AP - 013

STAGE 1 & 2 REPORTS

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SUBSURFACE INVESTIGATION REPORT

MONITORING WELLS MW-1 THROUGH MW-3 AND SOIL BORING SB-1

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
UNIT B, SECTION 28, TOWNSHIP 20 SOUTH, RANGE 37 EAST
LEA COUNTY, NEW MEXICO

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TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
UNIT B, SECTION 28, TOWNSHIP 20 SOUTH, RANGE 37 EAST
LEA COUNTY, NEW MEXICO

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Project Manager

KEI Job No. 810052-1

March 10, 1999

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PURPOSE AND SCOPE

Texas - New Mexico Pipe Line Company (TNMPL) release TNM-97-18 occurred on September 10, 1997, from a crude oil pipeline. The purpose of the subsurface investigation was to determine the horizontal and vertical extent of hydrocarbon impact within the stained area. The scope consisted of installing monitoring wells and soil borings at selected locations. The release site is located in Unit B, Section 28, Township 20 South, Range 37 East in Lea County, New Mexico. A site location map is provided as FIG. 1.

SITE CONDITIONS

Prior to the start of the investigation, minor excavation of impacted soils along the TNMPL 16-inch crude oil pipeline had taken place to facilitate pipeline repairs at the apparent release point. The site consisted of 3 open excavations and several areas of stockpiled soil. Approximate excavation details are presented below.

EXCAVATION DIMENSIONS (length, width, depth)	VOLUME OF EXCAVATED SOIL (with 30% expansion factor)
125 feet long, 15 feet wide, 7 feet deep	632 yd^3
38 feet long, 5 feet wide, 4 feet deep	37 yd^3
18 feet long, 15 feet wide, 10 feet deep	130 yd^3
Total:	799 yd^3

SOIL INVESTIGATION

During the subsurface investigation, 3 monitoring wells (designated MW-1 through MW-3) and 1 soil boring (designated SB-1) were installed utilizing air rotary drilling. Soil samples were collected at selected intervals from the ground surface to the bottom of each boring. The soils were classified in the field, soil samples were field screened, and selected samples were prepared and shipped to the laboratory for analysis.

Upon advancement to total depth and collection of soil samples, a monitoring well consisting of 2-inch slotted PVC and blank riser was placed in the each monitoring well. Upon completion of sampling activities, the soil boring was backfilled to the ground surface with cement/bentonite grout. The soil boring and monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico and 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, 4 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 tan sand encountered first at the surface and again at depth in soil boring SB-1 and at all monitoring well locations. The sand was fine to medium grained with clay lenses, loose, and moist to wet. The observed thickness of this soil type varied from 3 to 11 feet. Head-space readings from samples of this soil type ranged from below instrument detection limits (ND) to 341 ppm.

Soil Type II

This soil type consisted of grey sand and was encountered at multiple depths in soil boring SB-1 and at all monitoring well locations. The sand was fine to medium grained, silty to clayey, calcareous, medium dense, and moist to wet. The observed thickness of this soil type varied from approximately 0.5 to 8 feet. Head-space readings from samples of this soil type ranged from ND to 341 ppm.

Soil Type III

This soil type consisted of light grey to light tan clay encountered at depth in soil boring SB-1 and at all monitoring well locations. The clay was very sandy to silty with sand seams, slightly stiff to stiff, and moist to very moist. The observed thickness varied from approximately 0.5 to 21 feet. Head-space readings from samples of this soil type ranged from ND to 292 ppm.

Soil Type IV

This soil type consisted of blue clay encountered below Soil Type III in soil boring SB-1 and monitoring well MW-2. The clay was silty, slightly stiff to stiff, and moist to wet. The observed thickness varied from approximately 5 to 13 feet. Head-space readings from samples of this soil type ranged from 5 to 73 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 on FIGs. 3 through 6.

SOIL SAMPLING AND ANALYTICAL RESULTS

Samples were selected from each soil boring based on the following criteria:

- the sample collected from 0 to 2 feet below ground surface
- the sample with the highest PID between 2 and 15 feet below ground surface
- the sample with the highest PID reading between 15 feet below ground surface and ground water or the sample directly above the ground water level measured at the time of drilling

Soil samples selected for analytical testing consisted of the following:

- eight soil samples from the monitoring wells and 3 from the soil boring were tested for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons diesel range organics (TPH-DRO)
- one soil sample from monitoring well MW-1 exhibiting the highest concentration of TPH was tested for SPLP volatile organic compounds (VOC), SPLP semi-volatile organic compounds (SVOC), and SPLP TPH

- laboratory results for the selected samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGE
BENZENE	ND to 4.20 mg/kg
BTEX	ND to 37.62 mg/kg
TPH	ND to 4,320 ppm
SPLP SVOC	ND
SPLP VOC	ND to 0.045 mg/l
SPLP TPH	10.8 ppm

Soil laboratory results are summarized in TABLES I and II. Soil analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX A.

GROUND WATER SAMPLING AND ANALYTICAL RESULTS

Upon completion of drilling, each well was gauged to determine the depth to ground water and checked for the presence of phase-separate hydrocarbon (PSH). The depth to ground water measured in the monitoring wells on January 7, 1999, ranged from 26.63 to 27.69 feet below ground surface. Ground water elevations indicate an approximate gradient of 0.008 ft/ft towards the southeast. Ground water contours are presented on FIG. 7. PSH was observed during drilling in soil boring SB-1 with a thickness of approximately 0.50 feet. PSH was not observed in any of the monitoring wells. Ground water measurements are summarized in TABLE III.

Monitoring wells MW-1 through MW-3 were sampled on November 17, 1998. Each monitoring well was purged of approximately 3 well volumes of water and ground water samples were collected from each monitoring well. Purged water collected during the event was stored in steel drums pending disposal.

Ground water samples were tested for BTEX, polycyclic aromatic hydrocarbon (PAH), ICP heavy metals, major cations/anions, and total dissolved solids (TDS). Laboratory results indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGE (mg/l)
BENZENE	ND to 0.330
BTEX	ND to 0.558
PAH	ND to 0.013
METALS	ND to 2,270
BICARBONATE	318 to 663
SULFATE	1,170 to 4,710
CHLORIDE	910 to 2,040
TDS	4,790 to 8,800

Ground water laboratory results are summarized in TABLES IV and V. Water analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX B.

CLOSURE STANDARDS

SOIL

The New Mexico OCD Guidelines for Remediation of Leaks, Spills, and Releases contains the standard criteria for remediation activities. A ranking analysis for the site was performed to determine appropriate soil remediation levels. The ranking analysis is as follows:

Depth to Ground Water	Less Than 50 Feet	20 Points
	Greater Than 1000 Feet to Water Source	
Well Head Protection	Greater Than 200 Feet to Private Water Source	0 Points
Surface Water Body	Greater Than 1000 Feet	0 Points
	Total Ranking Score	**20 Points**

Based on the total ranking score, the closure objectives for this site for concentrations of benzene, BTEX, and TPH in soil are summarized as follows:

CONSTITUENT	CONCENTRATION RANGE	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	ND to 4.20 mg/kg	10
BTEX	ND to 37.62 mg/kg	50
TPH	ND to 4,320 ppm	100 + Background

GROUND WATER

The OCD requires remediation of impacted ground water to within the New Mexico Water Quality Control Commission (WQCC) Ground Water Standards for natural background water quality. This site exceeds the WQCC standards for several metals as well as benzene, chloride, sulfate and TDS as listed below:

CONSTITUENT	CONCENTRATION RANGE (mg/l)	CLOSURE CONCENTRATIONS (mg/l)
BENZENE	ND to .330	0.01
ARSENIC	0.106 to 1.66	0.1
SELENIUM	ND to 0.606	0.05
CHLORIDES	910 to 2,040	250
IRON	ND to 4.67	1.0
MANGANESE	0.413 to 0.664	0.2
SULFATE	1,170 to 4,710	600
TDS	4,790 to 8,800	1,000
BORON	2.26 to 5.1	0.75

SUMMARY AND RECOMMENDATIONS

Information gathered during this investigation is summarized as follows:

- hydrocarbon impact to soils exceeding OCD closure concentrations appears to extend from the surface to approximately 22 feet below ground surface at soil boring SB-1 in the source area
- hydrocarbon impact to soils exceeding OCD closure concentrations was also encountered at all monitoring well locations
- hydrocarbon impact to ground water was apparent by the presence of both PSH in soil boring SB-1 and dissolved phase concentrations exceeding the WQCC ground water standard for benzene in monitoring wells MW-2 and MW-3

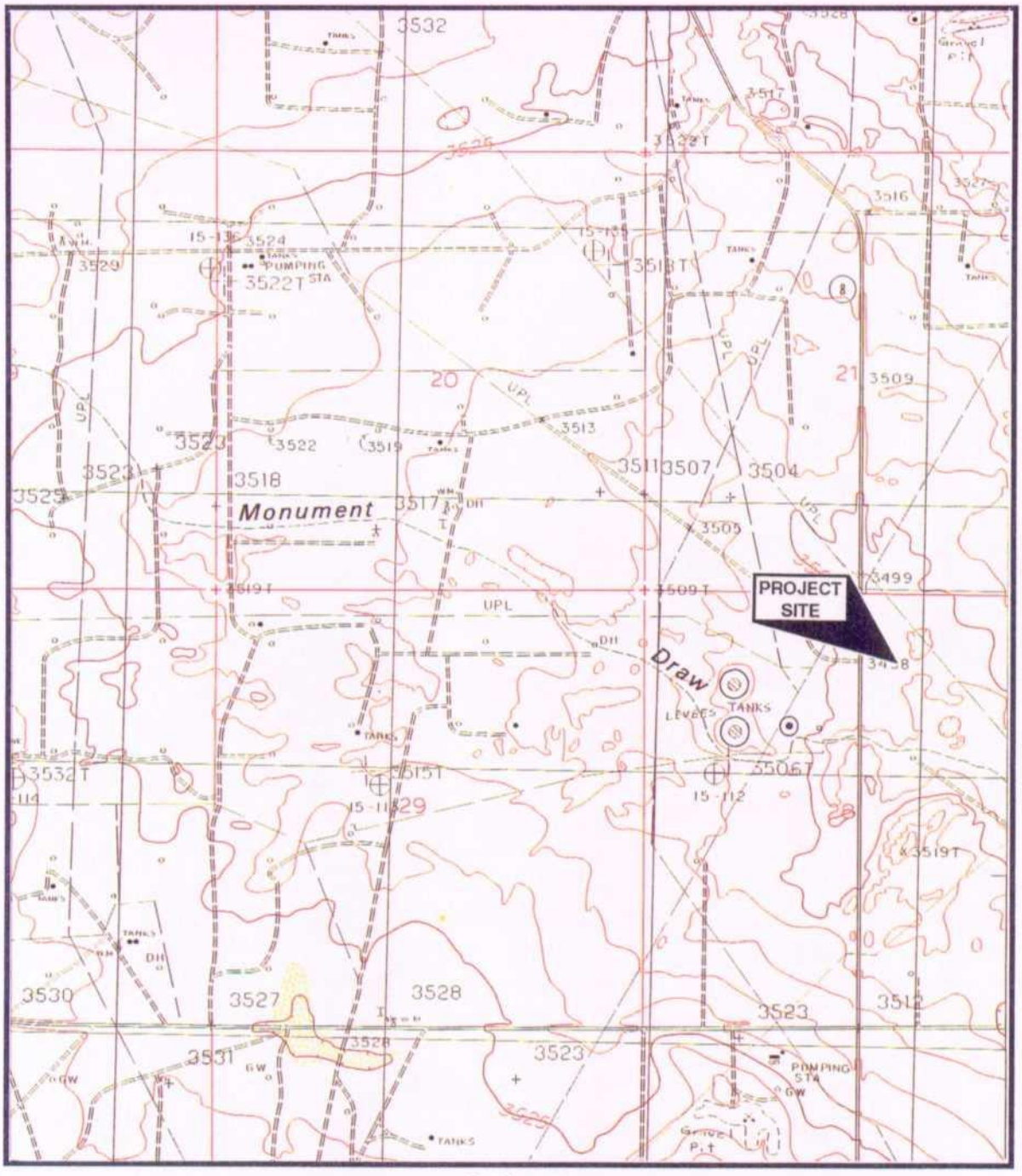
Recommendations based on the field observations, drilling activities, and laboratory results include the following:

- installation of 1 monitoring well in the source area
- monthly gauging of all monitoring wells
- quarterly ground water sampling for determination of BTEX concentrations
- installation of 3 delineation wells as follows:
  - ◊ upgradient of MW-2
  - ◊ cross gradient between MW-2 and MW-3
  - ◊ down gradient MW-3
- conduct a soils risk assessment

MONUMENT SOUTH QUADRANGLE

NEW MEXICO - LEA CO.

PRINTED 1985



SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

k·e·i	*SITE LOCATION MAP*	810052-1-0
	TEXAS-NEW MEXICO PIPE LINE TNM-97-18 LEA COUNTY, NEW MEXICO	FIG 1

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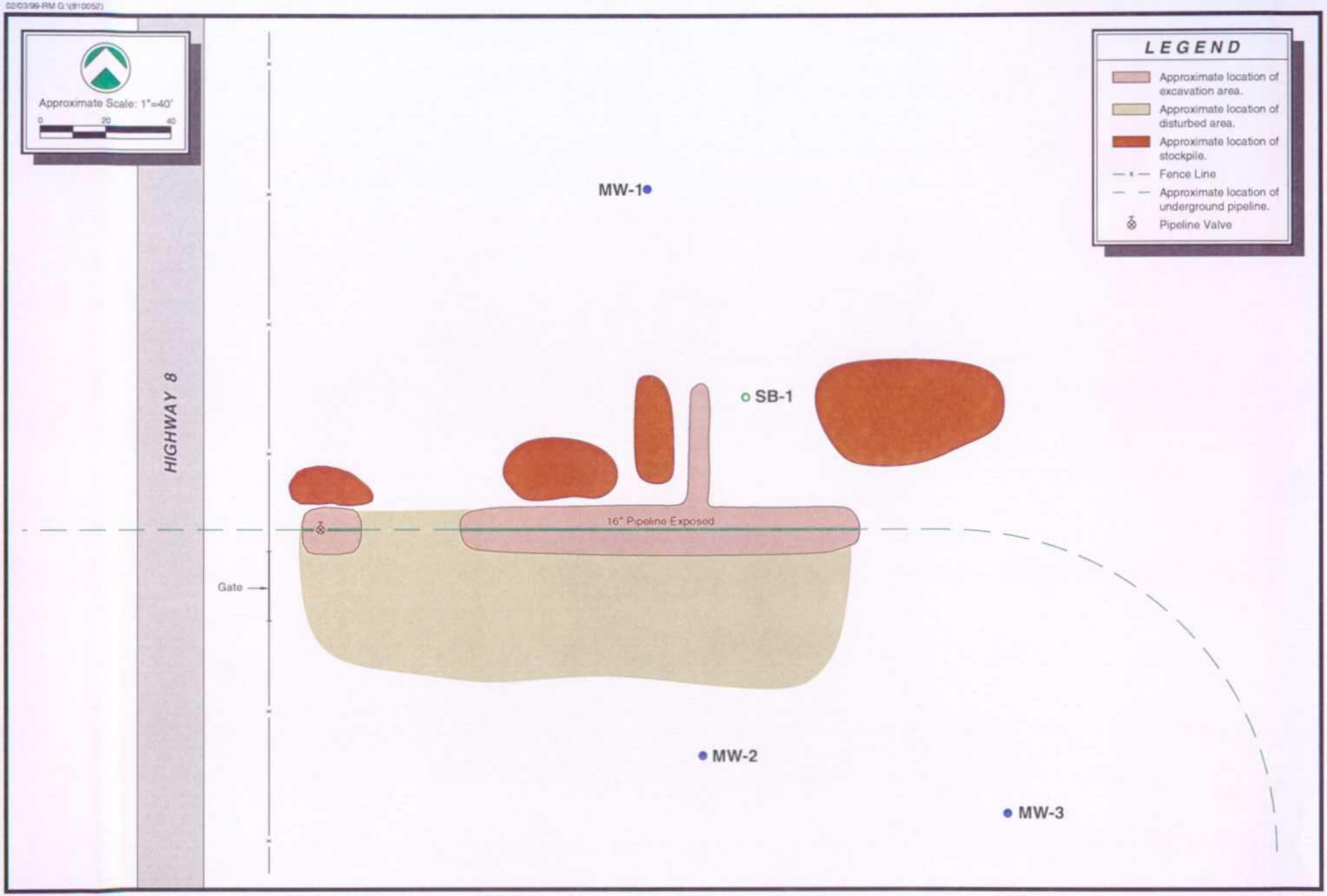
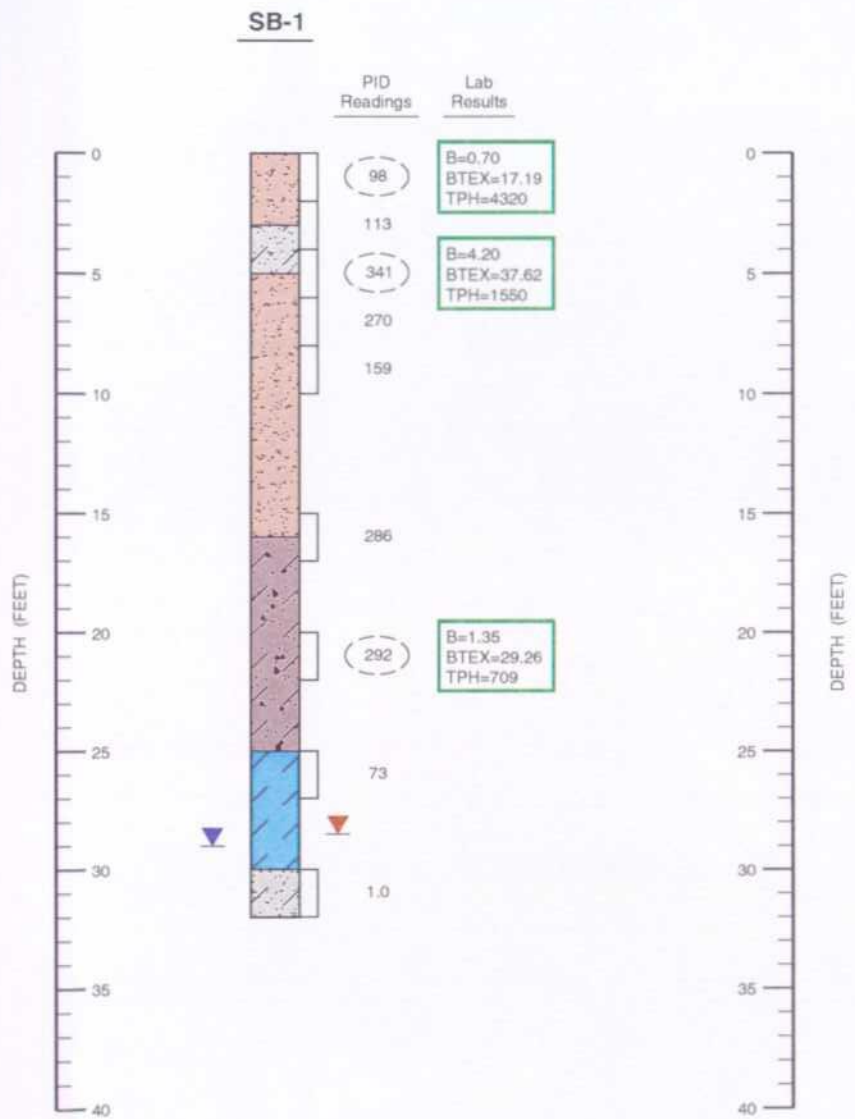


k·e·i	*SITE PLAN*	810052-1-0
	TEXAS-NEW MEXICO PIPE LINE CO. TNM-97-18 LEA COUNTY, NEW MEXICO	FIG 2



LEGEND

- Sand (SP), fine to medium grained, clay lenses, loose, tan, moist to wet.
- Sand (SC), fine to medium grained, silty to clayey, calcareous, medium dense, grey, moist to wet.
- Clay (CL), very sandy to silty, sand seams, slightly stiff to stiff, light grey to light tan, moist to wet.
- Clay (CL), silty, slightly stiff to stiff, blue, moist to wet.
- Indicates the depth from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.
- Indicates the PSH level measured during drilling.
- Indicates the ground water level measured during drilling.

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

ND Indicates the constituent was not detected.

B= Benzene Concentration (mg/kg)

BTEX= Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentration (mg/kg)

TPH= Total Petroleum Hydrocarbons Concentration (mg/kg)

NOTES

1. The soil boring was drilled on November 3, 1998 using an air rotary techniques.
2. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
3. The depths indicated are referenced from the ground surface.

k·e·i

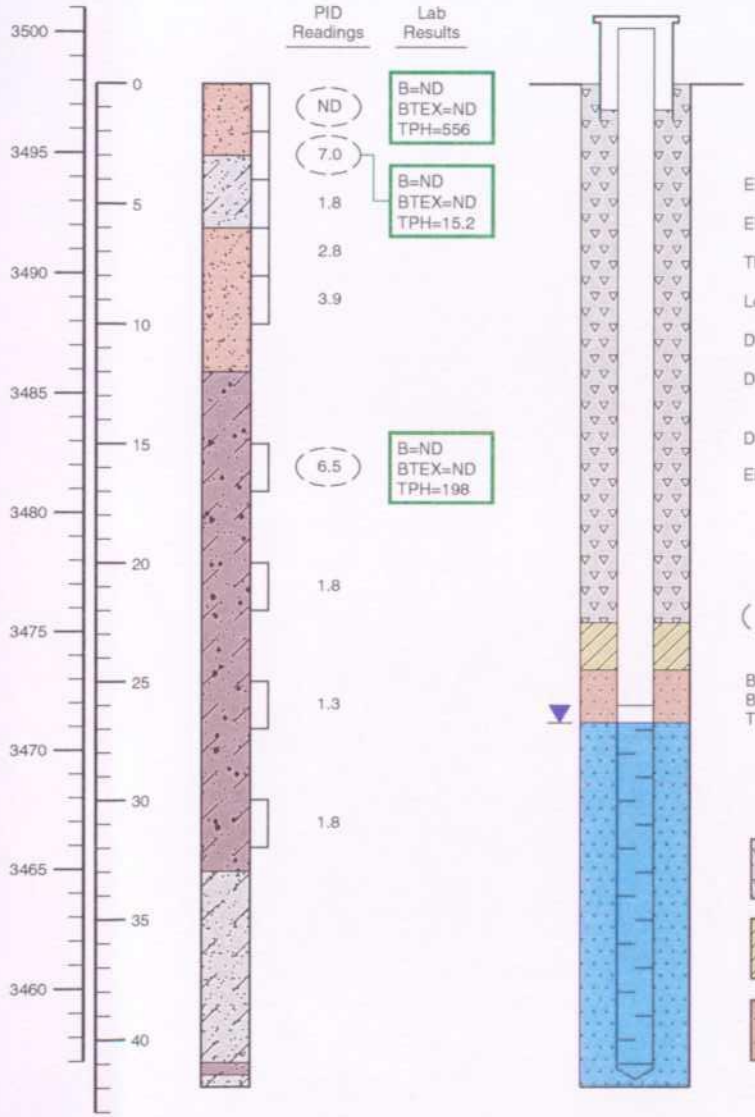
LOG AND DETAILS OF SOIL BORING SB-1

TEXAS-NEW MEXICO PIPE LINE CO. TNM-97-18 LEA COUNTY, NEW MEXICO

810052-1-0

FIG 3

MONITORING WELL MW-1



Monitoring Well Details (MW-1)

Elev of Ground Surface	3497.88 ft
Elev Top of PVC Well	3500.17 ft
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	41.69 ft
Depth of Exploratory Hole	42.0 ft
Depth to Ground Water	26.75 ft
Elev of Ground Water	3471.13 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

Sand (SP), fine to medium grained, clay lenses, loose, tan, moist to wet.

Sand (SC), fine to medium grained, silty to clayey, calcareous, medium dense, grey, moist to wet.

Clay (CL), very sandy to silty, sand seams, slightly stiff to stiff, light grey to light tan, moist to wet.

Indicates the depth from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured on January 7, 1999.

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 November 3, 1998 using air rotary drilling techniques.
2. The well was constructed with 2 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick up 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.

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LOG AND DETAILS OF MONITORING WELL MW-1

TEXAS-NEW MEXICO PIPE LINE CO. TNM-97-18 LEA COUNTY, NEW MEXICO

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FIG 4

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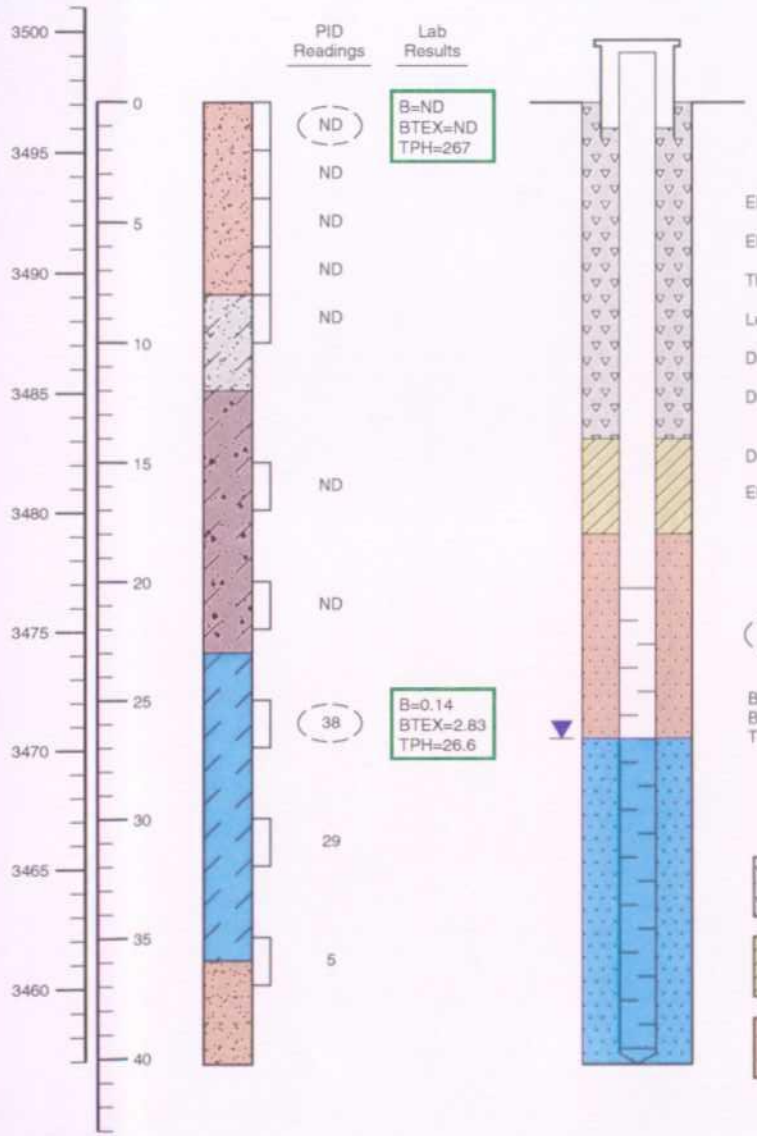
MONITORING WELL MW-2



Monitoring Well Details (MW-2)

Elev of Ground Surface	3497.12 ft
Elev Top of PVC Well	3499.19 ft
Thickness of Bentonite Seal	4.0 ft
Length of PVC Well Screen	20.0 ft
Depth of PVC Well	40.27 ft
Depth of Exploratory Hole	40.3 ft
Depth to Ground Water	26.63 ft
Elev of Ground Water	3470.49 ft

(ND) 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

Sand (SP), fine to medium grained, clay lenses, loose, tan, moist to wet.

Sand (SC), fine to medium grained, silty to clayey, calcareous, medium dense, grey, moist to wet.

Clay (CL), very sandy to silty, sand seams, slightly stiff to stiff, light grey to light tan, moist to wet.

Clay (CL), silty, slightly stiff to stiff, blue, moist to wet.

Indicates the depth from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured on January 7, 1999.

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 November 3, 1998 using air rotary drilling techniques.
2. The well was constructed with 2 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick up 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.

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LOG AND DETAILS OF MONITORING WELL MW-2

TEXAS-NEW MEXICO PIPE LINE CO. | TNM-97-18 | LEA COUNTY, NEW MEXICO

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FIG 5

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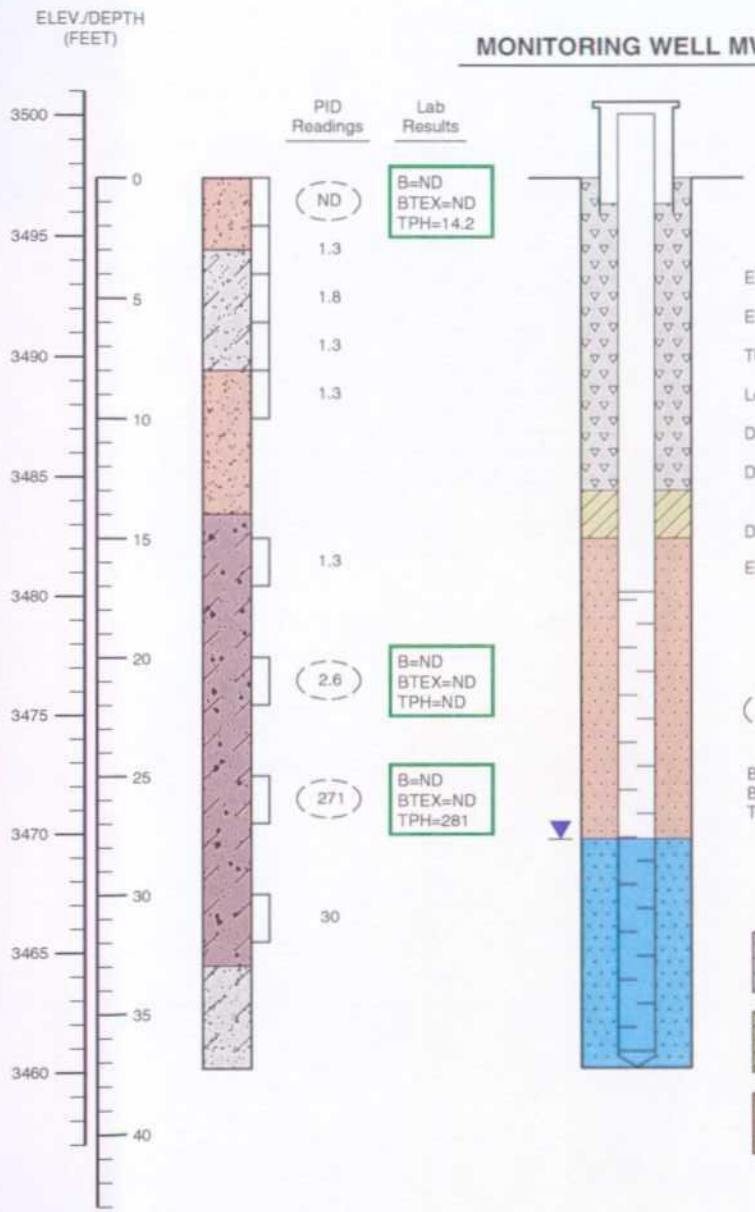

Monitoring Well Details (MW-3)

Elev of Ground Surface	3497.41 ft
Elev Top of PVC Well	3500.05 ft
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20.0 ft
Depth of PVC Well	37.26 ft
Depth of Exploratory Hole	37.3 ft
Depth to Ground Water	27.69 ft
Elev of Ground Water	3469.72 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

Sand (SP), fine to medium grained, clay lenses, loose, tan, moist to wet.

Sand (SC), fine to medium grained, silty to clayey, calcareous, medium dense, grey, moist to wet.

Clay (CL), very sandy to silty, sand seams, slightly stiff to stiff, light grey to light tan, moist to wet.

Indicates the depth from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured on January 7, 1999.

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 November 3, 1998 using air rotary drilling techniques.
2. The well was constructed with 2 inch ID, 0.010 inch factory slotted, threaded joint, Schedule 40 PVC pipe.
3. The well is protected with a stick up 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.

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LOG AND DETAILS OF MONITORING WELL MW-3

TEXAS-NEW MEXICO PIPE LINE CO. | TNM-97-18 | LEA COUNTY, NEW MEXICO

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FIG 6

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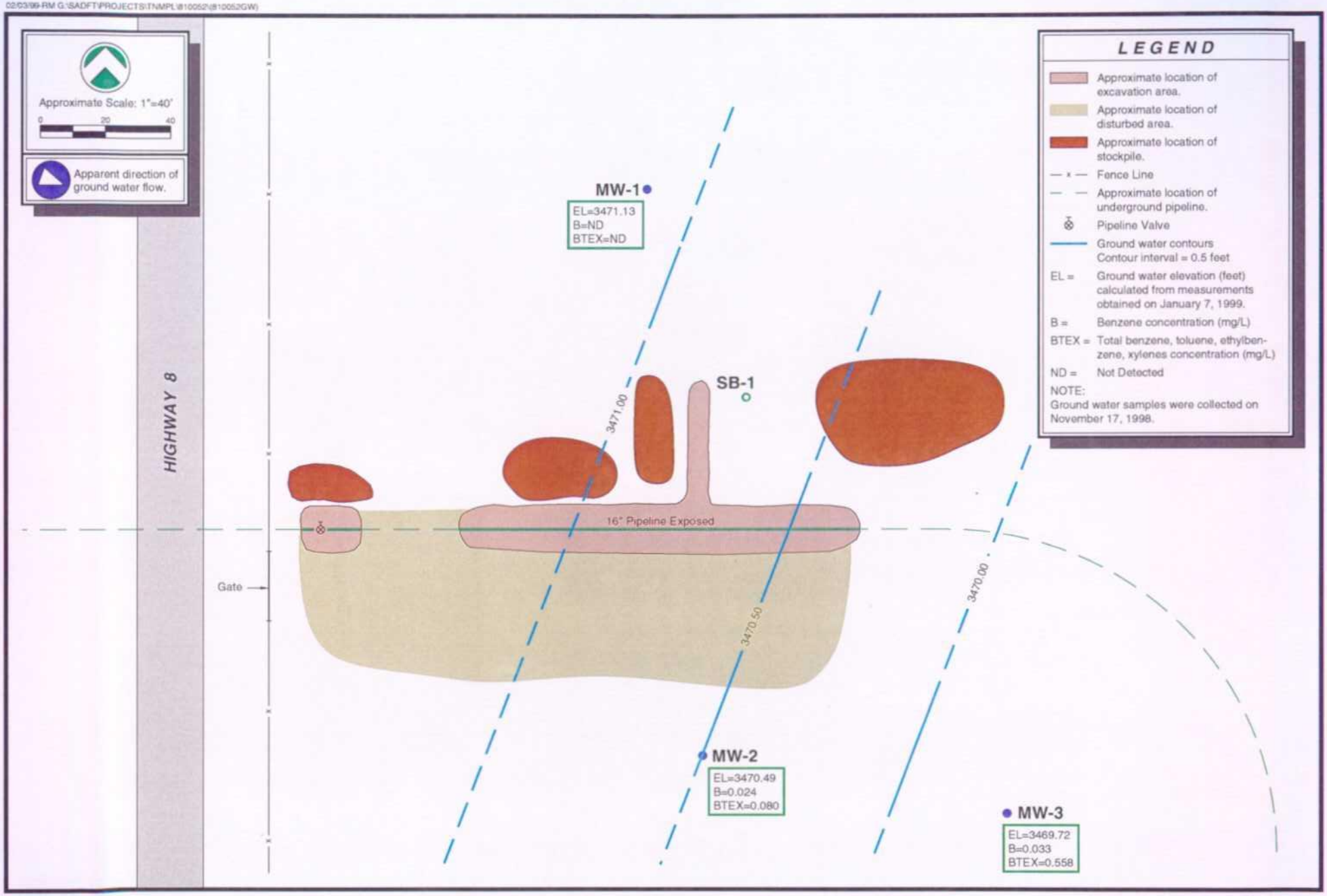

k·e·i

GROUND WATER CONTOUR / CONCENTRATION MAP

TEXAS-NEW MEXICO PIPE LINE CO. TNM-97-18 LEA COUNTY, NEW MEXICO

810052-1-0

FIG 7

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection or reporting limit.
--- - Indicates PSH was not detected (TABLE V).

Depth to ground water is referenced from the ground surface.

Method detection or reporting limits:

Soil:	BTEX	- 0.050 to 0.20 mg/kg
	TPH	- 10.0 to 500 ppm
	SPLP VOC	- 0.025 to 0.050 mg/l
	SPLP SVOC	- 0.005 to 0.013 mg/l
	SPLP TPH	- 0.7 ppm
Water:	BTEX	- 0.001 to 0.008 mg/l
	Metals	- 0.002 to 5.6 mg/l
	PAH	- 0.002 mg/l
	Cations	- 4 mg/l
	Anions	- 20 to 40 mg/l
	TDS	- 25 mg/l

Laboratory test methods:

BTEX	- EPA Method SW846-8021B
TPH	- Modified EPA Method 8015 Diesel Range Organics
SPLP VOC	- EPA Method 1312/8260
SPLP SVOC	- EPA Method 1312/8270
SPLP TPH	- EPA Method 1312/418.1
Metals	- EPA ICP Method 6010
PAH	- EPA Method 8270
Cations	- SM4500CO2D
Anions	- EPA Method 300.0
TDS	- EPA Method 160.1

TABLE I

SUMMARY OF SOIL RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
SB-1	11/3/98	0 - 2	0.70	0.49	3.38	12.62	17.19	4,320
	11/3/98	4 - 6	4.20	5.94	9.93	17.55	37.62	1,550
	11/3/98	20 - 22	1.35	4.05	8.15	15.71	29.26	709
MW-1	11/3/98	0 - 2	ND	ND	ND	ND	ND	556
	11/3/98	2 - 4	ND	ND	ND	ND	ND	15.2
	11/3/98	15 - 17	ND	ND	ND	ND	ND	198
MW-2	11/3/98	0 - 2	ND	ND	ND	ND	ND	267
	11/3/98	25 - 27	0.14	ND	0.68	2.01	2.83	26.6
MW-3	11/3/98	0 - 2	ND	ND	ND	ND	ND	14.2
	11/3/98	20 - 22	ND	ND	ND	ND	ND	ND
	11/3/98	25 - 27	ND	ND	ND	ND	ND	281

TABLE II

SUMMARY OF SOIL RESULTS - SPLP
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
LEA COUNTY, NEW MEXICO

PARAMETER	CONCENTRATION (mg/l)
SVOC	
All Constituents	ND
VOC	
1,2-Dichloroethane	0.110
o-Xylene	0.045
TPH	10.8 ppm

NOTES:

1. Sample was collected from soil boring SB-1 from 0 to 2 feet on 11/03/98.
2. Those constituents not listed above were ND.

TABLE III

SUMMARY OF GROUND WATER MEASUREMENTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
LEA COUNTY, NEW MEXICO

MONITORING WELL ID	DATE MEASURED	GROUND SURFACE ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
				Actual	Corrected	
MW-1	11/17/98	3,497.88	26.94	3,470.94	---	---
	01/07/99	3,497.88	26.75	3,471.13	---	---
MW-2	11/17/98	3,497.12	26.80	3,470.32	---	---
	01/07/99	3,497.12	26.63	3,470.49	---	---
MW-3	11/17/98	3,497.41	27.92	3,469.49	---	---
	01/07/99	3,497.41	27.69	3,469.72	---	---

TABLE IV

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS-NEW MEXICO PIPE LINE COMPANY
TNM-97-18
LEA COUNTY, NEW MEXICO

MONITORING WELL	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW-1	11/17/98	ND	ND	ND	ND	ND
MW-2	11/17/98	0.024	ND	0.046	0.010	0.080
MW-3	11/17/98	0.330	0.004	0.147	0.077	0.558

TABLE V

SUMMARY OF GROUND WATER RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-18
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	MW-1	MW-2	MW-3
SAMPLE DATE	11/17/98	11/17/98	11/17/98
CONSTITUENT	CONCENTRATION (mg/l)		
PAH			
Fluorene	ND	0.003	ND
Naphthalene	ND	ND	0.013
Phenanthrene	ND	0.004	ND
METALS			
Aluminum	1.27	ND	2.36
Arsenic	1.62	1.66	0.106
Barium	0.100	0.134	0.743
Boron	5.1	2.26	4.25
Calcium	639	640	358
Iron	0.56	ND	4.67
Magnesium	289	183	317
Manganese	0.413	0.490	0.664
Molybdenum	0.63	0.27	ND
Potassium	116	59.9	60.4
Selenium	0.606	ND	ND
Silicon	26.8	29.6	52.4
Sodium	2,270	1,010	1,630
Strontium	11.9	14.1	22.2
Tin	ND	ND	0.85
Vanadium	0.419	0.05	0.341
Zinc	0.030	ND	0.083
CATIONS/ANIONS			
Bicarbonate	318	393	663
Chloride	1,530	910	2,040
Sulfate	4,710	1,170	2,430
TDS	8,800	4,790	7,050

NOTE:
Those constituents not listed above were ND.

ANALYTICAL REPORT 1-84449

for

K.E.I. Consultants, Inc.

Project Manager: Stan Grover

Project Name: 810052-1-0

Project Id: 810052-1-0

December 3, 1998

XENCO Laboratories

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Houston - Dallas - San Antonio - Latin America

December 3, 1998

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

Reference: **XENCO Report No.: 1-84449**
Project Name: 810052-1-0
Project ID: 810052-1-0
Project Address: Lea County, NM.

Dear Stan 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 1-84449. 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. 1-84449 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!

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Manager: Stan Grover
Project Location: Lea County, NM.

Project Name: 810052-1-0

XENCO COC#: 1-84449
Date Received in Lab: Nov 18, 1998 12:20 by JO
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	184449-001	BTEX	SW-846	ppm	10 days	Nov 17, 1998 14:35		Nov 18, 1998 by HL	Nov 18, 1998 16:16 by HL
2			PAHs	SW846-8270	mg/L	10 days	Nov 17, 1998 14:35		Nov 19, 1998 by SS	Nov 20, 1998 14:38 by MM
3			TDS	EPA 160.1	mg/L	10 days	Nov 17, 1998 14:35		Nov 19, 1998 by JO	Nov 20, 1998 14:55 by JO
4			Anions	EPA 300.0	mg/L	10 days	Nov 17, 1998 14:35		Nov 20, 1998 by OR	Nov 20, 1998 22:55 by OR
5			Carbonate	SM4500CO2D	mg/L	10 days	Nov 17, 1998 14:35		Nov 23, 1998 by IF	Nov 23, 1998 09:40 by IF
6			Bicarbonate	SM 4500CO2D	mg/L	10 days	Nov 17, 1998 14:35		Nov 23, 1998 by IF	Nov 23, 1998 09:40 by IF
7			Tot. Metals	EPA	mg/L	10 days	Nov 17, 1998 14:35		Nov 24, 1998 by ALO	Nov 24, 1998 14:56 by MAB
8			Total Metals	EPA 6010	mg/L	10 days	Nov 17, 1998 14:35		Nov 24, 1998 by AO	Dec 1, 1998 14:49 by CG
9	MW-2	184449-002	BTEX	SW-846	ppm	10 days	Nov 17, 1998 14:20		Nov 18, 1998 by HL	Nov 18, 1998 18:26 by HL
10			PAHs	SW846-8270	mg/L	10 days	Nov 17, 1998 14:20		Nov 19, 1998 by SS	Nov 20, 1998 15:23 by MM
11			TDS	EPA 160.1	mg/L	10 days	Nov 17, 1998 14:20		Nov 19, 1998 by JO	Nov 20, 1998 15:00 by JO
12			Anions	EPA 300.0	mg/L	10 days	Nov 17, 1998 14:20		Nov 20, 1998 by OR	Nov 20, 1998 23:05 by OR
13			Carbonate	SM4500CO2D	mg/L	10 days	Nov 17, 1998 14:20		Nov 23, 1998 by IF	Nov 23, 1998 10:00 by IF
14			Bicarbonate	SM 4500CO2D	mg/L	10 days	Nov 17, 1998 14:20		Nov 23, 1998 by IF	Nov 23, 1998 10:00 by IF
15			Tot. Metals	EPA	mg/L	10 days	Nov 17, 1998 14:20		Nov 24, 1998 by ALO	Nov 24, 1998 15:16 by MAB
16			Total Metals	EPA 6010	mg/L	10 days	Nov 17, 1998 14:20		Nov 24, 1998 by AO	Dec 1, 1998 15:04 by CG
17	MW-3	184449-003	BTEX	SW-846	ppm	10 days	Nov 17, 1998 14:50		Nov 18, 1998 by HL	Nov 18, 1998 17:31 by HL
18			PAHs	SW846-8270	mg/L	10 days	Nov 17, 1998 14:50		Nov 19, 1998 by SS	Dec 2, 1998 19:16 by MM
19			TDS	EPA 160.1	mg/L	10 days	Nov 17, 1998 14:50		Nov 19, 1998 by JO	Nov 20, 1998 15:05 by JO
20			Anions	EPA 300.0	mg/L	10 days	Nov 17, 1998 14:50		Nov 20, 1998 by OR	Nov 20, 1998 23:15 by OR
21			Carbonate	SM4500CO2D	mg/L	10 days	Nov 17, 1998 14:50		Nov 23, 1998 by IF	Nov 23, 1998 10:10 by IF
22			Bicarbonate	SM 4500CO2D	mg/L	10 days	Nov 17, 1998 14:50		Nov 23, 1998 by IF	Nov 23, 1998 10:10 by IF
23			Tot. Metals	EPA	mg/L	10 days	Nov 17, 1998 14:50		Nov 24, 1998 by ALO	Nov 24, 1998 15:23 by MAB
24			Total Metals	EPA 6010	mg/L	10 days	Nov 17, 1998 14:50		Nov 24, 1998 by AO	Dec 1, 1998 15:09 by CG

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84449

K.E.I. Consultants, Inc.

Project Name: 810052-1-0

Project ID: 810052-1-0
Project Manager: Stan Grover
Project Location: Lea County, NM.

Date Received in Lab : Nov 18, 1998 12:20
Date Report Faxed: Dec 3, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184449 001		184449 002		184449 003	
	Field ID:	MW-1		MW-2		MW-3	
	Depth:						
	Matrix:	Liquid		Liquid		Liquid	
	Sampled:	11/17/98 14:35		11/17/98 14:20		11/17/98 14:50	
Total Metals (ICP) EPA 6010	*Analyzed:*	12/01/98		12/01/98		12/01/98	
	Units:	mg/L	R.L.	mg/L	R.L.	mg/L	R.L.
Boron		5.1	(0.1)	2.26	(0.11)	4.25	(0.11)
Molybdenum		0.63	(0.22)	0.27	(0.22)	< 0.22	(0.22)
Silicon		26.8	(0.6)	29.6	(0.6)	52.4	(0.6)
Sodium		2270	(5.6)	1010	(5.6)	1630	(5.6)
Strontium		11.9	(0.2)	14.1	(0.2)	22.2	(0.2)
Tin		< 0.22	(0.22)	< 0.22	(0.22)	0.85	(0.22)
BTEX EPA 8021B	*Analyzed:*	11/18/98		11/18/98		11/18/98	
	Units:	ppm	R.L.	ppm	R.L.	ppm	R.L.
Benzene		< 0.001	(0.001)	0.024	(0.004)	0.330	(0.004)
Toluene		< 0.001	(0.001)	< 0.004	(0.004)	0.004	(0.004)
Ethylbenzene		< 0.001	(0.001)	0.046	(0.004)	0.147	(0.004)
m,p-Xylene		< 0.002	(0.002)	0.010	(0.008)	0.070	(0.008)
o-Xylene		< 0.001	(0.001)	< 0.004	(0.004)	0.007	(0.004)
Total BTEX			N.D.		0.080		0.558
PAHs by GC-MS EPA 8270	*Analyzed:*	11/20/98		11/20/98		12/02/98	
	Units:	mg/L	R.L.	mg/L	R.L.	mg/L	R.L.
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)
Benz(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)
Dibenz(a,h)anthracene		< 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)
Fluorene		< 0.002	(0.002)	0.003	(0.002)	< 0.002	(0.002)
Indeno(1,2,3-cd)pyrene		< 0.002	(0.002)	< 0.002	(0.002)	< 0.002	(0.002)
Naphthalene		< 0.002	(0.002)	< 0.002	(0.002)	0.013	(0.002)
Phenanthrene		< 0.002	(0.002)	0.004	(0.002)	< 0.002	(0.002)
Pyrene		< 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

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84449

K.E.I. Consultants, Inc.

Project Name: 810052-1-0

Project ID: 810052-1-0
Project Manager: Stan Grover
Project Location: Lea County, NM.

Date Received in Lab : Nov 18, 1998 12:20
Date Report Faxed: Dec 3, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184449 001		184449 002		184449 003	
	Field ID:	MW-1		MW-2		MW-3	
	Depth:						
	Matrix:	Liquid		Liquid		Liquid	
	Sampled:	11/17/98 14:35		11/17/98 14:20		11/17/98 14:50	
Bicarbonate **SM 4500CO2D**	*Analyzed:*	11/23/98	R.L.	11/23/98	R.L.	11/23/98	R.L.
	Units:	mg/L		mg/L		mg/L	
Bicarbonate		318	(4.0)	393	(4.0)	663	(4.0)
Carbonate **SM4500CO2D**	*Analyzed:*	11/23/98	R.L.	11/23/98	R.L.	11/23/98	R.L.
	Units:	mg/L		mg/L		mg/L	
Carbonate		< 4.0	(4.0)	< 4.0	(4.0)	< 4.0	(4.0)
Total Dissolved Solids **EPA 160.1**	*Analyzed:*	11/20/98	R.L.	11/20/98	R.L.	11/20/98	R.L.
	Units:	mg/L		mg/L		mg/L	
Total Dissolved Solids		8800	(25.0)	4790	(25.0)	7050	(25.0)
Total Metals by ICP-MS **ICP-MS Metal**	*Analyzed:*	11/24/98	R.L.	11/24/98	R.L.	11/24/98	R.L.
	Units:	mg/L		mg/L		mg/L	
Aluminum		1.27	(1.11)	< 1.11	(1.11)	2.36	(1.11)
Arsenic		1.62	(0.06)	1.66	(0.06)	0.106	(0.056)
Barium		0.100	(0.028)	0.134	(0.028)	0.743	(0.028)
Beryllium		< 0.006	(0.006)	< 0.006	(0.006)	< 0.006	(0.006)
Cadmium		< 0.006	(0.006)	< 0.006	(0.006)	< 0.006	(0.006)
Calcium		639	(1.1)	640	(1.1)	358	(0.6)
Chromium		< 0.028	(0.028)	< 0.028	(0.028)	< 0.028	(0.028)
Cobalt		< 0.028	(0.028)	< 0.028	(0.028)	< 0.028	(0.028)
Copper		< 0.028	(0.028)	< 0.028	(0.028)	< 0.028	(0.028)
Iron		0.56	(0.56)	< 0.56	(0.56)	4.67	(0.56)
Lead		< 0.011	(0.011)	< 0.011	(0.011)	< 0.011	(0.011)
Magnesium		289	(1.1)	183	(1.1)	317	(1.1)
Manganese		0.413	(0.056)	0.490	(0.056)	0.664	(0.056)
Mercury		< 0.002	(0.002)	< 0.002	(0.002)	< 0.002	(0.002)
Nickel		< 0.056	(0.056)	< 0.056	(0.056)	< 0.056	(0.056)
Potassium		116	(2.778)	59.9	(2.8)	60.4	(2.8)
Selenium		0.606	(0.050)	< 0.050	(0.050)	< 0.050	(0.050)
Silver		< 0.028	(0.028)	< 0.028	(0.028)	< 0.028	(0.028)
Vanadium		0.419	(0.028)	0.047	(0.028)	0.341	(0.028)
Zinc		0.030	(0.028)	< 0.028	(0.028)	0.083	(0.028)
Anions by Ion Chromatography **EPA 300.0**	*Analyzed:*	11/20/98	R.L.	11/20/98	R.L.	11/20/98	R.L.
	Units:	mg/L		mg/L		mg/L	
Chloride		1530	(40)	910	(40)	2040	(20)
Sulfate		4710	(40)	1170	(40)	2430	(20)

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A48A33

EPA 200.8 Total Metals by ICP- MS

Date Validated: Nov 25, 1998 09:24
Date Analyzed: Nov 24, 1998 14:44

Analyst: MAB
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] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Aluminum	< 0.56	2.10	2.22	0.56	94.6	70-125	
Arsenic	< 0.0278	1.9344	2.2200	0.0278	87.1	70-125	
Barium	< 0.0278	0.9761	1.1100	0.0278	87.9	70-125	
Beryllium	< 0.0056	0.3983	0.4440	0.0056	89.7	70-125	
Cadmium	< 0.0056	0.4061	0.4440	0.0056	91.5	75-125	
Calcium	< 0.56	1.56	2.22	0.56	70.3	70-125	
Chromium	< 0.0111	0.9878	1.1000	0.0111	89.8	70-125	
Cobalt	< 0.0278	0.9917	1.1100	0.0278	89.3	70-125	
Copper	< 0.0278	1.0128	1.1100	0.0278	91.2	70-125	
Iron	< 0.556	2.389	2.220	0.556	107.6	70-125	
Lead	< 0.0111	1.8856	2.2200	0.0111	84.9	70-125	
Magnesium	< 0.56	4.39	4.44	0.56	98.9	70-125	
Manganese	< 0.0556	2.0461	2.2200	0.0556	92.2	70-125	
Mercury	< 0.0028	0.0056	0.0056	0.0028	100.0	75-125	
Nickel	< 0.0278	0.9861	1.1100	0.0278	88.8	70-125	
Potassium	< 2.778	4.111	4.440	2.778	92.6	70-125	
Selenium	< 0.0556	1.9850	2.2000	0.0556	90.2	70-125	
Silver	< 0.0278	0.5689	0.5560	0.0278	102.3	70-125	
Vanadium	< 0.0278	0.9517	1.1100	0.0278	85.7	70-125	
Zinc	< 0.0278	0.9650	1.1100	0.0278	86.9	70-125	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A48A33

EPA 200.8 Total Metals by ICP- MS

Date Validated: Nov 25, 1998 09:24
Date Analyzed: Nov 24, 1998 15:03

Analyst: MAB
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 184449- 001	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample	Duplicate		QC	LIMITS	Matrix Spike	Matrix	QC	LIMITS	
Parameter	Result	Result	Detection Limit	Relative Difference	Relative Difference	Result	Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Aluminum	1.267	1.182	0.556	6.9	25.0	3.556	2.20	104.0	70-125	
Arsenic	1.624	1.622	0.028	0.1	25.0	3.246	2.20	73.7	70-125	
Barium	0.0994	0.0978	0.0278	1.6	25.0	1.0944	1.100	90.5	70-125	
Beryllium	< 0.0056	< 0.0056	0.0056	N.C	25.0	0.3117	0.444	70.2	70-125	
Cadmium	< 0.0056	< 0.0056	0.0056	N.C	20.0	0.3400	0.444	76.6	75-125	
Calcium	639	636	0.56	0.5	25.0	563	4.4	1727	70-125	A,B
Chromium	< 0.0111	< 0.0111	0.0111	N.C	25.0	0.9261	1.100	84.2	70-125	
Cobalt	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.9056	1.100	82.3	70-125	
Copper	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.8856	1.100	80.5	70-125	
Iron	0.556	< 0.556	0.556	N.C	25.0	2.944	2.22	107.6	70-125	
Lead	< 0.0111	< 0.0111	0.0111	N.C	25.0	2.0061	2.220	90.4	70-125	
Magnesium	289	282	0.56	2.5	25.0	249	4.4	900.9	70-125	A,B
Manganese	0.4133	0.4106	0.0556	0.7	25.0	2.2350	2.220	82.1	70-125	

(A) High analyte concentration affects spike recovery.
(B) LCS within acceptance limits.
Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(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
Lab QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A48A33

EPA 200.8 Total Metals by ICP- MS

Date Validated: Nov 25, 1998 09:24
Date Analyzed: Nov 24, 1998 15:03

Analyst: MAB
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 184449- 001	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
	Sample Result	Duplicate Result	Detection Limit	QC LIMITS Relative Difference	QC LIMITS Relative Difference	Matrix Spike Result	Matrix Spike Amount	QC LIMITS Matrix Spike Recovery	QC LIMITS Recovery Range	Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0028	< 0.0028	0.0028	N.C	20.0	0.0033	0.006	58.9	75-125	B
Nickel	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.8617	1.100	78.3	70-125	
Potassium	116	114	2.7778	1.7	25.0	104	4.400	272.7	70-125	A,B
Selenium	0.6061	0.6167	0.0556	1.7	25.0	2.2644	2.200	75.4	70-125	
Silver	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.4811	0.556	86.5	70-125	
Vanadium	0.4189	0.4156	0.0278	0.8	25.0	1.3300	1.100	82.8	70-125	
Zinc	0.0294	< 0.0278	0.0278	N.C	25.0	0.7472	1.100	65.3	70-125	B

(A) High analyte concentration affects spike recovery.
(B) LCS within acceptance limits.
Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A46A77

EPA 6010 Total Metals (ICP)

Date Validated: Dec 2, 1998 16:33
Date Analyzed: Dec 1, 1998 14:39

Analyst: CG
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] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Boron	< 0.111	2.019	2.220	0.111	90.9	70-125	
Molybdenum	< 0.333	0.996	1.110	0.333	89.7	70-125	
Silicon	< 0.556	4.432	4.440	0.556	99.8	70-125	
Sodium	< 1.11	13.43	13.33	1.11	100.8	70-125	
Strontium	< 0.222	1.932	2.220	0.222	87.0	70-125	
Tin	< 0.222	2.399	2.220	0.222	108.1	70-125	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch = 18A46A77

EPA 6010 Total Metals (ICP)

Date Validated: Dec 2, 1998 16:33
Date Analyzed: Dec 1, 1998 14:54

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184449- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Boron	5.06	5.12	0.11	1.2	25.0	
Molybdenum	0.630	0.631	0.333	0.2	25.0	
Silicon	26.76	26.38	0.56	1.4	25.0	
Sodium	2270	2320	1.11	2.2	25.0	
Strontium	11.86	11.58	0.22	2.4	25.0	
Tin	< 0.222	< 0.222	0.222	N.C	25.0	

Relative Difference [D] = 200*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25E10

SW- 846 5030/8021B BTEX

Date Validated: Nov 19, 1998 13:15
Date Analyzed: Nov 18, 1998 14:24

Analyst: HL
Matrix: Liquid

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	
Toluene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	
Ethylbenzene	< 0.0010	0.1040	0.1000	0.0010	104.0	65-135	
m,p-Xylene	< 0.0020	0.2100	0.2000	0.0020	105.0	65-135	
o-Xylene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25E10

SW- 846 5030/8021B BTEX

Date Validated: Nov 19, 1998 13:15
Date Analyzed: Nov 18, 1998 15:02

Analyst: HL
Matrix: Liquid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 184445- 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 Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1030	0.1030	0.1000	0.0010	20.0	0.0	103.0	103.0	65-135	
Toluene	< 0.0010	0.1030	0.1020	0.1000	0.0010	20.0	1.0	103.0	102.0	65-135	
Ethylbenzene	< 0.0010	0.1010	0.1000	0.1000	0.0010	20.0	1.0	101.0	100.0	65-135	
m,p-Xylene	< 0.0020	0.2060	0.2040	0.2000	0.0020	20.0	1.0	103.0	102.0	65-135	
o-Xylene	< 0.0010	0.1040	0.1030	0.1000	0.0010	20.0	1.0	104.0	103.0	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A34F05

SW846- 8270 Semivolatiles (SVOCs TCL)

Date Validated: Nov 25, 1998 17:00
Date Analyzed: Nov 20, 1998 10:04

Analyst: MM
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	< 0.0025	0.0442	0.0471	0.0500	0.0025	31.0	6.4	88.4	94.2	46-118	
4-Chloro-3-methylphenol	< 0.0038	0.0368	0.0404	0.0500	0.0038	42.0	9.3	73.6	80.8	23-97	
2-Chlorophenol	< 0.0050	0.0357	0.0385	0.0500	0.0050	40.0	7.5	71.4	77.0	27-123	
1,4-Dichlorobenzene	< 0.0042	0.0388	0.0414	0.0500	0.0042	28.0	6.5	77.6	82.8	36-97	
2,4-Dinitrotoluene	< 0.0050	0.0397	0.0425	0.0500	0.0050	38.0	6.8	79.4	85.0	24-96	
N-Nitrosodi-n-propylamine	< 0.0040	0.0390	0.0426	0.0500	0.0040	38.0	8.8	78.0	85.2	41-116	
4-Nitrophenol	< 0.0040	0.0163	0.0181	0.0500	0.0040	50.0	10.5	32.6	36.2	10-80	
Pentachlorophenol	< 0.0086	0.0255	0.0285	0.0500	0.0086	50.0	11.1	51.0	57.0	9-103	
Phenol	< 0.0037	0.0113	0.0129	0.0500	0.0037	42.0	13.2	22.6	25.8	12-89	
Pyrene	< 0.0020	0.0499	0.0527	0.0500	0.0020	31.0	5.5	99.8	105.4	26-127	
1,2,4-Trichlorobenzene	< 0.0054	0.0380	0.0405	0.0500	0.0054	28.0	6.4	76.0	81.0	39-98	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20C18

SM4500CO2D Carbonate

Date Validated: Nov 23, 1998 16:04
Date Analyzed: Nov 23, 1998 09:40

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184449- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Carbonate	< 4.00	< 4.00	4.00	N.C	25.0	

Relative Difference [D] = 200*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20C17

SM 4500CO2D Bicarbonate

Date Validated: Nov 23, 1998 16:04
Date Analyzed: Nov 23, 1998 09:10

Analyst: IF
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] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Bicarbonate	< 4.00	250	250	4.00	100.0	70-125	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch - 8A20C17

SM 4500CO2D Bicarbonate

Date Validated: Nov 23, 1998 16:04
Date Analyzed: Nov 23, 1998 09:40

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184449- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Bicarbonate	318	320	4.00	0.6	25.0	

Relative Difference [D] = 200*(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

XENCO Laboratories

Certificate Of Quality Control for Batch: 18A47A07

EPA 160.1 Total Dissolved Solids

Date Validated: Nov 20, 1998 17:00
Date Analyzed: Nov 20, 1998 15:15

Analyst: JO
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184450- 002	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Total Dissolved Solids	10900	10900	25.00	0.0	25.0	

Relative Difference [D] = 200(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A10C80

EPA 300.0 Anions by Ion Chromatography

Date Validated: Nov 25, 1998 00:41
Date Analyzed: Nov 20, 1998 21:28

Analyst: OR
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
Chloride	< 0.20	5.23	5.06	5.00	0.20	20.0	3.3	104.6	101.2	70-125	
Fluoride	< 0.10	5.22	5.16	5.00	0.10	20.0	1.2	104.4	103.2	70-125	
Sulfate	< 0.20	5.44	5.25	5.00	0.20	20.0	3.6	108.8	105.0	70-125	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch - 18A10C80

EPA 300.0 Anions by Ion Chromatography

Date Validated: Nov 25, 1998 00:41
Date Analyzed: Nov 20, 1998 23:55

Analyst: OR
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184450- 003	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Chloride	4300	4350	40	1.2	20.0	
Sulfate	1610	1610	40	0.0	20.0	

Relative Difference [D] = 200*(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

XENCO Laboratories

☐ 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: 212 Work Order No: 10442 Page 1 of 1

Company: KEI	Phone: 210-680-3767
Project Name: 810052-1-0 ☐ Previously done at XENCO	Project ID: 810052-1-0
Location: LEA COUNTY, NM	
Project Manager (PM): STAN GROVER	Project Director (PD): M. HAWTHORNE
Fax Results to: ☒ PM and / or	Fax: 210-680-3763
Invoice to: ☐ Accounting ☐ Include Invoice with Final Report Attn PM ☐ Invoice must have a P.O Bill to:	
Quote No.	P.O No: 810052-1-01 ☐ Call for a P.O.
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)	
Specifications	
Sampler Name: Justin Taylor	Signature: Justin Taylor

Lab Only: 184449-SA

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

Lab Only Additions: From: Rcv by: Date / From: Rcv by: Date / From: Rcv by: Date

#	Sample ID	Sampling Date	Time	Depth ft' in" m	Matrix A P S W	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020 8021 8260 602 624	BTEX-MTBE by 8020 8021 8260 602 624 Other	TPH by TX1005 418.1 8015GRO 8015DRO 8015JetF	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	TDS by 160.1	CATION/ANION - (6010) (300.0)
1	MW-1	17NOV98	1435				X	6	V, 1	GA, P	H, C4 HNO3	X			X	X			X	X
2	MW-2	↓	1420				↓	↓	↓	↓	↓	↓			↓	↓			↓	↓
3	MW-3	↓	1450				↓	↓	↓	↓	↓	↓			↓	↓			↓	↓
4																				
5																				
6																				
7																				
8																				
9																				
10																				

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

Remarks

IF Questions call Stan Grover @ 210-680-3767

A 321 859 0325
U.P.S. Airbill

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time
1 Justin Taylor		17 NOV 98 / 1530
2		Via UPS
3	Lab: Johnny Orona	11/18/98 12:20

Total Containers per COC: 18

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**), Tedlar Bag (**B**), Wipe (**W**), Other _____ **TYPE** Glass Amb (**GA**), Glass Clear (**GC**), Plastic (**P**), Other (**O**) _____

ANALYTICAL REPORT 1-84274

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNMPL TNM-97-18

Project Id: 810052-1-0

December 9, 1998

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

December 9, 1998

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

Reference: **XENCO Report No.: 1-84274**
Project Name: TNMPL TNM-97-18
Project ID: 810052-1-0
Project Address: Lea County, 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 1-84274. 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. 1-84274 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!

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Manager: Theresa Nix
Project Location: Lea County, NM.

Project Name: TNMPL TNM-97-18

XENCO COC#: 1-84274
Date Received in Lab: Nov 5, 1998 10:10 by JO
XENCO contact : Carlos Castro/Karen Olson

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	SB-1	184274-001	BTEX	SW-846	ppm	10 days	Nov 3, 1998 09:35		Nov 10, 1998 by HL	Nov 10, 1998 14:07 by HL
2			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 09:35		Nov 9, 1998 by JM	Nov 17, 1998 08:34 by AM
3			VOA (8260)	EPA1312/8260	mg/kg	7 days	Nov 3, 1998 09:35	Nov17,1998 14:30	Nov 23, 1998 by CCE	Nov 23, 1998 20:46 by CCE
4			SPLP TPH	EPA	ppm	7 days	Nov 3, 1998 09:35	Nov17,1998 14:30	Nov 19, 1998 by EZ	Nov 19, 1998 17:35 by EZ
5			SPLP-SV(TCL)	SW846-1312/82	ug/L	7 days	Nov 3, 1998 09:35	Nov17,1998 14:30	Nov 19, 1998 by SS	Nov 20, 1998 13:53 by MM
6		184274-002	BTEX	SW-846	ppm	10 days	Nov 3, 1998 09:50		Nov 10, 1998 by HL	Nov 10, 1998 13:49 by HL
7			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 09:50		Nov 9, 1998 by JM	Nov 17, 1998 09:39 by AM
8		184274-003	BTEX	SW-846	ppm	10 days	Nov 3, 1998 10:15		Nov 10, 1998 by HL	Nov 10, 1998 13:12 by HL
9			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 10:15		Nov 9, 1998 by JM	Nov 17, 1998 07:29 by AM
10	MW-1	184274-004	BTEX	SW-846	ppm	10 days	Nov 3, 1998 13:25		Nov 10, 1998 by HL	Nov 10, 1998 11:38 by HL
11			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 13:25		Nov 9, 1998 by JM	Nov 17, 1998 03:10 by AM
12		184274-005	BTEX	SW-846	ppm	10 days	Nov 3, 1998 13:30		Nov 10, 1998 by HL	Nov 10, 1998 11:57 by HL
13			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 13:30		Nov 9, 1998 by JM	Nov 14, 1998 21:47 by AM
14	Mw-1	184274-006	BTEX	SW-846	ppm	10 days	Nov 3, 1998 13:40		Nov 10, 1998 by HL	Nov 10, 1998 12:16 by HL
15			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 13:40		Nov 9, 1998 by JM	Nov 14, 1998 22:20 by AM
16	MW-2	184274-007	BTEX	SW-846	ppm	10 days	Nov 3, 1998 14:35		Nov 10, 1998 by HL	Nov 10, 1998 12:34 by HL
17			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 14:35		Nov 9, 1998 by JM	Nov 14, 1998 22:52 by AM
18		184274-008	BTEX	SW-846	ppm	10 days	Nov 3, 1998 14:50		Nov 10, 1998 by HL	Nov 10, 1998 13:30 by HL
19			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 14:50		Nov 9, 1998 by JM	Nov 17, 1998 05:19 by AM
20	MW-3	184274-009	BTEX	SW-846	ppm	10 days	Nov 3, 1998 15:25		Nov 10, 1998 by HL	Nov 10, 1998 12:53 by HL
21			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 15:25		Nov 9, 1998 by JM	Nov 17, 1998 06:24 by AM
22		184274-010	BTEX	SW-846	ppm	10 days	Nov 3, 1998 15:40		Nov 10, 1998 by HL	Nov 10, 1998 14:56 by HL
23			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 15:40		Nov 9, 1998 by JM	Nov 17, 1998 01:32 by AM
24		184274-011	BTEX	SW-846	ppm	10 days	Nov 3, 1998 16:00		Nov 10, 1998 by HL	Nov 10, 1998 15:03 by HL
25			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 3, 1998 16:00		Nov 9, 1998 by JM	Nov 17, 1998 04:15 by AM

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84274

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Name: TNMPL TNM-97-18
Date Received in Lab : Nov 5, 1998 10:10
Project Manager: Theresa Nix
Date Report Faxed: Dec 9, 1998
Project Location: Lea County, NM.
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	Lab ID: / Field ID: / Depth: / Matrix: / Sampled:	184274 001 SB-1 0-2' Solid 11/03/98 09:35	184274 002 SB-1 4-6' Solid 11/03/98 09:50	184274 003 SB-1 20-22' Solid 11/03/98 10:15	184274 004 MW-1 0-2' Solid 11/03/98 13:25	184274 005 MW-1 2-4' Solid 11/03/98 13:30	184274 006 MW-1 15-17' Solid 11/03/98 13:40
TPH-DRO (Diesel) EPA 8015 M	Analyzed: / Units:	11/17/98 mg/kg R.L.	11/17/98 mg/kg R.L.	11/17/98 mg/kg R.L.	11/17/98 mg/kg R.L.	11/14/98 mg/kg R.L.	11/14/98 mg/kg R.L.
Total Petroleum Hydrocarbons		4320 (500)	1550 (100)	709 (10.0)	556 (10.0)	15.2 (10.0)	198 (10.0)
BTEX EPA 8021B	Analyzed: / Units:	11/10/98 ppm R.L.	11/10/98 ppm R.L.	11/10/98 ppm R.L.	11/10/98 ppm R.L.	11/10/98 ppm R.L.	11/10/98 ppm R.L.
Benzene		0.70 (0.10)	4.20 (0.10)	1.35 (0.10)	< 0.050 (0.050)	< 0.050 (0.050)	< 0.050 (0.050)
Toluene		0.49 (0.10)	5.94 (0.10)	4.05 (0.10)	< 0.050 (0.050)	< 0.050 (0.050)	< 0.050 (0.050)
Ethylbenzene		3.38 (0.10)	9.93 (0.10)	8.15 (0.10)	< 0.050 (0.050)	< 0.050 (0.050)	< 0.050 (0.050)
m,p-Xylene		6.30 (0.20)	12.20 (0.20)	11.40 (0.20)	< 0.100 (0.100)	< 0.100 (0.100)	< 0.100 (0.100)
o-Xylene		6.32 (0.10)	5.35 (0.10)	4.31 (0.10)	< 0.050 (0.050)	< 0.050 (0.050)	< 0.050 (0.050)
Total BTEX		17.190	37.620	29.260	N.D.	N.D.	N.D.
SPLP-Semivolatiles EPA1312/8270	Analyzed: / Units:	11/20/98 mg/L R.L.					
Acenaphthene		< 0.005 (0.005)					
Acenaphthylene		< 0.005 (0.005)					
Anthracene		< 0.005 (0.005)					
Benz(a)anthracene		< 0.005 (0.005)					
Benzo(a)pyrene		< 0.005 (0.005)					
Benzo(b)fluoranthene		< 0.005 (0.005)					
Benzo(g,h,i)perylene		< 0.005 (0.005)					
Benzo(k)fluoranthene		< 0.005 (0.005)					
4-Bromophenyl-phenylether		< 0.005 (0.005)					
Butyl benzyl phthalate		< 0.005 (0.005)					
Carbazole		< 0.005 (0.005)					
4-Chloro-3-methylphenol		< 0.005 (0.005)					

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Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84274

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Manager: Theresa Nix
Project Location: Lea County, NM.

Project Name: TNMPL TNM-97-18

Date Received in Lab : Nov 5, 1998 10:10
Date Report Faxed: Dec 9, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184274 001	184274 002	184274 003	184274 004	184274 005	184274 006
	Field ID:	SB-1	SB-1	SB-1	MW-1	MW-1	MW-1
	Depth:	0-2'	4-6'	20-22'	0-2'	2-4'	15-17'
	Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
	Sampled:	11/03/98 09:35	11/03/98 09:50	11/03/98 10:15	11/03/98 13:25	11/03/98 13:30	11/03/98 13:40
SPLP-Semivolatiles EPA1312/8270	*Analyzed:*	11/20/98					
	Units:	mg/L R.L.					
4-Chloroaniline		< 0.005 (0.005)					
2-Chloronaphthalene		< 0.005 (0.005)					
2-Chlorophenol		< 0.005 (0.005)					
4-Chlorophenyl-phenyl ether		< 0.005 (0.005)					
Chrysene		< 0.005 (0.005)					
Di-n-butyl phthalate		< 0.005 (0.005)					
Di-n-octylphthalate		< 0.005 (0.005)					
Dibenz(a,h)anthracene		< 0.005 (0.005)					
Dibenzofuran		< 0.005 (0.005)					
1,2-Dichlorobenzene		< 0.005 (0.005)					
1,3-Dichlorobenzene		< 0.005 (0.005)					
1,4-Dichlorobenzene		< 0.005 (0.005)					
3,3'-Dichlorobenzidine		< 0.005 (0.005)					
2,4-Dichlorophenol		< 0.005 (0.005)					
Diethyl phthalate		< 0.005 (0.005)					
2,4-Dimethylphenol		< 0.005 (0.005)					
Dimethyl phthalate		< 0.005 (0.005)					
4,6-Dinitro-2-methylphenol		< 0.013 (0.013)					
2,4-Dinitrophenol		< 0.013 (0.013)					
2,4-Dinitrotoluene		< 0.005 (0.005)					
2,6-Dinitrotoluene		< 0.005 (0.005)					
Fluoranthene		< 0.005 (0.005)					
Fluorene		< 0.005 (0.005)					
Hexachlorobenzene		< 0.005 (0.005)					

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Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84274

Project ID: 810052-1-0
Project Manager: Theresa Nix
Project Location: Lea County, NM.

K.E.I. Consultants, Inc.

Project Name: TNMPL TNM-97-18

Date Received in Lab : Nov 5, 1998 10:10
Date Report Faxed: Dec 9, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:* / *Field ID:* / *Depth:* / *Matrix:* / *Sampled:*	184274 001 SB-1 0-2' Solid 11/03/98 09:35	184274 002 SB-1 4-6' Solid 11/03/98 09:50	184274 003 SB-1 20-22' Solid 11/03/98 10:15	184274 004 MW-1 0-2' Solid 11/03/98 13:25	184274 005 MW-1 2-4' Solid 11/03/98 13:30	184274 006 MW-1 15-17' Solid 11/03/98 13:40
SPLP-Semivolatiles **EPA1312/8270**	*Analyzed:* *Units:*	11/20/98 R.L. mg/L					
Hexachlorobutadiene		< 0.005 (0.005)					
Hexachlorocyclopentadiene		< 0.005 (0.005)					
Hexachloroethane		< 0.005 (0.005)					
Indeno(1,2,3-cd)pyrene		< 0.005 (0.005)					
Isophorone		< 0.005 (0.005)					
2-Methylnaphthalene		< 0.005 (0.005)					
2-Methylphenol		< 0.005 (0.005)					
4-Methylphenol		< 0.005 (0.005)					
N-Nitrosodi-n-propylamine		< 0.005 (0.005)					
N-Nitrosodiphenylamine		< 0.005 (0.005)					
Naphthalene		< 0.005 (0.005)					
2-Nitroaniline		< 0.013 (0.013)					
3-Nitroaniline		< 0.013 (0.013)					
4-Nitroaniline		< 0.013 (0.013)					
Nitrobenzene		< 0.005 (0.005)					
2-Nitrophenol		< 0.005 (0.005)					
4-Nitrophenol		< 0.005 (0.005)					
Pentachlorophenol		< 0.013 (0.013)					
Phenanthrene		< 0.005 (0.005)					
Phenol		< 0.005 (0.005)					
Pyrene		< 0.005 (0.005)					
1,2,4-Trichlorobenzene		< 0.005 (0.005)					
2,4,5-Trichlorophenol		< 0.013 (0.013)					
2,4,6-Trichlorophenol		< 0.005 (0.005)					

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Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84274

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Name: TNMPL TNM-97-18
Date Received in Lab : Nov 5, 1998 10:10
Project Manager: Theresa Nix
Date Report Faxed: Dec 9, 1998
Project Location: Lea County, NM.
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	Lab ID: / Field ID: / Depth: / Matrix: / Sampled:	184274 001 SB-1 0-2' Solid 11/03/98 09:35	184274 002 SB-1 4-6' Solid 11/03/98 09:50	184274 003 SB-1 20-22' Solid 11/03/98 10:15	184274 004 MW-1 0-2' Solid 11/03/98 13:25	184274 005 MW-1 2-4' Solid 11/03/98 13:30	184274 006 MW-1 15-17' Solid 11/03/98 13:40
SPLP-Semivolatiles EPA1312/8270	Analyzed: / Units:	11/20/98 mg/L R.L.					
bis(2-Chloroethoxy) methane		< 0.005 (0.005)					
bis(2-Chloroethyl) ether		< 0.005 (0.005)					
bis(2-Chloroisopropyl) ether		< 0.005 (0.005)					
bis(2-Ethylhexyl) phthalate		< 0.005 (0.005)					
SPLP Volatiles EPA 8260	Analyzed: / Units:	11/23/98 mg/L R.L.					
Benzene		< 0.025 (0.025)					
Bromobenzene		< 0.025 (0.025)					
Bromochloromethane		< 0.025 (0.025)					
Bromodichloromethane		< 0.025 (0.025)					
Bromoform		< 0.025 (0.025)					
Bromomethane		< 0.025 (0.025)					
Carbon tetrachloride		< 0.025 (0.025)					
Chlorobenzene		< 0.025 (0.025)					
Chlorodibromomethane		< 0.025 (0.025)					
Chloroethane		< 0.050 (0.050)					
Chloroform		< 0.025 (0.025)					
Chloromethane		< 0.050 (0.050)					
2-Chlorotoluene		< 0.025 (0.025)					
4-Chlorotoluene		< 0.025 (0.025)					
1,2-Dibromo-3-chloropropane		< 0.025 (0.025)					
1,2-Dibromoethane		< 0.025 (0.025)					

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Project Location: Lea County, NM.

Project Name: TNMPL TNM-97-18

Date Received in Lab : Nov 5, 1998 10:10
Date Report Faxed: Dec 9, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184274 001	184274 002	184274 003	184274 004	184274 005	184274 006
	Field ID:	SB-1	SB-1	SB-1	MW-1	MW-1	MW-1
	Depth:	0-2'	4-6'	20-22'	0-2'	2-4'	15-17'
	Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
	Sampled:	11/03/98 09:35	11/03/98 09:50	11/03/98 10:15	11/03/98 13:25	11/03/98 13:30	11/03/98 13:40
SPLP Volatiles	*Analyzed:*	11/23/98					
EPA 8260	*Units:*	mg/L R.L.					
Dibromomethane		< 0.025 (0.025)					
1,2-Dichlorobenzene		< 0.025 (0.025)					
1,3-Dichlorobenzene		< 0.025 (0.025)					
1,4-Dichlorobenzene		< 0.025 (0.025)					
Dichlorodifluoromethane		< 0.025 (0.025)					
1,1-Dichloroethane		< 0.025 (0.025)					
1,2-Dichloroethane		0.110 (0.025)					
1,1-Dichloroethene		< 0.025 (0.025)					
1,2-Dichloropropane		< 0.025 (0.025)					
1,3-Dichloropropane		< 0.025 (0.025)					
2,2-Dichloropropane		< 0.025 (0.025)					
1,1-Dichloropropene		< 0.025 (0.025)					
Ethylbenzene		< 0.025 (0.025)					
Hexachlorobutadiene		< 0.025 (0.025)					
Isopropylbenzene (Cumene)		< 0.025 (0.025)					
MTBE		< 0.050 (0.050)					
Methylene chloride		< 0.050 (0.050)					
Naphthalene		< 0.025 (0.025)					
Styrene		< 0.025 (0.025)					
1,1,1,2-Tetrachloroethane		< 0.025 (0.025)					
1,1,2,2-Tetrachloroethane		< 0.025 (0.025)					
Tetrachloroethene		< 0.025 (0.025)					
Toluene		< 0.025 (0.025)					
1,2,3-Trichlorobenzene		< 0.025 (0.025)					

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QA/QC Manager

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CERTIFICATE OF ANALYSIS SUMMARY 1-84274

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Project ID: 810052-1-0
Project Name: TNMPL TNM-97-18
Date Received in Lab : Nov 5, 1998 10:10
Project Manager: Theresa Nix
Date Report Faxed: Dec 9, 1998
Project Location: Lea County, NM.
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184274 001	184274 002	184274 003	184274 004	184274 005	184274 006
	Field ID:	SB-1	SB-1	SB-1	MW-1	MW-1	MW-1
	Depth:	0-2'	4-6'	20-22'	0-2'	2-4'	15-17'
	Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
	Sampled:	11/03/98 09:35	11/03/98 09:50	11/03/98 10:15	11/03/98 13:25	11/03/98 13:30	11/03/98 13:40
SPLP Volatiles EPA 8260	*Analyzed:*	11/23/98					
	Units:	mg/L R.L.					
1,2,4-Trichlorobenzene		< 0.025 (0.025)					
1,1,1-Trichloroethane		< 0.025 (0.025)					
1,1,2-Trichloroethane		< 0.025 (0.025)					
Trichloroethene		< 0.025 (0.025)					
Trichlorofluoromethane		< 0.025 (0.025)					
1,2,3-Trichloropropane		< 0.025 (0.025)					
1,2,4-Trimethylbenzene		< 0.025 (0.025)					
1,3,5-Trimethylbenzene		< 0.025 (0.025)					
Vinyl chloride		< 0.025 (0.025)					
cis-1,2-Dichloroethene		< 0.025 (0.025)					
cis-1,3-Dichloropropene		< 0.025 (0.025)					
m,p-Xylene		< 0.025 (0.025)					
n-Butylbenzene		< 0.025 (0.025)					
n-Propylbenzene		< 0.025 (0.025)					
o-Xylene		0.045 (0.025)					
p-Isopropyltoluene (p-Cymene)		< 0.025 (0.025)					
sec-Butylbenzene		< 0.025 (0.025)					
tert-Butylbenzene		< 0.025 (0.025)					
trans-1,2-Dichloroethene		< 0.025 (0.025)					
trans-1,3-Dichloropropene		< 0.025 (0.025)					
SPLP TPH 1312/418.1	*Analyzed:*	11/19/98					
	Units:	ppm R.L.					

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QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84274

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Name: *TNMPL TNM-97-18*
Project Manager: Theresa Nix
Project Location: Lea County, NM.

Date Received in Lab : Nov 5, 1998 10:10
Date Report Faxed: Dec 9, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested		Lab ID:	184274 001	184274 002	184274 003	184274 004	184274 005	184274 006
		Field ID:	SB-1	SB-1	SB-1	MW-1	MW-1	MW-1
		Depth:	0-2'	4-6'	20-22'	0-2'	2-4'	15-17'
		Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
		Sampled:	11/03/98 09:35	11/03/98 09:50	11/03/98 10:15	11/03/98 13:25	11/03/98 13:30	11/03/98 13:40
SPLP TPH 1312/418.1		Analyzed:	11/19/98					
		Units:	ppm R.L.					
Total Petroleum Hydrocarbons			10.8 (0.7)					

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CERTIFICATE OF ANALYSIS SUMMARY 1-84274

K.E.I. Consultants, Inc.

Project ID: 810052-1-0
Project Name: TNMPL TNM-97-18
Date Received in Lab : Nov 5, 1998 10:10
Project Manager: Theresa Nix
Date Report Faxed: Dec 9, 1998
Project Location: Lea County, NM.
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested		Lab ID:	184274 007		184274 008		184274 009		184274 010		184274 011	
		Field ID:	MW-2		MW-2		MW-3		Mw-3		MW-3	
		Depth:	0-2'		25-27'		0-2'		20-22'		25-27'	
		Matrix:	Solid		Solid		Solid		Solid		Solid	
		Sampled:	11/03/98 14:35		11/03/98 14:50		11/03/98 15:25		11/03/98 15:40		11/03/98 16:00	
TPH-DRO (Diesel)	Analyzed:	11/14/98		11/17/98		11/17/98		11/17/98		11/17/98		
EPA 8015 M	Units:	mg/kg	R.L.	mg/kg	R.L.	mg/kg	R.L.	mg/kg	R.L.	mg/kg	R.L.	
Total Petroleum Hydrocarbons		267	(10.0)	26.6	(10.0)	14.2	(10.0)	< 10.0	(10.0)	281	(10.0)	
BTEX	Analyzed:	11/10/98		11/10/98		11/10/98		11/10/98		11/10/98		
EPA 8021B	Units:	ppm	R.L.	ppm	R.L.	ppm	R.L.	ppm	R.L.	ppm	R.L.	
Benzene		< 0.050	(0.050)	0.14	(0.10)	< 0.050	(0.050)	< 0.050	(0.050)	< 0.050	(0.050)	
Toluene		< 0.050	(0.050)	< 0.10	(0.10)	< 0.050	(0.050)	< 0.050	(0.050)	< 0.050	(0.050)	
Ethylbenzene		< 0.050	(0.050)	0.68	(0.10)	< 0.050	(0.050)	< 0.050	(0.050)	< 0.050	(0.050)	
m,p-Xylene		< 0.100	(0.100)	0.86	(0.20)	< 0.100	(0.100)	< 0.100	(0.100)	< 0.100	(0.100)	
o-Xylene		< 0.050	(0.050)	1.15	(0.10)	< 0.050	(0.050)	< 0.050	(0.050)	< 0.050	(0.050)	
Total BTEX		N.D.		2.830		N.D.		N.D.		N.D.		

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Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A40H72

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Nov 17, 1998 10:45
Date Analyzed: Nov 17, 1998 01:32

Analyst: AM
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 184274- 010 / **Parameter**	[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/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	
Total Petroleum Hydrocarbons	< 10.00	247	273	200	10.00	30.0	10.0	123.5	136.5	65-135	A

(A) MSD exceeded lab control limits; MS and LCS are within acceptance ranges.
Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch :- 18A40H72

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Nov 17, 1998 10:45
Date Analyzed: Nov 17, 1998 12:44

Analyst: AM
Matrix: Solid

	BLANK SPIKE ANALYSIS						
	[A]	[B]	[C]	[D]	[E]	[F]	[G]
					QC	LIMITS	
Parameter	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	Blank Spike Recovery	Recovery Range	Qualifier
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	
Total Petroleum Hydrocarbons	< 10.00	251	200	10.00	125.5	65-135	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25D97

SW- 846 5030/8021B BTEX

Date Validated: Nov 11, 1998 09:30
Date Analyzed: Nov 10, 1998 10:05

Analyst: HL
Matrix: Solid

	BLANK SPIKE ANALYSIS						
	[A]	[B]	[C]	[D]	[E]	[F]	[G]
					QC	LIMITS	
Parameter	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	Blank Spike Recovery	Recovery Range	Qualifier
	ppm	ppm	ppm	ppm	%	%	
Benzene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	
Toluene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
Ethylbenzene	< 0.0010	0.1030	0.1000	0.0010	103.0	65-135	
m,p-Xylene	< 0.0020	0.2060	0.2000	0.0020	103.0	65-135	
o-Xylene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	

Blank Spike Recovery [E] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25D97

SW- 846 5030/8021B BTEX

Date Validated: Nov 11, 1998 09:30
Date Analyzed: Nov 10, 1998 10:42

Analyst: HL
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 184272- 001 / **Parameter**	[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	< 0.020	1.872	1.984	2.000	0.020	25.0	5.8	93.6	99.2	65-135	
Toluene	< 0.020	1.862	1.980	2.000	0.020	25.0	6.1	93.1	99.0	65-135	
Ethylbenzene	< 0.020	1.882	2.000	2.000	0.020	25.0	6.1	94.1	100.0	65-135	
m,p-Xylene	< 0.040	3.800	4.020	4.000	0.040	25.0	5.6	95.0	100.5	65-135	
o-Xylene	< 0.020	1.906	1.980	2.000	0.020	25.0	3.8	95.3	99.0	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A23E61

EPA312/8260 SPLP Volatiles

Date Validated: Nov 25, 1998 10:00
Date Analyzed: Nov 23, 1998 17:32

Analyst: CCE
Matrix: Solid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result mg/kg	[B] Blank Spike Result mg/kg	[C] Blank Spike Duplicate Result mg/kg	[D] Blank Spike Amount mg/kg	[E] Detection Limit mg/kg	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
Benzene	< 0.0010	0.0447	0.0418	0.0500	0.0010	20.0	6.7	89.4	83.6	66-142	
Chlorobenzene	< 0.0010	0.0452	0.0428	0.0500	0.0010	20.0	5.5	90.4	85.6	60-133	
1,1-Dichloroethene	< 0.0040	0.0426	0.0379	0.0500	0.0040	25.0	11.7	85.2	75.8	59-172	
Toluene	< 0.0010	0.0444	0.0415	0.0500	0.0010	20.0	6.8	88.8	83.0	59-139	
Trichloroethene	< 0.0030	0.0416	0.0381	0.0500	0.0030	20.0	8.8	83.2	76.2	62-137	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A34F05

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Nov 25, 1998 17:00
Date Analyzed: Nov 20, 1998 10:04

Analyst: MM
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	< 0.0025	0.0442	0.0471	0.0500	0.0025	31.0	6.4	88.4	94.2	46-118	
4-Chloro-3-methylphenol	< 0.0038	0.0368	0.0404	0.0500	0.0038	42.0	9.3	73.6	80.8	23-97	
2-Chlorophenol	< 0.0050	0.0357	0.0385	0.0500	0.0050	40.0	7.5	71.4	77.0	27-123	
1,4-Dichlorobenzene	< 0.0042	0.0388	0.0414	0.0500	0.0042	28.0	6.5	77.6	82.8	36-97	
2,4-Dinitrotoluene	< 0.0050	0.0397	0.0425	0.0500	0.0050	38.0	6.8	79.4	85.0	24-96	
N-Nitrosodi-n-propylamine	< 0.0040	0.0390	0.0426	0.0500	0.0040	38.0	8.8	78.0	85.2	41-116	
4-Nitrophenol	< 0.0040	0.0163	0.0181	0.0500	0.0040	50.0	10.5	32.6	36.2	10-80	
Pentachlorophenol	< 0.0086	0.0255	0.0285	0.0500	0.0086	50.0	11.1	51.0	57.0	9-103	
Phenol	< 0.0037	0.0113	0.0129	0.0500	0.0037	42.0	13.2	22.6	25.8	12-89	
Pyrene	< 0.0020	0.0499	0.0527	0.0500	0.0020	31.0	5.5	99.8	105.4	26-127	
1,2,4-Trichlorobenzene	< 0.0054	0.0380	0.0405	0.0500	0.0054	28.0	6.4	76.0	81.0	39-98	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A34F08

SW846- 8270 Semivolatiles (SVOCs TCL)

Date Validated: Dec 1, 1998 13:15
Date Analyzed: Nov 30, 1998 17:52

Analyst: MM
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 184553- 005 / **Parameter**	[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] Detection Limit mg/Kg	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
Acenaphthene	< 0.083	1.453	1.450	1.667	0.083	19.0	0.2	87.2	87.0	31-137	
4-Chloro-3-methylphenol	< 0.127	1.240	1.227	1.667	0.127	33.0	1.1	74.4	73.6	26-103	
2-Chlorophenol	< 0.167	1.270	1.283	1.667	0.167	28.7	1.0	76.2	77.0	25-102	
1,4-Dichlorobenzene	< 0.140	1.310	1.340	1.667	0.140	32.1	2.3	78.6	80.4	28-104	
2,4-Dinitrotoluene	< 0.167	1.150	1.187	1.667	0.167	21.8	3.2	69.0	71.2	28-89	
N-Nitrosodi-n-propylamine	< 0.133	1.293	1.300	1.667	0.133	55.4	0.5	77.6	78.0	41-126	
4-Nitrophenol	< 0.133	1.320	1.333	1.667	0.133	47.2	1.0	79.2	80.0	11-114	
Pentachlorophenol	< 0.287	0.777	0.800	1.667	0.287	48.9	2.9	46.6	48.0	17-109	
Phenol	< 0.123	1.023	1.040	1.667	0.123	22.6	1.6	61.4	62.4	26-90	
Pyrene	< 0.067	1.527	1.580	1.667	0.067	25.2	3.4	91.6	94.8	35-142	
1,2,4-Trichlorobenzene	< 0.180	1.320	1.343	1.667	0.180	23.0	1.7	79.2	80.6	38-107	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A07E25

EPA 1312/418.1 SPLP TPH

Date Validated: Nov 20, 1998 10:05
Date Analyzed: Nov 19, 1998 17:05

Analyst: EZ
Matrix: Solid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Detection Limit ppm	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
Total Petroleum Hydrocarbons	< 0.50	4.65	4.54	4.18	0.50	20.0	2.4	111.2	108.6	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(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

XENCO Laboratories

☐ 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

10510

Company COC No: 193 **Work Order No:** Page 1 of 2

Company	KEI Consultants **Phone** (210) 680-3767
Project Name ☐ Previously done at XENCO	**Project ID** TNMPL TNM-97-18 810052-1-0
Location	Lea Co, NM
Project Manager (PM)	**Project Director (PD)** Theresa Mix / Mike Hawthorne
Fax Results to ☒ PM and / or	**Fax** (512) 364-3556
Invoice to ☐ Accounting ☐ Include Invoice with Final Report Attn PM ☒ Invoice must have a P.O Bill to:	
Quote No.	**P.O No** 810052-1-0 ☐ Call for a P.O.
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)	
Specifications	FAX RESULTS TO NUMBER LISTED ABOVE
Sampler Name Monica Sentz Signature	

Lab Only: 184274-SA

Lab Only Additions

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

	Sample ID	Sampling Date	Time	Depth (ft) in" m	Matrix A P S W	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020	BTEX-MTBE by 8020	TPH by TX1005	PAHs by 8270	METALS by 6010 8RCRA	VOAs by 8260	SVOAs by 8270	Highest TPH from each sample ID also analyzed for:	SPLP TPH (1312/418.1)	SPLP VOCs (1312/8260)	SPLP SVOCs (1312/8270)	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
1	SB-1	11/3/98	9:35	0-2	S		X	1	8oz	G	Ice	X		X						X	X	X			
2	SB-1	11/3/98	9:50	4-6	S		X	1	8oz	G	Ice	X		X						X	X	X			
3	SB-1	11/3/98	10:15	20-22	S		X	1	8oz	G	Ice	X		X						X	X	X			
4	MW-1	11/3/98	13:25	0-2	S		X	1	8oz	G	Ice	X		X						X	X	X			
5	MW-1	11/3/98	13:30	2-4	S		X	1	8oz	G	Ice	X		X						X	X	X			
6	MW-1	11/3/98	13:40	15-17	S		X	1	8oz	G	Ice	X		X						X	X	X			
7	MW-2	11/3/98	14:35	0-2	S		X	1	8oz	G	Ice	X		X						X	X	X			
8	MW-2	11/3/98	14:50	25-27	S		X	1	8oz	G	Ice	X		X						X	X	X			
9	MW-3	11/3/98	15:25	0-2	S		X	1	8oz	G	Ice	X		X						X	X	X			
10	MW-3	11/3/98	15:40	20-22	S		X	1	8oz	G	Ice	X		X						X	X	X			

Remarks

SPLP Analyses on highest TPH for each sample ID only

N240 1475 89 0

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time
1		11/4/98 10:00
2		Via U.P.S.
3	Lab: Johnny Mora	11/5/98 10:10

Total Containers per COC:

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), Tedlar Bag (B), Wipe (W), Other _____ **TYPE** Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O) _____

XENCO Laboratories

☐ 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

10511

Company COC No: | Work Order No: | Page 2 of 2

Company	KEI Consultants	**Phone**	(210)680-3767
Project Name ☐ Previously done at XENCO	TNMPL TNM-97-K	**Project ID**	810052-1-0
Location	Lea CO, NM		
Project Manager (PM)	Theresa Nix	**Project Director (PD)**	Mike Hawthorne
Fax Results to ☒ PM and / or		**Fax**	(512)364-3556

Invoice to ☐ Accounting ☐ Include Invoice with Final Report Attn PM ☒ Invoice must have a P.O Bill to:

Quote No. | **P.O No** 810052-1-0 ☐ Call for a P.O.

Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)

Specifications FAX RESULTS TO NUMBER LISTED ABOVE

Sampler Name Monica Sanchez Signature

Lab Only: 184274-SA

Lab Only Additions

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

#	Sample ID	Sampling Date	Time	Depth (ft) in"	Matrix A P S W	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8021 8260 602 624 Other (8020)	BTEX-MTBE by 8020 8021 8260 602 624 Other	TPH by TX1005 418.1 8015GRO 8015DRO 8015JetF	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	Highest TPH from each sample ID also analyzed for:	SPLP TPH (1312/418.1)	SPLP VOCs (1312/8260)	SPLP SVOCs (1312/8270)	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	Remarks	Rcv by: From: Date
1	MW-3	11/3/98	1600	25-27	S		X	1	8oz	G	Ice	X		X						X	X	X				SPLP Analyses on highest TPH sample for each sample ID only	
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time	
1		11/4/98 1605	Total Containers per COC: 11
2			Rush TATs Fax Due: Final Fax Due:
3	Lab:		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), Tedlar Bag (B), Wipe (W), Other _____ **TYPE** Glass Amb (GA), Glass Clear (GC), Plastic (P), Other (O) _____

QA/QC PROCEDURES

DECONTAMINATION OF EQUIPMENT

Cleaning of drilling equipment was the responsibility of the drilling company. In general, the cleaning procedures consisted 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 was cleaned with Liqui-Nox detergent and rinsed with distilled water.

SOIL SAMPLING

Samples of the subsurface soils were obtained utilizing an air rotary drilling rig with split spoon samples at discrete intervals. Representative soil samples were divided into 2 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 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 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.

Soil samples were express mailed to Xenco Laboratories of San Antonio, Texas for BTEX, TPH-DRO, SPLP SVOC, SPLP VOC, and SPLP TPH analyses using the methods described below. Soil samples were prepared for analysis by the analytical laboratory for BTEX, TPH, and SPLP concentrations within 14 days following the collection date.

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

- BTEX concentrations in accordance with EPA Method SW846-8021B
- TPH concentrations in accordance with modified EPA Method 8015-DRO
- SPLP TPH concentrations in accordance with EPA Method 1312/418.1
- SPLP VOC concentrations in accordance with EPA Method SW846-1312/8260
- SPLP SVOC concentrations in accordance with EPA Method SW846-1312/8270

GROUND WATER SAMPLING

Monitoring 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. Monitoring wells with sufficient recharge were purged by removing a minimum of 3 well volumes. Monitoring 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 and Cations/Anions 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
- Anion concentrations in accordance with EPA Method 300
- Cation concentrations in accordance with SM Method 4500CO2D
- TDS concentrations in accordance with SM Method 160.1

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.