RELEASE REPORT

ADDITIONAL SUBSURFACE INVESTIGATION REPORT
AND
ABATEMENT COMPLETION REPORT
(FINAL REPORT)

EOTT ENERGY CORP
TNM 97-14 RELEASE SITE
LEA COUNTY, NEW MEXICO

RECEIVED

JAN 12 2000

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

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

Environmental Technology Group, Inc. Project No. EOT1023C

Prepared By:
Environmental Technology Group, Inc.
4600 West Wall Street
Midland, Texas 79703

December 1999

A Report Prepared for:

EOTT Energy Corp
5805 East Highway 80
Midland, Texas 79701

Additional Subsurface Investigation Report
And
Abatement Completion Report
(Final Report)

Environmental Technology Group, Inc. Project No. EOT1023C

Prepared by:

Jesse Taylor
Principal Geologist

Jerry Nickell
Managing Principal

Environmental Technology Group, Inc.
4600 West Wall Street
Midland, Texas 79703

December 1999

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1.0 INTRODUCTION AND SITE BACKGROUND

The site is located approximately one mile south of the town of Monument, New Mexico in Section 8, Township 20 South, Range 37 East. A site location map is provided as Figure 1. On June 26, 1997, an estimated 29 barrels of crude oil was released at the site, none of which was recovered.

Approximately 9,200 cubic yards of impacted soil was excavated and stockpiled on site. The excavated soil was subsequently land-farmed on site as depicted on Figure 2, the Site Map. In September 1997, phase separated hydrocarbons (PSH) were observed in the excavated area. This product was skimmed off the water and PSH has not been observed at the site since that time. In October 1997, two temporary monitoring wells were installed at the site in order to assess the soil and ground water conditions. These activities were summarized in a report dated March 5, 1998.

A Remediation Plan was submitted to the OCD on October 29, 1998. This report summarized data collected during the excavation and temporary monitoring well installation. The report indicates that a significant portion of the excavation was backfilled with acceptable soil in order to minimize the collection of rainwater. A recovery trench was left open to recover water that collected in the excavation area. The remediation plan provided for the installation of a ground water monitoring well, located on the southwest corner of the excavation. The plan also called for a sampling of the land-farmed soil with one sample per 1,000 cubic yards.

In November 1998, a single ground water monitoring well was installed at the site at a point approximately 200 feet south-southwest of the excavated area. This location was at odds with the proposed location and the OCD requested that an additional well be installed at the southwest corner of the excavation location in a letter dated May 11, 1999. The results from this well installation were summarized in two similar reports, one dated February 3, 1999 and the other dated March 4, 1999.

A review of these reports indicates the following:

- Soil samples collected from the excavation floor and walls indicate that the remaining soil in place does not exceed regulatory limits for hydrocarbon impact;
- Initial water samples collected from the excavation had concentrations of benzene in excess of regulatory standards, however the final sample, collected on June 18, 1998 was non-detect for benzene;
- A small amount of PSH was observed in the excavation but was removed by skimming and no subsequent evidence of the presence of PSH has been detected; and
- Soil and ground water samples, collected from the temporary monitoring wells and one ground water monitoring well, were below regulatory levels for hydrocarbon constituents.

The only remaining issue regarding the site activities was related to the ground water conditions immediately downgradient from the excavation. In order to resolve this question, a ground water monitoring well was installed in this position in October 1999.

2.0 SUMMARY OF RECENT FIELD ACTIVITIES

The monitoring well was installed at the proscribed location on October 27, 1999. The well was drilled to a total depth of 38 feet bgs, as depicted on the soil boring log, included as Appendix A. The well was completed as prescribed by OCD requirements and in accordance with protocols outlined in Section 6 of this report. Both monitoring wells MW-1 and MW-2 were sampled in accordance with OCD requirements on November 9,1999. The soil laboratory data is included in Table 1 and ground water data, collected during the year 1999, is included as Table 2. The laboratory reports are included in Appendix B.

3.0 RESULTS

The soil column consisted primarily red sand interbedded with layers of caliche. No hydrocarbon staining, odors or elevated PID readings were detected in any of the boring soil samples. Ground water was detected at a depth of approximately 25 feet bgs during the well installation. The soil laboratory sample, collected from the interval of 20 to 22 feet bgs, was non-detect for BTEX or TPH. The historical data from monitoring wells MW-1 has been non-detect for BTEX. The ground water sample from monitoring well MW-2 was also non-detect for BTEX.

4.0 RECOMMENDATION

Soil and ground water at this site has been remediated to acceptable levels as described by OCD guidance documents. Therefore, it is recommended that no further abatement or monitoring activities be conducted at the site.

If this recommendation is approved by the OCD, the two monitoring wells will be plugged and abandoned in accordance with approved practices and in accordance with OCD requirements. The land-farmed soil will be tilled and re-seeded with native plants and grasses. Subsequently, adequate care will be provided to insure that these plants will thrive and erosion, associated with the remedial activities, will not occur at the site.

5.0 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.

DISTRIBUTION

Copies 1 and 2 to : EOTT Energy Corp
5805 East Highway 80
Midland, Texas 79701

Copy 3 to: Environmental Technology Group, Inc.
4600 West Wall Street
Midland, Texas 79703

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

COPY NO.: 1

TABLES

TABLE 1

SOIL CHEMISTRY DATA
TNM 97-14
ETGI JOB # 1023C

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)	GRO C6-C10 (mg/kg)	DRO >C10-C25 (mg/kg)
MW-1	11/02/98	0-2	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	11/02/98	28-30	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	10/27/99	20-22	ND	ND	ND	ND	ND	ND	ND	<10

NOTES: NA = Not Analyzed
ND = Not Detected
Detection Limits = 0.1 mg/kg BTEX
10 mg/kg TPH
10 mg/kg GRO/DRO

TABLE 2

GROUNDWATER ELEVATION DATA
TNM 97-14
ETGI PROJECT # EOT1023C

WELL NUMBER	DATE MEASURED	DEPTH TO WATER FROM PVC (feet)	ELEVATION OF WATER (feet)		PSH THICKNESS (feet)
			ACTUAL	CORRECTED	
MW-1	11/17/98	30.39	3,523.21	3,523.21	ND
MW-1	01/07/99	30.43	3,523.17	3,523.17	ND
MW-1	02/05/99	30.42	3,523.18	3,523.18	ND
MW-1	03/12/99	30.44	3,523.16	3,523.16	ND
MW-1	04/08/99	30.44	3,523.16	3,523.16	ND
MW-1	05/12/99	30.23	3,523.37	3,523.37	ND
MW-1	11/09/99	30.90	3,553.70	3,522.70	ND
MW-2	11/09/99	33.60	3,556.78	3,522.78	ND

NOTE: ND = Not Detected

TABLE 3

GROUNDWATER CHEMISTRY DATA
TNM 97-14
ETGI PROJECT # EOT1023C

SAMPLE LOCATION	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)
MW-1	02/05/99	ND	ND	ND	ND	ND
MW-1	05/12/99	ND	ND	ND	ND	ND
MW-1	08/24/99	ND	ND	ND	ND	ND
MW-1	11/09/99	ND	ND	ND	ND	ND
MW-2	11/09/99	ND	ND	ND	ND	ND

Note: Detection limit = 0.001 mg/L

FIGURES

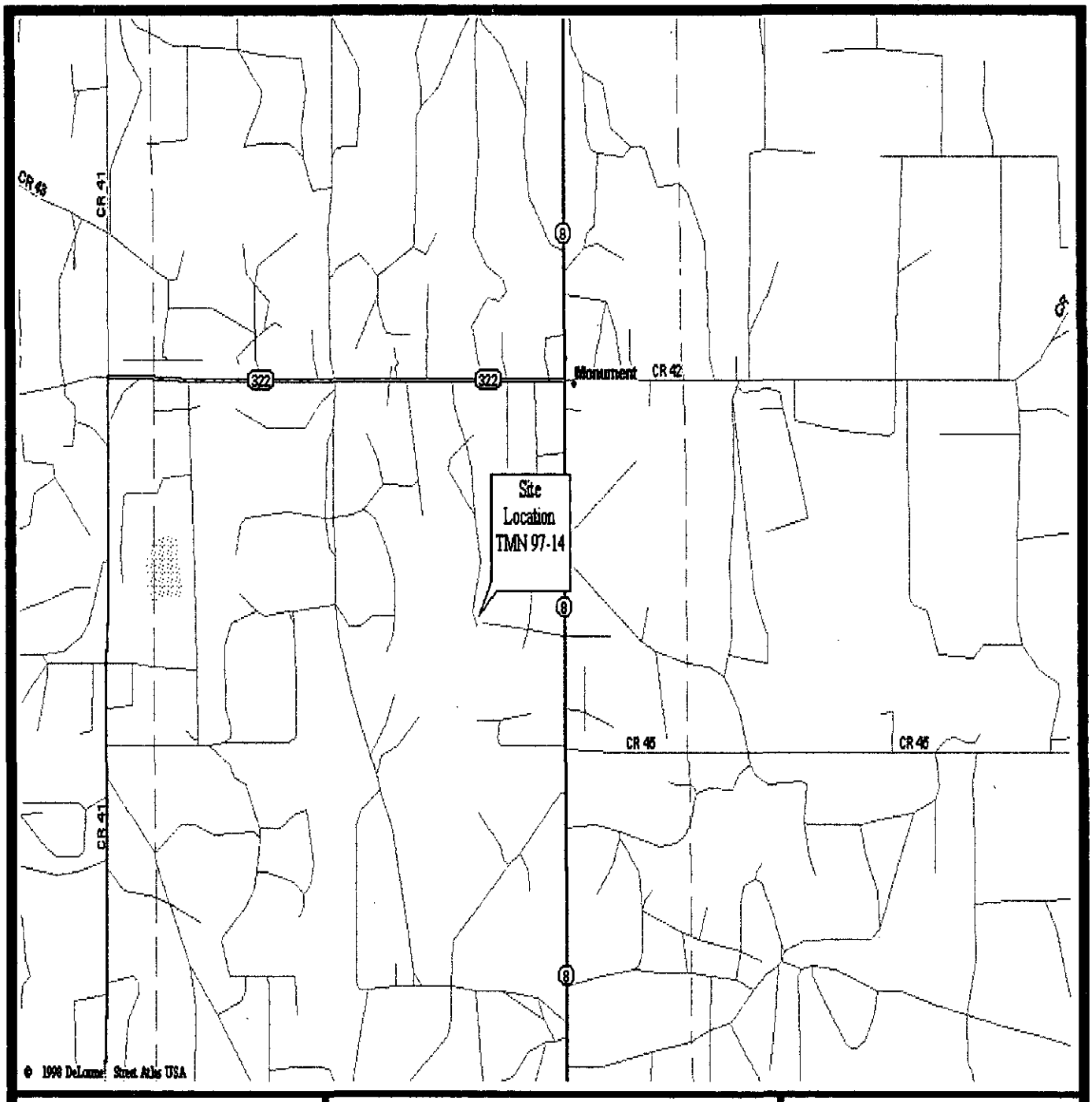
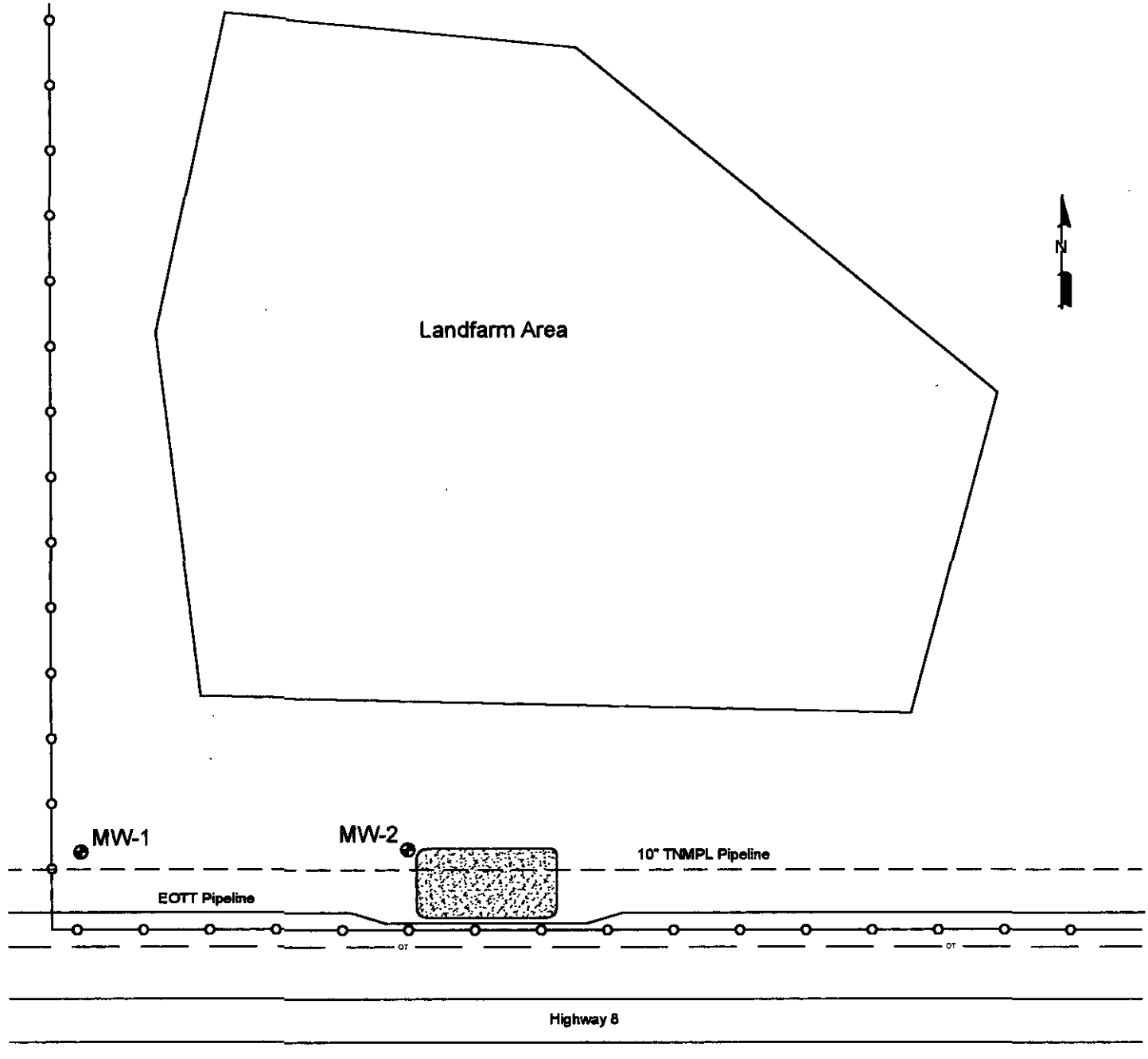


FIGURE 1	Site Location Map	Environmental Technology Group, Inc.
Not To Scale	EOTT Energy Corp. TNM-97-14 Lea County, NM	11 - 22 - 99 RS
		ETGI Project # EOT 1023C



LEGEND:

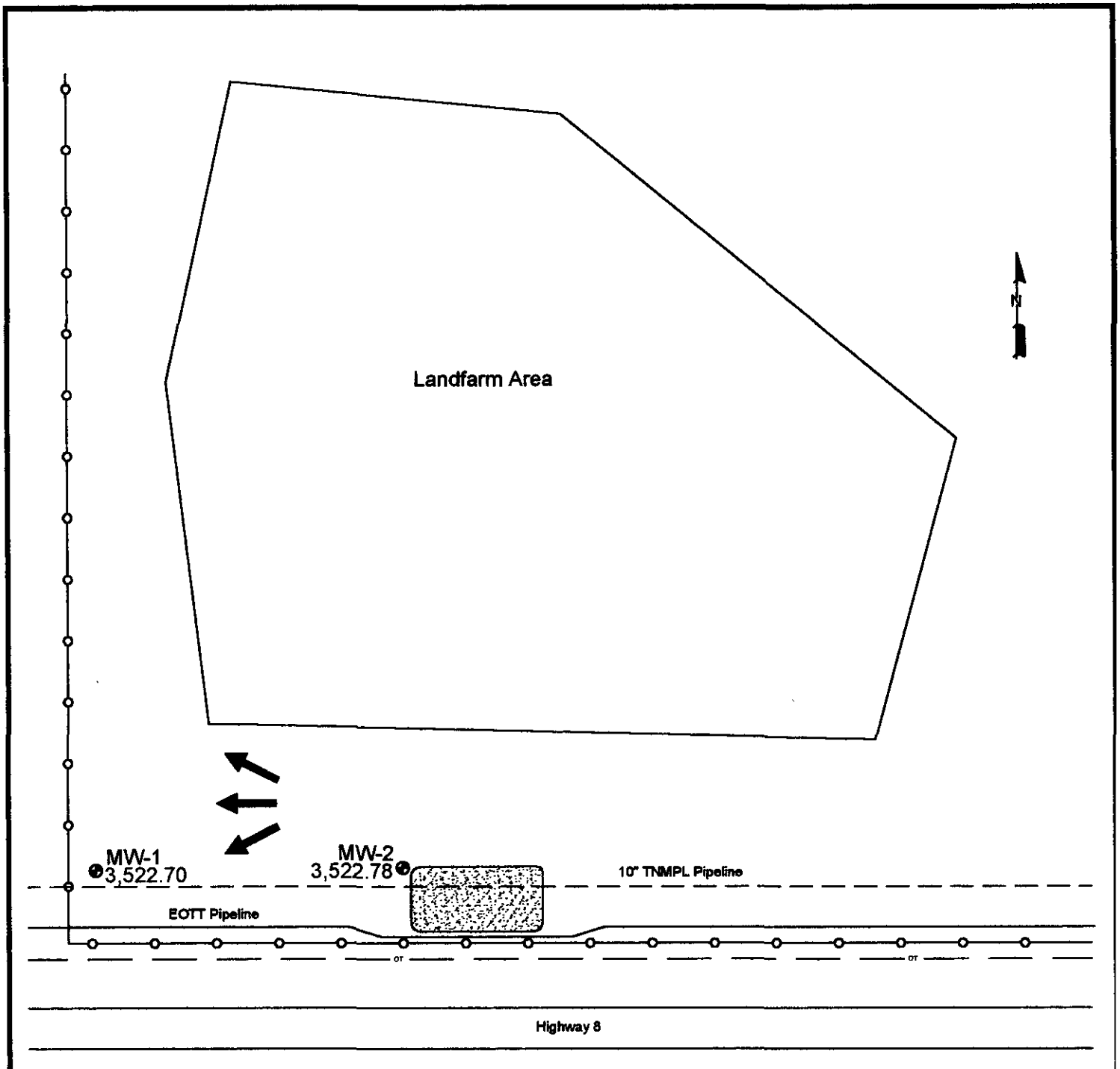
- Existing Monitoring Well
- Fence Line
- Overhead Telephone Line
- Excavated Area
- Possible Ground Water Flow Direction

Figure 2
Site Map

TNM 97-14
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1" = 140'	Prep By: RS	Checked By: JN
September 30, 1999	ETGI Project # EOT 1023C	



LEGEND:

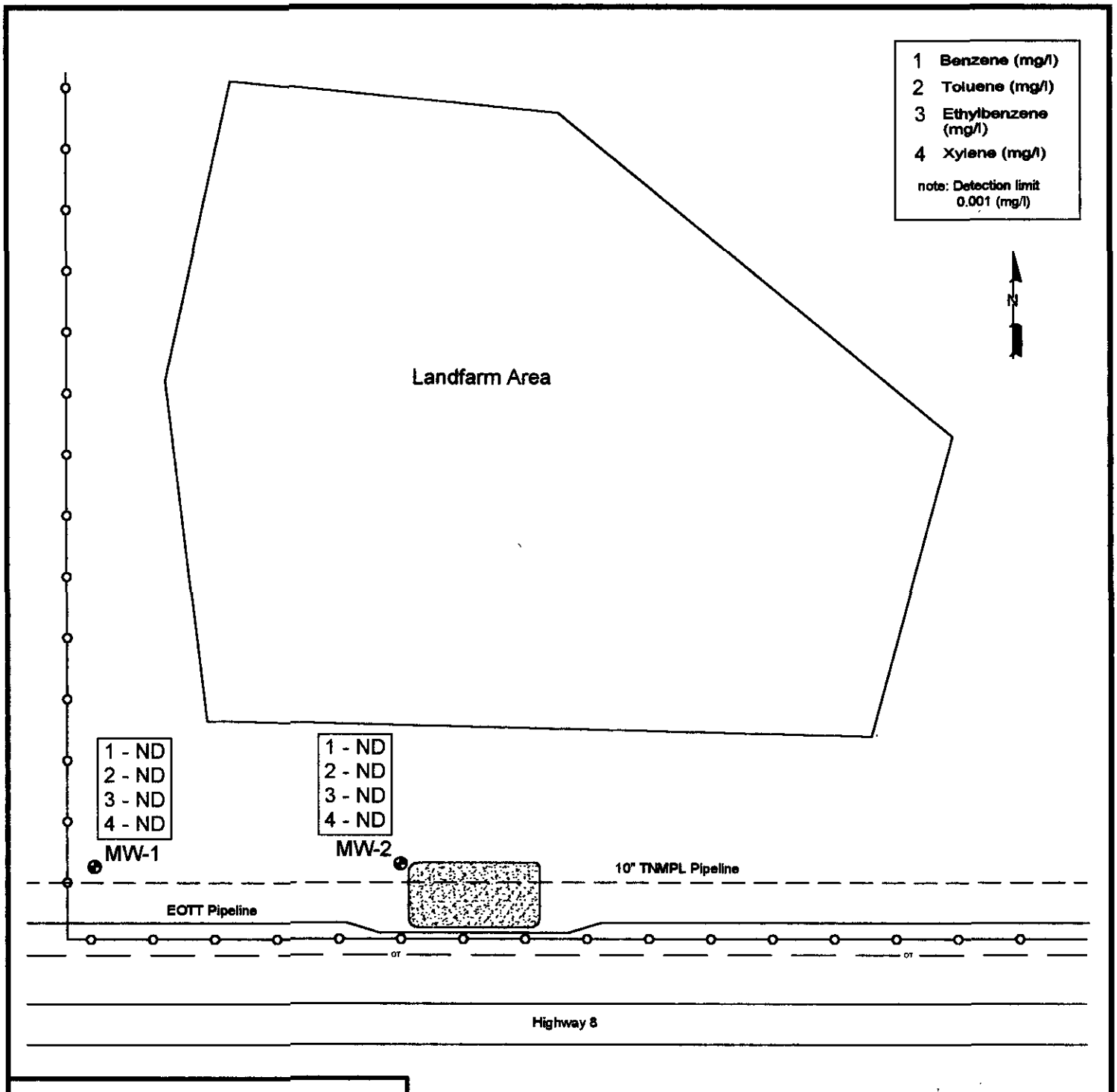
- Existing Monitoring Well
- Fence Line
- Overhead Telephone Line
- Excavated Area
- Possible Ground Water Flow Direction

Figure 3
Ground Water Elevation Map
11/09/99

TNM 97-14
Lea County, NM

Environmental Technology Group, Inc.

Scale: 1" = 140'	Prep By: RS	Checked By: JN
September 30, 1999	ETGI Project # EOT 1023C	



LEGEND:

- Existing Monitoring Well
- Fence Line
- Overhead Telephone Line
- Excavated Area
- Possible Ground Water Flow Direction

MW - 1 Sampled on 11/02/98

MW - 2 Sampled on 10/27/99

Figure 4
Ground Water
Chemisrty Map

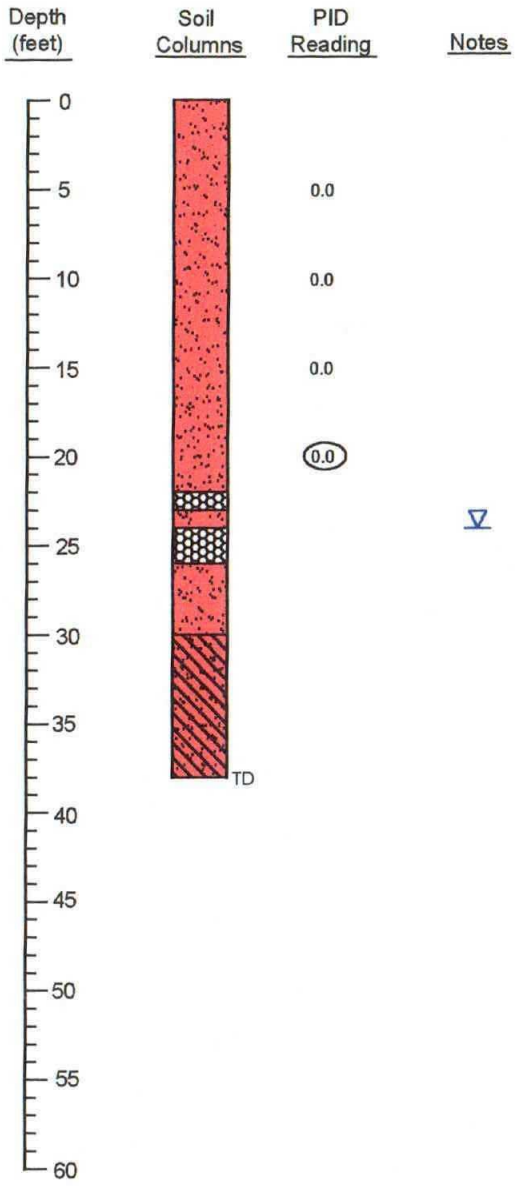
TNM 97-14
Lea County, NM

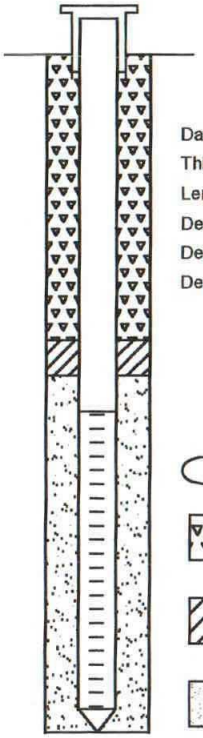
Environmental Technology Group, Inc.

Scale: 1" = 140'	Prep By: RS	Checked By: JN
September 30, 1999	ETGI Project # EOT 1023C	

APPENDIX A

Monitoring Well MW-2





Monitoring Well Details

Date Drilled	10 - 27 - 99
Thickness of Bentonite Seal	2.0 ft
Lenght of PVC Well Screen	20 ft
Depth of PVC Well	38 ft
Depth of Exploratory Well	38 ft
Depth to Ground Water	24 ft

Indicates samples selected for laboratory analysis.

Grout Surface Seal

Bentonite Pellet Seal

Sand Pack

Screen

Legend

Sand - (SM) - Red, very fine grained, well sorted, inter bedded with caliche.

Sand - (SM) - Red, very fine grained, well sorted, moist, interbedded with soft Red clay.

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

Legend

1. The monitoring well was installed on date using air rotary dailing techniques.
2. The well was constructed with 2" ID, 0.010 inch jactory 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 approxiate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 2

EOTT Energy Corp. TMN 97 - 14 Lea County, NM

Environmental Technology Group, Inc.

Scale: NTS	Prep By: RS	Checked By: JT
November 11, 1999	ETGI Project # EOT 1023C	

APPENDIX B

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ETGI
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310
FAX: 505-392-3760(Ken Dutton)

Sample Type: Soil
Sample Condition: Intact/Iced
Project #: TNM 97-14
Project Name: None Given
Project Location: Lea County, N.M.

Sampling Date: 10/27/99
Receiving Date: 10/30/99
Analysis Date: 11/01/99

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)
21151	MW-2 (20-22)	<0.100	<0.100	<0.100	<0.100	<0.100
	% IA	91	89	89	89	89
	% EA	93	86	88	88	89
	BLANK	<0.100	<0.100	<0.100	<0.100	<0.100

METHODS: SW 846-8021,5030

Raland K. Tuttle

11-5-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ETGI
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 505-392-3760 (Ken Dutton)
FAX: 915-520-4310

Sample Type: Soil
Sample Condition: Intact/Iced
Project #: TNM 97-14
Project Name: None Given
Project Location: Lea County, N.M.

Sampling Date: 10/27/99
Receiving Date: 10/30/99
Analysis Date: 11/01/99

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C25 mg/kg
21151	MW-2 (20-22)	<10	<10
	% INSTRUMENT ACCURACY	115	106
	% EXTRACTION ACCURACY	115	104
	BLANK	<10	<10

Methods: EPA SW 846-8015M GRO/DRO

Raland K. Tuttle

11-5-99
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

COC: 028

Project Manager: JESSE TAYLOR
Phone #: (915) 664-9166
FAX #: (915) 520-4310

Company Name & Address: ETGI
P.O. Box 4845 MIDLAND, TX 79704

Project #: TNM 97-14
Project Name: —

Project Location: Lea County NM
Sampler Signature: Ken Dutton

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME
	MW-2 (20-22')	1	4oz		X						X			10-27-99	1300

ANALYSIS REQUEST

BTEX 8020	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	TPH 8015 DRO/GRO
X								X

Relinquished by:	Date:	Time:	Received by:
Ken Dutton	28 oct 99	1420	Rebecca Jurado
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS
FAX Results:
K. DUTTON
(505) 392-3760

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ETGI
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 505-392-3760(Ken Dutton)

Sample Type: Water
Sample Condition: Intact/Iced/HCl
Project #: TNM 97-14
Project Name: EOT 1015C
Project Location: Lea County, N.M.

Sampling Date: 11/09/99
Receiving Date: 11/11/99
Analysis Date: 11/12/99

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
21553	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
21554	MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
	% IA	94	91	94	96	94
	% EA	100	98	101	104	100
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021 5030

Roland K. Tuttle

11-22-99
Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

T-2

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 505-392-3760

Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-14
Project Name: EOT 1015C
Project Location: Lea County,N.M.

Sampling Date: 11/09/99
Receiving Date: 11/11/99
Analysis Date: See Below

ELT#	FIELD CODE	Sulfate mg/L	Chloride mg/L	Carbonate mg/L	Bicarbonate mg/L	TDS mg/L
21554	MW-2	354	478	0	375	1464
	QUALITY CONTROL	44.3	4874	*	*	*
	TRUE VALUE	50.0	5000	*	*	*
	% PRECISION	89	97	*	*	*
	ANALYSIS DATE	11/12/99	11/15/99	11/12/99	11/12/99	11/12/99

METHODS: EPA 375.4, 325.3, 310, 160.1

Roland K. Tuttle

11-22-99
Date

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ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

I-3

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 505-392-3760

Sample Type: Water
Sample Condition: Intact/Iced/HCl
Project #: EOT 1015C
Project Name: TNM 97-16 14
Project Location: Lea County, N.M.

Sample Date: 11/09/99
Receiving Date: 11/11/99
Analysis Date: 11/19/99
Analysis Date: Hg 11/15/99

Analyte (mg/L)	MW-4 2 21554	Reporting Limit	%IA	%EA	BLANK	RPD
Aluminum	24.80	0.0500	97	92	<0.0500	4.75
Arsenic	0.0200	0.0050	106	104	<0.0050	8.00
Barium	1.040	0.0100	97	96	<0.0100	4.80
Beryllium	ND	0.0040	104	106	<0.0040	5.83
Cadmium	ND	0.0010	104	112	<0.0010	3.64
Calcium	477.0	1.000	98	*	<1.000	3.75
Chromium	0.0360	0.0050	102	98	<0.0050	4.74
Cobalt	0.0200	0.0200	100	103	<0.0200	5.16
Copper	0.0170	0.0100	97	93	<0.0100	4.10
Iron	20.90	0.0500	99	96	<0.0500	1.39
Lead	0.0120	0.0030	104	110	<0.0030	5.61
Magnesium	72.30	1.000	98	*	<1.000	1.37
Manganese	0.3510	0.0150	101	102	<0.0150	5.02
Mercury	ND	0.00020	106	83	<0.00020	17.58
Molybdenum	ND	0.050	100	100	<0.050	5.13
Nickel	0.0130	0.0100	102	103	<0.0100	5.77
Potassium	23.10	1.000	93	*	<1.000	3.81
Selenium	ND	0.0050	108	104	<0.0050	3.92
Silver	0.0120	0.0050	110	94	<0.0050	4.72
Sodium	487.0	1.000	110	*	<1.000	3.05
Tin	0.0500	0.0500	105	*	<0.0500	*
Vanadium	0.2240	0.0200	99	100	<0.0200	5.15
Zinc	0.0480	0.0200	94	95	<0.0200	4.95
Boron	0.740	0.050	107	110	<0.050	3.70
Strontium	3.82	0.050	108	108	<0.050	5.71

ND = Below Reporing Limit
METHOD: EPA SW846-6010B, 7470

Roland K Tuttle

Roland K. Tuttle

11-22-99

Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

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: 505-392-3760

Sample Type: Water
Sample Condition: Intact/ Iced
Project #: TNM 97-14
Project Name: EOT 1015C
Project Location: Lea County, N.M.
Field Code: MW-2

Sampling Date: 11/09/99
Receiving Date: 11/11/99
Extraction Date: 11/15/99
Analysis Date: 11/18/99

EPA SW846 8270 (mg/l)	REPORT LIMIT	ELT# 21554	RPD	%EA	%IA
Naphthalene	0.005	ND			70
Acenaphthylene	0.005	ND			82
Acenaphthene	0.005	ND	1.55	65	82
Fluorene	0.005	ND			86
Phenanthrene	0.005	ND			92
Anthracene	0.005	ND			90
Fluoranthene	0.005	ND			94
Pyrene	0.005	ND	1.38	73	98
Benzo[a]anthracene	0.005	ND			94
Chrysene	0.005	ND			96
Benzo[b]fluoranthene	0.005	ND			68
Benzo[k]fluoranthene	0.005	ND			152
Benzo [a]pyrene	0.005	ND			94
Indeno[1,2,3-cd]pyrene	0.005	ND			92
Dibenz[a,h]anthracene	0.005	ND			90
Benzo[g,h,i]perylene	0.005	ND			88

	% RECOVERY
Nitrobenzene-d5 SURR	50
2-Fluorobiphenyl SURR	49
Terphenyl-d14 SURR	43

ND= NOT DETECTED

Method: EPA SW 846 8270C, 3510

Raland K. Tuttle

11-22-99
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

COC: 40

Project Manager: Jesse Taylor
Phone #: (915) 664-9166
FAX #: (505) 392-3760

Company Name & Address: ETGI
P.O. Box 4845 Midland Tx 79704

Project #: TNM 97-14
Project Name: EOT 1015C

Project Location: Lea County, NM
Sampler Signature: Simon Casas

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8021(lowest)	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 160.1	RCI	Cations 6010	Anions 300.0	PAH (8100) or (8270)	Heavy Metals (ICP Scan) 6010
21553	MW 1	2	V	X					X		X			11-9	1142	X											
21554	MW 2	5	1L .5Z ✓	X					X	X	X			11-9	1238	X						X		X	X	X	X

Relinquished by:	Date:	Times:	Received by:
Simon Casas	11-11-98	1405	[signature]
Relinquished by:	Date:	Times:	Received by:
Relinquished by:	Date:	Times:	Received by Laboratory:

REMARKS
MAIL RESULTS:
K DUTTON

INVOICE: LENNAH FROST 1015M

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

March 4 1999

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

Re: Monitoring Well MW-1
TNM-97-14
Unit A, Section 8, Township 20 South, Range 37 East
Lea County, New Mexico
KEI Job No. 710028-1

Dear Mr. Savoie:

This letter summarizes the recent well installation activities at the TNM-97-14 release site. Ground water monitoring will be continued on a quarterly basis for 4 quarters per the Revised Remediation Work Plan approved by the New Mexico Oil Conservation Division (OCD), on November 30, 1998.

PURPOSE AND SCOPE

The purpose of the well installation was to provide a ground water monitoring location down gradient of the release site at the request of the OCD. The monitoring well location selected is believed to be down gradient from the source area based on the gradient direction of Monument Site 15 located north of the TNM-97-14 site.

SOIL INVESTIGATION

On November 2, 1998, 1 monitoring well (designated MW-1) was installed utilizing air rotary drilling. Soil samples were collected at selected intervals from the ground surface to the bottom of the well. 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 installed.

The monitoring well location was surveyed by a Professional Land Surveyor registered in the State of New Mexico and is presented on FIG. 1.

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 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 brown sand fill encountered at the surface. The sand was loose and dry with an observed thickness of approximately 4.5 feet. Head-space readings from samples of this soil type were below instrument detection limits (ND).

Soil Type II
This soil type consisted of tan to reddish brown sand encountered below Soil Type I. The sand was silty, dense to loose, and dry to wet. The observed thickness of this soil type was approximately 4.5 feet. Head-space readings from samples of this soil type were ND.

Soil Type III
This soil type consisted of white, silty sand encountered below Soil Type II. The sand was very calcareous with calcareous nodules, very dense, and dry to moist. The observed thickness of this soil type was approximately 20 feet. Head-space readings from samples of this soil type were ND.

Soil Type IV
This soil type consisted of a tan to reddish brown clay encountered below Soil Type III. The clay contained calcareous nodules, was soft and moist to wet. The observed thickness of this soil type was approximately 9 feet. No samples of this soil type were collected.

A log indicating the subsurface soil profile, depths at which soil samples were obtained, head-space results, laboratory results, and generalized geologic profile are presented on FIG. 2.

SOIL SAMPLING AND ANALYTICAL RESULTS

Two samples were selected from the soil boring based on the following criteria:

- the sample collected from 0 to 2 feet below ground surface
- the sample collected directly above the ground water level measured at the time of drilling

Soil samples selected for analytical testing consisted of the following:

- two soil samples from the monitoring well were tested for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons diesel range organics (TPH-DRO)
- laboratory results for the selected samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGE
BENZENE (mg/kg)	ND
BTEX (mg/kg)	ND
TPH (ppm)	ND

Soil laboratory results are summarized in TABLE I. Soil analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX A. QA/QC procedures are presented as APPENDIX C.

GROUND WATER SAMPLING AND ANALYTICAL RESULTS

Upon completion of drilling, the 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 well on January 7, 1999, was 28.03 feet below ground surface. Ground water measurements are summarized in TABLE II.

A ground water sample was obtained from monitoring well MW-1 on November 17, 1998, and tested for BTEX, ICP heavy metals, major cations/anions, and total dissolved solids (TDS). An additional ground water sample was collected on November 30, 1998, and submitted for polycyclic aromatic hydrocarbon (PAH) analysis. Laboratory results indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGE (mg/l)
BENZENE	ND
BTEX	ND
PAH	ND
METALS	ND to 430
BICARBONATE	405
SULFATE	228
CHLORIDES	412
TDS	1,910

Ground water laboratory results are summarized in TABLES III and IV. Ground water analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX B. QA/QC procedures are presented as APPENDIX C.

Please call me or Theresa Nix at (210) 680-3767 with your questions or comments.

Respectfully,

Monica Slentz
Project Manager

cc: Marc Oler, Equilon
Bill Olson, OCD Santa Fe
OCD Hobbs

mas\p:\tnmpl\710028\assment2\rsubsin2.doc

Approximate Scale: 1"=100'

0 25 50 100

Landfarm Area

10" TNMPL Pipeline

Excavation

Exposed 4" Polyline

EOTT Pipeline

HIGHWAY 8

OT

● MW-1

EL=3523.21
B=ND
BTEX=ND

Cooper's Land

LEGEND

- ● Location of Monitoring Wells
- O Location of Vent Stacks
- —— x —— Fence Line
- —— OT —— Overhead Telephone Line
- EL = Ground water elevation measured on January 7, 1999.
- B = Benzene concentration (mg/L)
- BTEX = Total Benzene, Toluene, Ethylbenzene, Xylenes concentration (mg/L)
- ND = Not Detected

NOTE:
Ground water samples were collected on November 17 and 30, 1998.

01/15/99-RM G:\7128GWC.MI

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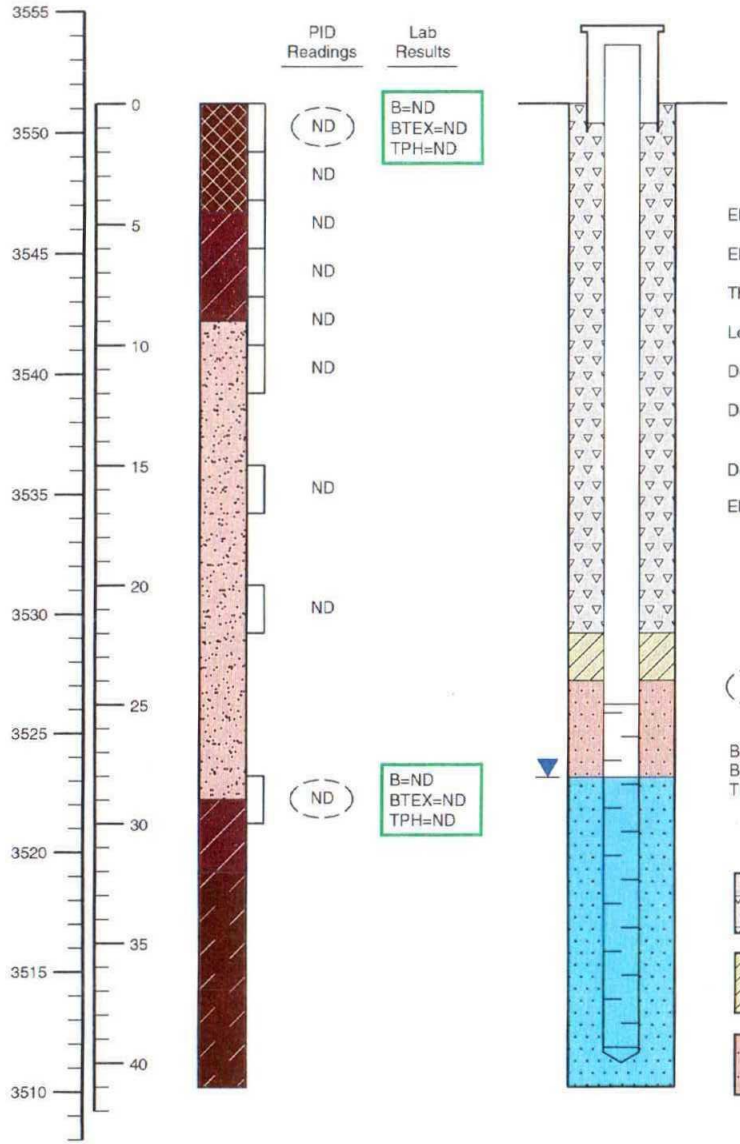
GROUND WATER ELEVATION / CONCENTRATION MAP			710028 - 1
TEXAS-NEW MEXICO PIPE LINE CO.	TNM-97-14	LEA COUNTY, NEW MEXICO	FIG 1

MONITORING WELL MW-1



Monitoring Well Details (MW-1)

Elev of Ground Surface	3551.21 ft
Elev Top of PVC Well	3553.60 ft
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	40.00 ft
Depth of Exploratory Hole	41.0 ft
Depth to Ground Water	28.03 ft
Elev of Ground Water	3523.17 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, sand, loose, brown, dry.

Sand (SM), silty, dense to loose, tan to reddish brown, dry to wet.

Sand (SM), silty, very calcareous with calcareous nodules, very dense, dry to moist, white.

Clay (CL), sandy, calcareous nodules, soft, tan to reddish brown, moist to wet.

Indicates the depth from which a soil-sample was selected and prepared for field head-space and/or laboratory analysis. The soil samples were obtained continuously by hydraulically pushing a split spoon sampler.

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 2, 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-97-14 LEA COUNTY, NEW MEXICO

710028-1-0

FIG 2

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection or reporting limit.
NS - Indicates the constituent was not analyzed.
--- - Indicates PSH was not detected.

Depth to ground water is referenced from the ground surface.

Method detection or reporting limits:

Soil:	BTEX	- 0.050 to 0.100 mg/kg
	TPH	- 10.0 to ppm
Water:	BTEX	- 0.001 to 0.002 mg/l
	Metals	- 0.002 to 5.6 mg/l
	PAH	- 0.002 mg/l
	Cations	- 4.0 mg/l
	Anions	- 4 mg/l
	TDS	- 25.0 mg/l

Laboratory test methods:

BTEX	- EPA Method SW846-8021B
TPH	- Modified EPA Method 8015 Diesel Range Organics
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-97-14
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)
MW-1	11/2/98	0 - 2	ND	ND	ND	ND	ND	ND
	11/2/98	28 - 30	ND	ND	ND	ND	ND	ND

TABLE II

SUMMARY OF GROUND WATER MEASUREMENTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
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	11/02/98	3,551.20	27.99	3,523.21	---	---
	01/07/99	3,551.20	28.03	3,523.17	---	---

NOTE:
Depth to ground water is referenced from ground surface.

TABLE III

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS-NEW MEXICO PIPE LINE COMPANY
TNM-97-14
LEA COUNTY, NEW MEXICO

MONITORING WELL	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/l)	BTEX (mg/l)
MW-1	11/17/98	ND	ND	ND	ND	ND

TABLE IV

SUMMARY OF GROUND WATER RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	MW-1	MW-1
SAMPLE DATE	11/17/98	11/30/98
CONSTITUENT	CONCENTRATION (mg/l)	
PAH		
All Constituents	NS	ND
METALS		
Barium	0.082	NS
Boron	0.76	NS
Calcium	372	NS
Magnesium	53.6	NS
Manganese	0.082	NS
Potassium	6.389	NS
Silicon	31.8	NS
Sodium	430	NS
Strontium	3.301	NS
Vanadium	0.049	NS
CATIONS/ANIONS		
Bicarbonate	405	NS
Chloride	412	NS
Sulfate	228	NS
TDS	1,910	NS

NOTE:
Those constituents not listed above were ND.

ANALYTICAL REPORT 1-84249

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNMPL

Project Id: 710028

November 17, 1998

XENCO Laboratories

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

November 17, 1998

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

Reference: **XENCO Report No.: 1-84249**
Project Name: TNMPL
Project ID: 710028
Project Address: Lea Co., 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 1-84249. 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. 1-84249 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

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Theresa Nix
Project Location: Lea Co., NM

Project Name: TNMPL

XENCO COC#: 1-84249
Date Received in Lab: Nov 4, 1998 10:00 by CC
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	MW-1	184249-001	BTEX	SW-846	ppm	10 days	Nov 2, 1998 11:10		Nov 4, 1998 by HL	Nov 4, 1998 18:56 by HL
2			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 2, 1998 11:10		Nov 9, 1998 by RK	Nov 14, 1998 07:10 by AM
3		184249-002	BTEX	SW-846	ppm	10 days	Nov 2, 1998 13:00		Nov 4, 1998 by HL	Nov 4, 1998 19:14 by HL
4			TPH8015M-D	SW-846 8015 M	mg/kg	10 days	Nov 2, 1998 13:00		Nov 9, 1998 by RK	Nov 14, 1998 08:47 by AM

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84249

K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 710028
Project Manager: Theresa Nix
Project Location: Lea Co., NM

Date Received in Lab : Nov 4, 1998 10:00
Date Report Faxed: Nov 17, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184249 001	184249 002		
	Field ID:	MW-1	MW-1		
	Depth:	0-2'	28-30'		
	Matrix:	Solid	Solid		
	Sampled:	11/02/98 11:10	11/02/98 13:00		
TPH-DRO (Diesel) **EPA 8015 M**	*Analyzed:*	11/14/98	11/14/98		
	Units:	mg/kg R.L.	mg/kg R.L.		
Total Petroleum Hydrocarbons		< 10.0 (10.0)	< 10.0 (10.0)		
BTEX **EPA 8021B**	*Analyzed:*	11/04/98	11/04/98		
	Units:	ppm R.L.	ppm R.L.		
Benzene		< 0.050 (0.050)	< 0.050 (0.050)		
Toluene		< 0.050 (0.050)	< 0.050 (0.050)		
Ethylbenzene		< 0.050 (0.050)	< 0.050 (0.050)		
m,p-Xylene		< 0.100 (0.100)	< 0.100 (0.100)		
o-Xylene		< 0.050 (0.050)	< 0.050 (0.050)		
Total BTEX		N.D.	N.D.		

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25D87

SW- 846 5030/8021B BTEX

Date Validated: Nov 5, 1998 11:15
Date Analyzed: Nov 4, 1998 11:42

Analyst: HL
Matrix: Solid

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] QC LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1160	0.1000	0.0010	116.0	65-135	
Toluene	< 0.0010	0.1130	0.1000	0.0010	113.0	65-135	
Ethylbenzene	< 0.0010	0.1140	0.1000	0.0010	114.0	65-135	
m,p-Xylene	< 0.0020	0.2290	0.2000	0.0020	114.5	65-135	
o-Xylene	< 0.0010	0.1120	0.1000	0.0010	112.0	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 : 18A25D87

SW- 846 5030/8021B BTEX

Date Validated: Nov 5, 1998 11:15
Date Analyzed: Nov 4, 1998 12:19

Analyst: HL
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 184238- 006	[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	< 0.020	1.942	1.880	2.000	0.020	25.0	3.2	97.1	94.0	65-135	
Toluene	< 0.020	1.980	1.936	2.000	0.020	25.0	2.2	99.0	96.8	65-135	
Ethylbenzene	< 0.020	1.998	2.000	2.000	0.020	25.0	0.1	99.9	100.0	65-135	
m,p-Xylene	< 0.040	4.040	4.020	4.000	0.040	25.0	0.5	101.0	100.5	65-135	
o-Xylene	< 0.020	1.990	2.000	2.000	0.020	25.0	0.5	99.5	100.0	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 : 18A40H67

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Nov 16, 1998 11:50
Date Analyzed: Nov 14, 1998 06:06

Analyst: AM
Matrix: *Solid*

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result	[B] Blank Spike Result	[C] Blank Spike Amount	[D] Detection Limit	[E] QC Blank Spike Recovery	[F] LIMITS Recovery Range	[G] Qualifier
	mg kg	mg/kg	mg/kg	mg/kg	%	%	
Total Petroleum Hydrocarbons	< 10.00	162	200	10.00	81.0	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

MENSO Laboratories

Certificate Of Quality Control for Batch : 18A40H67

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Nov 16, 1998 11:50
Date Analyzed: Nov 14, 1998 07:10

Analyst: AM
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 18219- 001 / 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
Total Petroleum Hydrocarbons	< 10.00	241	168	200	10.00	30.0	35.7	120.5	84.0	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

☐ 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

10504

Company COC No: 189 Work Order No: Page 1 of 1

Company	KEI
Phone	1800-253-0507
Project Name	TNMPL ☐ Previously done at XENCO
Project ID	710028
Location	LEA CO. N.M.
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: 710028/1/0
Quote No.	P.O No ☐ Call for a P.O.
Special DLs	(RR I RR II DW QAPP See Lab PM Call Proj. PM)
Specifications	PLEASE FAX RESULTS TO Theresa Nix AT THE NUMBER LISTED
Sampler Name	Steve Fruendt Signature

Lab Only: ~~182~~ 184249-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

Remarks

	Sample ID	Sampling Date	Time	Depth (ft / m)	Matrix (A P S W)	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020 (602 624 8260 8021)	BTEX-MTBE by 8020 (602 624 8260 8021)	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 - SPLPTPH SPLP's	SPLP Semi Volatiles	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	MW-1 ~~20'~~	11/2/98	1110	0-2'	S	X		1	902	GC	ICE	X		X					X				
2	MW-1 ~~30'~~	11/2/98	1300	28-30'	S	X		1	902	GC	ICE	X		X					X				
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

N240 1476 07 7

DELIVERY 2

VIA UPS

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time
1		11/2/98 1717
2		11/3/98 1602
3	Lab: Custop	11/4/98 10:00

Total Containers per COC: 2

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 1-84545

for

K.E.I. Consultants, Inc.

Project Manager: Stas Grover

Project Name: Reeves-TNM 9714

Project Id: 710028

December 8, 1998

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

December 8, 1998

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

Reference: **XENCO Report No.: 1-84545**
Project Name: Reeves-TNM 9714
Project ID: 710028
Project Address: Lea County, NM

Dear Stas 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 1-84545. 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. 1-84545 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

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Stas Grover
Project Location: Lea County, NM

Project Name: Reeves-TNM 9714

XENCO COC#: 1-84545
Date Received in Lab: Nov 24, 1998 13:10 by LY
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	MW-1	184545-001	BTEX	SW-846	ppm	10 days	Nov 17, 1998 11:00		Nov 24, 1998 by HL	Nov 24, 1998 19:32 by HL
2			TDS	EPA 160.1	mg/L	10 days	Nov 17, 1998 11:00		Nov 24, 1998 by JO	Nov 25, 1998 14:45 by JO
3			Tot. Metals	EPA	mg/L	10 days	Nov 17, 1998 11:00		Nov 30, 1998 by ALO	Nov 30, 1998 14:57 by MAB
4			Anions	EPA 300.0	mg/L	10 days	Nov 17, 1998 11:00		Nov 25, 1998 by OR	Nov 25, 1998 23:27 by OR
5			Mercury, Tot	SW846-7470	mg/L	10 days	Nov 17, 1998 11:00		Nov 30, 1998 by AO	Nov 30, 1998 14:09 by CG
6			Carbonate	SM4500CO2D	mg/L	10 days	Nov 17, 1998 11:00		Nov 25, 1998 by IF	Nov 25, 1998 15:15 by IF
7			Bicarbonate	SM 4500CO2D	mg/L	10 days	Nov 17, 1998 11:00		Nov 25, 1998 by IF	Nov 25, 1998 15:15 by IF
8			Total Metals	EPA 6010	mg/L	10 days	Nov 17, 1998 11:00		Nov 30, 1998 by AO	Dec 2, 1998 14:24 by CG

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84545

K.E.I. Consultants, Inc.

Project Name: Reeves-TNM 9714

Project ID: 710028
Project Manager: Stas Grover
Project Location: Lea County, NM

Date Received in Lab : Nov 24, 1998 13:10
Date Report Faxed: Dec 8, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	184545 001			
	Field ID:	MW-1			
	Depth:				
	Matrix:	Liquid			
	Sampled:	11/17/98 11:00			
Total Metals (ICP) **EPA 6010**	*Analyzed:*	12/02/98	R.L.		
	Units:	mg/L			
Boron		0.76	(0.11)		
Calcium		372	(1.1)		
Silicon		31.8	(0.6)		
Sodium		430	(5.6)		
Tin		< 0.22	(0.22)		
Total Mercury **EPA 7470**	*Analyzed:*	11/30/98	R.L.		
	Units:	mg/L			
Mercury		< 0.001	(0.001)		
BTEX **EPA 8021B**	*Analyzed:*	11/24/98	R.L.		
	Units:	ppm			
Benzene		< 0.001	(0.001)		
Toluene		< 0.001	(0.001)		
Ethylbenzene		< 0.001	(0.001)		
m,p-Xylene		< 0.002	(0.002)		
o-Xylene		< 0.001	(0.001)		
Total BTEX			N.D.		
Bicarbonate **SM 4500CO2D**	*Analyzed:*	11/25/98	R.L.		
	Units:	mg/L			
Bicarbonate		405	(4.0)		
Carbonate **SM4500CO2D**	*Analyzed:*	11/25/98	R.L.		
	Units:	mg/L			
Carbonate		< 4.0	(4.0)		
Total Dissolved Solids **EPA 160.1**	*Analyzed:*	11/25/98	R.L.		
	Units:	mg/L			
Total Dissolved Solids		1910	(25.0)		
Total Metals by ICP-MS **ICP-MS Metal**	*Analyzed:*	11/30/98	R.L.		
	Units:	mg/L			
Aluminum		< 1.11	(1.11)		
Arsenic		< 0.056	(0.056)		
Barium		0.082	(0.028)		
Beryllium		< 0.006	(0.006)		
Cadmium		< 0.006	(0.006)		
Chromium		< 0.028	(0.028)		

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84545

K.E.I. Consultants, Inc.

Project Name: Reeves-TNM 9714

Project ID: 710028
Project Manager: Stas Grover
Project Location: Lea County, NM

Date Received in Lab : Nov 24, 1998 13:10
Date Report Faxed: Dec 8, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	*184545 001*			
	Field ID:	MW-1			
	Depth:				
	Matrix:	Liquid			
	Sampled:	11/17/98 11:00			
Total Metals by ICP-MS	*Analyzed:*	11/30/98			
ICP-MS Metal	*Units:*	mg/L	R.L.		
Cobalt		< 0.028	(0.028)		
Copper		< 0.028	(0.028)		
Iron		< 0.56	(0.56)		
Lead		< 0.011	(0.011)		
Magnesium		53.6	(0.6)		
Manganese		0.082	(0.056)		
Mercury		< 0.002	(0.002)		
Molybdenum		< 0.056	(0.056)		
Nickel		< 0.056	(0.056)		
Potassium		6.389	(2.778)		
Selenium		< 0.050	(0.050)		
Silver		< 0.028	(0.028)		
Strontium		3.301	(0.556)		
Tin		< 1.11	(1.11)		
Vanadium		0.049	(0.028)		
Zinc		< 0.028	(0.028)		
Anions by Ion Chromatography	*Analyzed:*	11/25/98			
EPA 300.0	*Units:*	mg/L	R.L.		
Chloride		412	(4)		
Sulfate		228	(4)		

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A48A35

EPA SW846/6020 Total Metals by ICP- MS

Date Validated: Dec 1, 1998 13:17
Date Analyzed: Nov 30, 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	2.37	2.20	0.56	107.7	70-125	
Arsenic	< 0.0278	2.1350	2.2000	0.0278	97.0	70-125	
Barium	< 0.0278	1.0039	1.1000	0.0278	91.3	70-125	
Beryllium	< 0.0056	0.4422	0.4440	0.0056	99.6	70-125	
Cadmium	< 0.0056	0.4200	0.4440	0.0056	94.6	75-125	
Chromium	< 0.0111	1.0872	1.1000	0.0111	98.8	70-125	
Cobalt	< 0.0278	1.1072	1.1000	0.0278	100.7	70-125	
Copper	< 0.0278	1.0511	1.1000	0.0278	95.6	70-125	
Iron	< 0.556	2.778	2.222	0.556	125.0	70-125	
Lead	< 0.0111	2.0578	2.2200	0.0111	92.7	70-125	
Magnesium	< 0.56	4.33	4.44	0.56	97.5	70-125	
Manganese	< 0.0556	2.2650	2.2200	0.0556	102.0	70-125	
Mercury	< 0.0028	0.0033	0.0028	0.0028	117.9	75-125	
Nickel	< 0.0278	1.0933	1.1000	0.0278	99.4	70-125	
Potassium	< 2.778	4.556	4.400	2.778	103.5	70-125	
Selenium	< 0.0556	2.1550	2.2000	0.0556	98.0	70-125	
Silver	< 0.0278	0.8783	1.1000	0.0278	79.8	70-125	
Strontium	< 0.556	2.030	2.200	0.556	92.3	70-125	
Vanadium	< 0.0278	1.0461	1.1000	0.0278	95.1	70-125	
Zinc	< 0.0278	1.0078	1.1000	0.0278	91.6	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 : 18A48A35

EPA SW846/6020 Total Metals by ICP- MS

Date Validated: Dec 1, 1998 13:17
Date Analyzed: Nov 30, 1998 15:03

Analyst: MAB
Matrix: Liquid

Q.C. Sample ID 184545- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Aluminum	< 0.556	< 0.556	0.556	N.C	25.0	2.321	2.20	105.5	70-125	
Arsenic	< 0.0278	< 0.0278	0.0278	N.C	25.0	2.1717	2.200	98.7	70-125	
Barium	0.0817	0.0822	0.0278	0.6	25.0	1.1000	1.100	92.6	70-125	
Beryllium	< 0.0056	< 0.0056	0.0056	N.C	25.0	0.4267	0.444	96.1	70-125	
Cadmium	< 0.0056	< 0.0056	0.0056	N.C	20.0	0.3961	0.444	89.2	75-125	
Chromium	< 0.0111	< 0.0111	0.0111	N.C	25.0	1.0544	1.100	95.9	70-125	
Cobalt	< 0.0278	< 0.0278	0.0278	N.C	25.0	1.0928	1.100	99.3	70-125	
Copper	< 0.0278	< 0.0278	0.0278	N.C	25.0	1.0133	1.100	92.1	70-125	
Iron	< 0.556	< 0.556	0.556	N.C	25.0	2.667	2.22	120.1	70-125	
Lead	< 0.0111	< 0.0111	0.0111	N.C	25.0	2.1428	2.220	96.5	70-125	
Magnesium	53.61	54.94	0.56	2.5	25.0	52.22	4.4	31.3	70-125	A,B
Manganese	0.0817	0.0828	0.0556	1.3	25.0	2.1378	2.220	92.6	70-125	
Mercury	< 0.0028	< 0.0028	0.0028	N.C	20.0	0.0028	0.003	100.0	75-125	

(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
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A48A35

EPA SW846/6020 Total Metals by ICP- MS

Date Validated: Dec 1, 1998 13:17
Date Analyzed: Nov 30, 1998 15:03

Analyst: MAB
Matrix: Liquid

Q.C. Sample ID 184545- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Nickel	< 0.0278	< 0.0278	0.0278	N.C	25.0	1.0678	1.100	97.1	70-125	
Potassium	6.3889	6.5556	2.7778	2.6	25.0	9.9444	4.400	80.8	70-125	
Selenium	< 0.0556	< 0.0556	0.0556	N.C	25.0	2.0839	2.200	94.7	70-125	
Silver	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.3939	1.100	35.8	70-125	B
Strontium	3.3006	3.3622	0.5556	1.8	25.0	4.9861	2.200	76.6	70-125	
Vanadium	0.0489	0.0494	0.0278	1.0	25.0	1.0939	1.100	95.0	70-125	
Zinc	< 0.0278	< 0.0278	0.0278	N.C	25.0	0.9139	1.100	83.1	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
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A05E12

SW846- 7470 Total Mercury

Date Validated: Nov 30, 1998 16:21
Date Analyzed: Nov 30, 1998 14:10

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 184545- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC	[I] LIMITS	[G]
Parameter			Detection Limit	Relative Difference	Relative Difference			Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0011	< 0.0011	0.0011	N.C	25.0	0.0026	0.003	92.9	70-120	

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 : 18A25E18

SW- 846 5030/8021B BTEX

Date Validated: Nov 25, 1998 16:00
Date Analyzed: Nov 24, 1998 14:33

Analyst: HL
Matrix: Liquid

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
Benzene	< 0.0010	0.0975	0.1020	0.1000	0.0010	20.0	4.5	97.5	102.0	65-135	
Toluene	< 0.0010	0.0968	0.0979	0.1000	0.0010	20.0	1.1	96.8	97.9	65-135	
Ethylbenzene	< 0.0010	0.0954	0.0960	0.1000	0.0010	20.0	0.6	95.4	96.0	65-135	
m,p-Xylene	< 0.0020	0.1930	0.1980	0.2000	0.0020	20.0	2.6	96.5	99.0	65-135	
o-Xylene	< 0.0010	0.0982	0.1000	0.1000	0.0010	20.0	1.8	98.2	100.0	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

Certificate Of Quality Control for Batch : 18A20C23

SM 4500C02D Bicarbonate

Date Validated: Nov 25, 1998 15:48
Date Analyzed: Nov 25, 1998 14:45

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	260	250	4.00	104.0	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 : 18A20C23

SM 4500C02D Bicarbonate

Date Validated: Nov 25, 1998 15:48
Date Analyzed: Nov 25, 1998 15:25

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184545- 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	%	%	
Bicarbonate	405	403	4.00	0.5	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 : 18A20C22

SM4500C02D Carbonate

Date Validated: Nov 25, 1998 15:48
Date Analyzed: Nov 25, 1998 15:25

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184545- 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	%	%	
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 : 18A47A08

EPA 160.1 Total Dissolved Solids

Date Validated: Nov 25, 1998 15:00
Date Analyzed: Nov 25, 1998 14:30

Analyst: JO
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184493- 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	%	%	
Total Dissolved Solids	384	383	5.00	0.3	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. Clemens, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A46A78

EPA 6010 Total Metals (ICP)

Date Validated: Dec 3, 1998 08:58
Date Analyzed: Dec 2, 1998 14:17

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	2.109	2.220	0.111	95.0	70-125	
Calcium	< 1.111	4.373	4.444	1.111	98.4	70-125	
Silicon	< 0.556	4.641	4.440	0.556	104.5	70-125	
Sodium	< 1.11	14.00	13.32	1.11	105.1	70-125	
Tin	< 0.222	2.311	2.220	0.222	104.1	70-125	

lank Spike Recovery [E] = 100*(B-A)/(C)
.C. = Not calculated, data below detection limit
D. = Below detection limit
ll results are based on MDL and validated for QC purposes only

Eddie L. Clemens, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A46A78

EPA 6010 Total Metals (ICP)

Date Validated: Dec 3, 1998 08:58
Date Analyzed: Dec 2, 1998 14:28

Analyst: CG
Matrix: Liquid

Q.C. Sample ID 184545- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Boron	0.756	0.760	0.111	0.5	25.0	2.772	2.22	90.8	70-125	
Calcium	372	372	1.11	0.0	25.0	324	4.4	1081	70-125	A,B
Silicon	31.77	32.03	0.56	0.8	25.0	32.41	4.4	14.4	70-125	A,B
Sodium	430	434	1.11	0.9	25.0	384	4.4	1036	70-125	A,B
Tin	< 0.222	< 0.222	0.222	N.C	25.0	2.333	2.22	105.1	70-125	

(A) High analyte concentration affects spike recovery.
(B) Post-digestion spike 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. Clemens, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A10C86

EPA 300.0 Anions by Ion Chromatography

Date Validated: Dec 8, 1998 09:13
Date Analyzed: Nov 25, 1998 20:57

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	4.78	4.09	5.00	0.20	20.0	15.6	95.6	81.8	70-125	
Nitrate	< 0.20	4.07	4.41	5.00	0.20	20.0	8.0	81.4	88.2	70-125	
Sulfate	< 0.20	4.26	4.51	5.00	0.20	20.0	5.7	85.2	90.2	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 = 18A10C86

EPA 300.0 Anions by Ion Chromatography

Date Validated: Dec 8, 1998 09:13
Date Analyzed: Nov 25, 1998 23:37

Analyst: OR
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184546- 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	%	%	
Chloride	209	212	4.0	1.4	20.0	
Sulfate	76.0	78.0	4.0	2.6	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

Certificate Of Quality Control for Batch = 18A10C86

EPA 300.0 Anions by Ion Chromatography

Date Validated: Dec 8, 1998 09:13

Date Analyzed: Nov 25, 1998 23:04

Analyst: OR

Matrix: *Liquid*

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 184565- 016	[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	%	%	
Nitrate	77.0	78.0	8.0	1.3	20.0	
Sulfate	1050	1130	8.0	7.3	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: 213 **Work Order No:** 10445

Page 1 of 1

Company KEI	**Phone** 210-680-3767
Project Name 710028 ☐ Previously done at XENCO	**Project ID** 710028
Location LEA COUNTY, NM	
Project Manager (PM) STAS GROTER	**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** 710028 ☐ 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

Lab Only: 184545-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	418.1	8015GRO	8015DRO	8015JetF	PAHs by 8270	8100	8310	METALS by 6010	BRCRA	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 (6010) / ANION (300.0)	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
		17Nov98										8021	8260	602	624	Other																																		
1	MW-1	~~17Nov98~~	1100				X	6	V,1	GA P	H2C4 HNO3	X							X			X																					X	X				IF Questions call STAS GROTER @ 210-680-3767	
2																																															
3																																															
4																																															
5																																															
6																																															
7																																															
8																																															
9																																															
10																																															

Remarks

Lab Only Additions From: / Rcv by: / Date

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time
1		17Nov98/1530
2	by UPS	
3	Lab:	11-24-98 1310

Total Containers per COC: 6

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 1-84622

for

K.E.I. Consultants, Inc.

Project Manager: Stan Grover

Project Name: 710028-1-0

Project Id: 710028-1-0

December 14, 1998

XENCO Laboratories

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 14, 1998

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

Reference: **XENCO Report No.: 1-84622**
Project Name: 710028-1-0
Project ID: 710028-1-0
Project Address: Lea Co., 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 1-84622. 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. 1-84622 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

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710028-1-0
Project Manager: Stan Grover
Project Location: Lea Co., NM.

Project Name: 710028-1-0

XENCO COC#: 1-84622
Date Received in Lab: Dec 1, 1998 10:05 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	MW-1	184622-001	PAHs	SW846-8270	mg/L	10 days	Nov 30, 1998 14:00		Dec 2, 1998 by RK	Dec 3, 1998 10:56 by MM

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-84622

K.E.I. Consultants, Inc.

Project Name: 710028-1-0

Project ID: 710028-1-0
Project Manager: Stan Grover
Project Location: Lea Co., NM.

Date Received in Lab : Dec 1, 1998 10:05
Date Report Faxed: Dec 14, 1998
XENCO contact : *Carlos Castro/Karen Olson*

Analysis Requested	*Lab ID:*	184622 001			
	Field ID:	MW-1			
	Depth:				
	Matrix:	Liquid			
	Sampled:	11/30/98 14:00			
PAHs by GC-MS	*Analyzed:*	12/03/98			
EPA 8270	*Units:*	mg/L	R.L.		
Acenaphthene		< 0.002	(0.002)		
Acenaphthylene		< 0.002	(0.002)		
Anthracene		< 0.002	(0.002)		
Benz(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)		
Dibenz(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		< 0.002	(0.002)		
Phenanthrene		< 0.002	(0.002)		
Pyrene		< 0.002	(0.002)		

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A02D79

SW846- 8270 PAHs by GC- MS

Date Validated: Dec 14, 1998 12:00
Date Analyzed: Dec 3, 1998 03:44

Analyst: MM
Matrix: Liquid

Parameter	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
	[A] Blank Result	[B] Blank Spike Result	[C] Blank Spike Duplicate Result	[D] Blank Spike Amount	[E] Detection Limit	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
	mg/L	mg/L	mg/L	mg/L	mg/L	%	%	%	%	%	
Acenaphthene	< 0.0020	0.0444	0.0454	0.0500	0.0020	31.0	2.2	88.8	90.8	46-118	
4-Chloro-3-methylphenol	< 0.0020	0.0411	0.0413	0.0500	0.0020	42.0	0.5	82.2	82.6	23-97	
2-Chlorophenol	< 0.0020	0.0366	0.0375	0.0500	0.0020	40.0	2.4	73.2	75.0	27-123	
1,4-Dichlorobenzene	< 0.0020	0.0402	0.0411	0.0500	0.0020	28.0	2.2	80.4	82.2	36-97	
2,4-Dinitrotoluene	< 0.0020	0.0411	0.0432	0.0500	0.0020	38.0	5.0	82.2	86.4	24-96	
N-Nitrosodi-n-propylamine	< 0.0040	0.0451	0.0462	0.0500	0.0040	38.0	2.4	90.2	92.4	41-116	
4-Nitrophenol	< 0.0040	0.0102	0.0100	0.0500	0.0040	50.5	2.0	20.4	20.0	10-80	
Pentachlorophenol	< 0.0010	0.0216	0.0249	0.0500	0.0010	50.0	14.2	43.2	49.8	9-103	
Phenol	< 0.0010	0.0125	0.0129	0.0500	0.0010	42.0	3.1	25.0	25.8	12-89	
Pyrene	< 0.0020	0.0532	0.0562	0.0500	0.0020	31.0	5.5	106.4	112.4	26-127	
1,2,4-Trichlorobenzene	< 0.0010	0.0423	0.0435	0.0500	0.0010	28.0	2.8	84.6	87.0	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

for 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

13273

Company COC No: 204 Work Order No: 710028-1-Ø Page 1 of 1

Company: KEI	Phone: (210) 680-3767
Project Name: 710028-1-Ø ☐ Previously done at XENCO	Project ID:
Location: LEA CO NM	
Project Manager (PM): S. GLOVER	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: 710028-1-Ø	
Quote No.	P.O No: ☐ Call for a P.O.
Special DLs (RR I RR II DW QAPP See Lab PM Call Proj. PM)	
Specifications	
Sampler Name: KEN SUTTON Signature:	

Lab Only: 184622-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

Remarks: QUESTIONS; S. GLOVER @ (210) 680-3767

	Sample ID	Sampling Date	Time	Depth ft" in" m	Matrix A P S W	Composite	Grab	# Containers	Container Size	Type	Preservatives
1	MW-1	30 NOV 98	HRP				X	1	1	GA	C4
2											
3											
4											
5											
6											
7											
8											
9											
10											

BTEX by 8020 8021 8260 602 624 Other
BTEX-MTBE by 8020 8021 8260 602 624 Other
TPH by TX1005 418.1 8015GRO 8015DRO 8015JetF
PAHs by 8270 8100 8310 — X
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 14d 21d — 10d
Addn: PAH above mg/L W. mg/Kg S Highest Hit
Hold Analysis

N031 906 755 1 DELIVERY 1

Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time	
1		30 NOV 98	Total Containers per COC: 1
2		Via U.P.S.	Rush TATs Fax Due: Final Fax Due:
3	Lab: Johnny Orona	12/1/98 10:05	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, and TPH-DRO analyses using the methods described below. Soil samples were prepared for analysis by the analytical laboratory for BTEX and TPH 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

GROUND WATER SAMPLING

The monitoring well was 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. The monitoring well had sufficient recharge and was purged by removing a minimum of 3 well volumes.

After purging the well, the ground water sample was 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).

The ground water sample collected for BTEX analysis was placed in two 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.

The ground water sample collected for PAH and Cations/Anions analyses was filled to capacity in 2 sterile, 1 liter glass containers equipped with Teflon-lined caps. The ground water sample collected for metals analysis was filled to capacity in a 1 liter plastic container pre-preserved with HNO_3 and equipped a with Teflon-lined cap. The ground water sample collected for TDS analysis was filled to capacity in a sterile, 500 ml plastic container equipped with a Teflon-lined cap. 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 EPA 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.

SUBSURFACE INVESTIGATION REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
LEA COUNTY, NEW MEXICO

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

SUBSURFACE INVESTIGATION REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
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

Theresa Nix
Project Manager

Paul B. Hartnett, P.E.
Senior Engineer

KEI Job No. 710028

March 5, 1998

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Texas - New Mexico Pipe Line Company (TNMPL) release site TNM-97-14 is located approximately five miles south of Monument, New Mexico, in Section 8, Township 20 North, Range 37 East. A site location map is presented as FIG. 1. This report summarizes subsurface investigation activities conducted October 17, 1997.

Subsurface investigation activities performed included the following:

- installing temporary monitoring wells TMW-1 and TMW-2
- collection of native soil samples from the temporary monitoring wells for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) concentrations;
- collecting ground water samples from temporary monitoring wells TMW-1 and TMW-2 for analysis of BTEX and polycyclic aromatic hydrocarbon (PAH).

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 below these closure standards.
- Phase-separate hydrocarbon (PSH) was not observed in either of the temporary monitoring wells.
- Ground water samples at the site indicated BTEX concentrations below 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 subsurface investigation activities was to evaluate depth to ground water across the site. The following activities were performed to achieve this objective:

- install two temporary monitoring wells
- collect soil and ground water samples for analysis of hydrocarbon concentrations

FIELD INVESTIGATION

SOIL INVESTIGATION

During the subsurface investigation, two temporary monitoring wells (designated TMW-1 and TMW-2) 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 temporary monitoring wells were prepared and shipped to the laboratory for analysis.

Upon advancement to total depth and collection of soil and ground water samples, the temporary well was removed. The borings were grouted and capped at the surface.

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 locations of the temporary monitoring wells 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, three 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 a tan to brown sand and was encountered at the surface of both temporary monitoring well locations. The sand was slightly coarse, moist to dry, and contained calcareous nodules. This soil type thickness ranged from approximately 6 to 23 feet. Head-space readings from samples of this soil type were non-detectable (ND).

Soil Type II

This soil type consisted of a white to tan gravel (caliche) and was encountered beneath Soil Type I at temporary monitoring well TMW-2. The gravel was weathered and varied in thickness from approximately 4 to 8 feet. The head-space reading from a sample of this soil type was ND.

Soil Type III

This soil type consisted of a brown clay and was encountered at both temporary monitoring well locations. The clay was sandy, moist to wet, and contained calcareous nodules. This soil type varied in thickness from approximately 6 to 10 feet. The head-space readings from samples of this soil type were ND.

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 FIG. 4.

SOIL SAMPLING AND ANALYTICAL RESULTS

Native soil samples were collected at selected intervals from the ground surface to a depth at approximately 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 at 10 to 12 feet below ground surface; and
- The sample directly above the ground water level measured at the time of drilling.

Four soil samples from the temporary monitoring wells were selected for determination of BTEX and TPH concentrations by EPA Method SW846-8020 and Modified 8015 Diesel Range Organics (DRO), respectively.

Laboratory results for the selected samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATIONS (mg/kg)
BENZENE	ND to 0.052
BTEX	ND to 0.315
TPH	16.6 to 19.8

Soil laboratory results are summarized in TABLE I. BTEX and TPH laboratory results are also graphically presented on FIG. 3. Analytical laboratory reports are included in APPENDIX A.

GROUND WATER SAMPLING AND ANALYTICAL RESULTS

Upon completion of drilling, a temporary well consisting of two-inch PVC was placed in each boring to collect ground water samples. Each temporary 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 each of the temporary monitoring wells with a disposable Teflon sampler 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 sterile one liter glass 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 San Antonio, Texas for determination of BTEX and concentrations using EPA Method SW846-8020 and 8100, 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
BTEX	ND to 0.001
PAHs	ND

Ground water BTEX laboratory results are summarized in TABLE II. Laboratory results are graphically presented on FIG. 5. Analytical laboratory reports are included in APPENDIX A.

Purged water collected during the event was stored in steel drums pending disposal.

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 each of the temporary monitoring wells indicated BTEX and TPH concentrations below closure standards.
- PSH was not observed in the temporary monitoring wells.

- *Ground water samples obtained from the temporary monitoring wells indicated* BTEX concentrations below New Mexico Drinking Water Standards.

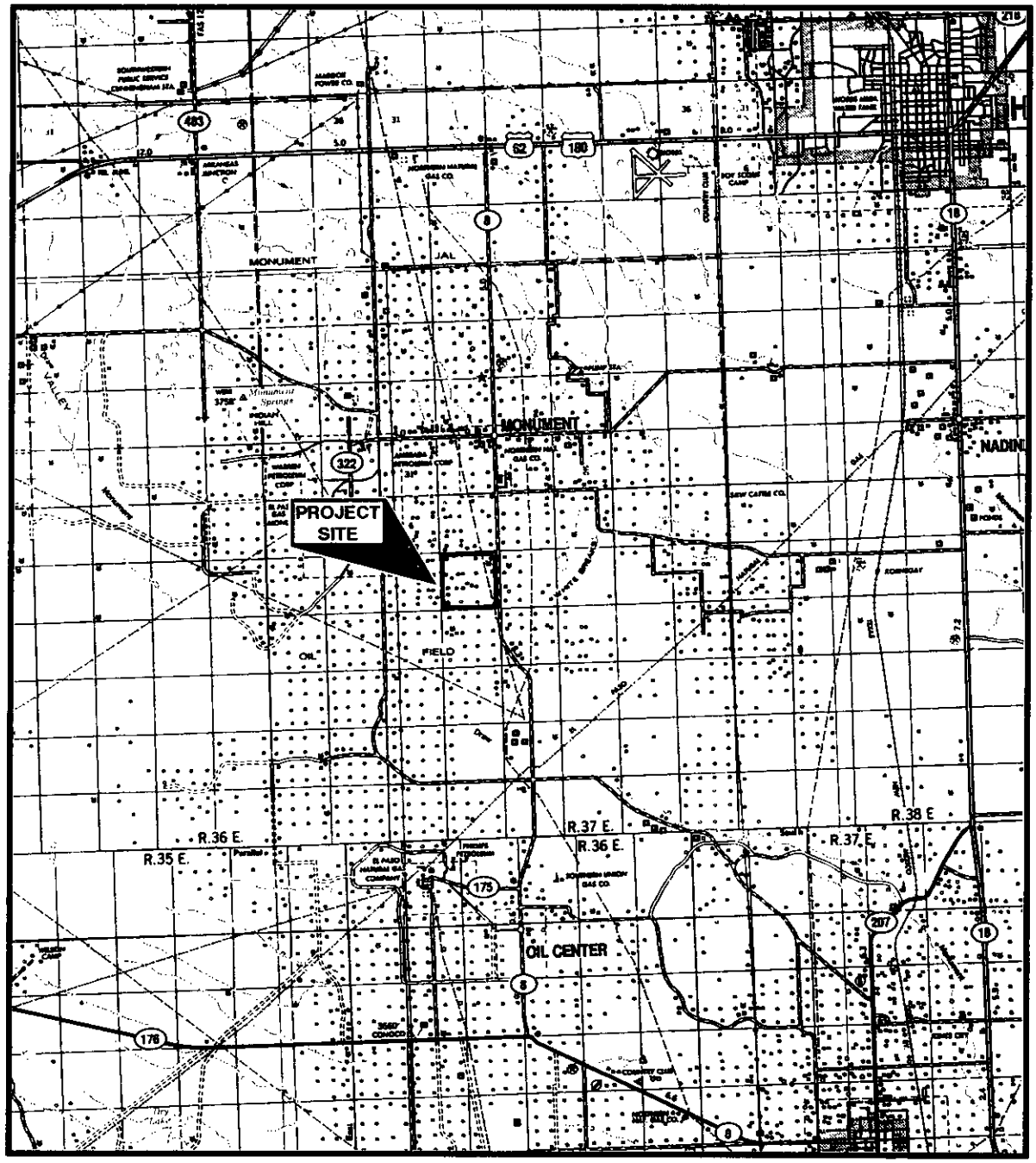
STAGE 1 ABATEMENT PLAN

Although the field investigation results presented above do not indicate hydrocarbon concentration results above closure standards, PSH is currently observed on top of water within the excavation on-site. As a result, additional subsurface investigation activities shall be conducted at the site to determine site geology, site hydrogeology, vertical and horizontal extent, and magnitude of vadose-zone and ground water impact. A workplan will be developed to address additional subsurface investigation activities. Upon OCD approval, implementation of the plan, and data review, a remediation plan and subsequent schedule will be prepared and submitted to OCD.

THE ROADS OF NEW MEXICO

NEW MEXICO-LEA CO.

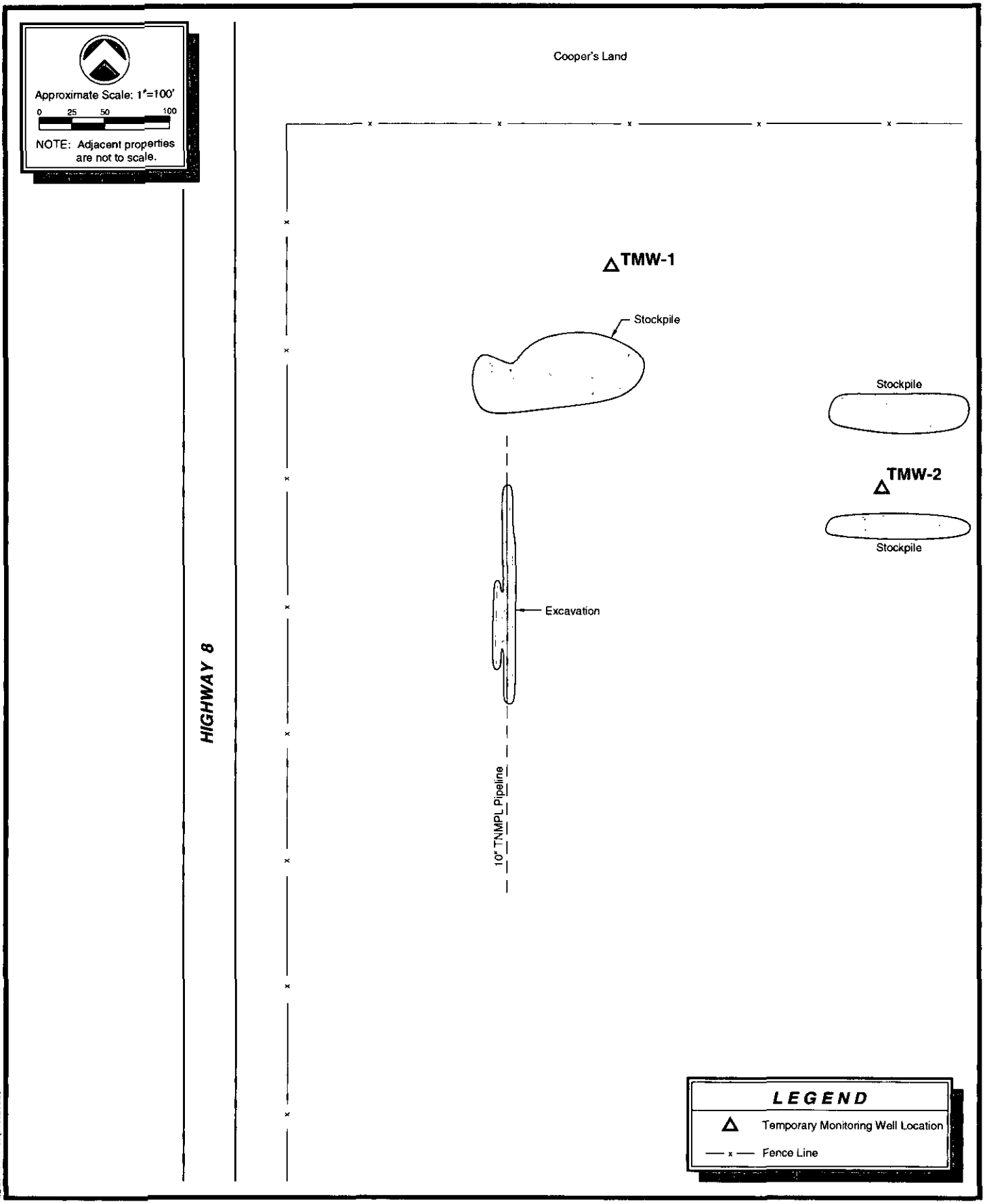
MONUMENT



SCALE - ONE INCH EQUALS 2.9 MILES

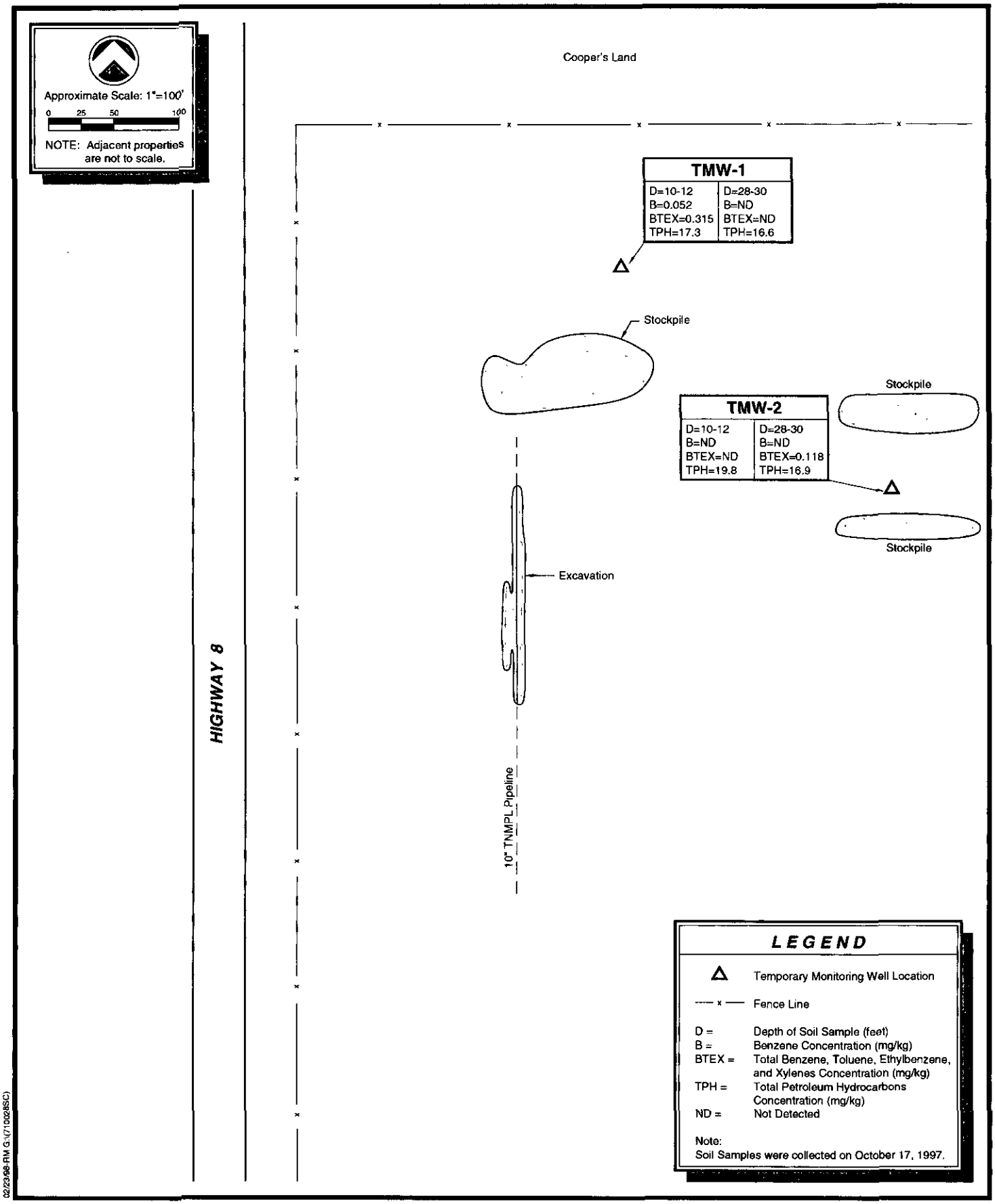
0 1 2 3 4 5 6

k·e·i	*SITE LOCATION MAP*		710028
	TNMPL	TNM-97-14 LEA COUNTY, NEW MEXICO	FIG 1



02/23/98-RM G:\(710028SD)

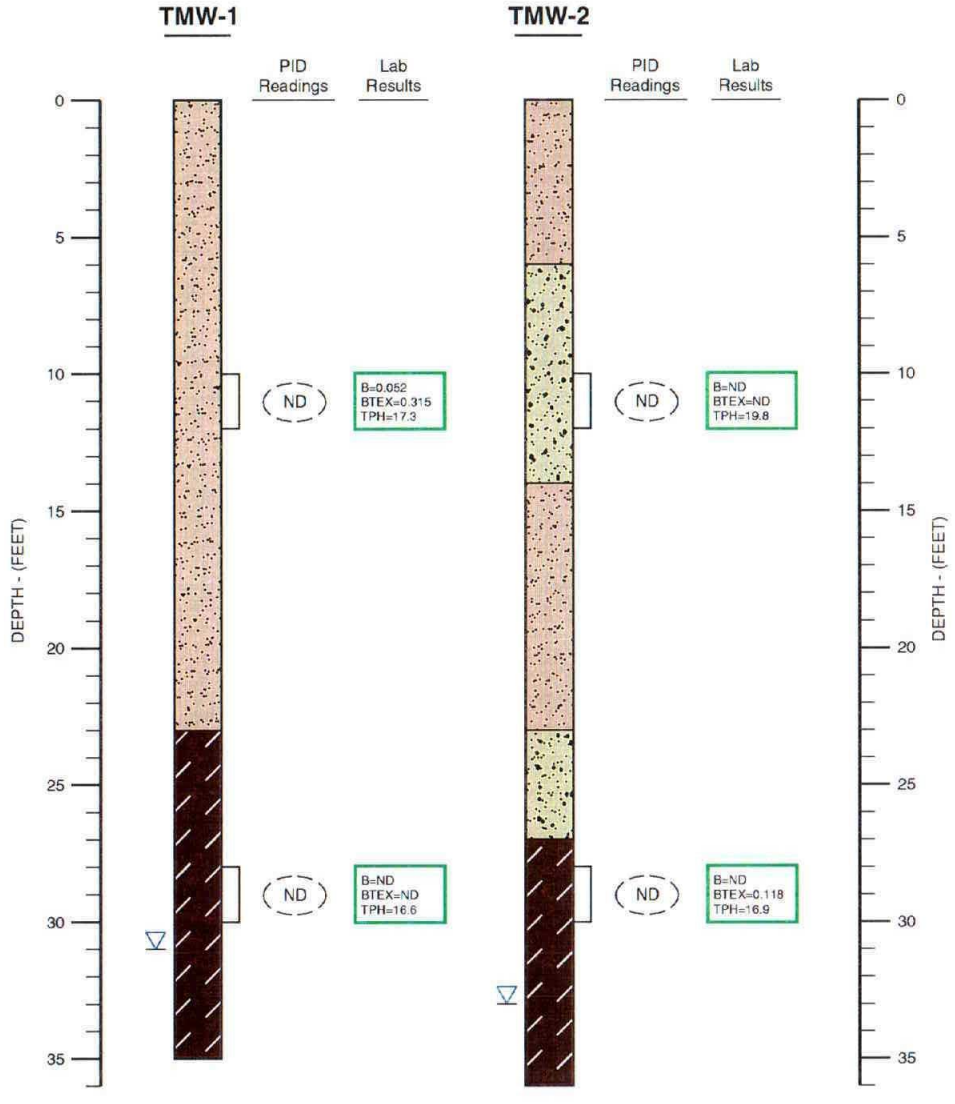
k·e·i	*SITE DETAILS*	710028
	TNMPL TNM-97-14 LEA COUNTY, NEW MEXICO	FIG 2



02/23/98-RM G:\(710028SC)

k·e·i

SOIL CONCENTRATION MAP - OCTOBER 1997			710028
TNMPL	TNM-97-14	LEA COUNTY, NEW MEXICO	FIG 3



LEGEND

Sand (SM), slightly coarse, moist to dry, tan to brown, contains calcareous nodules.

Gravel (GM), weathered, tan to white.

Clay (CL), sandy. moist to wet, brown, contains calcareous nodules.

Indicates the depth from which a soil-sample was selected and prepared for field head-space and/or laboratory analysis. The soil samples were obtained continuously by hydraulically pushing a split spoon sampler.

Indicates sample selected for laboratory analysis.

B = Benzene concentration (mg/kg)
BTEX = Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentration (mg/kg)
TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

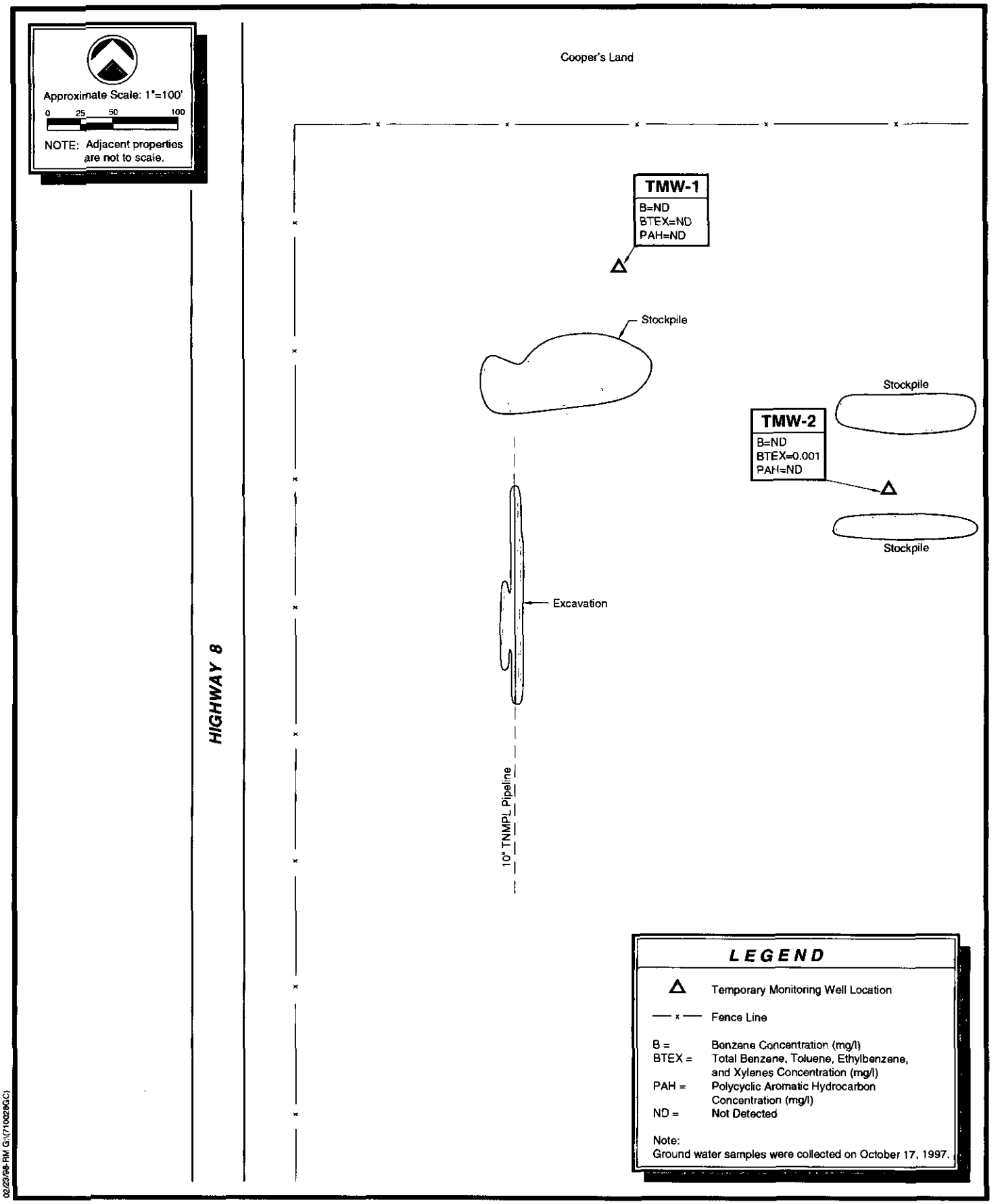
PID = Head-space readings in ppm obtained with a photoionization detector.
ND = Indicates the concentration was below laboratory detection limits.

Depth of ground water during drilling.

NOTES:

1. The temporary monitoring wells were drilled on October 17, 1997 using an air rotary rig.
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.
4. The temporary monitoring wells were backfilled with a cement/bentonite grout and capped at the surface with concrete.

k·e·i	***LEGEND AND NOTES - TEMPORARY MONITORING WELLS***	**710028**
	TNMPL **TNM-97-14** **LEA COUNTY, NEW MEXICO**	**FIG 4**



02/23/98-RM G:\(710028GC)

k·e·i	GROUND WATER CONCENTRATION MAP - OCTOBER 1997	710028
	TNMPL TNM-97-14 LEA COUNTY, NEW MEXICO	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	-	0.050 to 0.300 mg/kg
	TPH	-	10 mg/kg
Water:	BTEX	-	0.001 to 0.006 mg/l
	PAH	-	0.002 mg/l
Laboratory test methods:	BTEX	-	EPA Method SW846-8020
	TPH	-	Modified EPA Method 8015 Diesel Range Organics
	PAH	-	EPA Method 8100

TABLE I

SUMMARY OF SOIL LABORATORY RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
LEA COUNTY, 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)
TMW-1	10/17/97	10 - 12	0.052	0.051	0.050	0.162	0.315	17.3
TMW-1	10/17/97	28 - 30	ND	ND	ND	ND	ND	16.6
TMW-2	10/17/97	10 - 12	ND	ND	ND	ND	ND	19.8
TMW-2	10/17/97	28 - 30	ND	ND	ND	0.118	0.118	16.9

TABLE II

SUMMARY OF GROUND WATER LABORATORY RESULTS - BTEX
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-97-14
LEA COUNTY, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
TMW-1	10/17/97	ND	ND	ND	ND	ND
TMW-2	10/17/97	ND	0.001	ND	ND	0.001

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-72544

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Theresa Nix
Project Location: TNMPL Reeves

Project Name: TNMPL

Date Received in Lab : Oct 21, 1997 10:00 by AS
Date Report Faxed: Oct 27, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	172544-001	172544-002	172544-003	172544-004	172544-005	172544-006	172544-007	172544-008
	Field ID:	TMW-1	TMW-1	TMW-1	TMW-1	TMW-2	TMW-2	TMW-2	TMW-2
	Depth:	10-12'	28-30'			10-12'	28-30'		
TPH-DRO (Diesel) by EPA 8015 M		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)							
		Oct 22, 1997	Oct 22, 1997			Oct 22, 1997	Oct 22, 1997		
Total Petroleum Hydrocarbons		17.3	16.6			19.8	16.9		
BTEX by EPA 8020		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)							
		Oct 23, 1997	Oct 23, 1997	Oct 23, 1997		Oct 23, 1997	Oct 23, 1997	Oct 23, 1997	
Benzene		0.052	< 0.050	< 0.001		< 0.050	< 0.050	< 0.001	
Toluene		0.051	< 0.050	< 0.001		< 0.050	< 0.050	0.001	
Ethylbenzene		0.050	< 0.050	< 0.001		< 0.050	< 0.050	< 0.001	
m,p-Xylenes		0.112	< 0.100	< 0.002		< 0.100	0.118	< 0.002	
o-Xylene		0.050	< 0.050	< 0.001		< 0 050	< 0.050	< 0.001	
Total BTEX		0.315	< 0.300	< 0.006		< 0.300	0.118	0.001	
PAHs by GC-MS by EPA 8100		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)							
					Oct 23, 1997				Oct 23, 1997
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

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-72544

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Theresa Nix
Project Location: TNMPL Reeves

Project Name: TNMPL

Date Received in Lab : Oct 21, 1997 10:00 by AS
Date Report Faxed: Oct 27, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	172544-001	172544-002	172544-003	172544-004	172544-005	172544-006	172544-007	172544-008
	Field ID:	TMW-1	TMW-1	TMW-1	TMW-1	TMW-2	TMW-2	TMW-2	TMW-2
	Depth:	10-12'	28-30'			10-12'	28-30'		
		Date Analyzed - Analytical Results							**ppm (mg/L - mg/Kg)**
					Oct 23, 1997				Oct 23, 1997
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,e)pyrene					< 0.002				< 0.002
Dibenzo(a,h)anthracene					< 0.002				< 0.002
Dibenz(a,j)acridine					< 0.002				< 0.002
Fluoranthene					< 0.002				< 0.002
Fluorene					< 0.002				< 0.002
Indeno(1,2,3-cd)pyrene					< 0.002				< 0.002
3-Methylcholanthrene					< 0.002				< 0.002
Naphthalene					< 0.002				< 0.002
Phenanthrene					< 0.002				< 0.002
Pyrene					< 0.002				< 0.002
Dibenz(a,h)acridine					< 0.002				< 0.002
Benzo(j)fluoranthene					< 0.002				< 0.002
7H-Dibenzo(c,g)carbazole					< 0.002				< 0.002

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-72544

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Theresa Nix
Project Location: TNMPL Reeves

Project Name: TNMPL

Date Received in Lab : Oct 21, 1997 10:00 by AS
Date Report Faxed: Oct 27, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	172544-001	172544-002	172544-003	172544-004	172544-005	172544-006	172544-007	172544-008	
	Field ID:	TMW-1	TMW-1	TMW-1	TMW-1	TMW-2	TMW-2	TMW-2	TMW-2	
	Depth:	10-12'	28-30'			10-12'	28-30'			
		Date Analyzed - Analytical Results							**ppm (mg/L - mg/Kg)**	
					Oct 23, 1997				Oct 23, 1997	
Dibenzo(a,h)pyrene					< 0.002				< 0.002	
Dibenzo(a,i)pyrene					< 0.002				< 0.002	

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A29D12

SW- 846 5030/8020 BTEX

Date Validated: Oct 24, 1997 16:00
Date Analyzed: Oct 22, 1997 18:26
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OR
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.0972	0.1000	0.0010	97.2	65-135	
Toluene	< 0.0010	0.0957	0.1000	0.0010	95.7	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2070	0.2000	0.0020	103.5	65-135	
o-Xylene	< 0.0010	0.0962	0.1000	0.0010	96.2	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
B.D. = Below detection limit
Results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A29D12

SW- 846 5030/8020 BTEX

Date Validated: Oct 24, 1997 16:00
Date Analyzed: Oct 22, 1997 19:02
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OR
Matrix: Liquid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 172468- 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
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1080	0.1120	0.1000	0.0010	25.0	3.6	108.0	112.0	65-135	
Toluene	< 0.0010	0.1070	0.1110	0.1000	0.0010	25.0	3.7	107.0	111.0	65-135	
Ethylbenzene	< 0.0010	0.1070	0.1120	0.1000	0.0010	25.0	4.6	107.0	112.0	65-135	
m,p-Xylenes	< 0.0020	0.2150	0.2240	0.2000	0.0020	25.0	4.1	107.5	112.0	65-135	
o-Xylene	< 0.0010	0.1040	0.1080	0.1000	0.0010	25.0	3.8	104.0	108.0	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

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A34F28

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

Date Validated: Oct 23, 1997 14:17
Date Analyzed: Oct 22, 1997 17:45
QA/QC Manager: Edward H. Yonemoto, Ph.D.

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] Method 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	0.0830	0.0860	0.1000	0.0040	31.0	3.6	83.0	86.0	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0702	0.0750	0.1000	0.0040	42.0	6.6	70.2	75.0	23-97	
2-Chlorophenol	< 0.0040	0.0652	0.0704	0.1000	0.0040	40.0	7.7	65.2	70.4	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0720	0.0780	0.1000	0.0040	28.0	8.0	72.0	78.0	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0814	0.0818	0.1000	0.0040	38.0	0.5	81.4	81.8	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0810	0.0810	0.1000	0.0080	38.0	0.0	81.0	81.0	41-116	
4-Nitrophenol	< 0.0080	0.0226	0.0206	0.1000	0.0080	50.5	9.3	22.6	20.6	10-80	
Pentachlorophenol	< 0.0020	0.0770	0.0810	0.1000	0.0020	50.0	5.1	77.0	81.0	9-103	
Phenol	< 0.0020	0.0258	0.0300	0.1000	0.0020	42.0	15.1	25.8	30.0	12-89	
Pyrene	< 0.0040	0.0898	0.0906	0.1000	0.0040	31.0	0.9	89.8	90.6	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0778	0.0820	0.1000	0.0020	28.0	5.3	77.8	82.0	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

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A02C53

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Oct 22, 1997 12:05
Date Analyzed: Oct 21, 1997 20:23
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: LC
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 172473- 006 / **Parameter**	[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	%	%	%	%	%	
Total Petroleum Hydrocarbons	16.01	208	214	200	10.00	30.0	2.8	96.0	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

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A02C53

SW- 846 8015 M TPH- DRO (Diesel)

Date Validated: Oct 22, 1997 12:05
Date Analyzed: Oct 21, 1997 17:01
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: LC
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/kg	[B] Blank Spike Result mg/kg	[C] Blank Spike Amount mg/kg	[D] Method Detection Limit mg/kg	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Total Petroleum Hydrocarbons	< 10.00	178	200	10.00	89.0	65-135	

Blank Spike Recovery [E] = 100*(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

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 710028
Project Manager: Theresa Nix
Project Location: TNMPL Reeves

Project Name: TNMPL

XENCO COC#: **1-72544**
Date Received in Lab: Oct 21, 1997 10:00 by AS
XENCO contact : Carlos Castro/Edward Yonemoto

	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	TMW-1 (10-12')	172544-001	BTEX	SW-846	ppm	Standard	Oct 17, 1997 12:55		Oct 23, 1997 by OR	Oct 23, 1997 18:00 by OR
2			TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Oct 17, 1997 12:55		Oct 21, 1997 by CY	Oct 22, 1997 00:58 by LC
3	TMW-1 (28-30')	172544-002	BTEX	SW-846	ppm	Standard	Oct 17, 1997 13:11		Oct 23, 1997 by OR	Oct 23, 1997 18:43 by OR
4			TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Oct 17, 1997 13:11		Oct 21, 1997 by CY	Oct 22, 1997 01:27 by LC
5	TMW-1	172544-003	BTEX	SW-846	ppm	Standard	Oct 17, 1997 13:40		Oct 22, 1997 by OR	Oct 23, 1997 03:00 by OR
6		172544-004	PAH	SW-846 8100	mg/L	Standard	Oct 17, 1997 13:40		Oct 22, 1997 by RK	Oct 23, 1997 01:28 by LC
7	TMW-2 (10-12')	172544-005	BTEX	SW-846	ppm	Standard	Oct 17, 1997 14:23		Oct 23, 1997 by OR	Oct 23, 1997 19:01 by OR
8			TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Oct 17, 1997 14:23		Oct 21, 1997 by CY	Oct 22, 1997 01:56 by LC
9	TMW-2 (28-30')	172544-006	BTEX	SW-846	ppm	Standard	Oct 17, 1997 14:48		Oct 23, 1997 by OR	Oct 23, 1997 19:19 by OR
10			TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Oct 17, 1997 14:48		Oct 21, 1997 by CY	Oct 22, 1997 02:25 by LC
11	TMW-2	172544-007	BTEX	SW-846	ppm	Standard	Oct 17, 1997 15:20		Oct 22, 1997 by OR	Oct 23, 1997 03:18 by OR
12		172544-008	PAH	SW-846 8100	mg/L	Standard	Oct 17, 1997 15:20		Oct 22, 1997 by RK	Oct 23, 1997 02:15 by LC

XENCO Laboratories

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Lab. Batch # 172544-H

Contractor: K.E.I Consultants — Phone: (210) 680-3767

Address: 5309 Wurzbach, Suite 100 San Antonio, TX 78238

Project Name: TNMPL — Project Director: Mike Hauffhorn

Project Location: TNMPL Reeves — Project Manager: Theresa Nix

Sampler Signature: Stanley Hoover — Project No.: 710028

No. coolers this shipment: — Contractor COC #

Carrier: UPS — Quote #:

Airbill No. — P.O. No.:

	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (8260)	TPH (418.1)	2015 MOD	VOC's SW846-8260	SVOC's SW846-8270	SPLP TPH 1312	PAH method 8100	Please Hold	Remarks	LAB ONLY ID #
1	TMW-1	10/17/97	1255	10-12 Ft	/		/		8oz		/			1	/	/	/	/	/					1
2	TMW-1	10/17/97	1311	28-30 Ft	/		/		8oz		/			1	/	/	/	/	/					2
3	TMW-1	10/17/97	1340			/		/			/	HCl		2	/									3
4	TMW-1	10/17/97	1340			/		/			/			1						/				4
5	TMW-2	10/17/97	1423	10-12	/		/		8oz		/			1	/	/	/	/	/					5
6	TMW-2	10/17/97	1448	28-30 Ft	/		/		8oz		/			1	/	/	/	/	/					6
7	TMW-2	10/17/97	1520			/		/			/	HCl		2	/									7
8	TMW-2	10/17/97	1520			/		/			/			1						/				8
9																								9
10																								10

SAMPLE CHARACTERIZATION: Unl Dies Ker Unknown; Waste Oil; PIT No: Tank No:

Turn-around: ASAP; 24 hrs; 48 hrs; (Standard)

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Stanley Hoover	10-20-97	1630			
			Received For Laboratory by: Tyler R. Sims	10/21/97	10:00

Remarks: Sample w/Highest TPH (2015)
Please Run SVOC's VOC's SPLP TPH

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

* Pre-scheduling is recommended

Precision Analytical Services