53.15	3921.04	---	---
	07/29/97	3,974.19	53.05	3921.14	---	---
MW-2	06/18/97	3,974.65	53.24	3921.41	---	---
	07/29/97	3,974.65	53.14	3921.51	---	---
MW-3	06/18/97	3,974.63	60.08	3914.55	3921.94	8.69
	06/23/97	3,974.63	60.08	3914.55	3921.96	8.72
	06/23/97	3,974.63	53.30	3921.33	3921.56	0.27
	06/23/97	3,974.63	53.78	3920.85	3921.71	1.01
	06/25/97	3,974.63	59.85	3914.78	3921.99	8.48
	06/25/97	3,974.63	55.50	3919.13	3921.72	3.05
	06/25/97	3,974.63	56.34	3918.29	3921.78	4.10
	06/25/97	3,974.63	53.29	3921.34	---	---
	06/27/97	3,974.63	59.99	3914.64	3921.96	8.61
	06/27/97	3,974.63	56.68	3917.95	3921.60	4.29
	07/01/97	3,974.63	59.99	3914.64	3921.96	8.61
	07/03/97	3,974.63	60.04	3914.59	3921.98	8.69
	07/03/97	3,974.63	55.22	3919.41	3921.75	2.75
	07/29/97	3,974.63	60.03	3914.60	3921.96	8.66
	07/29/97	3,974.63	54.47	3920.16	3921.90	2.05
MW-4	06/18/97	3,974.55	52.96	3921.59	---	---
	07/29/97	3,974.55	52.92	3921.63	---	---
MW-5	06/18/97	3,974.31	60.85	3913.46	3922.41	10.53
	06/23/97	3,974.31	58.09	3916.22	3922.08	6.89
	06/23/97	3,974.31	56.57	3917.74	3922.38	5.46
	06/23/97	3,974.31	59.18	3915.13	3921.32	7.28
	06/23/97	3,974.31	59.74	3914.57	3922.08	8.83
	06/23/97	3,974.31	54.91	3919.40	3921.88	2.92
	06/25/97	3,974.31	60.47	3913.84	3922.02	9.62
	06/25/97	3,974.31	58.47	3915.84	3921.99	7.24
	06/25/97	3,974.31	59.49	3914.82	3922.01	8.46
	06/25/97	3,974.31	53.42	3920.89	3921.94	1.23
	06/25/97	3,974.31	55.95	3918.36	3921.90	4.16
	06/25/97	3,974.31	58.50	3915.81	3922.02	7.30
	06/25/97	3,974.31	52.46	3921.85	3921.87	0.02
	06/25/97	3,974.31	51.81	3922.50	3922.50	0.00
	06/27/97	3,974.31	60.46	3913.85	3922.06	9.66
	06/27/97	3,974.31	57.47	3916.84	3922.00	6.07
	07/01/97	3,974.31	60.45	3913.86	3922.01	9.59
	07/01/97	3,974.31	56.40	3917.91	3921.94	4.74
	07/03/97	3,974.31	60.41	3913.90	3922.01	9.54
	07/03/97	3,974.31	57.53	3916.78	3921.98	6.12
	07/29/97	3,974.31	60.19	3914.12	3922.02	9.29
	07/29/97	3,974.31	57.69	3916.62	3920.97	5.12

97 QTR 2



NOTES:

1. The ground water elevation in wells containing PSH was corrected using a factor of 0.814.
2. Ground water samples were collected on June 18, 1997.
3. Monitoring wells MW-3 and MW-5 were not sampled due to the presence of PSH.



C:\99 RM G\SAOFT\PROJECTS\TMPL\710016\MONITOR\OR\71PSH4.97



PSH THICKNESS MAP - JUNE 1997		
TEXAS - NEW MEXICO PIPE LINE COMPANY	TNM-97-04	LOVINGTON, NEW MEXICO

710016
FIG 2

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

KEI
ATTN: THERESA NIX
5309 WURZBACH SUITE 100
SAN ANTONIO, TEXAS 78238
FAX: 210-680-3763

Receiving Date: 06/19/97
Sample Type: WATER
Project #: 710016
Project Location: LOVINGTON
Project Name: GW Sampling

Analysis Date: TPH 06/19/97
Analysis Date: BTEX 06/20/97
Sampling Date: 06/18/97
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L	TPH mg/L
11513	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001	<1
11514	MW-2	0.044	0.014	0.004	0.006	0.002	2
11515	MW-4	0.155	0.106	0.007	0.014	0.009	2

% IA	94	89	87	85	86	102
% EA	103	97	95	92	95	***
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<1

METHODS: SW 846-8020,5030 , EPA 418.1


Michael R. Fowler

6-20-97
Date

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager.

Phone #: 210 680-3763

Theresa Nix

FAT# 210 680 -3763

Company Name & Address: KET

5309 Wurzbach Seite 100 SA Tx 78238

Project #:

710016

Project Name :

GW Sampling

Project Location:

Sampler Signature:

Lovington

BTEX 8(12)/5(13)

TPH 418.1

TCLP Metals Ag As B⁺ Cd Cr Pb Hg Se

Total Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TCLP Semi Volatiles

SDS

301

Relinquished by:

Date

6-18-97

Times:

1630

Received by:

Relinquished by

Date:

06-19-97

Times:

0900

Received by:

Г. М. Мухомов

Relinquished by:

Date:**Thick:**

Received by Laboratory:

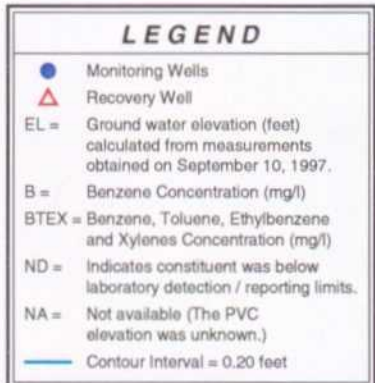
REMARKS

Results by Monday June 23 (p.m)

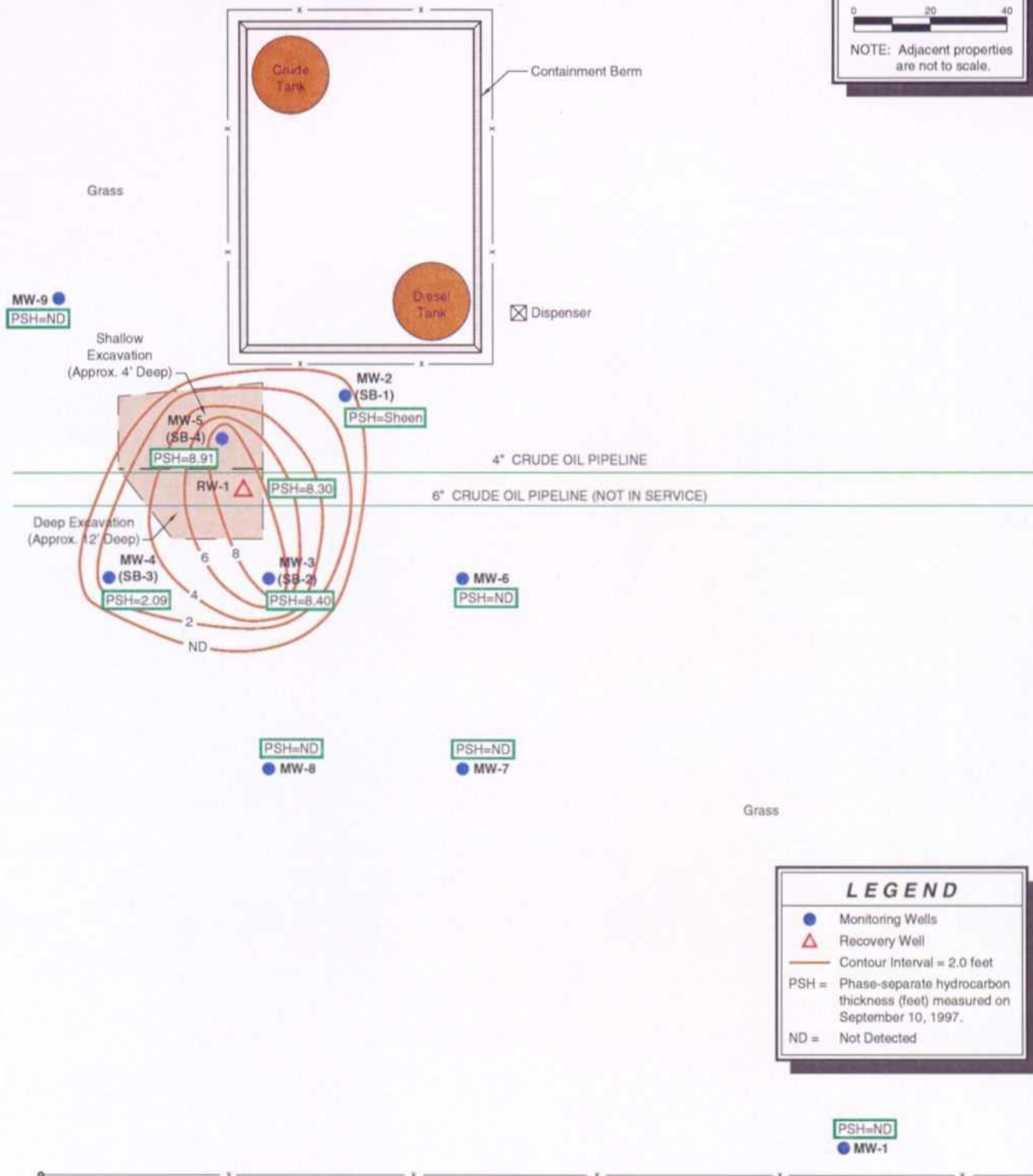
Please

MCS

97 QTR 3



-
- Grass
- 3921.20
- EL=3921.20
B=ND
BTEX=ND
- MW-1



C:\99-RM-G\SADFT\PROJECTS\TNM\PLY10016\MONITOR\71\PSH697



PSH THICKNESS MAP - SEPTEMBER 1997

TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016

FIG 2



CERTIFICATE OF ANALYSIS SUMMARY 1-72112

K.E.I. Consultants, Inc.

Project Name: TNMPL

Date Received in Lab : Sep 12, 1997 10:15 by AS

Project ID: 710016

Project Manager: Theresa Nix

Date Report Faxed: Oct 13, 1997

Project Location: Lovington, NM


XENCO contact : Scott Sample/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Metals by ICP by EPA 6010		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Aluminum				0.61	0.82	0.32	0.41			
Barium				0.058	0.079	0.084	0.072			
Beryllium				< 0.020	< 0.020	< 0.020	< 0.020			
Cadmium				< 0.040	< 0.040	< 0.040	< 0.040			
Calcium				69.4	88.5	118	98.5			
Chromium				< 0.050	< 0.050	< 0.050	< 0.050			
Cobalt				< 0.050	< 0.050	< 0.050	< 0.050			
Iron				0.40	0.47	0.19	0.23			
Magnesium				10.1	13.3	17.1	13.7			
Manganese				< 0.050	< 0.050	< 0.050	< 0.050			
Molybdenum				< 0.50	< 0.50	< 0.50	< 0.50			
Potassium				1.48	1.60	2.07	1.94			
Silver				< 0.080	< 0.080	< 0.080	< 0.080			
Sodium				18.6	33.9	32.1	31.9			
Tin				< 0.20	< 0.20	< 0.20	< 0.20			
Vanadium				< 0.050	< 0.050	< 0.050	< 0.050			
Zinc				< 0.050	< 0.050	< 0.050	< 0.050			

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Edward H. Yonemoto, Ph.D.
QA/QC Manager

**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Sep 12, 1997 10:15 by AS****Project ID: 710016****Project Manager: Theresa Nix****Date Report Faxed: Oct 13, 1997****Project Location: Lovington, NM****XENCO contact : Scott Sample/Edward Yonemoto**

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)										
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Nickel				< 0.20	< 0.20	< 0.20	< 0.20			
Copper				< 0.050	< 0.050	< 0.050	< 0.050			
Boron				< 0.20	< 0.10	< 0.10	< 0.10			
Silicon				20.8	21.0	20.8	21.1			
Strontium				0.53	0.60	0.75	0.62			
Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)										
Total Mercury by EPA 7470				Sep 18, 1997	Sep 18, 1997	Sep 18, 1997	Sep 18, 1997			
Mercury				< 0.0002	< 0.0002	< 0.0002	< 0.0002			
Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)										
BTEX by EPA 8020		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Benzene		< 0.001	18.25	0.003	0.002	0.012	0.055			
Toluene		< 0.001	9.70	< 0.001	0.001	< 0.001	0.014			
Ethylbenzene		< 0.001	0.61	< 0.001	< 0.001	< 0.001	< 0.001			
m,p-Xylenes		< 0.002	2.06	< 0.002	< 0.002	< 0.002	< 0.002			
o-Xylene		< 0.001	1.04	< 0.001	< 0.001	< 0.001	< 0.001			
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The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.										
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										 Edward H. Yonemoto, Ph.D. QA/QC Manager

**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Sep 12, 1997 10:15 by AS****Project ID: 710016****Project Manager: Theresa Nix****Date Report Faxed: Oct 13, 1997****Project Location: Lovington, NM****XENCO contact : Carlos Castro/Edward Yonemoto**

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Total BTEX		< 0.006	31.66	0.003	0.003	0.012	0.069			

PAHs by GC-MS by EPA 8100	Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Acenaphthene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Acenaphthylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Anthracene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)anthracene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)pyrene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(b)fluoranthene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(g,h,i)perylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(k)fluoranthene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Chrysene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,e)pyrene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)anthracene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,j)acridine	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Fluoranthene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			

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Edward H. Yonemoto, Ph.D.
QA/QC Manager


**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Sep 12, 1997 10:15 by AS**

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Date Report Faxed: Oct 13, 1997**XENCO contact :** Scott Sample/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results						ppm (mg/L - mg/Kg)		
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Fluorene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Indeno(1,2,3-cd)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
3-Methylcholanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Naphthalene		< 0.002	0.071	< 0.002	< 0.002	< 0.002	< 0.002			
Phenanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,h)acridine		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(j)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
7H-Dibenzo(c,g)carbazole		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,i)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
		Date Analyzed - Analytical Results						ppm (mg/L - mg/Kg)		
Bicarbonate by SM 4500CO2D				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Bicarbonate				179	177	173	178			


This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Edward H. Yonemoto, Ph.D.
QA/QC Manager

**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project ID:** 710016**Project Name:** TNMPL**Date Received in Lab :** Sep 12, 1997 10:15 by AS**Project Manager:** Theresa Nix**Date Report Faxed:** Oct 13, 1997**Project Location:** Lovington, NM**XENCO contact :** Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Carbonate by SM4500CO2D	Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)									
				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Carbonate				< 1.00	< 1.00	< 1.00	< 1.00			
Total Dissolved Solids by EPA 160.1	Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)									
				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Total Dissolved Solids				448	515	574	426			
Anions by Ion Chromatography by EPA 300.0	Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)									
				Oct 3, 1997	Oct 3, 1997	Oct 3, 1997	Oct 3, 1997			
Sulfate				42.2	59.7	103	49.2			
Chloride				40.21	54.54	51.98	38.97			

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The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:08

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

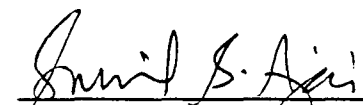
Parameter	BLANK SPIKE ANALYSIS						
	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.050	1.875	2.000	0.050	93.8	70-125	
Barium	< 0.0060	1.0460	1.0000	0.0060	104.6	70-125	
Beryllium	< 0.0200	0.4230	0.4000	0.0200	105.8	70-125	
Cadmium	< 0.0400	0.4320	0.4000	0.0400	108.0	70-125	
Calcium	< 0.050	4.469	4.000	0.050	111.7	70-125	
Chromium	< 0.0500	1.0650	1.0000	0.0500	106.5	70-125	
Cobalt	< 0.0100	1.0390	1.0000	0.0100	103.9	70-125	
Copper	< 0.0300	1.0800	1.0000	0.0300	108.0	70-125	
Iron	< 0.025	1.912	2.000	0.025	95.6	70-125	
Magnesium	< 0.050	3.970	4.000	0.050	99.3	70-125	
Manganese	< 0.025	1.794	2.000	0.025	89.7	70-125	
Molybdenum	< 0.100	5.679	5.000	0.100	113.6	70-125	
Nickel	< 0.100	1.030	1.000	0.100	103.0	70-125	
Potassium	< 0.100	4.378	4.000	0.100	109.5	70-125	
Silver	< 0.0400	0.8134	0.8000	0.0400	101.7	70-125	
Sodium	< 0.100	3.681	4.000	0.100	92.0	70-125	
Strontium	< 0.100	4.939	5.000	0.100	98.8	70-125	
Vanadium	< 0.0120	1.0590	1.0000	0.0120	105.9	70-125	
Zinc	< 0.0300	1.0510	1.0000	0.0300	105.1	70-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. Not calculated, data below detection limit

N.D. Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A18E33

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003 Parameter	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Method Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Potassium	1.482	1.656	0.100	11.1	25.0	5.769	4.00	107.2	70-125	
Silver	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.8170	0.800	102.1	70-125	
Sodium	18.57	23.93	0.10	25.2	25.0	29.49	4.0	273.0	70-125	B,C
Strontium	0.532	0.444	0.100	18.0	25.0	5.193	5.00	93.2	70-125	
Vanadium	0.0230	< 0.0120	0.0120	N.C	25.0	1.0970	1.000	107.4	70-125	
Zinc	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0790	1.000	107.9	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

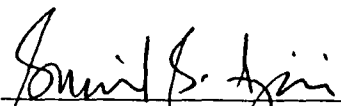
Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A18E33

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Method Detection Limit mg/L	[D]	[E]	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[J] Qualifier
				QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Aluminum	0.611	0.766	0.050	22.5	25.0	2.888	2.00	113.9	70-125	
Barium	0.0580	0.0730	0.0060	22.9	25.0	1.1110	1.000	105.3	70-125	
Beryllium	< 0.0200	< 0.0200	0.0200	N.C	25.0	0.4360	0.400	109.0	70-125	
Cadmium	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.4120	0.400	103.0	70-125	
Calcium	69.37	98.94	0.05	35.1	25.0	98.94	4.0	739.3	70-125	A,C
Chromium	< 0.0500	< 0.0500	0.0500	N.C	25.0	1.0620	1.000	106.2	70-125	
Cobalt	< 0.0100	< 0.0100	0.0100	N.C	25.0	1.0230	1.000	102.3	70-125	
Copper	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0690	1.000	106.9	70-125	
Iron	0.404	0.382	0.025	5.6	25.0	2.275	2.00	93.6	70-125	
Magnesium	10.05	12.67	0.05	23.1	25.0	17.90	4.0	196.3	70-125	B,C
Manganese	< 0.0250	< 0.0250	0.0250	N.C	25.0	1.8010	2.000	90.1	70-125	
Molybdenum	< 0.500	< 0.500	0.500	N.C	25.0	5.687	5.00	113.7	70-125	
Nickel	< 0.100	< 0.100	0.100	N.C	25.0	0.971	1.00	97.1	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

Relative Difference [D] = $200 \times (B-A)/(B+A)$

Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A05C49

SW846- 7470 Total Mercury

Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:37

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172129- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample	Duplicate	Method	QC	LIMITS	Matrix Spike	Matrix	QC	LIMITS	Qualifier
	Result	Result	Detection	Relative	Relative	Result	Spike	Matrix Spike	Recovery	
Parameter	mg/L	mg/L	Limit	Difference	Difference	mg/L	Amount	Recovery	Range	
			mg/L	%	%		mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	20.0	0.0026	0.0025	104.0	80-120	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

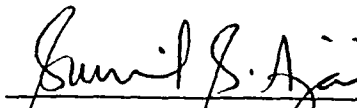
Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW846- 7470 Total Mercury

Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:33

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

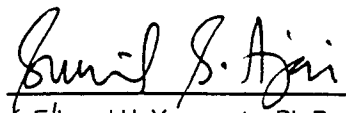
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	Qualifier
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Mercury	< 0.0010	0.0022	0.0025	0.0010	88.0	80-120	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A34E30

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Sep 17, 1997 09:39

Analyst: LC

Date Analyzed: Sep 15, 1997 17:41

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result mg/L	Blank Spike Result mg/L	Blank Spike Duplicate Result mg/L	Blank Spike Amount mg/L	Method Detection Limit mg/L		QC	QC	QC	Blank Spike Recovery Range %	
							Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %		
Acenaphthene	< 0.0050	0.0618	0.0588	0.1000	0.0050	31.0	5.0	61.8	58.8	46-118	
4-Chloro-3-Methylphenol	< 0.0076	0.0706	0.0616	0.1000	0.0076	42.0	13.6	70.6	61.6	23-97	
2-Chlorophenol	< 0.0100	0.0666	0.0594	0.1000	0.0100	40.0	11.4	66.6	59.4	27-123	
1,4-Dichlorobenzene	< 0.0084	0.0654	0.0656	0.1000	0.0084	28.0	0.3	65.4	65.6	36-97	
2,4-Dinitrotoluene	< 0.0100	0.0768	0.0692	0.1000	0.0100	38.0	10.4	76.8	69.2	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0692	0.0678	0.1000	0.0080	38.0	2.0	69.2	67.8	41-116	
4-Nitrophenol	< 0.0080	0.0204	0.0192	0.1000	0.0080	50.0	6.1	20.4	19.2	10-80	
Pentachlorophenol	< 0.0172	0.0836	0.0686	0.1000	0.0172	50.0	19.7	83.6	68.6	9-103	
Phenol	< 0.0074	0.0306	0.0262	0.1000	0.0074	42.0	15.5	30.6	26.2	12-89	
Pyrene	< 0.0040	0.0882	0.0832	0.1000	0.0040	31.0	5.8	88.2	83.2	26-127	
1,2,4-Trichlorobenzene	< 0.0108	0.0656	0.0666	0.1000	0.0108	28.0	1.5	65.6	66.6	39-98	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW- 846 5030/8020 BTEX
Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 10:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	Qualifier
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1190	0.1000	0.0010	119.0	65-135	
Toluene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Ethylbenzene	< 0.0010	0.1150	0.1000	0.0010	115.0	65-135	
m,p-Xylenes	< 0.0020	0.2330	0.2000	0.0020	116.5	65-135	
o-Xylene	< 0.0010	0.1110	0.1000	0.0010	111.0	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. Not calculated, data below detection limit

N.D. Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A04D06

SW- 846 5030/8020 BTEX

Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 11:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172108- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1150	0.1160	0.1000	0.0010	25.0	0.9	115.0	116.0	65-135	
Toluene	< 0.0010	0.1020	0.1040	0.1000	0.0010	25.0	1.9	102.0	104.0	65-135	
Ethylbenzene	< 0.0010	0.1130	0.1140	0.1000	0.0010	25.0	0.9	113.0	114.0	65-135	
m,p-Xylenes	< 0.0020	0.2310	0.2330	0.2000	0.0020	25.0	0.9	115.5	116.5	65-135	
o-Xylene	< 0.0010	0.1100	0.1110	0.1000	0.0010	25.0	0.9	110.0	111.0	65-135	

Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:00

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	Qualifier
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Bicarbonate	< 0.50	26.10	25.00	0.50	104.4	70-125	

Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N/A Not calculated, data below detection limit

N/A Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 003	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Bicarbonate	179	176	0.50	1.7	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SM4500C02D Carbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 003	[A]	[B]	[C]	[D]	[E]	[F] Qualifier
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	Relative Difference %	Relative Difference %	
Carbonate	< 1.000	< 1.000	1.000	N.C	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 160.1 Total Dissolved Solids

Date Validated: Sep 16, 1997 14:05

Analyst: IF

Date Analyzed: Sep 16, 1997 11:05

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172097- 001	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Method Detection Limit mg/L	[D]	[E]	[F] Qualifier
				QC	LIMITS	
Parameter				Relative Difference %	Relative Difference %	
Total Dissolved Solids	720	713	4.00	1.0	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A10A85

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 16:36

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Parameter	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Blank Spike Recovery Range %	
Chloride	< 0.050	5.532	5.570	5.000	0.050	20.0	0.7	110.6	111.4	70-125	
Sulfate	< 0.10	4.35	4.39	5.00	0.10	20.0	0.9	87.0	87.8	70-125	

Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \times (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 18:48

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 006	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Qualifier
	mg/L	mg/L	mg/L			
Chloride	38.969	40.247	0.050	3.2	20.0	
Sulfate	49.23	50.50	0.10	2.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Project Name: TNMPL

XENCO COC#: 1-72112
Date Received in Lab: Sep 12, 1997 10:15 by AS
XENCO contact : Scott Sample/Edward Yonemoto

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	172112-001	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by OR	Sep 15, 1997 12:29 by OR
2			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by CY	Sep 15, 1997 21:33 by LC
3	MW-2	172112-002	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by OR	Sep 15, 1997 17:49 by OR
4			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by CY	Sep 15, 1997 22:19 by LC
5	MW-6	172112-003	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by OR	Sep 15, 1997 17:13 by OR
6			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by CY	Sep 15, 1997 23:05 by LC
7			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by IF	Sep 16, 1997 11:15 by IF
8			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:05		Oct 3, 1997 by OR	Oct 3, 1997 18:14 by OR
9			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 17, 1997 15:21 by SA
10			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 18, 1997 11:14 by EZ
11			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
12			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
13	MW-7	172112-004	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by OR	Sep 15, 1997 13:23 by OR
14			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by CY	Sep 15, 1997 23:50 by LC
15			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by IF	Sep 16, 1997 11:20 by IF
16			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:30		Oct 3, 1997 by OR	Oct 3, 1997 18:22 by OR
17			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 17, 1997 15:41 by SA
18			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 18, 1997 11:15 by EZ
19			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
20			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
21	MW-8	172112-005	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by OR	Sep 15, 1997 13:41 by OR
22			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by CY	Sep 16, 1997 00:36 by LC
23			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by IF	Sep 16, 1997 11:25 by IF
24			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:45		Oct 3, 1997 by OR	Oct 3, 1997 18:40 by OR
25			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 17, 1997 15:48 by SA
26			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 18, 1997 11:16 by EZ
27			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF
28			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: TNMPL

XENCO COC#: 1-72112

Date Received in Lab: Sep 12, 1997 10:15 by AS

XENCO contact : Scott Sample/Edward Yonemoto

Project ID: 710016

Project Manager: Theresa Nix

Project Location: Lovington, NM

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
29	MW-9	172112-006	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by OR	Sep 15, 1997 14:00 by OR
30			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by CY	Sep 16, 1997 01:21 by LC
31			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by IF	Sep 16, 1997 11:30 by IF
32			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:25		Oct 3, 1997 by OR	Oct 3, 1997 18:48 by OR
33			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 17, 1997 15:54 by SA
34			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 18, 1997 11:17 by EZ
35			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF
36			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF



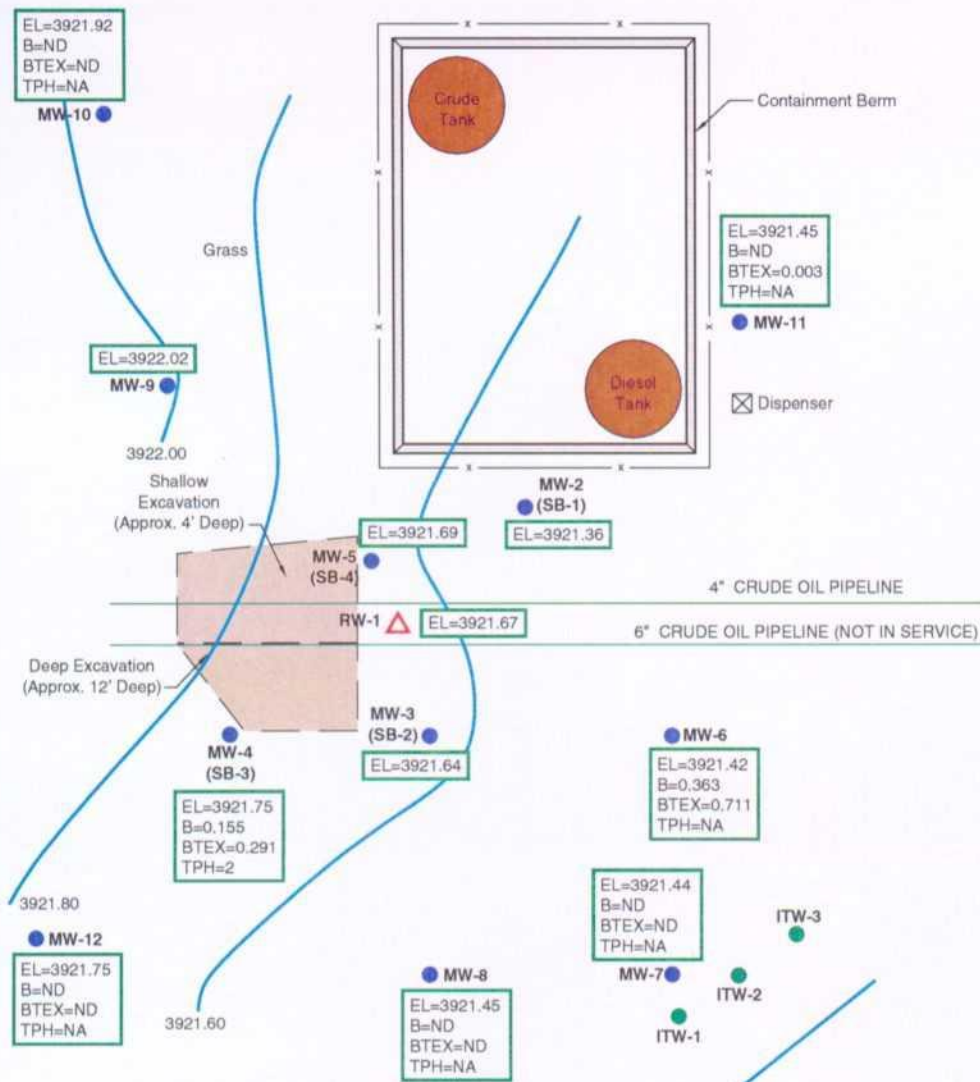
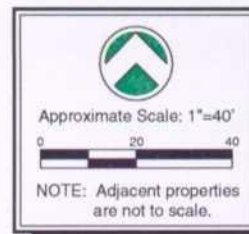
11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page / of
Lab. Batch # 172112-H

Contractor KEI CONSULTANTS		Phone (210) 680-3767		No. coolers this shipment: 1		Contractor COC #													
Address 5309 WURZBACH STE 100 SAN ANTONIO, TX 78238		Project Director MIKE HAWTHORNE		Carrier: UPS		Quote #: 1													
Project Name TNMP		Project Manager		Airbill No.		P.O. No: ?													
Project Location SEAFORD, LOUISIANA, N.M.		Project No. 710016		CONTAINERS Total		Turn-around + ASAP + 24 hrs 48 hrs <u>Standard</u>		LAB ONLY ID #											
Sampler Signature [Signature]		THANESA NIX																	
SAMPLE CHARACTERIZATION				Preservative		Unl Dies Ker Unknown													
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type P, G	Ice	Other	Waste Oil	PIT No:	Tank No:	Sample Description					
1 MW-1	9/10/97	1615		X			X	LTR VOA G	X	HCL NONE				MW-1	3	X	X	9/11/97	
2 MW-2		1750												MW-2	↓				
3 MW-6		1705						LTR 500 VOA PG	X	HCL NONE				MW-6	6		X	9/11/97	
4 MW-7		1630												MW-7	↓				
5 MW-8		1645												MW-8	↓				
6 MW-9	↓	1725												MW-9	↓				
7																			
8																			
9																			
10																			
Relinquished by: [Signature]				DATE 9/11/97		TIME 1000		Received by: [Signature]				DATE 9/12/97		TIME 10:15		Remarks * PLEASE UTILIZE THE ICPSCAN EPA 6010 METHOD FOR METALS * FAX RESULTS TO THANESA NIX AT SAN ANTONIO OFFICE 680-3763			
								Received For Laboratory by [Signature]											

97 QTR 4



LEGEND

- Infiltration Test Wells
- Monitoring Wells
- △ Recovery Well

EL = Ground water elevation (feet) calculated from measurements obtained on December 18, 1997.

B = Benzene Concentration (mg/l)

BTEX = Benzene, Toluene, Ethylbenzene and Xylenes Concentration (mg/l)

TPH = Total Petroleum Hydrocarbon Concentration (mg/l)

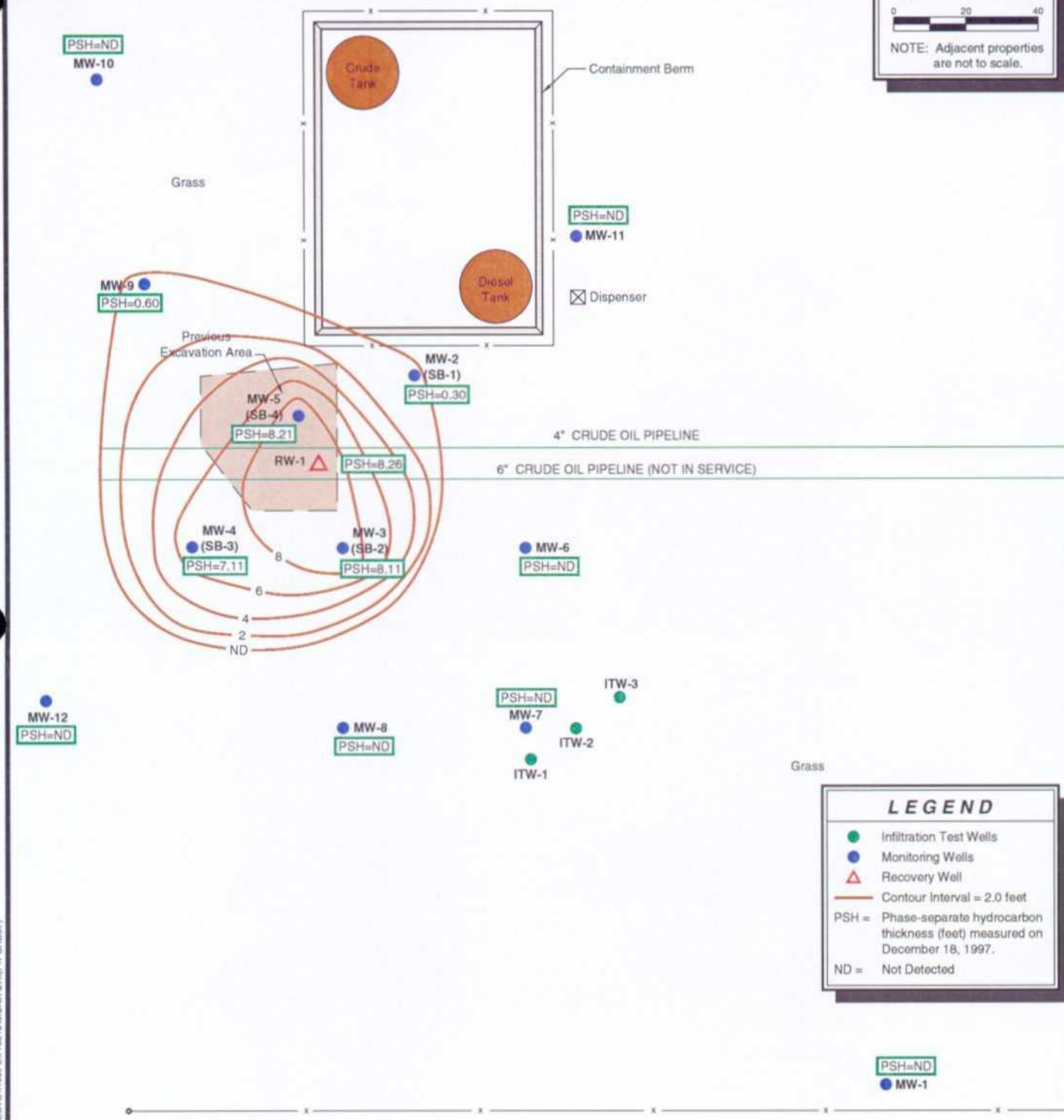
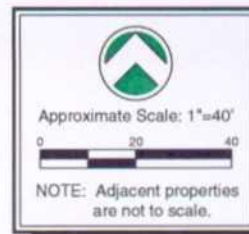
NA = Not Analyzed

ND = Indicates constituent was below laboratory detection / reporting limits.

— Contour Interval = 0.20 feet

- NOTES:
1. The ground water elevation in wells containing PSH was corrected using a factor of 0.814.
 2. Ground water samples were collected on December 18, 1997.
 3. Monitoring wells MW-2, MW-3, MW-5, MW-9, and RW-1 were not sampled due to the presence of PSH.

3:59 PM G:\SADFT\PROJECTS\NMP\1710016DEC-GNM\710016.D97



LEGEND

- Infiltration Test Wells
- Monitoring Wells
- ▲ Recovery Well
- Contour Interval = 2.0 feet

PSH = Phase-separate hydrocarbon thickness (feet) measured on December 18, 1997.

ND = Not Detected

C:\98 RM G:\SAOFT\PROJECTS\TMPL\UT1018\MONT ORL\7\PSH097

CERTIFICATE OF ANALYSIS SUMMARY 1-73369
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Dec 19, 1997 09:43
Date Report Faxed: Jan 6, 1998
XENCO contact : Carlos Castro/Edward Yonemoto
Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	173369 001 MW-1 Liquid 12/18/97 11:50	173369 002 MW-6 Liquid 12/18/97 12:32	173369 003 MW-7 Liquid 12/18/97 11:59	173369 004 MW-8 Liquid 12/18/97 12:20	173369 005 MW-10 Liquid 12/18/97 13:42	173369 006 MW-11 Liquid 12/18/97 12:55
	Analyzed: Units:					12/30/97 mg/L R.L.	12/30/97 mg/L R.L.
Metals by ICP EPA 6010							
Aluminum						1.33 (0.22)	< 0.22 (0.22)
Barium						0.18 (0.02)	0.10 (0.02)
Beryllium						< 0.022 (0.022)	< 0.022 (0.022)
Boron						0.18 (0.11)	0.15 (0.11)
Cadmium						< 0.044 (0.044)	< 0.044 (0.044)
Calcium						306 (0.6)	121 (0.6)
Chromium						< 0.056 (0.056)	< 0.056 (0.056)
Cobalt						< 0.056 (0.056)	< 0.056 (0.056)
Copper						< 0.033 (0.033)	< 0.033 (0.033)
Iron						2.03 (0.11)	0.13 (0.11)
Magnesium						12.6 (0.1)	14.0 (0.1)
Manganese						0.20 (0.06)	< 0.056 (0.056)
Molybdenum						< 0.33 (0.33)	< 0.33 (0.33)
Nickel						< 0.11 (0.11)	< 0.11 (0.11)
Potassium						3.84 (0.56)	2.75 (0.56)
Silicon						21.1 (0.1)	17.6 (0.1)
Silver						< 0.089 (0.089)	< 0.089 (0.089)
Sodium						46.7 (0.6)	29.5 (0.6)
Strontium						0.63 (0.11)	0.61 (0.11)
Tin						1.01 (0.11)	< 0.11 (0.11)
Vanadium						0.067 (0.056)	< 0.056 (0.056)
Zinc						1.19 (0.03)	0.22 (0.03)

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Edward H. Yonemoto
 Edward H. Yonemoto, Ph.D.
 Technical Director



CERTIFICATE OF ANALYSIS SUMMARY 1-73369

Project ID: 710016

K.E.I. Consultants, Inc.

Date Received in Lab : Dec 19, 1997 09:43

Project Manager: Theresa Nix

Project Name: TNMPL

Date Report Faxed: Jan 6, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	173369 001	173369 002	173369 003	173369 004	173369 005	173369 006
	Field ID:	MW-1	MW-6	MW-7	MW-8	MW-10	MW-11
	Depth:						
	Matrix:						
	Sampled:	Liquid 12/18/97 11:50	Liquid 12/18/97 12:32	Liquid 12/18/97 11:59	Liquid 12/18/97 12:20	Liquid 12/18/97 13:42	Liquid 12/18/97 12:55
BTEX EPA 8020	Analyzed: Units:	12/21/97 ppm R.L.	12/22/97 ppm R.L.	12/21/97 ppm R.L.	12/21/97 ppm R.L.	12/21/97 ppm R.L.	12/21/97 ppm R.L.
Benzene		< 0.001 (0.001)	0.363 (0.004)	< 0.004 (0.004)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	0.241 (0.004)	< 0.004 (0.004)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	0.015 (0.004)	< 0.004 (0.004)	< 0.001 (0.001)	< 0.001 (0.001)	0.003 (0.001)
m,p-Xylenes		< 0.002 (0.002)	0.066 (0.008)	< 0.008 (0.008)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	0.026 (0.004)	< 0.004 (0.004)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	0.711	N.D.	N.D.	N.D.	0.003
PAHs by GC-MS (610 List) EPA 8270	Analyzed: Units:					12/23/97 mg/L R.L.	12/23/97 mg/L R.L.
Acenaphthene						< 0.002 (0.002)	0.006 (0.002)
Acenaphthylene						< 0.002 (0.002)	0.003 (0.002)
Anthracene						< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)anthracene						< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)pyrene						< 0.002 (0.002)	< 0.002 (0.002)
Benzo(b)fluoranthene						< 0.002 (0.002)	< 0.002 (0.002)
Benzo(g,h,i)perylene						< 0.002 (0.002)	< 0.002 (0.002)
Benzo(k)fluoranthene						< 0.002 (0.002)	< 0.002 (0.002)
Chrysene						< 0.002 (0.002)	< 0.002 (0.002)
Dibenzo(a,h)anthracene						< 0.002 (0.002)	< 0.002 (0.002)
Fluoranthene						< 0.002 (0.002)	< 0.002 (0.002)
Fluorene						< 0.002 (0.002)	0.027 (0.002)
Indeno(1,2,3-cd)pyrene						< 0.002 (0.002)	< 0.002 (0.002)
Naphthalene						< 0.002 (0.002)	0.122 (0.002)
Phenanthrene						< 0.002 (0.002)	0.028 (0.002)
Pyrene						< 0.002 (0.002)	0.003 (0.002)

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Edward H. Yonemoto
Edward H. Yonemoto, Ph.D.
Technical Director



CERTIFICATE OF ANALYSIS SUMMARY 1-73369

Project ID: 710016

K.E.I. Consultants, Inc.

Project Name: TNMPL

Date Received in Lab : Dec 19, 1997 09:43

Project Manager: Theresa Nix

Date Report Faxed: Jan 6, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	173369 001	173369 002	173369 003	173369 004	173369 005	173369 006
	Field ID:	MW-1	MW-6	MW-7	MW-8	MW-10	MW-11
	Depth:						
	Matrix:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	Sampled:	12/18/97 11:50	12/18/97 12:32	12/18/97 11:59	12/18/97 12:20	12/18/97 13:42	12/18/97 12:55
Bicarbonate SM 4500CO2D	Analyzed: Units:					12/23/97 mg/L R.L.	12/23/97 mg/L R.L.
Bicarbonate						108 (1.0)	145 (1.0)
Carbonate SM4500CO2D	Analyzed: Units:					12/23/97 ppm R.L.	12/23/97 ppm R.L.
Carbonate						< 1.0 (1.0)	< 1.0 (1.0)
Total Dissolved Solids EPA 160.1	Analyzed: Units:					12/23/97 mg/L R.L.	12/23/97 mg/L R.L.
Total Dissolved Solids						437 (4)	532 (4)
Anions by Ion Chromatography EPA 300.0	Analyzed: Units:					01/02/98 mg/L R.L.	01/02/98 mg/L R.L.
Chloride						53.4 (2.0)	55.3 (2.0)
Sulfate						63.7 (2.0)	68.0 (2.0)

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Technical Director

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Project ID: 710016

K.E.I. Consultants, Inc.Project Name: *TNMPL*

Date Received in Lab : Dec 19, 1997 09:43

Project Manager: Theresa Nix

Date Report Faxed: Jan 6, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	173369 007					
	Field ID:	MW-12					
	Depth:						
	Matrix:	Liquid					
	Sampled:	12/18/97 13:25					
Metals by ICP EPA 6010	Analyzed: Units:	12/30/97 mg/L	R.L.				
Aluminum		< 0.22	(0.22)				
Barium		0.073	(0.022)				
Beryllium		< 0.022	(0.022)				
Boron		< 0.1	(0.1)				
Cadmium		< 0.044	(0.044)				
Calcium		91.6	(0.6)				
Chromium		< 0.056	(0.056)				
Cobalt		< 0.056	(0.056)				
Copper		< 0.033	(0.033)				
Iron		< 0.11	(0.11)				
Magnesium		14.7	(0.1)				
Manganese		< 0.056	(0.056)				
Molybdenum		< 0.33	(0.33)				
Nickel		< 0.11	(0.11)				
Potassium		2.83	(0.56)				
Silicon		17.5	(0.1)				
Silver		< 0.089	(0.089)				
Sodium		37.6	(0.6)				
Strontium		0.50	(0.11)				
Tin		< 0.11	(0.11)				
Vanadium		< 0.056	(0.056)				
Zinc		0.12	(0.03)				

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XENCO contact : Carlos Castro/Edward Yonemoto

Project ID: 710016

Project Manager: Theresa Nix

Project Location: Lovington, NM

Analysis Requested	Lab ID:	173369 007					
	Field ID:	MW-12					
	Depth:						
	Matrix:	Liquid					
	Sampled:	12/18/97 13:25					
BTEX EPA 8020	Analyzed: Units:	12/21/97 ppm	R.L.				
Benzene		< 0.001 (0.001)					
Toluene		< 0.001 (0.001)					
Ethylbenzene		< 0.001 (0.001)					
m,p-Xylenes		< 0.002 (0.002)					
o-Xylene		< 0.001 (0.001)					
Total BTEX		N.D.					
PAHs by GC-MS (610 List) EPA 8270	Analyzed: Units:	12/23/97 mg/L	R.L.				
Acenaphthene		< 0.002 (0.002)					
Acenaphthylene		< 0.002 (0.002)					
Anthracene	**	0.616 (0.002)					
Benzo(a)anthracene		0.013 (0.002)					
Benzo(a)pyrene		0.003 (0.002)					
Benzo(b)fluoranthene		0.004 (0.002)					
Benzo(g,h,i)perylene		< 0.002 (0.002)					
Benzo(k)fluoranthene		0.004 (0.002)					
Chrysene		0.021 (0.002)					
Dibenzo(a,h)anthracene		< 0.002 (0.002)					
Fluoranthene		0.070 (0.002)					
Fluorene		0.094 (0.002)					
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)					
Naphthalene		< 0.002 (0.002)					
Phenanthrene	**	0.237 (0.002)					
Pyrene		0.054 (0.002)					

** Result beyond calibration limits

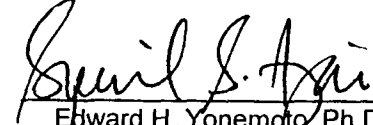
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Edward H. Yonemoto, Ph.D.
Technical Director

**CERTIFICATE OF ANALYSIS SUMMARY 1-73369****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Dec 19, 1997 09:43****Project ID: 710016**
Project Manager: Theresa Nix
Project Location: Lovington, NM**Date Report Faxed: Jan 6, 1998****XENCO contact : Carlos Castro/Edward Yonemoto**

Analysis Requested	Lab ID:	173369 007					
	Field ID:	MW-12					
	Depth:						
	Matrix:	Liquid					
	Sampled:	12/18/97 13:25					
	Analyzed:	12/23/97					
	Units:						
Bicarbonate SM 4500CO2D	Analyzed:	12/23/97	R.L.				
	Units:	mg/L					
Bicarbonate		117	(1.0)				
Carbonate SM4500CO2D	Analyzed:	12/23/97	R.L.				
	Units:	ppm					
Carbonate		< 1.0	(1.0)				
Total Dissolved Solids EPA 160.1	Analyzed:	12/23/97	R.L.				
	Units:	mg/L					
Total Dissolved Solids		524	(4)				
Anions by Ion Chromatography EPA 300.0	Analyzed:	01/02/98	R.L.				
	Units:	mg/L					
Chloride		70.3	(2.0)				
Sulfate		53.0	(2.0)				

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The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
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Edward H. Yonemoto, Ph.D.
Technical Director

EPA 6010 Metals by ICP

Date Validated: Jan 5, 1998 10:45

Analyst: CG

Date Analyzed: Dec 30, 1997 11:12

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.222	1.907	2.222	0.222	85.8	70-125	
Barium	< 0.0067	1.2122	1.1111	0.0067	109.1	80-120	
Beryllium	< 0.0222	0.4678	0.4444	0.0222	105.3	80-120	
Cadmium	< 0.0444	0.4989	0.4444	0.0444	112.3	80-120	
Calcium	0.229	4.852	4.444	0.056	104.0	80-120	
Chromium	< 0.0556	1.1589	1.1111	0.0556	104.3	80-120	
Cobalt	< 0.0111	1.1767	1.1111	0.0111	105.9	80-120	
Copper	< 0.0333	1.0189	1.1111	0.0333	91.7	70-125	
Iron	< 0.028	1.936	2.222	0.028	87.1	80-120	
Magnesium	< 0.056	4.146	4.444	0.056	93.3	80-120	
Manganese	< 0.0278	2.0189	2.2222	0.0278	90.9	80-120	
Molybdenum	< 0.111	1.011	1.110	0.111	91.1	70-125	
Nickel	< 0.111	1.176	1.111	0.111	105.8	80-120	
Potassium	0.128	4.143	4.444	0.111	90.3	80-120	
Sodium	0.436	9.326	8.880	0.111	100.1	80-120	
Strontium	< 0.111	1.941	2.222	0.111	87.3	70-125	
Vanadium	< 0.0133	1.1122	1.1111	0.0133	100.1	80-120	
Zinc	< 0.0333	1.1967	1.1111	0.0333	107.7	80-120	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. Not calculated, data below detection limit

N.D. Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto
 Edward H. Yonemoto, Ph.D.
 Technical Director



Certificate Of Quality Control for Batch : 18A18A03

EPA 6010 Metals by ICP

Date Validated: Jan 5, 1998 10:45

Analyst: CG

Date Analyzed: Dec 30, 1997 11:32

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 173369- 005	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample	Duplicate	Method	QC	LIMITS	Matrix Spike	Matrix	QC	LIMITS	Qualifier
	Result	Result	Detection	Relative	Relative	Result	Spike	Matrix Spike	Recovery	
Parameter	mg/L	mg/L	Limit	Difference	Difference	mg/L	Amount	Recovery	Range	
			mg/L	%	%		mg/L	%	%	
Aluminum	1.334	1.403	0.222	5.0	25.0	3.142	2.22	81.4	70-125	
Barium	0.177	0.150	0.007	16.5	20.0	1.230	1.11	94.9	70-125	
Beryllium	< 0.0222	< 0.0222	0.0222	N.C	20.0	0.4344	0.444	97.7	70-125	
Cadmium	< 0.0444	< 0.0444	0.0444	N.C	20.0	0.4644	0.444	104.5	70-125	
Calcium	306	319	0.06	4.2	20.0	284	4.4	495.0	70-125	A,B
Chromium	< 0.0556	< 0.0556	0.0556	N.C	20.0	1.0978	1.111	98.8	70-125	
Cobalt	< 0.0111	< 0.0111	0.0111	N.C	20.0	1.0778	1.111	97.0	70-125	
Copper	< 0.0333	< 0.0333	0.0333	N.C	25.0	0.9411	1.111	84.7	70-125	
Iron	2.034	2.073	0.028	1.9	20.0	3.818	2.22	80.3	70-125	
Magnesium	12.56	13.28	0.06	5.6	20.0	15.67	4.4	70.0	70-125	
Manganese	0.200	0.204	0.028	2.0	20.0	2.219	2.22	90.9	70-125	
Molybdenum	<0.333	<0.333	0.333	N.C	25.0	1.003	1.11	76.3	70-125	
Nickel	< 0.111	< 0.111	0.111	N.C	20.0	1.112	1.11	100.1	70-125	

(A) High analyte concentration affects spike recovery.

(B) Post-digestion spike within acceptance limits.

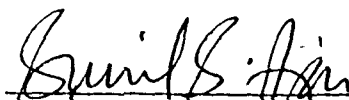
Relative Difference [D] = $200 \times (B-A)/(B+A)$

Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A18A03

EPA 6010 Metals by ICP

Date Validated: Jan 5, 1998 10:45

Analyst: CG

Date Analyzed: Dec 30, 1997 11:32

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 173369- 005	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Method Detection Limit mg/L	[D]	[E]	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
				QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Potassium	3.840	3.394	0.111	12.3	20.0	6.858	4.44	67.9	75-125	B
Silver	< 0.0444	< 0.0444	0.0444	N.C	20.0	0.0522	0.889	5.9	75-125	B
Sodium	46.72	43.97	0.11	6.1	20.0	45.91	4.4	18.2	75-125	A,B
Strontium	0.629	0.582	0.111	7.8	25.0	2.460	2.22	82.4	75-125	
Vanadium	0.0667	0.0622	0.0133	7.0	20.0	1.0944	1.111	92.5	75-125	
Zinc	1.189	1.199	0.033	0.8	20.0	2.183	1.11	89.5	75-125	

(A) High analyte concentration affects spike recovery.

(B) Post-digestion spike within acceptance limits.

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

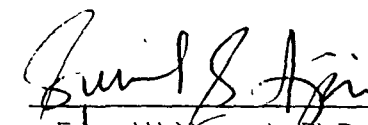
Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 17A25D97

SW- 846 5030/3020 BTEX

Date Validated: Dec 22, 1997 17:00

Analyst: HL

Date Analyzed: Dec 21, 1997 18:41

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY											
Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit		QC	QC	QC	Blank Spike Recovery	
	ppm	ppm	ppm	ppm	ppm		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Blank Spike Recovery Range %	
Benzene	< 0.0010	0.0971	0.0938	0.1000	0.0010	20.0	3.5	97.1	93.8	65-135	
Toluene	< 0.0010	0.0902	0.0891	0.1000	0.0010	20.0	1.2	90.2	89.1	65-135	
Ethylbenzene	< 0.0010	0.0975	0.0969	0.1000	0.0010	20.0	0.6	97.5	96.9	65-135	
m,p-Xylenes	< 0.0020	0.2020	0.2030	0.2000	0.0020	20.0	0.5	100.8	101.3	65-135	
o-Xylene	< 0.0010	0.0954	0.0963	0.1000	0.0010	20.0	0.9	95.4	96.3	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes

How many Duplicates? Two (Minimum)

Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 17A25D97

SW- 846 5030/8020 BTEX

Date Validated: Dec 22, 1997 17:00

Analyst: HL

Date Analyzed: Dec 21, 1997 19:39

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 173369- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.0981	0.1020	0.1000	0.0010	20.0	3.9	98.1	102.0	65-135	
Toluene	< 0.0010	0.0945	0.0971	0.1000	0.0010	20.0	2.7	94.5	97.1	65-135	
Ethylbenzene	< 0.0010	0.1030	0.1060	0.1000	0.0010	20.0	2.9	103.0	106.0	65-135	
m,p-Xylenes	< 0.0020	0.2160	0.2230	0.2000	0.0020	20.0	3.2	108.0	111.5	65-135	
o-Xylene	< 0.0010	0.1030	0.1060	0.1000	0.0010	20.0	2.9	103.0	106.0	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

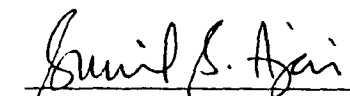
M S D = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes

Houston Dallas San Antonio


Edward H. Yonemoto, Ph.D.
Technical Director

SM 4500C02D Bicarbonate

Date Validated: Dec 23, 1997 17:50

Analyst: IF

Date Analyzed: Dec 23, 1997 10:00

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	Qualifier
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Bicarbonate	< 1.00	250	250	1.00	100.0	70-125	

Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. Not calculated, data below detection limit

N.D. Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto
Edward H. Yonemoto, Ph.D.
Technical Director

SM 4500CO2D Bicarbonate

Date Validated: Dec 23, 1997 17:50

Analyst: IF

Date Analyzed: Dec 23, 1997 10:30

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 173369- 005	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Parameter						
Bicarbonate	108	107	1.00	0.9	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto
Edward H. Yonemoto, Ph.D.
Technical Director

SM4500C02D Carbonate

Date Validated: Dec 23, 1997 17:50

Analyst: IF

Date Analyzed: Dec 23, 1997 10:30

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

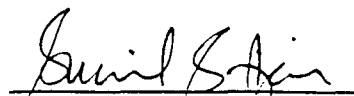
MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 173369- 005	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	
Parameter	ppm	ppm	ppm	Relative Difference %	Relative Difference %	Qualifier
Carbonate	108	107	1.00	0.9	25.0	

Relative Difference [D] = $200 \times (B-A) / (B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 17A02D35

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Dec 26, 1997 11:55

Analyst: LC

Date Analyzed: Dec 23, 1997 02:14

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result mg/L	Blank Spike Result mg/L	Blank Spike Duplicate Result mg/L	Blank Spike Amount mg/L	Method Detection Limit mg/L		QC	QC	QC	Blank Spike Recovery Range %	
							Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %		
Acenaphthene	< 0.0050	0.0748	0.0752	0.1000	0.0050	31.0	0.5	74.8	75.2	46-118	
4-Chloro-3-Methylphenol	< 0.0076	0.0882	0.0898	0.1000	0.0076	42.0	1.8	88.2	89.8	23-97	
2-Chlorophenol	< 0.0100	0.0782	0.0780	0.1000	0.0100	40.0	0.3	78.2	78.0	27-123	
1,4-Dichlorobenzene	< 0.0084	0.0670	0.0664	0.1000	0.0084	28.0	0.9	67.0	66.4	36-97	
2,4-Dinitrotoluene	< 0.0100	0.0774	0.0788	0.1000	0.0100	38.0	1.8	77.4	78.8	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0688	0.0678	0.1000	0.0080	38.0	1.5	68.8	67.8	41-116	
4-Nitrophenol	< 0.0080	0.0498	0.0502	0.1000	0.0080	50.0	0.8	49.8	50.2	10-80	
Pentachlorophenol	< 0.0172	0.0976	0.0986	0.1000	0.0172	50.0	1.0	97.6	98.6	9-103	
Phenol	< 0.0074	0.0502	0.0498	0.1000	0.0074	42.0	0.8	50.2	49.8	12-89	
Pyrene	< 0.0040	0.0930	0.0902	0.1000	0.0040	31.0	3.1	93.0	90.2	26-127	
1,2,4-Trichlorobenzene	< 0.0108	0.0688	0.0696	0.1000	0.0108	28.0	1.2	68.8	69.6	39-98	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

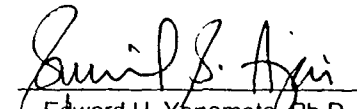
Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
Technical Director

EPA 160.1 Total Dissolved Solids

Date Validated: Dec 26, 1997 09:10

Analyst: EZ

Date Analyzed: Dec 23, 1997 11:40

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 173391- 002	[A]	[B]	[C]	[D]	[E]	[F]
	Sample	Duplicate	Method	QC	LIMITS	Qualifier
	Result	Result	Detection	Relative	Relative	
Parameter	mg/L	mg/L	Limit	Difference	Difference	
			mg/L	%	%	
Total Dissolved Solids	541	522	4.0	3.6	25.0	

Relative Difference [D] = $200 \times (B-A) / (B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto
Edward H. Yonemoto, Ph.D.

Technical Director

EPA 300.0 Anions by Ion Chromatography

Date Validated: Jan 5, 1998 10:25

Analyst: OR

Date Analyzed: Jan 2, 1998 21:01

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 173369- 007	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Qualifier
	mg/L	mg/L	mg/L			
Chloride	70.26	69.82	0.05	0.6	20.0	
Sulfate	52.97	53.78	0.10	1.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A10A03

EPA 300.0 Anions by Ion Chromatography

Date Validated: Jan 5, 1998 10:25

Analyst: OR

Date Analyzed: Jan 2, 1998 20:36

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Parameter	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result mg/L	Blank Spike Result mg/L	Blank Spike Duplicate Result mg/L	Blank Spike Amount mg/L	Method Detection Limit mg/L		QC	QC	QC	Blank Spike Recovery Range %	
							Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %		
Chloride	< 0.050	4.713	4.758	5.000	0.050	20.0	1.0	94.3	95.2	70-125	
Sulfate	< 0.10	4.67	4.67	5.00	0.10	20.0	0.0	93.4	93.4	70-125	

Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \times (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
Technical Director



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: TNMPL

XENCO COC#: 1-73369

Date Received in Lab: Dec 19, 1997 09:43 by CC

XENCO contact : Carlos Castro/Edward Yonemoto

Project ID: 710016

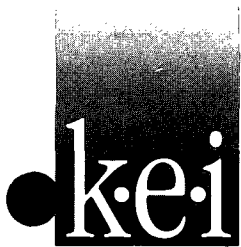
Project Manager: Theresa Nix

Project Location: Lovington, NM

Project Location:						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	173369-001	BTEX	SW-846	ppm	Standard	Dec 18, 1997 11:50		Dec 21, 1997 by HL	Dec 21, 1997 19:39 by HL
2	MW-6	173369-002	BTEX	SW-846	ppm	Standard	Dec 18, 1997 12:32		Dec 22, 1997 by HL	Dec 22, 1997 02:38 by HL
3	MW-7	173369-003	BTEX	SW-846	ppm	Standard	Dec 18, 1997 11:59		Dec 21, 1997 by HL	Dec 21, 1997 22:30 by HL
4	MW-8	173369-004	BTEX	SW-846	ppm	Standard	Dec 18, 1997 12:20		Dec 21, 1997 by HL	Dec 21, 1997 21:14 by HL
5	MW-10	173369-005	PAHs	SW846-8270	mg/L	Standard	Dec 18, 1997 13:42		Dec 22, 1997 by LC	Dec 23, 1997 10:07 by LC
6			Anions	EPA 300.0	mg/L	Standard	Dec 18, 1997 13:42		Jan 2, 1998 by OR	Jan 2, 1998 20:45 by OR
7			Carbonate	SM4500CO2D	ppm	Standard	Dec 18, 1997 13:42		Dec 23, 1997 by IF	Dec 23, 1997 10:30 by IF
8			Bicarbonate	SM 4500CO2D	mg/L	Standard	Dec 18, 1997 13:42		Dec 23, 1997 by IF	Dec 23, 1997 10:30 by IF
9			TDS	EPA 160.1	mg/L	Standard	Dec 18, 1997 13:42		Dec 22, 1997 by EZ	Dec 23, 1997 11:50 by EZ
10			Metals (ICP)	EPA 6010	mg/L	Standard	Dec 18, 1997 13:42		Dec 24, 1997 by AO	Dec 30, 1997 11:25 by CG
11			BTEX	SW-846	ppm	Standard	Dec 18, 1997 13:42		Dec 21, 1997 by HL	Dec 21, 1997 21:33 by HL
12	MW-11	173369-006	PAHs	SW846-8270	mg/L	Standard	Dec 18, 1997 12:55		Dec 22, 1997 by LC	Dec 23, 1997 10:53 by LC
13			Anions	EPA 300.0	mg/L	Standard	Dec 18, 1997 12:55		Jan 2, 1998 by OR	Jan 2, 1998 20:53 by OR
14			Carbonate	SM4500CO2D	ppm	Standard	Dec 18, 1997 12:55		Dec 23, 1997 by IF	Dec 23, 1997 10:50 by IF
15			Bicarbonate	SM 4500CO2D	mg/L	Standard	Dec 18, 1997 12:55		Dec 23, 1997 by IF	Dec 23, 1997 10:50 by IF
16			TDS	EPA 160.1	mg/L	Standard	Dec 18, 1997 12:55		Dec 22, 1997 by EZ	Dec 23, 1997 11:55 by EZ
17			Metals (ICP)	EPA 6010	mg/L	Standard	Dec 18, 1997 12:55		Dec 24, 1997 by AO	Dec 30, 1997 11:45 by CG
18			BTEX	SW-846	ppm	Standard	Dec 18, 1997 12:55		Dec 21, 1997 by HL	Dec 21, 1997 21:52 by HL
19	MW-12	173369-007	PAHs	SW846-8270	mg/L	Standard	Dec 18, 1997 13:25		Dec 22, 1997 by LC	Dec 23, 1997 11:39 by LC
20			Anions	EPA 300.0	mg/L	Standard	Dec 18, 1997 13:25		Jan 2, 1998 by OR	Jan 2, 1998 21:01 by OR
21			Carbonate	SM4500CO2D	ppm	Standard	Dec 18, 1997 13:25		Dec 23, 1997 by IF	Dec 23, 1997 11:00 by IF
22			Bicarbonate	SM 4500CO2D	mg/L	Standard	Dec 18, 1997 13:25		Dec 23, 1997 by IF	Dec 23, 1997 11:00 by IF
23			TDS	EPA 160.1	mg/L	Standard	Dec 18, 1997 13:25		Dec 22, 1997 by EZ	Dec 23, 1997 12:00 by EZ
24			Metals (ICP)	EPA 6010	mg/L	Standard	Dec 18, 1997 13:25		Dec 24, 1997 by AO	Dec 30, 1997 11:52 by CG
25			BTEX	SW-846	ppm	Standard	Dec 18, 1997 13:25		Dec 21, 1997 by HL	Dec 21, 1997 22:11 by HL

98 QTR 2





5309 Wurzbach, Suite 100
San Antonio, Texas 78238
(210) 680-3767
(210) 680-3763 FAX

November 3, 1998

Mr. Tony Savoie
TEXAS - NEW MEXICO PIPE LINE COMPANY
P. O. Box 1030
Jal, New Mexico 88252

RECEIVED

DEC 07 1998

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Re: Groundwater Monitoring Event
Texas - New Mexico Pipe Line Company
TNM-97-04
Section 11, Township 16 South, Range 35 East
Lovington, New Mexico
Job No. 710016-1

Dear Mr. Savoie:

Transmitted with this letter is the ground water binder update packet for the second quarter of 1998 ground water monitoring event conducted at TNM-97-04, located near Lovington, New Mexico. A copy has been submitted to OCD Hobbs and OCD Santa Fe.

The packet contains the following:

- Updated gauging tables and general notes
- Updated ground water laboratory results tables
- Updated figures
- A copy of the laboratory ground water results and chain-of-custody documentation
- A dated "tab" for the new event

Please remove and replace the former tables. Add the new dated tab and place the updated figures, laboratory reports, and chain-of-custody documentation behind this tab.

Please call me at (210) 680-3767 if you have any questions or comments.

Respectfully,

Theresa Nix
Project Manager

Enclosure

cc: Marc Oler, Equilon
OCD Hobbs
OCD Santa Fe, William Olson ✓
J. Michael Hawthorne, KEI

GENERAL NOTES

- ND - Indicates constituent was not detected above the method detection/reporting limit.
- PSH - Phase-separate hydrocarbons.
- - Indicates the constituent was not analyzed (TABLE I and III) or PSH was not detected and a corrected ground water elevation was not required (TABLE IV).
- SHEEN - Indicates a visible phase separation with a thickness less than 0.01 feet.

Depth to water is referenced from the top of PVC elevation.

Ground water elevations in monitoring wells containing PSH have been corrected for PSH density. (Correction Factor = 0.85 prior to December of 1997, Correction Factor = 0.814 as of December of 1997)

Method detection/reporting limits:

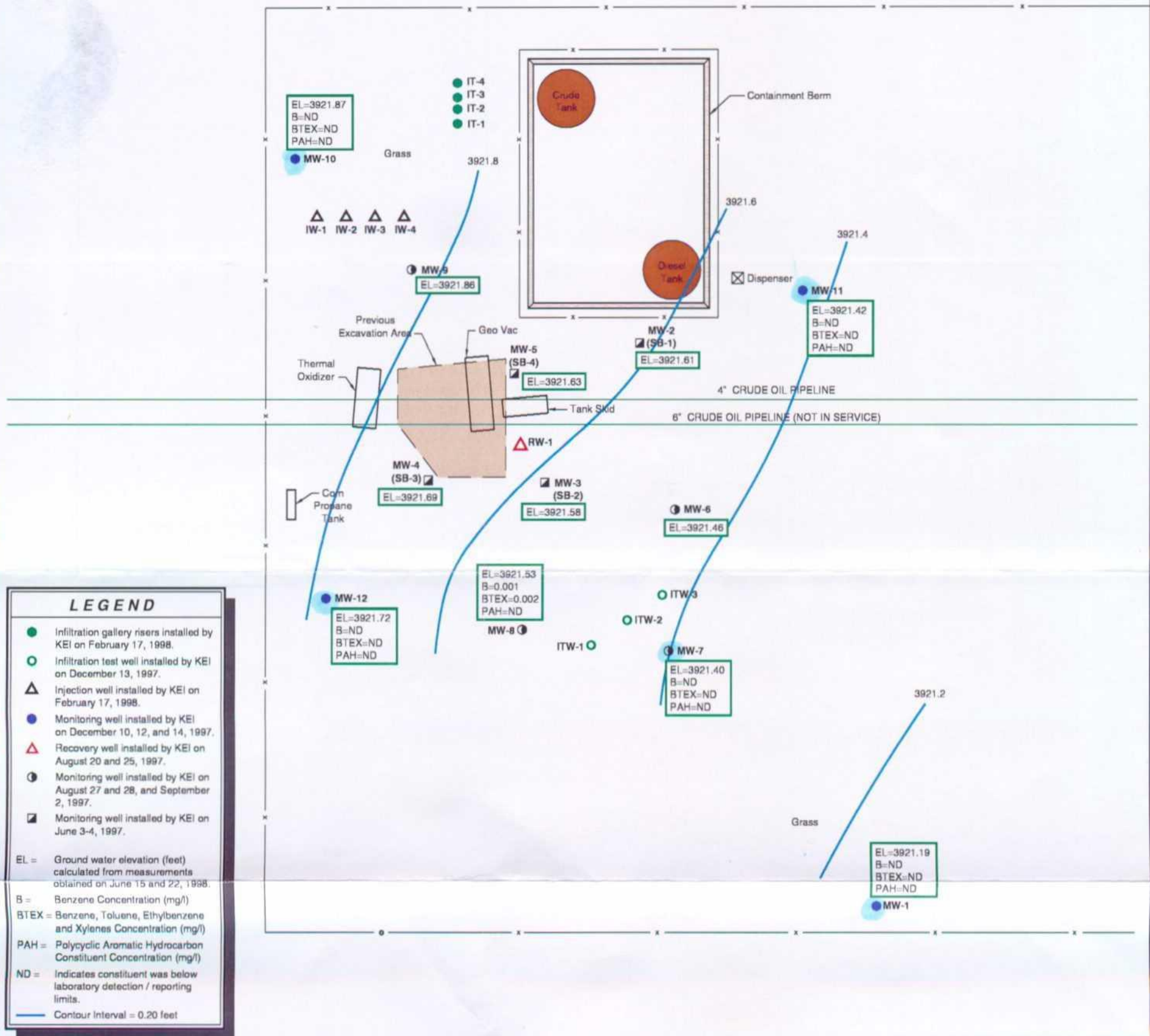
- BTEX - 0.001 to 0.008 mg/l
- TPH - 0.001 to 1 mg/l
- PAH - 0.002 mg/l
- Metals - 0.0011 to 50 mg/l

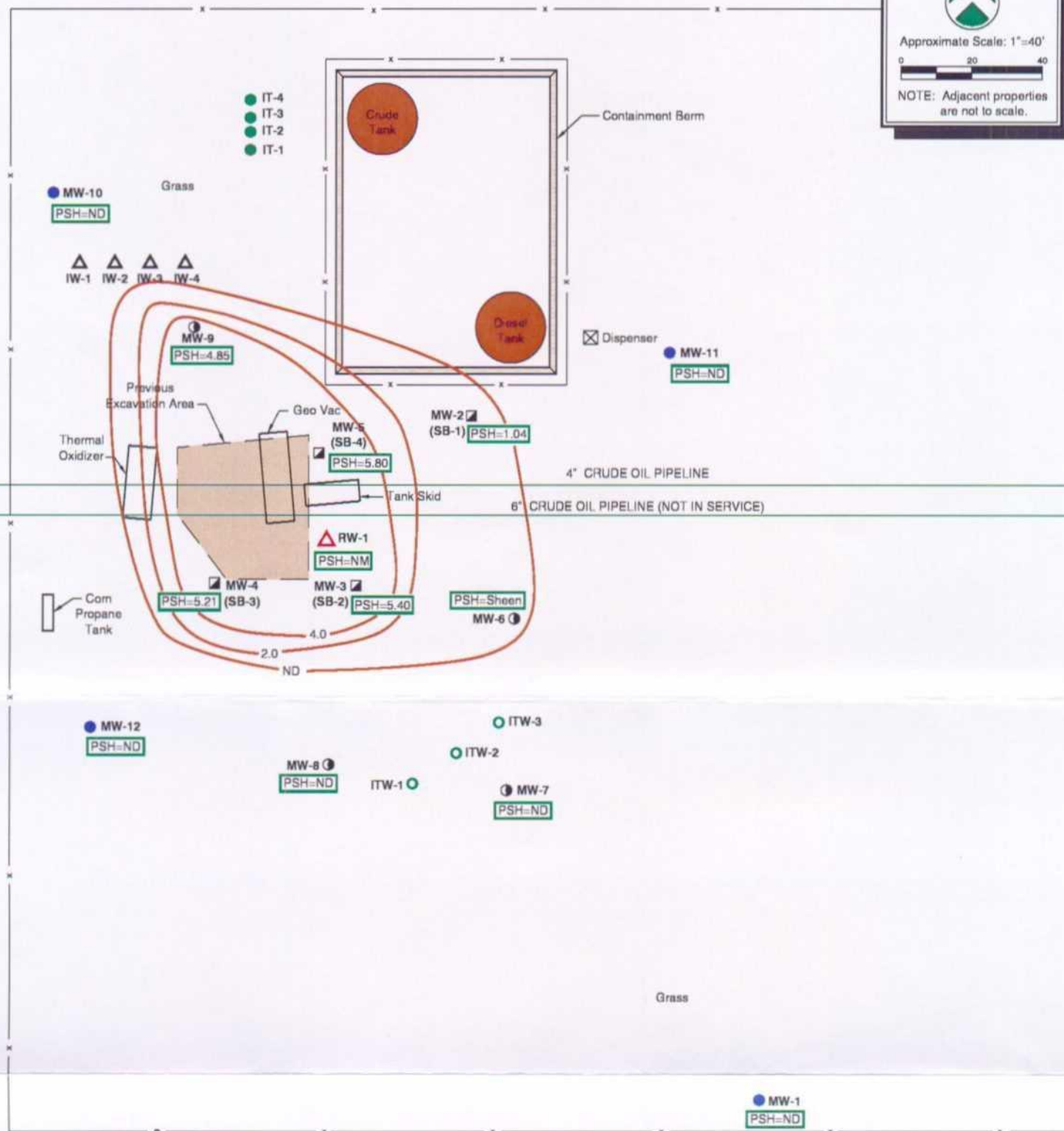
Laboratory test methods:

- BTEX - EPA Method SW846-8020, 5030
- TPH - EPA Method 418.1
- PAH - EPA Method 8100 or 8270
- Metals - EPA Method 6010

NOTES:

1. The ground water elevation in wells containing PSH was corrected using a factor of 0.814.
2. Ground water samples were collected on June 24, 1998.
3. Monitoring wells MW-2 through MW-6 and MW-9 were not sampled due to the presence of PSH.
4. RW-1 is not accessible due to the remediation system.





LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1998.
- Infiltration test well installed by KEI on December 13, 1997.
- △ Injection well installed by KEI on February 17, 1998.
- Monitoring well installed by KEI on December 10, 12, and 14, 1997.
- △ Recovery well installed by KEI on August 20 and 25, 1997.
- Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
- Monitoring well installed by KEI on June 3-4, 1997.
- Contour Interval = 2.0 feet
- PSH = Phase-separate hydrocarbon thickness (feet) measured on June 15 and 22, 1998.
- ND = Not Detected
- NM = Not Measured
- NOTE: RW-1 is not accessible due to the remediation system.

PSH THICKNESS MAP - JUNE 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016

FIG 2

kei

TABLE I
SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-1	06/18/97	ND	ND	ND	ND	ND	ND
MW-1	09/10/97	ND	ND	ND	ND	ND	—
MW-1	12/18/97	ND	ND	ND	ND	ND	—
MW-1	03/05/98	ND	ND	ND	ND	ND	—
MW-1	06/24/98	ND	ND	ND	ND	ND	—
MW-2	06/18/97	0.044	0.014	0.004	0.008	0.070	2
MW-2	09/10/97	18.25	9.70	0.61	3.10	31.66	—
MW-4	06/18/97	0.155	0.106	0.007	0.023	0.291	2
MW-6	09/10/97	0.003	ND	ND	ND	0.003	—
MW-6	12/18/97	0.363	0.241	0.015	0.092	0.711	—
MW-6	03/05/98	7.5	1.8	0.2	0.5	10.0	—
MW-7	09/10/97	0.002	0.001	ND	ND	0.003	—
MW-7	12/18/97	ND	ND	ND	ND	ND	—
MW-7	03/05/98	ND	ND	ND	ND	ND	—
MW-7	06/24/98	ND	ND	ND	ND	ND	—
MW-8	09/10/97	0.012	ND	ND	ND	0.012	—
MW-8	12/18/97	ND	ND	ND	ND	ND	—
MW-8	03/05/98	0.025	ND	ND	ND	0.025	—
MW-8	06/24/98	0.001	0.001	ND	ND	0.002	—
MW-9	09/10/97	0.055	0.014	ND	ND	0.069	—
MW-10	12/18/97	ND	ND	ND	ND	ND	—
MW-10	03/05/98	0.003	ND	ND	ND	0.003	—
MW-10	06/24/98	ND	ND	ND	ND	ND	—
MW-11	12/18/97	ND	ND	0.003	ND	0.003	—
MW-11	03/05/98	0.002	ND	ND	ND	0.002	—
MW-11	06/24/98	ND	ND	ND	ND	ND	—
MW-12	12/18/97	ND	ND	ND	ND	ND	—
MW-12	03/05/98	0.003	ND	ND	ND	0.003	—
MW-12	06/24/98	ND	ND	ND	ND	ND	—
LOV-1 (crude)	11/07/97	---	—	—	—	—	9.3

TABLE II

**SUMMARY OF GROUND WATER RESULTS - PAH
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-6	MW-7	MW-8	MW-10
DATE SAMPLED:	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	03/05/98	03/05/98	03/05/98	03/05/98	03/05/98
PARAMETER:	CONCENTRATION (mg/l)													
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	0.006	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.616	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.013	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	0.021	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.070	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	0.027	0.094	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	—	0.122	—	—	—	—	—	—
Naphthalene	ND	0.071	ND	ND	ND	ND	ND	0.028	0.237	ND	0.037	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	0.003	0.054	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Benzo(j)fluoranthene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
7H-Dibenzo(c,g)carbazole	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Dibenzo(a,h)pyrene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Dibenzo(a,i)pyrene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—

TABLE II
(continued)

SUMMARY OF GROUND WATER RESULTS - PAH
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE ID:	MW-11	MW-12	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED:	03/05/98	03/05/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98
PARAMETER:	CONCENTRATION (mg/l)							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	—	—	—	—	—	—	—	—
Naphthalene	ND	0.006	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	—	—	—	—	—	—	—	—
Benzo(j)fluoranthene	—	—	—	—	—	—	—	—
7H-Dibenzo(c,g)carbazole	—	—	—	—	—	—	—	—
Dibenzo(a,h)pyrene	—	—	—	—	—	—	—	—
Dibenzo(a,i)pyrene	—	—	—	—	—	—	—	—

TABLE III

SUMMARY OF GROUND WATER RESULTS - METALS
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE ID	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98
PARAMETER	CONCENTRATION (mg/l)												
Aluminum	0.61	0.82	0.32	0.41	1.33	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Barium	0.058	0.079	0.084	0.072	0.18	0.10	0.073	0.10	0.09	0.08	0.09	0.09	0.11
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	ND	ND	ND	ND	0.18	0.15	ND	0.19	0.20	0.13	0.17	0.13	0.11
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	69.4	88.5	118	98.5	306	121	91.6	140	102	105	118	143	151
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	0.40	0.47	0.19	0.23	2.03	0.13	ND	ND	ND	ND	ND	ND	ND
Lead	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Magnesium	10.1	13.3	17.1	13.7	12.6	14.0	14.7	15.2	15.4	16.1	18.1	14.9	18.5
Manganese	ND	ND	ND	ND	0.20	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	1.48	1.60	2.07	1.94	3.84	2.75	2.83	1.71	1.64	1.58	2.34	1.95	2.80
Selenium	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Silicon	20.8	21.0	20.8	21.1	21.1	17.6	17.5	20.8	21.6	22.1	22.0	20.2	21.9
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	18.6	33.9	32.1	31.9	46.7	29.5	37.6	38.4	40.5	30.6	42.3	28.1	33.8
Strontium	0.53	0.60	0.75	0.62	0.63	0.61	0.50	0.75	0.75	0.77	0.82	0.75	0.78
Tin	ND	ND	ND	ND	1.01	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	0.067	ND	ND	ND	ND	ND	ND	ND	0.05
Zinc	ND	ND	ND	ND	1.19	0.22	0.12	ND	ND	ND	0.16	0.11	0.10
Mercury	ND	ND	ND	ND	—	—	—	ND	ND	ND	ND	ND	ND

TABLE IV

**MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.19	53.15	3921.04	—	—
07/29/97	3,974.19	53.05	3921.14	—	—
09/10/97	3,974.19	52.99	3921.20	—	—
10/22/97	3,974.19	52.98	3921.21	—	—
10/29/97	3,974.19	52.98	3921.21	—	—
11/04/97	3,974.19	52.97	3921.22	—	—
11/11/97	3,974.19	52.97	3921.22	—	—
12/04/97	3,974.19	52.97	3921.22	—	—
12/10/97	3,974.19	52.99	3921.20	—	—
12/18/97	3,974.18	52.97	3921.21	—	—
12/23/97	3,974.18	52.96	3921.22	—	—
12/31/97	3,974.18	52.96	3921.22	—	—
01/06/98	3,974.18	52.96	3921.22	—	—
01/06/98	3,974.18	52.96	3921.22	—	—
01/07/98	3,974.18	52.97	3921.21	—	—
01/15/98	3,974.18	52.96	3921.22	—	—
01/23/98	3,974.18	52.98	3921.20	—	—
01/27/98	3,974.18	52.97	3921.21	—	—
02/03/98	3,974.18	52.95	3921.23	—	—
02/11/98	3,974.18	52.97	3921.21	—	—
02/17/98	3,974.18	52.95	3921.23	—	—
02/25/98	3,974.18	52.93	3921.25	—	—
03/05/98	3,974.18	52.91	3921.27	—	—
03/11/98	3,974.18	52.94	3921.24	—	—
03/16/98	3,974.18	52.93	3921.25	—	—
03/25/98	3,974.18	52.92	3921.26	—	—
03/31/98	3,974.18	52.90	3921.28	—	—
04/09/98	3,974.18	52.96	3921.22	—	—
04/16/98	3,974.18	52.95	3921.23	—	—
04/21/98	3,974.18	52.96	3921.22	—	—
04/28/98	3,974.18	52.94	3921.24	—	—
05/04/98	3,974.18	52.95	3921.23	—	—
05/11/98	3,974.18	52.97	3921.21	—	—

TABLE IV
(continued)

MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
05/18/98	3,974.18	52.99	3921.19	—	—
05/27/98	3,974.18	52.98	3921.20	—	—
06/01/98	3,974.18	53.02	3921.16	—	—
06/09/98	3,974.18	52.94	3921.24	—	—
06/15/98	3,974.18	53.94	3920.24	—	—
06/22/98	3,974.18	52.99	3921.19	—	—
06/24/98	3,974.18	52.96	3921.22	—	—

TABLE IV
(continued)

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.65	53.24	3921.41	—	—
07/29/97	3,974.65	53.14	3921.51	—	—
09/10/97	3,974.65	53.11	3921.54	—	SHEEN
10/22/97	3,974.65	53.20	3921.45	3921.60	0.18
10/29/97	3,974.65	53.24	3921.41	3921.60	0.22
11/04/97	3,974.65	53.26	3921.39	3921.60	0.25
11/11/97	3,974.65	53.30	3921.35	3921.61	0.30
12/04/97	3,974.65	53.45	3921.20	3921.58	0.47
12/10/97	3,974.65	53.47	3921.18	3921.60	0.52
12/18/97	3,974.62	53.51	3921.11	3921.36	0.30
12/23/97	3,974.62	53.52	3921.10	3921.59	0.60
12/31/97	3,974.62	53.58	3921.04	3921.57	0.65
01/06/98	3,974.62	53.58	3921.04	3921.61	0.69
01/06/98	3,974.62	53.57	3921.05	3921.62	0.69
01/06/98	3,974.62	53.60	3921.02	3921.59	0.70
01/06/98	3,974.62	53.59	3921.03	3921.60	0.69
01/06/98	3,974.62	53.61	3921.01	3921.59	0.71
01/07/98	3,974.62	53.66	3920.96	3921.54	0.71
01/08/98	3,974.62	53.65	3920.97	3921.58	0.75
01/09/98	3,974.62	53.64	3920.98	3921.59	0.74
01/10/98	3,974.62	53.70	3920.92	3921.53	0.75
01/12/98	3,974.62	53.67	3920.95	3921.57	0.76
01/15/98	3,974.62	53.68	3920.94	3921.57	0.77
01/23/98	3,974.62	53.78	3920.84	3921.53	0.84
01/27/98	3,974.62	53.80	3920.82	3921.52	0.86
02/03/98	3,974.62	53.77	3920.85	3921.55	0.86
02/11/98	3,974.62	53.88	3920.74	3921.53	0.97
02/17/98	3,974.62	53.80	3920.82	3921.57	0.92
02/25/98	3,974.62	53.78	3920.84	3921.59	0.92
03/05/98	3,974.62	53.82	3920.80	3921.59	0.96
03/11/98	3,974.62	53.87	3920.75	3921.58	1.01
03/16/98	3,974.62	53.85	3920.77	3921.59	1.00
03/25/98	3,974.62	53.93	3920.69	3921.61	1.12
03/31/98	3,974.62	53.42	3921.20	3921.62	0.51
04/09/98	3,974.62	53.79	3920.83	3921.46	0.77

TABLE IV
(continued)

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/16/98	3,974.62	53.60	3921.02	3921.59	0.69
04/21/98	3,974.62	53.65	3920.97	3921.58	0.75
04/28/98	3,974.62	53.70	3920.92	3921.58	0.81
04/29/98	3,974.62	53.99	3920.63	3921.42	0.97
04/30/98	3,974.62	53.94	3920.68	3921.46	0.95
05/01/98	3,974.62	53.92	3920.70	3921.48	0.95
05/04/98	3,974.62	53.66	3920.96	3921.62	0.81
05/11/98	3,974.62	53.93	3920.69	3921.50	0.99
05/13/98	3,974.62	53.80	3920.82	3921.60	0.95
05/18/98	3,974.62	53.84	3920.78	3921.55	0.94
05/27/98	3,974.62	53.88	3920.74	3921.56	1.00
06/01/98	3,974.62	53.91	3920.71	3921.54	1.02
06/09/98	3,974.62	53.80	3920.82	3921.62	0.98
06/15/98	3,974.62	53.86	3920.76	3921.61	1.04

TABLE IV
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.63	60.08	3914.55	3921.94	8.69
06/23/97	3,974.63	60.08	3914.55	3921.96	8.72
06/23/97	3,974.63	53.30	3921.33	3921.56	0.27
06/23/97	3,974.63	53.78	3920.85	3921.71	1.01
06/25/97	3,974.63	59.85	3914.78	3921.99	8.48
06/25/97	3,974.63	55.50	3919.13	3921.72	3.05
06/25/97	3,974.63	56.34	3918.29	3921.78	4.10
06/25/97	3,974.63	53.29	3921.34	—	—
06/27/97	3,974.63	59.99	3914.64	3921.96	8.61
06/27/97	3,974.63	56.68	3917.95	3921.60	4.29
07/01/97	3,974.63	59.99	3914.64	3921.96	8.61
07/03/97	3,974.63	60.04	3914.59	3921.98	8.69
07/03/97	3,974.63	55.22	3919.41	3921.75	2.75
07/29/97	3,974.63	60.03	3914.60	3921.96	8.66
07/29/97	3,974.63	54.47	3920.16	3921.90	2.05
09/10/97	3,974.63	59.81	3914.82	3921.96	8.40
09/16/97	3,974.63	59.86	3914.77	3921.95	8.45
09/23/97	3,974.63	59.84	3914.79	3921.96	8.44
10/22/97	3,974.63	59.78	3914.85	3921.96	8.37
10/29/97	3,974.63	59.75	3914.88	3921.96	8.33
11/04/97	3,974.63	59.73	3914.90	3921.96	8.31
11/11/97	3,974.63	59.70	3914.93	3921.97	8.28
12/04/97	3,974.63	59.64	3914.99	3921.66	8.19
12/10/97	3,974.63	59.56	3915.07	3921.68	8.12
12/18/97	3,974.60	59.56	3915.04	3921.64	8.11
12/23/97	3,974.60	59.52	3915.08	3921.66	8.08
12/31/97	3,974.60	59.47	3915.13	3921.65	8.00
01/06/98	3,974.60	59.48	3915.12	3921.67	8.04
01/06/98	3,974.60	59.53	3915.07	3921.63	8.06
01/06/98	3,974.60	59.45	3915.15	3921.61	7.93
01/06/98	3,974.60	59.49	3915.11	3921.60	7.97
01/06/98	3,974.60	59.48	3915.12	3921.60	7.96
01/07/98	3,974.60	59.54	3915.06	3921.56	7.98
01/08/98	3,974.60	59.44	3915.16	3921.58	7.88
01/09/98	3,974.60	59.58	3915.02	3921.54	8.00

TABLE IV
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
01/10/98	3,974.60	59.35	3915.25	3921.54	7.72
01/12/98	3,974.60	59.22	3915.38	3921.58	7.61
01/15/98	3,974.60	59.18	3915.42	3921.57	7.55
01/23/98	3,974.60	58.98	3915.62	3921.52	7.24
01/27/98	3,974.60	58.89	3915.71	3921.53	7.15
02/03/98	3,974.60	58.83	3915.77	3921.54	7.09
02/11/98	3,974.60	58.67	3915.93	3921.53	6.87
02/17/98	3,974.60	58.74	3915.86	3921.63	7.09
02/25/98	3,974.60	58.85	3915.75	3921.65	7.25
03/05/98	3,974.60	58.85	3915.75	3921.65	7.24
03/11/98	3,974.60	58.87	3915.73	3921.64	7.26
03/16/98	3,974.60	58.86	3915.74	3921.65	7.26
03/25/98	3,974.60	58.87	3915.73	3921.67	7.29
03/31/98	3,974.60	58.74	3915.86	3921.68	7.14
04/09/98	3,974.60	59.13	3915.47	3921.06	6.86
04/16/98	3,974.60	58.48	3916.12	3921.64	6.78
04/21/98	3,974.60	58.52	3916.08	3921.65	6.84
04/28/98	3,974.60	58.45	3916.15	3921.64	6.74
04/29/98	3,974.60	58.91	3915.69	3921.01	6.53
04/30/98	3,974.60	58.63	3915.97	3921.09	6.29
05/01/98	3,974.60	58.55	3916.05	3921.02	6.10
05/04/98	3,974.60	57.92	3916.68	3921.66	6.11
05/11/98	3,974.60	57.82	3916.78	3921.15	5.36
05/13/98	3,974.60	58.13	3916.47	3921.18	5.78
05/18/98	3,974.60	57.16	3917.44	3921.44	4.91
05/27/98	3,974.60	57.78	3916.82	3921.30	5.50
06/01/98	3,974.60	57.01	3917.59	3921.47	4.76
06/09/98	3,974.60	57.32	3917.28	3921.68	5.40
06/15/98	3,974.60	57.42	3917.18	3921.67	5.51
06/22/98	3,974.60	57.42	3917.18	3921.58	5.40

TABLE IV
(continued)

**MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.55	52.96	3921.59	—	—
07/29/97	3,974.55	52.92	3921.63	—	—
09/10/97	3,974.55	54.53	3920.02	3921.80	2.09
09/16/97	3,974.55	54.38	3920.17	3921.80	1.92
09/23/97	3,974.55	54.45	3920.10	3921.81	2.01
10/22/97	3,974.55	57.92	3916.63	3922.00	6.32
10/29/97	3,974.55	57.29	3917.26	3921.96	5.53
11/04/97	3,974.55	56.75	3917.80	3921.92	4.85
11/11/97	3,974.55	57.63	3916.92	3921.98	5.95
12/04/97	3,974.55	58.53	3916.02	3921.76	7.05
12/10/97	3,974.55	58.25	3916.30	3921.80	6.75
12/18/97	3,974.53	58.57	3915.96	3921.75	7.11
12/23/97	3,974.53	58.17	3916.36	3921.76	6.63
12/31/97	3,974.53	58.36	3916.17	3921.77	6.87
01/06/98	3,974.53	58.48	3916.05	3921.80	7.06
01/06/98	3,974.53	58.48	3916.05	3921.78	7.03
01/06/98	3,974.53	58.50	3916.03	3921.76	7.04
01/06/98	3,974.53	58.47	3916.06	3921.76	7.00
01/06/98	3,974.53	58.47	3916.06	3921.76	7.00
01/07/98	3,974.53	58.53	3916.00	3921.72	7.02
01/08/98	3,974.53	58.54	3915.99	3921.73	7.05
01/09/98	3,974.53	58.53	3916.00	3921.73	7.03
01/10/98	3,974.53	58.51	3916.02	3921.70	6.97
01/12/98	3,974.53	58.51	3916.02	3921.68	6.95
01/15/98	3,974.53	58.47	3916.06	3921.73	6.96
01/23/98	3,974.53	58.37	3916.16	3921.70	6.80
01/27/98	3,974.53	52.31	3922.22	3922.81	0.72
02/03/98	3,974.53	58.20	3916.33	3921.71	6.60
02/11/98	3,974.53	58.13	3916.40	3921.69	6.49
02/17/98	3,974.53	58.11	3916.42	3921.75	6.54
02/25/98	3,974.53	58.09	3916.44	3921.77	6.54
03/05/98	3,974.53	58.07	3916.46	3921.76	6.51
03/11/98	3,974.53	58.05	3916.48	3921.75	6.47
03/16/98	3,974.53	58.11	3916.42	3921.76	6.56
03/25/98	3,974.53	58.10	3916.43	3921.77	6.56
03/31/98	3,974.53	57.88	3916.65	3921.80	6.32

TABLE IV
(continued)

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/09/98	3,974.53	58.28	3916.25	3921.50	6.45
04/16/98	3,974.53	57.89	3916.64	3921.76	6.29
04/21/98	3,974.53	57.82	3916.71	3921.76	6.20
04/28/98	3,974.53	57.83	3916.70	3921.75	6.20
04/29/98	3,974.53	58.28	3916.25	3921.43	6.36
04/30/98	3,974.53	58.12	3916.41	3921.46	6.20
05/01/98	3,974.53	58.09	3916.44	3921.50	6.21
05/04/98	3,974.53	57.64	3916.89	3921.78	6.00
05/11/98	3,974.53	57.71	3916.82	3921.54	5.80
05/13/98	3,974.53	57.63	3916.90	3921.63	5.81
05/18/98	3,974.53	57.24	3917.29	3921.66	5.36
05/27/98	3,974.53	57.30	3917.23	3921.61	5.38
06/01/98	3,974.53	57.02	3917.51	3921.66	5.10
06/09/98	3,974.53	56.99	3917.54	3921.78	5.21
06/15/98	3,974.53	56.99	3917.54	3921.78	5.20
06/22/98	3,974.53	57.08	3917.45	3921.69	5.21

TABLE IV
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.31	60.85	3913.46	3922.41	10.53
06/23/97	3,974.31	58.09	3916.22	3922.08	6.89
06/23/97	3,974.31	56.57	3917.74	3922.38	5.46
06/23/97	3,974.31	59.18	3915.13	3921.32	7.28
06/23/97	3,974.31	59.74	3914.57	3922.08	8.83
06/23/97	3,974.31	54.91	3919.40	3921.88	2.92
06/25/97	3,974.31	60.47	3913.84	3922.02	9.62
06/25/97	3,974.31	58.47	3915.84	3921.99	7.24
06/25/97	3,974.31	59.49	3914.82	3922.01	8.46
06/25/97	3,974.31	53.42	3920.89	3921.94	1.23
06/25/97	3,974.31	55.95	3918.36	3921.90	4.16
06/25/97	3,974.31	58.50	3915.81	3922.02	7.30
06/25/97	3,974.31	52.46	3921.85	3921.87	0.02
06/25/97	3,974.31	51.81	3922.50	3922.50	0.00
06/27/97	3,974.31	60.46	3913.85	3922.06	9.66
06/27/97	3,974.31	57.47	3916.84	3922.00	6.07
07/01/97	3,974.31	60.45	3913.86	3922.01	9.59
07/01/97	3,974.31	56.40	3917.91	3921.94	4.74
07/03/97	3,974.31	60.41	3913.90	3922.01	9.54
07/03/97	3,974.31	57.53	3916.78	3921.98	6.12
07/29/97	3,974.31	60.19	3914.12	3922.02	9.29
07/29/97	3,974.31	57.69	3916.62	3920.97	5.12
09/10/97	3,974.31	59.88	3914.43	3922.00	8.91
09/16/97	3,974.31	59.85	3914.46	3922.00	8.87
09/23/97	3,974.31	59.79	3914.52	3922.01	8.81
10/22/97	3,974.31	59.60	3914.71	3922.01	8.59
10/29/97	3,974.31	59.56	3914.75	3921.99	8.52
11/04/97	3,974.31	59.54	3914.77	3922.00	8.50
11/11/97	3,974.31	59.48	3914.83	3922.00	8.44
12/04/97	3,974.31	59.38	3914.93	3921.69	8.30
12/10/97	3,974.31	59.31	3915.00	3921.71	8.24
12/18/97	3,974.28	59.28	3915.00	3921.69	8.21
12/23/97	3,974.28	59.25	3915.03	3921.70	8.19
12/31/97	3,974.28	59.23	3915.05	3921.67	8.13
12/31/97	3,974.28	59.23	3915.05	3921.67	8.13

TABLE IV
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
01/06/98	3,974.28	59.19	3915.09	3921.70	8.11
01/06/98	3,974.28	59.21	3915.07	3921.69	8.13
01/06/98	3,974.28	59.20	3915.08	3921.66	8.08
01/06/98	3,974.28	59.19	3915.09	3921.66	8.06
01/06/98	3,974.28	59.17	3915.11	3921.68	8.06
01/07/98	3,974.28	59.23	3915.05	3921.62	8.06
01/08/98	3,974.28	59.17	3915.11	3921.66	8.04
01/09/98	3,974.28	59.14	3915.14	3921.57	7.89
01/10/98	3,974.28	59.16	3915.12	3921.60	7.96
01/12/98	3,974.28	59.06	3915.22	3921.65	7.89
01/15/98	3,974.28	59.03	3915.25	3921.64	7.85
01/23/98	3,974.28	58.90	3915.38	3921.60	7.64
01/27/98	3,974.28	58.83	3915.45	3921.60	7.55
02/03/98	3,974.28	58.74	3915.54	3921.62	7.46
02/11/98	3,974.28	58.60	3915.68	3921.60	7.27
02/17/98	3,974.28	58.59	3915.69	3921.69	7.36
02/25/98	3,974.28	58.63	3915.65	3921.70	7.43
03/05/98	3,974.28	58.61	3915.67	3921.70	7.40
03/11/98	3,974.28	58.60	3915.68	3921.68	7.37
03/16/98	3,974.28	58.58	3915.70	3921.70	7.37
03/25/98	3,974.28	58.57	3915.71	3921.71	7.36
03/31/98	3,974.28	58.52	3915.76	3921.72	7.32
04/09/98	3,974.28	58.69	3915.59	3921.32	7.03
04/16/98	3,974.28	58.33	3915.95	3921.69	7.05
04/21/98	3,974.28	58.33	3915.95	3921.70	7.06
04/28/98	3,974.28	58.29	3915.99	3921.68	6.99
04/29/98	3,974.28	58.41	3915.87	3921.33	6.70
04/30/98	3,974.28	58.29	3915.99	3921.31	6.53
05/01/98	3,974.28	58.11	3916.17	3921.38	6.40
05/04/98	3,974.28	57.96	3916.32	3921.72	6.63
05/11/98	3,974.28	57.80	3916.48	3921.44	6.09
05/13/98	3,974.28	57.88	3916.40	3921.54	6.31
05/18/98	3,974.28	57.33	3916.95	3921.60	5.71
05/27/98	3,974.28	57.67	3916.61	3921.51	6.02
06/01/98	3,974.28	57.14	3917.14	3921.60	5.48

TABLE IV
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/09/98	3,974.28	57.38	3916.90	3921.71	5.91
06/15/98	3,974.28	57.39	3916.89	3921.70	5.91
06/22/98	3,974.28	57.38	3916.90	3921.63	5.80

TABLE IV
(continued)

MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.73	53.29	3921.44	—	—
10/22/97	3,974.73	53.30	3921.43	—	—
10/29/97	3,974.73	53.30	3921.43	—	—
11/04/97	3,974.73	53.29	3921.44	—	—
11/11/97	3,974.73	53.30	3921.43	—	—
12/04/97	3,974.73	53.26	3921.47	—	—
12/10/97	3,974.73	53.25	3921.48	—	—
12/18/97	3,974.72	53.30	3921.42	—	—
12/23/97	3,974.72	53.24	3921.48	—	—
12/31/97	3,974.72	53.23	3921.49	—	—
01/06/98	3,974.72	53.23	3921.49	—	—
01/06/98	3,974.72	53.23	3921.49	—	—
01/07/98	3,974.72	53.23	3921.49	—	—
01/15/98	3,974.72	53.23	3921.49	—	—
01/23/98	3,974.72	53.28	3921.44	—	—
01/27/98	3,974.72	53.27	3921.45	—	—
02/03/98	3,974.72	53.24	3921.48	—	—
02/11/98	3,974.72	53.27	3921.45	—	—
02/17/98	3,974.72	53.23	3921.49	—	—
02/25/98	3,974.72	53.20	3921.52	—	—
03/05/98	3,974.72	53.16	3921.56	—	—
03/11/98	3,974.72	53.23	3921.49	—	—
03/16/98	3,974.72	53.20	3921.52	—	—
03/25/98	3,974.72	53.19	3921.53	—	—
03/31/98	3,974.72	53.18	3921.54	—	—
04/09/98	3,974.72	53.33	3921.39	—	—
04/16/98	3,974.72	53.21	3921.51	—	—
04/21/98	3,974.72	53.23	3921.49	—	—
04/28/98	3,974.72	53.21	3921.51	—	—
05/04/98	3,974.72	53.21	3921.51	—	—
05/11/98	3,974.72	53.32	3921.40	—	—
05/18/98	3,974.72	53.32	3921.40	—	—
05/27/98	3,974.72	53.28	3921.44	—	—
06/01/98	3,974.72	53.33	3921.39	—	—

TABLE IV
(continued)

**MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/09/98	3,974.72	53.20	3921.52	—	sheen
06/15/98	3,974.72	53.19	3921.53	—	sheen
06/22/98	3,974.72	53.26	3921.46	—	sheen

TABLE IV
(continued)

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.66	53.21	3921.45	—	—
10/22/97	3,974.66	53.23	3921.43	—	—
10/29/97	3,974.66	53.24	3921.42	—	—
11/04/97	3,974.66	53.23	3921.43	—	—
11/11/97	3,974.66	53.23	3921.43	—	—
12/04/97	3,974.66	53.17	3921.49	—	—
12/10/97	3,974.66	53.19	3921.47	—	—
12/18/97	3,974.60	53.16	3921.44	—	—
12/23/97	3,974.60	53.16	3921.44	—	—
12/31/97	3,974.60	53.17	3921.43	—	—
01/06/98	3,974.60	53.18	3921.42	—	—
01/06/98	3,974.60	53.17	3921.43	—	—
01/07/98	3,974.60	53.19	3921.41	—	—
01/15/98	3,974.60	53.17	3921.43	—	—
01/23/98	3,974.60	53.20	3921.40	—	—
01/27/98	3,974.60	53.19	3921.41	—	—
02/03/98	3,974.60	53.16	3921.44	—	—
02/11/98	3,974.60	53.19	3921.41	—	—
02/17/98	3,974.60	53.15	3921.45	—	—
02/25/98	3,974.60	53.13	3921.47	—	—
03/05/98	3,974.60	53.12	3921.48	—	—
03/11/98	3,974.60	53.14	3921.46	—	—
03/16/98	3,974.60	53.12	3921.48	—	—
03/25/98	3,974.60	53.11	3921.49	—	—
03/31/98	3,974.60	53.12	3921.48	—	—
04/09/98	3,974.60	53.21	3921.39	—	—
04/16/98	3,974.60	53.14	3921.46	—	—
04/21/98	3,974.60	53.16	3921.44	—	—
04/28/98	3,974.60	53.14	3921.46	—	—
05/04/98	3,974.60	53.14	3921.46	—	—
05/11/98	3,974.60	53.21	3921.39	—	—
05/18/98	3,974.60	53.24	3921.36	—	—
05/27/98	3,974.60	53.18	3921.42	—	—
06/01/98	3,974.60	53.23	3921.37	—	—
06/09/98	3,974.60	53.12	3921.48	—	—

TABLE IV
(continued)

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/15/98	3,974.60	53.13	3921.47	—	—
06/22/98	3,974.60	53.20	3921.40	—	—
06/24/98	3,974.60	53.23	3921.37	—	—

TABLE IV
(continued)

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.52	52.97	3921.55	—	—
10/22/97	3,974.52	52.98	3921.54	—	—
10/29/97	3,974.52	53.02	3921.50	—	—
11/04/97	3,974.52	53.01	3921.51	—	—
11/11/97	3,974.52	53.03	3921.49	—	—
12/04/97	3,974.52	52.92	3921.60	—	—
12/10/97	3,974.52	52.92	3921.60	—	—
12/18/97	3,974.48	53.03	3921.45	—	—
12/23/97	3,974.48	52.91	3921.57	—	—
12/31/97	3,974.48	52.91	3921.57	—	—
01/06/98	3,974.48	52.90	3921.58	—	—
01/06/98	3,974.48	52.90	3921.58	—	—
01/07/98	3,974.48	52.92	3921.56	—	—
01/15/98	3,974.48	52.93	3921.55	—	—
01/23/98	3,974.48	52.94	3921.54	—	—
01/27/98	3,974.48	52.94	3921.54	—	—
02/03/98	3,974.48	52.91	3921.57	—	—
02/11/98	3,974.48	52.94	3921.54	—	—
02/17/98	3,974.48	52.89	3921.59	—	—
02/25/98	3,974.48	52.87	3921.61	—	—
03/05/98	3,974.48	52.85	3921.63	—	—
03/11/98	3,974.48	52.88	3921.60	—	—
03/16/98	3,974.48	52.88	3921.60	—	—
03/25/98	3,974.48	52.87	3921.61	—	—
03/31/98	3,974.48	52.84	3921.64	—	—
04/09/98	3,974.48	52.98	3921.50	—	—
04/16/98	3,974.48	52.89	3921.59	—	—
04/21/98	3,974.48	52.88	3921.60	—	—
04/28/98	3,974.48	52.89	3921.59	—	—
05/04/98	3,974.48	52.88	3921.60	—	—
05/11/98	3,974.48	52.99	3921.49	—	—
05/18/98	3,974.48	53.02	3921.46	—	—
05/27/98	3,974.48	52.94	3921.54	—	—
06/01/98	3,974.48	53.01	3921.47	—	—
06/09/98	3,974.48	52.88	3921.60	—	—

TABLE IV
(continued)

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/15/98	3,974.48	52.88	3921.60	—	—
06/22/98	3,974.48	52.95	3921.53	—	—
06/24/98	3,974.48	52.89	3921.59	—	—

TABLE IV
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,975.80	53.29	3922.51	—	—
10/22/97	3,975.80	53.34	3922.46	—	—
10/29/97	3,975.80	53.36	3922.44	—	—
11/04/97	3,975.80	53.35	3922.45	—	—
11/11/97	3,975.80	53.32	3922.48	—	—
12/04/97	3,975.80	53.37	3922.43	3922.49	0.07
12/10/97	3,975.80	53.38	3922.42	3922.54	0.15
12/18/97	3,975.06	53.53	3921.53	3922.02	0.60
12/23/97	3,975.06	53.57	3921.49	3921.80	0.38
12/31/97	3,975.06	53.70	3921.36	3921.77	0.51
01/06/98	3,975.06	53.79	3921.27	3921.81	0.67
01/06/98	3,975.06	53.81	3921.25	3921.83	0.71
01/06/98	3,975.06	53.80	3921.26	3921.80	0.67
01/06/98	3,975.06	53.81	3921.25	3921.80	0.68
01/06/98	3,975.06	53.81	3921.25	3921.80	0.68
01/07/98	3,975.06	53.86	3921.20	3921.75	0.68
01/08/98	3,975.06	53.85	3921.21	3921.79	0.72
01/09/98	3,975.06	53.88	3921.18	3921.80	0.76
01/10/98	3,975.06	53.94	3921.12	3921.74	0.77
01/12/98	3,975.06	53.96	3921.10	3921.78	0.84
01/15/98	3,975.06	53.98	3921.08	3921.79	0.87
01/23/98	3,975.06	54.33	3920.73	3921.74	1.24
01/27/98	3,975.06	54.47	3920.59	3921.73	1.41
02/03/98	3,975.06	54.72	3920.34	3921.76	1.75
02/11/98	3,975.06	55.05	3920.01	3921.73	2.12
02/17/98	3,975.06	55.23	3919.83	3921.78	2.40
02/25/98	3,975.06	55.57	3919.49	3921.81	2.85
03/05/98	3,975.06	55.90	3919.16	3921.80	3.25
03/11/98	3,975.06	56.14	3918.92	3921.79	3.53
03/16/98	3,975.06	56.35	3918.71	3921.82	3.82
03/25/98	3,975.06	56.68	3918.38	3921.83	4.24
03/31/98	3,975.06	55.22	3919.84	3921.83	2.45
04/09/98	3,975.06	55.88	3919.18	3921.71	3.11
04/16/98	3,975.06	56.16	3918.90	3921.82	3.59
04/21/98	3,975.06	56.43	3918.63	3921.83	3.93

TABLE IV
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/28/98	3,975.06	56.77	3918.29	3921.81	4.33
04/29/98	3,975.06	56.83	3918.23	3921.78	4.37
04/30/98	3,975.06	56.61	3918.45	3922.02	4.39
05/01/98	3,975.06	56.63	3918.43	3922.04	4.44
05/04/98	3,975.06	56.89	3918.17	3921.92	4.61
05/11/98	3,975.06	56.98	3918.08	3921.93	4.73
05/13/98	3,975.06	57.04	3918.02	3921.90	4.77
05/18/98	3,975.06	56.83	3918.23	3922.12	4.78
05/27/98	3,975.06	57.05	3918.01	3921.93	4.82
06/01/98	3,975.06	56.92	3918.14	3922.08	4.84
06/09/98	3,975.06	57.14	3917.92	3921.87	4.86
06/15/98	3,975.06	57.15	3917.91	3921.86	4.85

TABLE IV
(continued)

MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-94
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
12/18/97	3,975.02	53.10	3921.92	—	—
12/23/97	3,975.02	53.11	3921.91	—	—
12/31/97	3,975.02	53.10	3921.92	—	—
01/06/98	3,975.02	53.11	3921.91	—	—
01/06/98	3,975.02	53.11	3921.91	—	—
01/07/98	3,975.02	53.12	3921.90	—	—
01/15/98	3,975.02	53.12	3921.90	—	—
01/23/98	3,975.02	53.12	3921.90	—	—
01/27/98	3,975.02	53.13	3921.89	—	—
02/03/98	3,975.02	53.09	3921.93	—	—
02/11/98	3,975.02	53.13	3921.89	—	—
02/17/98	3,975.02	53.11	3921.91	—	—
02/25/98	3,975.02	53.08	3921.94	—	—
03/05/98	3,975.02	53.07	3921.95	—	—
03/11/98	3,975.02	53.10	3921.92	—	—
03/16/98	3,975.02	53.08	3921.94	—	—
03/25/98	3,975.02	53.07	3921.95	—	—
03/31/98	3,975.02	53.05	3921.97	—	—
04/09/98	3,975.02	53.13	3921.89	—	—
04/16/98	3,975.02	53.09	3921.93	—	—
04/21/98	3,975.02	53.09	3921.93	—	—
04/28/98	3,975.02	53.09	3921.93	—	—
05/04/98	3,975.02	53.01	3922.01	—	—
05/11/98	3,975.02	52.95	3922.07	—	—
05/18/98	3,975.02	52.89	3922.13	—	—
05/27/98	3,975.02	53.01	3922.01	—	—
06/01/98	3,975.02	52.95	3922.07	—	—
06/09/98	3,975.02	53.05	3921.97	—	—
06/15/98	3,975.02	53.08	3921.94	—	—
06/22/98	3,975.02	53.15	3921.87	—	—
06/24/98	3,975.02	53.02	3922.00	—	—

TABLE IV
(continued)

**MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
12/18/97	3,975.30	53.85	3921.45	—	—
12/23/97	3,975.30	53.85	3921.45	—	—
12/31/97	3,975.30	53.84	3921.46	—	—
01/06/98	3,975.30	53.83	3921.47	—	—
01/06/98	3,975.30	53.85	3921.45	—	—
01/07/98	3,975.30	53.86	3921.44	—	—
01/15/98	3,975.30	53.85	3921.45	—	—
01/23/98	3,975.30	53.89	3921.41	—	—
01/27/98	3,975.30	53.87	3921.43	—	—
02/03/98	3,975.30	53.83	3921.47	—	—
02/11/98	3,975.30	53.86	3921.44	—	—
02/17/98	3,975.30	53.82	3921.48	—	—
02/25/98	3,975.30	53.81	3921.49	—	—
03/05/98	3,975.30	53.79	3921.51	—	—
03/11/98	3,975.30	53.83	3921.47	—	—
03/16/98	3,975.30	53.81	3921.49	—	—
03/25/98	3,975.30	53.80	3921.50	—	—
03/31/98	3,975.30	53.78	3921.52	—	—
04/09/98	3,975.30	53.86	3921.44	—	—
04/16/98	3,975.30	53.82	3921.48	—	—
04/21/98	3,975.30	53.82	3921.48	—	—
04/28/98	3,975.30	53.83	3921.47	—	—
05/04/98	3,975.30	53.80	3921.50	—	—
05/11/98	3,975.30	53.83	3921.47	—	—
05/18/98	3,975.30	53.85	3921.45	—	—
05/27/98	3,975.30	53.83	3921.47	—	—
06/01/98	3,975.30	53.87	3921.43	—	—
06/09/98	3,975.30	53.82	3921.48	—	—
06/15/98	3,975.30	53.81	3921.49	—	—
06/22/98	3,975.30	53.88	3921.42	—	—
06/24/98	3,975.30	53.81	3921.49	—	—

TABLE IV
(continued)

MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
12/18/97	3,974.55	52.80	3921.75	—	—
12/23/97	3,974.55	52.80	3921.75	—	—
12/31/97	3,974.55	52.80	3921.75	—	—
01/06/98	3,974.55	52.80	3921.75	—	—
01/06/98	3,974.55	52.79	3921.76	—	—
01/07/98	3,974.55	52.82	3921.73	—	—
01/15/98	3,974.55	52.81	3921.74	—	—
01/23/98	3,974.55	52.83	3921.72	—	—
01/27/98	3,974.55	52.23	3922.32	—	—
02/03/98	3,974.55	58.79	3915.76	—	—
02/11/98	3,974.55	52.82	3921.73	—	—
02/17/98	3,974.55	52.78	3921.77	—	—
02/25/98	3,974.55	52.77	3921.78	—	—
03/05/98	3,974.55	52.75	3921.80	—	—
03/11/98	3,974.55	52.78	3921.77	—	—
03/16/98	3,974.55	52.76	3921.79	—	—
03/25/98	3,974.55	52.75	3921.80	—	—
03/31/98	3,974.55	52.74	3921.81	—	—
04/09/98	3,974.55	52.85	3921.70	—	—
04/16/98	3,974.55	52.79	3921.76	—	—
04/21/98	3,974.55	52.77	3921.78	—	—
04/28/98	3,974.55	52.79	3921.76	—	—
05/04/98	3,974.55	52.75	3921.80	—	—
05/11/98	3,974.55	52.83	3921.72	—	—
05/18/98	3,974.55	52.85	3921.70	—	—
05/27/98	3,974.55	52.81	3921.74	—	—
06/01/98	3,974.55	52.86	3921.69	—	—
06/09/98	3,974.55	52.77	3921.78	—	—
06/15/98	3,974.55	52.77	3921.78	—	—
06/22/98	3,974.55	52.83	3921.72	—	—
06/24/98	3,974.55	52.79	3921.76	—	—

TABLE IV
(continued)

**RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	Unknown	56.36	Unknown	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	8.30
12/18/97	3,970.79	55.84	3914.95	3921.67	8.26
12/22/97	3,970.79	55.80	3914.99	3921.69	8.23
12/31/97	3,970.79	55.79	3915.00	3921.67	8.19
01/06/98	3,970.79	55.18	3915.61	3921.68	7.46
01/06/98	3,970.79	49.50	3921.29	—	—
01/06/98	3,970.79	49.50	3921.29	—	—
01/06/98	3,970.79	49.51	3921.28	—	—
01/06/98	3,970.79	49.63	3921.16	3921.67	0.63
01/07/98	3,970.79	49.58	3921.21	—	—
01/08/98	3,970.79	49.50	3921.29	—	—
01/09/98	3,970.79	49.58	3921.21	3921.23	0.03
01/10/98	3,970.79	49.64	3921.15	3921.17	0.03
01/12/98	3,970.79	49.62	3921.17	—	sheen
01/15/98	3,970.79	49.63	3921.16	—	sheen
01/23/98	3,970.79	49.67	3921.12	3921.16	0.05
01/27/98	3,970.79	49.68	3921.11	3921.13	0.03
02/03/98	3,970.79	49.69	3921.10	3921.12	0.03
02/11/98	3,970.79	49.69	3921.10	3921.12	0.02
06/16/98	3,970.79	53.32	3917.47	3922.03	5.60

**CERTIFICATE OF ANALYSIS SUMMARY 1-82357**

Project ID: 710016-1-0

Project Manager: T. Nix / J. Mosley

Project Location: Lovington, NM

K.E.I. Consultants, Inc.**Project Name: Lovington**

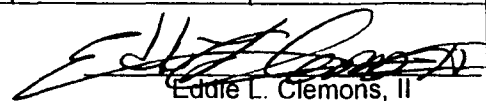
Date Received in Lab : Jun 25, 1998 09:50

Date Report Faxed: Jul 13, 1998

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:						
	Sampled:	Liquid 06/24/98 08:52	Liquid 06/24/98 09:08	Liquid 06/24/98 09:36	Liquid 06/24/98 10:09	Liquid 06/24/98 09:20	Liquid 06/24/98 09:47
Metals by ICP EPA 6010	Analyzed: Units:	07/09/98 mg/L R.L.	07/09/98 mg/L R.L.	07/09/98 mg/L R.L.	07/09/98 mg/L R.L.	07/09/98 mg/L R.L.	07/09/98 mg/L R.L.
Aluminum		< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)
Arsenic		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)
Barium		0.10 (0.04)	0.09 (0.04)	0.08 (0.04)	0.09 (0.04)	0.09 (0.04)	0.11 (0.04)
Beryllium		< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)	< 0.02 (0.02)
Boron		0.19 (0.10)	0.20 (0.10)	0.13 (0.10)	0.17 (0.10)	0.13 (0.10)	0.11 (0.10)
Cadmium		< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)	< 0.01 (0.01)
Calcium		140 (0.5)	102 (0.5)	105 (0.5)	118 (0.5)	143 (0.5)	151 (0.5)
Chromium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Cobalt		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Copper		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Iron		< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)	< 0.50 (0.50)
Lead		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Magnesium		15.2 (0.3)	15.4 (0.3)	16.1 (0.3)	18.1 (0.3)	14.9 (0.3)	18.5 (0.3)
Manganese		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.05 (0.05)	< 0.10 (0.10)	< 0.10 (0.10)
Molybdenum		< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)
Nickel		< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)	< 0.10 (0.10)
Potassium		1.71 (0.50)	1.64 (0.50)	1.58 (0.50)	2.34 (0.50)	1.95 (0.50)	2.80 (0.50)
Selenium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)
Silicon		20.8 (0.5)	21.6 (0.5)	22.1 (0.5)	22.0 (0.5)	20.2 (0.5)	21.9 (0.5)
Silver		< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)	< 0.04 (0.04)
Sodium		38.4 (0.5)	40.5 (0.5)	30.6 (0.5)	42.3 (0.5)	28.1 (0.5)	33.8 (0.5)
Strontium		0.75 (0.20)	0.75 (0.20)	0.77 (0.20)	0.82 (0.20)	0.75 (0.20)	0.78 (0.20)
Tin		< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)	< 0.20 (0.20)
Vanadium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	0.05 (0.05)

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The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Eddie L. Clemons, II
QA/QC Manager



CERTIFICATE OF ANALYSIS SUMMARY 1-82357

Project ID: 710016-1-0

K.E.I. Consultants, Inc.

Date Received in Lab : Jun 25, 1998 09:50

Project Manager: T. Nix / J. Mosley

Project Name: Lovington


Date Report Faxed: Jul 13, 1998

Project Location: Lovington, NM

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	Sampled:	06/24/98 08:52	06/24/98 09:08	06/24/98 09:36	06/24/98 10:09	06/24/98 09:20	06/24/98 09:47
EPA 6010	Analyzed:	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98	07/09/98
	Units:	R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Zinc		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	0.16 (0.05)	0.11 (0.05)	0.10 (0.05)
Total Mercury	Analyzed:	07/06/98	07/06/98	07/06/98	07/06/98	07/06/98	07/06/98
EPA 7470	Units:	R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Mercury		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)
BTEX	Analyzed:	06/27/98	06/27/98	06/27/98	06/27/98	06/27/98	06/27/98
EPA 8020	Units:	R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Benzene		ppm	ppm	ppm	ppm	ppm	ppm
		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylenes		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	N.D.	0.002	N.D.	N.D.	N.D.
PAHs by GC-MS	Analyzed:	07/01/98	07/01/98	07/01/98	07/02/98	07/02/98	07/02/98
EPA 8270	Units:	R.L.	R.L.	R.L.	R.L.	R.L.	R.L.
Acenaphthene		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Acenaphthylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(a)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(b)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(g,h,i)perylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Benzo(k)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)

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Eddie L. Clemons, II
QA/QC Manager

**CERTIFICATE OF ANALYSIS SUMMARY 1-82357**

Project ID: 710016-1-0

Project Manager: T. Nix / J. Mosley

Project Location: Lovington, NM

K.E.I. Consultants, Inc.**Project Name: Lovington**


Date Received in Lab : Jun 25, 1998 09:50

Date Report Faxed: Jul 13, 1998

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	182357 001	182357 002	182357 003	182357 004	182357 005	182357 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix:	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	Sampled:	06/24/98 08:52	06/24/98 09:08	06/24/98 09:36	06/24/98 10:09	06/24/98 09:20	06/24/98 09:47
EPA 8270	Analyzed:	07/01/98	07/01/98	07/01/98	07/02/98	07/02/98	07/02/98
	Units:	R.L. mg/L	R.L. mg/L	R.L. mg/L	R.L. mg/L	R.L. mg/L	R.L. mg/L
Chrysene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Dibenzo(a,h)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Fluorene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Naphthalene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Phenanthrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
Pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)

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Eddie L. Clemons, II
QA/QC Manager

SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jun 30, 1998 09:00

Analyst: OR

Date Analyzed: Jun 27, 1998 17:49

Matrix: Liquid

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1130	0.1000	0.0010	113.0	75-125	
Toluene	< 0.0010	0.1190	0.1000	0.0010	119.0	75-125	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	75-125	
MTBE	< 0.0200	1.0560	1.0000	0.0200	105.6	75-125	
m,p-Xylenes	< 0.0020	0.2070	0.2000	0.0020	103.5	75-125	
o-Xylene	< 0.0010	0.1060	0.1000	0.0010	106.0	75-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit.

All results are based on MDL and validated for QC purposes only


 Eddie L. Clements, II
 QA/QC Manager

Certificate Of Quality Control for Batch : 18A29C80
SW- 846 5030/8020 BTEX and MTBE

Date Validated: Jun 30, 1998 09:00

Analyst: OR

Date Analyzed: Jun 27, 1998 22:53

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 182344- 004	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit	[F] QC	[G] QC	[H] QC	[I] Matrix Spike	[J] Qualifier
	mg/L	mg/L	mg/L	mg/L	mg/L	Relative Difference %	Spike Relative Difference %	Matrix Spike Recovery %	M.S.D. Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1140	0.1200	0.1000	0.0010	20.0	5.1	114.0	120.0	75-125	
Toluene	< 0.0010	0.1180	0.1240	0.1000	0.0010	20.0	5.0	118.0	124.0	75-125	
Ethylbenzene	< 0.0010	0.1000	0.1050	0.1000	0.0010	20.0	4.9	100.0	105.0	75-125	
MTBE	< 0.0200	1.1510	1.2440	1.0000	0.0200	20.0	7.8	115.1	124.4	75-125	
m,p-Xylenes	< 0.0020	0.2010	0.2110	0.2000	0.0020	20.0	4.9	100.5	105.5	75-125	
o-Xylene	< 0.0010	0.1050	0.1100	0.1000	0.0010	20.0	4.7	105.0	110.0	75-125	

 Spike Relative Difference [F] = $200 \times (B-C) / (B+C)$


 Matrix Spike Recovery [G] = $100 \times (B-A) / [D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \times (C-A) / [D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Eddie L. Clemons, II
 QA/QC Manager

SW846- 7470 Total Mercury

Date Validated: Jul 7, 1998 08:53

Analyst: AO

Date Analyzed: Jul 6, 1998 17:13

Matrix: Liquid

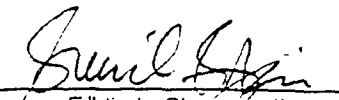
BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Mercury	< 0.0011	0.0020	0.0028	0.0011	71.4	70-120	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QC Manager



Certificate Of Quality Control for Batch : 18A05C23

SW846- 7470 Total Mercury

Date Validated: Jul 7, 1998 08:53

Analyst: AO

Date Analyzed: Jul 6, 1998 17:19

Matrix: Liquid

Q.C. Sample ID 182357- 001 Parameter	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample Result	Duplicate Result	Detection Limit	QC	LIMITS	Matrix Spike Result	Matrix Spike Amount	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	mg/L	mg/L	Matrix Spike Recovery %	Recovery Range %	
Mercury	< 0.0011	< 0.0011	0.0011	N.C	15.0	0.0022	0.0028	78.6	70-120	

Relative Difference [D] = $200 \cdot (B-A) / (B+A)$

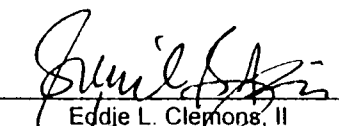
Matrix Spike Recovery [H] = $100 \cdot (F-A) / [G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston · Dallas · San Antonio


Eddie L. Clemons, II
QA/QC Manager



Certificate Of Quality Control for Batch : 18A34C60

SW846-8270 PAHs by GC-MS

Date Validated: Jul 2, 1998 12:07

Analyst: LC

Date Analyzed: Jul 1, 1998 20:09

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 0-BKS	[A] Sample Result mg/L	[B] Matrix Spike Result mg/L	[C] Matrix Spike Duplicate Result mg/L	[D] Matrix Spike Amount mg/L	[E] Detection Limit mg/L	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC Spike Relative Difference %	QC Matrix Spike Recovery %	QC M.S.D. Recovery %	Matrix Spike Recovery Range %	
Parameter											
Acenaphthene	< 0.0040	0.0868	0.0876	0.1000	0.0040	31.0	0.9	86.8	87.6	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0736	0.0776	0.1000	0.0040	42.0	5.3	73.6	77.6	23-97	
2-Chlorophenol	< 0.0040	0.0710	0.0778	0.1000	0.0040	40.0	9.1	71.0	77.8	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0780	0.0828	0.1000	0.0040	28.0	6.0	78.0	82.8	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0812	0.0826	0.1000	0.0040	38.0	1.7	81.2	82.6	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0622	0.0624	0.1000	0.0080	38.0	0.3	62.2	62.4	41-116	
4-Nitrophenol	< 0.0080	0.0404	0.0410	0.1000	0.0080	50.5	1.5	40.4	41.0	10-80	
Pentachlorophenol	< 0.0020	0.0756	0.0766	0.1000	0.0020	50.0	1.3	75.6	76.6	9-103	
Phenol	< 0.0020	0.0476	0.0520	0.1000	0.0020	42.0	8.8	47.6	52.0	12-89	
Pyrene	< 0.0040	0.1110	0.1112	0.1000	0.0040	31.0	0.2	111.0	111.2	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0756	0.0826	0.1000	0.0020	28.0	8.8	75.6	82.6	39-98	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$


Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Eddie L. Clemons, II
QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:13

Matrix: Liquid

BLANK SPIKE ANALYSIS

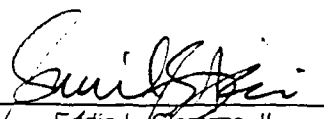
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.100	1.073	1.000	0.100	107.3	70-125	
Arsenic	< 0.100	0.982	1.000	0.100	98.2	70-125	
Barium	< 0.010	0.507	0.500	0.010	101.4	70-125	
Beryllium	< 0.010	0.223	0.200	0.010	111.5	70-125	
Cadmium	< 0.020	0.223	0.200	0.020	111.5	70-125	
Calcium	< 0.03	2.17	2.00	0.03	108.5	70-125	
Chromium	< 0.050	0.509	0.500	0.050	101.8	70-125	
Cobalt	< 0.010	0.504	0.500	0.010	100.8	70-125	
Copper	< 0.015	0.508	0.500	0.015	101.6	70-125	
Iron	0.389	2.560	2.000	0.050	108.6	70-125	
Lead	< 0.050	1.022	1.000	0.050	102.2	70-125	
Magnesium	< 0.025	2.127	2.000	0.025	106.4	70-125	
Manganese	< 0.013	1.067	1.000	0.013	106.7	70-125	
Nickel	< 0.050	0.549	0.500	0.050	109.8	70-125	
Potassium	< 0.050	2.096	2.000	0.050	104.8	70-125	
Selenium	< 0.100	0.983	1.000	0.100	98.3	70-125	
Silicon	< 0.100	1.824	2.000	0.100	91.2	70-125	
Silver	< 0.020	0.808	0.800	0.020	101.0	70-125	
Sodium	< 0.050	6.700	7.500	0.050	89.3	70-125	
Strontium	< 0.050	1.096	1.000	0.050	109.6	70-125	
Vanadium	< 0.015	0.492	0.500	0.015	98.4	70-125	
Zinc	< 0.015	0.519	0.500	0.015	103.8	70-125	

 Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemmons, II
 QC Manager



Certificate Of Quality Control for Batch : 18A18E83

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:40

Matrix: Liquid

Q.C. Sample ID 182357- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample Result	Duplicate Result	Detection Limit	QC	LIMITS	Matrix Spike Result	Matrix Spike Amount	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	mg/L	mg/L	Matrix Spike Recovery %	Recovery Range %	
Aluminum	< 0.500	< 0.500	0.500	N.C	25.0	2.904	2.00	131.0	70-125	B
Arsenic	< 0.100	< 0.100	0.100	N.C	25.0	0.970	1.00	97.0	70-125	
Barium	0.104	0.110	0.010	5.6	25.0	0.582	0.50	95.6	70-125	
Beryllium	< 0.010	< 0.010	0.010	N.C	25.0	0.211	0.20	105.5	70-125	
Cadmium	< 0.020	< 0.020	0.020	N.C	25.0	0.203	0.20	101.5	70-125	
Calcium	140	145	0.03	3.5	25.0	142	2.0	100.0	70-125	
Chromium	< 0.050	< 0.050	0.050	N.C	25.0	0.474	0.50	94.8	70-125	
Cobalt	< 0.010	< 0.010	0.010	N.C	25.0	0.455	0.50	91.0	70-125	
Copper	< 0.015	< 0.015	0.015	N.C	25.0	0.472	0.50	94.4	70-125	
Iron	< 0.500	< 0.500	0.500	N.C	25.0	1.551	2.00	77.5	70-125	
Lead	< 0.050	< 0.050	0.050	N.C	25.0	0.938	1.00	93.8	70-125	
Magnesium	15.20	16.12	0.03	5.9	25.0	17.36	2.0	108.0	70-125	
Manganese	< 0.013	< 0.013	0.013	N.C	25.0	0.967	1.00	96.7	70-125	

(A) High analyte concentration affects spike recovery.

(B) Post-digestion spike within acceptance limits.

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Eddie L. Clemens, II
QA/QC Manager



Certificate Of Quality Control for Batch : 18A18E83

EPA 6010 Metals by ICP

Date Validated: Jul 10, 1998 09:47

Analyst: CG

Date Analyzed: Jul 9, 1998 20:40

Matrix: Liquid

Q.C. Sample ID 182357- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	Sample Result mg/L	Duplicate Result mg/L	Detection Limit mg/L	QC	LIMITS	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	QC	LIMITS	Qualifier
				Relative	Relative			Matrix Spike	Recovery	
				Difference	Difference			Recovery	Range	
Parameter				%	%			%	%	
Nickel	< 0.050	< 0.050	0.050	N.C	25.0	0.470	0.50	94.0	70-125	
Potassium	1.713	1.804	0.050	5.2	25.0	3.718	2.00	100.3	70-125	
Selenium	< 0.100	< 0.100	0.100	N.C	25.0	0.980	1.00	98.0	70-125	
Silicon	20.76	22.03	0.10	5.9	25.0	26.96	2.0	310.0	70-125	A,B
Silver	< 0.020	< 0.020	0.020	N.C	25.0	0.023	0.40	5.8	70-125	B
Sodium	38.43	40.65	0.05	5.6	25.0	43.86	2.0	271.5	70-125	A,B
Strontium	0.751	0.790	0.050	5.1	25.0	1.772	2.00	51.1	70-125	B
Vanadium	0.044	0.046	0.015	4.4	25.0	0.501	0.50	91.4	70-125	
Zinc	0.027	0.029	0.015	7.1	25.0	0.521	0.50	98.8	70-125	

(A) High analyte concentration affects spike recovery.

(B) Post-digestion spike within acceptance limits.

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Eddie L. Clemons, II
QC Manager



ANALYTICAL CHAIN CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016-1-0
Project Manager: T. Nix / J. Mosley
Project Location: Lovington, NM

Project Name: Lovington

XENCO COC#: 1-82357
Date Received in Lab: Jun 25, 1998 09:50 by LY
XENCO contact : Carlos Castro/Eddie Clemons

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	182357-001	BTEX	SW-846	ppm	10 days	Jun 24, 1998 08:52		Jun 27, 1998 by OR	Jun 27, 1998 18:27 by OR
2			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 08:52		Jun 29, 1998 by RK	Jul 1, 1998 21:57 by LC
3			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 08:52		Jul 1, 1998 by AO	Jul 9, 1998 20:31 by CG
4			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 08:52		Jul 1, 1998 by AO	Jul 6, 1998 17:18 by AO
5	MW-7	182357-002	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:08		Jun 27, 1998 by OR	Jun 27, 1998 18:46 by OR
6			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:08		Jun 29, 1998 by RK	Jul 1, 1998 22:45 by LC
7			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:08		Jul 1, 1998 by AO	Jul 9, 1998 20:58 by CG
8			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:08		Jul 1, 1998 by AO	Jul 6, 1998 17:21 by AO
9	MW-8	182357-003	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:36		Jun 27, 1998 by OR	Jun 27, 1998 19:05 by OR
10			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:36		Jun 29, 1998 by RK	Jul 1, 1998 23:31 by LC
11			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:36		Jul 1, 1998 by AO	Jul 9, 1998 21:07 by CG
12			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:36		Jul 1, 1998 by AO	Jul 6, 1998 17:22 by AO
13	MW-10	182357-004	BTEX	SW-846	ppm	10 days	Jun 24, 1998 10:09		Jun 27, 1998 by OR	Jun 27, 1998 19:24 by OR
14			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 10:09		Jun 29, 1998 by RK	Jul 2, 1998 00:18 by LC
15			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 10:09		Jul 1, 1998 by AO	Jul 9, 1998 21:16 by CG
16			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 10:09		Jul 1, 1998 by AO	Jul 6, 1998 17:22 by AO
17	MW-11	182357-005	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:20		Jun 27, 1998 by OR	Jun 27, 1998 19:43 by OR
18			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:20		Jun 29, 1998 by RK	Jul 2, 1998 01:04 by LC
19			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:20		Jul 1, 1998 by AO	Jul 9, 1998 21:26 by CG
20			Mercury, Tot	SW846-7470	mg/L	10 days	Jun 24, 1998 09:20		Jul 1, 1998 by AO	Jul 6, 1998 17:23 by AO
21	MW-12	182357-006	BTEX	SW-846	ppm	10 days	Jun 24, 1998 09:47		Jun 27, 1998 by OR	Jun 27, 1998 20:02 by OR
22			PAHs	SW846-8270	mg/L	10 days	Jun 24, 1998 09:47		Jun 29, 1998 by RK	Jul 2, 1998 01:49 by LC
23			Metals (ICP)	EPA 6010	mg/L	10 days	Jun 24, 1998 09:47		Jul 1, 1998 by AO	Jul 9, 1998 21:35 by CG
24			Mercury, Tot	SW846-7470	mg/L	Standard	Jun 24, 1998 09:47		Jul 1, 1998 by AO	Jul 6, 1998 17:24 by AO



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

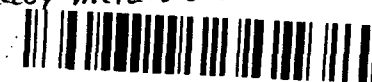
CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page / of
Lab. Batch # 182357-SA

Contractor K.E. Consultants		Phone (210) 1680-3767		No. coolers this shipment:		Contractor COC # 147											
Address 5309 Wurzbach, Ste. 100 San Antonio, TX 78238		Project Director Mike Hawthorne		Carrier: UPS		Quote #:											
Project Name Lovington		Project Manager Theresa Nix / Jim Masley		Airbill No.		P.O. No: 8951											
Project Location Lovington, NM		Project No. 710016-1-0		SAMPLER SIGNATURE Stanley J. Hoover Jr.		Turn-around • ASAP • 24 hrs • 48 hrs Standard											
SAMPLE CHARACTERIZATION		Preservative		Unl Dies Ker Unknown		LAB ONLY ID #											
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAV	Container Size Type P, G	Ice	Other	Waste Oil	PIT No:	Tank No:	Sample Description	Total	Remarks	LAB ONLY ID #
MW-1	24 June 98	8:52						1 Liter 40 mL 362 mL		TEL HNO3					4	Call Theresa Nix for Analysis if needed.	1
MW-6															4	Did not sample	2
MW-7		9:08													4		3
MW-8		9:36													4		4
MW-10		10:09													4		5
MW-11		9:20													4		6
MW-12		9:47													4		7
																	8
																	9
																	10
Relinquished by: (Signature)		DATE		TIME		Received by: (Signature)		DATE		TIME		Remarks					
Stanley J. Hoover Jr.		6-24-98		1300		UPS		6/25/98		950		Fax Results to Theresa Nix at 210-680-3763 • BTEX: SW846-8020 • PAH: 8100 or 8270 • Heavy metals: (ICP SCAN) 6010					

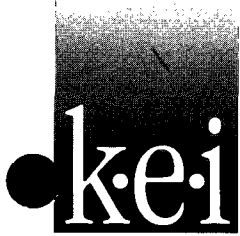
Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended



al Services

98 QTR 3



5309 Wurzbach, Suite 100
San Antonio, Texas 78238
(210) 680-3767
(210) 680-3763 FAX

October 29, 1998

Mr. Tony Savoie
TEXAS - NEW MEXICO PIPE LINE COMPANY
P. O. Box 1030
Jal, New Mexico 88252

Re: Groundwater Monitoring Event
Texas - New Mexico Pipe Line Company
TNM-97-04
Section 11, Township 16 South, Range 35 East
Lovington, New Mexico
Job No. 710016-1

RECEIVED

DEC 23 1998

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Dear Mr. Savoie:

Transmitted with this letter is the ground water binder update packet for the third quarter of 1998 ground water monitoring event conducted at TNM-97-04, located near Lovington, New Mexico. A copy has been submitted to OCD Hobbs and OCD Santa Fe.

The packet contains the following:

- Revised Table of Contents
- Updated gauging tables and general notes
- Updated ground water laboratory results tables
- Updated figures
- A copy of the laboratory ground water results and chain-of-custody documentation
- A dated "tab" for the new event

Please remove and replace the former Table of Contents and tables. Add the new dated tab and place the updated figures, laboratory reports, and chain-of-custody documentation behind this tab.

Please call me at (210) 680-3767 if you have any questions or comments.

Respectfully,

Theresa Nix

Theresa Nix
Project Manager

Enclosure

cc: Marc Oler, Equilon
OCD Hobbs
OCD Santa Fe, William Olson ✓
J. Michael Hawthorne, KEI

TABLE OF CONTENTS

INTRODUCTION	1
PURPOSE AND SCOPE	1
FIELD AND REPORTING PROTOCOLS	1
GROUND WATER MONITORING AND SAMPLING	
LABORATORY RESULTS	
GROUND WATER GRADIENT	
PSH MONITORING	
TABLES	
GENERAL NOTES	
TABLE I - SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH	
TABLE II - SUMMARY OF GROUND WATER RESULTS - PAH	
TABLE III - SUMMARY OF GROUND WATER RESULTS - METALS	
TABLE IV - SUMMARY OF GROUND WATER MONITORING	
DATED TABS	
FIG. 1 - GROUND WATER CONTOURS/CONCENTRATIONS	
FIG. 2 - PSH THICKNESS MAP	
FIG. 3 - AVERAGE GROUND WATER DATA (Beginning 98 QTR 3)	
FIG. 4 - DISSOLVED PHASE CONCENTRATIONS (Beginning 98 QTR 3)	
CERTIFIED LABORATORY REPORTS	
CHAIN-OF-CUSTODY DOCUMENTATION	

GENERAL NOTES

- ND - Indicates constituent was not detected above the method detection/reporting limit.
- PSH - Phase-separate hydrocarbons.
- - Indicates the constituent was not analyzed (TABLE I and III) or PSH was not detected and a corrected ground water elevation was not required (TABLE IV).
- SHEEN - Indicates a visible phase separation with a thickness less than 0.01 feet.

Depth to water is referenced from the top of PVC elevation.

Ground water elevations in monitoring wells containing PSH have been corrected for PSH density. (Correction Factor = 0.85 prior to December of 1997, Correction Factor = 0.814 as of December of 1997)

Method detection/reporting limits:

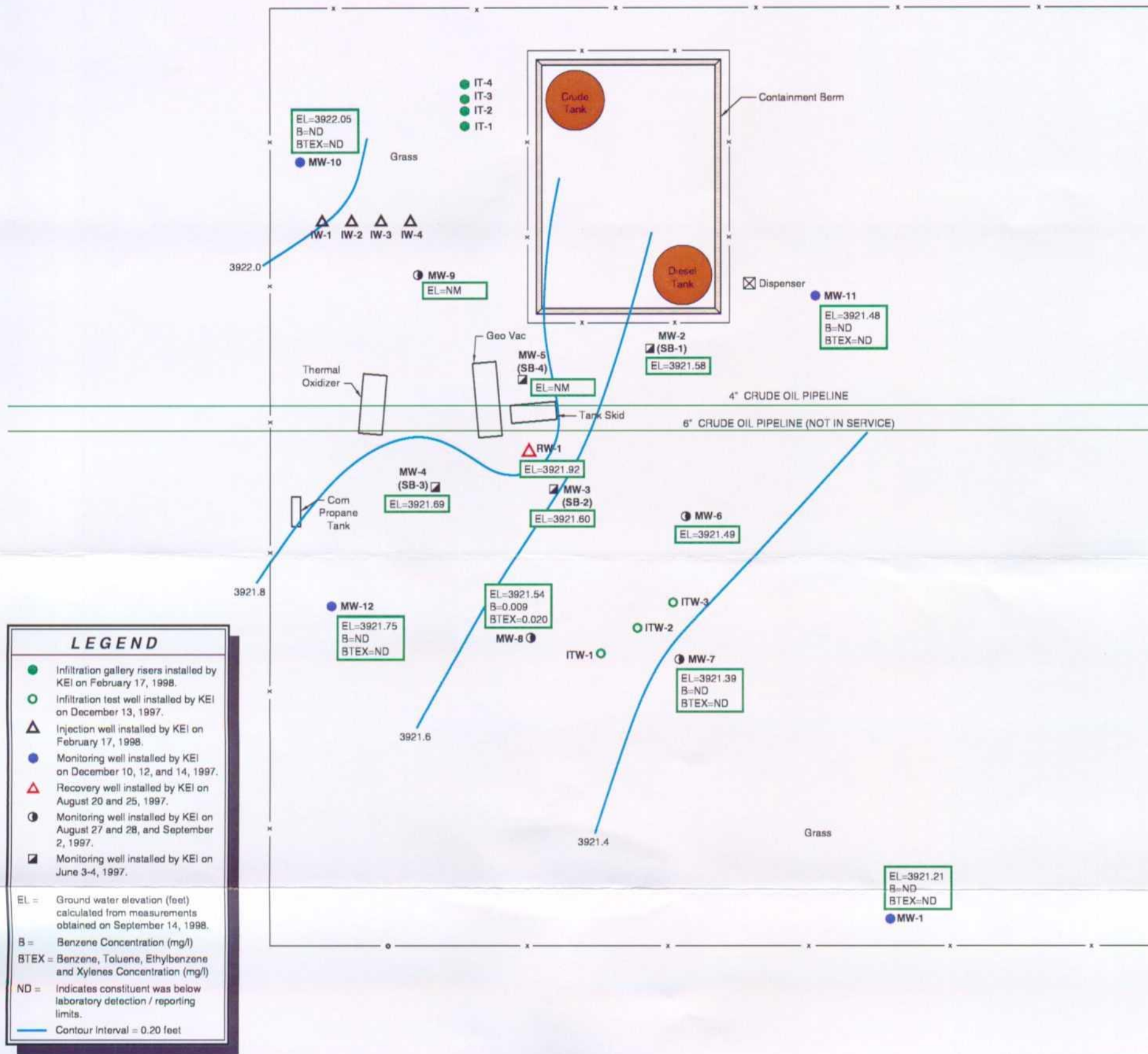
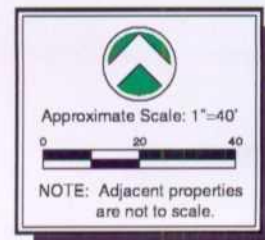
- BTEX - 0.001 to 0.008 mg/l
- TPH - 0.001 to 1 mg/l
- PAH - 0.002 mg/l
- Metals - 0.0011 to 50 mg/l

Laboratory test methods:

- BTEX - EPA Method SW846-8020, 5030
- TPH - EPA Method 418.1
- PAH - EPA Method 8100 or 8270
- Metals - EPA Method 6010

NOTES:

1. The ground water elevation in wells containing PSH was corrected using a factor of 0.814.
2. Ground water samples were collected on September 17, 1998.
3. Monitoring wells MW-2 through MW-6 and MW-9 were not sampled due to the presence of PSH.
4. RW-1 is not accessible due to the remediation system.



11/15/98-PM CUSACTY PROJECTS/TNMP/LUT/101/MONITOR/CW-SEP98



GROUND WATER CONTOURS / CONCENTRATIONS - SEPTEMBER 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY

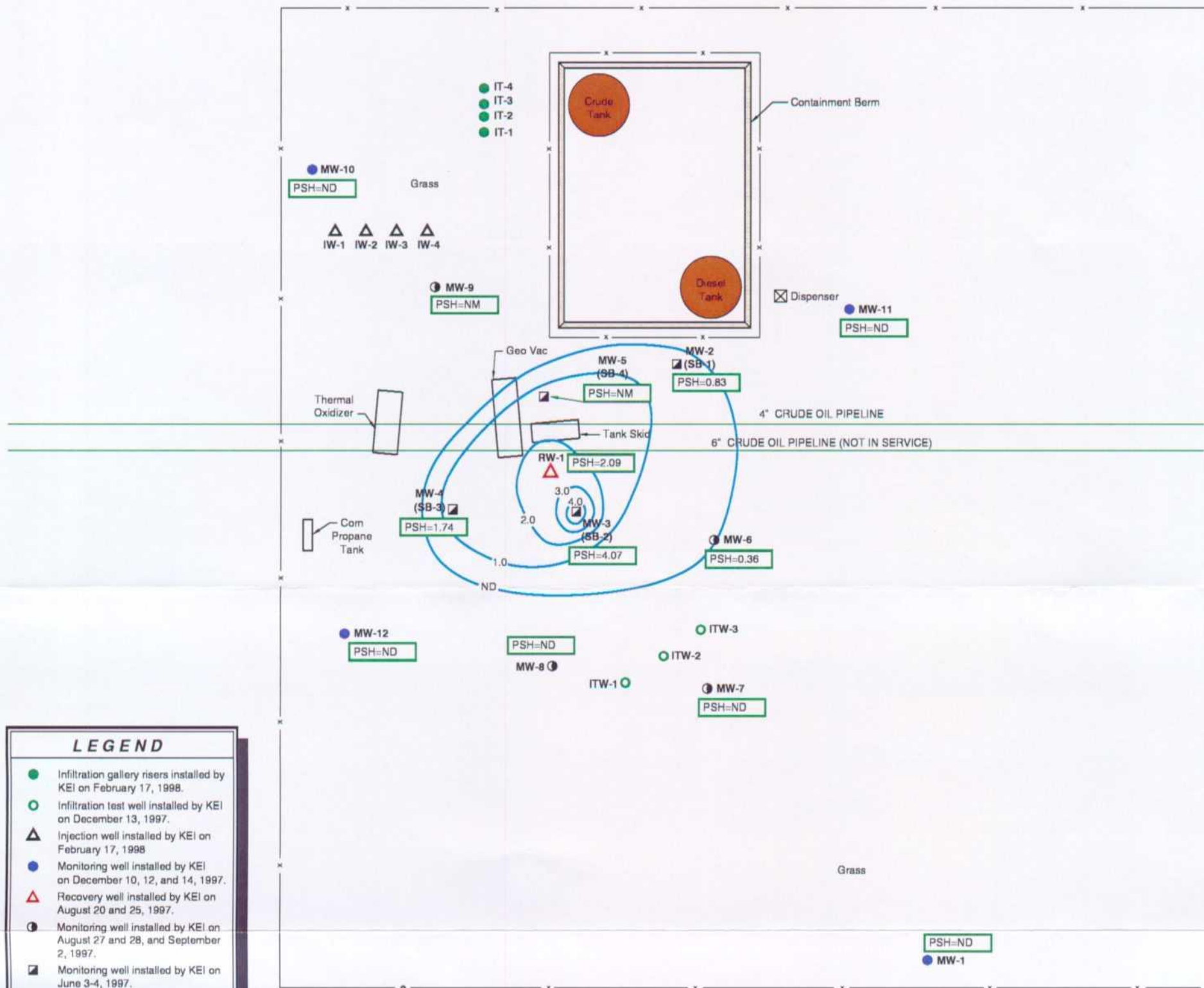
TNM-97-04

LOVINGTON, NEW MEXICO

710016-1-0

FIG 1

NOTE:
MW-5 and MW-9 are piped to the remediation system
and therefore cannot be gauged.



LEGEND

- Infiltration gallery risers installed by KEI on February 17, 1998.
 - Infiltration test well installed by KEI on December 13, 1997.
 - △ Injection well installed by KEI on February 17, 1998.
 - Monitoring well installed by KEI on December 10, 12, and 14, 1997.
 - △ Recovery well installed by KEI on August 20 and 25, 1997.
 - Monitoring well installed by KEI on August 27 and 28, and September 2, 1997.
 - Monitoring well installed by KEI on June 3-4, 1997.
- PSH = Phase-Separated hydrocarbons thickness (feet) measured on September 14, 1998.
- NM = Not Measured
- Contour Interval = 1.0 foot

11/15/98-JB G:\SAFETY\PROJECTS\TANPLU\1001\MONTHLY\PSHSEP98

kei

PSH THICKNESS MAP - SEPTEMBER 1998

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

710016-1-0

FIG 2

FIGURE 3
AVERAGE GROUND WATER DATA

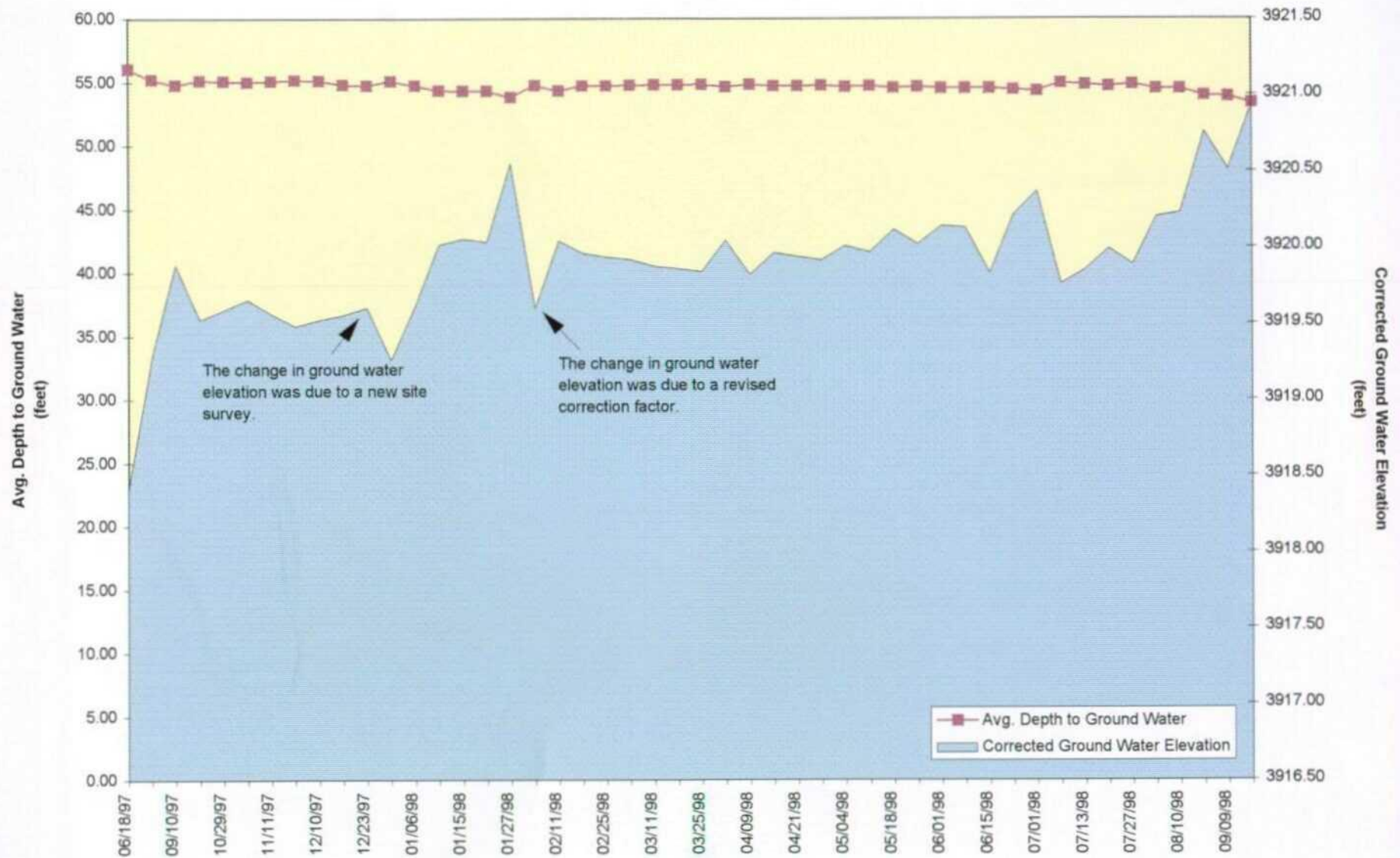


FIGURE 4
DISSOLVED PHASE CONCENTRATIONS

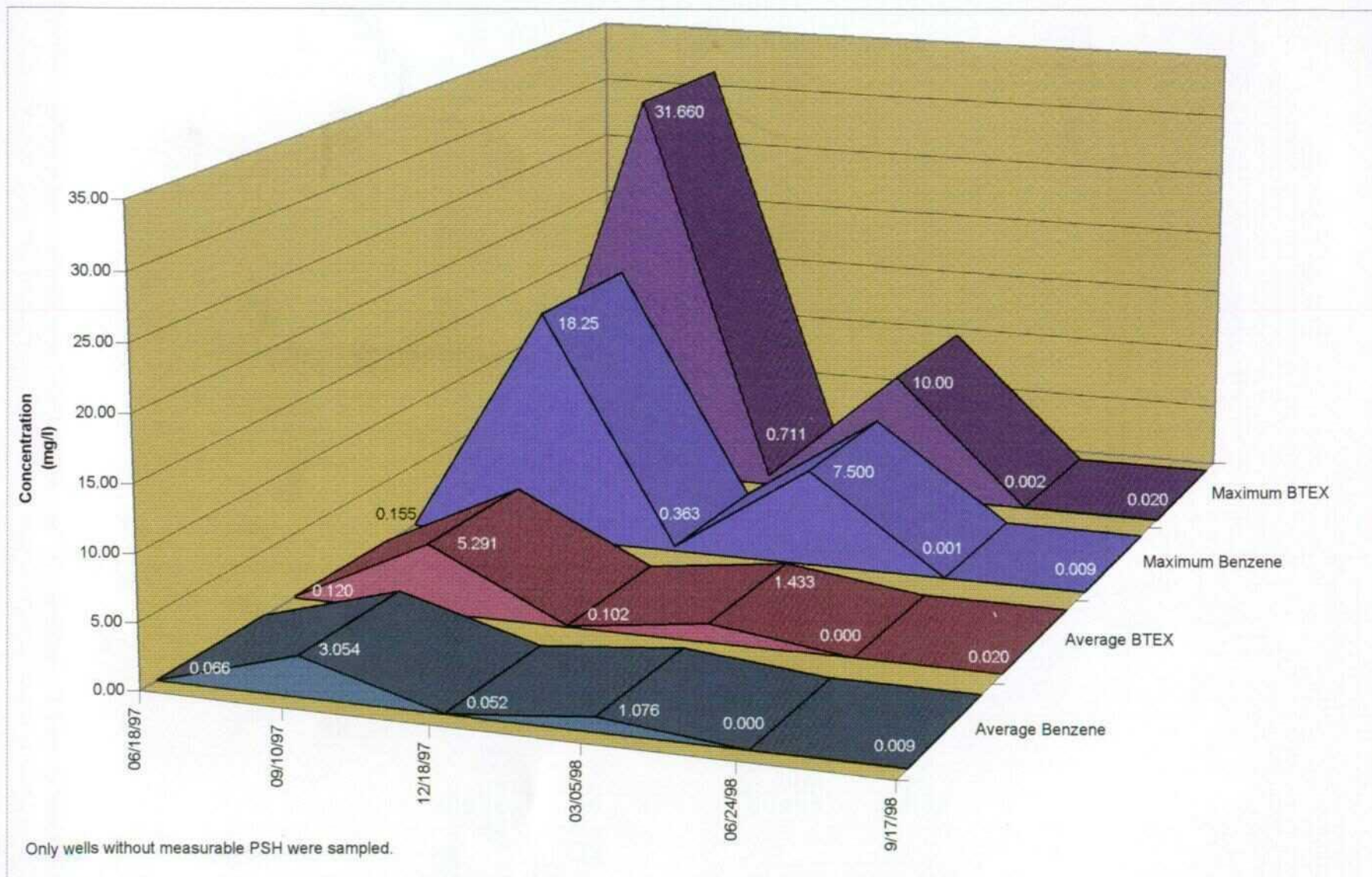


TABLE I
SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-1	06/18/97	ND	ND	ND	ND	ND	ND
MW-1	09/10/97	ND	ND	ND	ND	ND	—
MW-1	12/18/97	ND	ND	ND	ND	ND	—
MW-1	03/05/98	ND	ND	ND	ND	ND	—
MW-1	06/24/98	ND	ND	ND	ND	ND	—
MW-1	09/17/98	ND	ND	ND	ND	ND	—
MW-2	06/18/97	0.044	0.014	0.004	0.008	0.070	2
MW-2	09/10/97	18.25	9.70	0.61	3.10	31.66	—
MW-4	06/18/97	0.155	0.106	0.007	0.023	0.291	2
MW-6	09/10/97	0.003	ND	ND	ND	0.003	—
MW-6	12/18/97	0.363	0.241	0.015	0.092	0.711	—
MW-6	03/05/98	7.5	1.8	0.2	0.5	10.0	—
MW-7	09/10/97	0.002	0.001	ND	ND	0.003	—
MW-7	12/18/97	ND	ND	ND	ND	ND	—
MW-7	03/05/98	ND	ND	ND	ND	ND	—
MW-7	06/24/98	ND	ND	ND	ND	ND	—
MW-7	09/17/98	ND	ND	ND	ND	ND	—
MW-8	09/10/97	0.012	ND	ND	ND	0.012	—
MW-8	12/18/97	ND	ND	ND	ND	ND	—
MW-8	03/05/98	0.025	ND	ND	ND	0.025	—
MW-8	06/24/98	0.001	0.001	ND	ND	0.002	—
MW-8	09/17/98	0.009	0.006	0.001	0.004	0.020	—
MW-9	09/10/97	0.055	0.014	ND	ND	0.069	—
MW-10	12/18/97	ND	ND	ND	ND	ND	—
MW-10	03/05/98	0.003	ND	ND	ND	0.003	—
MW-10	06/24/98	ND	ND	ND	ND	ND	—
MW-10	09/17/98	ND	ND	ND	ND	ND	—
MW-11	12/18/97	ND	ND	0.003	ND	0.003	—
MW-11	03/05/98	0.002	ND	ND	ND	0.002	—

TABLE I
(continued)

SUMMARY OF GROUND WATER RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-11	06/24/98	ND	ND	ND	ND	ND	—
MW-11	09/17/98	ND	ND	ND	ND	ND	—
MW-12	12/18/97	ND	ND	ND	ND	ND	—
MW-12	03/05/98	0.003	ND	ND	ND	0.003	—
MW-12	06/24/98	ND	ND	ND	ND	ND	—
MW-12	09/17/98	ND	ND	ND	ND	ND	—
LOV-1 (crude)	11/07/97	—	—	—	—	—	9.3

TABLE II

SUMMARY OF GROUND WATER RESULTS - PAH
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-6	MW-7	MW-8	MW-10
DATE SAMPLED:	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	03/05/98	03/05/98	03/05/98	03/05/98	03/05/98
PARAMETER:	CONCENTRATION (mg/l)													
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	0.006	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.616	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	0.013	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	0.021	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	0.070	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	0.027	0.094	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	—	0.122	—	—	—	—	—	—
Naphthalene	ND	0.071	ND	ND	ND	ND	ND	0.028	0.237	ND	0.037	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	0.003	0.054	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Benzo(j)fluoranthene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
7H-Dibenzo(c,g)carbazole	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Dibenzo(a,h)pyrene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—
Dibenzo(a,i)pyrene	ND	ND	ND	ND	ND	ND	—	—	—	—	—	—	—	—

TABLE II
(continued)

**SUMMARY OF GROUND WATER RESULTS - PAH
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE ID:	MW-11	MW-12	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED:	03/05/98	03/05/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98
PARAMETER:	CONCENTRATION (mg/l)							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	—	—	—	—	—	—	—	—
Naphthalene	ND	0.006	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	—	—	—	—	—	—	—	—
Benzo(j)fluoranthene	—	—	—	—	—	—	—	—
7H-Dibenzo(c,g)carbazole	—	—	—	—	—	—	—	—
Dibenzo(a,h)pyrene	—	—	—	—	—	—	—	—
Dibenzo(a,i)pyrene	—	—	—	—	—	—	—	—

TABLE III

SUMMARY OF GROUND WATER RESULTS - METALS
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE ID	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97	12/18/97	12/18/97	12/18/97	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98	06/24/98
PARAMETER	CONCENTRATION (mg/l)												
Aluminum	0.61	0.82	0.32	0.41	1.33	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Barium	0.058	0.079	0.084	0.072	0.18	0.10	0.073	0.10	0.09	0.08	0.09	0.09	0.11
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	ND	ND	ND	ND	0.18	0.15	ND	0.19	0.20	0.13	0.17	0.13	0.11
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	69.4	88.5	118	98.5	306	121	91.6	140	102	105	118	143	151
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	0.40	0.47	0.19	0.23	2.03	0.13	ND	ND	ND	ND	ND	ND	ND
Lead	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Magnesium	10.1	13.3	17.1	13.7	12.6	14.0	14.7	15.2	15.4	16.1	18.1	14.9	18.5
Manganese	ND	ND	ND	ND	0.20	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	1.48	1.60	2.07	1.94	3.84	2.75	2.83	1.71	1.64	1.58	2.34	1.95	2.80
Selenium	—	—	—	—	—	—	—	ND	ND	ND	ND	ND	ND
Silicon	20.8	21.0	20.8	21.1	21.1	17.6	17.5	20.8	21.6	22.1	22.0	20.2	21.9
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	18.6	33.9	32.1	31.9	46.7	29.5	37.6	38.4	40.5	30.6	42.3	28.1	33.8
Strontium	0.53	0.60	0.75	0.62	0.63	0.61	0.50	0.75	0.75	0.77	0.82	0.75	0.78
Tin	ND	ND	ND	ND	1.01	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	0.067	ND	ND	ND	ND	ND	ND	ND	0.05
Zinc	ND	ND	ND	ND	1.19	0.22	0.12	ND	ND	ND	0.16	0.11	0.10
Mercury	ND	ND	ND	ND	—	—	—	ND	ND	ND	ND	ND	ND

TABLE IV

**MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.19	53.15	3921.04	—	—
07/29/97	3,974.19	53.05	3921.14	—	—
09/10/97	3,974.19	52.99	3921.20	—	—
10/22/97	3,974.19	52.98	3921.21	—	—
10/29/97	3,974.19	52.98	3921.21	—	—
11/04/97	3,974.19	52.97	3921.22	—	—
11/11/97	3,974.19	52.97	3921.22	—	—
12/04/97	3,974.19	52.97	3921.22	—	—
12/10/97	3,974.19	52.99	3921.20	—	—
12/18/97	3,974.18	52.97	3921.21	—	—
12/23/97	3,974.18	52.96	3921.22	—	—
12/31/97	3,974.18	52.96	3921.22	—	—
01/06/98	3,974.18	52.96	3921.22	—	—
01/06/98	3,974.18	52.96	3921.22	—	—
01/07/98	3,974.18	52.97	3921.21	—	—
01/15/98	3,974.18	52.96	3921.22	—	—
01/23/98	3,974.18	52.98	3921.20	—	—
01/27/98	3,974.18	52.97	3921.21	—	—
02/03/98	3,974.18	52.95	3921.23	—	—
02/11/98	3,974.18	52.97	3921.21	—	—
02/17/98	3,974.18	52.95	3921.23	—	—
02/25/98	3,974.18	52.93	3921.25	—	—
03/05/98	3,974.18	52.91	3921.27	—	—
03/11/98	3,974.18	52.94	3921.24	—	—
03/16/98	3,974.18	52.93	3921.25	—	—
03/25/98	3,974.18	52.92	3921.26	—	—
03/31/98	3,974.18	52.90	3921.28	—	—
04/09/98	3,974.18	52.96	3921.22	—	—
04/16/98	3,974.18	52.95	3921.23	—	—
04/21/98	3,974.18	52.96	3921.22	—	—
04/28/98	3,974.18	52.94	3921.24	—	—
05/04/98	3,974.18	52.95	3921.23	—	—
05/11/98	3,974.18	52.97	3921.21	—	—
05/18/98	3,974.18	52.99	3921.19	—	—
05/27/98	3,974.18	52.98	3921.20	—	—

TABLE IV
(continued)

**MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/01/98	3,974.18	53.02	3921.16	—	—
06/09/98	3,974.18	52.94	3921.24	—	—
06/15/98	3,974.18	53.94	3920.24	—	—
06/22/98	3,974.18	52.99	3921.19	—	—
06/24/98	3,974.18	52.96	3921.22	—	—
07/01/98	3,974.18	53.01	3921.17	—	—
07/06/98	3,974.18	52.98	3921.20	—	—
07/13/98	3,974.18	53.00	3921.18	—	—
07/20/98	3,974.18	53.03	3921.15	—	—
07/27/98	3,974.18	53.07	3921.11	—	—
08/03/98	3,974.18	52.98	3921.20	—	—
08/10/98	3,974.18	53.07	3921.11	—	—
08/17/98	3,974.18	53.09	3921.09	—	—
08/24/98	3,974.18	53.08	3921.10	—	—
09/02/98	3,974.18	53.04	3921.14	—	—
09/09/98	3,974.18	53.02	3921.16	—	—
09/14/98	3,974.18	52.97	3921.21	—	—
09/22/98	3,974.18	53.02	3921.16	—	—
09/30/98	3,974.18	53.02	3921.16	—	—

TABLE IV
(continued)

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.65	53.24	3921.41	—	—
07/29/97	3,974.65	53.14	3921.51	—	—
09/10/97	3,974.65	53.11	3921.54	—	SHEEN
10/22/97	3,974.65	53.20	3921.45	3921.60	0.18
10/29/97	3,974.65	53.24	3921.41	3921.60	0.22
11/04/97	3,974.65	53.26	3921.39	3921.60	0.25
11/11/97	3,974.65	53.30	3921.35	3921.61	0.30
12/04/97	3,974.65	53.45	3921.20	3921.58	0.47
12/10/97	3,974.65	53.47	3921.18	3921.60	0.52
12/18/97	3,974.62	53.51	3921.11	3921.36	0.30
12/23/97	3,974.62	53.52	3921.10	3921.59	0.60
12/31/97	3,974.62	53.58	3921.04	3921.57	0.65
01/06/98	3,974.62	53.58	3921.04	3921.61	0.69
01/06/98	3,974.62	53.57	3921.05	3921.62	0.69
01/06/98	3,974.62	53.60	3921.02	3921.59	0.70
01/06/98	3,974.62	53.59	3921.03	3921.60	0.69
01/06/98	3,974.62	53.61	3921.01	3921.59	0.71
01/07/98	3,974.62	53.66	3920.96	3921.54	0.71
01/08/98	3,974.62	53.65	3920.97	3921.58	0.75
01/09/98	3,974.62	53.64	3920.98	3921.59	0.74
01/10/98	3,974.62	53.70	3920.92	3921.53	0.75
01/12/98	3,974.62	53.67	3920.95	3921.57	0.76
01/15/98	3,974.62	53.68	3920.94	3921.57	0.77
01/23/98	3,974.62	53.78	3920.84	3921.53	0.84
01/27/98	3,974.62	53.80	3920.82	3921.52	0.86
02/03/98	3,974.62	53.77	3920.85	3921.55	0.86
02/11/98	3,974.62	53.88	3920.74	3921.53	0.97
02/17/98	3,974.62	53.80	3920.82	3921.57	0.92
02/25/98	3,974.62	53.78	3920.84	3921.59	0.92
03/05/98	3,974.62	53.82	3920.80	3921.59	0.96
03/11/98	3,974.62	53.87	3920.75	3921.58	1.01
03/16/98	3,974.62	53.85	3920.77	3921.59	1.00
03/25/98	3,974.62	53.93	3920.69	3921.61	1.12
03/31/98	3,974.62	53.42	3921.20	3921.62	0.51
04/09/98	3,974.62	53.79	3920.83	3921.46	0.77
04/16/98	3,974.62	53.60	3921.02	3921.59	0.69

TABLE IV
(continued)

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/21/98	3,974.62	53.65	3920.97	3921.58	0.75
04/28/98	3,974.62	53.70	3920.92	3921.58	0.81
04/29/98	3,974.62	53.99	3920.63	3921.42	0.97
04/30/98	3,974.62	53.94	3920.68	3921.46	0.95
05/01/98	3,974.62	53.92	3920.70	3921.48	0.95
05/04/98	3,974.62	53.66	3920.96	3921.62	0.81
05/11/98	3,974.62	53.93	3920.69	3921.50	0.99
05/13/98	3,974.62	53.80	3920.82	3921.60	0.95
05/18/98	3,974.62	53.84	3920.78	3921.55	0.94
05/27/98	3,974.62	53.88	3920.74	3921.56	1.00
06/01/98	3,974.62	53.91	3920.71	3921.54	1.02
06/09/98	3,974.62	53.80	3920.82	3921.62	0.98
06/15/98	3,974.62	53.86	3920.76	3921.61	1.04
07/03/98	3,974.62	57.32	3917.30	3920.25	3.62
07/06/98	3,974.62	57.57	3917.05	3920.42	4.13
07/13/98	3,974.62	58.24	3916.38	3920.35	4.87
07/20/98	3,974.62	55.58	3919.04	3919.13	0.11
07/27/98	3,974.62	58.02	3916.60	3919.06	3.02
08/03/98	3,974.62	56.88	3917.74	3921.61	4.75
08/10/98	3,974.62	57.50	3917.12	3921.41	5.26
08/17/98	3,974.62	57.65	3916.97	3921.37	5.40
08/24/98	3,974.62	54.31	3920.31	3921.38	1.31
09/02/98	3,974.62	55.54	3919.08	3921.47	2.93
09/09/98	3,974.62	56.12	3918.50	3921.30	3.44
09/14/98	3,974.62	53.72	3920.90	3921.58	0.83
09/22/98	3,974.62	53.68	3920.94	3921.47	0.65
09/30/98	3,974.62	53.48	3921.14	3921.57	0.52

TABLE IV
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.63	60.08	3914.55	3921.94	8.69
06/23/97	3,974.63	60.08	3914.55	3921.96	8.72
06/23/97	3,974.63	53.30	3921.33	3921.56	0.27
06/23/97	3,974.63	53.78	3920.85	3921.71	1.01
06/25/97	3,974.63	59.85	3914.78	3921.99	8.48
06/25/97	3,974.63	55.50	3919.13	3921.72	3.05
06/25/97	3,974.63	56.34	3918.29	3921.78	4.10
06/25/97	3,974.63	53.29	3921.34	—	—
06/27/97	3,974.63	59.99	3914.64	3921.96	8.61
06/27/97	3,974.63	56.68	3917.95	3921.60	4.29
07/01/97	3,974.63	59.99	3914.64	3921.96	8.61
07/03/97	3,974.63	60.04	3914.59	3921.98	8.69
07/03/97	3,974.63	55.22	3919.41	3921.75	2.75
07/29/97	3,974.63	60.03	3914.60	3921.96	8.66
07/29/97	3,974.63	54.47	3920.16	3921.90	2.05
09/10/97	3,974.63	59.81	3914.82	3921.96	8.40
09/16/97	3,974.63	59.86	3914.77	3921.95	8.45
09/23/97	3,974.63	59.84	3914.79	3921.96	8.44
10/22/97	3,974.63	59.78	3914.85	3921.96	8.37
10/29/97	3,974.63	59.75	3914.88	3921.96	8.33
11/04/97	3,974.63	59.73	3914.90	3921.96	8.31
11/11/97	3,974.63	59.70	3914.93	3921.97	8.28
12/04/97	3,974.63	59.64	3914.99	3921.66	8.19
12/10/97	3,974.63	59.56	3915.07	3921.68	8.12
12/18/97	3,974.60	59.56	3915.04	3921.64	8.11
12/23/97	3,974.60	59.52	3915.08	3921.66	8.08
12/31/97	3,974.60	59.47	3915.13	3921.65	8.00
01/06/98	3,974.60	59.48	3915.12	3921.67	8.04
01/06/98	3,974.60	59.53	3915.07	3921.63	8.06
01/06/98	3,974.60	59.45	3915.15	3921.61	7.93
01/06/98	3,974.60	59.49	3915.11	3921.60	7.97
01/06/98	3,974.60	59.48	3915.12	3921.60	7.96
01/07/98	3,974.60	59.54	3915.06	3921.56	7.98
01/08/98	3,974.60	59.44	3915.16	3921.58	7.88
01/09/98	3,974.60	59.58	3915.02	3921.54	8.00

TABLE IV
(continued)

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
01/10/98	3,974.60	59.35	3915.25	3921.54	7.72
01/12/98	3,974.60	59.22	3915.38	3921.58	7.61
01/15/98	3,974.60	59.18	3915.42	3921.57	7.55
01/23/98	3,974.60	58.98	3915.62	3921.52	7.24
01/27/98	3,974.60	58.89	3915.71	3921.53	7.15
02/03/98	3,974.60	58.83	3915.77	3921.54	7.09
02/11/98	3,974.60	58.67	3915.93	3921.53	6.87
02/17/98	3,974.60	58.74	3915.86	3921.63	7.09
02/25/98	3,974.60	58.85	3915.75	3921.65	7.25
03/05/98	3,974.60	58.85	3915.75	3921.65	7.24
03/11/98	3,974.60	58.87	3915.73	3921.64	7.26
03/16/98	3,974.60	58.86	3915.74	3921.65	7.26
03/25/98	3,974.60	58.87	3915.73	3921.67	7.29
03/31/98	3,974.60	58.74	3915.86	3921.68	7.14
04/09/98	3,974.60	59.13	3915.47	3921.06	6.86
04/16/98	3,974.60	58.48	3916.12	3921.64	6.78
04/21/98	3,974.60	58.52	3916.08	3921.65	6.84
04/28/98	3,974.60	58.45	3916.15	3921.64	6.74
04/29/98	3,974.60	58.91	3915.69	3921.01	6.53
04/30/98	3,974.60	58.63	3915.97	3921.09	6.29
05/01/98	3,974.60	58.55	3916.05	3921.02	6.10
05/04/98	3,974.60	57.92	3916.68	3921.66	6.11
05/11/98	3,974.60	57.82	3916.78	3921.15	5.36
05/13/98	3,974.60	58.13	3916.47	3921.18	5.78
05/18/98	3,974.60	57.16	3917.44	3921.44	4.91
05/27/98	3,974.60	57.78	3916.82	3921.30	5.50
06/01/98	3,974.60	57.01	3917.59	3921.47	4.76
06/09/98	3,974.60	57.32	3917.28	3921.68	5.40
06/15/98	3,974.60	57.42	3917.18	3921.67	5.51
06/22/98	3,974.60	57.42	3917.18	3921.58	5.40
07/01/98	3,974.60	57.85	3916.75	3921.12	5.36
07/06/98	3,974.60	57.85	3916.75	3921.13	5.38
07/13/98	3,974.60	57.67	3916.93	3921.16	5.19
07/20/98	3,974.60	57.52	3917.08	3920.97	4.78
07/27/98	3,974.60	57.71	3916.89	3920.78	4.78

TABLE IV
(continued)

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
08/03/98	3,974.60	56.96	3917.64	3921.63	4.90
08/10/98	3,974.60	57.59	3917.01	3920.87	4.74
08/17/98	3,974.60	57.30	3917.30	3920.87	4.38
08/24/98	3,974.60	54.07	3920.53	3920.89	0.44
09/09/98	3,974.60	54.10	3920.50	3920.91	0.50
09/14/98	3,974.60	56.32	3918.28	3921.60	4.07
09/22/98	3,974.60	56.61	3917.99	3921.00	3.69
09/30/98	3,974.60	55.11	3919.49	3921.20	2.10

TABLE IV
(continued)

**MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/18/97	3,974.55	52.96	3921.59	—	—	—
07/29/97	3,974.55	52.92	3921.63	—	—	—
09/10/97	3,974.55	54.53	3920.02	3921.80	3922.11	2.09
09/16/97	3,974.55	54.38	3920.17	3921.80	3922.09	1.92
09/23/97	3,974.55	54.45	3920.10	3921.81	3922.11	2.01
10/22/97	3,974.55	57.92	3916.63	3922.00	3922.95	6.32
10/29/97	3,974.55	57.29	3917.26	3921.96	3922.79	5.53
11/04/97	3,974.55	56.75	3917.80	3921.92	3922.65	4.85
11/11/97	3,974.55	57.63	3916.92	3921.98	3922.87	5.95
12/04/97	3,974.55	58.53	3916.02	3921.76	3923.07	7.05
12/10/97	3,974.55	58.25	3916.30	3921.80	3923.05	6.75
12/18/97	3,974.53	58.57	3915.96	3921.75	3923.07	7.11
12/23/97	3,974.53	58.17	3916.36	3921.76	3922.99	6.63
12/31/97	3,974.53	58.36	3916.17	3921.77	3923.04	6.87
01/06/98	3,974.53	58.48	3916.05	3921.80	3923.11	7.06
01/06/98	3,974.53	58.48	3916.05	3921.78	3923.08	7.03
01/06/98	3,974.53	58.50	3916.03	3921.76	3923.07	7.04
01/06/98	3,974.53	58.47	3916.06	3921.76	3923.06	7.00
01/06/98	3,974.53	58.47	3916.06	3921.76	3923.06	7.00
01/07/98	3,974.53	58.53	3916.00	3921.72	3923.02	7.02
01/08/98	3,974.53	58.54	3915.99	3921.73	3923.04	7.05
01/09/98	3,974.53	58.53	3916.00	3921.73	3923.03	7.03
01/10/98	3,974.53	58.51	3916.02	3921.70	3922.99	6.97
01/12/98	3,974.53	58.51	3916.02	3921.68	3922.97	6.95
01/15/98	3,974.53	58.47	3916.06	3921.73	3923.02	6.96
01/23/98	3,974.53	58.37	3916.16	3921.70	3922.96	6.80
01/27/98	3,974.53	52.31	3922.22	3922.81	3922.94	0.72
02/03/98	3,974.53	58.20	3916.33	3921.71	3922.93	6.60
02/11/98	3,974.53	58.13	3916.40	3921.69	3922.89	6.49
02/17/98	3,974.53	58.11	3916.42	3921.75	3922.96	6.54
02/25/98	3,974.53	58.09	3916.44	3921.77	3922.98	6.54
03/05/98	3,974.53	58.07	3916.46	3921.76	3922.97	6.51
03/11/98	3,974.53	58.05	3916.48	3921.75	3922.95	6.47
03/16/98	3,974.53	58.11	3916.42	3921.76	3922.98	6.56
03/25/98	3,974.53	58.10	3916.43	3921.77	3922.99	6.56
03/31/98	3,974.53	57.88	3916.65	3921.80	3922.97	6.32

TABLE IV
(continued)

**MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
04/09/98	3,974.53	58.28	3916.25	3921.50	3922.70	6.45
04/16/98	3,974.53	57.89	3916.64	3921.76	3922.93	6.29
04/21/98	3,974.53	57.82	3916.71	3921.76	3922.91	6.20
04/28/98	3,974.53	57.83	3916.70	3921.75	3922.90	6.20
04/29/98	3,974.53	58.28	3916.25	3921.43	3922.61	6.36
04/30/98	3,974.53	58.12	3916.41	3921.46	3922.61	6.20
05/01/98	3,974.53	58.09	3916.44	3921.50	3922.65	6.21
05/04/98	3,974.53	57.64	3916.89	3921.78	3922.89	6.00
05/11/98	3,974.53	57.71	3916.82	3921.54	3922.62	5.80
05/13/98	3,974.53	57.63	3916.90	3921.63	3922.71	5.81
05/18/98	3,974.53	57.24	3917.29	3921.66	3922.65	5.36
05/27/98	3,974.53	57.30	3917.23	3921.61	3922.61	5.38
06/01/98	3,974.53	57.02	3917.51	3921.66	3922.61	5.10
06/09/98	3,974.53	56.99	3917.54	3921.78	3922.75	5.21
06/15/98	3,974.53	56.99	3917.54	3921.78	3922.74	5.20
06/22/98	3,974.53	57.08	3917.45	3921.69	3922.66	5.21
07/01/98	3,974.53	57.21	3917.32	3921.55	3922.51	5.19
07/06/98	3,974.53	57.15	3917.38	3921.61	3922.57	5.19
07/13/98	3,974.53	57.10	3917.43	3921.55	3922.49	5.06
07/20/98	3,974.53	57.00	3917.53	3921.46	3922.35	4.82
07/27/98	3,974.53	57.17	3917.36	3921.31	3922.21	4.85
08/03/98	3,974.53	56.67	3917.86	3921.75	3922.63	4.77
08/10/98	3,974.53	57.00	3917.53	3921.37	3922.24	4.71
08/17/98	3,974.53	56.94	3917.59	3921.32	3922.17	4.58
08/24/98	3,974.53	56.66	3917.87	3921.40	3922.20	4.33
09/02/98	3,974.53	56.01	3918.52	3920.31	3920.72	2.20
09/09/98	3,974.53	57.43	3917.10	3919.55	3920.11	3.01
09/14/98	3,974.53	54.26	3920.27	3921.69	3922.01	1.74
09/22/98	3,974.53	54.17	3920.36	3921.44	3921.68	1.32
09/30/98	3,974.53	54.15	3920.38	3921.57	3921.84	1.46

TABLE IV
(continued)

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/18/97	3,974.31	60.85	3913.46	3922.41	3923.99	10.53
06/23/97	3,974.31	58.09	3916.22	3922.08	3923.11	6.89
06/23/97	3,974.31	56.57	3917.74	3922.38	3923.20	5.46
06/23/97	3,974.31	59.18	3915.13	3921.32	3922.41	7.28
06/23/97	3,974.31	59.74	3914.57	3922.08	3923.40	8.83
06/23/97	3,974.31	54.91	3919.40	3921.88	3922.32	2.92
06/25/97	3,974.31	60.47	3913.84	3922.02	3923.46	9.62
06/25/97	3,974.31	58.47	3915.84	3921.99	3923.08	7.24
06/25/97	3,974.31	59.49	3914.82	3922.01	3923.28	8.46
06/25/97	3,974.31	53.42	3920.89	3921.94	3922.12	1.23
06/25/97	3,974.31	55.95	3918.36	3921.90	3922.52	4.16
06/25/97	3,974.31	58.50	3915.81	3922.02	3923.11	7.30
06/25/97	3,974.31	52.46	3921.85	3921.87	3921.87	0.02
06/25/97	3,974.31	51.81	3922.50	3922.50	3922.50	0.00
06/27/97	3,974.31	60.46	3913.85	3922.06	3923.51	9.66
06/27/97	3,974.31	57.47	3916.84	3922.00	3922.91	6.07
07/01/97	3,974.31	60.45	3913.86	3922.01	3923.45	9.59
07/01/97	3,974.31	56.40	3917.91	3921.94	3922.65	4.74
07/03/97	3,974.31	60.41	3913.90	3922.01	3923.44	9.54
07/03/97	3,974.31	57.53	3916.78	3921.98	3922.90	6.12
07/29/97	3,974.31	60.19	3914.12	3922.02	3923.41	9.29
07/29/97	3,974.31	57.69	3916.62	3920.97	3921.74	5.12
09/10/97	3,974.31	59.88	3914.43	3922.00	3923.34	8.91
09/16/97	3,974.31	59.85	3914.46	3922.00	3923.33	8.87
09/23/97	3,974.31	59.79	3914.52	3922.01	3923.33	8.81
10/22/97	3,974.31	59.60	3914.71	3922.01	3923.30	8.59
10/29/97	3,974.31	59.56	3914.75	3921.99	3923.27	8.52
11/04/97	3,974.31	59.54	3914.77	3922.00	3923.27	8.50
11/11/97	3,974.31	59.48	3914.83	3922.00	3923.27	8.44
12/04/97	3,974.31	59.38	3914.93	3921.69	3923.23	8.30
12/10/97	3,974.31	59.31	3915.00	3921.71	3923.24	8.24
12/18/97	3,974.28	59.28	3915.00	3921.69	3923.21	8.21
12/23/97	3,974.28	59.25	3915.03	3921.70	3923.22	8.19
12/31/97	3,974.28	59.23	3915.05	3921.67	3923.18	8.13
12/31/97	3,974.28	59.23	3915.05	3921.67	3923.18	8.13

TABLE IV
(continued)

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
01/06/98	3,974.28	59.19	3915.09	3921.70	3923.20	8.11
01/06/98	3,974.28	59.21	3915.07	3921.69	3923.20	8.13
01/06/98	3,974.28	59.20	3915.08	3921.66	3923.16	8.08
01/06/98	3,974.28	59.19	3915.09	3921.66	3923.15	8.06
01/06/98	3,974.28	59.17	3915.11	3921.68	3923.17	8.06
01/07/98	3,974.28	59.23	3915.05	3921.62	3923.11	8.06
01/08/98	3,974.28	59.17	3915.11	3921.66	3923.15	8.04
01/09/98	3,974.28	59.14	3915.14	3921.57	3923.03	7.89
01/10/98	3,974.28	59.16	3915.12	3921.60	3923.08	7.96
01/12/98	3,974.28	59.06	3915.22	3921.65	3923.11	7.89
01/15/98	3,974.28	59.03	3915.25	3921.64	3923.10	7.85
01/23/98	3,974.28	58.90	3915.38	3921.60	3923.02	7.64
01/27/98	3,974.28	58.83	3915.45	3921.60	3923.00	7.55
02/03/98	3,974.28	58.74	3915.54	3921.62	3923.00	7.46
02/11/98	3,974.28	58.60	3915.68	3921.60	3922.95	7.27
02/17/98	3,974.28	58.59	3915.69	3921.69	3923.05	7.36
02/25/98	3,974.28	58.63	3915.65	3921.70	3923.08	7.43
03/05/98	3,974.28	58.61	3915.67	3921.70	3923.07	7.40
03/11/98	3,974.28	58.60	3915.68	3921.68	3923.05	7.37
03/16/98	3,974.28	58.58	3915.70	3921.70	3923.07	7.37
03/25/98	3,974.28	58.57	3915.71	3921.71	3923.07	7.36
03/31/98	3,974.28	58.52	3915.76	3921.72	3923.08	7.32
04/09/98	3,974.28	58.69	3915.59	3921.32	3922.62	7.03
04/16/98	3,974.28	58.33	3915.95	3921.69	3923.00	7.05
04/21/98	3,974.28	58.33	3915.95	3921.70	3923.01	7.06
04/28/98	3,974.28	58.29	3915.99	3921.68	3922.98	6.99
04/29/98	3,974.28	58.41	3915.87	3921.33	3922.57	6.70
04/30/98	3,974.28	58.29	3915.99	3921.31	3922.52	6.53
05/01/98	3,974.28	58.11	3916.17	3921.38	3922.57	6.40
05/04/98	3,974.28	57.96	3916.32	3921.72	3922.95	6.63
05/11/98	3,974.28	57.80	3916.48	3921.44	3922.57	6.09
05/13/98	3,974.28	57.88	3916.40	3921.54	3922.71	6.31
05/18/98	3,974.28	57.33	3916.95	3921.60	3922.66	5.71
05/27/98	3,974.28	57.67	3916.61	3921.51	3922.63	6.02
06/01/98	3,974.28	57.14	3917.14	3921.60	3922.62	5.48
06/09/98	3,974.28	57.38	3916.90	3921.71	3922.81	5.91

TABLE IV
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/15/98	3,974.28	57.39	3916.89	3921.70	3922.80	5.91
06/22/98	3,974.28	57.38	3916.90	3921.63	3922.70	5.80
07/01/98	3,974.28	54.27	3920.01	3921.23	3921.51	1.50
07/06/98	3,974.28	58.84	3915.44	3921.21	3922.52	7.08
07/13/98	3,974.28	57.27	3917.01	3921.43	3922.43	5.42
07/20/98	3,974.28	56.94	3917.34	3921.40	3922.32	4.98
08/03/98	3,974.28	56.56	3917.72	3921.69	3922.59	4.87
09/09/98	3,974.28	54.29	3919.99	3921.34	3921.65	1.66

TABLE IV
(continued)

MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
09/10/97	3,974.73	53.29	3921.44	—	—	—
10/22/97	3,974.73	53.30	3921.43	—	—	—
10/29/97	3,974.73	53.30	3921.43	—	—	—
11/04/97	3,974.73	53.29	3921.44	—	—	—
11/11/97	3,974.73	53.30	3921.43	—	—	—
12/04/97	3,974.73	53.26	3921.47	—	—	—
12/10/97	3,974.73	53.25	3921.48	—	—	—
12/18/97	3,974.72	53.30	3921.42	—	—	—
12/23/97	3,974.72	53.24	3921.48	—	—	—
12/31/97	3,974.72	53.23	3921.49	—	—	—
01/06/98	3,974.72	53.23	3921.49	—	—	—
01/06/98	3,974.72	53.23	3921.49	—	—	—
01/07/98	3,974.72	53.23	3921.49	—	—	—
01/15/98	3,974.72	53.23	3921.49	—	—	—
01/23/98	3,974.72	53.28	3921.44	—	—	—
01/27/98	3,974.72	53.27	3921.45	—	—	—
02/03/98	3,974.72	53.24	3921.48	—	—	—
02/11/98	3,974.72	53.27	3921.45	—	—	—
02/17/98	3,974.72	53.23	3921.49	—	—	—
02/25/98	3,974.72	53.20	3921.52	—	—	—
03/05/98	3,974.72	53.16	3921.56	—	—	—
03/11/98	3,974.72	53.23	3921.49	—	—	—
03/16/98	3,974.72	53.20	3921.52	—	—	—
03/25/98	3,974.72	53.19	3921.53	—	—	—
03/31/98	3,974.72	53.18	3921.54	—	—	—
04/09/98	3,974.72	53.33	3921.39	—	—	—
04/16/98	3,974.72	53.21	3921.51	—	—	—
04/21/98	3,974.72	53.23	3921.49	—	—	—
04/28/98	3,974.72	53.21	3921.51	—	—	—
05/04/98	3,974.72	53.21	3921.51	—	—	—
05/11/98	3,974.72	53.32	3921.40	—	—	—
05/18/98	3,974.72	53.32	3921.40	—	—	—
05/27/98	3,974.72	53.28	3921.44	—	—	—
06/01/98	3,974.72	53.33	3921.39	—	—	—
06/09/98	3,974.72	53.20	3921.52	—	3921.52	sheen
06/15/98	3,974.72	53.19	3921.53	—	3921.53	sheen

TABLE IV
(continued)

MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/22/98	3,974.72	53.26	3921.46	—	3921.46	sheen
07/01/98	3,974.72	53.35	3921.37	3921.39	3921.39	0.02
07/06/98	3,974.72	53.26	3921.46	3921.48	3921.48	0.02
07/13/98	3,974.72	53.33	3921.39	3921.43	3921.43	0.04
07/20/98	3,974.72	53.43	3921.29	3921.35	3921.36	0.07
07/27/98	3,974.72	53.58	3921.14	3921.23	3921.25	0.11
08/03/98	3,974.72	53.34	3921.38	3921.50	3921.52	0.14
08/10/98	3,974.72	53.62	3921.10	3921.24	3921.27	0.17
08/17/98	3,974.72	53.64	3921.08	3921.24	3921.27	0.19
08/24/98	3,974.72	53.63	3921.09	3921.29	3921.33	0.24
09/02/98	3,974.72	53.66	3921.06	3921.28	3921.33	0.27
09/09/98	3,974.72	53.51	3921.21	3921.47	3921.52	0.31
09/14/98	3,974.72	53.53	3921.19	3921.49	3921.55	0.36
09/22/98	3,974.72	53.84	3920.88	3921.23	3921.31	0.43
09/30/98	3,974.72	53.68	3921.04	3921.43	3921.51	0.47

TABLE IV
(continued)

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
09/10/97	3,974.66	53.21	3921.45	—	—	—
10/22/97	3,974.66	53.23	3921.43	—	—	—
10/29/97	3,974.66	53.24	3921.42	—	—	—
11/04/97	3,974.66	53.23	3921.43	—	—	—
11/11/97	3,974.66	53.23	3921.43	—	—	—
12/04/97	3,974.66	53.17	3921.49	—	—	—
12/10/97	3,974.66	53.19	3921.47	—	—	—
12/18/97	3,974.60	53.16	3921.44	—	—	—
12/23/97	3,974.60	53.16	3921.44	—	—	—
12/31/97	3,974.60	53.17	3921.43	—	—	—
01/06/98	3,974.60	53.18	3921.42	—	—	—
01/06/98	3,974.60	53.17	3921.43	—	—	—
01/07/98	3,974.60	53.19	3921.41	—	—	—
01/15/98	3,974.60	53.17	3921.43	—	—	—
01/23/98	3,974.60	53.20	3921.40	—	—	—
01/27/98	3,974.60	53.19	3921.41	—	—	—
02/03/98	3,974.60	53.16	3921.44	—	—	—
02/11/98	3,974.60	53.19	3921.41	—	—	—
02/17/98	3,974.60	53.15	3921.45	—	—	—
02/25/98	3,974.60	53.13	3921.47	—	—	—
03/05/98	3,974.60	53.12	3921.48	—	—	—
03/11/98	3,974.60	53.14	3921.46	—	—	—
03/16/98	3,974.60	53.12	3921.48	—	—	—
03/25/98	3,974.60	53.11	3921.49	—	—	—
03/31/98	3,974.60	53.12	3921.48	—	—	—
04/09/98	3,974.60	53.21	3921.39	—	—	—
04/16/98	3,974.60	53.14	3921.46	—	—	—
04/21/98	3,974.60	53.16	3921.44	—	—	—
04/28/98	3,974.60	53.14	3921.46	—	—	—
05/04/98	3,974.60	53.14	3921.46	—	—	—
05/11/98	3,974.60	53.21	3921.39	—	—	—
05/18/98	3,974.60	53.24	3921.36	—	—	—
05/27/98	3,974.60	53.18	3921.42	—	—	—
06/01/98	3,974.60	53.23	3921.37	—	—	—
06/09/98	3,974.60	53.12	3921.48	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/15/98	3,974.60	53.13	3921.47	—	—	—
06/22/98	3,974.60	53.20	3921.40	—	—	—
06/24/98	3,974.60	53.23	3921.37	—	—	—
07/01/98	3,974.60	53.25	3921.35	—	—	—
07/06/98	3,974.60	53.18	3921.42	—	—	—
07/13/98	3,974.60	53.22	3921.38	—	—	—
07/20/98	3,974.60	53.29	3921.31	—	—	—
07/27/98	3,974.60	53.41	3921.19	—	—	—
08/03/98	3,974.60	53.21	3921.39	—	—	—
08/10/98	3,974.60	53.39	3921.21	—	—	—
08/17/98	3,974.60	53.42	3921.18	—	—	—
08/24/98	3,974.60	53.39	3921.21	—	—	—
09/02/98	3,974.60	53.36	3921.24	—	—	—
09/09/98	3,974.60	53.30	3921.30	—	—	—
09/14/98	3,974.60	53.21	3921.39	—	—	—
09/22/98	3,974.60	53.03	3921.57	—	—	—
09/30/98	3,974.60	53.01	3921.59	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
09/10/97	3,974.52	52.97	3921.55	—	—	—
10/22/97	3,974.52	52.98	3921.54	—	—	—
10/29/97	3,974.52	53.02	3921.50	—	—	—
11/04/97	3,974.52	53.01	3921.51	—	—	—
11/11/97	3,974.52	53.03	3921.49	—	—	—
12/04/97	3,974.52	52.92	3921.60	—	—	—
12/10/97	3,974.52	52.92	3921.60	—	—	—
12/18/97	3,974.48	53.03	3921.45	—	—	—
12/23/97	3,974.48	52.91	3921.57	—	—	—
12/31/97	3,974.48	52.91	3921.57	—	—	—
01/06/98	3,974.48	52.90	3921.58	—	—	—
01/06/98	3,974.48	52.90	3921.58	—	—	—
01/07/98	3,974.48	52.92	3921.56	—	—	—
01/15/98	3,974.48	52.93	3921.55	—	—	—
01/23/98	3,974.48	52.94	3921.54	—	—	—
01/27/98	3,974.48	52.94	3921.54	—	—	—
02/03/98	3,974.48	52.91	3921.57	—	—	—
02/11/98	3,974.48	52.94	3921.54	—	—	—
02/17/98	3,974.48	52.89	3921.59	—	—	—
02/25/98	3,974.48	52.87	3921.61	—	—	—
03/05/98	3,974.48	52.85	3921.63	—	—	—
03/11/98	3,974.48	52.88	3921.60	—	—	—
03/16/98	3,974.48	52.88	3921.60	—	—	—
03/25/98	3,974.48	52.87	3921.61	—	—	—
03/31/98	3,974.48	52.84	3921.64	—	—	—
04/09/98	3,974.48	52.98	3921.50	—	—	—
04/16/98	3,974.48	52.89	3921.59	—	—	—
04/21/98	3,974.48	52.88	3921.60	—	—	—
04/28/98	3,974.48	52.89	3921.59	—	—	—
05/04/98	3,974.48	52.88	3921.60	—	—	—
05/11/98	3,974.48	52.99	3921.49	—	—	—
05/18/98	3,974.48	53.02	3921.46	—	—	—
05/27/98	3,974.48	52.94	3921.54	—	—	—
06/01/98	3,974.48	53.01	3921.47	—	—	—
06/09/98	3,974.48	52.88	3921.60	—	—	—
06/15/98	3,974.48	52.88	3921.60	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
06/22/98	3,974.48	52.95	3921.53	—	—	—
06/24/98	3,974.48	52.89	3921.59	—	—	—
07/01/98	3,974.48	53.01	3921.47	—	—	—
07/06/98	3,974.48	52.93	3921.55	—	—	—
07/13/98	3,974.48	52.97	3921.51	—	—	—
07/20/98	3,974.48	53.08	3921.40	—	—	—
07/27/98	3,974.48	53.10	3921.38	—	—	—
08/03/98	3,974.48	52.94	3921.54	—	—	—
08/10/98	3,974.48	53.17	3921.31	—	—	—
08/17/98	3,974.48	53.19	3921.29	—	—	—
08/24/98	3,974.48	53.16	3921.32	—	—	—
09/02/98	3,974.48	53.12	3921.36	—	—	—
09/09/98	3,974.48	53.06	3921.42	—	—	—
09/14/98	3,974.48	52.94	3921.54	—	—	—
09/22/98	3,974.48	53.09	3921.39	—	—	—
09/30/98	3,974.48	52.98	3921.50	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
09/10/97	3,975.80	53.29	3922.51	—	—	—
10/22/97	3,975.80	53.34	3922.46	—	—	—
10/29/97	3,975.80	53.36	3922.44	—	—	—
11/04/97	3,975.80	53.35	3922.45	—	—	—
11/11/97	3,975.80	53.32	3922.48	—	—	—
12/04/97	3,975.80	53.37	3922.43	3922.49	3922.50	0.07
12/10/97	3,975.80	53.38	3922.42	3922.54	3922.57	0.15
12/18/97	3,975.06	53.53	3921.53	3922.02	3922.13	0.60
12/23/97	3,975.06	53.57	3921.49	3921.80	3921.87	0.38
12/31/97	3,975.06	53.70	3921.36	3921.77	3921.87	0.51
01/06/98	3,975.06	53.79	3921.27	3921.81	3921.94	0.67
01/06/98	3,975.06	53.81	3921.25	3921.83	3921.96	0.71
01/06/98	3,975.06	53.80	3921.26	3921.80	3921.93	0.67
01/06/98	3,975.06	53.81	3921.25	3921.80	3921.93	0.68
01/06/98	3,975.06	53.81	3921.25	3921.80	3921.93	0.68
01/07/98	3,975.06	53.86	3921.20	3921.75	3921.88	0.68
01/08/98	3,975.06	53.85	3921.21	3921.79	3921.93	0.72
01/09/98	3,975.06	53.88	3921.18	3921.80	3921.94	0.76
01/10/98	3,975.06	53.94	3921.12	3921.74	3921.89	0.77
01/12/98	3,975.06	53.96	3921.10	3921.78	3921.94	0.84
01/15/98	3,975.06	53.98	3921.08	3921.79	3921.95	0.87
01/23/98	3,975.06	54.33	3920.73	3921.74	3921.97	1.24
01/27/98	3,975.06	54.47	3920.59	3921.73	3922.00	1.41
02/03/98	3,975.06	54.72	3920.34	3921.76	3922.09	1.75
02/11/98	3,975.06	55.05	3920.01	3921.73	3922.13	2.12
02/17/98	3,975.06	55.23	3919.83	3921.78	3922.23	2.40
02/25/98	3,975.06	55.57	3919.49	3921.81	3922.34	2.85
03/05/98	3,975.06	55.90	3919.16	3921.80	3922.41	3.25
03/11/98	3,975.06	56.14	3918.92	3921.79	3922.45	3.53
03/16/98	3,975.06	56.35	3918.71	3921.82	3922.53	3.82
03/25/98	3,975.06	56.68	3918.38	3921.83	3922.62	4.24
03/31/98	3,975.06	55.22	3919.84	3921.83	3922.29	2.45
04/09/98	3,975.06	55.88	3919.18	3921.71	3922.29	3.11
04/16/98	3,975.06	56.16	3918.90	3921.82	3922.49	3.59
04/21/98	3,975.06	56.43	3918.63	3921.83	3922.56	3.93
04/28/98	3,975.06	56.77	3918.29	3921.81	3922.62	4.33

TABLE IV
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
04/29/98	3,975.06	56.83	3918.23	3921.78	3922.60	4.37
04/30/98	3,975.06	56.61	3918.45	3922.02	3922.84	4.39
05/01/98	3,975.06	56.63	3918.43	3922.04	3922.87	4.44
05/04/98	3,975.06	56.89	3918.17	3921.92	3922.78	4.61
05/11/98	3,975.06	56.98	3918.08	3921.93	3922.81	4.73
05/13/98	3,975.06	57.04	3918.02	3921.90	3922.79	4.77
05/18/98	3,975.06	56.83	3918.23	3922.12	3923.01	4.78
05/27/98	3,975.06	57.05	3918.01	3921.93	3922.83	4.82
06/01/98	3,975.06	56.92	3918.14	3922.08	3922.98	4.84
06/09/98	3,975.06	57.14	3917.92	3921.87	3922.78	4.86
06/15/98	3,975.06	57.15	3917.91	3921.86	3922.76	4.85
07/01/98	3,975.06	55.42	3919.64	3920.02	3920.11	0.47
07/03/98	3,975.06	54.93	3920.13	3920.70	3920.83	0.70
07/06/98	3,975.06	55.41	3919.65	3920.44	3920.62	0.97
07/20/98	3,975.06	56.57	3918.49	3919.02	3919.14	0.65
07/27/98	3,975.06	57.05	3918.01	3918.97	3919.19	1.18
08/03/98	3,975.06	54.29	3920.77	3921.42	3921.57	0.80
08/10/98	3,975.06	54.14	3920.92	3921.69	3921.87	0.95
08/17/98	3,975.06	54.74	3920.32	3921.45	3921.71	1.39
08/24/98	3,975.06	54.64	3920.42	3921.70	3921.99	1.57
09/02/98	3,975.06	55.03	3920.03	3921.44	3921.76	1.73
09/09/98	3,975.06	56.54	3918.52	3920.05	3920.40	1.88
09/22/98	3,975.06	54.85	3920.21	3920.87	3921.02	0.81

TABLE IV
(continued)

MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-94
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
12/18/97	3,975.02	53.10	3921.92	—	—	—
12/23/97	3,975.02	53.11	3921.91	—	—	—
12/31/97	3,975.02	53.10	3921.92	—	—	—
01/06/98	3,975.02	53.11	3921.91	—	—	—
01/06/98	3,975.02	53.11	3921.91	—	—	—
01/07/98	3,975.02	53.12	3921.90	—	—	—
01/15/98	3,975.02	53.12	3921.90	—	—	—
01/23/98	3,975.02	53.12	3921.90	—	—	—
01/27/98	3,975.02	53.13	3921.89	—	—	—
02/03/98	3,975.02	53.09	3921.93	—	—	—
02/11/98	3,975.02	53.13	3921.89	—	—	—
02/17/98	3,975.02	53.11	3921.91	—	—	—
02/25/98	3,975.02	53.08	3921.94	—	—	—
03/05/98	3,975.02	53.07	3921.95	—	—	—
03/11/98	3,975.02	53.10	3921.92	—	—	—
03/16/98	3,975.02	53.08	3921.94	—	—	—
03/25/98	3,975.02	53.07	3921.95	—	—	—
03/31/98	3,975.02	53.05	3921.97	—	—	—
04/09/98	3,975.02	53.13	3921.89	—	—	—
04/16/98	3,975.02	53.09	3921.93	—	—	—
04/21/98	3,975.02	53.09	3921.93	—	—	—
04/28/98	3,975.02	53.09	3921.93	—	—	—
05/04/98	3,975.02	53.01	3922.01	—	—	—
05/11/98	3,975.02	52.95	3922.07	—	—	—
05/18/98	3,975.02	52.89	3922.13	—	—	—
05/27/98	3,975.02	53.01	3922.01	—	—	—
06/01/98	3,975.02	52.95	3922.07	—	—	—
06/09/98	3,975.02	53.05	3921.97	—	—	—
06/15/98	3,975.02	53.08	3921.94	—	—	—
06/22/98	3,975.02	53.15	3921.87	—	—	—
06/24/98	3,975.02	53.02	3922.00	—	—	—
07/01/98	3,975.02	53.11	3921.91	—	—	—
07/06/98	3,975.02	53.05	3921.97	—	—	—
07/13/98	3,975.02	53.02	3922.00	—	—	—
07/20/98	3,975.02	52.83	3922.19	—	—	—
07/27/98	3,975.02	52.90	3922.12	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-10
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-94
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
08/03/98	3,975.02	53.09	3921.93	—	—	—
08/10/98	3,975.02	52.82	3922.20	—	—	—
08/17/98	3,975.02	52.99	3922.03	—	—	—
08/24/98	3,975.02	52.78	3922.24	—	—	—
09/02/98	3,975.02	52.93	3922.09	—	—	—
09/09/98	3,975.02	52.91	3922.11	—	—	—
09/14/98	3,975.02	52.97	3922.05	—	—	—
09/22/98	3,975.02	52.86	3922.16	—	—	—
09/30/98	3,975.02	52.84	3922.18	—	—	—

TABLE IV
(continued)

**MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
12/18/97	3,975.30	53.85	3921.45	—	—	—
12/23/97	3,975.30	53.85	3921.45	—	—	—
12/31/97	3,975.30	53.84	3921.46	—	—	—
01/06/98	3,975.30	53.83	3921.47	—	—	—
01/06/98	3,975.30	53.85	3921.45	—	—	—
01/07/98	3,975.30	53.86	3921.44	—	—	—
01/15/98	3,975.30	53.85	3921.45	—	—	—
01/23/98	3,975.30	53.89	3921.41	—	—	—
01/27/98	3,975.30	53.87	3921.43	—	—	—
02/03/98	3,975.30	53.83	3921.47	—	—	—
02/11/98	3,975.30	53.86	3921.44	—	—	—
02/17/98	3,975.30	53.82	3921.48	—	—	—
02/25/98	3,975.30	53.81	3921.49	—	—	—
03/05/98	3,975.30	53.79	3921.51	—	—	—
03/11/98	3,975.30	53.83	3921.47	—	—	—
03/16/98	3,975.30	53.81	3921.49	—	—	—
03/25/98	3,975.30	53.80	3921.50	—	—	—
03/31/98	3,975.30	53.78	3921.52	—	—	—
04/09/98	3,975.30	53.86	3921.44	—	—	—
04/16/98	3,975.30	53.82	3921.48	—	—	—
04/21/98	3,975.30	53.82	3921.48	—	—	—
04/28/98	3,975.30	53.83	3921.47	—	—	—
05/04/98	3,975.30	53.80	3921.50	—	—	—
05/11/98	3,975.30	53.83	3921.47	—	—	—
05/18/98	3,975.30	53.85	3921.45	—	—	—
05/27/98	3,975.30	53.83	3921.47	—	—	—
06/01/98	3,975.30	53.87	3921.43	—	—	—
06/09/98	3,975.30	53.82	3921.48	—	—	—
06/15/98	3,975.30	53.81	3921.49	—	—	—
06/22/98	3,975.30	53.88	3921.42	—	—	—
06/24/98	3,975.30	53.81	3921.49	—	—	—
07/01/98	3,975.30	53.91	3921.39	—	—	—
07/06/98	3,975.30	53.82	3921.48	—	—	—
07/13/98	3,975.30	53.85	3921.45	—	—	—
07/20/98	3,975.30	53.89	3921.41	—	—	—
07/27/98	3,975.30	53.96	3921.34	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-11
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
08/03/98	3,975.30	53.83	3921.47	—	—	—
08/10/98	3,975.30	53.93	3921.37	—	—	—
08/17/98	3,975.30	53.96	3921.34	—	—	—
08/24/98	3,975.30	53.92	3921.38	—	—	—
09/02/98	3,975.30	53.89	3921.41	—	—	—
09/09/98	3,975.30	53.86	3921.44	—	—	—
09/14/98	3,975.30	53.82	3921.48	—	—	—
09/22/98	3,975.30	53.82	3921.48	—	—	—
09/30/98	3,975.30	53.83	3921.47	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
12/18/97	3,974.55	52.80	3921.75	—	—	—
12/23/97	3,974.55	52.80	3921.75	—	—	—
12/31/97	3,974.55	52.80	3921.75	—	—	—
01/06/98	3,974.55	52.80	3921.75	—	—	—
01/06/98	3,974.55	52.79	3921.76	—	—	—
01/07/98	3,974.55	52.82	3921.73	—	—	—
01/15/98	3,974.55	52.81	3921.74	—	—	—
01/23/98	3,974.55	52.83	3921.72	—	—	—
01/27/98	3,974.55	52.23	3922.32	—	—	—
02/03/98	3,974.55	58.79	3915.76	—	—	—
02/11/98	3,974.55	52.82	3921.73	—	—	—
02/17/98	3,974.55	52.78	3921.77	—	—	—
02/25/98	3,974.55	52.77	3921.78	—	—	—
03/05/98	3,974.55	52.75	3921.80	—	—	—
03/11/98	3,974.55	52.78	3921.77	—	—	—
03/16/98	3,974.55	52.76	3921.79	—	—	—
03/25/98	3,974.55	52.75	3921.80	—	—	—
03/31/98	3,974.55	52.74	3921.81	—	—	—
04/09/98	3,974.55	52.85	3921.70	—	—	—
04/16/98	3,974.55	52.79	3921.76	—	—	—
04/21/98	3,974.55	52.77	3921.78	—	—	—
04/28/98	3,974.55	52.79	3921.76	—	—	—
05/04/98	3,974.55	52.75	3921.80	—	—	—
05/11/98	3,974.55	52.83	3921.72	—	—	—
05/18/98	3,974.55	52.85	3921.70	—	—	—
05/27/98	3,974.55	52.81	3921.74	—	—	—
06/01/98	3,974.55	52.86	3921.69	—	—	—
06/09/98	3,974.55	52.77	3921.78	—	—	—
06/15/98	3,974.55	52.77	3921.78	—	—	—
06/22/98	3,974.55	52.83	3921.72	—	—	—
06/24/98	3,974.55	52.79	3921.76	—	—	—
07/01/98	3,974.55	52.88	3921.67	—	—	—
07/06/98	3,974.55	52.80	3921.75	—	—	—
07/13/98	3,974.55	52.83	3921.72	—	—	—
07/20/98	3,974.55	52.89	3921.66	—	—	—
07/27/98	3,974.55	52.98	3921.57	—	—	—

TABLE IV
(continued)

MONITORING WELL MW-12
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPELINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected		
08/03/98	3,974.55	52.80	3921.75	---	---	---
08/10/98	3,974.55	52.96	3921.59	---	---	---
08/17/98	3,974.55	52.99	3921.56	---	---	---
08/24/98	3,974.55	52.93	3921.62	---	---	---
09/02/98	3,974.55	52.92	3921.63	---	---	---
09/09/98	3,974.55	52.86	3921.69	---	---	---
09/14/98	3,974.55	52.80	3921.75	---	---	---
09/22/98	3,974.55	52.89	3921.66	---	---	---
09/30/98	3,974.55	52.80	3921.75	---	---	---

TABLE IV
(continued)

**RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	Unknown	56.36	Unknown	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	8.30
12/18/97	3,970.79	55.84	3914.95	3921.67	8.26
12/22/97	3,970.79	55.80	3914.99	3921.69	8.23
12/31/97	3,970.79	55.79	3915.00	3921.67	8.19
01/06/98	3,970.79	55.18	3915.61	3921.68	7.46
01/06/98	3,970.79	49.50	3921.29	—	—
01/06/98	3,970.79	49.50	3921.29	—	—
01/06/98	3,970.79	49.51	3921.28	—	—
01/06/98	3,970.79	49.63	3921.16	3921.67	0.63
01/07/98	3,970.79	49.58	3921.21	—	—
01/08/98	3,970.79	49.50	3921.29	—	—
01/09/98	3,970.79	49.58	3921.21	3921.23	0.03
01/10/98	3,970.79	49.64	3921.15	3921.17	0.03
01/12/98	3,970.79	49.62	3921.17	—	sheen
01/15/98	3,970.79	49.63	3921.16	—	sheen
01/23/98	3,970.79	49.67	3921.12	3921.16	0.05
01/27/98	3,970.79	49.68	3921.11	3921.13	0.03
02/03/98	3,970.79	49.69	3921.10	3921.12	0.03
02/11/98	3,970.79	49.69	3921.10	3921.12	0.02
06/16/98	3,970.79	53.32	3917.47	3922.03	5.60
09/09/98	3,970.79	49.10	3921.69	3921.79	0.12
09/14/98	3,970.79	50.57	3920.22	3921.92	2.09

ANALYTICAL REPORT 1-83649

for

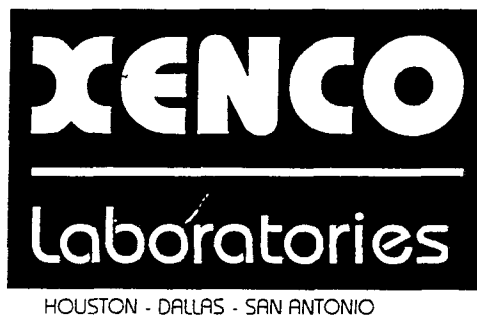
K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: Lovington

Project Id: 710016-1-0

September 22, 1998



11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
Phone (281) 589-0692 Fax (281) 589-0695



11381 Meadowglen Suite L
Houston, Texas 77082-2647
(281) 589-0692 Fax: (281) 589-0695
Houston - Dallas - San Antonio - Latin America

September 22, 1998

Project Manager: Theresa Nix
K.E.I. Consultants, Inc.
5309 Wurzbach Rd. Suite 100
San Antonio, TX 78238

Reference: **XENCO Report No.: 1-83649**
Project Name: Lovington
Project ID: 710016-1-0
Project Address: Lovington, NM.

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-83649. All results being reported to you apply only to the samples analyzed, properly identified with a Laboratory ID number. This letter documents the official transmission of the contents of the report and validates the information contained within.


All the results for the quality control samples passed thorough examination. Also, all parameters for data reduction and validation checked satisfactorily. In view of this, we are able to release the analytical data for this report within acceptance criteria for accuracy, precision, completeness or properly flagged.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 3 years in our archives and after that time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in COC No. 1-83649 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

XENCO operates under the A2LA guidelines. Our Quality System meets ISO/IEC Guide 25 requirements which is strictly implemented and enforced through our standard QA/QC procedures.

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Sincerely,



Eddie L. Clemons, II
QA/QC Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY!



CERTIFICATE OF ANALYSIS SUMMARY 1-83649

K.E.I. Consultants, Inc.

Project ID: 710016-1-0

Project Name: Lovington

Date Received in Lab : Sep 19, 1998 10:15

Project Manager: Theresa Nix

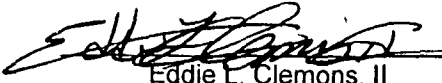
Date Report Faxed: Sep 22, 1998

Project Location: Lovington, NM.

XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	Lab ID:	183649 001	183649 002	183649 003	183649 004	183649 005	183649 006
	Field ID:	MW-1	MW-7	MW-8	MW-10	MW-11	MW-12
	Depth:						
	Matrix: Sampled:	Liquid 09/17/98 14:30	Liquid 09/17/98 14:40	Liquid 09/17/98 14:45	Liquid 09/17/98 14:55	Liquid 09/17/98 15:10	Liquid 09/17/98 15:05
BTEX EPA 8021B	Analyzed: Units:	09/21/98 ppm R.L.	09/21/98 ppm R.L.	09/21/98 ppm R.L.	09/21/98 ppm R.L.	09/21/98 ppm R.L.	09/21/98 ppm R.L.
Benzene		< 0.001 (0.001)	< 0.001 (0.001)	0.009 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	0.006 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
m,p-Xylenes		< 0.002 (0.002)	< 0.002 (0.002)	0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	0.002 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)	< 0.001 (0.001)
Total BTEX		N.D.	N.D.	0.020	N.D.	N.D.	N.D.

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Eddie L. Clemons, II
QA/QC Manager

SW- 846 5030/8021B BTEX

Date Validated: Sep 21, 1998 15:45

Analyst: HL

Date Analyzed: Sep 21, 1998 11:57

Matrix: Liquid

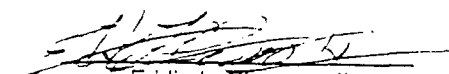
BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Detection	QC	LIMITS	Qualifier
	Result	Result	Spike		Blank Spike	Recovery	
	ppm	ppm	Amount	Limit	Recovery	Range	
			ppm	ppm	%	%	
Benzene	< 0.0010	0.1040	0.1000	0.0010	104.0	65-135	
Toluene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2080	0.2000	0.0020	104.0	65-135	
o-Xylene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	

 Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Eddie L. Clemons, II
 QA/QC Manager



Certificate Of Quality Control for Batch : 18A25D35

SW- 846 5030/8021B BTEX

Date Validated: Sep 21, 1998 15:45

Analyst: HL

Date Analyzed: Sep 21, 1998 12:34

Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 183649- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1170	0.1200	0.1000	0.0010	20.0	2.5	117.0	120.0	65-135	
Toluene	< 0.0010	0.1170	0.1200	0.1000	0.0010	20.0	2.5	117.0	120.0	65-135	
Ethylbenzene	< 0.0010	0.1160	0.1190	0.1000	0.0010	20.0	2.6	116.0	119.0	65-135	
m,p-Xylenes	< 0.0020	0.2370	0.2430	0.2000	0.0020	20.0	2.5	118.5	121.5	65-135	
o-Xylene	< 0.0010	0.1180	0.1230	0.1000	0.0010	20.0	4.1	118.0	123.0	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$


Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Eddie L. Clemons, II
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

XENCO COC#: 1-83649

Project ID: 710016-1-0
Project Manager: Theresa Nix
Project Location: Lovington, NM.

Project Name: Lovington

Date Received in Lab: Sep 19, 1998 10:15 by JO

XENCO contact : Carlos Castro/Eddie Clemons

Project Location:						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1	183649-001	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:30		Sep 21, 1998 by HL	Sep 21, 1998 12:34 by HL
2	MW-7	183649-002	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:40		Sep 21, 1998 by HL	Sep 21, 1998 13:30 by HL
3	MW-8	183649-003	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:45		Sep 21, 1998 by HL	Sep 21, 1998 13:48 by HL
4	MW-10	183649-004	BTEX	SW-846	ppm	10 days	Sep 17, 1998 14:55		Sep 21, 1998 by HL	Sep 21, 1998 14:07 by HL
5	MW-11	183649-005	BTEX	SW-846	ppm	10 days	Sep 17, 1998 15:10		Sep 21, 1998 by HL	Sep 21, 1998 14:45 by HL
6	MW-12	183649-006	BTEX	SW-846	ppm	10 days	Sep 17, 1998 15:05		Sep 21, 1998 by HL	Sep 21, 1998 14:26 by HL



- ☐ 11381 Meadowglen, Suite L, Houston TX 77082 281-589-0692
☒ 5309 Wurzbach Road, Suite 104, San Antonio, TX 78238 210-509-3334
☐ 11078 Morrison Road, Suite D, Dallas, TX 75229 972-481-9999

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

On-LINE Help & Technical Services at **XENCO.com**

Company COC No: 180

Work Order No: 710016-1-0 Page 1 of 1

065

Company KEI		Phone (210) 680-3767		Lab Only: 183649-SA		Lab Only Additions						
Project Name LOVINGTON		<input checked="" type="checkbox"/> Previously done at XENCO Project ID 710016-1-0		TAT: 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d Standard TAT is 10 Working Days unless otherwise agreed in writing. But often reported in 5-7 Working Days								
Location LOVINGTON NM		Project Director (PD) M. Hawthorne		Remarks CALL T. NIX IF QUESTIONS @ (210) 680-3767								
Project Manager (PM) T. NIX		Project Director (PD) M. Hawthorne										
Fax Results to <input checked="" type="checkbox"/> PM and / or (512) 364-3556		Fax (512) 364-3556										
Invoice to <input type="checkbox"/> Accounting <input type="checkbox"/> Include Invoice with Final Report Attn PM <input type="checkbox"/> Invoice must have a P.O. Bill to: 710016-1-0		Quote No. P.O. No		<input type="checkbox"/> Call for a P.O.								
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)		Specifications										
Sampler Name Ken Dutton		Signature <i>Ken Dutton</i>										
Sample ID	Sampling Date	Time	Depth ft' in"	Matrix APSW	Composite	Grab	# Containers	Container Size	Type	Preservatives	TAT 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d Addn: PAH above mg/L W. mg/Kg \$ Highest Hlt Hold Analysis	
1 MW-1	17 SEPT	1430					2	V	GA	H		
2 MW-7		1440										
3 MW-8		1445										
4 MW-10		1455										
5 MW-11		1510										
6 MW-12		1505										
7												
8												
9												
10												
Relinquished by (Initials and Signature) <i>AD Ken Dutton</i>		Relinquished to (Initials and Signature) <i>Johnny Orma</i>		Date & Time 12 Sept 4/16 3p		Total Containers per COC: 12		Rush TATs Fax Due:		Final Fax Due:		
								Final Report Data Package Due Date:				
		Lab: Johnny Orma		09/19/98 10:15		Rush Charges are Pre-Approved upon Requesting them. All Terms Apply						

Preservatives - Various (V), HCl pH<2 (H), H2SO4 pH<2 (S), HNO4 pH<2 (N), NaOH+Asbc Acid (NAA), ZnAc+NaOH (ZA), (Cool,<4C) (C4), None (N), See Label (SL), Other (O)

SIZE: 4oz (4), 8oz (8), 32oz (32), 40ml VOA (V), 1L (1), 500ml (.5), Tedlar Bag (B), Wipe (W), Other TYPE Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O)



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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

SUBSURFACE INVESTIGATION REPORT

**TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**



5309 Wurzbach, Suite 100
San Antonio, Texas 78238
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SUBSURFACE INVESTIGATION REPORT

**TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY

P. O. Box 1030
Jal, New Mexico 88252

Mr. Tony Savoie

PREPARED BY:

KEI

A handwritten signature in cursive script, reading 'Theresa Nix', is written over a horizontal line.

Theresa Nix
Project Manager

A handwritten signature in cursive script, reading 'J. Michael Hawthorne', is written over a horizontal line.

J. Michael Hawthorne, P.G., REM
Senior Geologist

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
PURPOSE AND SCOPE	2
FIELD INVESTIGATION	2
SOIL INVESTIGATION	
SOIL DESCRIPTION	
SOIL SAMPLING AND ANALYTICAL RESULTS	
GROUND WATER SAMPLING AND ANALYTICAL RESULTS	
CONCLUSIONS	6
FIGURES	
FIG. 1 - Site Location Map	
FIG. 2 - Site Plan	
FIG. 3 - Soil Concentration Map - August & September 1997	
FIG. 4 - Ground Water Concentration Map - September 1997	
FIG. 5 - Ground Water Contours - September 10, 1997	
TABLES	
General Notes	
TABLE I - Summary of Soil Laboratory Results - BTEX and TPH	
TABLE II - Summary of Soil Laboratory Results - VOCs	
TABLE III - Summary of Soil Laboratory Results - SVOCs	
TABLE IV - Summary of Laboratory Results - Miscellaneous	
TABLE V - Summary of Ground Water Monitoring	
TABLE VI - Summary of Ground Water Laboratory Results - BTEX and TPH	
TABLE VII - Summary of Ground Water Laboratory Results - Heavy Metals	
TABLE VIII - Summary of Ground Water Laboratory Results - PAHs	
TABLE IX - Summary of Ground Water Results - Miscellaneous	
APPENDICES	
APPENDIX A - Monitoring Well and Recovery Well Logs and Details	
APPENDIX B - Analytical Laboratory Reports	
Chain-of-Custody Documentation	

EXECUTIVE SUMMARY

The Texas - New Mexico Pipe Line Company (TNMPL) release site is located approximately two miles west of Lovington, New Mexico, in Section 11, Township 16 South, Range 35 East. A site location map is presented as FIG. 1. An initial investigation of the site was conducted in June of 1997. The initial investigation consisted of installation of five monitoring wells. The report for that investigation was dated September 22, 1997. An additional investigation was conducted in August and September 1997 to complete delineation of phase-separate hydrocarbons (PSH) and to install a recovery well. This report summarizes these additional subsurface investigation activities.

Subsurface investigation activities performed included the following:

- installing monitoring wells MW-6 through MW-9
- installing recovery well RW-1
- collection of native soil samples from the monitoring wells and recovery well for analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) concentrations;
- collection and analysis of an unimpacted native soil sample for determination of moisture content and organic carbon content
- gauging ground water and PSH levels in monitoring wells MW-1 through MW-9 and recovery well RW-1
- collecting ground water samples from monitoring wells MW-1, MW-2, and MW-6 through MW-9 for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbon (PAH), ICP heavy metals, major cations/anions, and total dissolved solids (TDS) concentrations.

The following conclusions are based on the data presented in this report:

- The closure standards for soil impact were determined to be as follows:

CONSTITUENT	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	10
BTEX	50
TPH	100 + Background Concentration

- Soil samples at the site indicated TPH, benzene, and BTEX concentrations above these closure standards.
- PSH was observed in five of the monitoring wells and in recovery well RW-1.
- Ground water samples at the site indicated benzene concentrations above New Mexico Environment Department (NMED) Drinking Water Standards. The NMED Drinking Water Standards for BTEX are as follows:

CONSTITUENT	DRINKING WATER STANDARD (mg/l)
BENZENE	0.01
TOLUENE	0.75
ETHYLBENZENE	0.75
XYLENES	0.62

PURPOSE AND SCOPE

The objective of the additional subsurface investigation activities was to delineate hydrocarbon impact across the site. The following activities were performed to achieve this objective:

- install monitoring wells upgradient and downgradient from release location
- install a recovery well in the source area
- collect soil and ground water samples for analysis of hydrocarbon and other constituent concentrations

FIELD INVESTIGATION

SOIL INVESTIGATION

During the subsurface investigation, four monitoring wells (designated MW-6 through MW-9) and one recovery well (designated RW-1) were installed utilizing air rotary technology. Soil samples were collected at selected intervals from the ground surface to termination boring depth. The soils were classified in the field, soil samples were field screened, and selected samples from the monitoring wells were prepared and shipped to the laboratory for analysis.

Upon advancement to total depth and collection of soil samples, a permanent well consisting of four-inch perforated PVC and blank riser was placed in the open hole of each boring designated as a permanent monitoring well. A permanent well consisting of six-inch perforated PVC and blank riser was placed in the open hole of the boring designated as a permanent recovery well.

All drilling and sampling equipment was cleaned prior to first use, between boring locations, and between sampling intervals with a Liqui-Nox detergent wash followed by a distilled water rinse.

The monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico. The locations of the monitoring wells and recovery well installed are presented on FIG. 2.

SOIL DESCRIPTION

The subsurface soil profile was classified in general accordance with the Unified Soil Classification System by visually observing the soil samples obtained during the assessment. In

general, five soil types were encountered. A general description of the soil, approximate thickness, and head-space sample results for each soil type are as follows:

Soil Type I

This soil type consisted of topsoil and was encountered at the surface of monitoring well locations MW-6 through MW-9. This soil type thickness ranged from approximately 0.5 to 1 feet. No head-space readings were obtained from this soil type.

Soil Type II

This soil type consisted of a white to brown rock (caliche) and was encountered beneath the topsoil layer at monitoring wells MW-6 through MW-9. The rock was moist and varied in thickness from approximately 3 to 6 feet. The head-space reading from a sample of this soil type was non-detectable (ND).

Soil Type III

This soil type consisted of a tan to brown sand and was encountered at all monitoring and recovery well locations. The sand was fine-grained, moist to wet, and was intermixed with stone. This soil type varied in thickness from approximately 4 to 58 feet. The head-space readings from samples of this soil type varied from ND to 1,000 ppm.

Soil Type IV

This soil type consisted of a tan to red limestone and was encountered only at monitoring well locations MW-6 and MW-9. The limestone was very hard. This soil type varied in thickness from approximately 2 feet in MW-6 to 18.5 feet in MW-9. No head-space readings were obtained from this soil type.

Soil Type V

This soil type consisted of backfill located at recovery well RW-1. The backfill was approximately 12 feet thick and consisted of the soils excavated and replaced as part of the initial response activities to the release. The head-space reading obtained from this soil type was 421 ppm.

Logs indicating the typical subsurface soil profile, depths at which soil samples were obtained, head-space results, laboratory results, and generalized geologic profiles are presented in APPENDIX A.

SOIL SAMPLING AND ANALYTICAL RESULTS

Native soil samples were collected at selected intervals from the ground surface to a depth of approximately two feet below ground water by pushing a split spoon sampler. The soil samples were used to evaluate water levels and the distribution of phase-separate hydrocarbons.

Representative soil samples were divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample was placed in a disposable sample bag. The bag was labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample was allowed to volatilize for approximately 30 minutes at ambient temperature prior to conducting the PID analysis.

The other portion of the soil sample was placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container was filled to capacity with soil to limit the amount of head-space present. Each container was labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler was sealed for shipment to the laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

Two soil samples were selected from each soil boring based on the following criteria:

- The sample with the highest head-space reading
- The sample directly above the ground water level measured at the time of drilling, or
- The sample at the bottom of each boring

One soil sample was collected from stockpiled soils which were used to backfill the excavation in the area of recovery well RW-1.

Eight soil samples from the monitoring wells were selected for determination of TPH and VOC concentrations by EPA Method 8015 Diesel Range Organics (DRO) and 8260, respectively. One soil sample collected from MW-9 was selected and submitted for determination of moisture content and organic content by ASTM Method 2216-71 and D2974, respectively.

Two soil samples from the recovery well were selected and submitted to the lab for determination of TPH and BTEX concentrations by EPA Method 8015 DRO and 8020, respectively. The soil sample collected from the stockpiled soils by RW-1 was submitted for determination of TPH, BTEX, VOCs, SVOCs, and SPLP TPH concentrations by EPA Method 8015 DRO, 8020, 8260, 8270, and 1312/418.1, respectively.

Laboratory results for the selected samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATIONS (mg/kg)
BENZENE	ND to 420
BTEX	ND to 1,740
TPH	ND to 142,000

Soil laboratory results are summarized in TABLES I through IV. BTEX and TPH laboratory results are also graphically presented on FIG. 3. Analytical laboratory reports are included in APPENDIX B.

GROUND WATER SAMPLING AND ANALYTICAL RESULTS

Upon completion of drilling and then approximately twice a month, each well was gauged to determine the depth to ground water and the PSH thickness. Ground water depth during the December 10, 1997, gauging event indicated the depth to ground water from wells without PSH varied from 52.92 to 53.25 feet below the ground surface and PSH thickness varied from ND to 8.30 feet. Ground water elevations indicate an approximate gradient of 0.010 ft/ft towards the southeast. Ground water contours are presented on FIG. 5. Ground water measurements are summarized in TABLE V.

On September 10, 1997, each monitoring well was purged of approximately three well volumes of water using a PVC bailer. The bailer was cleaned prior to each use with Liqui-Nox detergent and rinsed with water. After purging the wells, ground water samples were collected from monitoring wells which did not contain PSH with a disposable Teflon bailer and polyethylene line.

Water samples collected for BTEX analyses were placed in sterile, 40 ml glass VOA vials equipped with Teflon-lined caps. Water samples collected for PAH analysis were placed in unpreserved sterile one liter glass containers equipped with Teflon-lined caps. Water samples collected for metals analysis were placed in 500 ml containers equipped with Teflon-lined caps. The containers were provided by the analytical laboratory. The vials were filled to a positive meniscus, sealed, and visually checked for the presence of air bubbles.

The filled containers were labeled and placed on ice in an insulated cooler. The cooler was sealed for shipment to Xenco Laboratories in Houston, Texas for determination of metals, BTEX, PAH, major cations/anions, and total dissolved solids (TDS) concentrations using EPA Method 6010, 8020, 8100, SM4500CO2D, 300.0, and 160.1, respectively. Proper chain-of-custody documentation was maintained throughout the sampling process.

Laboratory results indicated the following concentration ranges:

CONSTITUENT	CONCENTRATIONS (mg/L)
BENZENE	ND to 18.25
BTEX	ND to 31.66
Aluminum	0.32 to 0.82
Barium	0.058 to 0.084
Calcium	69.4 to 118
Iron	0.19 to 0.47
Magnesium	10.1 to 17.1
Potassium	1.48 to 2.07
Sodium	18.6 to 33.9
Silicon	20.8 to 21.1
Strontium	0.53 to 0.75
Naphthalene	ND to 0.071
Bicarbonate	173 to 179
Carbonate	ND
TDS	426 to 574
Sulfate	42.2 to 103
Chloride	38.97 to 54.54

Metals and PAH constituents not listed above were all ND. Ground water laboratory results are summarized in TABLES VI through IX. BTEX laboratory results are graphically presented on FIG. 4. Analytical laboratory reports are included in APPENDIX B.

Purged water collected during the event was stored in steel drums pending disposal.

A crude oil sample was collected on September 9, 1997, and submitted to Environmental Lab of Texas, Inc. located in Odessa, Texas for determination of specific gravity by ASTM Method D287-64. The laboratory result indicated a specific gravity of 0.8031. The laboratory result is summarized in TABLE IV. Analytical laboratory reports are included in APPENDIX B.

CONCLUSIONS

The following conclusions are based on the data presented in this report:

- The soil closure standards were determined to be as follows:

CONSTITUENT	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	10
BTEX	50
TPH	100 + Background Concentration

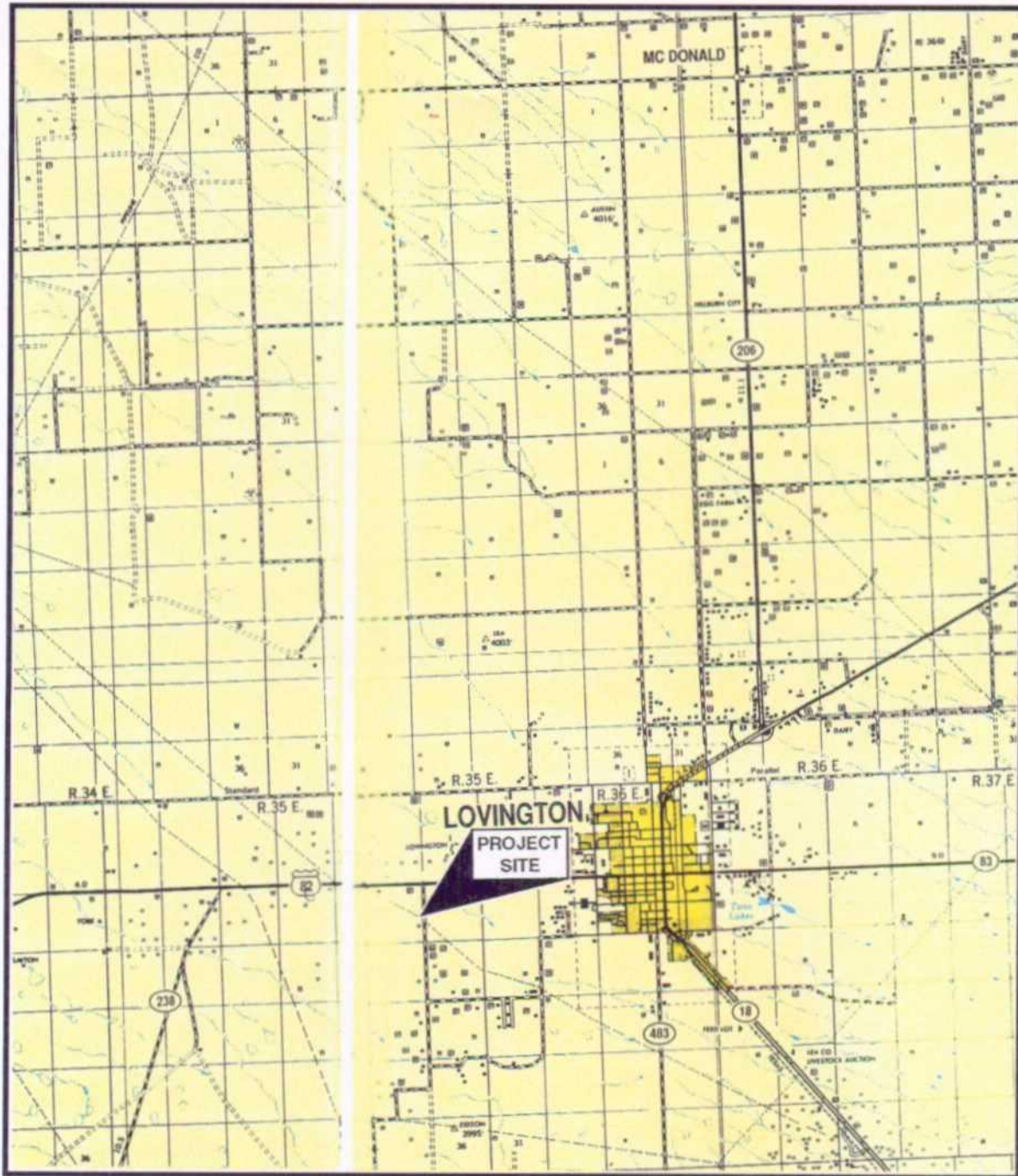
- Soil samples obtained from recovery well RW-1 indicated benzene, BTEX, and TPH concentrations above closure standards.
- PSH was observed in monitoring wells MW-2, MW-3, MW-4, MW-5, MW-9, and recovery well RW-1 with thicknesses ranging from 2.09 to 8.30 feet.
- Ground water samples obtained from monitoring wells MW-2, MW-8, and MW-9 indicated benzene concentrations above New Mexico Drinking Water Standards.

Figures

THE ROADS OF NEW MEXICO

NEW MEXICO-LEA CO.

LOVINGTON



SCALE - ONE INCH EQUALS 2.9 MILES



kei

SITE LOCATION MAP

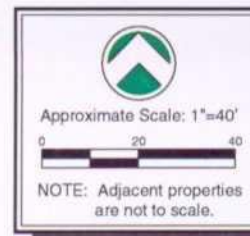
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TNM-97-04

LOVINGTON, NEW MEXICO

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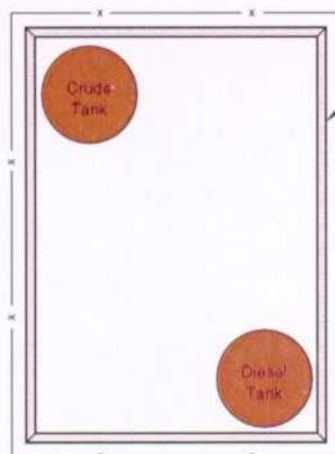
FIG 1



MW-10

Grass

MW-9



Containment Berm

MW-11

☒ Dispenser

MW-2
(SB-1)

MW-5
(SB-4)

4" CRUDE OIL PIPELINE

RW-1 ▲

6" CRUDE OIL PIPELINE (NOT IN SERVICE)

MW-4
(SB-3)

MW-3
(SB-2)

MW-6

MW-12

MW-8

MW-7

Grass

LEGEND

- Existing Monitoring Wells
- ▲ Recovery Well

MW-1

SITE DETAILS

TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

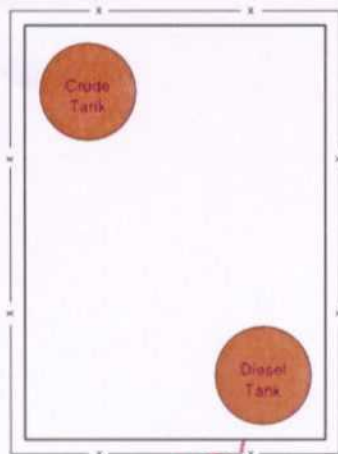
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FIG 2

kei



MW-9 (08/27/97)	
D=25-27	D=50-52
B=ND	B=ND
BTEX=ND	BTEX=0.164
TPH=ND	TPH=ND



☒ Dispenser

0.15'

8.24'

0.52'

MW-2 (SB-1)

MW-5 (SB-4)

RW-1 (08/25/97)		
D=8-10	D=20-20.5	D=50-51.5
B=0.28	B=17.30	B=420
BTEX=45.36	BTEX=197	BTEX=1740
TPH=142,000	TPH=13,800	TPH=34,900

4" CRUDE OIL PIPELINE

6" CRUDE OIL PIPELINE (NOT IN SERVICE)

6.75'

MW-4 (SB-3)

8.12'

MW-3 (SB-2)

MW-6 (09/02/97)	
D=20-22	D=50-52
B=ND	B=ND
BTEX=ND	BTEX=ND
TPH=76.9	TPH=66.7

Grass

MW-8 (08/28/97)	
D=21-22	D=46-48
B=ND	B=ND
BTEX=ND	BTEX=ND
TPH=ND	TPH=ND

MW-7 (09/02/97)	
D=20-22	D=50-52
B=ND	B=ND
BTEX=ND	BTEX=ND
TPH=ND	TPH=ND

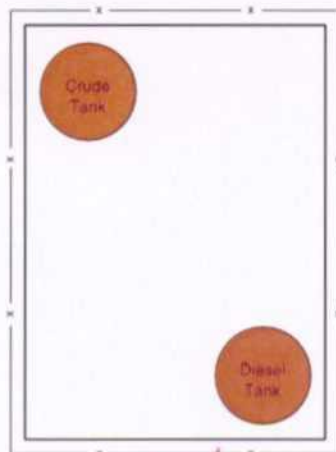
LEGEND

- Existing Monitoring Wells
- ▲ Recovery Well
- D = Depth of Soil Sample (feet)
- B = Benzene Concentration (mg/kg)
- BTEX = Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentration (mg/kg)
- TPH = Total Petroleum Hydrocarbons Concentration (mg/kg)
- ND = Not Detected

● MW-1



Grass



MW-9
B=0.055
BTEX=0.069

0.15'

⊗ Dispenser

0.52'

MW-2 (SB-1)
B=18.25
BTEX=31.66

MW-5
(SB-4)

8.24'

4" CRUDE OIL PIPELINE

RW-1 △

6" CRUDE OIL PIPELINE (NOT IN SERVICE)

6.75'

MW-4
(SB-3)

8.12'

MW-3
(SB-2)

MW-6
B=0.003
BTEX=0.003

Grass

MW-8
B=0.012
BTEX=0.012

MW-7
B=0.002
BTEX=0.003

LEGEND

- Existing Monitoring Wells
- △ Recovery Well
- B = Benzene Concentration (mg/l)
- BTEX = Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentration (mg/l)
- ND = Not Detected

NOTE:

1. Ground water samples were collected on September 10, 1997.
2. Ground water samples were not collected from MW-3, MW-4, MW-5, and RW-1 due to presence of PSH.

MW-1
B=ND
BTEX=ND

01/13/98 RW G:\711803\9

kei

GROUND WATER CONCENTRATION MAP - SEPTEMBER 1997

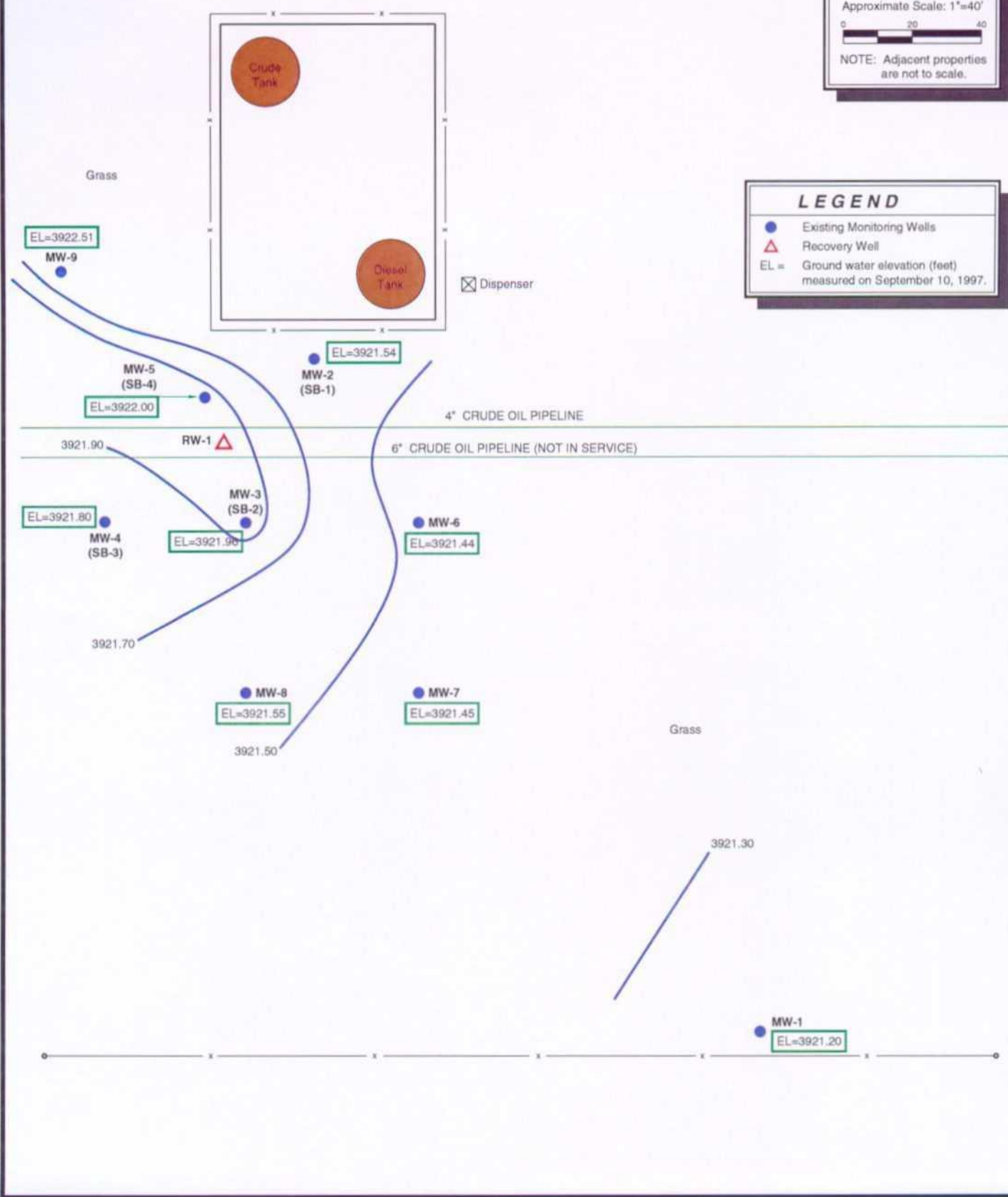
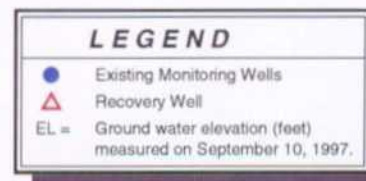
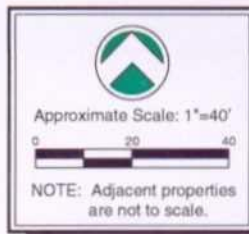
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016

FIG 4



01/13/98 RM G(7116GWCW)



Tables

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection limit.

PSH - Phase-separate hydrocarbons.

Method detection or reporting limits:

Soil: BTEX - 0.100 mg/kg
 TPH - 10 mg/kg
 VOCs - 0.005 to 1.0 mg/kg
 SVOCs - 17 mg/kg

Water: BTEX - 0.001 to 0.002 mg/l
 Metals - 0.020 to 0.50 mg/l
 PAH - 0.002 mg/l

Laboratory test methods:

BTEX	- EPA Method SW846-8020
TPH	- Modified EPA Method 8015 Diesel Range Organics
VOCs	- EPA Method 8260
SVOC	- EPA Method 8270
SPLP TPH	- EPA Method 1312/418.1
Metals	- EPA ICP Method 6010
Total Mercury	- EPA Method 7470
Bicarbonate	- SM 4500CO2D
Carbonate	- SM4500CO2D
TDS	- EPA Method 160.1
Anions	- EPA Method 300.0

TABLE I

**SUMMARY OF SOIL LABORATORY RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TMN-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	DATE SAMPLED	SAMPLE DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	BTEX (mg/kg)	TPH (mg/kg)
MW-6	09/02/97	20 - 22	ND	ND	ND	ND	ND	76.9
MW-6	09/02/97	50 - 52	ND	ND	ND	ND	ND	66.7
MW-7	09/02/97	20 - 22	ND	ND	ND	ND	ND	ND
MW-7	09/02/97	50 - 52	ND	ND	ND	ND	ND	ND
MW-8	08/28/97	21 - 22	ND	ND	ND	ND	ND	ND
MW-8	08/28/97	46 - 48	ND	ND	ND	ND	ND	ND
MW-9	08/27/97	25 - 27	ND	ND	ND	ND	ND	ND
MW-9	08/27/97	50 - 52	ND	0.035	ND	0.129	0.164	ND
RW-1	08/25/97	8 - 10	0.28	8.44	6.50	30.14	45.36	142,000
RW-1	08/25/97	8 - 10	---	---	---	---	---	5.3*
RW-1	08/25/97	20 - 20.5	17.30	65.80	28.10	86.10	197	13,800
RW-1	08/25/97	50 - 51.5	420	680	200	443	1,740	34,900

*Indicates SPLP TPH result.

TABLE II

SUMMARY OF SOIL LABORATORY RESULTS - VOCs
 TEXAS - NEW MEXICO PIPE LINE COMPANY
 TNM-97-04
 LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9
DATE SAMPLED	08/25/97	09/02/97	09/02/97	09/02/97	09/02/97	08/28/97	08/28/97	08/27/97	08/27/97
DEPTH	8 - 10	20 - 22	50 - 52	20 - 22	50 - 52	21 - 22	46 - 48	25 - 27	50 - 52
PARAMETER	CONCENTRATION (mg/kg)								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	9.0	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	4.9	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE II
(continued)

SUMMARY OF SOIL LABORATORY RESULTS - VOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9
DATE SAMPLED	08/25/97	09/02/97	09/02/97	09/02/97	09/02/97	08/28/97	08/28/97	08/27/97	08/27/97
DEPTH	8 - 10	20 - 22	50 - 52	20 - 22	50 - 52	21 - 22	46 - 48	25 - 27	50 - 52
PARAMETER	CONCENTRATION (mg/kg)								
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	8.2	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	4.0	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	21.8	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	6.7	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	9.9	ND	ND	ND	ND	ND	ND	ND	0.035
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	36.7**	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	13.5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	12.2	ND	ND	ND	ND	ND	ND	ND	0.030
m,p-Xylenes	22.9	ND	ND	ND	ND	ND	ND	ND	0.099
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE:

** Indicates that result was beyond calibration limits.

TABLE III

**SUMMARY OF SOIL LABORATORY RESULTS - SVOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	RW-1 B.F.
DATE SAMPLED	08/25/97
DEPTH	8 - 10
PARAMETER	CONCENTRATION (mg/kg)
Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(g,h,i)perylene	ND
Benzo(k)fluoranthene	ND
Butyl benzyl phthalate	ND
Carbazole	ND
4-Chloroaniline	ND
bis [2-Chloroethoxy] methane	ND
bis [2-Chloroethyl] ether	ND
bis [2-Chloroisopropyl] ether	ND
2-Chloronaphthalene	ND
2-Chlorophenol	ND
4-Chlorophenyl-phenyl ether	ND
Chrysene	ND
Dibenzofuran	ND
Dibenzo(a,h)anthracene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
3,3-Dichlorobenzidine	ND
2,4-Dichlorophenol	ND
Diethyl phthalate	ND
2,4-Dimethylphenol	ND
Dimethyl phthalate	ND
4,6-Dinitro-2-methylphenol	ND
2,4-Dinitrophenol	ND
2,4-Dinitrotoluene	ND
2,6-Dinitrotoluene	ND
Di-n-octyl phthalate	ND
bis [2-Ethylhexyl] phthalate	ND
Fluoranthene	ND
Fluorene	ND

TABLE III
(continued)

SUMMARY OF SOIL LABORATORY RESULTS - SVOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.
DATE SAMPLED	08/25/97
DEPTH	8 - 10
PARAMETER	CONCENTRATION (mg/kg)
Hexachlorobenzene	ND
Hexachlorobutadiene	ND
Hexachlorocyclopentadiene	ND
Hexachloroethane	ND
Indeno(1,2,3-cd)pyrene	ND
Isophorone	ND
2-Methylnaphthalene	56
2-Methylphenol	ND
4-Methylphenol	ND
Naphthalene	19
2-Nitroaniline	ND
3-Nitroaniline	ND
4-Nitroaniline	ND
Nitrobenzene	ND
2-Nitrophenol	ND
4-Nitrophenol	ND
N-Nitroso-di-n-propylamine	ND
N-Nitrosodiphenylamine	ND
Pentachlorophenol	ND
Phenanthrene	ND
Phenol	ND
Pyrene	ND
Pyridine	ND
1,2,4-Trichlorobenzene	ND
2,4,5-Trichlorophenol	ND
2,4,6-Trichlorophenol	ND
4-Bromophenyl-phenylether	ND
4-Chloro-3-Methylphenol	ND
Di-n-butyl phthalate	ND

TABLE IV

**SUMMARY OF LABORATORY RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	DATE SAMPLED	SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY @ 60 DEGREES F
MW-9	08/27/97	27 - 29	11.9	0.8	---
RW-1 (crude)	09/09/97	---	---	---	0.8031

TABLE V

MONITORING WELL MW-1

SUMMARY OF GROUND WATER MONITORING

TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.19	53.15	3921.04	---	---
07/29/97	3,974.19	53.05	3921.14	---	---
09/10/97	3,974.19	52.99	3921.20	---	---
10/22/97	3,974.19	52.98	3921.21	---	---
10/29/97	3,974.19	52.98	3921.21	---	---
11/04/97	3,974.19	52.97	3921.22	---	---
11/11/97	3,974.19	52.97	3921.22	---	---
12/04/97	3,974.19	52.97	3921.22	---	---
12/10/97	3,974.19	52.99	3921.20	---	---

TABLE V
(continued)

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.65	53.24	3921.41	—	—
07/29/97	3,974.65	53.14	3921.51	—	—
09/10/97	3,974.65	53.11	3921.54	—	SHEEN
10/22/97	3,974.65	53.20	3921.45	3921.60	0.18
10/29/97	3,974.65	53.24	3921.41	3921.60	0.22
11/04/97	3,974.65	53.26	3921.39	3921.60	0.25
11/11/97	3,974.65	53.30	3921.35	3921.61	0.30
12/04/97	3,974.65	53.45	3921.20	3921.60	0.47
12/10/97	3,974.65	53.47	3921.18	3921.62	0.52

TABLE V
(continued)

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.63	60.08	3914.55	3921.94	8.69
06/23/97	3,974.63	60.08	3914.55	3921.96	8.72
06/23/97	3,974.63	53.30	3921.33	3921.56	0.27
06/23/97	3,974.63	53.78	3920.85	3921.71	1.01
06/25/97	3,974.63	59.85	3914.78	3921.99	8.48
06/25/97	3,974.63	55.50	3919.13	3921.72	3.05
06/25/97	3,974.63	56.34	3918.29	3921.78	4.10
06/25/97	3,974.63	53.29	3921.34	—	—
06/27/97	3,974.63	59.99	3914.64	3921.96	8.61
06/27/97	3,974.63	56.68	3917.95	3921.60	4.29
07/01/97	3,974.63	59.99	3914.64	3921.96	8.61
07/03/97	3,974.63	60.04	3914.59	3921.98	8.69
07/03/97	3,974.63	55.22	3919.41	3921.75	2.75
07/29/97	3,974.63	60.03	3914.60	3921.96	8.66
07/29/97	3,974.63	54.47	3920.16	3921.90	2.05
09/10/97	3,974.63	59.81	3914.82	3921.96	8.40
09/16/97	3,974.63	59.86	3914.77	3921.95	8.45
09/23/97	3,974.63	59.84	3914.79	3921.96	8.44
10/22/97	3,974.63	59.78	3914.85	3921.96	8.37
10/29/97	3,974.63	59.75	3914.88	3921.96	8.33
11/04/97	3,974.63	59.73	3914.90	3921.96	8.31
11/11/97	3,974.63	59.70	3914.93	3921.97	8.28
12/04/97	3,974.63	59.64	3914.99	3921.95	8.19
12/10/97	3,974.63	59.56	3915.07	3921.97	8.12

TABLE V
(continued)

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.55	52.96	3921.59	—	—
07/29/97	3,974.55	52.92	3921.63	—	—
09/10/97	3,974.55	54.53	3920.02	3921.80	2.09
09/16/97	3,974.55	54.38	3920.17	3921.80	1.92
09/23/97	3,974.55	54.45	3920.10	3921.81	2.01
10/22/97	3,974.55	57.92	3916.63	3922.00	6.32
10/29/97	3,974.55	57.29	3917.26	3921.96	5.53
11/04/97	3,974.55	56.75	3917.80	3921.92	4.85
11/11/97	3,974.55	57.63	3916.92	3921.98	5.95
12/04/97	3,974.55	58.53	3916.02	3922.01	7.05
12/10/97	3,974.55	58.25	3916.30	3922.04	6.75

TABLE V
(continued)

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.31	60.85	3913.46	3922.41	10.53
06/23/97	3,974.31	58.09	3916.22	3922.08	6.89
06/23/97	3,974.31	56.57	3917.74	3922.38	5.46
06/23/97	3,974.31	59.18	3915.13	3921.32	7.28
06/23/97	3,974.31	59.74	3914.57	3922.08	8.83
06/23/97	3,974.31	54.91	3919.40	3921.88	2.92
06/25/97	3,974.31	60.47	3913.84	3922.02	9.62
06/25/97	3,974.31	58.47	3915.84	3921.99	7.24
06/25/97	3,974.31	59.49	3914.82	3922.01	8.46
06/25/97	3,974.31	53.42	3920.89	3921.94	1.23
06/25/97	3,974.31	55.95	3918.36	3921.90	4.16
06/25/97	3,974.31	58.50	3915.81	3922.02	7.30
06/25/97	3,974.31	52.46	3921.85	3921.87	0.02
06/25/97	3,974.31	51.81	3922.50	3922.50	0.00
06/27/97	3,974.31	60.46	3913.85	3922.06	9.66
06/27/97	3,974.31	57.47	3916.84	3922.00	6.07
07/01/97	3,974.31	60.45	3913.86	3922.01	9.59
07/01/97	3,974.31	56.40	3917.91	3921.94	4.74
07/03/97	3,974.31	60.41	3913.90	3922.01	9.54
07/03/97	3,974.31	57.53	3916.78	3921.98	6.12
07/29/97	3,974.31	60.19	3914.12	3922.02	9.29
07/29/97	3,974.31	57.69	3916.62	3920.97	5.12
09/10/97	3,974.31	59.88	3914.43	3922.00	8.91
09/16/97	3,974.31	59.85	3914.46	3922.00	8.87
09/23/97	3,974.31	59.79	3914.52	3922.01	8.81
10/22/97	3,974.31	59.60	3914.71	3922.01	8.59
10/29/97	3,974.31	59.56	3914.75	3921.99	8.52
11/04/97	3,974.31	59.54	3914.77	3922.00	8.50
11/11/97	3,974.31	59.48	3914.83	3922.00	8.44
12/04/97	3,974.31	59.38	3914.93	3921.99	8.30
12/10/97	3,974.31	59.31	3915.00	3922.00	8.24

TABLE V
(continued)

**MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.73	53.29	3921.44	---	---
10/22/97	3,974.73	53.30	3921.43	---	---
10/29/97	3,974.73	53.30	3921.43	---	---
11/04/97	3,974.73	53.29	3921.44	---	---
11/11/97	3,974.73	53.30	3921.43	---	---
12/04/97	3,974.73	53.26	3921.47	---	---
12/10/97	3,974.73	53.25	3921.48	---	---

TABLE V
(continued)

**MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.52	52.97	3921.55	---	---
10/22/97	3,974.52	52.98	3921.54	---	---
10/29/97	3,974.52	53.02	3921.50	---	---
11/04/97	3,974.52	53.01	3921.51	---	---
11/11/97	3,974.52	53.03	3921.49	---	---
12/04/97	3,974.52	52.92	3921.60	---	---
12/10/97	3,974.52	52.92	3921.60	---	---

TABLE V
(continued)

**MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.66	53.21	3921.45	---	---
10/22/97	3,974.66	53.23	3921.43	---	---
10/29/97	3,974.66	53.24	3921.42	---	---
11/04/97	3,974.66	53.23	3921.43	---	---
11/11/97	3,974.66	53.23	3921.43	---	---
12/04/97	3,974.66	53.17	3921.49	---	---
12/10/97	3,974.66	53.19	3921.47	---	---

TABLE V
(continued)

**MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH LEVATIO (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
09/10/97	3,975.80	53.29	3922.51	---		---	---
10/22/97	3,975.80	53.34	3922.46	---		---	---
10/29/97	3,975.80	53.36	3922.44	---		---	---
11/04/97	3,975.80	53.35	3922.45	---		---	---
11/11/97	3,975.80	53.32	3922.48	---		---	---
12/04/97	3,975.80	53.37	3922.43	3922.49	53.30	3922.50	0.07
12/10/97	3,975.80	53.38	3922.42	3922.55	53.23	3922.57	0.15

TABLE V
(continued)

RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	Unknown	56.36	Unknown	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	8.30

TABLE VI

SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX AND TPH
 TEXAS - NEW MEXICO PIPE LINE COMPANY
 TNM-97-04
 LOVINGTON, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-1	06/18/97	ND	ND	ND	ND	ND	ND
MW-1	09/10/97	ND	ND	ND	ND	ND	---
MW-1	12/18/97	ND	ND	ND	ND	ND	---
MW-2	06/18/97	0.044	0.014	0.004	0.008	0.070	2
MW-2	09/10/97	18.25	9.70	0.61	3.10	31.66	---
MW-4	06/18/97	0.155	0.106	0.007	0.023	0.291	2
MW-6	09/10/97	0.003	ND	ND	ND	0.003	---
MW-6	12/18/97	0.363	0.241	0.015	0.092	0.711	---
MW-7	09/10/97	0.002	0.001	ND	ND	0.003	---
MW-7	12/18/97	ND	ND	ND	ND	ND	---
MW-8	09/10/97	0.012	ND	ND	ND	0.012	---
MW-8	12/18/97	ND	ND	ND	ND	ND	---
MW-9	09/10/97	0.055	0.014	ND	ND	0.069	---
MW-10	12/18/97	ND	ND	ND	ND	ND	---
MW-11	12/18/97	ND	ND	0.003	ND	0.003	---
MW-12	12/18/97	ND	ND	ND	ND	ND	---

TABLE VII**SUMMARY OF GROUND WATER LABORATORY RESULTS - HEAVY METALS
TEXAS - NEW MEXICO PIPE LINE COMPANY****TNM-97-04****LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)			
Aluminum	0.61	0.82	0.32	0.41
Barium	0.058	0.079	0.084	0.072
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Calcium	69.4	88.5	118	98.5
Chromium	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Iron	0.40	0.47	0.19	0.23
Magnesium	10.1	13.3	17.1	13.7
Manganese	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Potassium	1.48	1.60	2.07	1.94
Silver	ND	ND	ND	ND
Sodium	18.6	33.9	32.1	31.9
Tin	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Boron	ND	ND	ND	ND
Silicon	20.8	21.0	20.8	21.1
Strontium	0.53	0.60	0.75	0.62
Mercury	ND	ND	ND	ND

TABLE VIII

**SUMMARY OF GROUND WATER LABORATORY RESULTS - PAHs
TEXAS - NEW MEXICO PIPE LINE COMPANY**

TNM-97-04

LOVINGTON, NEW MEXICO

SAMPLE LOCATION	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)					
Acenaphthene	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	0.071	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	ND	ND	ND	ND	ND	ND
Benzo(j)fluoranthene	ND	ND	ND	ND	ND	ND
7H-Dibenzo(c,g)carbazole	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)pyrene	ND	ND	ND	ND	ND	ND
Dibenzo(a,i)pyrene	ND	ND	ND	ND	ND	ND

TABLE IX

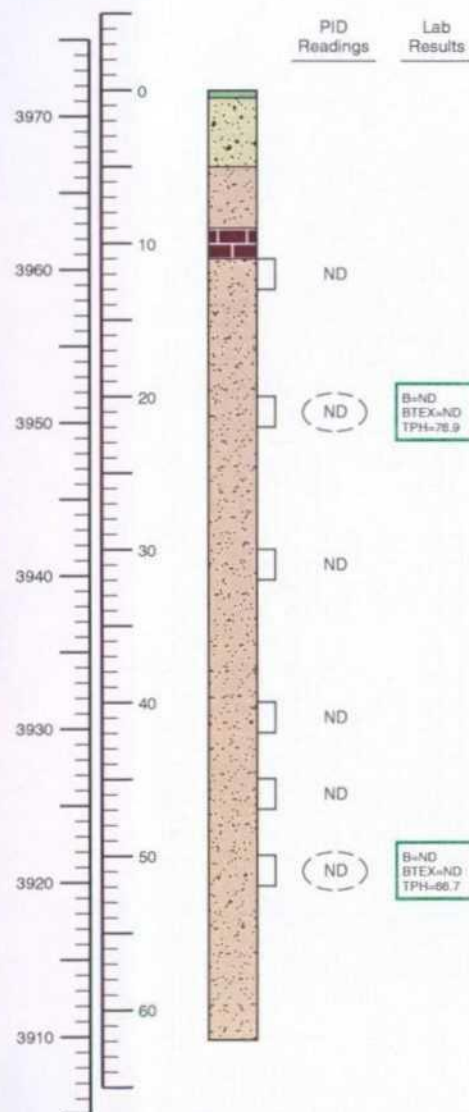
**SUMMARY OF GROUND WATER LABORATORY RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)			
Bicarbonate	179	177	173	178
Carbonate	ND	ND	ND	ND
Sulfate	42.2	59.7	103	49.2
Chloride	40.21	54.54	51.98	38.97
TDS	448	515	574	426

Appendix A

ELEV/DEPTH
(FEET)

MONITORING WELL MW-6



Monitoring Well Details (MW-6)

Elev of Ground Surface	3971.72 ft
Elev Top of PVC Well	3974.73 ft
Thickness of Bentonite Seal	4.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	62.0 ft
Depth of Exploratory Hole	62.0 ft
Depth to Ground Water (During drilling)	52.34 ft
Depth to Ground Water	50.28 ft
Elev of Ground Water	3921.44 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

	Concrete Surface Seal
	Bentonite Pellet Seal
	Sand Pack

LEGEND

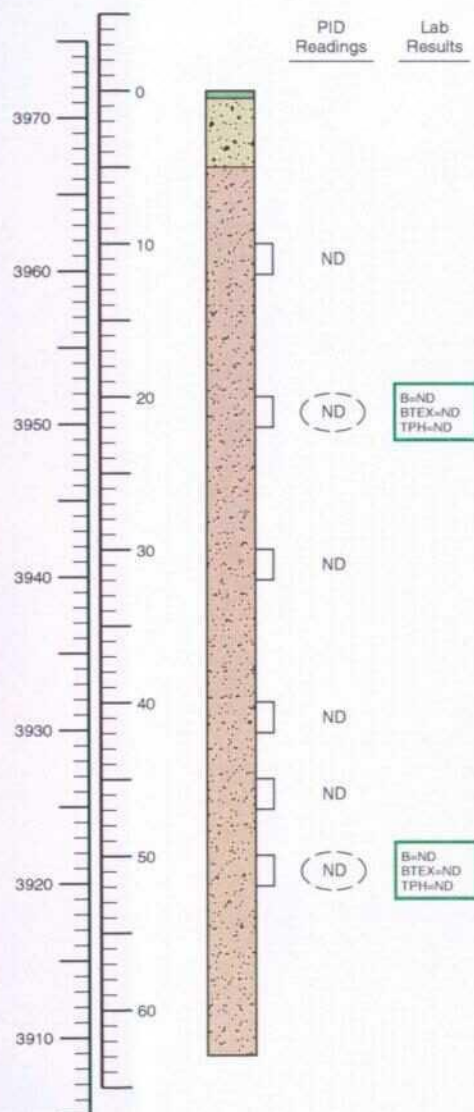
	Topsoil, grass.
	Rock (caliche), moist, white to brown.
	Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.
	Limestone, very hard, brown, tan to red.
	Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.
	Indicates the ground water level measured during drilling.
	Indicates the ground water level measured on September 10, 1997.
PID	Head-space readings in ppm obtained with a photo-ionization detector.
ND	Indicates the constituent was not detected.

NOTES

1. The monitoring well was installed on September 2, 1997 using an air rotary rig.
2. The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick-up mount steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

ELEV./DEPTH
(FEET)

MONITORING WELL MW-7



Monitoring Well Details (MW-7)

Elev of Ground Surface	3971.79 ft
Elev Top of PVC Well	3974.66 ft
Thickness of Bentonite Seal	2.5 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	63.0 ft
Depth of Exploratory Hole	63.0 ft
Depth to Ground Water (During drilling)	52.14 ft
Depth to Ground Water	50.34 ft
Elev of Ground Water	3921.45 ft

() Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

	Concrete Surface Seal
	Bentonite Pellet Seal
	Sand Pack

LEGEND

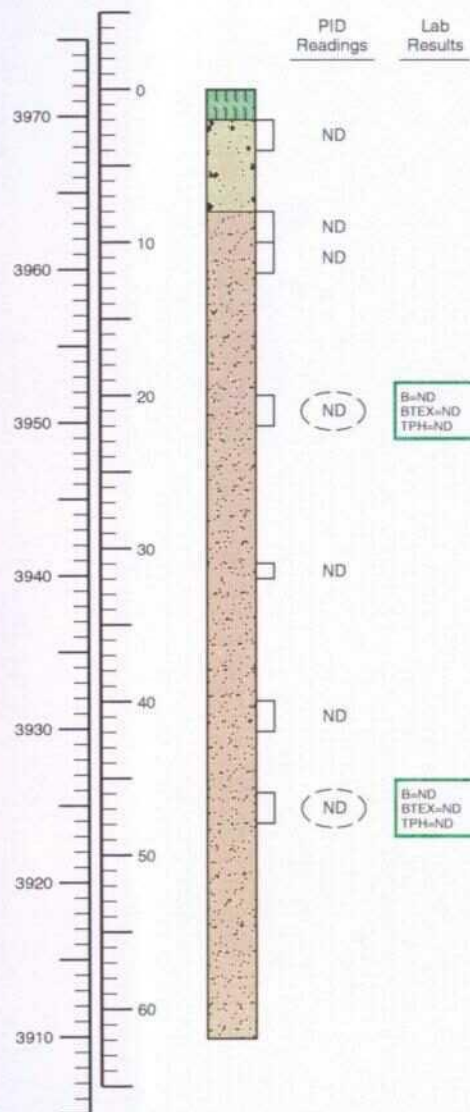
	Topsoil, grass.
	Rock (caliche), moist, white to brown.
	Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.
	Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.
	Indicates the ground water level measured during drilling.
	Indicates the ground water level measured on September 10, 1997.
PID	Head-space readings in ppm obtained with a photo-ionization detector.
ND	Indicates the constituent was not detected.

NOTES

1. The monitoring well was installed on September 2, 1997 using an air rotary rig.
2. The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick-up mount steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

ELEV./DEPTH
(FEET)

MONITORING WELL MW-8

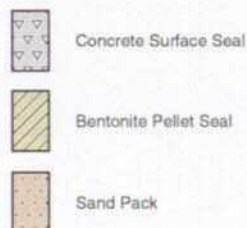


Monitoring Well Details (MW-8)

Elev of Ground Surface	3971.72 ft
Elev Top of PVC Well	3974.52 ft
Thickness of Bentonite Seal	3.5 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	62.0 ft
Depth of Exploratory Hole	62.0 ft
Depth to Ground Water (During drilling)	53.57 ft
Depth to Ground Water	50.17 ft
Elev of Ground Water	3921.55 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)



LEGEND

- Topsoil, grass.
- Rock (caliche), moist, white to brown.
- Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.
- Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.
- Indicates the ground water level measured during drilling.
- Indicates the ground water level measured on September 10, 1997.
- PID Head-space readings in ppm obtained with a photo-ionization detector.
- ND Indicates the constituent was not detected.

NOTES

- The monitoring well was installed on August 28, 1997 using an air rotary rig.
- The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
- The well is protected with a stick-up mount steel cover and a locked compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- The depths indicated are referenced from the ground surface.

ELEV/DEPTH
(FEET)PID
ReadingsLab
Results

MONITORING WELL MW-9

Monitoring Well Details (MW-9)

Elev of Ground Surface	3972.09 ft
Elev Top of PVC Well	3975.80 ft
Thickness of Bentonite Seal	3.5 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	64.0 ft
Depth of Exploratory Hole	64.0 ft
Depth to Ground Water (During drilling)	51.58 ft
Depth to Ground Water	49.58 ft
Elev of Ground Water	3922.51 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

Concrete Surface Seal

Bentonite Pellet Seal

Sand Pack

LEGEND



Topsoil, grass.



Rock (caliche), moist, white to brown.



Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.



Limestone, very hard, brown, tan to red.



Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.



Indicates the ground water level measured during drilling.



Indicates the ground water level measured on September 10, 1997.

PID

Head-space readings in ppm obtained with a photo-ionization detector.

ND

Indicates the constituent was not detected.

NOTES

1. The monitoring well was installed on August 27, 1997 using an air rotary rig.
2. The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick-up mount steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

k.e.i.

LOG AND DETAILS OF MONITORING WELL MW-9

TEXAS-NEW MEXICO PIPE LINE COMPANY

TMN-97-04

LOVINGTON, NEW MEXICO

710016

APPENDIX A

ELEV/DEPTH
(FEET)

PID Readings	Lab Results
(421)	B=0.28 BTEX=45.36 TPH=142.00
(229)	B=17.30 BTEX=197 TPH=13,800
(1000)	B=420 BTEX=1740 TPH=34,900

RECOVERY WELL RW-1

Recovery Well Details (RW-1)

Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	30.0 ft
Depth of PVC Well	67.0 ft
Depth of Exploratory Hole	67.0 ft
Depth to Ground Water (During drilling)	51.16 ft
Depth to Ground Water	56.36 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

- Concrete Surface Seal
- Bentonite Pellet Seal
- Sand Pack

LEGEND

- Fill Material
- Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.
- Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.
- Indicates the ground water level measured during drilling.
- Indicates the ground water level measured on September 10, 1997.
- PID Head-space readings in ppm obtained with a photo-ionization detector.
- ND Indicates the constituent was not detected.

NOTES

- The recovery well was installed on August 20 and 25, 1997 using an air rotary rig.
- The well was constructed with 6 inch ID, 0.020 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
- The well is protected with a flush mount steel cover and a locked compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- The depths indicated are referenced from the ground surface.

k.e.i

LOG AND DETAILS OF RECOVERY WELL RW-1

TEXAS-NEW MEXICO PIPE LINE COMPANY

TMN-97-04

LOVINGTON, NEW MEXICO

710016

APPENDIX A

]

Appendix B

CERTIFICATE OF ANALYSIS SUMMARY 1-72059**K.E.I. Consultants, Inc.**Project ID: 710016
Project Manager: Mike Chapa
Project Location: LovingtonProject Name: *TNMPL*


Date Received in Lab : Sep 5, 1997 12:30 by AS

Date Report Faxed: Oct 16, 1997

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
TPH-DRO (Diesel) by EPA 8015 M		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997
Total Petroleum Hydrocarbons		142000	13800	34900	76.9	66.7	< 10.0	< 10.0	< 10.0	< 10.0
BTEX by EPA 8020		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997	Sep 8, 1997	Sep 8, 1997						
Benzene		0.28	17.30	420						
Toluene		8.44	65.80	680						
Ethylbenzene		6.50	28.10	200						
m,p-Xylenes		20.40	59.70	314						
o-Xylene		9.74	26.40	129						
Total BTEX		45.36	197	1740						
Volatile Organic Analysis by EPA 8260		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
Benzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromodichloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromoform		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromomethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


Edward H. Yonemoto, Ph.D.
QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
n-Butylbenzene		9.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
sec-Butylbenzene		4.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
tert-Butylbenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroethane		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chloroform		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2-Chlorotoluene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4-Chlorotoluene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dibromo-3-chloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dibromoethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromomethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,4-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dichlorodifluoromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Date Report Faxed: Oct 16, 1997
Project Location: Lovington
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)										
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
1,1-Dichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
cis-1,2-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,2-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
cis-1,3-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene		8.2			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Isopropylbenzene		4.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
p-Isopropyltoluene		5.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Methylene chloride		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Naphthalene		21.8			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

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 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
n-Propylbenzene		6.7			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Styrene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,1,2-Tetrachloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Tetrachloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene		9.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,3-Trichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,4-Trichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,1-Trichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichlorofluoromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,3-Trichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,4-Trimethylbenzene		.. 36.7			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3,5-Trimethylbenzene		13.5			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
o-Xylene		12.2			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
m,p-Xylenes		22.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromochloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
MTBE		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
** Result beyond calibration limits										
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
Semivolatiles (SVOCs TCL) by EPA 8270										
Acenaphthene		< 17								
Acenaphthylene		< 17								
Anthracene		< 17								
Benzo(a)anthracene		< 17								
Benzo(a)pyrene		< 17								
Benzo(b)fluoranthene		< 17								
Benzo(g,h,i)perylene		< 17								
Benzo(k)fluoranthene		< 17								
Butyl benzyl phthalate		< 17								

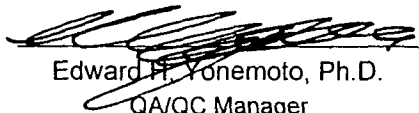
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Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
Carbazole		< 17								
4-Chloroaniline		< 17								
bis [2-Chloroethoxy] methane		< 17								
bis [2-Chloroethyl] ether		< 17								
bis [2-Chloroisopropyl] ether		< 17								
2-Chloronaphthalene		< 17								
2-Chlorophenol		< 17								
4-Chlorophenyl-phenyl ether		< 17								
Chrysene		< 17								
Dibenzofuran		< 17								
Dibenzo(a,h)anthracene		< 17								
1,2-Dichlorobenzene		< 17								
1,3-Dichlorobenzene		< 17								
1,4-Dichlorobenzene		< 17								
3,3'-Dichlorobenzidine		< 17								
2,4-Dichlorophenol		< 17								
Diethyl phthalate		< 17								

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CERTIFICATE OF ANALYSIS SUMMARY 1-72059

Project ID: 710016
 Project Manager: Mike Chapa
 Project Location: Lovington

K.E.I. Consultants, Inc.
 Project Name: *TNMPL*

Date Received in Lab : Sep 5, 1997 12:30 by AS
 Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2,4-Dimethylphenol		< 17								
Dimethyl phthalate		< 17								
4,6-Dinitro-2-methylphenol		< 42								
2,4-Dinitrophenol		< 42								
2,4-Dinitrotoluene		< 17								
2,6-Dinitrotoluene		< 17								
Di-n-octyl phthalate		< 17								
bis [2-Ethylhexyl] phthalate		< 17								
Fluoranthene		< 17								
Fluorene		< 17								
Hexachlorobenzene		< 17								
Hexachlorobutadiene		< 17								
Hexachlorocyclopentadiene		< 17								
Hexachloroethane		< 17								
Indeno(1,2,3-cd)pyrene		< 17								
Isophorone		< 17								
2-Methylnaphthalene		56								

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CERTIFICATE OF ANALYSIS SUMMARY 1-72059

Project ID: 710016
 Project Manager: Mike Chapa
 Project Location: Lovington

K.E.I. Consultants, Inc.
 Project Name: TNMPL

Date Received in Lab : Sep 5, 1997 12:30 by AS
 Date Report Faxed: Oct 16, 1997
 XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2-Methylphenol		< 17								
4-Methylphenol		< 17								
Naphthalene		19								
2-Nitroaniline		< 42								
3-Nitroaniline		< 42								
4-Nitroaniline		< 42								
Nitrobenzene		< 17								
2-Nitrophenol		< 17								
4-Nitrophenol		< 17								
N-Nitroso-di-n-propylamine		< 17								
N-Nitrosodiphenylamine		< 17								
Pentachlorophenol		< 42								
Phenanthrene		< 17								
Phenol		< 17								
Pyrene		< 17								
Pyridine		< 17								
1,2,4-Trichlorobenzene		< 17								

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Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2,4,5-Trichlorophenol		< 42								
2,4,6-Trichlorophenol		< 17								
4-Bromophenyl-phenylether		< 17								
4-Chloro-3-Methylphenol		< 17								
Di-n-butyl phthalate		< 17								
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 10, 1997								
SPLP TPH by 1312/418.1		5.3								
Total Petroleum Hydrocarbons										


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Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
Moisture Content by ASTM 2216-71		Date Analyzed - Analytical Results %								
Moisture Content			Sep 9, 1997							
			11.9							
Organic Content by ASTM D2974		Date Analyzed - Analytical Results %								
Organic Content			Sep 10, 1997							
			0.8							
TPH-DRO (Diesel) by EPA 8015 M		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Total Petroleum Hydrocarbons		Sep 10, 1997		Sep 10, 1997						
		< 10.0		< 10.0						
Volatile Organic Analysis by EPA 8260		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
Benzene		< 0.005		< 0.025						
Bromobenzene		< 0.005		< 0.025						
Bromodichloromethane		< 0.005		< 0.025						
Bromoform		< 0.005		< 0.025						
Bromomethane		< 0.005		< 0.025						
n-Butylbenzene		< 0.005		< 0.025						

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Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
sec-Butylbenzene		< 0.005		< 0.025						
tert-Butylbenzene		< 0.005		< 0.025						
Carbon Tetrachloride		< 0.005		< 0.025						
Chloroethane		< 0.010		< 0.050						
Chloroform		< 0.005		< 0.025						
Chloromethane		< 0.010		< 0.050						
2-Chlorotoluene		< 0.005		< 0.025						
4-Chlorotoluene		< 0.005		< 0.025						
1,2-Dibromo-3-chloropropane		< 0.005		< 0.025						
Dibromochloromethane		< 0.005		< 0.025						
1,2-Dibromoethane		< 0.005		< 0.025						
Dibromomethane		< 0.005		< 0.025						
1,2-Dichlorobenzene		< 0.005		< 0.025						
1,3-Dichlorobenzene		< 0.005		< 0.025						
1,4-Dichlorobenzene		< 0.005		< 0.025						
Dichlorodifluoromethane		< 0.005		< 0.025						
1,1-Dichloroethane		< 0.005		< 0.025						

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Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
1,2-Dichloroethane		< 0.005		< 0.025						
1,1-Dichloroethene		< 0.005		< 0.025						
cis-1,2-Dichloroethene		< 0.005		< 0.025						
trans-1,2-Dichloroethene		< 0.005		< 0.025						
1,2-Dichloropropane		< 0.005		< 0.025						
1,3-Dichloropropane		< 0.005		< 0.025						
2,2-Dichloropropane		< 0.005		< 0.025						
1,1-Dichloropropene		< 0.005		< 0.025						
cis-1,3-Dichloropropene		< 0.005		< 0.025						
trans-1,3-Dichloropropene		< 0.005		< 0.025						
Ethylbenzene		< 0.005		< 0.025						
Hexachlorobutadiene		< 0.005		< 0.025						
Isopropylbenzene		< 0.005		< 0.025						
p-Isopropyltoluene		< 0.005		< 0.025						
Methylene chloride		< 0.010		< 0.050						
Naphthalene		< 0.005		< 0.025						
n-Propylbenzene		< 0.005		< 0.025						

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Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed		Analytical Results		ppm (mg/L - mg/Kg)				
		Sep 9, 1997		Sep 11, 1997						
Styrene		< 0.005		< 0.025						
1,1,1,2-Tetrachloroethane		< 0.005		< 0.025						
1,1,2,2-Tetrachloroethane		< 0.005		< 0.025						
Tetrachloroethene		< 0.005		< 0.025						
Toluene		< 0.005		0.035						
1,2,3-Trichlorobenzene		< 0.005		< 0.025						
1,2,4-Trichlorobenzene		< 0.005		< 0.025						
1,1,1-Trichloroethane		< 0.005		< 0.025						
1,1,2-Trichloroethane		< 0.005		< 0.025						
Trichloroethene		< 0.005		< 0.025						
Trichlorofluoromethane		< 0.005		< 0.025						
1,2,3-Trichloropropane		< 0.005		< 0.025						
1,2,4-Trimethylbenzene		< 0.005		< 0.025						
1,3,5-Trimethylbenzene		< 0.005		< 0.025						
Vinyl chloride		< 0.005		< 0.025						
o-Xylene		< 0.005		0.030						
m,p-Xylenes		< 0.005		0.099						


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XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	<i>Lab ID:</i>	172059-010	172059-011	172059-012						
	<i>Field ID:</i>	MW-9	MW-9	MW-9						
	<i>Depth:</i>	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
Bromochloromethane		< 0.005		< 0.025						
Chlorobenzene		< 0.005		< 0.025						
MTBE		< 0.010		< 0.050						

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 QA/QC Manager

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Sep 11, 1997 13:05

Analyst: LC

Date Analyzed: Sep 10, 1997 11:28

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/kg	mg/kg	Amount	Limit	Recovery	Range	
			mg/kg	mg/kg	%	%	
Total Petroleum Hydrocarbons	< 10.00	171	200	10.00	85.5	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

B.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

Certificate Of Quality Control for Batch ; 17A02C24
SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Sep 11, 1997 13:05
 Date Analyzed: Sep 10, 1997 07:54
 QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: LC
 Matrix: Solid

Q.C. Sample ID 172059- 010	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/kg	Matrix Spike Amount mg/kg	[H]	[I]	Qualifier
	Sample Result mg/kg	Duplicate Result mg/kg	Method Detection Limit mg/kg	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Total Petroleum Hydrocarbons	< 10.00	< 10.00	10.00	N.C	30.0	240	200	120.0	65-135	

Relative Difference [D] = $200 \times (B-A) / (B+A)$

Matrix Spike Recovery [H] = $100 \times (F-A) / [G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A29C66

SW- 846 5030/3020 BTEX

Date Validated: Sep 9, 1997 17:15

Analyst: OR

Date Analyzed: Sep 8, 1997 10:25

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0897	0.1000	0.0010	89.7	65-135	
Toluene	< 0.0010	0.0881	0.1000	0.0010	88.1	65-135	
Ethylbenzene	< 0.0010	0.0933	0.1000	0.0010	93.3	65-135	
m,p-Xylenes	< 0.0020	0.1900	0.2000	0.0020	95.0	65-135	
o-Xylene	< 0.0010	0.0905	0.1000	0.0010	90.5	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A29C66

SW- 846 5030/8020 BTEX

Date Validated: Sep 9, 1997 17:15

Analyst: OR

Date Analyzed: Sep 8, 1997 12:14

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172063- 005	[A]	[B]	[C]	[D]	[E]	Matrix	[F]	[G]	[H]	[I]	[J]
	Sample Result	Matrix Spike Result	Matrix Spike Duplicate Result	Matrix Spike Amount	Method Detection Limit	Limit Relative Difference	QC	QC	QC	Matrix Spike	Qualifier
							Spike Relative Difference	Matrix Spike Recovery	M.S.D. Recovery	Recovery Range	
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.050	1.675	1.730	2.000	0.050	20.0	3.2	83.8	86.5	65-135	
Toluene	< 0.050	1.730	1.735	2.000	0.050	20.0	0.3	86.5	86.8	65-135	
Ethylbenzene	< 0.050	1.835	1.905	2.000	0.050	20.0	3.7	91.8	95.3	65-135	
m,p-Xylenes	0.160	3.820	3.955	4.000	0.100	20.0	3.5	91.5	94.9	65-135	
o-Xylene	< 0.050	1.805	1.875	2.000	0.050	20.0	3.8	90.3	93.8	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW- 846 5030/8020 BTEX

Date Validated: Oct 6, 1997 17:00

Analyst: OR

Date Analyzed: Oct 3, 1997 12:08

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0871	0.1000	0.0010	87.1	65-135	
Toluene	< 0.0010	0.0904	0.1000	0.0010	90.4	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2080	0.2000	0.0020	104.0	65-135	
o-Xylene	< 0.0010	0.0987	0.1000	0.0010	98.7	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

MDL = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A23B80

SW846- 8260 Volatile Organic Analysis

Date Validated: Oct 3, 1997 16:00

Analyst: CE

Date Analyzed: Sep 9, 1997 11:40

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0497	0.0500	0.0010	99.4	66-142	
Chlorobenzene	< 0.0010	0.0515	0.0500	0.0010	103.0	60-133	
1,1-Dichloroethene	< 0.0040	0.0506	0.0500	0.0040	101.2	59-172	
Toluene	< 0.0010	0.0508	0.0500	0.0010	101.6	59-139	
Trichloroethene	< 0.0030	0.0490	0.0500	0.0030	98.0	62-137	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW846- 8260 Volatile Organic Analysis

Date Validated: Oct 3, 1997 16:00

Analyst: CE

Date Analyzed: Sep 9, 1997 14:43

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172059- 008	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	%	%	%	%	%	
Benzene	< 0.0010	0.0502	0.0471	0.0500	0.0010	20.0	6.4	100.4	94.2	66-142	
Chlorobenzene	< 0.0010	0.0517	0.0502	0.0500	0.0010	20.0	2.9	103.4	100.4	60-133	
1,1-Dichloroethene	< 0.0040	0.0508	0.0507	0.0500	0.0040	25.0	0.2	101.6	101.4	59-172	
Toluene	< 0.0010	0.0522	0.0526	0.0500	0.0010	20.0	0.8	104.4	105.2	59-139	
Trichloroethene	< 0.0030	0.0498	0.0478	0.0500	0.0030	20.0	4.1	99.6	95.6	62-137	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

 Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

Certificate Of Quality Control for Batch : 17A34E11

SW846-8270 PAHs by GC-MS

Date Validated: Sep 9, 1997 17:25

Analyst: LC

Date Analyzed: Sep 8, 1997 20:21

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172066-003	[A] Sample Result mg/Kg	[B] Matrix Spike Result mg/Kg	[C] Matrix Spike Duplicate Result mg/Kg	[D] Matrix Spike Amount mg/Kg	[E] Method Detection Limit mg/Kg	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC	QC	QC	Matrix Spike	
Parameter							Spike Relative Difference %	Matrix Spike Recovery %	M.S.D. Recovery %	Recovery Range %	
Acenaphthene	2.69	28.46	24.58	24.88	1.00	19.0	14.6	103.6	88.0	31-137	
4-Chloro-3-Methylphenol	< 0.50	27.41	25.22	24.88	0.50	33.0	8.3	110.2	101.4	26-103	A
2-Chlorophenol	< 0.50	29.50	28.81	24.88	0.50	28.7	2.4	118.6	115.8	25-102	A
1,4-Dichlorobenzene	< 2.09	27.06	25.72	24.88	2.09	32.1	5.1	108.8	103.4	28-104	A
2,4-Dinitrotoluene	< 0.50	26.96	25.92	24.88	0.50	21.8	3.9	108.4	104.2	28-89	A
N-Nitroso-di-n-propylamine	< 1.99	29.30	26.37	24.88	1.99	55.4	10.5	117.8	106.0	41-126	
4-Nitrophenol	< 1.99	24.13	21.94	24.88	1.99	47.2	9.5	97.0	88.2	11-114	
Pentachlorophenol	1.00	31.84	30.45	24.88	1.00	48.9	4.5	124.0	118.4	17-109	A
Phenol	< 0.50	26.67	25.97	24.88	0.50	22.6	2.7	107.2	104.4	26-90	A
Pyrene	2.94	27.96	27.02	24.88	0.80	25.2	3.4	100.6	96.8	35-142	
1,2,4-Trichlorobenzene	< 2.69	26.52	25.87	24.88	2.69	23.0	2.5	106.6	104.0	38-107	

(A) High recovery attributed to chromatographic parameters (biased by small sample amount)

 $\text{Spike Relative Difference [F]} = 200 \cdot (\text{B}-\text{C}) / (\text{B}+\text{C})$
 $\text{Matrix Spike Recovery [G]} = 100 \cdot (\text{B}-\text{A}) / [\text{D}]$

M.S.D. = Matrix Spike Duplicate

 $\text{M.S.D. Recovery [H]} = 100 \cdot (\text{C}-\text{A}) / [\text{D}]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW846-8270 PAHs by GC-MS
Date Validated: Sep 9, 1997 17:25

Analyst: LC

Date Analyzed: Sep 8, 1997 18:47

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/Kg	mg/Kg	Amount	Limit	Recovery	Range	
			mg/Kg	mg/Kg	%	%	
Acenaphthene	< 0.133	3.060	3.333	0.133	91.8	31-137	
4-Chloro-3-Methylphenol	< 0.067	2.933	3.333	0.067	88.0	26-103	
2-Chlorophenol	< 0.067	3.200	3.333	0.067	96.0	25-102	
1,4-Dichlorobenzene	< 0.280	3.080	3.333	0.280	92.4	28-104	
2,4-Dinitrotoluene	< 0.067	2.867	3.333	0.067	86.0	28-89	
N-Nitroso-di-n-propylamine	< 0.267	3.407	3.333	0.267	102.2	41-126	
4-Nitrophenol	< 0.267	2.513	3.333	0.267	75.4	11-114	
Pentachlorophenol	< 0.133	3.333	3.333	0.133	100.0	17-109	
Phenol	< 0.067	2.967	3.333	0.067	89.0	26-90	
Pyrene	< 0.107	3.220	3.333	0.107	96.6	35-142	
1,2,4-Trichlorobenzene	< 0.360	3.073	3.333	0.360	92.2	38-107	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

ASTM D2974 Organic Content

Date Validated: Sep 10, 1997 13:00

Analyst: IF

Date Analyzed: Sep 10, 1997 10:20

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172059- 011	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Qualifier
				Relative Difference	Relative Difference	
Parameter	%	%	%	%	%	
Organic Content	0.81	0.79	0.1	2.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

ASTM 2216- 71 Moisture Content

Date Validated: Sep 10, 1997 08:30

Analyst: OG

Date Analyzed: Sep 9, 1997 12:36

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172066- 004	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	Parameter					
	%	%	%	%	%	
Moisture Content	41.14	41.01	0.1	0.3	20.0	

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Certificate Of Quality Control for Batch : 17A07F98

EPA 1312/413.1 SPLP TPH

Date Validated: Sep 10, 1997 10:20

Analyst: CG

Date Analyzed: Sep 10, 1997 09:20

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY											
Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit	[F]	[G]	[H]	[I]	[J]
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit	Relative Difference	QC	QC	QC	Blank Spike Recovery	Qualifier
	ppm	ppm	ppm	ppm	ppm	%	Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Blank Spike Recovery Range %	
Total Petroleum Hydrocarbons	< 0.50	3.88	3.73	4.03	0.50	20.0	3.9	96.3	92.6	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Contractor KEI Consultants		Phone (214) 480 3767		No. coolers this shipment: 1		Contractor COC #	
Address 5309 Wurzbach Suite 100 SA, Tx 78238				Carrier: UPS		Quote #:	
Project Name TNMP		Project Director Mike Hawthorne		Airbill No.		P.O. No: 7949	
Project Location 710111 Lovington		Project Manager Mike Chapa					
Sampler Signature <i>[Signature]</i>		Project No. 710016					

SAMPLE CHARACTERIZATION										Preservative		Unl. Dies Ker Unknown		CONTAINERS	Total	LAB ONLY ID #			
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container		Ice	Other	Waste Oil	PTT No:				Tank No:	Sample Description	Remarks
								Size	Type										
								P, G											
1	RW-1	8-25-97		8'-10'	/	/	/	90L		/							1		
2	RW-1	8-25-97		20'-20.5'	/	/	/	90L		/							2		
3	RW-1	8-25-97		50'-57.5'	/	/	/	90L		/							3		
4	MW-6	9-7-97		20'-22'	/	/	/	90L		/							4		
5	MW-6	9-2-97		50'-52'	/	/	/	90L		/							5		
6	MW-7	9-2-97		20'-22'	/	/	/	90L		/							6		
7	MW-7	9-2-97		50'-52'	/	/	/	90L		/							7		
8	MW-8	8-28-97		20'-22'	/	/	/	90L		/							8		
9	MW-8	8-28-97		46'-48'	/	/	/	90L		/							9		
10	MW-9	8-27-97		25'-27'	/	/	/	90L		/							10		

Relinquished by: <i>[Signature]</i>		DATE: 9-4-97		TIME: 1600		Received by: <i>[Signature]</i>		DATE: 9/5/97		TIME: 12:30		Remarks Samples w/ highest TPH (B015) also run SPLP TPH, VOC's + SVOC's <div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">MIS</div>

Contractor <u>KEI Consultants</u> Phone <u>(210) 680-3767</u>										No. coolers this shipment: <u>1</u> Carrier: <u>UPS</u> Airbill No. _____ Contractor COC # _____ Quote #: _____ P.O. No: <u>7949</u>																																																																																																																																																																																													
Address <u>5309 Wurzbach Suite 100 SA, TX 78238</u>																																																																																																																																																																																																							
Project Name <u>TNMP</u> Project Director <u>Mike Hawthorne</u>																																																																																																																																																																																																							
Project Location <u>Lovington</u> Project Manager <u>Mike Chapa</u>										Turn-around * ASAP * 24 hrs 48 hrs (Standard) Remarks																																																																																																																																																																																													
Sampler Signature <u>[Signature]</u> Project No. <u>770016</u>																																																																																																																																																																																																							
SAMPLE CHARACTERIZATION <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Field ID</th> <th rowspan="2">Date</th> <th rowspan="2">Time</th> <th rowspan="2">DEPTH</th> <th rowspan="2">SOIL</th> <th rowspan="2">WATER</th> <th rowspan="2">COMP</th> <th rowspan="2">GRAB</th> <th colspan="2">Container</th> <th colspan="2">Preservative</th> <th rowspan="2">Unl</th> <th rowspan="2">Dies</th> <th rowspan="2">Ker</th> <th rowspan="2">Unknown</th> </tr> <tr> <th>Size</th> <th>Type</th> <th>Ice</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td>1 MW-9</td> <td>8-27-97</td> <td></td> <td>27-29</td> <td>/</td> <td></td> <td></td> <td>/</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 MW-9</td> <td>8-27-97</td> <td></td> <td>50-52</td> <td>/</td> <td></td> <td></td> <td>/</td> <td>9</td> <td>102</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>												Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container		Preservative		Unl	Dies	Ker	Unknown	Size	Type	Ice	Other	1 MW-9	8-27-97		27-29	/			/										2 MW-9	8-27-97		50-52	/			/	9	102								3																	4																	5																	6																	7																	8																	9																	10														
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Relinquished by: <u>[Signature]</u> DATE <u>9-4-97</u> TIME <u>1600</u> Received by: _____ DATE _____ TIME _____ Received For Laboratory by: <u>[Signature]</u> <u>9/5/97</u> <u>12:30</u>										Remarks <u>Sample w/ highest TPH (8015)</u> <u>also w/ VOC's + SVOC's + SPLP TPH</u> <u>(MCS)</u>																																																																																																																																																																																													

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

KEI CONSULTANTS

SEP 19 1997

SAN ANTONIO

KEI
ATTN: MR. PAUL HARTNETT
5309 WURZBACH, SUITE 100
SAN ANTONIO, TEXAS 78238
FAX: 210-680-3763

RECEIVING DATE: 09/16/97
SAMPLE TYPE: OIL
PROJECT #: 710016
PROJECT LOCATION: TOWNSEND

ANALYSIS DATE: 09/16/97
SAMPLING DATE: 09/09/97
SAMPLE CONDITION: Intact

ELT#	FIELD CODE	Specific Gravity @ 60 Deg F.
12552	RW-1	0.8031

Method: D 287-64


Michael R. Fowler

9-17-97
Date

Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763

(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Phone #: 210 680 3767

FAX# 210 680 3763

Paul Hartnett

ANALYSIS REQUEST

Company Name & Address:

KEI 5309 Wurzbach Suite 100 SA, TX 78238

Project #:

Project Name :

710016

Project Location:

Sampler Signatures:

Townsend

[illegible]

Relinquished by:

Date: _____

9-15-97

Thence:

1130

Received by:

Recognized by:

Date:

09-16-97

Tides:

0900

Received by:

9 months

Relinquished by:

Date:**Times:**

Received by Laboratory:

REMARKS

Please Fax results to Paul ASAP. Thanks *MS*

**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Sep 12, 1997 10:15 by AS****Project ID: 710016**
Project Manager: Theresa Nix
Project Location: Lovington, NM**Date Report Faxed: Oct 13, 1997****XENCO contact : Scott Sample/Edward Yonemoto**

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Metals by ICP by EPA 6010		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Aluminum				0.61	0.82	0.32	0.41			
Barium				0.058	0.079	0.084	0.072			
Beryllium				< 0.020	< 0.020	< 0.020	< 0.020			
Cadmium				< 0.040	< 0.040	< 0.040	< 0.040			
Calcium				69.4	88.5	118	98.5			
Chromium				< 0.050	< 0.050	< 0.050	< 0.050			
Cobalt				< 0.050	< 0.050	< 0.050	< 0.050			
Iron				0.40	0.47	0.19	0.23			
Magnesium				10.1	13.3	17.1	13.7			
Manganese				< 0.050	< 0.050	< 0.050	< 0.050			
Molybdenum				< 0.50	< 0.50	< 0.50	< 0.50			
Potassium				1.48	1.60	2.07	1.94			
Silver				< 0.080	< 0.080	< 0.080	< 0.080			
Sodium				18.6	33.9	32.1	31.9			
Tin				< 0.20	< 0.20	< 0.20	< 0.20			
Vanadium				< 0.050	< 0.050	< 0.050	< 0.050			
Zinc				< 0.050	< 0.050	< 0.050	< 0.050			

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Edward H. Yonemoto, Ph.D.
QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72112
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 12, 1997 10:15 by AS
Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM
Date Report Faxed: Oct 13, 1997
XENCO contact : Scott Sample/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Nickel				< 0.20	< 0.20	< 0.20	< 0.20			
Copper				< 0.050	< 0.050	< 0.050	< 0.050			
Boron				< 0.20	< 0.10	< 0.10	< 0.10			
Silicon				20.8	21.0	20.8	21.1			
Strontium				0.53	0.60	0.75	0.62			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Total Mercury by EPA 7470				Sep 18, 1997	Sep 18, 1997	Sep 18, 1997	Sep 18, 1997			
Mercury				< 0.0002	< 0.0002	< 0.0002	< 0.0002			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
BTEX by EPA 8020		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Benzene		< 0.001	18.25	0.003	0.002	0.012	0.055			
Toluene		< 0.001	9.70	< 0.001	0.001	< 0.001	0.014			
Ethylbenzene		< 0.001	0.61	< 0.001	< 0.001	< 0.001	< 0.001			
m,p-Xylenes		< 0.002	2.06	< 0.002	< 0.002	< 0.002	< 0.002			
o-Xylene		< 0.001	1.04	< 0.001	< 0.001	< 0.001	< 0.001			


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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72112
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 12, 1997 10:15 by AS
Project ID: 710016
Project Manager: Theresa Nix
Date Report Faxed: Oct 13, 1997
Project Location: Lovington, NM
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Total BTEX		< 0.006	31.66	0.003	0.003	0.012	0.069			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
PAHs by GC-MS by EPA 8100		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Acenaphthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Acenaphthylene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(b)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(g,h,i)perylene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(k)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Chrysene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,e)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,j)acridine		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

**CERTIFICATE OF ANALYSIS SUMMARY 1-72112****K.E.I. Consultants, Inc.****Project Name: TNMPL****Date Received in Lab : Sep 12, 1997 10:15 by AS**

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Date Report Faxed: Oct 13, 1997**XENCO contact : Scott Sample/Edward Yonemoto**

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)			
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Fluorene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Indeno(1,2,3-cd)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
3-Methylcholanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Naphthalene		< 0.002	0.071	< 0.002	< 0.002	< 0.002	< 0.002			
Phenanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,h)acridine		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(j)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
7H-Dibenzo(c,g)carbazole		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,i)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)			
Bicarbonate by SM 4500CO2D				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Bicarbonate				179	177	173	178			


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Edward H. Yonemoto, Ph.D.
QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72112
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 12, 1997 10:15 by AS
Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM
Date Report Faxed: Oct 13, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Carbonate by SM4500CO2D		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Carbonate				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
				< 1.00	< 1.00	< 1.00	< 1.00			
Total Dissolved Solids by EPA 160.1		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Total Dissolved Solids				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
				448	515	574	426			
Anions by Ion Chromatography by EPA 300.0		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Sulfate				Oct 3, 1997	Oct 3, 1997	Oct 3, 1997	Oct 3, 1997			
				42.2	59.7	103	49.2			
Chloride				40.21	54.54	51.98	38.97			

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:08

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.050	1.875	2.000	0.050	93.8	70-125	
Barium	< 0.0060	1.0460	1.0000	0.0060	104.6	70-125	
Beryllium	< 0.0200	0.4230	0.4000	0.0200	105.8	70-125	
Cadmium	< 0.0400	0.4320	0.4000	0.0400	108.0	70-125	
Calcium	< 0.050	4.469	4.000	0.050	111.7	70-125	
Chromium	< 0.0500	1.0650	1.0000	0.0500	106.5	70-125	
Cobalt	< 0.0100	1.0390	1.0000	0.0100	103.9	70-125	
Copper	< 0.0300	1.0800	1.0000	0.0300	108.0	70-125	
Iron	< 0.025	1.912	2.000	0.025	95.6	70-125	
Magnesium	< 0.050	3.970	4.000	0.050	99.3	70-125	
Manganese	< 0.025	1.794	2.000	0.025	89.7	70-125	
Molybdenum	< 0.100	5.679	5.000	0.100	113.6	70-125	
Nickel	< 0.100	1.030	1.000	0.100	103.0	70-125	
Potassium	< 0.100	4.378	4.000	0.100	109.5	70-125	
Silver	< 0.0400	0.8134	0.8000	0.0400	101.7	70-125	
Sodium	< 0.100	3.681	4.000	0.100	92.0	70-125	
Strontium	< 0.100	4.939	5.000	0.100	98.8	70-125	
Vanadium	< 0.0120	1.0590	1.0000	0.0120	105.9	70-125	
Zinc	< 0.0300	1.0510	1.0000	0.0300	105.1	70-125	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

ND = Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.

QA/QC Manager



Certificate Of Quality Control for Batch : 17A18E33

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Method Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Potassium	1.482	1.656	0.100	11.1	25.0	5.769	4.00	107.2	70-125	
Silver	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.8170	0.800	102.1	70-125	
Sodium	18.57	23.93	0.10	25.2	25.0	29.49	4.0	273.0	70-125	B,C
Strontium	0.532	0.444	0.100	18.0	25.0	5.193	5.00	93.2	70-125	
Vanadium	0.0230	< 0.0120	0.0120	N.C	25.0	1.0970	1.000	107.4	70-125	
Zinc	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0790	1.000	107.9	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

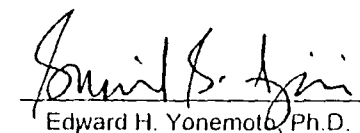
Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston Dallas San Antonio


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Method Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Aluminum	0.611	0.766	0.050	22.5	25.0	2.888	2.00	113.9	70-125	
Barium	0.0580	0.0730	0.0060	22.9	25.0	1.1110	1.000	105.3	70-125	
Beryllium	< 0.0200	< 0.0200	0.0200	N.C	25.0	0.4360	0.400	109.0	70-125	
Cadmium	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.4120	0.400	103.0	70-125	
Calcium	69.37	98.94	0.05	35.1	25.0	98.94	4.0	739.3	70-125	A,C
Chromium	< 0.0500	< 0.0500	0.0500	N.C	25.0	1.0620	1.000	106.2	70-125	
Cobalt	< 0.0100	< 0.0100	0.0100	N.C	25.0	1.0230	1.000	102.3	70-125	
Copper	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0690	1.000	106.9	70-125	
Iron	0.404	0.382	0.025	5.6	25.0	2.275	2.00	93.6	70-125	
Magnesium	10.05	12.67	0.05	23.1	25.0	17.90	4.0	196.3	70-125	B,C
Manganese	< 0.0250	< 0.0250	0.0250	N.C	25.0	1.8010	2.000	90.1	70-125	
Molybdenum	< 0.500	< 0.500	0.500	N.C	25.0	5.687	5.00	113.7	70-125	
Nickel	< 0.100	< 0.100	0.100	N.C	25.0	0.971	1.00	97.1	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

 Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

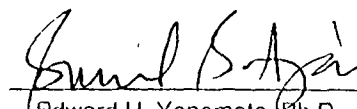
 Matrix Spike Recovery [H] = $100 \cdot (F-A)/(G)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

Certificate Of Quality Control for Batch : 17A05C49
SW846- 7470 Total Mercury

Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:37

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172129- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample	Duplicate	Method	QC	LIMITS	Matrix Spike	Matrix	QC	LIMITS	
	Result	Result	Detection	Relative	Relative	Result	Spike	Matrix Spike	Recovery	
Parameter	mg/L	mg/L	Limit	Difference	Difference	mg/L	Amount	Recovery	Range	Qualifier
			mg/L	%	%		mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	20.0	0.0026	0.0025	104.0	80-120	

 Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

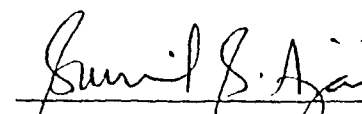
 Matrix Spike Recovery [H] = $100 \cdot (F-A)/(G)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW346- 7470 Total Mercury

Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:33

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

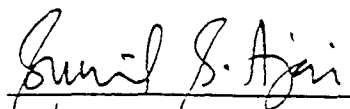
BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
	mg/L	mg/L	mg/L	mg/L	%	%	
Mercury	< 0.0010	0.0022	0.0025	0.0010	88.0	80-120	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

MDL = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A34E30

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Sep 17, 1997 09:39

Analyst: LC

Date Analyzed: Sep 15, 1997 17:41

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Recovery Range %	
Acenaphthene	< 0.0050	0.0618	0.0588	0.1000	0.0050	31.0	5.0	61.8	58.8	46-118	
4-Chloro-3-Methylphenol	< 0.0076	0.0706	0.0616	0.1000	0.0076	42.0	13.6	70.6	61.6	23-97	
2-Chlorophenol	< 0.0100	0.0666	0.0594	0.1000	0.0100	40.0	11.4	66.6	59.4	27-123	
1,4-Dichlorobenzene	< 0.0084	0.0654	0.0656	0.1000	0.0084	28.0	0.3	65.4	65.6	36-97	
2,4-Dinitrotoluene	< 0.0100	0.0768	0.0692	0.1000	0.0100	38.0	10.4	76.8	69.2	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0692	0.0678	0.1000	0.0080	38.0	2.0	69.2	67.8	41-116	
4-Nitrophenol	< 0.0080	0.0204	0.0192	0.1000	0.0080	50.0	6.1	20.4	19.2	10-80	
Pentachlorophenol	< 0.0172	0.0836	0.0686	0.1000	0.0172	50.0	19.7	83.6	68.6	9-103	
Phenol	< 0.0074	0.0306	0.0262	0.1000	0.0074	42.0	15.5	30.6	26.2	12-89	
Pyrene	< 0.0040	0.0882	0.0832	0.1000	0.0040	31.0	5.8	88.2	83.2	26-127	
1,2,4-Trichlorobenzene	< 0.0108	0.0656	0.0666	0.1000	0.0108	28.0	1.5	65.6	66.6	39-98	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.

QA/QC Manager



Certificate Of Quality Control for Batch : 17A04D06

SW- 846 5030/8020 BTEX

Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 10:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	Qualifier
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	ppm	ppm	Amount	Limit	Recovery	Range	
			ppm	ppm	%	%	
Benzene	< 0.0010	0.1190	0.1000	0.0010	119.0	65-135	
Toluene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Ethylbenzene	< 0.0010	0.1150	0.1000	0.0010	115.0	65-135	
m,p-Xylenes	< 0.0020	0.2330	0.2000	0.0020	116.5	65-135	
o-Xylene	< 0.0010	0.1110	0.1000	0.0010	111.0	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

MDL = Below detection limit

Results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Certificate Of Quality Control for Batch : 17A04D06
SW- 846 5030/8020 BTEX

Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 11:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172108- 001	[A]	[B]	[C]	[D]	[E]	Matrix	[F]	[G]	[H]	[I]	[J]
	Sample	Matrix Spike	Matrix Spike	Matrix	Method	Limit	QC	QC	QC	Matrix Spike	Qualifier
Parameter	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Matrix Spike	M.S.D.	Recovery	
	ppm	ppm	Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
			ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1150	0.1160	0.1000	0.0010	25.0	0.9	115.0	116.0	65-135	
Toluene	< 0.0010	0.1020	0.1040	0.1000	0.0010	25.0	1.9	102.0	104.0	65-135	
Ethylbenzene	< 0.0010	0.1130	0.1140	0.1000	0.0010	25.0	0.9	113.0	114.0	65-135	
m,p-Xylenes	< 0.0020	0.2310	0.2330	0.2000	0.0020	25.0	0.9	115.5	116.5	65-135	
o-Xylene	< 0.0010	0.1100	0.1110	0.1000	0.0010	25.0	0.9	110.0	111.0	65-135	

$$\text{Spike Relative Difference [F]} = 200 \cdot (B-C)/(B+C)$$

$$\text{Matrix Spike Recovery [G]} = 100 \cdot (B-A)/[D]$$

M.S.D. = Matrix Spike Duplicate

$$\text{M.S.D. Recovery [H]} = 100 \cdot (C-A)/[D]$$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:00

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	Qualifier
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Bicarbonate	< 0.50	26.10	25.00	0.50	104.4	70-125	

Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. = Not calculated, data below detection limit

D. = Below detection limit

results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A20A62

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172H2- 003	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Parameter						
Bicarbonate	179	176	0.50	1.7	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A20A63

SM4500C02D Carbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS

Q.C. Sample ID 172112- 003	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Qualifier
	ppm	ppm	ppm	Relative Difference %	Relative Difference %	
Carbonate	< 1.000	< 1.000	1.000	N.C	25.0	

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A19D20

EPA 160.1 Total Dissolved Solids

Date Validated: Sep 16, 1997 14:05

Analyst: IF

Date Analyzed: Sep 16, 1997 11:05

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172097- 001	[A]	[B]	[C]	[D]	[E]	[F] Qualifier
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	
				Relative Difference	Relative Difference	
Parameter:	mg/L	mg/L	mg/L	%	%	
Total Dissolved Solids	720	713	4.00	1.0	25.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A10A85

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 16:36

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank	[F]	[G]	[H]	[I]	[J]
	Blank	Blank Spike	Blank Spike	Blank	Method	Limit	QC	QC	QC	Blank Spike	Qualifier
	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Blank Spike	B.S.D.	Recovery	
	mg/L	mg/L	Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
			mg/L	mg/L	mg/L	%	%	%	%	%	
Chloride	< 0.050	5.532	5.570	5.000	0.050	20.0	0.7	110.6	111.4	70-125	
Sulfate	< 0.10	4.35	4.39	5.00	0.10	20.0	0.9	87.0	87.8	70-125	

Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \times (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A10A85

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 18:48

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 006	[A]	[B]	[C]	[D]	[E]	[F]
	Sample	Duplicate	Method	QC	LIMITS	Qualifier
	Result	Result	Detection	Relative	Relative	
Parameter	mg/L	mg/L	Limit	Difference	Difference	
			mg/L	%	%	
Chloride	38.969	40.247	0.050	3.2	20.0	
Sulfate	49.23	50.50	0.10	2.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Project Name: TNMPL

XENCO COC#: 1-72112
Date Received in Lab: Sep 12, 1997 10:15 by AS
XENCO contact : Scott Sample/Edward Yonemoto

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 MW-1	172112-001	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by OR	Sep 15, 1997 12:29 by OR
2		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by CY	Sep 15, 1997 21:33 by LC
3 MW-2	172112-002	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by OR	Sep 15, 1997 17:49 by OR
4		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by CY	Sep 15, 1997 22:19 by LC
5 MW-6	172112-003	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by OR	Sep 15, 1997 17:13 by OR
6		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by CY	Sep 15, 1997 23:05 by LC
7		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by IF	Sep 16, 1997 11:15 by IF
8		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:05		Oct 3, 1997 by OR	Oct 3, 1997 18:14 by OR
9		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 17, 1997 15:21 by SA
10		Mercury, Tot	SW846-7470	ng/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 18, 1997 11:14 by EZ
11		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
12		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
13 MW-7	172112-004	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by OR	Sep 15, 1997 13:23 by OR
14		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by CY	Sep 15, 1997 23:50 by LC
15		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by IF	Sep 16, 1997 11:20 by IF
16		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:30		Oct 3, 1997 by OR	Oct 3, 1997 18:22 by OR
17		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 17, 1997 15:41 by SA
18		Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 18, 1997 11:15 by EZ
19		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
20		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
21 MW-8	172112-005	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by OR	Sep 15, 1997 13:41 by OR
22		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by CY	Sep 16, 1997 00:36 by LC
23		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by IF	Sep 16, 1997 11:25 by IF
24		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:45		Oct 3, 1997 by OR	Oct 3, 1997 18:40 by OR
25		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 17, 1997 15:48 by SA
26		Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 18, 1997 11:16 by EZ
27		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF
28		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF



ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: TNMPL

XENCO COC#: 1-72112

Project ID: 710016

Project Manager: Theresa Nix

Project Location: Lovington, NM

Date Received in Lab: Sep 12, 1997 10:15 by AS

XENCO contact : Scott Sample/Edward Yonemoto

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
29	MW-9	172112-006	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by OR	Sep 15, 1997 14:00 by OR
30			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by CY	Sep 16, 1997 01:21 by LC
31			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by IF	Sep 16, 1997 11:30 by IF
32			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:25		Oct 3, 1997 by OR	Oct 3, 1997 18:48 by OR
33			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 17, 1997 15:54 by SA
34			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 18, 1997 11:17 by EZ
35			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF
36			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF

Contractor KEI CONSULTANTS		Phone (210) 680-3767		No. coolers this shipment: 1		Contractor COC #																																																																																																																																																																																																																																																																													
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Project Director MIKE HAWTHORNE				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> No. of CONTAINERS Total </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> BTEX (5000-8000-8000) PAH EPA 8100 CAT/AN (1000-1000-1000) TDS (EPA 160.1) METALS (ICPSCAN/EPA 6010) </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> Please Hold </div> </div>																																																																																																																																																																																																																																																																															
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<div style="display: flex; justify-content: space-between;"> <div> SAMPLE CHARACTERIZATION <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Field ID</th> <th>Date</th> <th>Time</th> <th>DEPTH</th> <th>SOIL</th> <th>WATER</th> <th>COMP</th> <th>GRAB</th> <th>Container Size Type P, G</th> <th>Preservative</th> <th>Ice</th> <th>Other</th> <th>Waste Oil</th> <th>PTT No:</th> <th>Tank No:</th> <th>Sample Description</th> </tr> </thead> <tbody> <tr> <td>MW-1</td> <td>9/10/97</td> <td>1615</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td>LTR VOA G</td> <td></td> <td>X</td> <td>HCL NONE</td> <td></td> <td></td> <td></td> <td>MW-1</td> </tr> <tr> <td>MW-2</td> <td></td> <td>1750</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>↓</td> <td></td> <td>↓</td> <td>↓</td> <td></td> <td></td> <td></td> <td>MW-2</td> </tr> <tr> <td>MW-6</td> <td></td> <td>1705</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>LTR 500 VOA PG</td> <td>X</td> <td></td> <td>HCL NONE</td> <td></td> <td></td> <td></td> <td>MW-6</td> </tr> <tr> <td>MW-7</td> <td></td> <td>1630</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>MW-7</td> </tr> <tr> <td>MW-8</td> <td></td> <td>1645</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>MW-8</td> </tr> <tr> <td>MW-9</td> <td>↓</td> <td>1725</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>MW-9</td> </tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> </div> <div> Turn-around • ASAP • 24 hrs 48 hrs Standard </div> </div>				Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type P, G	Preservative	Ice	Other	Waste Oil	PTT No:	Tank No:	Sample Description	MW-1	9/10/97	1615			X		X	LTR VOA G		X	HCL NONE				MW-1	MW-2		1750						↓		↓	↓				MW-2	MW-6		1705						LTR 500 VOA PG	X		HCL NONE				MW-6	MW-7		1630													MW-7	MW-8		1645													MW-8	MW-9	↓	1725													MW-9																																																																																																																																																																
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Relinquished by: Theresa Nix	DATE: 9/11/97	TIME: 1000	Received by: John R. Duchs	DATE: 9/12/97	TIME: 10:15	Remarks:
						* PLEASE UTILIZE THE ICPSCAN EPA 6010 METHOD FOR METALS * FAX RESULTS TO THERESA NIX AT SAN ANTONIO OFFICE 680-3763



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

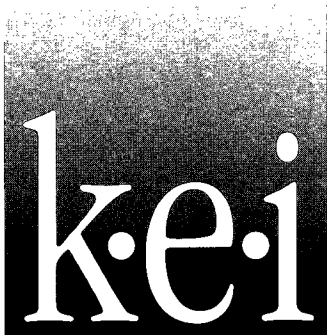
CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 172112-H

Contractor KEI CONSULTANTS		Phone (210) 680-3767		No coolers this shipment: 0		Contractor COC #													
Address 5309 WURZBACH STE 100 SAN ANTONIO, TX 78238				Carrier: UPS		Quote #:													
Project Name TNMA				Airbill No.		P.O. No.:													
Project Director MIKE HAWTHORNE				<div style="writing-mode: vertical-rl; transform: rotate(180deg);">CONTAINERS</div>															
Project Location SEPTA, LODINGTON, N.M. 710016																			
Project Manager TERESA NIX				Turn-around															
Sampler Signature [Signature]				+ ASAP															
Project No. 710016				+ 24 hrs															
SAMPLE CHARACTERIZATION				+ 48 hrs															
Preservative				Standard															
Unl Dies Ker Unknown				Remarks															
Waste Oil				LAB ONLY															
PIT No: Tank No:				ID #															
Sample Description																			
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRA B	Container Size Type P, G	Ice	Other									
MW-1	9/14/97	1615			X		X	LTK VCA G	X	HCL NONE									1
MW-2		1750																	2
MW-6		1705						LTK VCA PG	X	HCL NONE									3
MW-7		1630																	4
MW-8		1645																	5
MW-9		1725																	6
																			7
																			8
																			9
																			10

Relinquished by: [Signature]	DATE 9/17/97	TIME 1000	Received by: [Signature]	DATE 9/12/97	TIME 10:15	Remarks: * PLEASE UTILIZE THE ICPSCAN EPA 6010 METHOD FOR METALS * FAX RESULTS TO TERESA NIX AT SAN ANTONIO OFFICE 680-3763
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Oil Conservation Division

SUBSURFACE INVESTIGATION REPORT

**TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**



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San Antonio, Texas 78238
(210) 680-3767
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SUBSURFACE INVESTIGATION REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY

P. O. Box 1030
Jal, New Mexico 88252

Mr. Tony Savoie

PREPARED BY:

KEI

A handwritten signature in cursive script, reading 'Theresa Nix', written over a horizontal line.

Theresa Nix
Project Manager

A handwritten signature in cursive script, reading 'J. Michael Hawthorne', written over a horizontal line.

J. Michael Hawthorne, P.G., REM
Senior Geologist

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
PURPOSE AND SCOPE	2
FIELD INVESTIGATION	2
SOIL INVESTIGATION	
SOIL DESCRIPTION	
SOIL SAMPLING AND ANALYTICAL RESULTS	
GROUND WATER SAMPLING AND ANALYTICAL RESULTS	
CONCLUSIONS	6
FIGURES	
FIG. 1 - Site Location Map	
FIG. 2 - Site Plan	
FIG. 3 - Soil Concentration Map - August & September 1997	
FIG. 4 - Ground Water Concentration Map - September 1997	
FIG. 5 - Ground Water Contours - September 10, 1997	
TABLES	
General Notes	
TABLE I - Summary of Soil Laboratory Results - BTEX and TPH	
TABLE II - Summary of Soil Laboratory Results - VOCs	
TABLE III - Summary of Soil Laboratory Results - SVOCs	
TABLE IV - Summary of Laboratory Results - Miscellaneous	
TABLE V - Summary of Ground Water Monitoring	
TABLE VI - Summary of Ground Water Laboratory Results - BTEX and TPH	
TABLE VII - Summary of Ground Water Laboratory Results - Heavy Metals	
TABLE VIII - Summary of Ground Water Laboratory Results - PAHs	
TABLE IX - Summary of Ground Water Results - Miscellaneous	
APPENDICES	
APPENDIX A - Monitoring Well and Recovery Well Logs and Details	
APPENDIX B - Analytical Laboratory Reports	
Chain-of-Custody Documentation	

EXECUTIVE SUMMARY

The Texas - New Mexico Pipe Line Company (TNMPL) release site is located approximately two miles west of Lovington, New Mexico, in Section 16, Township 11 South, Range 35 East. A site location map is presented as FIG. 1. An initial investigation of the site was conducted in June of 1997. The initial investigation consisted of installation of five monitoring wells. The report for that investigation was dated September 22, 1997. An additional investigation was conducted in August and September 1997 to complete delineation of phase-separate hydrocarbons (PSH) and to install a recovery well. This report summarizes these additional subsurface investigation activities.

Subsurface investigation activities performed included the following:

- installing monitoring wells MW-6 through MW-9
- installing recovery well RW-1
- collection of native soil samples from the monitoring wells and recovery well for analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) concentrations;
- collection and analysis of an unimpacted native soil sample for determination of moisture content and organic carbon content
- gauging ground water and PSH levels in monitoring wells MW-1 through MW-9 and recovery well RW-1
- collecting ground water samples from monitoring wells MW-1, MW-2, and MW-6 through MW-9 for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbon (PAH), ICP heavy metals, major cations/anions, and total dissolved solids (TDS) concentrations.

The following conclusions are based on the data presented in this report:

- The closure standards for soil impact were determined to be as follows:

CONSTITUENT	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	10
BTEX	50
TPH	100 + Background Concentration

- Soil samples at the site indicated TPH, benzene, and BTEX concentrations above these closure standards.
- PSH was observed in five of the monitoring wells and in recovery well RW-1.
- Ground water samples at the site indicated benzene concentrations above New Mexico Environment Department (NMED) Drinking Water Standards. The NMED Drinking Water Standards for BTEX are as follows:

CONSTITUENT	DRINKING WATER STANDARD (mg/l)
BENZENE	0.01
TOLUENE	0.75
ETHYLBENZENE	0.75
XYLENES	0.62

PURPOSE AND SCOPE

The objective of the additional subsurface investigation activities was to delineate hydrocarbon impact across the site. The following activities were performed to achieve this objective:

- install monitoring wells upgradient and downgradient from release location
- install a recovery well in the source area
- collect soil and ground water samples for analysis of hydrocarbon and other constituent concentrations

FIELD INVESTIGATION

SOIL INVESTIGATION

During the subsurface investigation, four monitoring wells (designated MW-6 through MW-9) and one recovery well (designated RW-1) were installed utilizing air rotary technology. Soil samples were collected at selected intervals from the ground surface to termination boring depth. The soils were classified in the field, soil samples were field screened, and selected samples from the monitoring wells were prepared and shipped to the laboratory for analysis.

Upon advancement to total depth and collection of soil samples, a permanent well consisting of four-inch perforated PVC and blank riser was placed in the open hole of each boring designated as a permanent monitoring well. A permanent well consisting of six-inch perforated PVC and blank riser was placed in the open hole of the boring designated as a permanent recovery well.

All drilling and sampling equipment was cleaned prior to first use, between boring locations, and between sampling intervals with a Liqui-Nox detergent wash followed by a distilled water rinse.

The monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico. The locations of the monitoring wells and recovery well installed are presented on FIG. 2.

SOIL DESCRIPTION

The subsurface soil profile was classified in general accordance with the Unified Soil Classification System by visually observing the soil samples obtained during the assessment. In

general, five soil types were encountered. A general description of the soil, approximate thickness, and head-space sample results for each soil type are as follows:

Soil Type I

This soil type consisted of topsoil and was encountered at the surface of monitoring well locations MW-6 through MW-9. This soil type thickness ranged from approximately 0.5 to 1 feet. No head-space readings were obtained from this soil type.

Soil Type II

This soil type consisted of a white to brown rock (caliche) and was encountered beneath the topsoil layer at monitoring wells MW-6 through MW-9. The rock was moist and varied in thickness from approximately 3 to 6 feet. The head-space reading from a sample of this soil type was non-detectable (ND).

Soil Type III

This soil type consisted of a tan to brown sand and was encountered at all monitoring and recovery well locations. The sand was fine-grained, moist to wet, and was intermixed with stone. This soil type varied in thickness from approximately 4 to 58 feet. The head-space readings from samples of this soil type varied from ND to 1,000 ppm.

Soil Type IV

This soil type consisted of a tan to red limestone and was encountered only at monitoring well locations MW-6 and MW-9. The limestone was very hard. This soil type varied in thickness from approximately 2 feet in MW-6 to 18.5 feet in MW-9. No head-space readings were obtained from this soil type.

Soil Type V

This soil type consisted of backfill located at recovery well RW-1. The backfill was approximately 12 feet thick and consisted of the soils excavated and replaced as part of the initial response activities to the release. The head-space reading obtained from this soil type was 421 ppm.

Logs indicating the typical subsurface soil profile, depths at which soil samples were obtained, head-space results, laboratory results, and generalized geologic profiles are presented in APPENDIX A.

SOIL SAMPLING AND ANALYTICAL RESULTS

Native soil samples were collected at selected intervals from the ground surface to a depth of approximately two feet below ground water by pushing a split spoon sampler. The soil samples were used to evaluate water levels and the distribution of phase-separate hydrocarbons.

Representative soil samples were divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample was placed in a disposable sample bag. The bag was labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample was allowed to volatilize for approximately 30 minutes at ambient temperature prior to conducting the PID analysis.

The other portion of the soil sample was placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container was filled to capacity with soil to limit the amount of head-space present. Each container was labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler was sealed for shipment to the laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

Two soil samples were selected from each soil boring based on the following criteria:

- The sample with the highest head-space reading
- The sample directly above the ground water level measured at the time of drilling, or
- The sample at the bottom of each boring

One soil sample was collected from stockpiled soils which were used to backfill the excavation in the area of recovery well RW-1.

Eight soil samples from the monitoring wells were selected for determination of TPH and VOC concentrations by EPA Method 8015 Diesel Range Organics (DRO) and 8260, respectively. One soil sample collected from MW-9 was selected and submitted for determination of moisture content and organic content by ASTM Method 2216-71 and D2974, respectively.

Two soil samples from the recovery well were selected and submitted to the lab for determination of TPH and BTEX concentrations by EPA Method 8015 DRO and 8020, respectively. The soil sample collected from the stockpiled soils by RW-1 was submitted for determination of TPH, BTEX, VOCs, SVOCs, and SPLP TPH concentrations by EPA Method 8015 DRO, 8020, 8260, 8270, and 1312/418.1, respectively.

Laboratory results for the selected samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATIONS (mg/kg)
BENZENE	ND to 420
BTEX	ND to 1,740
TPH	ND to 142,000

Soil laboratory results are summarized in TABLES I through IV. BTEX and TPH laboratory results are also graphically presented on FIG. 3. Analytical laboratory reports are included in APPENDIX B.

GROUND WATER SAMPLING AND ANALYTICAL RESULTS

Upon completion of drilling and then approximately twice a month, each well was gauged to determine the depth to ground water and the PSH thickness. Ground water depth during the December 10, 1997, gauging event indicated the depth to ground water from wells without PSH varied from 52.92 to 53.25 feet below the ground surface and PSH thickness varied from ND to 8.30 feet. Ground water elevations indicate an approximate gradient of 0.010 ft/ft towards the southeast. Ground water contours are presented on FIG. 5. Ground water measurements are summarized in TABLE V.

On September 10, 1997, each monitoring well was purged of approximately three well volumes of water using a PVC bailer. The bailer was cleaned prior to each use with Liqui-Nox detergent and rinsed with water. After purging the wells, ground water samples were collected from monitoring wells which did not contain PSH with a disposable Teflon bailer and polyethylene line.

Water samples collected for BTEX analyses were placed in sterile, 40 ml glass VOA vials equipped with Teflon-lined caps. Water samples collected for PAH analysis were placed in unpreserved sterile one liter glass containers equipped with Teflon-lined caps. Water samples collected for metals analysis were placed in 500 ml containers equipped with Teflon-lined caps. The containers were provided by the analytical laboratory. The vials were filled to a positive meniscus, sealed, and visually checked for the presence of air bubbles.

The filled containers were labeled and placed on ice in an insulated cooler. The cooler was sealed for shipment to Xenco Laboratories in Houston, Texas for determination of metals, BTEX, PAH, major cations/anions, and total dissolved solids (TDS) concentrations using EPA Method 6010, 8020, 8100, SM4500CO2D, 300.0, and 160.1, respectively. Proper chain-of-custody documentation was maintained throughout the sampling process.

Laboratory results indicated the following concentration ranges:

CONSTITUENT	CONCENTRATIONS (mg/L)
BENZENE	ND to 18.25
BTEX	ND to 31.66
Aluminum	0.32 to 0.82
Barium	0.058 to 0.084
Calcium	69.4 to 118
Iron	0.19 to 0.47
Magnesium	10.1 to 17.1
Potassium	1.48 to 2.07
Sodium	18.6 to 33.9
Silicon	20.8 to 21.1
Strontium	0.53 to 0.75
Naphthalene	ND to 0.071
Bicarbonate	173 to 179
Carbonate	ND
TDS	426 to 574
Sulfate	42.2 to 103
Chloride	38.97 to 54.54

Metals and PAH constituents not listed above were all ND. Ground water laboratory results are summarized in TABLES VI through IX. BTEX laboratory results are graphically presented on FIG. 4. Analytical laboratory reports are included in APPENDIX B.

Purged water collected during the event was stored in steel drums pending disposal.

A crude oil sample was collected on September 9, 1997, and submitted to Environmental Lab of Texas, Inc. located in Odessa, Texas for determination of specific gravity by ASTM Method D287-64. The laboratory result indicated a specific gravity of 0.8031. The laboratory result is summarized in TABLE IV. Analytical laboratory reports are included in APPENDIX B.

CONCLUSIONS

The following conclusions are based on the data presented in this report:

- The soil closure standards were determined to be as follows:

CONSTITUENT	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	10
BTEX	50
TPH	100 + Background Concentration

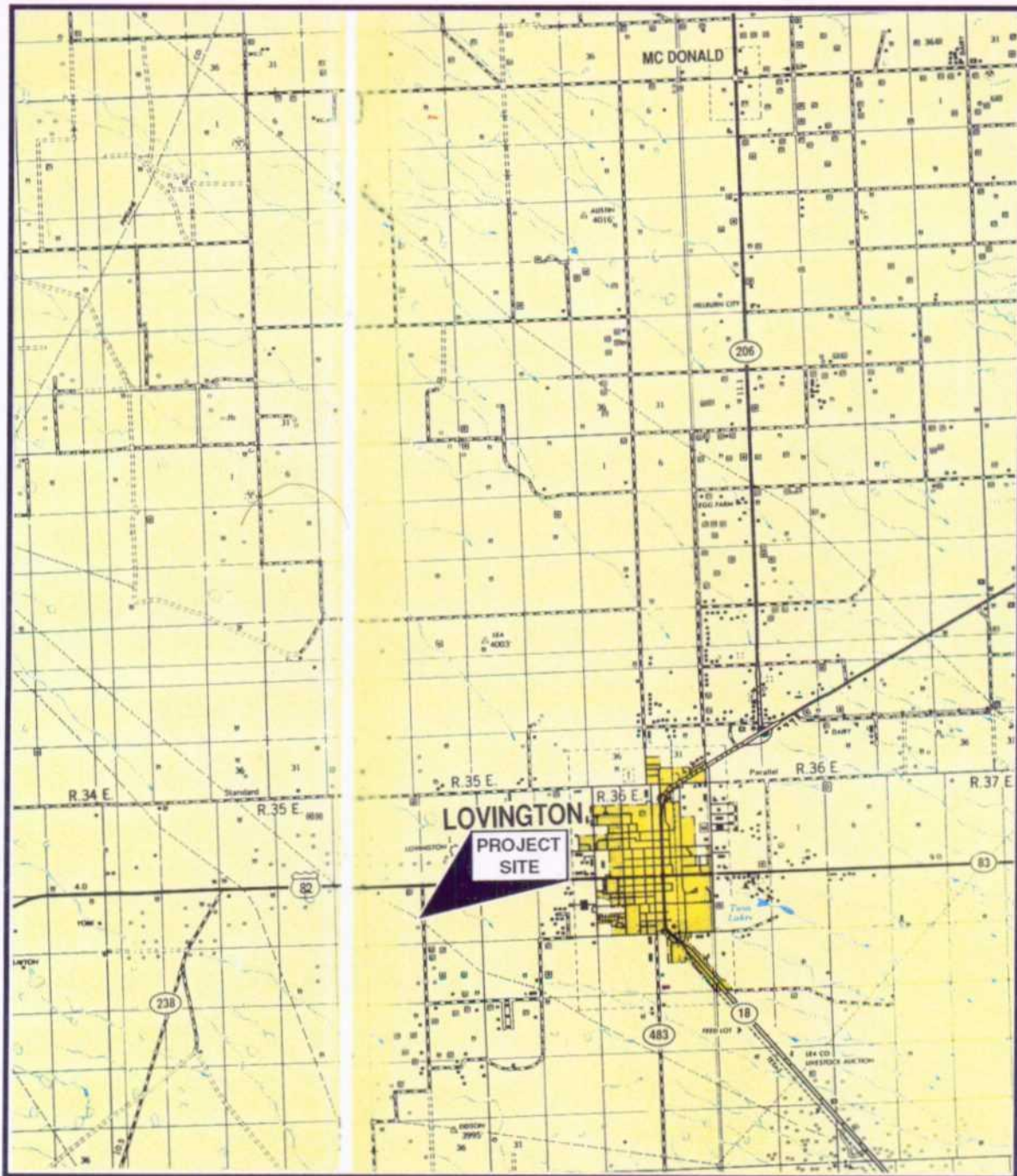
- Soil samples obtained from recovery well RW-1 indicated benzene, BTEX, and TPH concentrations above closure standards.
- PSH was observed in monitoring wells MW-2, MW-3, MW-4, MW-5, MW-9, and recovery well RW-1 with thicknesses ranging from 2.09 to 8.30 feet.
- Ground water samples obtained from monitoring wells MW-2, MW-8, and MW-9 indicated benzene concentrations above New Mexico Drinking Water Standards.

Figures

THE ROADS OF NEW MEXICO

NEW MEXICO-LEA CO.

LOVINGTON



SCALE - ONE INCH EQUALS 2.9 MILES



kei

SITE LOCATION MAP

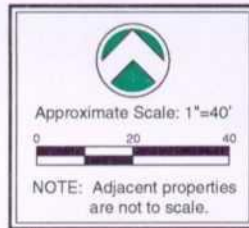
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016

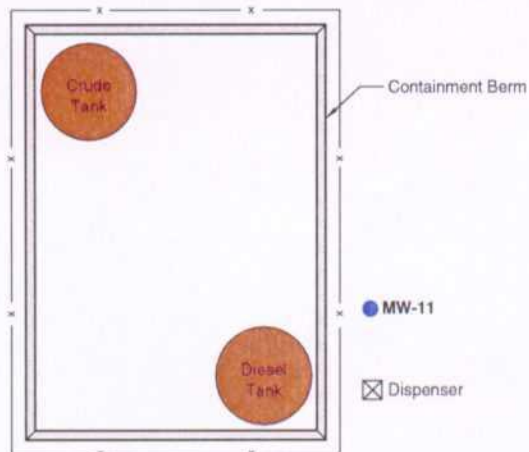
FIG 1



MW-10

Grass

MW-9



MW-11

MW-2
(SB-1)

MW-5
(SB-4)

4" CRUDE OIL PIPELINE

RW-1

6" CRUDE OIL PIPELINE (NOT IN SERVICE)

MW-4
(SB-3)

MW-3
(SB-2)

MW-6

MW-12

MW-8

MW-7

Grass

LEGEND

- Existing Monitoring Wells
- △ Recovery Well

MW-1

SITE DETAILS

TEXAS - NEW MEXICO PIPE LINE COMPANY

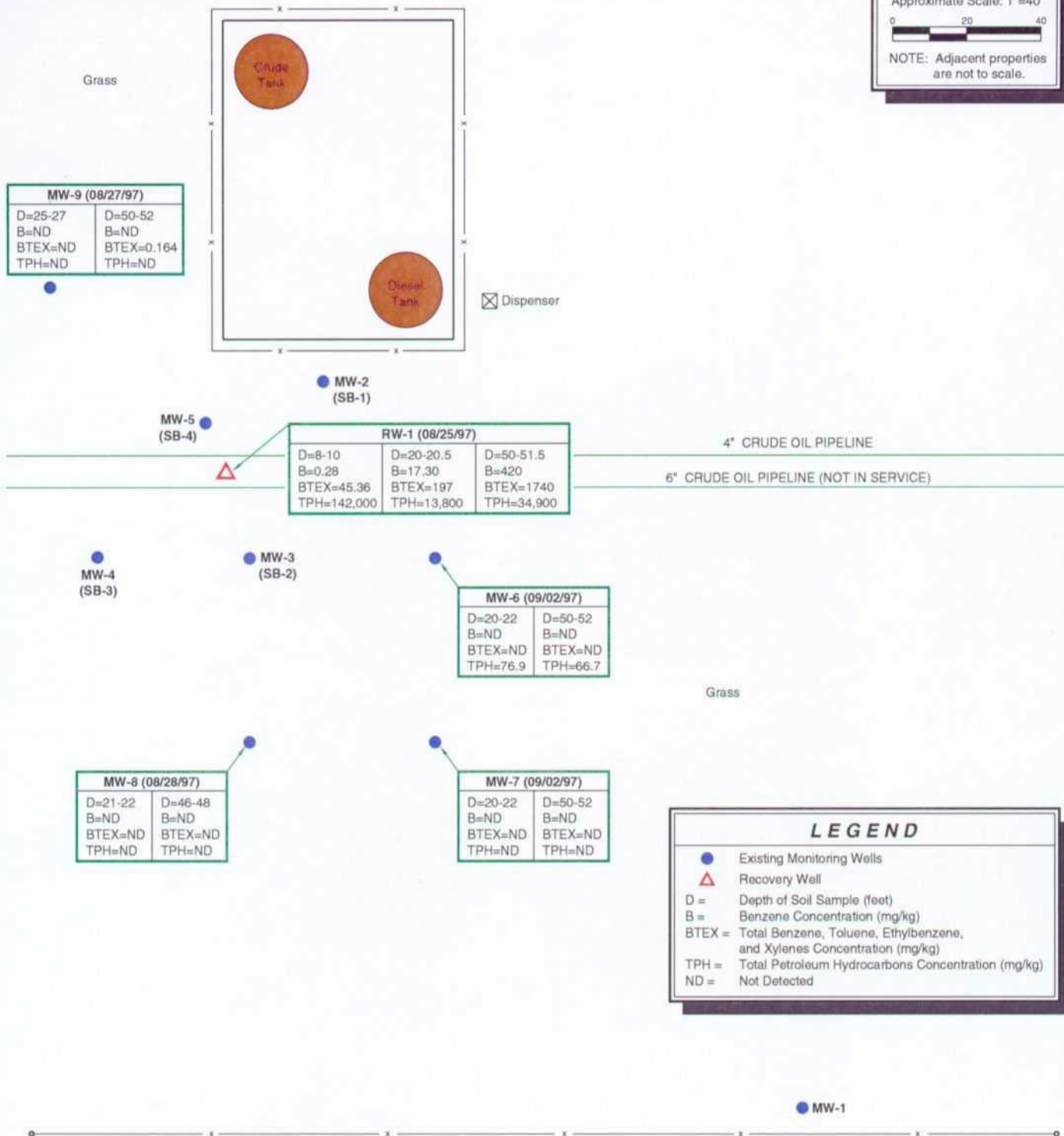
TNM-97-04

LOVINGTON, NEW MEXICO

710016

FIG 2

kei



01/13/98 RW G-17116SC-9)

kei

SOIL CONCENTRATION MAP - AUGUST AND SEPTEMBER 1997

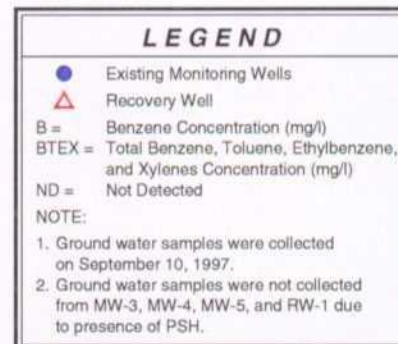
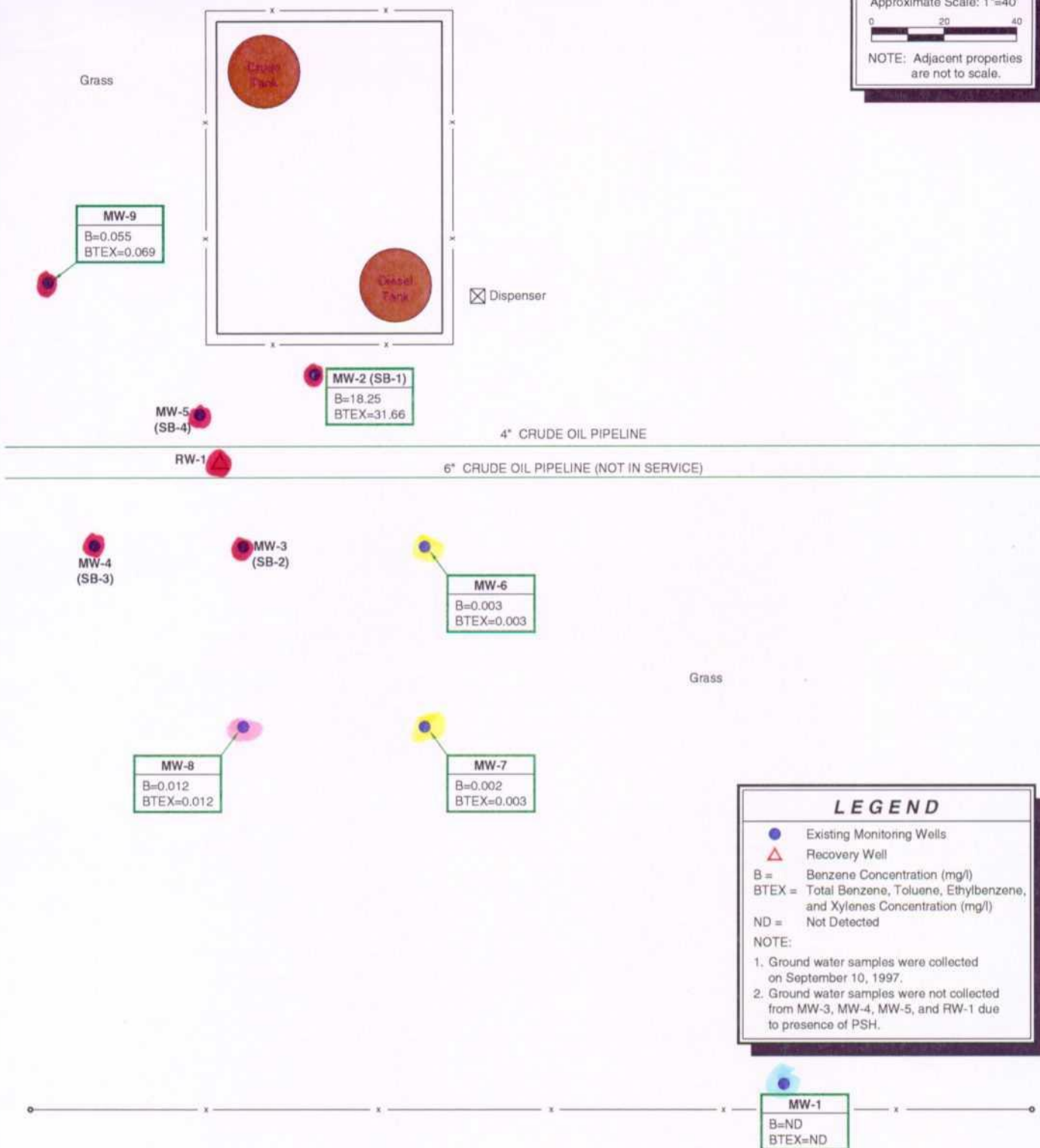
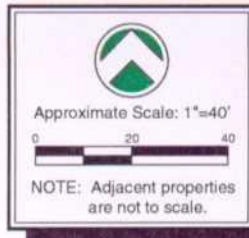
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016

FIG 3



01/13/98-RW GJ(71163W-9)

kei

GROUND WATER CONCENTRATION MAP - SEPTEMBER 1997

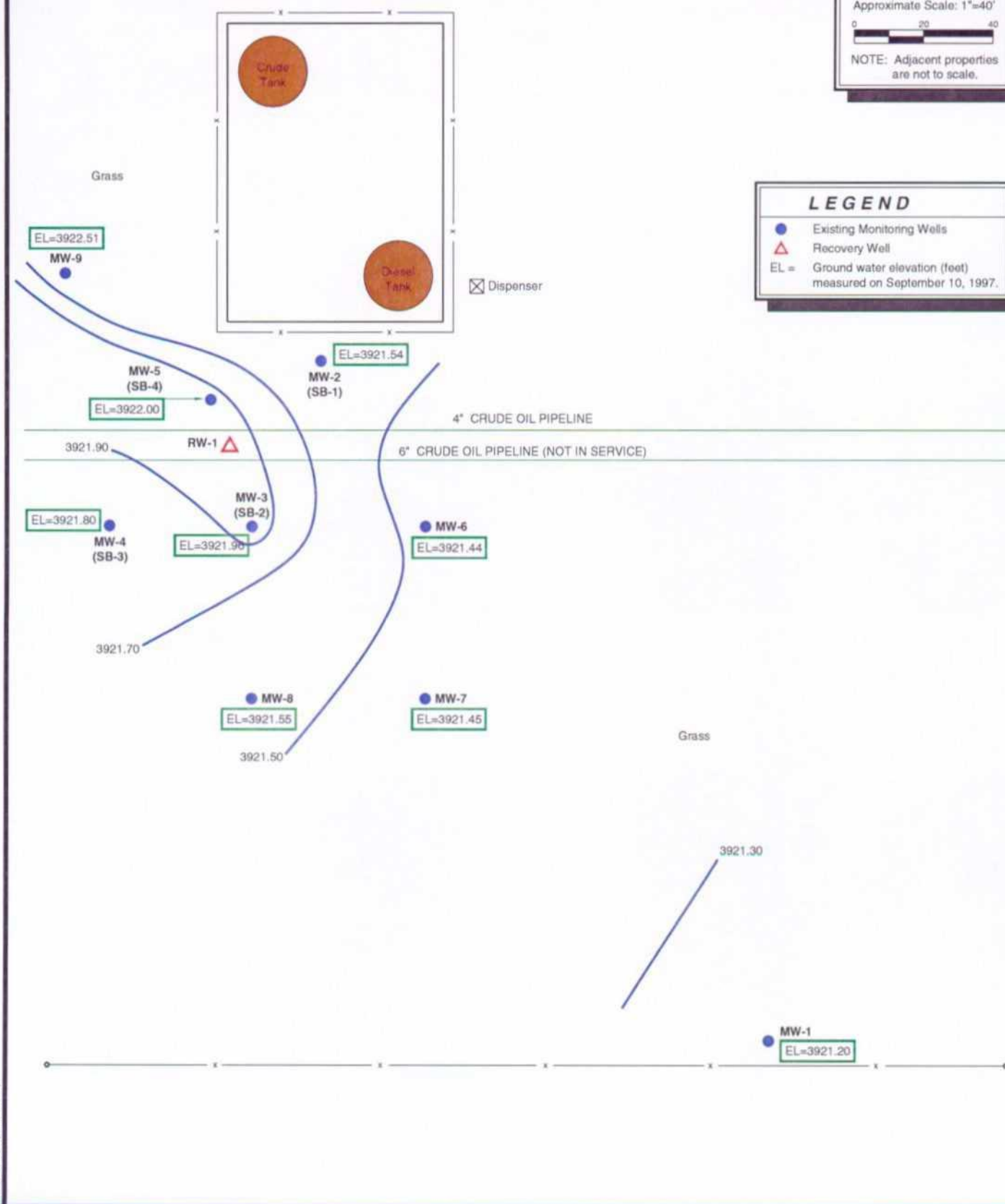
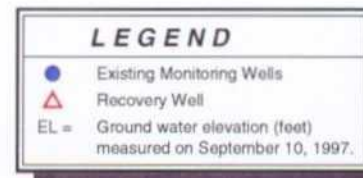
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

710016

FIG 4



01/13/98 RM G.V.1163(WCM)



GROUND WATER CONTOURS - SEPTEMBER 10, 1997		
TEXAS - NEW MEXICO PIPE LINE COMPANY	TNM-97-04	LOVINGTON, NEW MEXICO

710016
FIG 5

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection limit.

PSH - Phase-separate hydrocarbons.

Method detection or reporting limits:

Soil: BTEX - 0.100 mg/kg
 TPH - 10 mg/kg
 VOCs - 0.005 to 1.0 mg/kg
 SVOCs - 17 mg/kg

Water: BTEX - 0.001 to 0.002 mg/l
 Metals - 0.020 to 0.50 mg/l
 PAH - 0.002 mg/l

Laboratory test methods:

BTEX	- EPA Method SW846-8020
TPH	- Modified EPA Method 8015 Diesel Range Organics
VOCs	- EPA Method 8260
SVOC	- EPA Method 8270
SPLP TPH	- EPA Method 1312/418.1
Metals	- EPA ICP Method 6010
Total Mercury	- EPA Method 7470
Bicarbonate	- SM 4500CO2D
Carbonate	- SM4500CO2D
TDS	- EPA Method 160.1
Anions	- EPA Method 300.0

TABLE I

**SUMMARY OF SOIL LABORATORY RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY**

TMN-97-04

LOVINGTON, NEW MEXICO

SAMPLE LOCATION	DATE SAMPLED	SAMPLE DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	BTEX (mg/kg)	TPH (mg/kg)
MW-6	09/02/97	20 - 22	ND	ND	ND	ND	ND	76.9
MW-6	09/02/97	50 - 52	ND	ND	ND	ND	ND	66.7
MW-7	09/02/97	20 - 22	ND	ND	ND	ND	ND	ND
MW-7	09/02/97	50 - 52	ND	ND	ND	ND	ND	ND
MW-8	08/28/97	21 - 22	ND	ND	ND	ND	ND	ND
MW-8	08/28/97	46 - 48	ND	ND	ND	ND	ND	ND
MW-9	08/27/97	25 - 27	ND	ND	ND	ND	ND	ND
MW-9	08/27/97	50 - 52	ND	0.035	ND	0.129	0.164	ND
RW-1	08/25/97	8 - 10	0.28	8.44	6.50	30.14	45.36	142,000
RW-1	08/25/97	8 - 10	---	---	---	---	---	5.3*
RW-1	08/25/97	20 - 20.5	17.30	65.80	28.10	86.10	197	13,800
RW-1	08/25/97	50 - 51.5	420	680	200	443	1,740	34,900

*Indicates SPLP TPH result.

TABLE II

SUMMARY OF SOIL LABORATORY RESULTS - VOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY

TNM-97-04

LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9
DATE SAMPLED	08/25/97	09/02/97	09/02/97	09/02/97	09/02/97	08/28/97	08/28/97	08/27/97	08/27/97
DEPTH	8 - 10	20 - 22	50 - 52	20 - 22	50 - 52	21 - 22	46 - 48	25 - 27	50 - 52
PARAMETER	CONCENTRATION (mg/kg)								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	9.0	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	4.9	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE II
(continued)

SUMMARY OF SOIL LABORATORY RESULTS - VOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.	CONCENTRATION (mg/kg)					
		MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
DATE SAMPLED	08/25/97	09/02/97	09/02/97	09/02/97	09/02/97	08/28/97	08/27/97
DEPTH	8 - 10	20 - 22	50 - 52	20 - 22	50 - 52	21 - 22	46 - 48
PARAMETER							
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	8.2	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	4.0	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND
Naphthalene	21.8	ND	ND	ND	ND	ND	ND
n-Propylbenzene	6.7	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
Toluene	9.9	ND	ND	ND	ND	ND	0.035
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	36.7**	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	13.5	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND
o-Xylene	12.2	ND	ND	ND	ND	ND	0.030
m,p-Xylenes	22.9	ND	ND	ND	ND	ND	0.099
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND	ND	ND

NOTE:

** Indicates that result was beyond calibration limits.

TABLE III

SUMMARY OF SOIL LABORATORY RESULTS - SVOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	RW-1 B.F.
DATE SAMPLED	08/25/97
DEPTH	8 - 10
PARAMETER	CONCENTRATION (mg/kg)
Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(g,h,i)perylene	ND
Benzo(k)fluoranthene	ND
Butyl benzyl phthalate	ND
Carbazole	ND
4-Chloroaniline	ND
bis [2-Chloroethoxy] methane	ND
bis [2-Chloroethyl] ether	ND
bis [2-Chloroisopropyl] ether	ND
2-Chloronaphthalene	ND
2-Chlorophenol	ND
4-Chlorophenyl-phenyl ether	ND
Chrysene	ND
Dibenzofuran	ND
Dibenzo(a,h)anthracene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
3,3-Dichlorobenzidine	ND
2,4-Dichlorophenol	ND
Diethyl phthalate	ND
2,4-Dimethylphenol	ND
Dimethyl phthalate	ND
4,6-Dinitro-2-methylphenol	ND
2,4-Dinitrophenol	ND
2,4-Dinitrotoluene	ND
2,6-Dinitrotoluene	ND
Di-n-octyl phthalate	ND
bis [2-Ethylhexyl] phthalate	ND
Fluoranthene	ND
Fluorene	ND

TABLE III

**SUMMARY OF SOIL LABORATORY RESULTS - SVOCs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	RW-1 B.F.
DATE SAMPLED	08/25/97
DEPTH	8 - 10
PARAMETER	CONCENTRATION (mg/kg)
Hexachlorobenzene	ND
Hexachlorobutadiene	ND
Hexachlorocyclopentadiene	ND
Hexachloroethane	ND
Indeno(1,2,3-cd)pyrene	ND
Isophorone	ND
2-Methylnaphthalene	56
2-Methylphenol	ND
4-Methylphenol	ND
Naphthalene	19
2-Nitroaniline	ND
3-Nitroaniline	ND
4-Nitroaniline	ND
Nitrobenzene	ND
2-Nitrophenol	ND
4-Nitrophenol	ND
N-Nitroso-di-n-propylamine	ND
N-Nitrosodiphenylamine	ND
Pentachlorophenol	ND
Phenanthrene	ND
Phenol	ND
Pyrene	ND
Pyridine	ND
1,2,4-Trichlorobenzene	ND
2,4,5-Trichlorophenol	ND
2,4,6-Trichlorophenol	ND
4-Bromophenyl-phenylether	ND
4-Chloro-3-Methylphenol	ND
Di-n-butyl phthalate	ND

TABLE IV

**SUMMARY OF LABORATORY RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	DATE SAMPLED	SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY @ 60 DEGREES F
MW-9	08/27/97	27 - 29	11.9	0.8	---
RW-1 (crude)	09/09/97	---	---	---	0.8031

TABLE V

**MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.19	53.15	3921.04	---	---
07/29/97	3,974.19	53.05	3921.14	---	---
09/10/97	3,974.19	52.99	3921.20	---	---
10/22/97	3,974.19	52.98	3921.21	---	---
10/29/97	3,974.19	52.98	3921.21	---	---
11/04/97	3,974.19	52.97	3921.22	---	---
11/11/97	3,974.19	52.97	3921.22	---	---
12/04/97	3,974.19	52.97	3921.22	---	---
12/10/97	3,974.19	52.99	3921.20	---	---

TABLE V
(continued)

**MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.65	53.24	3921.41	---	---
07/29/97	3,974.65	53.14	3921.51	---	---
09/10/97	3,974.65	53.11	3921.54	---	SHEEN
10/22/97	3,974.65	53.20	3921.45	3921.60	0.18
10/29/97	3,974.65	53.24	3921.41	3921.60	0.22
11/04/97	3,974.65	53.26	3921.39	3921.60	0.25
11/11/97	3,974.65	53.30	3921.35	3921.61	0.30
12/04/97	3,974.65	53.45	3921.20	3921.60	0.47
12/10/97	3,974.65	53.47	3921.18	3921.62	0.52

TABLE V
(continued)

**MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.63	60.08	3914.55	3921.94	8.69
06/23/97	3,974.63	60.08	3914.55	3921.96	8.72
06/23/97	3,974.63	53.30	3921.33	3921.56	0.27
06/23/97	3,974.63	53.78	3920.85	3921.71	1.01
06/25/97	3,974.63	59.85	3914.78	3921.99	8.48
06/25/97	3,974.63	55.50	3919.13	3921.72	3.05
06/25/97	3,974.63	56.34	3918.29	3921.78	4.10
06/25/97	3,974.63	53.29	3921.34	---	---
06/27/97	3,974.63	59.99	3914.64	3921.96	8.61
06/27/97	3,974.63	56.68	3917.95	3921.60	4.29
07/01/97	3,974.63	59.99	3914.64	3921.96	8.61
07/03/97	3,974.63	60.04	3914.59	3921.98	8.69
07/03/97	3,974.63	55.22	3919.41	3921.75	2.75
07/29/97	3,974.63	60.03	3914.60	3921.96	8.66
07/29/97	3,974.63	54.47	3920.16	3921.90	2.05
09/10/97	3,974.63	59.81	3914.82	3921.96	8.40
09/16/97	3,974.63	59.86	3914.77	3921.95	8.45
09/23/97	3,974.63	59.84	3914.79	3921.96	8.44
10/22/97	3,974.63	59.78	3914.85	3921.96	8.37
10/29/97	3,974.63	59.75	3914.88	3921.96	8.33
11/04/97	3,974.63	59.73	3914.90	3921.96	8.31
11/11/97	3,974.63	59.70	3914.93	3921.97	8.28
12/04/97	3,974.63	59.64	3914.99	3921.95	8.19
12/10/97	3,974.63	59.56	3915.07	3921.97	8.12

TABLE V
(continued)

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.55	52.96	3921.59	---	---
07/29/97	3,974.55	52.92	3921.63	---	---
09/10/97	3,974.55	54.53	3920.02	3921.80	2.09
09/16/97	3,974.55	54.38	3920.17	3921.80	1.92
09/23/97	3,974.55	54.45	3920.10	3921.81	2.01
10/22/97	3,974.55	57.92	3916.63	3922.00	6.32
10/29/97	3,974.55	57.29	3917.26	3921.96	5.53
11/04/97	3,974.55	56.75	3917.80	3921.92	4.85
11/11/97	3,974.55	57.63	3916.92	3921.98	5.95
12/04/97	3,974.55	58.53	3916.02	3922.01	7.05
12/10/97	3,974.55	58.25	3916.30	3922.04	6.75

TABLE V
(continued)

**MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
06/18/97	3,974.31	60.85	3913.46	3922.41	10.53
06/23/97	3,974.31	58.09	3916.22	3922.08	6.89
06/23/97	3,974.31	56.57	3917.74	3922.38	5.46
06/23/97	3,974.31	59.18	3915.13	3921.32	7.28
06/23/97	3,974.31	59.74	3914.57	3922.08	8.83
06/23/97	3,974.31	54.91	3919.40	3921.88	2.92
06/25/97	3,974.31	60.47	3913.84	3922.02	9.62
06/25/97	3,974.31	58.47	3915.84	3921.99	7.24
06/25/97	3,974.31	59.49	3914.82	3922.01	8.46
06/25/97	3,974.31	53.42	3920.89	3921.94	1.23
06/25/97	3,974.31	55.95	3918.36	3921.90	4.16
06/25/97	3,974.31	58.50	3915.81	3922.02	7.30
06/25/97	3,974.31	52.46	3921.85	3921.87	0.02
06/25/97	3,974.31	51.81	3922.50	3922.50	0.00
06/27/97	3,974.31	60.46	3913.85	3922.06	9.66
06/27/97	3,974.31	57.47	3916.84	3922.00	6.07
07/01/97	3,974.31	60.45	3913.86	3922.01	9.59
07/01/97	3,974.31	56.40	3917.91	3921.94	4.74
07/03/97	3,974.31	60.41	3913.90	3922.01	9.54
07/03/97	3,974.31	57.53	3916.78	3921.98	6.12
07/29/97	3,974.31	60.19	3914.12	3922.02	9.29
07/29/97	3,974.31	57.69	3916.62	3920.97	5.12
09/10/97	3,974.31	59.88	3914.43	3922.00	8.91
09/16/97	3,974.31	59.85	3914.46	3922.00	8.87
09/23/97	3,974.31	59.79	3914.52	3922.01	8.81
10/22/97	3,974.31	59.60	3914.71	3922.01	8.59
10/29/97	3,974.31	59.56	3914.75	3921.99	8.52
11/04/97	3,974.31	59.54	3914.77	3922.00	8.50
11/11/97	3,974.31	59.48	3914.83	3922.00	8.44
12/04/97	3,974.31	59.38	3914.93	3921.99	8.30
12/10/97	3,974.31	59.31	3915.00	3922.00	8.24

TABLE V
(continued)

**MONITORING WELL MW-6
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.73	53.29	3921.44	---	---
10/22/97	3,974.73	53.30	3921.43	---	---
10/29/97	3,974.73	53.30	3921.43	---	---
11/04/97	3,974.73	53.29	3921.44	---	---
11/11/97	3,974.73	53.30	3921.43	---	---
12/04/97	3,974.73	53.26	3921.47	---	---
12/10/97	3,974.73	53.25	3921.48	---	---

TABLE V
(continued)

**MONITORING WELL MW-7
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.66	53.21	3921.45	---	---
10/22/97	3,974.66	53.23	3921.43	---	---
10/29/97	3,974.66	53.24	3921.42	---	---
11/04/97	3,974.66	53.23	3921.43	---	---
11/11/97	3,974.66	53.23	3921.43	---	---
12/04/97	3,974.66	53.17	3921.49	---	---
12/10/97	3,974.66	53.19	3921.47	---	---

TABLE V
(continued)

**MONITORING WELL MW-8
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,974.52	52.97	3921.55	---	---
10/22/97	3,974.52	52.98	3921.54	---	---
10/29/97	3,974.52	53.02	3921.50	---	---
11/04/97	3,974.52	53.01	3921.51	---	---
11/11/97	3,974.52	53.03	3921.49	---	---
12/04/97	3,974.52	52.92	3921.60	---	---
12/10/97	3,974.52	52.92	3921.60	---	---

TABLE V
(continued)

MONITORING WELL MW-9
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	3,975.80	53.29	3922.51	---	---
10/22/97	3,975.80	53.34	3922.46	---	---
10/29/97	3,975.80	53.36	3922.44	---	---
11/04/97	3,975.80	53.35	3922.45	---	---
11/11/97	3,975.80	53.32	3922.48	---	---
12/04/97	3,975.80	53.37	3922.43	3922.49	0.07
12/10/97	3,975.80	53.38	3922.42	3922.55	0.15

TABLE V
(continued)

RECOVERY WELL RW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
09/10/97	Unknown	56.36	Unknown	Unknown	8.88
09/16/97	Unknown	56.35	Unknown	Unknown	8.85
09/23/97	Unknown	56.32	Unknown	Unknown	8.82
10/22/97	Unknown	56.15	Unknown	Unknown	8.60
10/29/97	Unknown	56.09	Unknown	Unknown	8.53
11/04/97	Unknown	56.98	Unknown	Unknown	9.44
11/11/97	Unknown	56.03	Unknown	Unknown	8.48
12/04/97	Unknown	56.94	Unknown	Unknown	9.35
12/10/97	Unknown	55.87	Unknown	Unknown	8.30

TABLE VI

**SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL- BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)	TPH (mg/l)
MW-1	06/18/97	ND	ND	ND	ND	ND	ND
MW-1	09/10/97	ND	ND	ND	ND	ND	---
MW-1	12/18/97	ND	ND	ND	ND	ND	---
MW-2	06/18/97	0.044	0.014	0.004	0.008	0.070	2
MW-2	09/10/97	18.25	9.70	0.61	3.10	31.66	---
MW-4	06/18/97	0.155	0.106	0.007	0.023	0.291	2
MW-6	09/10/97	0.003	ND	ND	ND	0.003	---
MW-6	12/18/97	0.363	0.241	0.015	0.092	0.711	---
MW-7	09/10/97	0.002	0.001	ND	ND	0.003	---
MW-7	12/18/97	ND	ND	ND	ND	ND	---
MW-8	09/10/97	0.012	ND	ND	ND	0.012	---
MW-8	12/18/97	ND	ND	ND	ND	ND	---
MW-9	09/10/97	0.055	0.014	ND	ND	0.069	---
MW-10	12/18/97	ND	ND	ND	ND	ND	---
MW-11	12/18/97	ND	ND	0.003	ND	0.003	---
MW-12	12/18/97	ND	ND	ND	ND	ND	---

TABLE VII

**SUMMARY OF GROUND WATER LABORATORY RESULTS - HEAVY METALS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO**

SAMPLE LOCATION	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)			
Aluminum	0.61	0.82	0.32	0.41
Barium	0.058	0.079	0.084	0.072
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Calcium	69.4	88.5	118	98.5
Chromium	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Iron	0.40	0.47	0.19	0.23
Magnesium	10.1	13.3	17.1	13.7
Manganese	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Potassium	1.48	1.60	2.07	1.94
Silver	ND	ND	ND	ND
Sodium	18.6	33.9	32.1	31.9
Tin	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Boron	ND	ND	ND	ND
Silicon	20.8	21.0	20.8	21.1
Strontium	0.53	0.60	0.75	0.62
Mercury	ND	ND	ND	ND

TABLE VIII

SUMMARY OF GROUND WATER LABORATORY RESULTS - PAHs
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-04
LOVINGTON, NEW MEXICO

SAMPLE LOCATION	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)					
Acenaphthene	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	0.071	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND
Dibenz(a,h)acridine	ND	ND	ND	ND	ND	ND
Benzo(j)fluoranthene	ND	ND	ND	ND	ND	ND
7H-Dibenzo(c,g)carbazole	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)pyrene	ND	ND	ND	ND	ND	ND
Dibenzo(a,i)pyrene	ND	ND	ND	ND	ND	ND

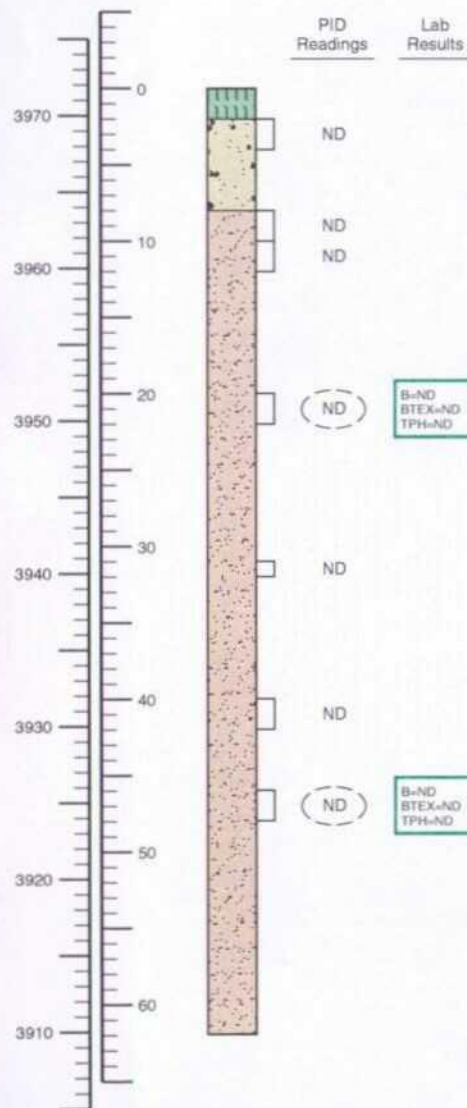
TABLE IX

SUMMARY OF GROUND WATER LABORATORY RESULTS - MISCELLANEOUS TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-04 LOVINGTON, NEW MEXICO

SAMPLE LOCATION	MW-6	MW-7	MW-8	MW-9
DATE SAMPLED	09/10/97	09/10/97	09/10/97	09/10/97
PARAMETER	CONCENTRATION (mg/l)			
Bicarbonate	179	177	173	178
Carbonate	ND	ND	ND	ND
Sulfate	42.2	59.7	103	49.2
Chloride	40.21	54.54	51.98	38.97
TDS	448	515	574	426

ELEV./DEPTH
(FEET)

MONITORING WELL MW-8



Monitoring Well Details (MW-8)

Elev of Ground Surface	3971.72 ft
Elev Top of PVC Well	3974.52 ft
Thickness of Bentonite Seal	3.5 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	62.0 ft
Depth of Exploratory Hole	62.0 ft
Depth to Ground Water (During drilling)	53.57 ft
Depth to Ground Water	50.17 ft
Elev of Ground Water	3921.55 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

	Concrete Surface Seal
	Bentonite Pellet Seal
	Sand Pack

LEGEND

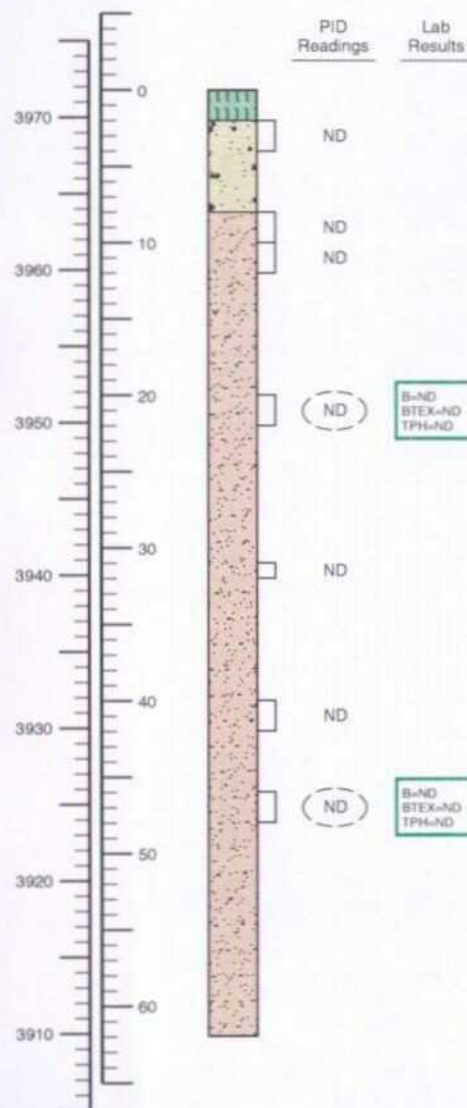
	Topsoil, grass.
	Rock (caliche), moist, white to brown.
	Sand (SM), fine to very fine-grained, moist, tan to brown, intermixed with stone.
	Indicates sample interval. Sample was obtained by hydraulically pushing a split spoon sampler.
	Indicates the ground water level measured during drilling.
	Indicates the ground water level measured on September 10, 1997.
PID	Head-space readings in ppm obtained with a photo-ionization detector.
ND	Indicates the constituent was not detected.

NOTES

- The monitoring well was installed on August 28, 1997 using an air rotary rig.
- The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
- The well is protected with a stick-up mount steel cover and a locked compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- The depths indicated are referenced from the ground surface.

ELEV./DEPTH
(FEET)

MONITORING WELL MW-8



Monitoring Well Details (MW-8)

Elev of Ground Surface	3971.72 ft
Elev Top of PVC Well	3974.52 ft
Thickness of Bentonite Seal	3.5 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	62.0 ft
Depth of Exploratory Hole	62.0 ft
Depth to Ground Water (During drilling)	53.57 ft
Depth to Ground Water	50.17 ft
Elev of Ground Water	3921.55 ft

○ Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
 BTEX = Total BTEX Concentration (mg/kg)
 TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)



LEGEND

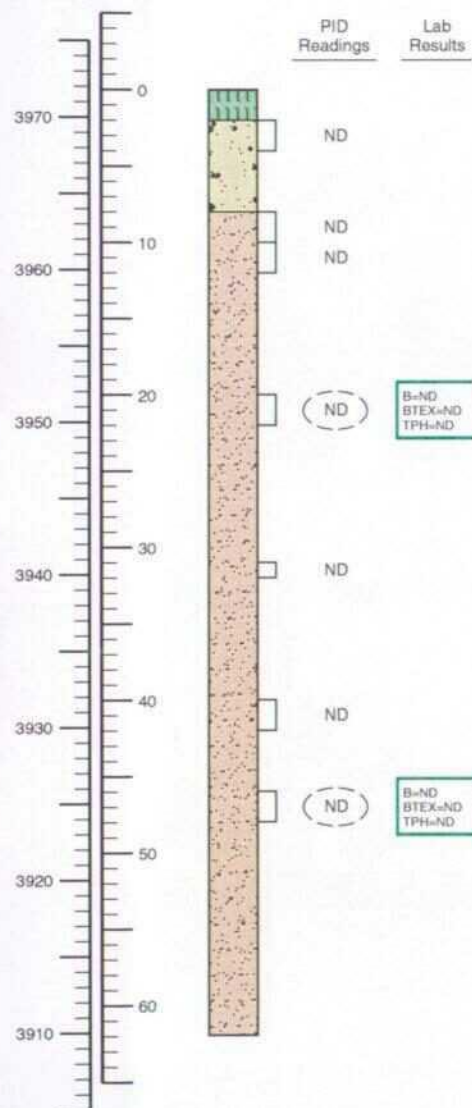
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(FEET)

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LEGEND

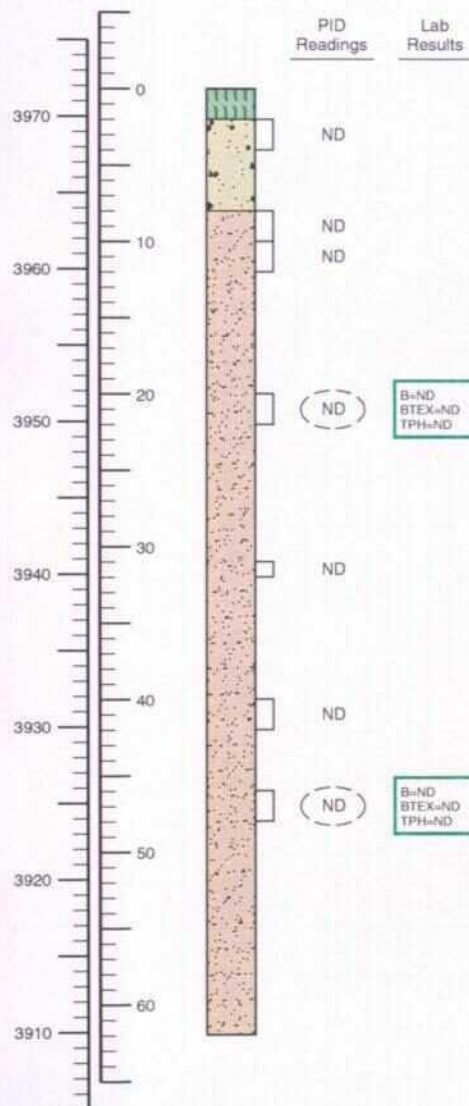
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ELEV/DEPTH
(FEET)

MONITORING WELL MW-8

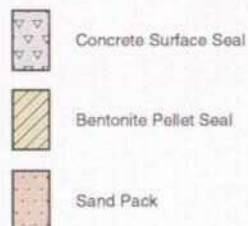


Monitoring Well Details (MW-8)

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○ Indicates sample selected for laboratory analysis.

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LEGEND

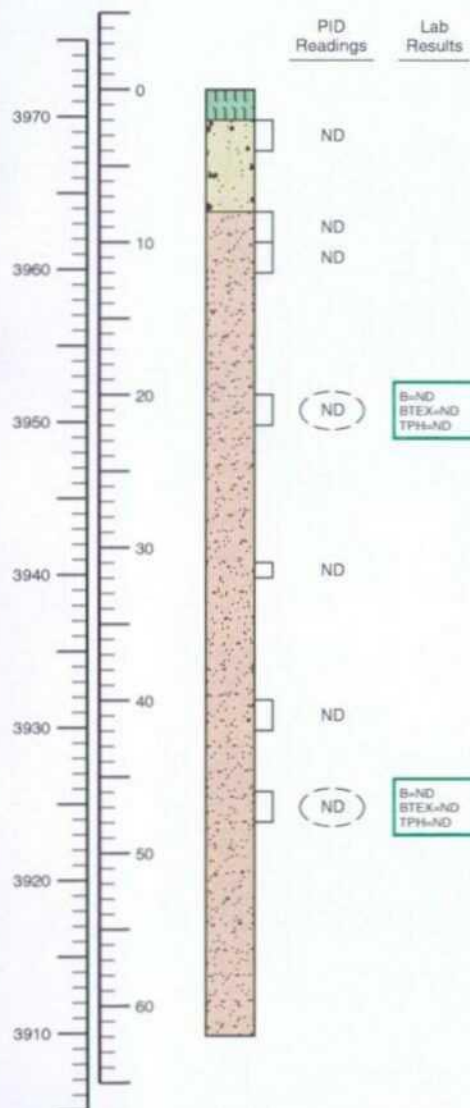


NOTES

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- The well was constructed with 4 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
- The well is protected with a stick-up mount steel cover and a locked compression cap.
- The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
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ELEV./DEPTH
(FEET)

MONITORING WELL MW-8



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LEGEND

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Appendix B

CERTIFICATE OF ANALYSIS SUMMARY 1-72112
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 12, 1997 10:15 by AS
Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM
Date Report Faxed: Oct 13, 1997
XENCO contact : Scott Sample/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Metals by ICP by EPA 6010		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Aluminum				0.61	0.82	0.32	0.41			
Barium				0.058	0.079	0.084	0.072			
Beryllium				< 0.020	< 0.020	< 0.020	< 0.020			
Cadmium				< 0.040	< 0.040	< 0.040	< 0.040			
Calcium				69.4	88.5	118	98.5			
Chromium				< 0.050	< 0.050	< 0.050	< 0.050			
Cobalt				< 0.050	< 0.050	< 0.050	< 0.050			
Iron				0.40	0.47	0.19	0.23			
Magnesium				10.1	13.3	17.1	13.7			
Manganese				< 0.050	< 0.050	< 0.050	< 0.050			
Molybdenum				< 0.50	< 0.50	< 0.50	< 0.50			
Potassium				1.48	1.60	2.07	1.94			
Silver				< 0.080	< 0.080	< 0.080	< 0.080			
Sodium				18.6	33.9	32.1	31.9			
Tin				< 0.20	< 0.20	< 0.20	< 0.20			
Vanadium				< 0.050	< 0.050	< 0.050	< 0.050			
Zinc				< 0.050	< 0.050	< 0.050	< 0.050			


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 The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories.
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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

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Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9-			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 17, 1997	Sep 17, 1997	Sep 17, 1997	Sep 17, 1997			
Nickel				< 0.20	< 0.20	< 0.20	< 0.20			
Copper				< 0.050	< 0.050	< 0.050	< 0.050			
Boron				< 0.20	< 0.10	< 0.10	< 0.10			
Silicon				20.8	21.0	20.8	21.1			
Strontium				0.53	0.60	0.75	0.62			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Total Mercury by EPA 7470				Sep 18, 1997	Sep 18, 1997	Sep 18, 1997	Sep 18, 1997			
Mercury				< 0.0002	< 0.0002	< 0.0002	< 0.0002			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
BTEX by EPA 8020		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Benzene		< 0.001	18.25	0.003	0.002	0.012	0.055			
Toluene		< 0.001	9.70	< 0.001	0.001	< 0.001	0.014			
Ethylbenzene		< 0.001	0.61	< 0.001	< 0.001	< 0.001	< 0.001			
m,p-Xylenes		< 0.002	2.06	< 0.002	< 0.002	< 0.002	< 0.002			
o-Xylene		< 0.001	1.04	< 0.001	< 0.001	< 0.001	< 0.001			

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	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997			
Total BTEX		< 0.006	31.66	0.003	0.003	0.012	0.069			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
PAHs by GC-MS by EPA 8100		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Acenaphthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Acenaphthylene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(a)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(b)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(g,h,i)perylene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(k)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Chrysene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,e)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)anthracene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,j)acridine		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			

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XENCO contact : Scott Sample/Edward Yonemoto

Analysis Requested	Lab ID:	172112-001	172112-002	172112-003	172112-004	172112-005	172112-006			
	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 15, 1997	Sep 16, 1997	Sep 16, 1997			
Fluorene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Indeno(1,2,3-cd)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
3-Methylcholanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Naphthalene		< 0.002	0.071	< 0.002	< 0.002	< 0.002	< 0.002			
Phenanthrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenz(a,h)acridine		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Benzo(j)fluoranthene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
7H-Dibenzo(c,g)carbazole		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
Dibenzo(a,i)pyrene		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002			
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Bicarbonate by SM 4500CO2D				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Bicarbonate				179	177	173	178			

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	Field ID:	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9			
	Depth:									
Carbonate by SM4500CO2D		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Carbonate				< 1.00	< 1.00	< 1.00	< 1.00			
Total Dissolved Solids by EPA 160.1		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Sep 16, 1997	Sep 16, 1997	Sep 16, 1997	Sep 16, 1997			
Total Dissolved Solids				448	515	574	426			
Anions by Ion Chromatography by EPA 300.0		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
				Oct 3, 1997	Oct 3, 1997	Oct 3, 1997	Oct 3, 1997			
Sulfate				42.2	59.7	103	49.2			
Chloride				40.21	54.54	51.98	38.97			

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:08

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

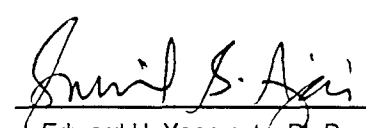
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Aluminum	< 0.050	1.875	2.000	0.050	93.8	70-125	
Barium	< 0.0060	1.0460	1.0000	0.0060	104.6	70-125	
Beryllium	< 0.0200	0.4230	0.4000	0.0200	105.8	70-125	
Cadmium	< 0.0400	0.4320	0.4000	0.0400	108.0	70-125	
Calcium	< 0.050	4.469	4.000	0.050	111.7	70-125	
Chromium	< 0.0500	1.0650	1.0000	0.0500	106.5	70-125	
Cobalt	< 0.0100	1.0390	1.0000	0.0100	103.9	70-125	
Copper	< 0.0300	1.0800	1.0000	0.0300	108.0	70-125	
Iron	< 0.025	1.912	2.000	0.025	95.6	70-125	
Magnesium	< 0.050	3.970	4.000	0.050	99.3	70-125	
Manganese	< 0.025	1.794	2.000	0.025	89.7	70-125	
Molybdenum	< 0.100	5.679	5.000	0.100	113.6	70-125	
Nickel	< 0.100	1.030	1.000	0.100	103.0	70-125	
Potassium	< 0.100	4.378	4.000	0.100	109.5	70-125	
Silver	< 0.0400	0.8134	0.8000	0.0400	101.7	70-125	
Sodium	< 0.100	3.681	4.000	0.100	92.0	70-125	
Strontium	< 0.100	4.939	5.000	0.100	98.8	70-125	
Vanadium	< 0.0120	1.0590	1.0000	0.0120	105.9	70-125	
Zinc	< 0.0300	1.0510	1.0000	0.0300	105.1	70-125	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.

QA/QC Manager

EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Matrix Spike Result	Matrix Spike Amount	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	mg/L	mg/L	Matrix Spike Recovery %	Recovery Range %	
Potassium	1.482	1.656	0.100	11.1	25.0	5.769	4.00	107.2	70-125	
Silver	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.8170	0.800	102.1	70-125	
Sodium	18.57	23.93	0.10	25.2	25.0	29.49	4.0	273.0	70-125	B,C
Strontium	0.532	0.444	0.100	18.0	25.0	5.193	5.00	93.2	70-125	
Vanadium	0.0230	< 0.0120	0.0120	N.C	25.0	1.0970	1.000	107.4	70-125	
Zinc	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0790	1.000	107.9	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

 Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

 Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.

QA/QC Manager

Certificate Of Quality Control for Batch : 17A18E33
EPA 6010 Metals by ICP

Date Validated: Sep 25, 1997 08:45

Analyst: SA

Date Analyzed: Sep 17, 1997 15:28

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172112- 003	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Method Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Aluminum	0.611	0.766	0.050	22.5	25.0	2.888	2.00	113.9	70-125	
Barium	0.0580	0.0730	0.0060	22.9	10	1.1110	1.000	105.3	70-125	
Beryllium	< 0.0200	< 0.0200	0.0200	N.C	25.0	0.4360	0.400	109.0	70-125	
Cadmium	< 0.0400	< 0.0400	0.0400	N.C	25.0	0.4120	0.400	103.0	70-125	
Calcium	69.37	98.94	0.05	35.1	25.0	98.94	4.0	739.3	70-125	A,C
Chromium	< 0.0500	< 0.0500	0.0500	N.C	25.0	1.0620	1.000	106.2	70-125	
Cobalt	< 0.0100	< 0.0100	0.0100	N.C	25.0	1.0230	1.000	102.3	70-125	
Copper	< 0.0300	< 0.0300	0.0300	N.C	25.0	1.0690	1.000	106.9	70-125	
Iron	0.404	0.382	0.025	5.6	25.0	2.275	2.00	93.6	70-125	
Magnesium	10.05	12.67	0.05	23.1	25.0	17.90	4.0	196.3	70-125	B,C
Manganese	< 0.0250	< 0.0250	0.0250	N.C	25.0	1.8010	2.000	90.1	70-125	
Molybdenum	< 0.500	< 0.500	0.500	N.C	25.0	5.687	5.00	113.7	70-125	
Nickel	< 0.100	< 0.100	0.100	N.C	25.0	0.971	1.00	97.1	70-125	

(A) Presence of a non-homogeneous sample affects duplicate/spike recovery.

(B) High analyte concentration affects spike recovery.

(C) Blank spike within acceptance limits.

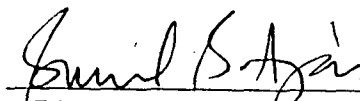
 Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

 Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

Certificate Of Quality Control for Batch : 17A05C49
SW846- 7470 Total Mercury

Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:37

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172129- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier
	Sample Result mg/L	Duplicate Result mg/L	Method Detection Limit mg/L	QC	LIMITS			QC	LIMITS	
				Relative Difference %	Relative Difference %			Matrix Spike Recovery %	Recovery Range %	
Parameter										
Mercury	< 0.0010	< 0.0010	0.0010	N.C	20.0	0.0026	0.0025	104.0	80-120	

 Relative Difference [D] = $200 \times (B-A)/(B+A)$

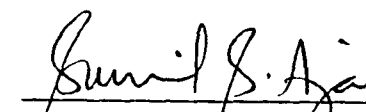
 Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only

Houston - Dallas - San Antonio


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW846- 7470 Total Mercury
Date Validated: Sep 18, 1997 16:52

Analyst: EZ

Date Analyzed: Sep 18, 1997 10:33

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

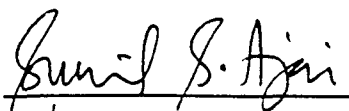
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/L	mg/L	Amount	Limit	Recovery	Range	
			mg/L	mg/L	%	%	
Mercury	< 0.0010	0.0022	0.0025	0.0010	88.0	80-120	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

D. = Below detection limit

results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

Certificate Of Quality Control for Batch : 17A34E30

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Sep 17, 1997 09:39

Analyst: LC

Date Analyzed: Sep 15, 1997 17:41

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Recovery Range %	
Acenaphthene	< 0.0050	0.0618	0.0588	0.1000	0.0050	31.0	5.0	61.8	58.8	46-118	
4-Chloro-3-Methylphenol	< 0.0076	0.0706	0.0616	0.1000	0.0076	42.0	13.6	70.6	61.6	23-97	
2-Chlorophenol	< 0.0100	0.0666	0.0594	0.1000	0.0100	40.0	11.4	66.6	59.4	27-123	
1,4-Dichlorobenzene	< 0.0084	0.0654	0.0656	0.1000	0.0084	28.0	0.3	65.4	65.6	36-97	
2,4-Dinitrotoluene	< 0.0100	0.0768	0.0692	0.1000	0.0100	38.0	10.4	76.8	69.2	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0692	0.0678	0.1000	0.0080	38.0	2.0	69.2	67.8	41-116	
4-Nitrophenol	< 0.0080	0.0204	0.0192	0.1000	0.0080	50.0	6.1	20.4	19.2	10-80	
Pentachlorophenol	< 0.0172	0.0836	0.0686	0.1000	0.0172	50.0	19.7	83.6	68.6	9-103	
Phenol	< 0.0074	0.0306	0.0262	0.1000	0.0074	42.0	15.5	30.6	26.2	12-89	
Pyrene	< 0.0040	0.0882	0.0832	0.1000	0.0040	31.0	5.8	88.2	83.2	26-127	
1,2,4-Trichlorobenzene	< 0.0108	0.0656	0.0666	0.1000	0.0108	28.0	1.5	65.6	66.6	39-98	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

 Blank Spike Recovery [G] = $100 \times (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

 B.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW- 846 5030/8020 BTEX

Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 10:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.1190	0.1000	0.0010	119.0	65-135	
Toluene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Ethylbenzene	< 0.0010	0.1150	0.1000	0.0010	115.0	65-135	
m,p-Xylenes	< 0.0020	0.2330	0.2000	0.0020	116.5	65-135	
o-Xylene	< 0.0010	0.1110	0.1000	0.0010	111.0	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A04D06

SW- 846 5030/8020 BTEx

Date Validated: Sep 16, 1997 16:30

Analyst: OR

Date Analyzed: Sep 15, 1997 11:35

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172108- 001	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC Spike Relative Difference %	QC Matrix Spike Recovery %	QC M.S.D. Recovery %	Matrix Spike Recovery Range %	
Parameter											
Benzene	< 0.0010	0.1150	0.1160	0.1000	0.0010	25.0	0.9	115.0	116.0	65-135	
Toluene	< 0.0010	0.1020	0.1040	0.1000	0.0010	25.0	1.9	102.0	104.0	65-135	
Ethylbenzene	< 0.0010	0.1130	0.1140	0.1000	0.0010	25.0	0.9	113.0	114.0	65-135	
m,p-Xylenes	< 0.0020	0.2310	0.2330	0.2000	0.0020	25.0	0.9	115.5	116.5	65-135	
o-Xylene	< 0.0010	0.1100	0.1110	0.1000	0.0010	25.0	0.9	110.0	111.0	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager



Certificate Of Quality Control for Batch : 17A20A62

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:00

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Bicarbonate	< 0.50	26.10	25.00	0.50	104.4	70-125	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SM 4500C02D Bicarbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 003	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	
Parameter	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	Qualifier
Bicarbonate	179	176	0.50	1.7	25.0	

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SM4500C02D Carbonate

Date Validated: Sep 17, 1997 10:00

Analyst: IF

Date Analyzed: Sep 16, 1997 15:50

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 003	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	
Parameter				Relative Difference	Relative Difference	Qualifier
	ppm	ppm	ppm	%	%	
Carbonate	< 1.000	< 1.000	1.000	N.C	25.0	

Relative Difference [D] = $200 \cdot (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 160.1 Total Dissolved Solids

Date Validated: Sep 16, 1997 14:05

Analyst: IF

Date Analyzed: Sep 16, 1997 11:05

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172097- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Parameter						
Total Dissolved Solids	720	713	4.00	1.0	25.0	

Relative Difference [D] = $200 \times (B-A) / (B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Certificate Of Quality Control for Batch : 17A10A85

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 16:36

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY											
Parameter	[A]	[B]	[C]	[D]	[E]	Blank Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Duplicate Result	Blank Spike Amount	Method Detection Limit		QC	QC	QC	Blank Spike Recovery	
	mg/L	mg/L	mg/L	mg/L	mg/L		Spike Relative Difference %	Blank Spike Recovery %	B.S.D. Recovery %	Blank Spike Recovery Range %	
Chloride	< 0.050	5.532	5.570	5.000	0.050	20.0	0.7	110.6	111.4	70-125	
Sulfate	< 0.10	4.35	4.39	5.00	0.10	20.0	0.9	87.0	87.8	70-125	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

EPA 300.0 Anions by Ion Chromatography

Date Validated: Oct 6, 1997 15:30

Analyst: OR

Date Analyzed: Oct 3, 1997 18:48

Matrix: Liquid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172112- 006	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Chloride	38.969	40.247	0.050	3.2	20.0	
Sulfate	49.23	50.50	0.10	2.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Project Name: TNMPL

XENCO COC#: 1-72112
Date Received in Lab: Sep 12, 1997 10:15 by AS
XENCO contact : Scott Sample/Edward Yonemoto

						Date and Time			
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1 MW-1	172112-001	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by OR	Sep 15, 1997 12:29 by OR
2		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:15		Sep 15, 1997 by CY	Sep 15, 1997 21:33 by LC
3 MW-2	172112-002	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by OR	Sep 15, 1997 17:49 by OR
4		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:50		Sep 15, 1997 by CY	Sep 15, 1997 22:19 by LC
5 MW-6	172112-003	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by OR	Sep 15, 1997 17:13 by OR
6		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by CY	Sep 15, 1997 23:05 by LC
7		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:05		Sep 15, 1997 by IF	Sep 16, 1997 11:15 by IF
8		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:05		Oct 3, 1997 by OR	Oct 3, 1997 18:14 by OR
9		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 17, 1997 15:21 by SA
10		Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 17:05		Sep 17, 1997 by EZ	Sep 18, 1997 11:14 by EZ
11		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
12		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:05		Sep 16, 1997 by IF	Sep 16, 1997 15:40 by IF
13 MW-7	172112-004	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by OR	Sep 15, 1997 13:23 by OR
14		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by CY	Sep 15, 1997 23:50 by LC
15		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:30		Sep 15, 1997 by IF	Sep 16, 1997 11:20 by IF
16		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:30		Oct 3, 1997 by OR	Oct 3, 1997 18:22 by OR
17		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 17, 1997 15:41 by SA
18		Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:30		Sep 17, 1997 by EZ	Sep 18, 1997 11:15 by EZ
19		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
20		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:30		Sep 16, 1997 by IF	Sep 16, 1997 16:00 by IF
21 MW-8	172112-005	BTEX	SW-846	ppm	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by OR	Sep 15, 1997 13:41 by OR
22		PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by CY	Sep 16, 1997 00:36 by LC
23		TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 16:45		Sep 15, 1997 by IF	Sep 16, 1997 11:25 by IF
24		Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 16:45		Oct 3, 1997 by OR	Oct 3, 1997 18:40 by OR
25		Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 17, 1997 15:48 by SA
26		Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 16:45		Sep 17, 1997 by EZ	Sep 18, 1997 11:16 by EZ
27		Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF
28		Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 16:45		Sep 16, 1997 by IF	Sep 16, 1997 16:10 by IF



ANALYTICAL CHAIN OF CUSTODY REPORT

CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

XENCO COC#: 1-72112

Project ID: 710016
Project Manager: Theresa Nix
Project Location: Lovington, NM

Project Name: TNMPL

Date Received in Lab: Sep 12, 1997 10:15 by AS

XENCO contact : Scott Sample/Edward Yonemoto

						Date and Time				
	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
29	MW-9	172112-006	BTEX	SW-846	ppm	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by OR	Sep 15, 1997 14:00 by OR
30			PAH	SW-846 8100	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by CY	Sep 16, 1997 01:21 by LC
31			TDS	EPA 160.1	mg/L	Standard	Sep 10, 1997 17:25		Sep 15, 1997 by IF	Sep 16, 1997 11:30 by IF
32			Anions	EPA 300.0	mg/L	Standard	Sep 10, 1997 17:25		Oct 3, 1997 by OR	Oct 3, 1997 18:48 by OR
33			Metals (ICP)	EPA 6010	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 17, 1997 15:54 by SA
34			Mercury, Tot	SW846-7470	mg/L	Standard	Sep 10, 1997 17:25		Sep 17, 1997 by EZ	Sep 18, 1997 11:17 by EZ
35			Bicarbonate	SM 4500CO2D	mg/L	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF
36			Carbonate	SM4500CO2D	ppm	Standard	Sep 10, 1997 17:25		Sep 16, 1997 by IF	Sep 16, 1997 16:20 by IF



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

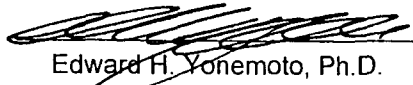
Lab. Batch # 172112-H

Contractor KEI CONSULTANTS		Phone (210) 680-3767		No. coolers this shipment		Contractor COC #	
Address 5309 WURZBACH STE 100 SAN ANTONIO, TX 78238		Project Director MIKE HAWTHORNE		Carrier: UPS		Quote #: ---	
Project Name TNMP		Project Manager		Airbill No.		P.O. No: ?	
Project Location SEAF, LOUISIANA, N.M.		Project No. 710016		Total		Turn-around	
Sampler Signature [Signature]		Project No. THREESA NIX		Total		+ ASAP	
SAMPLE CHARACTERIZATION		Preservative		Unl Dies Ker Unknown		+ 24 hrs	
Field ID		Date		Time		48 hrs	
DEPTH		SOIL		WATER		Standard	
COMP		GRAB		Container		Remarks	
Size Type		Ice Other		Waste Oil		LAB ONLY	
P, G				PTT No: Tank No:		ID #	
Sample Description							
1 MW-1		9/1/97		1615		1	
2 MW-2				1750		2	
3 MW-6				1705		3	
4 MW-7				1630		4	
5 MW-8				1645		5	
6 MW-9				1725		6	
7						7	
8						8	
9						9	
10						10	
Relinquished by: [Signature]		DATE 9/1/97		TIME 1000		Received by: [Signature]	
						DATE 9/12/97	
						TIME 10:15	
						Remarks	
						* PLEASE UTILIZE THE ICPSCAN	
						EPA 6010 METHOD FOR METALS	
						* FAX RESULTS TO THREESA NIX	
						AT SAN ANTONIO OFFICE	
						680-3763	

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Date Report Faxed: Oct 16, 1997
Project Location: Lovington
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-001	172059-002	172059-003	172059-004	172059-005	172059-006	172059-007	172059-008	172059-009
	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
TPH-DRO (Diesel) by EPA 8015 M		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997	Sep 10, 1997
Total Petroleum Hydrocarbons		142000	13800	34900	76.9	66.7	< 10.0	< 10.0	< 10.0	< 10.0
BTEX by EPA 8020		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997	Sep 8, 1997	Sep 8, 1997						
Benzene		0.28	17.30	420						
Toluene		8.44	65.80	680						
Ethylbenzene		6.50	28.10	200						
m,p-Xylenes		20.40	59.70	314						
o-Xylene		9.74	26.40	129						
Total BTEX		45.36	197	1740						
Volatile Organic Analysis by EPA 8260		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
Benzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromodichloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromoform		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromomethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
n-Butylbenzene		9.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
sec-Butylbenzene		4.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
tert-Butylbenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroethane		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chloroform		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2-Chlorotoluene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4-Chlorotoluene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dibromo-3-chloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dibromoethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromomethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,4-Dichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dichlorodifluoromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

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	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
1,1-Dichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
cis-1,2-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,2-Dichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
cis-1,3-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene		8.2			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Isopropylbenzene		4.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
p-Isopropyltoluene		5.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Methylene chloride		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Naphthalene		21.8			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
n-Propylbenzene		6.7			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Styrene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,1,2-Tetrachloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Tetrachloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene		9.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,3-Trichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,4-Trichlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,1-Trichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichlorofluoromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,3-Trichloropropane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2,4-Trimethylbenzene		** 36.7			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,3,5-Trimethylbenzene		13.5			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
o-Xylene		12.2			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005


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	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997			Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997	Sep 9, 1997
m,p-Xylenes		22.9			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromochloromethane		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene		< 1.0			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
MTBE		< 2.0			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
** Result beyond calibration limits										
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Semivolatiles (SVOCs TCL) by EPA 8270		Sep 8, 1997								
Acenaphthene		< 17								
Acenaphthylene		< 17								
Anthracene		< 17								
Benzo(a)anthracene		< 17								
Benzo(a)pyrene		< 17								
Benzo(b)fluoranthene		< 17								
Benzo(g,h,i)perylene		< 17								
Benzo(k)fluoranthene		< 17								
Butyl benzyl phthalate		< 17								


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	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
Carbazole		< 17								
4-Chloroaniline		< 17								
bis [2-Chloroethoxy] methane		< 17								
bis [2-Chloroethyl] ether		< 17								
bis [2-Chloroisopropyl] ether		< 17								
2-Chloronaphthalene		< 17								
2-Chlorophenol		< 17								
4-Chlorophenyl-phenyl ether		< 17								
Chrysene		< 17								
Dibenzofuran		< 17								
Dibenzo(a,h)anthracene		< 17								
1,2-Dichlorobenzene		< 17								
1,3-Dichlorobenzene		< 17								
1,4-Dichlorobenzene		< 17								
3,3'-Dichlorobenzidine		< 17								
2,4-Dichlorophenol		< 17								
Diethyl phthalate		< 17								

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	Field ID:	RW-1 B.F.	RW-1	RW-1	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8
	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2,4-Dimethylphenol		< 17								
Dimethyl phthalate		< 17								
4,6-Dinitro-2-methylphenol		< 42								
2,4-Dinitrophenol		< 42								
2,4-Dinitrotoluene		< 17								
2,6-Dinitrotoluene		< 17								
Di-n-octyl phthalate		< 17								
bis [2-Ethylhexyl] phthalate		< 17								
Fluoranthene		< 17								
Fluorene		< 17								
Hexachlorobenzene		< 17								
Hexachlorobutadiene		< 17								
Hexachlorocyclopentadiene		< 17								
Hexachloroethane		< 17								
Indeno(1,2,3-cd)pyrene		< 17								
Isophorone		< 17								
2-Methylnaphthalene		56								

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	Depth:	8-10'	20-20.5'	50-51.5'	20-22'	50-52'	20-22'	50-52'	21-22	46-48'
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2-Methylphenol		< 17								
4-Methylphenol		< 17								
Naphthalene		19								
2-Nitroaniline		< 42								
3-Nitroaniline		< 42								
4-Nitroaniline		< 42								
Nitrobenzene		< 17								
2-Nitrophenol		< 17								
4-Nitrophenol		< 17								
N-Nitroso-di-n-propylamine		< 17								
N-Nitrosodiphenylamine		< 17								
Pentachlorophenol		< 42								
Phenanthrene		< 17								
Phenol		< 17								
Pyrene		< 17								
Pyridine		< 17								
1,2,4-Trichlorobenzene		< 17								


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		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 8, 1997								
2,4,5-Trichlorophenol		< 42								
2,4,6-Trichlorophenol		< 17								
4-Bromophenyl-phenylether		< 17								
4-Chloro-3-Methylphenol		< 17								
Di-n-butyl phthalate		< 17								
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
SPLP TPH by 1312/418.1		Sep 10, 1997								
Total Petroleum Hydrocarbons		5.3								

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Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
Moisture Content by ASTM 2216-71		Date Analyzed - Analytical Results %								
Moisture Content			Sep 9, 1997							
			11.9							
Organic Content by ASTM D2974		Date Analyzed - Analytical Results %								
Organic Content			Sep 10, 1997							
			0.8							
TPH-DRO (Diesel) by EPA 8015 M		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
Total Petroleum Hydrocarbons		Sep 10, 1997		Sep 10, 1997						
		< 10.0		< 10.0						
Volatile Organic Analysis by EPA 8260		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
Benzene		< 0.005		< 0.025						
Bromobenzene		< 0.005		< 0.025						
Bromodichloromethane		< 0.005		< 0.025						
Bromoform		< 0.005		< 0.025						
Bromomethane		< 0.005		< 0.025						
n-Butylbenzene		< 0.005		< 0.025						

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..
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 XENCO Laboratories, however, assumes no responsibility and makes no warranty to the end use of the data hereby presented.


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
sec-Butylbenzene		< 0.005		< 0.025						
tert-Butylbenzene		< 0.005		< 0.025						
Carbon Tetrachloride		< 0.005		< 0.025						
Chloroethane		< 0.010		< 0.050						
Chloroform		< 0.005		< 0.025						
Chloromethane		< 0.010		< 0.050						
2-Chlorotoluene		< 0.005		< 0.025						
4-Chlorotoluene		< 0.005		< 0.025						
1,2-Dibromo-3-chloropropane		< 0.005		< 0.025						
Dibromochloromethane		< 0.005		< 0.025						
1,2-Dibromoethane		< 0.005		< 0.025						
Dibromomethane		< 0.005		< 0.025						
1,2-Dichlorobenzene		< 0.005		< 0.025						
1,3-Dichlorobenzene		< 0.005		< 0.025						
1,4-Dichlorobenzene		< 0.005		< 0.025						
Dichlorodifluoromethane		< 0.005		< 0.025						
1,1-Dichloroethane		< 0.005		< 0.025						


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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
1,2-Dichloroethane		< 0.005		< 0.025						
1,1-Dichloroethene		< 0.005		< 0.025						
cis-1,2-Dichloroethene		< 0.005		< 0.025						
trans-1,2-Dichloroethene		< 0.005		< 0.025						
1,2-Dichloropropane		< 0.005		< 0.025						
1,3-Dichloropropane		< 0.005		< 0.025						
2,2-Dichloropropane		< 0.005		< 0.025						
1,1-Dichloropropene		< 0.005		< 0.025						
cis-1,3-Dichloropropene		< 0.005		< 0.025						
trans-1,3-Dichloropropene		< 0.005		< 0.025						
Ethylbenzene		< 0.005		< 0.025						
Hexachlorobutadiene		< 0.005		< 0.025						
Isopropylbenzene		< 0.005		< 0.025						
p-Isopropyltoluene		< 0.005		< 0.025						
Methylene chloride		< 0.010		< 0.050						
Naphthalene		< 0.005		< 0.025						
n-Propylbenzene		< 0.005		< 0.025						

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Date Report Faxed: Oct 16, 1997
Project Location: Lovington
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed		Analytical Results		ppm (mg/L - mg/Kg)				
		Sep 9, 1997		Sep 11, 1997						
Styrene		< 0.005		< 0.025						
1,1,1,2-Tetrachloroethane		< 0.005		< 0.025						
1,1,2,2-Tetrachloroethane		< 0.005		< 0.025						
Tetrachloroethene		< 0.005		< 0.025						
Toluene		< 0.005		0.035						
1,2,3-Trichlorobenzene		< 0.005		< 0.025						
1,2,4-Trichlorobenzene		< 0.005		< 0.025						
1,1,1-Trichloroethane		< 0.005		< 0.025						
1,1,2-Trichloroethane		< 0.005		< 0.025						
Trichloroethene		< 0.005		< 0.025						
Trichlorofluoromethane		< 0.005		< 0.025						
1,2,3-Trichloropropane		< 0.005		< 0.025						
1,2,4-Trimethylbenzene		< 0.005		< 0.025						
1,3,5-Trimethylbenzene		< 0.005		< 0.025						
Vinyl chloride		< 0.005		< 0.025						
o-Xylene		< 0.005		0.030						
m,p-Xylenes		< 0.005		0.099						

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

CERTIFICATE OF ANALYSIS SUMMARY 1-72059
K.E.I. Consultants, Inc.
Project Name: TNMPL
Date Received in Lab : Sep 5, 1997 12:30 by AS
Project ID: 710016
Project Manager: Mike Chapa
Project Location: Lovington
Date Report Faxed: Oct 16, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172059-010	172059-011	172059-012						
	Field ID:	MW-9	MW-9	MW-9						
	Depth:	25-27'	27-29'	50-52'						
		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)								
		Sep 9, 1997		Sep 11, 1997						
Bromochloromethane		< 0.005		< 0.025						
Chlorobenzene		< 0.005		< 0.025						
MTBE		< 0.010		< 0.050						

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 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Sep 11, 1997 13:05

Analyst: LC

Date Analyzed: Sep 10, 1997 11:28

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	Qualifier
	mg/kg	mg/kg	mg/kg	mg/kg	Blank Spike Recovery %	Recovery Range %	
Total Petroleum Hydrocarbons	< 10.00	171	200	10.00	85.5	65-135	

Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Sep 11, 1997 13:05

Analyst: LC

Date Analyzed: Sep 10, 1997 07:54

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

Q.C. Sample ID 172059- 010	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Matrix Spike Result	Matrix Spike Amount	QC	LIMITS	Qualifier
	mg/kg	mg/kg	mg/kg	Relative Difference %	Relative Difference %	mg/kg	mg/kg	Matrix Spike Recovery %	Recovery Range %	
Total Petroleum Hydrocarbons	< 10.00	< 10.00	10.00	N.C	30.0	240	200	120.0	65-135	

 Relative Difference [D] = $200 \times (B-A)/(B+A)$

 Matrix Spike Recovery [H] = $100 \times (F-A)/[G]$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW- 846 5030/8020 BTEX

Date Validated: Sep 9, 1997 17:15

Analyst: OR

Date Analyzed: Sep 8, 1997 10:25

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0897	0.1000	0.0010	89.7	65-135	
Toluene	< 0.0010	0.0881	0.1000	0.0010	88.1	65-135	
Ethylbenzene	< 0.0010	0.0933	0.1000	0.0010	93.3	65-135	
m,p-Xylenes	< 0.0020	0.1900	0.2000	0.0020	95.0	65-135	
o-Xylene	< 0.0010	0.0905	0.1000	0.0010	90.5	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A29C66

SW- 846 5030/8020 BTEX

Date Validated: Sep 9, 1997 17:15

Analyst: OR

Date Analyzed: Sep 8, 1997 12:14

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172063- 005	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.050	1.675	1.730	2.000	0.050	20.0	3.2	83.8	86.5	65-135	
Toluene	< 0.050	1.730	1.735	2.000	0.050	20.0	0.3	86.5	86.8	65-135	
Ethylbenzene	< 0.050	1.835	1.905	2.000	0.050	20.0	3.7	91.8	95.3	65-135	
m,p-Xylenes	0.160	3.820	3.955	4.000	0.100	20.0	3.5	91.5	94.9	65-135	
o-Xylene	< 0.050	1.805	1.875	2.000	0.050	20.0	3.8	90.3	93.8	65-135	

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

SW- 846 5030/3020 BTEX

Date Validated: Oct 6, 1997 17:00

Analyst: OR

Date Analyzed: Oct 3, 1997 12:08

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	Qualifier
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0871	0.1000	0.0010	87.1	65-135	
Toluene	< 0.0010	0.0904	0.1000	0.0010	90.4	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2080	0.2000	0.0020	104.0	65-135	
o-Xylene	< 0.0010	0.0987	0.1000	0.0010	98.7	65-135	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

D. = Below detection limit

results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW846- 8260 Volatile Organic Analysis

Date Validated: Oct 3, 1997 16:00

Analyst: CE

Date Analyzed: Sep 9, 1997 11:40

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0497	0.0500	0.0010	99.4	66-142	
Chlorobenzene	< 0.0010	0.0515	0.0500	0.0010	103.0	60-133	
1,1-Dichloroethene	< 0.0040	0.0506	0.0500	0.0040	101.2	59-172	
Toluene	< 0.0010	0.0508	0.0500	0.0010	101.6	59-139	
Trichloroethene	< 0.0030	0.0490	0.0500	0.0030	98.0	62-137	

 Blank Spike Recovery [E] = $100 \cdot (B-A)/(C)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

SW846- 8260 Volatile Organic Analysis

Date Validated: Oct 3, 1997 16:00

Analyst: CE

Date Analyzed: Sep 9, 1997 14:43

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172059- 008	[A] Sample Result mg/Kg	[B] Matrix Spike Result mg/Kg	[C] Matrix Spike Duplicate Result mg/Kg	[D] Matrix Spike Amount mg/Kg	[E] Method Detection Limit mg/Kg	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
							QC Spike Relative Difference %	QC Matrix Spike Recovery %	QC M.S.D. Recovery %	Matrix Spike Recovery Range %	
Parameter											
Benzene	< 0.0010	0.0502	0.0471	0.0500	0.0010	20.0	6.4	100.4	94.2	66-142	
Chlorobenzene	< 0.0010	0.0517	0.0502	0.0500	0.0010	20.0	2.9	103.4	100.4	60-133	
1,1-Dichloroethene	< 0.0040	0.0508	0.0507	0.0500	0.0040	25.0	0.2	101.6	101.4	59-172	
Toluene	< 0.0010	0.0522	0.0526	0.0500	0.0010	20.0	0.8	104.4	105.2	59-139	
Trichloroethene	< 0.0030	0.0498	0.0478	0.0500	0.0030	20.0	4.1	99.6	95.6	62-137	

 Spike Relative Difference [F] = $200 \times (B-C)/(B+C)$

 Matrix Spike Recovery [G] = $100 \times (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

 M.S.D. Recovery [H] = $100 \times (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager



Certificate Of Quality Control for Batch : 17A34E11

SW846-8270 PAHs by GC-MS

Date Validated: Sep 9, 1997 17:25

Analyst: LC

Date Analyzed: Sep 8, 1997 20:21

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 172066-003	[A]	[B]	[C]	[D]	[E]	Matrix Limit Relative Difference %	[F]	[G]	[H]	[I]	[J] Qualifier
	Sample Result	Matrix Spike Result	Matrix Spike Duplicate Result	Matrix Spike Amount	Method Detection Limit		QC	QC	QC	Matrix Spike	
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		Spike Relative Difference %	Matrix Spike Recovery %	M.S.D. Recovery %	Recovery Range %	
Parameter											
Acenaphthene	2.69	28.46	24.58	24.88	1.00	19.0	14.6	103.6	88.0	31-137	
4-Chloro-3-Methylphenol	< 0.50	27.41	25.22	24.88	0.50	33.0	8.3	110.2	101.4	26-103	A
2-Chlorophenol	< 0.50	29.50	28.81	24.88	0.50	28.7	2.4	118.6	115.8	25-102	A
1,4-Dichlorobenzene	< 2.09	27.06	25.72	24.88	2.09	32.1	5.1	108.8	103.4	28-104	A
2,4-Dinitrotoluene	< 0.50	26.96	25.92	24.88	0.50	21.8	3.9	108.4	104.2	28-89	A
N-Nitroso-di-n-propylamine	< 1.99	29.30	26.37	24.88	1.99	55.4	10.5	117.8	106.0	41-126	
4-Nitrophenol	< 1.99	24.13	21.94	24.88	1.99	47.2	9.5	97.0	88.2	11-114	
Pentachlorophenol	1.00	31.84	30.45	24.88	1.00	48.9	4.5	124.0	118.4	17-109	A
Phenol	< 0.50	26.67	25.97	24.88	0.50	22.6	2.7	107.2	104.4	26-90	A
Pyrene	2.94	27.96	27.02	24.88	0.80	25.2	3.4	100.6	96.8	35-142	
1,2,4-Trichlorobenzene	< 2.69	26.52	25.87	24.88	2.69	23.0	2.5	106.6	104.0	38-107	

(A) High recovery attributed to chromatographic parameters (biased by small sample amount)

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$

Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$

M.S.D. = Matrix Spike Duplicate

M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Certificate Of Quality Control for Batch : 17A34E11

SW846-8270 PAHs by GC-MS

Date Validated: Sep 9, 1997 17:25

Analyst: LC

Date Analyzed: Sep 8, 1997 18:47

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE ANALYSIS


Parameter	[A]	[B]	[C]	[D]	[E]	[F]	Qualifier
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
	Result	Result	Spike	Detection	Blank Spike	Recovery	
	mg/Kg	mg/Kg	Amount	Limit	Recovery	Range	
			mg/Kg	mg/Kg	%	%	
Acenaphthene	< 0.133	3.060	3.333	0.133	91.8	31-137	
4-Chloro-3-Methylphenol	< 0.067	2.933	3.333	0.067	88.0	26-103	
2-Chlorophenol	< 0.067	3.200	3.333	0.067	96.0	25-102	
1,4-Dichlorobenzene	< 0.280	3.080	3.333	0.280	92.4	28-104	
2,4-Dinitrotoluene	< 0.067	2.867	3.333	0.067	86.0	28-89	
N-Nitroso-di-n-propylamine	< 0.267	3.407	3.333	0.267	102.2	41-126	
4-Nitrophenol	< 0.267	2.513	3.333	0.267	75.4	11-114	
Pentachlorophenol	< 0.133	3.333	3.333	0.133	100.0	17-109	
Phenol	< 0.067	2.967	3.333	0.067	89.0	26-90	
Pyrene	< 0.107	3.220	3.333	0.107	96.6	35-142	
1,2,4-Trichlorobenzene	< 0.360	3.073	3.333	0.360	92.2	38-107	

 Blank Spike Recovery [E] = $100 \times (B-A)/(C)$

N.C. = Not calculated, data below detection limit

M.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 QA/QC Manager

ASTM D2974 Organic Content

Date Validated: Sep 10, 1997 13:00

Analyst: IF

Date Analyzed: Sep 10, 1997 10:20

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172059- 011	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Qualifier
				Relative Difference	Relative Difference	
Parameter	%	%	%	%	%	
Organic Content	0.81	0.79	0.1	2.5	20.0	

Relative Difference [D] = $200 \times (B-A)/(B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

ASTM 2216- 71 Moisture Content

Date Validated: Sep 10, 1997 08:30

Analyst: OG

Date Analyzed: Sep 9, 1997 12:36

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.


MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 172066- 004	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC	LIMITS	Qualifier
				Relative Difference	Relative Difference	
Parameter	%	%	%	%	%	
Moisture Content	41.14	41.01	0.1	0.3	20.0	

Relative Difference [D] = $200 \times (B-A) / (B+A)$

N.C. = Not calculated, data below detection limit

N.D. = Below detection limit

All results are based on MDL and validated for QC purposes only


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Certificate Of Quality Control for Batch : 17A07F98
EPA 1312/418.1 SPLP TPH
Date Validated: Sep 10, 1997 10:20

Analyst: CG

Date Analyzed: Sep 10, 1997 09:20

Matrix: Solid

QA/QC Manager: Edward H. Yonemoto, Ph.D.

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A]	[B]	[C]	[D]	[E]	Blank	[F]	[G]	[H]	[I]	[J]
	Blank	Blank Spike	Blank Spike	Blank	Method	Limit	QC	QC	QC	Blank Spike	Qualifier
	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Blank Spike	B.S.D.	Recovery	
	ppm	ppm	ppm	ppm	ppm	Difference	Difference	Recovery	Recovery	Range	
						%	%	%	%	%	
Total Petroleum Hydrocarbons	< 0.50	3.88	3.73	4.03	0.50	20.0	3.9	96.3	92.6	65-135	

Spike Relative Difference [F] = $200 \times (B-C) / (B+C)$

Blank Spike Recovery [G] = $100 \times (B-A) / [D]$


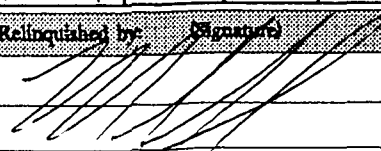

B.S.D. = Blank Spike Duplicate

B.S.D. Recovery [H] = $100 \times (C-A) / [D]$

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
QA/QC Manager

Contractor KEI Consultants		Phone (214) 680 3767		No. coolers this shipment: 1 Carrier: UPS Airbill No. Contractor COC # Quote #: P.O. No: 7949																		
Address 5309 Wurzbach Suite 100 SA, TX 78238																						
Project Name TNMP		Project Director Mike Hawthorne																				
Project Location 7400 Lovington		Project Manager Mike Chapin																				
Sampler Signature 		Project No. 710016		Turn-around * ASAP * 24 hrs 48 hrs Standard																		
SAMPLE CHARACTERIZATION																						
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type	Preservative	Ice	Other	Unl	Dies	Ker	Unknown	Waste Oil	PIT No:	Tank No:	Sample Description	CONTAINERS Total BTX (5000-8020-802) TPH (8000-8015) SVOC's (8272) VOC's (8260) SPLP & TPH (1312) Please Hold <th rowspan="11" style="text-align: center; vertical-align: middle;"> LAB ONLY ID # </th>	LAB ONLY ID #	
1	RW-1	8-25-97	8'-10'	/	/	/	/	40L														
2	RW-1	8-25-97	20'-20.5'	/	/	/	/	90L														
3	RW-1	8-25-97	50'-57.5'	/	/	/	/	90L														
4	MW-6	9-2-97	20'-22'	/	/	/	/	90L														
5	MW-6	9-2-97	50'-52'	/	/	/	/	90L														
6	MW-7	9-2-97	20'-22'	/	/	/	/	90L														
7	MW-7	9-2-97	50'-52'	/	/	/	/	90L														
8	MW-8	8-28-97	20'-22'	/	/	/	/	90L														
9	MW-8	8-28-97	40'-48'	/	/	/	/	90L														
10	MW-9	8-27-97	25'-27'	/	/	/	/	90L														
Relinquished by: 		DATE		TIME		Received by: 		DATE		TIME		Remarks Samples w/ highest TPH (8015) also run SPLP TPH, VOC's + SVOC's (MUG)										
		9-4-97		1600				9-5-97		12:30												



11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 2 of 2

Lab. Batch # 172059-17

Contractor <u>KEI Consultants</u>		Phone <u>(210) 680-3767</u>		No. coolers this shipment: <u>1</u>		Contractor COC #										
Address <u>5309 Wurzbach Suite 100 SA, TX 78238</u>		Carrier: <u>UPS</u>		Quote #:		P.O. No: <u>7949</u>										
Project Name <u>TNMP L</u>		Project Director <u>Mike Hawthorne</u>		Airbill No.		P.O. No: <u>7949</u>										
Project Location <u>Lovington</u>		Project Manager <u>Mike Chapa</u>		Project No. <u>710016</u>		Turn-around										
Sampler Signature <u>[Signature]</u>		Project No. <u>710016</u>		Total		* ASAP * 24 hrs 48 hrs <u>Standard</u>										
SAMPLE CHARACTERIZATION		Preservative		Unl Dies Ker Unknown		LAB ONLY ID #										
Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size Type P, G	Ice	Other	Waste Oil	PTT No:	Tank No:	Sample Description	Remarks	LAB ONLY ID #
1	MW-9	8-27-97	27-29	/	/	/	/	/	/	/	/	/	/	/	/	1
2	MW-9	8-27-97	50-52	/	/	/	/	902	/	/	/	/	/	/	/	2
3																3
4																4
5																5
6																6
7																7
8																8
9																9
10																10

Relinquished by: <u>[Signature]</u>	DATE <u>9-4-97</u>	TIME <u>1600</u>	Received by: <u>[Signature]</u>	DATE <u>9/5/97</u>	TIME <u>12:30</u>	Remarks <u>Sample w/ highest TPH (8015)</u> <u>also w/ VOC's + SVOC's + SPLP TPH</u> <u>(MIS)</u>
Received For Laboratory by <u>[Signature]</u>						

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

KEI CONSULTANTS

SEP 19 1997

SAN ANTONIO

KEI
ATTN: MR. PAUL HARTNETT
5309 WURZBACH, SUITE 100
SAN ANTONIO, TEXAS 78238
FAX: 210-680-3763

RECEIVING DATE: 09/16/97
SAMPLE TYPE: OIL
PROJECT #: 710016
PROJECT LOCATION: TOWNSEND

ANALYSIS DATE: 09/16/97
SAMPLING DATE: 09/09/97
SAMPLE CONDITION: Intact

ELT#	FIELD CODE	Specific Gravity @ 60 Deg F.
12552	RW-1	0.8031

Method: D 287-64


Michael R. Fowler

9-17-97
Date

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Paul Hartnett

FAX#: 210 680 3763

KEI 5309 Wurzbach Suite 100 SA, TX 78238

710016

Project Name :

Townsend

Sampler Signatures:

BTX 8020/5030

TPI# 418.1

TCLP Metals Ag As Ba Cd Cr Pb Hg Se

Total Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TCLP Semi Volatiles

SOL

102

Specific Gravity

Date: _____

9-15-97

Index:

1130

Received by:

Date:

09-16-97

Times

0900

Received by:

9 months

Date:

Time:

Received by Laboratory:

REMARKS

Please Fax results to Paul ASAP. Thanks 