

RELEASE REPORT



**REMEDIATION WORK PLAN
SUPPLEMENT**

**EOTT ENERGY CORP.
TNM 98S-01
LEA COUNTY, NEW MEXICO**

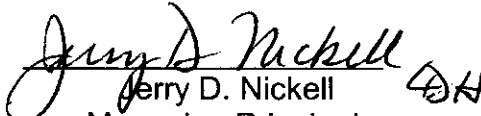
Prepared For:
EOTT Energy Corp.
5805 East Highway 80
Midland, Texas 79701

Environmental Technology Group, Inc. Project No. EOT2067C

Prepared By:
Environmental Technology Group, Inc. (ETGI)
2540 West Marland Blvd.
Hobbs, New Mexico 88240

May 2001


Ken Dutton
Sr. Project Manager


Jerry D. Nickell
Managing Principal

**REMEDICATION
WORK PLAN SUPPLEMENT
FOR SITE CLOSURE
TNM 98S-01
Lea County, New Mexico
May 3, 2001
Prepared By: ETGI**

INTRODUCTION

Environmental Technology Group, Inc. (ETGI) hereby submits a Remediation Work Plan Supplement (RWPS) to the New Mexico Oil Conservation Division on behalf of EOTT Energy Corp. (EOTT) for the installation of an additional temporary groundwater monitoring well at the TNM 98S-01 leak site. This plan will serve as a "Work Plan Supplement" as referenced in the "General Work Plan for Remediation of EOTT Pipeline Spills, Leaks, and Releases in New Mexico" approved by New Mexico Oil Conservation Division (NMOCD) on August 1, 2000. The regulatory basis for both the General Work Plan and this Work Plan Supplement is the August 1993 NMOCD Guidelines for Remediation of Leaks, Spills, and Releases.

BACKGROUND

The leak site is located northwest of the town of Monument, in NW ¼, NW ¼ of Section 20, Township 19 South, Range 37 East, in Lea County, New Mexico as depicted in Figure 1, Site Location Map. Prior activities at the site included installation of three monitoring wells and quarterly sampling and analysis of the groundwater for constituents of concern (COC). The groundwater-sampling events, prior to this RWPS, indicated no analytical results above the New Mexico Water Quality Control Commission (NMWQCC) standards. These results are shown in Table 1 and Table 2. The corresponding laboratory analytical and quality assurance/quality control data are found in Appendix A.

As per NMOCD requirements and after the completion of four consecutive groundwater-sampling events with successful results, a letter was submitted for closure of this site.

The NMOCD response, dated October 30, 2000, required the installation of a temporary monitoring well to further investigate the groundwater at the TNM 98S-01 site.

PURPOSE OF INVESTIGATION

The additional temporary monitoring well is needed to support previously submitted data and allow the closure of this site. If the soil samples taken during the installation of this well and the one-time water sample are found to be below the standards set forth in NMOCD Rule 19.B, the NMOCD will then issue closure approval of the TNM 98S-01 leak site.

METHODOLOGY

ETGI plans to supervise and coordinate the drilling of the temporary groundwater monitoring well at the above-described location. The monitoring well will be installed adjacent to and down gradient of the release point. The proposed location is depicted on Figure 2, Site Map. During the monitoring well installation, soil samples will be collected every five feet with a split spoon sampler except in those locations containing indurated materials. Each five-foot sample will be field screened with a photoionization detector

(PID) and a continuous lithologic log of the penetrated section will be maintained and recorded. All of the soil samples, including a surface sample, will be transported under Chain of Custody to Environmental Laboratory of Texas (ELOT) for analysis.

The monitoring well will be completed and developed in accordance with NMOCD Guideline Parts V.C.1 and V.C.3, respectively. The fluid levels will be measured within 1/100th of a foot then purged and sampled in accordance with the NMOCD Guideline Part V.C.4. As required by NMOCD Rule 19.B, the groundwater sample will be submitted for analyses identified below.

ANALYSES

All soil samples submitted for analysis will be analyzed for TPH using EPA Method 8015 Modified GRO/DRO Extended Range. Samples with a field PID reading in excess of 100ppm may be submitted for Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) analysis using EPA Method 8021B.I

The groundwater sample will be submitted for the following analysis:

- BTEX (EPA Method 8021B and 5030)
- TPH – EPA Method 8015 Modified GRO/DRO Extended Range
- Major Cations and Anions – EPA Methods 375.4, 3251.3 and 310
- Total Dissolved Solids (TDS) – EPA Method 160.1
- Polynuclear Aromatic Hydrocarbons (PAH) – EPA Method 8270C, 3510
- Metals – EPA Method 6010B, 7470

FOLLOW-UP ACTIVITIES

Installation of the temporary monitoring well can be initiated within two weeks of the work plan approval. Once installed, purging and sampling of the groundwater will be conducted. The groundwater sample will be transported under Chain of Custody to ELOT for analysis. On notification of the results of the analysis, the site will be resubmitted for closure if the analysis indicates no COC above the NMWQCC standards. If the analyses do not support closure of this site, further investigation will be addressed as required by NMOCD.

DISTRIBUTION

Copy 1 to : Mr. Bill Olson
New Mexico Oil Conservation Division
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Santa Fe, New Mexico

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New Mexico Oil Conservation Division
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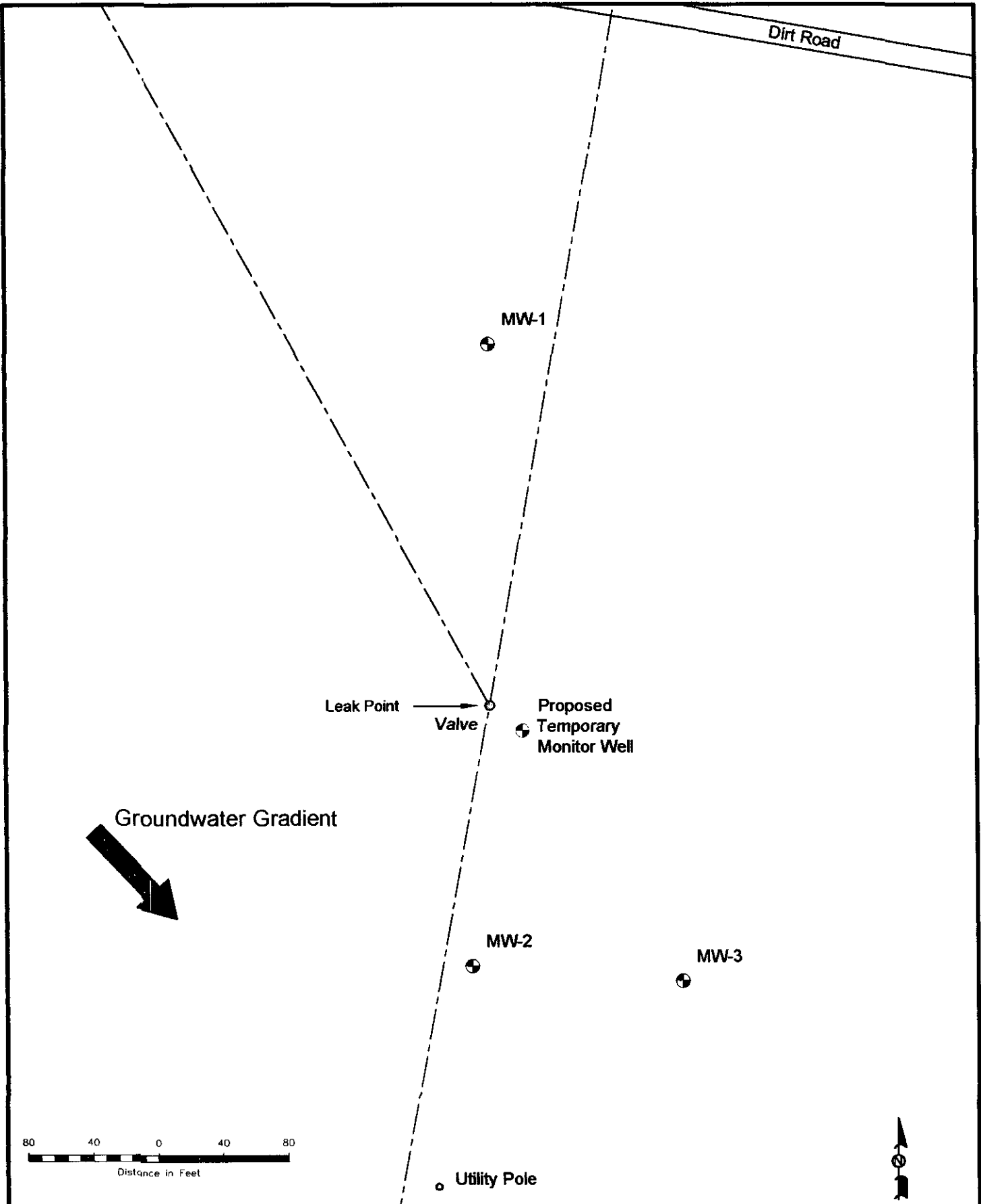
Copy 5 to : Environmental Technology Group, Inc.
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Hobbs, New Mexico 88240

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P. O. Box 4845
Midland, Texas 79704

COPY NO.: 1


Glenn E. Waldrop, Principal
Quality Control Reviewer

FIGURES



LEGEND:

⊕ Monitor Well Location

Figure 2
Site Map
 Proposed Temp. MW
 EOTT Energy Corp.
 TNM 98S-01
 Lea County, NM



Environmental Technology Group, Inc.

Scale: 1" = 80'	Prep By: JDJ	Checked By: BA
January 24, 2001		ETGI Project # EOT2067C

TABLES

TABLE 1

GROUND WATER CHEMISTRY

EOTT ENERGY CORPORATION

TNM 98-SO1

LEA COUNTY, NEW MEXICO

ETGI PROJECT # EOT 2067C

All concentrations are in mg/L

SAMPLE LOCATION	SAMPLE DATE	SW 846-8021B, 5030				
		BENZENE	TOLUENE	ETHYL-BENZENE	M,P-XYLENES	O-XYLENES
MW - 1	12/14/99	<0.001	<0.001	<0.001	<0.001	<0.001
	03/28/00	0.001	<0.001	<0.001	<0.001	<0.001
	06/20/00	<0.001	<0.001	<0.001	<0.001	<0.001
	08/30/00	<0.001	<0.001	<0.001	<0.001	<0.001
MW - 2	12/14/98	<0.001	<0.001	<0.001	<0.001	<0.001
	03/28/00	<0.001	<0.001	<0.001	<0.001	<0.001
	06/20/00	<0.001	<0.001	<0.001	<0.001	<0.001
	08/30/00	<0.001	<0.001	<0.001	<0.001	<0.001
MW - 3	12/14/99	0.002	0.002	0.002	0.003	0.003
	03/28/00	<0.001	<0.001	0.001	0.001	<0.001
	06/20/00	<0.001	0.001	<0.001	<0.001	<0.001
	08/30/00	0.003	<0.001	<0.001	<0.001	<0.001

Table 2

GROUNDWATER ELEVATION TABLE

EOTT ENERGY CORPORATION
 TNM 98-S01
 LEA COUNTY, NEW MEXICO
 PROJECT # EOT2067C
 12/14/99 - 8/30/00

Well Number	Date	Casing Well Elevation	Depth to Product	Depth to Water	PSH Thickness	Corrected Groundwater Elevation
MW - 1	12/14/99	3,634.38	-	17.90	0.00	3,616.48
MW - 1	03/28/00	3,634.38	-	17.84	0.00	3,616.54
MW - 1	06/20/00	3,634.38	-	17.76	0.00	3,616.62
MW - 1	08/30/00	3,634.38	-	17.46	0.00	3,616.92
MW - 2	12/14/99	3,633.96	-	22.21	0.00	3,611.75
MW - 2	03/28/00	3,633.96	-	22.05	0.00	3,611.91
MW - 2	06/20/00	3,633.96	-	21.91	0.00	3,612.05
MW - 2	08/30/00	3,633.96	-	21.81	0.00	3,612.15
MW - 3	12/14/99	3,631.79	-	26.81	0.00	3,604.98
MW - 3	03/28/00	3,631.79	-	26.80	0.00	3,604.99
MW - 3	06/20/00	3,631.79	-	26.78	0.00	3,605.01
MW - 3	08/30/00	3,631.79	-	26.36	0.00	3,605.43

APPENDIX A

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 30 deg. F
Project #: EOT 2067C
Project Name: TNM 98-S01
Project Location: Monument, N.M.

Sampling Date: 08/30/00
Receiving Date: 09/01/00
Analysis Date: 09/05/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L	TOTAL BTEX mg/L
30307	MW 1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30308	MW 2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30309	MW 3	0.003	<0.001	<0.001	<0.001	<0.001	0.003
30310	EB 1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

% IA	103	100	103	106	99
% EA	104	104	106	110	102
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021B.5030


Raland K. Tuttle

9-6-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
2540 MARLAND
HOBBS, N.M. 88240
FAX: 505-397-4701
FAX: 915-520-4310

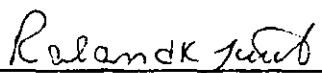
Sample Type: Water
Sample Condition: Intact/ Iced/ HCl/ 30 deg. F
Project #: EOT 2015C
Project Name: TNM 98-S01
Project Location: Lea County, N.M.

Sampling Date: 06/20/00
Receiving Date: 06/23/00
Analysis Date: 06/27/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
27352	MW 1	<0.001	<0.001	<0.001	<0.001	<0.001
27353	MW 2	<0.001	<0.001	<0.001	<0.001	<0.001
27354	MW 3	<0.001	0.001	<0.001	<0.001	<0.001

% IA	96	91	92	100	93
% EA	98	96	96	107	97
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021B,5030


Roland K. Tuttle

6-29-00
Date

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Case # 169

Phone #: (505) 397-4882

FAX# (505) 397-4701

ETGI 2540 W. Maryland Hobbs, NM 88240

Projected Name:

TN 98-501

Simple Signatures:

Ben Hur & Simon Fraser

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX					PRESERVATIVE METHOD					SAMPLING		TPH 418.1	TCLP Metals Ag A	Total Metals Ag A	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME								
27352	MW-1	2	V	X				X				X			6/20	1050	X						
27353	MW-2	2	V	X				X				X				1025	X						
27354	MW-3	2	V	X				X				X				1110	X						

2022/04/24

10/10/10

1000

Received by:

Received by [unclear]

REMARKS:

1

REMARKS

FR: (505) 397-4741

ATTN: KID

303

INVOICE: FOTT

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
ATTN: MR. JESSE TAYLOR
P.O. BOX 4845
MIDLAND, TEXAS 79704
FAX: 915-520-4310
FAX: 505-392-3760

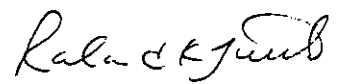
SampleType: Water
Sample Condition: Intact/ Iced/HCl
Project #: EOT 1015C
Project Name: TNM 98-501
Project Location: Monument , N.M.

Sampling Date: 03/28/00
Receiving Date: 03/28/00
Analysis Date: 3/28 & 3/29/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
24390	MW 1	0.001	<0.001	<0.001	<0.001	<0.001
24391	MW 2	<0.001	<0.001	<0.001	<0.001	<0.001
24392	MW 3	<0.001	<0.001	0.001	0.001	<0.001

% IA	97	87	91	100	87
% EA	97	87	87	94	85
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021B,5030


Ralanda K. Tuttle

3-30-00
Date

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

CoC 113

KS
Mile Report: K. Dutton

TYPE: 730004

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

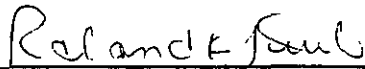
Sample Type: Water
Sample Condition: Intact/Iced/HCl
Project #: EOT1015C
Project Name: TNM 98-501
Project Location: Monument, N.M.

Sampling Date: 12/14/99
Receiving Date: 12/17/99
Analysis Date: 12/18/99

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
22416	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
22417	MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
22418	MW-3	0.002	0.002	0.002	0.003	0.003

% IA	104	100	101	102	101
% EA	91	89	89	90	89
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B.5030



Roland K. Tuttle

12-21-99
Date

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

053

Phone H: (915) 664-9166

FAX #: (505) 505-3760

ETHEL
P.O. BOX 4845
MIDLAND TX 79704

Project Name:

05101 103

Supplier Statement:

James P. [Signature]

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX						PRESERVATIVE METHOD					SAMPLING	
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME	
22416	MU 1	2	✓	X						X			X		12-14	1248
22417	MU 2	1	✓	✓											✓	1205
22418	MU 3	✓	✓	✓						✓					✓	1225

TIME	PLING
10:00	10:00
10:15	10:15
10:30	10:30
10:45	10:45
11:00	11:00
11:15	11:15
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23:15	23:15
23:30	23:30
23:45	23:45
24:00	24:00

1248	1205	225
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Date: _____

Date: 12-06-99

Time:

Exhibit

Received by: 

Date:

Date: 12-17-99

Time:

3

Formville E
569 PYA132918

Date: _____

Time:

Decoded by T. Aboulsam

REMARKS

RKS
MAIL RESCUE. K. DUNN

Index: Lennan Frost 10/5/22



RECEIVED

AUG 31 1998

**ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION**

SUBSURFACE INVESTIGATION REPORT
MONITORING WELLS MW-1, MW-2, MW-3
SOIL BORINGS SB-1, SB-2, SB-3

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO



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

SUBSURFACE INVESTIGATION REPORT

MONITORING WELLS MW-1, MW-2, MW-3

SOIL BORINGS SB-1, SB-2, SB-3

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
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

A handwritten signature in cursive script, appearing to read "Monica A. Sientz", is written over a horizontal line.

Monica A. Sientz
Project Manager

Theresa Nix
Project Manager

Pat Bullinger, P.E.

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PURPOSE AND SCOPE

The purpose of the subsurface investigation was to install monitoring wells and soil borings to characterize the extent of hydrocarbon impact to ground water and soils across the site. The site is located in Section 20, Township 19 South, Range 37 East in Lea County, New Mexico. The site location is shown on FIG. 1.

SOIL INVESTIGATION

During the subsurface investigation conducted on February 18 and 19, 1998, 3 monitoring wells (designated MW-1 through MW-3) and 3 soil borings (designated SB-1 through SB-3) were installed utilizing air rotary technology. Soil samples were collected at selected intervals from the ground surface to the bottom of the boring. The soils were classified in the field, soil samples were field screened, and selected samples were prepared and shipped to the laboratory for analysis.

Upon advancement to total depth and collection of soil samples, a permanent well consisting of 2 inch perforated PVC and blank riser was placed in the open hole of each boring designated as a permanent monitoring well. Upon completion of sampling activities, each soil boring not completed as a monitoring well was backfilled to the surface with a cement/bentonite grout.

The monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico. The locations of the monitoring wells and soil borings installed are presented on FIG. 2.

SOIL DESCRIPTION

The subsurface soil profile was classified in general accordance with the Unified Soil Classification System by visually observing the soil samples obtained during the assessment. In general, 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 brown sand encountered at the surface of all soil boring and monitoring well locations. The sand was clayey, fine-grained, firm and slightly moist. The observed thickness of this soil type was approximately 1.5 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 white sand and was encountered beneath Soil Type I at all soil boring and monitoring well locations. The sand was silty, moist and interbedded with caliche gravel. The observed thickness of this sand varied from approximately 12.5 to 26.5 feet. Head-space readings from samples of this soil type ranged from ND to 21 ppm.

Soil Type III

This soil type consisted of tan to brown clay and was encountered beneath Soil Type II at borings SB-2, SB-3, and monitoring wells MW-1 and MW-2. The clay was sandy to slightly

silty, firm and moist. The observed thickness of this soil type varied from 0.5 to 12 feet. Head-space readings from samples of this soil type varied from ND to 21 ppm.

Logs indicating the subsurface soil profile, depths at which soil samples were obtained, and head-space and laboratory results are presented on FIGs. 3 through 7.

ANALYTICAL RESULTS

A minimum of 3 soil samples were selected from each soil boring based on the following criteria:

- The sample collected from 5 to 7 feet below ground surface.
- The sample with the highest head-space reading from 0 to 15 feet.
- The sample directly above the ground water level measured at the time of drilling.

Soil samples selected for analytical testing consisted of the following:

- Ten soil samples from the monitoring wells and 9 samples from the soil borings were tested for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons diesel range organics (TPH-DRO).
- One soil sample from soil boring SB-2 (exhibiting the highest concentration of TPH by EPA Method 8015 DRO) was also tested for SPLP TPH, SPLP Volatile Organic Compounds (VOCs) and SPLP Semi-volatile Organic Compounds (SVOCs).
- One undisturbed soil sample from MW-3 was selected and analyzed for Fraction of Organic Carbon (FOC) and moisture content.
- Laboratory results for the selected soil samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES
BENZENE	ND
BTEX	ND
TPH	19.0 to 1650 mg/kg
SPLP TPH	0.9 mg/L
SPLP VOCs	ND
SPLP SVOCs	ND
FOC	0.6%
MOISTURE CONTENT	11.7%

Constituents not listed above were ND. Soil laboratory results are summarized in TABLES I through III. Soil analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX A. Quality Assurance/Quality Control Procedures are described in APPENDIX C.

GROUND WATER MONITORING

MONITORING WELLS

Monitoring wells were installed to complete a triangulation of ground water monitoring points around the release area. The monitoring wells were installed to depths of approximately 27 to 28 feet below the ground surface. The monitoring wells were installed by a well driller licensed in the State of New Mexico.

The monitoring well PVC riser, top of concrete surface pad, and ground surface, as well as monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico. The monitoring well elevations were referenced from mean sea level and are given on FIGs. 5 through 7.

GROUND WATER MONITORING

Ground water monitoring events were conducted at the site on March 3, 1998, and on April 7, 1998. The events consisted of gauging the water level in monitoring wells MW-1 through MW-3, and checking for the presence of PSH. A ground water sampling event was conducted during the March 1998 ground water monitoring event.

The depth to ground water ranged from 14.89 to 23.89 feet below the ground surface. No PSH was present at the time of measurement. Additional ground water information will be presented with the quarterly monitoring conducted at the site. A ground water contour map for the April 1998 event is shown on FIG. 8.

Ground water measurements obtained during the April 7, 1998, event indicated a general direction of flow to the east, with a calculated gradient of approximately 0.049 ft/ft. A summary of ground water gauging and elevation data is presented on TABLE IV.

ANALYTICAL RESULTS

On March 3, 1998, a ground water sample was collected from each monitor well after the well was purged using a PVC bailer. The samples were field tested for temperature, pH, and conductivity using a HyDAC multi parameter water quality meter and for dissolved oxygen using a YSI water quality meter. Samples were then sent to the analytical laboratory where they were tested for BTEX, polycyclic aromatic hydrocarbons (PAH), major cations and anions, total dissolved solids (TDS), and heavy metals (ICP Scan). Results of ground water field testing are summarized in TABLE V.

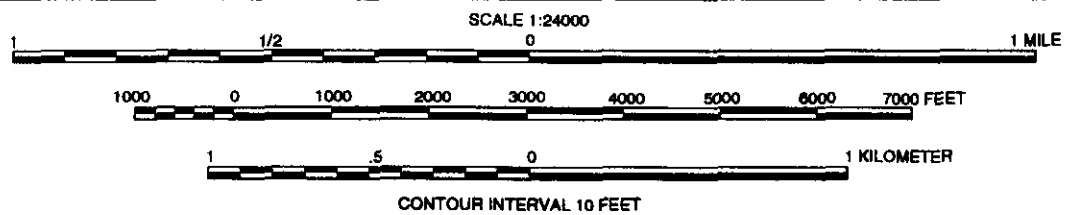
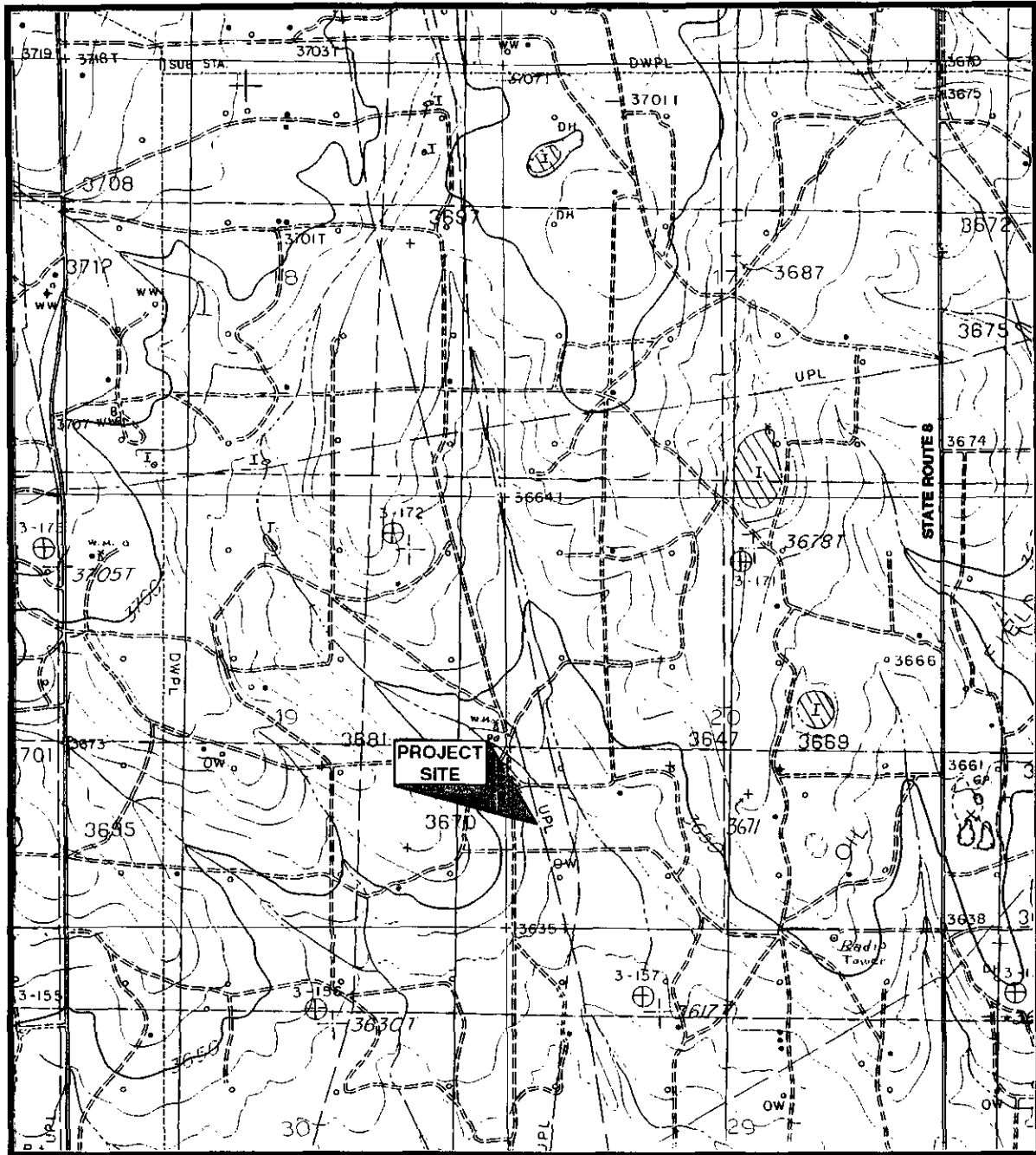
Laboratory testing for the ground water samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES (mg/L)
BENZENE	ND to 0.005
BTEX	ND to 0.005
BICARBONATE	314 to 494
CHLORIDE	66.48 to 109
SULFATE	30.62 to 52.95

CONSTITUENT	CONCENTRATION RANGES (mg/L)
TDS	601 to 844
ALUMINUM	ND to 5.1
BARIUM	0.14 to 1.20
BORON	ND to 0.24
CALCIUM	134 to 871
IRON	0.33 to 7.27
MAGNESIUM	18.7 to 34.3
MANGANESE	ND to 1.07
POTASSIUM	3.61 to 5.71
SILICON	26.2 to 166
SODIUM	53.5 to 79.7
STRONTIUM	1.26 to 2.44
TIN	ND to 1.34

Constituents not listed above were ND. Ground water laboratory results are summarized in TABLE VI. Ground water analytical laboratory reports and chain-of-custody documentation are presented in APPENDIX B. Quality Assurance/Quality Control Procedures are described in APPENDIX C.

MONUMENT NORTH QUADRANGLE
NEW MEXICO - LEA CO.
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SITE LOCATION MAP

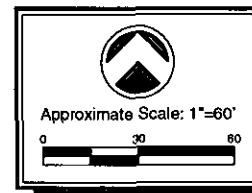
TEXAS - NEW MEXICO PIPE LINE CO.

TNM - 98-S01

LEA COUNTY, NEW MEXICO

810004

FIG 1



MW-1●

SB-1○

Inactive TNMPL Underground Pipeline

Active TNMPL Underground Pipeline

OSB-2

SB-3○

● MW-2

● MW-3

DIRT ROAD

DIRT ROAD

LEGEND

- Monitoring Well installed by KEI on February 18, 1998.
- Soil Boring advanced by KEI on February 19, 1998.
- ⊗ Valve connection for pipelines

08/26/98-RW G. USAD/TP PROJECTS/TNMPL 010004/1(810004-SD)

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SITE DETAILS

TEXAS - NEW MEXICO PIPE LINE CO.

TNM-98-S01

LEA COUNTY, NEW MEXICO

810004

FIG 2

LEGEND



Sand (SC), clayey, fine-grained, firm, brown, slightly moist.



Sand (SM), silty, interbedded with caliche gravel, tan to white, moist.



Clay (CL), sandy to slightly silty, firm, tan to brown, moist.



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



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)

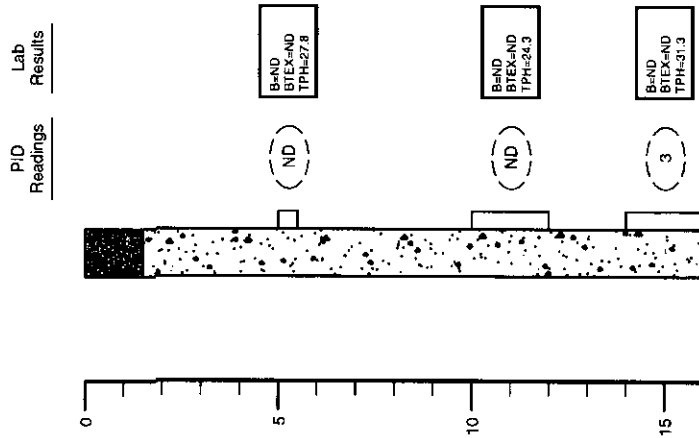
PID = Head-space readings in ppm obtained with a photo-ionization detector.

ND = Indicates the constituent was not detected or was below laboratory detection limits.

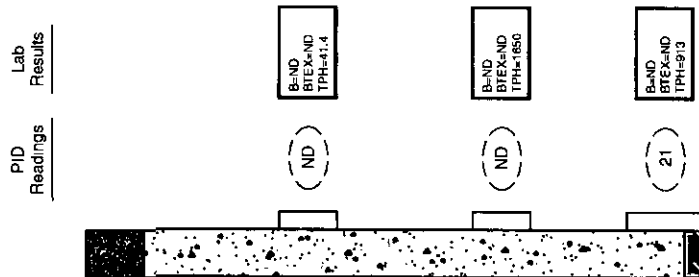
NOTES:

1. The soil borings were drilled on February 19, 1998, using an air rotary rig.
2. The soil borings were located by measuring from existing site features.
The locations of those soil borings completed as monitor wells were surveyed by a Professional Land Surveyor registered in the State of New Mexico.
3. The lines between material types shown on the profile log represent approximate boundaries.
Actual transitions may be gradual.
4. The depths indicated are referenced from the ground surface unless otherwise noted.
5. The soil borings were backfilled with a cement/bentonite grout.

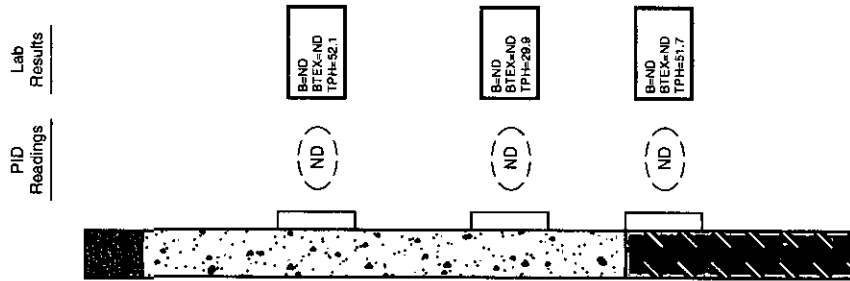
SB-1



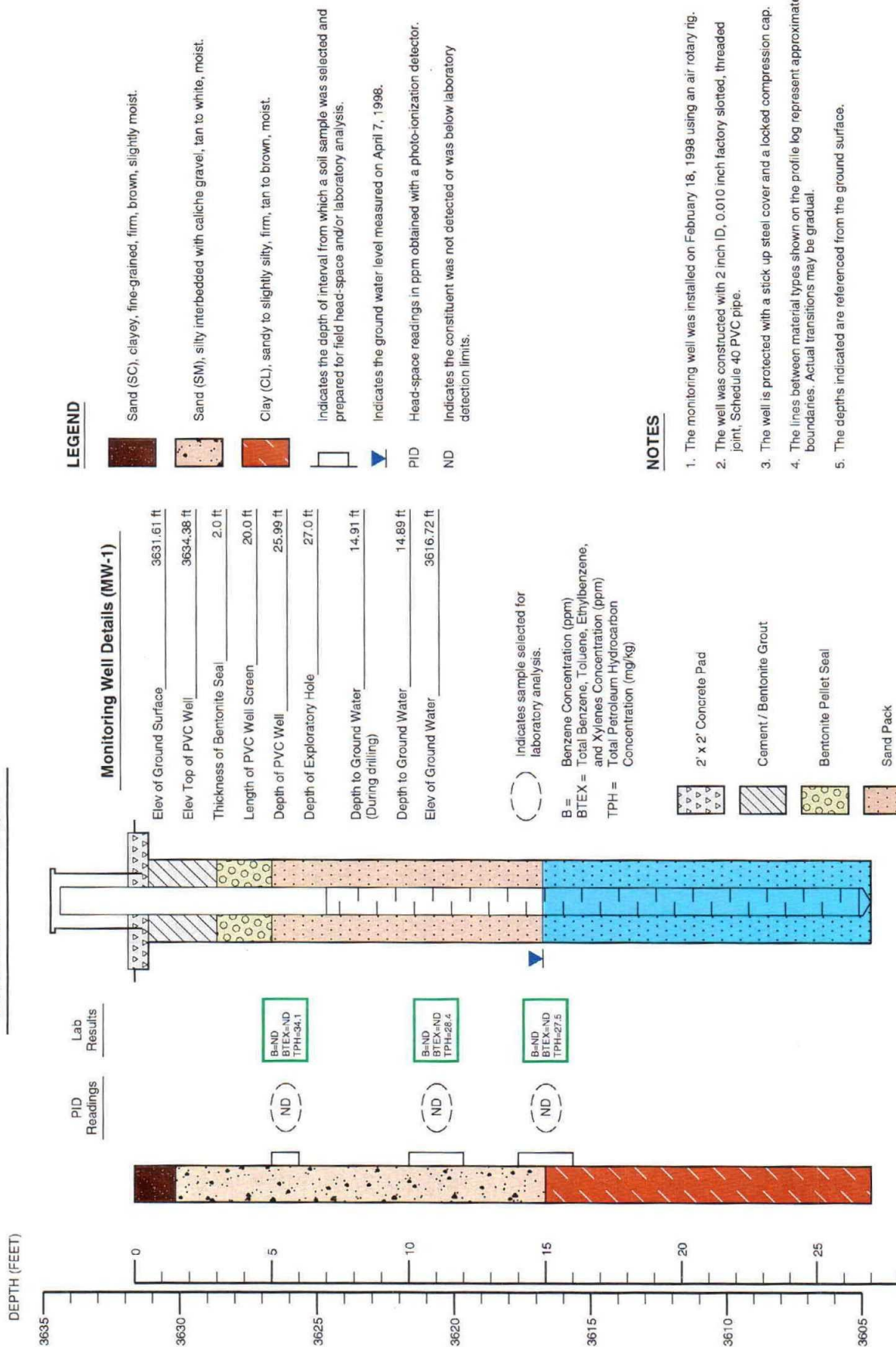
SB-2



SB-3



MONITORING WELL MW-1



LOG AND DETAILS OF MONITORING WELL MW-1

TEXAS - NEW MEXICO PIPE LINE CO.

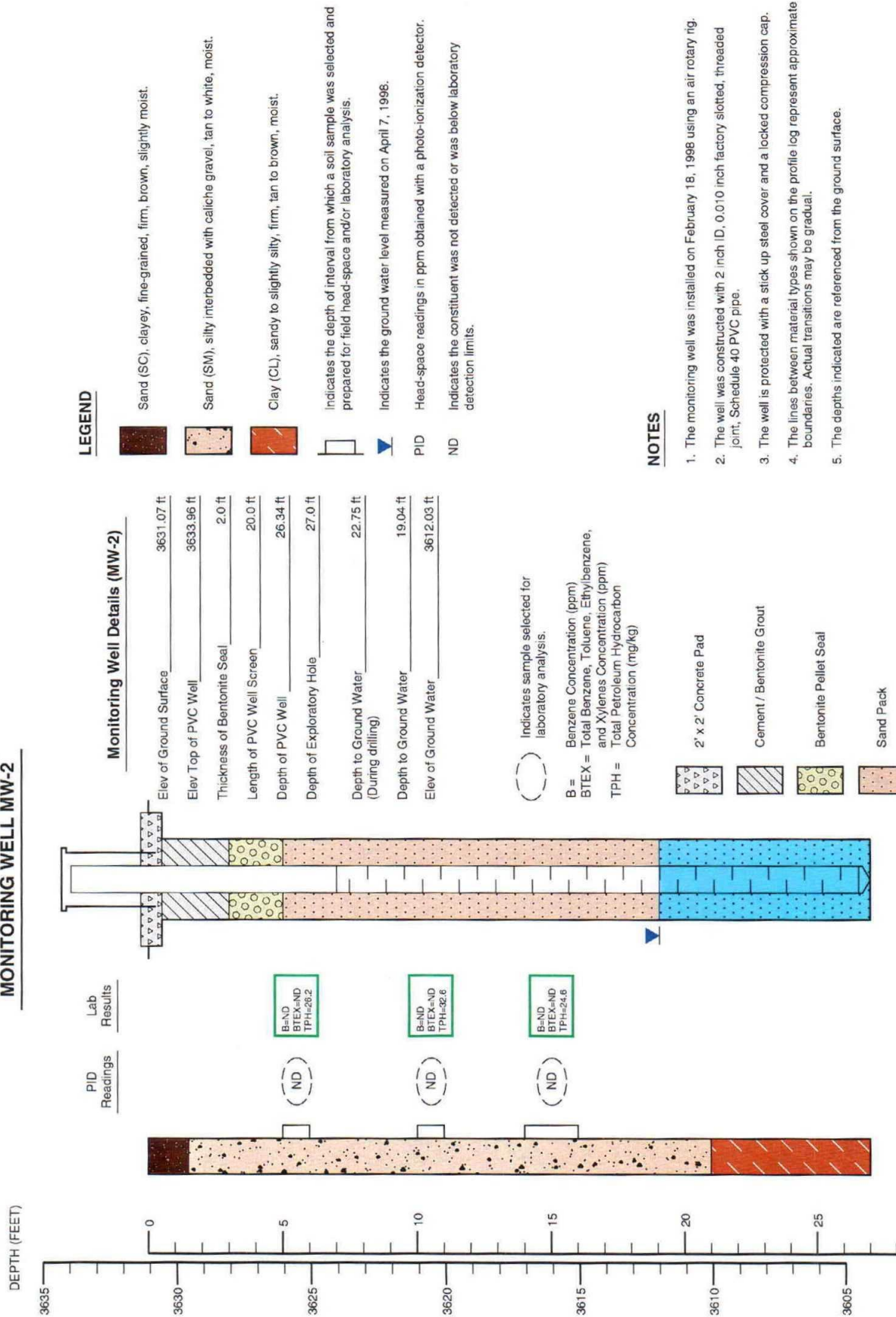
TNM-98-S01

LEA COUNTY, NEW MEXICO

810004

FIG 5

MONITORING WELL MW-2



LOG AND DETAILS OF MONITORING WELL MW-2

TEXAS - NEW MEXICO PIPE LINE CO.

TNM-98-S01

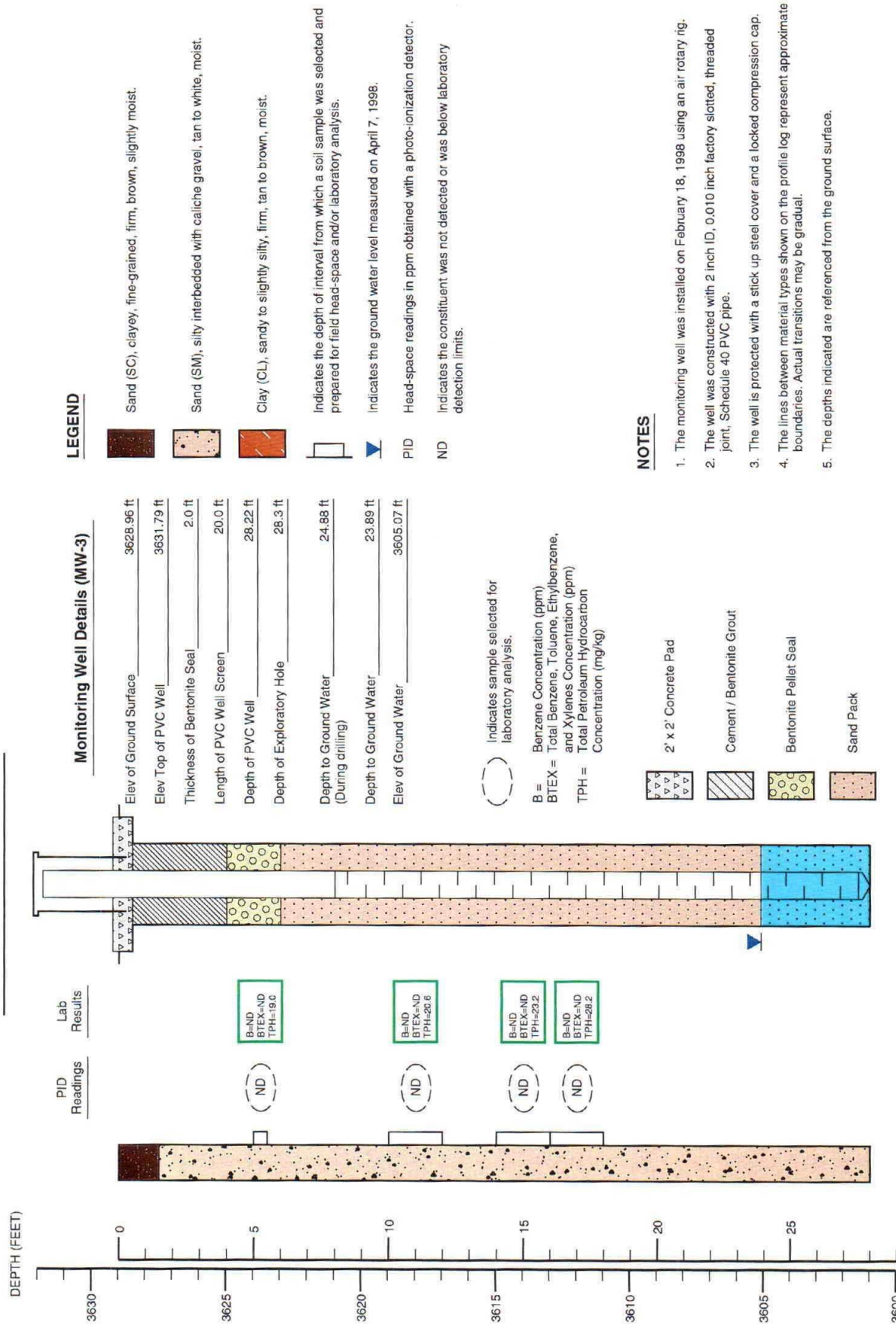
LEA COUNTY, NEW MEXICO

810004

FIG 6

kei

MONITORING WELL MW-3



LOG AND DETAILS OF MONITORING WELL MW-3

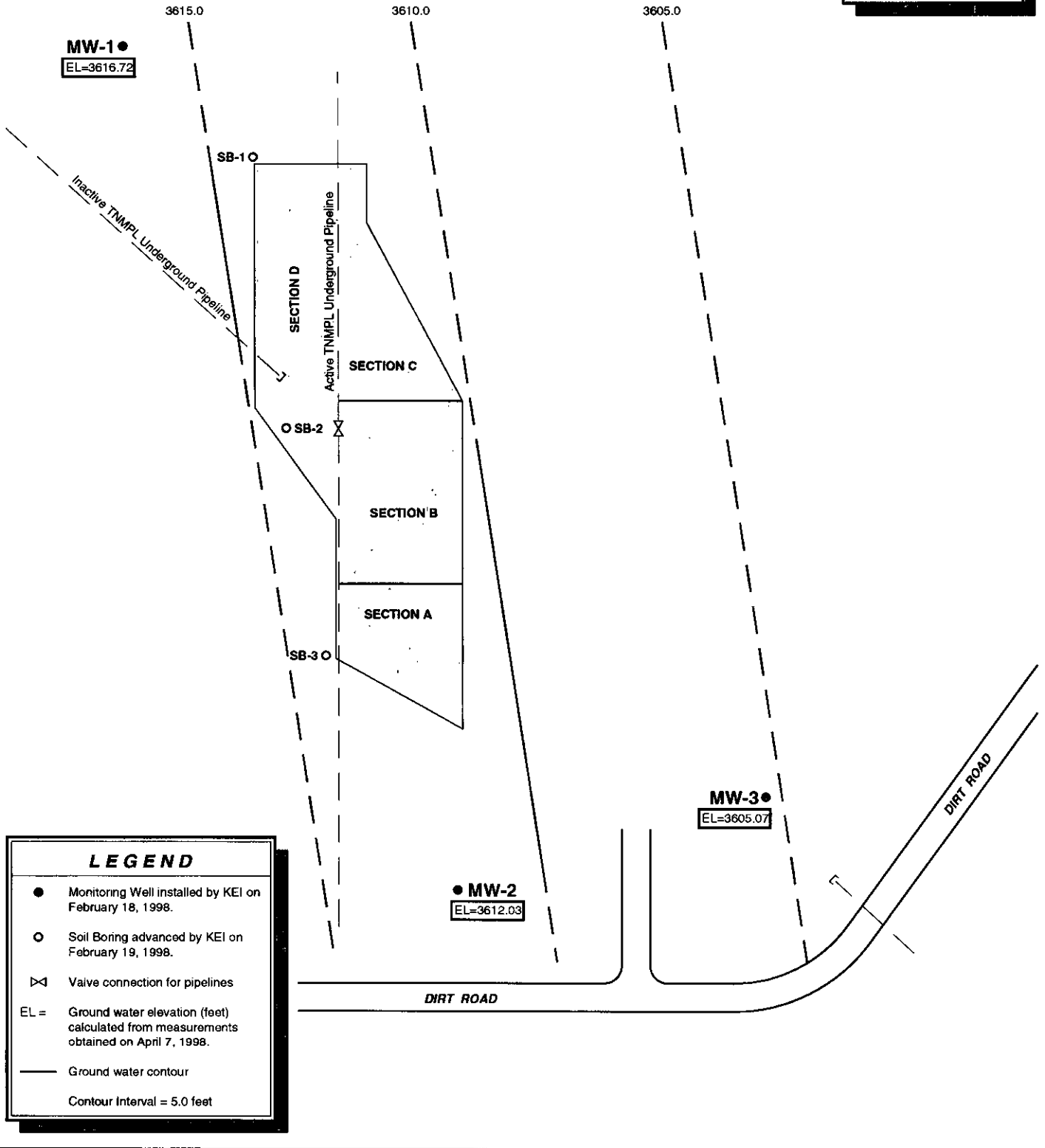
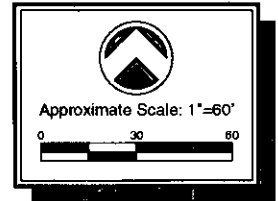
TEXAS - NEW MEXICO PIPE LINE CO.

TNM-98-S01

LEA COUNTY, NEW MEXICO

810004

FIG 7



08/27/98 RM G:\GW\APR98



GENERAL NOTES

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

Method detection or reporting limits:

Soil Samples:	BTEX	- 0.020 to 0.20 mg/kg
	TPH	- 10.0 to 200 mg/kg
	SPLP TPH	- 0.7 mg/L
	SPLP VOCs	- 0.025 to 0.050 mg/L
	SPLP SVOCs	- 0.010 to 0.025 mg/L
	FOC	- 0.1%
	Moisture Content	- 0.1%
Ground Water Samples:	BTEX	- 0.001 to 0.008 mg/L
	PAH	- 0.002 mg/L
	Cations	- 1.0 mg/L
	Anions	- 1.00 mg/L
	TDS	- 4.0 mg/L
	Metals	- 0.05 to 2.2 mg/L
	Total Mercury	- 0.0011 mg/L

Laboratory test methods:

Soil Samples:	BTEX	- EPA Method SW846-8020
	TPH	- Modified EPA Method 8015 DRO
	SPLP TPH	- EPA Method 1312/418.1
	SPLP VOCs	- EPA Method 1312/8260
	SPLP SVOCs	- EPA Method 1312/8270
	FOC	- ASTM Method D2974
	Moisture Content	- ASTM Method 2216-7
Ground Water Samples:	BTEX	- EPA Method SW846-8020
	PAH	- EPA Method 8270
	Cations	- SM 4500CO2D
	Anions	- EPA Method 300.0
	TDS	- EPA Method 160.1
	Metals	- EPA ICP Method 6010
	Total Mercury	- EPA Method 7470

TABLE I

**SUMMARY OF SOIL RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY**

TNM-98-S01

LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL- BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
SB-1	02/19/98	5 - 5.5	ND	ND	ND	ND	ND	27.8
SB-1	02/19/98	10 - 12	ND	ND	ND	ND	ND	24.3
SB-1	02/19/98	14 - 16	ND	ND	ND	ND	ND	31.3
SB-2	02/19/98	5 - 6.5	ND	ND	ND	ND	ND	41.4
SB-2	02/19/98	10 - 11.5	ND	ND	ND	ND	ND	1,650
SB-2	02/19/98	14 - 16	ND	ND	ND	ND	ND	913
SB-3	02/19/98	5 - 7	ND	ND	ND	ND	ND	52.1
SB-3	02/19/98	10 - 12	ND	ND	ND	ND	ND	29.9
SB-3	02/19/98	14 - 16	ND	ND	ND	ND	ND	51.7
MW-1	02/18/98	5 - 6	ND	ND	ND	ND	ND	34.1
MW-1	02/18/98	10 - 12	ND	ND	ND	ND	ND	28.4
MW-1	02/18/98	14 - 16	ND	ND	ND	ND	ND	27.5
MW-2	02/18/98	5 - 6	ND	ND	ND	ND	ND	26.2
MW-2	02/18/98	10 - 11	ND	ND	ND	ND	ND	32.6
MW-2	02/18/98	14 - 16	ND	ND	ND	ND	ND	24.6
MW-3	02/18/98	5 - 5.5	ND	ND	ND	ND	ND	19.0
MW-3	02/18/98	10 - 12	ND	ND	ND	ND	ND	20.6
MW-3	02/18/98	14 - 16	ND	ND	ND	ND	ND	23.2
MW-3	02/18/98	16 - 18	ND	ND	ND	ND	ND	28.2

TABLE II

**SUMMARY OF SOIL RESULTS - SPLP
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO**

PARAMETER	CONCENTRATION (mg/L)
VOCs	ND
SVOCs	ND
TPH	0.9

NOTES:

1. The sample was obtained on 02/19/98 from SB-2 at 10 to 11.5 feet.
2. Those constituents not listed were ND.

TABLE III

**SUMMARY OF SOIL RESULTS - GEOTECHNICAL
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO**

PARAMETER	CONCENTRATION (percent)
Organic Content (FOC)	0.6
Moisture Content	11.7

NOTE:

The sample was obtained on 02/18/98 from MW-3 at approximately 14 to 16 feet below ground surface.

TABLE IV

**SUMMARY OF GROUND WATER GAUGING DATA
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO**

MONITORING WELL ID	DATE MEASURED	ELEV. OF GROUND SURFACE	DEPTH TO WATER	ELEV. OF WATER (feet)	PSH THICKNESS (feet)
MW-1	03/03/98	3631.61	14.90	3616.71	---
MW-1	04/07/98	3631.61	14.89	3616.72	---
MW-2	03/03/98	3631.07	18.97	3612.10	---
MW-2	04/07/98	3631.07	19.04	3612.03	---
MW-3	03/03/98	3628.96	23.86	3605.10	---
MW-3	04/07/98	3628.96	23.89	3605.07	---

NOTES:

1. --- Indicates PSH was not present
2. Depths are referenced from the ground surface.

TABLE V

**SUMMARY OF GROUND WATER FIELD RESULTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO**

MONITORING WELL ID	DATE MEASURED	TEMPERATURE (°F)	CONDUCTIVITY (µS)	pH	DISSOLVED OXYGEN (mg/L)
MW-1	03/03/98	63.1	1.04	6.77	1.68
MW-2	03/03/98	63.5	0.78	6.03	5.27
MW-3	03/03/98	63.3	0.87	6.48	1.45

TABLE VI

**SUMMARY OF GROUND WATER LABORATORY RESULTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO**

SAMPLE LOCATION	MW-1	MW-2	MW-3
PARAMETER	CONCENTRATION (mg/L)		
Benzene	0.001	ND	0.005
Total BTEX	0.001	ND	0.005
Metals:			
Aluminum	5.1	ND	ND
Barium	0.41	0.14	1.20
Boron	0.24	ND	ND
Calcium	871	134	738
Iron	7.27	0.34	0.33
Magnesium	34.3	18.7	29.5
Manganese	0.45	ND	1.07
Potassium	5.71	3.61	3.87
Silicon	166	27.4	26.2
Sodium	79.7	53.5	59.6
Strontium	2.44	1.26	2.04
Tin	1.34	ND	ND
Total Mercury	ND	ND	ND
Cations/Anions:			
Bicarbonate	494	314	350
Chloride	97.97	66.48	109
Sulfate	40.67	52.95	30.62
Total Dissolved Solids	844	601	701

NOTES:

1. Ground water samples were obtained on 03/03/98.
2. Those constituents not listed were ND.

ANALYTICAL REPORT 1-80766

for

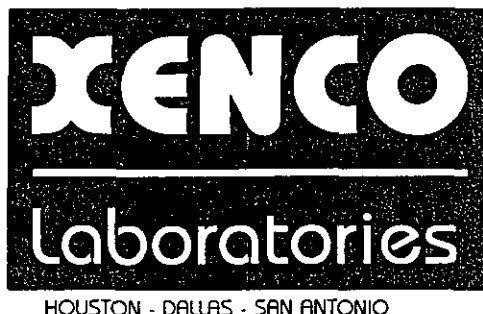
K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNM 98-S01

Project Id: 810004

March 12, 1998



11381 Meadowglen Lane Suite L * Houston, Texas 77082-2647
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Houston - Dallas - San Antonio - Latin America

March 12, 1998

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

Reference: **XENCO Report No.: 1-80766**
Project Name: TNM 98-S01
Project ID: 810004
Project Address: Monument

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 1-80766. 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. 1-80766 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

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

Sincerely,


Eddie Yonemoto, Ph.D.
Technical Director

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

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CERTIFICATE OF ANALYSIS SUMMARY 1-80766

K.E.I. Consultants, Inc.

Project ID: 810004
Project Manager: Theresa Nix
Project Location: Monument

Project Name: TNM 98-S01

Date Received in Lab : Feb 27, 1998 09:38
Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:		Field ID:		Depth:		Matrix:		Sampled:		180766 001		180766 002		180766 003		180766 004		180766 005		180766 006	
	Analyzed:		Units:		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
TPH-DRO (Diesel)	02/28/98		R.L.		34.1 (10.0)		28.4 (10.0)		27.5 (10.0)		26.2 (10.0)		32.6 (10.0)		24.6 (10.0)		R.L.		R.L.		R.L.	
EPA 8015 M	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
Total Petroleum Hydrocarbons	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
BTEX	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
EPA 8020	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
Benzene	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
Toluene	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
Ethylbenzene	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
m,p-Xylenes	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
o-Xylene	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	
Total BTEX	03/01/98		ppm		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)		< 0.020 (0.020)	

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


Edward H. Yonemoto, Ph.D.
Technical Director

Project ID: 810004 Project Manager: Theresa Nix Project Location: Monument		K.E.I. Consultants, Inc. Project Name: TNM 98-S01		Date Received in Lab : Feb 27, 1998 09:38 Date Report Faxed: Mar 12, 1998 XENCO contact : Carlos Castro/Edward Yonemoto	
Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180766 007 MW-3 5-5.5 Solid 02/18/98	180766 008 MW-3 10-12 Solid 02/18/98	180766 009 MW-3 14-16 Solid 02/18/98	180766 010 MW-3 16-18 Solid 02/18/98
	Analyzed: Units:				
	Moisture Content ASTM 2216-71				
	Moisture Content				
	Organic Content ASTM D2974				
Organic Content					
TPH-DRO (Diesel) EPA 8015 M	Analyzed: Units:	02/28/98 mg/kg	02/28/98 mg/kg	02/28/98 mg/kg	02/28/98 mg/kg
Total Petroleum Hydrocarbons		19.0 (10.0)	20.6 (10.0)	23.2 (10.0)	26.2 (10.0)
BTEX EPA 8020	Analyzed: Units:	03/01/98 ppm	03/01/98 ppm	03/01/98 ppm	03/01/98 ppm
Benzene		< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.10 (0.10)
Toluene		< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.10 (0.10)
Ethylbenzene		< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.10 (0.10)
m,p-Xylenes		< 0.040 (0.040)	< 0.040 (0.040)	< 0.040 (0.040)	< 0.20 (0.20)
o-Xylene		< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.10 (0.10)
Total BTEX		N.D.	N.D.	N.D.	N.D.

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


 Edward H. Yonemoto, Ph.D.
 Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

K.E.I. Consultants, Inc.
Project Name: TNM 98-S01

Project ID: 810004
Project Manager: Theresa Nix
Project Location: Monument

Date Received in Lab : Feb 27, 1998 09:38
Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested

Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
TPH-DRO (Diesel)	03/01/98 mg/kg	R.L. 41.4 (10.0)	03/01/98 mg/kg	R.L. 1650 (200)	03/01/98 mg/kg	R.L. 52.1 (10.0)
EPA 8015 M	03/01/98 mg/kg	R.L. 31.3 (10.0)	03/01/98 mg/kg	R.L. 1650 (200)	03/01/98 mg/kg	R.L. 52.1 (10.0)
Total Petroleum Hydrocarbons	03/01/98 mg/kg	R.L. 31.3 (10.0)	03/01/98 mg/kg	R.L. 1650 (200)	03/01/98 mg/kg	R.L. 52.1 (10.0)
BTEX	03/01/98 ppm	R.L. 41.4 (10.0)	03/01/98 ppm	R.L. 1650 (200)	03/01/98 ppm	R.L. 52.1 (10.0)
EPA 8020	03/01/98 ppm	R.L. 41.4 (10.0)	03/01/98 ppm	R.L. 1650 (200)	03/01/98 ppm	R.L. 52.1 (10.0)
Benzene	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)
Toluene	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)
Ethylbenzene	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)
m,p-Xylenes	< 0.040 (0.040)	< 0.040 (0.040)	< 0.040 (0.040)	< 0.040 (0.040)	< 0.040 (0.040)	< 0.040 (0.040)
o-Xylene	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)	< 0.020 (0.020)
Total BTEX	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPLP-Semivolatiles	03/06/98 mg/L	R.L.	03/06/98 mg/L	R.L.	03/06/98 mg/L	R.L.
EPA1312/8270	03/06/98 mg/L	R.L.	03/06/98 mg/L	R.L.	03/06/98 mg/L	R.L.
Acenaphthene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Acenaphthylene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Anthracene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Benzo(a)anthracene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Benzo(a)pyrene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Benzo(b)fluoranthene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Benzo(g,h,i)perylene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Benzo(k)fluoranthene	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
4-Bromophenyl-phenylether	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Butyl benzyl phthalate	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
Carbazole	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)
4-Chloro-3-Methylphenol	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)	< 0.010 (0.010)

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Edward A. Yonemoto, Ph.D.
Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

Project ID: 810004 Project Manager: Theresa Nix Project Location: Monument		K.E.I. Consultants, Inc. Project Name: TNM 98-S01		Date Received in Lab : Feb 27, 1998 09:38 Date Report Faxed: Mar 12, 1998 XENCO contact : Carlos Castro/Edward Yonemoto				
Analysis Requested		Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
EPA1312/8270	Analyzed: Units:				03/06/98 mg/L			
4-Chloroaniline					< 0.010 (0.010)			
2-Chloronaphthalene					< 0.010 (0.010)			
2-Chlorophenol					< 0.010 (0.010)			
4-Chlorophenyl-phenyl ether					< 0.010 (0.010)			
Chrysene					< 0.010 (0.010)			
Di-n-butyl phthalate					< 0.010 (0.010)			
Di-n-octyl phthalate					< 0.010 (0.010)			
Dibenzo(a,h)anthracene					< 0.010 (0.010)			
Dibenzofuran					< 0.010 (0.010)			
1,2-Dichlorobenzene					< 0.010 (0.010)			
1,3-Dichlorobenzene					< 0.010 (0.010)			
1,4-Dichlorobenzene					< 0.010 (0.010)			
3,3'-Dichlorobenzidine					< 0.010 (0.010)			
2,4-Dichlorophenol					< 0.010 (0.010)			
Diethyl phthalate					< 0.010 (0.010)			
2,4-Dimethylphenol					< 0.010 (0.010)			
Dimethyl phthalate					< 0.010 (0.010)			
4,6-Dinitro-2-methylphenol					< 0.025 (0.025)			
2,4-Dinitrophenol					< 0.025 (0.025)			
2,4-Dinitrotoluene					< 0.010 (0.010)			
2,6-Dinitrotoluene					< 0.010 (0.010)			
Fluoranthene					< 0.010 (0.010)			
Fluorene					< 0.010 (0.010)			
Hexachlorobenzene					< 0.010 (0.010)			

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 Edward Yonemoto, Ph.D.
 Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

K.E.I. Consultants, Inc.

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Date Received in Lab : Feb 27, 1998 09:38

Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
EPA 1312/8270	Analyzed: Units:			03/06/98 mg/L			
Hexachlorobutadiene				< 0.010 (0.010)			
Hexachlorocyclopentadiene				< 0.010 (0.010)			
Hexachloroethane				< 0.010 (0.010)			
Indeno(1,2,3-cd)pyrene				< 0.010 (0.010)			
Isophorone				< 0.010 (0.010)			
2-Methylnaphthalene				< 0.010 (0.010)			
2-Methylphenol				< 0.010 (0.010)			
4-Methylphenol				< 0.010 (0.010)			
N-Nitroso-di-n-propylamine				< 0.010 (0.010)			
N-Nitrosodiphenylamine				< 0.010 (0.010)			
Naphthalene				< 0.010 (0.010)			
2-Nitroaniline				< 0.025 (0.025)			
3-Nitroaniline				< 0.025 (0.025)			
4-Nitroaniline				< 0.025 (0.025)			
Nitrobenzene				< 0.010 (0.010)			
2-Nitrophenol				< 0.010 (0.010)			
4-Nitrophenol				< 0.010 (0.010)			
Pentachlorophenol				< 0.025 (0.025)			
Phenanthrene				< 0.010 (0.010)			
Phenol				< 0.010 (0.010)			
Pyrene				< 0.010 (0.010)			
1,2,4-Trichlorobenzene				< 0.010 (0.010)			
2,4,5-Trichlorophenol				< 0.025 (0.025)			
2,4,6-Trichlorophenol				< 0.010 (0.010)			

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Edward Yonemoto, Ph.D.
Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

K.E.I. Consultants, Inc.

Project Name: *TNM 98-S01*

Date Received in Lab : Feb 27, 1998 09:38

Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested

Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
EPA1312/8270			03/06/98 mg/L			
bis [2-Chloroethoxy] methane			R.L.			
bis [2-Chloroethyl] ether			< 0.010 (0.010)			
bis [2-Chloroisopropyl] ether			< 0.010 (0.010)			
bis [2-Ethylhexyl] phthalate			< 0.010 (0.010)			
SPLP Volatiles EPA 8260			03/10/98 mg/L			
Benzene			< 0.025 (0.025)			
Bromobenzene			< 0.025 (0.025)			
Bromochloromethane			< 0.025 (0.025)			
Bromodichloromethane			< 0.025 (0.025)			
Bromoform			< 0.025 (0.025)			
Bromomethane			< 0.025 (0.025)			
Carbon Tetrachloride			< 0.025 (0.025)			
Chlorobenzene			< 0.025 (0.025)			
Chloroethane			< 0.050 (0.050)			
Chloroform			< 0.025 (0.025)			
Chloromethane			< 0.050 (0.050)			
2-Chlorotoluene			< 0.025 (0.025)			
4-Chlorotoluene			< 0.025 (0.025)			
1,2-Dibromo-3-chloropropane			< 0.025 (0.025)			
Dibromochloromethane			< 0.025 (0.025)			
1,2-Dibromoethane			< 0.025 (0.025)			

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Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

K.E.I. Consultants, Inc.

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

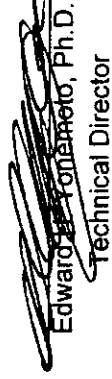
Date Received in Lab: Feb 27, 1998 09:38

Date Report Faxed: Mar 12, 1998

XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013	180766 014	180766 015	180766 016	180766 017	180766 018
		SB-1 14-16 Solid 02/19/98	SB-2 5-6.5 Solid 02/19/98	SB-2 10-11.5 Solid 02/19/98	SB-2 14-16 Solid 02/19/98	SB-3 5-7 Solid 02/19/98	SB-3 10-12 Solid 02/19/98
EPA 8260	Analyzed: Units:			03/10/98 mg/L			
Dibromomethane				< 0.025 (0.025)			
1,2-Dichlorobenzene				< 0.025 (0.025)			
1,3-Dichlorobenzene				< 0.025 (0.025)			
1,4-Dichlorobenzene				< 0.025 (0.025)			
Dichlorodifluoromethane				< 0.025 (0.025)			
1,1-Dichloroethane				< 0.025 (0.025)			
1,2-Dichloroethane				< 0.025 (0.025)			
1,1-Dichloroethene				< 0.025 (0.025)			
1,2-Dichloropropane				< 0.025 (0.025)			
1,3-Dichloropropane				< 0.025 (0.025)			
2,2-Dichloropropane				< 0.025 (0.025)			
1,1-Dichloropropene				< 0.025 (0.025)			
Ethylbenzene				< 0.025 (0.025)			
Hexachlorobutadiene				< 0.025 (0.025)			
Isopropylbenzene				< 0.025 (0.025)			
MTBE				< 0.050 (0.050)			
Methylene chloride				< 0.050 (0.050)			
Naphthalene				< 0.025 (0.025)			
Styrene				< 0.025 (0.025)			
1,1,1,2-Tetrachloroethane				< 0.025 (0.025)			
1,1,2,2-Tetrachloroethane				< 0.025 (0.025)			
Tetrachloroethene				< 0.025 (0.025)			
Toluene				< 0.025 (0.025)			
1,2,3-Trichlorobenzene				< 0.025 (0.025)			

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Edward Yonemoto, Ph.D.
Technical Director

CERTIFICATE OF ANALYSIS SUMMARY 1-80766

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

K.E.I. Consultants, Inc.

Project Name: *TNM 98-S01*

Date Received in Lab : Feb 27, 1998 09:38

Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested

Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
EPA 8260			03/10/98 mg/L			
1,2,4-Trichlorobenzene			< 0.025 (0.025)			
1,1,1-Trichloroethane			< 0.025 (0.025)			
1,1,2-Trichloroethane			< 0.025 (0.025)			
Trichloroethene			< 0.025 (0.025)			
Trichlorofluoromethane			< 0.075 (0.075)			
1,2,3-Trichloropropane			< 0.025 (0.025)			
1,2,4-Trimethylbenzene			< 0.025 (0.025)			
1,3,5-Trimethylbenzene			< 0.025 (0.025)			
Vinyl chloride			< 0.025 (0.025)			
cis-1,2-Dichloroethene			< 0.025 (0.025)			
cis-1,3-Dichloropropene			< 0.025 (0.025)			
m,p-Xylenes			< 0.025 (0.025)			
n-Butylbenzene			< 0.025 (0.025)			
n-Propylbenzene			< 0.025 (0.025)			
o-Xylene			< 0.025 (0.025)			
p-Isopropyltoluene			< 0.025 (0.025)			
sec-Butylbenzene			< 0.025 (0.025)			
tert-Butylbenzene			< 0.025 (0.025)			
trans-1,2-Dichloroethene			< 0.025 (0.025)			
trans-1,3-Dichloropropene			< 0.025 (0.025)			
SPLP TPH 1312/418.1			03/05/98 ppm			
			R.L.			

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Edward Yonemoto, Ph.D.
Technical Director



CERTIFICATE OF ANALYSIS SUMMARY 1-80766

Project ID: 810004 Project Manager: Theresa Nix Project Location: Monument		K.E.I. Consultants, Inc. Project Name: TNM 98-S01		Date Received in Lab : Feb 27, 1998 09:38 Date Report Faxed: Mar 12, 1998 XENCO contact : Carlos Castro/Edward Yonemoto			
Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180766 013 SB-1 14-16 Solid 02/19/98	180766 014 SB-2 5-6.5 Solid 02/19/98	180766 015 SB-2 10-11.5 Solid 02/19/98	180766 016 SB-2 14-16 Solid 02/19/98	180766 017 SB-3 5-7 Solid 02/19/98	180766 018 SB-3 10-12 Solid 02/19/98
	1312/418.1	Analyzed: Units:		03/05/98 ppm		R.L.	
Total Petroleum Hydrocarbons				0.9 (0.7)			

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Edward B. Yonemoto, Ph.D.
Technical Director

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

K.E.I. Consultants, Inc.

Project Name: TNM 98-S01

Date Received in Lab : Feb 27, 1998 09:38

Date Report Faxed: Mar 12, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested

TPH-DRO (Diesel)

EPA 8015 M

Lab ID:
Field ID:
Depth:
Matrix:
Sampled:

180766 019

SB-3

14-16

Solid

02/19/98

Analyzed:
Units:

03/01/98

mg/kg

R.L.

51.7 (10.0)

Total Petroleum Hydrocarbons

BTEX

EPA 8020

Analyzed:
Units:

03/01/98

ppm

R.L.

Benzene

< 0.020 (0.020)

Toluene

< 0.020 (0.020)

Ethylbenzene

< 0.020 (0.020)

m,p-Xylenes

< 0.040 (0.040)

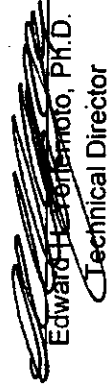
o-Xylene

< 0.020 (0.020)

Total BTEX

N.D.

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Edward H. Yonemoto, Ph.D.
Technical Director

**SW- 846 3015 M TPII- PRO (Diesel)**

Date Validated: Mar 3, 1998 10:00

Date Analyzed: Feb 28, 1998 17:07

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

Analyst: HL

Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 180766- 001	Parameter	[A]	[B]	[C]	[D]	[E]	Matrix	[F]	[G]	[H]	[I]	[J]
		Sample Result mg/kg	Matrix Spike Result mg/kg	Matrix Spike Duplicate Result mg/kg	Matrix Spike Amount mg/kg	Method Detection Limit mg/kg	Relative Difference	Spike Relative Difference	Matrix Spike Recovery	M.S.D. Recovery	Recovery Range	Qualifier
	Total Petroleum Hydrocarbons	34.10	1040	1040	1000	10.00	30.0	0.0	100.6	100.6	65-135	

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

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

M.S.D. = Matrix Spike Duplicate

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

N.D. = Below detection limit or not detected

NOTE: Below detection limit or not detected. All results are based on MDL and validated for QC purposes.

Houston Dallas San Antonio

Page

Edward H. Tonemoto, Ph.D.
Technical Director

SW- 846 5030/8020 BTEX
Date Validated: Mar 5, 1998 10:00

Analyst: HL

Date Analyzed: Mar 1, 1998 12:40

Matrix: Solid

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

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC	LIMITS	
	ppm	ppm	ppm	ppm	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0961	0.1000	0.0010	96.1	65-135	
Toluene	< 0.0010	0.0983	0.1000	0.0010	98.3	65-135	
Ethylbenzene	< 0.0010	0.1010	0.1000	0.0010	101.0	65-135	
m,p-Xylenes	< 0.0020	0.2020	0.2000	0.0020	101.0	65-135	
o-Xylene	< 0.0010	0.0991	0.1000	0.0010	99.1	65-135	

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

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

N.D. = Below detection limit

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


 Edward H. Yokemoto, Ph.D.
 Technical Director

Certificate of Quality Control for Batch : 18A25A78

SW- 846 5030/8020 BTEX

Date Validated: Mar 5, 1998 10:00
Date Analyzed: Mar 1, 1998 13:18
QA/QC Manager: Sunil Ajai, M.S.

Analyst: HL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY											
Q.C. Sample ID 180766- 001	Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F]		[G]	
								QC	Spike Relative Difference %	QC	Matrix Spike Recovery %
	Benzene	< 0.020	1.888	1.894	2.000	0.020	25.0	0.3	94.4	94.7	65-135
	Toluene	< 0.020	1.944	1.880	2.000	0.020	25.0	3.3	97.2	94.0	65-135
	Ethylbenzene	< 0.020	1.984	1.928	2.000	0.020	25.0	2.9	99.2	96.4	65-135
	m,p-Xylenes	< 0.040	4.000	3.840	4.000	0.040	25.0	4.1	100.0	96.0	65-135
	o-Xylene	< 0.020	1.966	1.896	2.000	0.020	25.0	3.6	98.3	94.8	65-135

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$
Matrix Spike Recovery [G] = $100 \cdot (B-A)/[D]$
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes


Edward H. Yonemoto, Ph.D.
Technical Director

ASTM 2216- 71 Moisture Content

Date Validated: Mar 3, 1998 08:25

Analyst: OG

Date Analyzed: Mar 2, 1998 14:47

Matrix: Solid

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

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 180801- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D]	[E]	[F] Qualifier
				QC	LIMITS	
Parameter				Relative Difference	Relative Difference	
	%	%	%	%	%	
Moisture Content	16.97	15.66	0.1	8.0	20.0	

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

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

N.D. = Below detection limit

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


 Edward H. Yonemoto, Ph.D.
 Technical Director

ASTM D2974 Organic Content

Date Validated: Mar 4, 1998 15:08

Analyst: IF

Date Analyzed: Mar 3, 1998 14:50

Matrix: Solid

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

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 180766- 009	[A]	[B]	[C]	[D]	[E]	[F]
	Sample Result	Duplicate Result	Method Detection Limit	QC Relative Difference	LIMITS Relative Difference	Qualifier
Parameter	%	%	%	%	%	
Organic Content	0.57	0.56	0.1	1.8	20.0	

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

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

N.D. = Below detection limit

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


Edward H. Yenemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch 18A34B11

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

Date Validated: Mar 9, 1998 20:31
Date Analyzed: Mar 6, 1998 20:55
QA/QC Manager: Sunil Ajai, M.S.

Analyst: LC
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F]		[G]		[H]		[I] Blank Spike Recovery Range %	[J] Qualifier
							QC	Spike Relative Difference %	QC	Blank Spike Recovery %	QC	B.S.D. Recovery %		
Acenaphthene	< 0.0040	0.0724	0.0890	0.1000	0.0040	31.0	20.6	72.4	89.0	46-118				
4-Chloro-3-Methylphenol	< 0.0040	0.0690	0.0770	0.1000	0.0040	42.0	11.0	69.0	77.0	23-97				
2-Chlorophenol	< 0.0040	0.0618	0.0754	0.1000	0.0040	40.0	19.8	61.8	75.4	27-123				
1,4-Dichlorobenzene	< 0.0040	0.0668	0.0840	0.1000	0.0040	28.0	22.8	66.8	84.0	36-97				
2,4-Dinitrotoluene	< 0.0040	0.0816	0.0910	0.1000	0.0040	38.0	10.9	81.6	91.0	24-96				
N-Nitroso-di-n-propylamine	< 0.0080	0.0736	0.0914	0.1000	0.0080	38.0	21.6	73.6	91.4	41-116				
4-Nitrophenol	< 0.0080	0.0326	0.0336	0.1000	0.0080	50.5	3.0	32.6	33.6	10-80				
Pentachlorophenol	< 0.0020	0.0792	0.0786	0.1000	0.0020	50.0	0.8	79.2	78.6	9-103				
Phenol	< 0.0020	0.0306	0.0388	0.1000	0.0020	42.0	23.6	30.6	38.8	12-89				
Pyrene	< 0.0040	0.0968	0.0974	0.1000	0.0040	31.0	0.6	96.8	97.4	26-127				
1,2,4-Trichlorobenzene	< 0.0020	0.0722	0.0894	0.1000	0.0020	28.0	21.3	72.2	89.4	39-98				

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$
Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Tonemoto, Ph.D.
Technical Director

EPA1312/8260 SPLP Volatiles

Date Validated: Mar 11, 1998 12:30

Analyst: CE

Date Analyzed: Mar 10, 1998 13:48

Matrix: Solid

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

BLANK SPIKE ANALYSIS

Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0516	0.0500	0.0010	103.2	66-142	
Chlorobenzene	< 0.0010	0.0518	0.0500	0.0010	103.6	60-133	
1,1-Dichloroethene	< 0.0040	0.0535	0.0500	0.0040	107.0	59-172	
Toluene	0.0064	0.0514	0.0500	0.0010	90.0	59-139	
Trichloroethene	< 0.0030	0.0554	0.0500	0.0030	110.8	62-137	

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

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

B.D. = Below detection limit

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


 Edward H. Yamamoto, Ph.D.
 Technical Director

EPA1312/8260 SPLP Volatiles

Date Validated: Mar 11, 1998 12:30

Analyst: CE

Date Analyzed: Mar 10, 1998 13:48

Matrix: Solid

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

Parameter	BLANK SPIKE ANALYSIS						
	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Benzene	< 0.0010	0.0516	0.0500	0.0010	103.2	66-142	
Chlorobenzene	< 0.0010	0.0518	0.0500	0.0010	103.6	60-133	
1,1-Dichloroethene	< 0.0040	0.0535	0.0500	0.0040	107.0	59-172	
Toluene	0.0064	0.0514	0.0500	0.0010	90.0	59-139	
Trichloroethene	< 0.0030	0.0554	0.0500	0.0030	110.8	62-137	

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

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

B.D. = Below detection limit

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


 Edward H. Yonemoto, Ph.D.
 Technical Director

Certificate Of Quality Control for Batch : 18A07C04

EPA 1312/418.1 SPLP TPH

Date Validated: Mar 5, 1998 16:50
Date Analyzed: Mar 5, 1998 16:03
QA/QC Manager: Sunil Ajai, M.S.

Analyst: MB
Matrix: Solid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY														
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Method Detection Limit ppm	Blank Limit Relative Difference %	[F]		[G]		[H]		[I] Blank Spike Recovery Range %	[J] Qualifier
							QC	Spike Relative Difference %	QC	Blank Spike Recovery %	QC	B.S.D. Recovery %		
Total Petroleum Hydrocarbons	< 0.50	3.28	3.24	3.36	0.50	20.0	1.2		97.7	96.5	65-135			

Spike Relative Difference [F] = $200 \cdot (B-C)/(B+C)$
Blank Spike Recovery [G] = $100 \cdot (B-A)/[D]$
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = $100 \cdot (C-A)/[D]$
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Project Name: TNM 98-S01

XENCO COC#: 1-80766

Date Received in Lab: Feb 27, 1998 09:38 by CC

XENCO contact : Carlos Castro/Edward Yonemoto

		Date and Time									
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis		
1 MW-1 (5-6)	180766-001	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	13:18	by HL
2		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	17:07	by HL
3 MW-1 (10-12)	180766-002	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	14:15	by HL
4		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	17:41	by HL
5 MW-1 (14-16)	180766-003	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	14:34	by HL
6		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	18:15	by HL
7 MW-2 (5-6)	180766-004	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	14:52	by HL
8		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	18:49	by HL
9 MW-2 (10-11)	180766-005	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	15:11	by HL
10		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	19:29	by HL
11 MW-2 (14-16)	180766-006	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	15:30	by HL
12		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	20:03	by HL
13 MW-3 (5-5.5)	180766-007	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	15:49	by HL
14		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	20:37	by HL
15 MW-3 (10-12)	180766-008	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	16:07	by HL
16		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	21:11	by HL
17 MW-3 (14-16)	180766-009	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	16:27	by HL
18		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	21:45	by HL
19		Moisture	ASTM 2216-71	%	Standard	Feb 18, 1998		Mar 2, 1998 by OG	Mar 2, 1998	14:49	by OG
20		Org. Content	ASTM D2974	%	Standard	Feb 18, 1998		Mar 3, 1998 by IF	Mar 3, 1998	14:50	by IF
21 MW-3 (16-18)	180766-010	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	16:46	by HL
22		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	22:19	by HL
23 SB-1 (5-5.5)	180766-011	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	20:29	by HL
24		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	23:27	by HL
25 SB-1 (10-12)	180766-012	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	20:48	by HL
26		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Feb 28, 1998	00:01	by HL
27 SB-1 (14-16)	180766-013	BTEX	SW-846	ppm	Standard	Feb 18, 1998		Mar 1, 1998 by HL	Mar 1, 1998	21:07	by HL
28		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 18, 1998		Feb 28, 1998 by HL	Mar 1, 1998	00:35	by HL

ANALYTICAL CHAIN OF CUSTODY REPORT CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Project Name: TNM 98-S01

XENCO COC#: 1-80766

Date Received in Lab: Feb 27, 1998 09:38 by CC

XENCO contact : Carlos Castro/Edward Yonemoto

Date and Time									
Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
29 SB-2 (5-6.5)	180766-014	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 21:28 by HL
30		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 01:09 by HL
31 SB-2 (10-11.5)	180766-015	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 21:45 by HL
32		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 01:43 by HL
33		SPLP TPH	EPA	ppm	Standard	Feb 19, 1998		Mar 5, 1998 by MB	Mar 5, 1998 16:18 by MB
34		SPLP-SV(TCL)	SW846-1312/82	ug/L	Standard	Feb 19, 1998		Mar 6, 1998 by SS	Mar 6, 1998 23:14 by LC
35		VOA (8260)	EPA1312/8260	mg/kg	Standard	Feb 19, 1998		Mar 10, 1998 by CE	Mar 10, 1998 15:27 by CE
36 SB-2 (14-16)	180766-016	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 22:04 by HL
37		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 02:17 by HL
38 SB-3 (5-7)	180766-017	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 22:23 by HL
39		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 02:52 by HL
40 SB-3 (10-12)	180766-018	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 22:42 by HL
41		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 03:26 by HL
42 SB-3 (14-16)	180766-019	BTEX	SW-846	ppm	Standard	Feb 19, 1998		Mar 1, 1998 by HL	Mar 1, 1998 23:01 by HL
43		TPH8015M-D	SW-846 8015 M	mg/kg	Standard	Feb 19, 1998		Feb 28, 1998 by HL	Mar 1, 1998 04:04 by HL



13881 Meadowcreek Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page

of 2

Lab. Batch # 180766-SA

Contractor KEI Consultants		Phone (210) 680-3767		No. coolers this shipment: 1		Contractor COC #											
Address 5309 Wurzbach Suite 100 SA, Tx 78238		Project Director Mike Hawthorne		Carrier: UPS		Quote #:											
Project Name TNM 98-501		Project Manager Theresa Nix		Airbill No.		P.O. No.:											
Project Location Monument		Project No. 810004															
SAMPLE CHARACTERIZATION				No. of CONTAINERS													
Field ID	Date	Time	DEPT H	SOIL	WATER	COM P	G R A P	Container Size Type P, G	Preservative	Is	Other	Unl Dies Ker Unknown	Waste Oil	PTT No:	Tank No:	Sample Description	Total
MW-1	2-18-98		5-6					102.6									1
MW-1	2-18-98		10-12														1
MW-1	2-18-98		14-16														1
MW-2	2-18-98		5-6														1
MW-2	2-18-98		10-12														1
MW-2	2-18-98		14-16														1
MW-3	2-18-98		5-55														1
MW-3	2-18-98		10-12														1
MW-3	2-18-98		14-16														1
MW-3	2-18-98		16-18														1
Relinquished by: <i>[Signature]</i> DATE: 02-26-98 TIME: 0930																	
Received by: <i>[Signature]</i> DATE: 2/27/98 TIME: 09:38																	
Received For Laboratory by: <i>[Signature]</i> DATE: 2/27/98 TIME: 09:38																	

Remarks

Sample w/ highest TPH DLO

run SPLP TPH

SPLP VOC

SPLP SVOC

(UPS)

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

* Pre-scheduling is recommended

Precision Analytical Services

Contractor KEI Consultants		Phone (210) 680-3767		No. of Containers		No. coolers this shipment		Contractor COC #	
Address 5309 Wurzbach Suite 100 SA, Tx 78238		Project Director Mike Hawthorne		Carrier: UPS		Quote #:		PO. No.:	
Project Name TNM 98-501		Project Manager Theresa Nix		Airtail No.					
Project Location Monument		Project No. 810004							
Sample Signature 		Unal. Dies		Ker		Unknown			
		Preservative		Waste Oil		FTT No.		Tank No.	
		S O I L		C A R T		S I Z E		T Y P E	
		D E P T H		G R A B		P. G.			
		Time		Date		Field ID			
		5-55		2-19-98		SB-1			
		10-12		2-19-98		SB-1			
		14-16		2-19-98		SB-1			
		5-65		2-19-98		SB-2			
		10-11		2-19-98		SB-2			
		14-16		2-19-98		SB-2			
		5-7		2-19-98		SB-3			
		10-12		2-19-98		SB-3			
		14-16		2-19-98		SB-3			

Requested by 		Received by 		DATE		TIME		Signature		DATE		TIME		Remarks	
				2-20-98		0930								Sample w/ highest TPH DEO	
														NN SPUP TPH	
														SPUP VOC	
														SPUP SVOC	
														(VPS)	

ANALYTICAL REPORT 1-80826

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNM 98-S01

Project Id: 810004

April 7, 1998



HOUSTON - DALLAS - SAN ANTONIO

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



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

April 7, 1998

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

Reference: **XENCO Report No.: 1-80826**
Project Name: TNM 98-S01
Project ID: 810004
Project Address: Monument

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 1-80826. 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. 1-80826 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

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

Sincerely,


Eddie Yonemoto, Ph.D.
Technical Director

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

K.E.I. Consultants, Inc.
Project Name: TNM 98-S01

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Date Received in Lab : Mar 4, 1998 11:00

Date Report Faxed: Apr 7, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID: Depth: Matrix: Sampled:	180826 001 MW-1 Liquid 03/03/98 10:18	180826 002 MW-2 Liquid 03/03/98 09:40	180826 003 MW-3 Liquid 03/03/98 10:00	
Metals by ICP EPA 6010	Analyzed: Units:	03/19/98 mg/L R.L.	03/19/98 mg/L R.L.	03/19/98 mg/L R.L.	
Aluminum		5.1 (0.6)	< 0.56 (0.56)	< 0.56 (0.56)	
Barium		0.41 (0.09)	0.14 (0.09)	1.20 (0.09)	
Beryllium		< 0.022 (0.022)	< 0.022 (0.022)	< 0.022 (0.022)	
Boron		0.24 (0.22)	< 0.22 (0.22)	< 0.22 (0.22)	
Calcium		871 (2.2)	134 (2.2)	738 (2.2)	
Chromium		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	
Cobalt		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	
Copper		< 0.11 (0.11)	< 0.11 (0.11)	< 0.11 (0.11)	
Iron		7.27 (0.22)	0.34 (0.22)	0.33 (0.22)	
Magnesium		34.3 (0.2)	18.7 (0.2)	29.5 (0.2)	
Manganese		0.45 (0.06)	< 0.06 (0.06)	1.07 (0.06)	
Molybdenum		< 0.56 (0.56)	< 0.56 (0.56)	< 0.56 (0.56)	
Nickel		< 0.11 (0.11)	< 0.11 (0.11)	< 0.11 (0.11)	
Potassium		5.71 (1.11)	3.61 (1.11)	3.87 (1.11)	
Silicon		166 (0.6)	27.4 (0.6)	26.2 (0.6)	
Silver		< 0.05 (0.05)	< 0.05 (0.05)	< 0.05 (0.05)	
Sodium		79.7 (2.2)	53.5 (2.2)	59.6 (2.2)	
Strontium		2.44 (0.22)	1.26 (0.22)	2.04 (0.22)	
Tin		1.34 (0.22)	< 0.22 (0.22)	< 0.22 (0.22)	
Vanadium		< 0.11 (0.11)	< 0.11 (0.11)	< 0.11 (0.11)	
Zinc		< 1.11 (1.11)	< 1.11 (1.11)	< 1.11 (1.11)	
RCRA Metals EPA 6010	Analyzed: Units:	03/18/98 mg/L R.L.	03/18/98 mg/L R.L.	03/18/98 mg/L R.L.	
Arsenic		< 0.22 (0.22)	< 0.22 (0.22)	< 0.22 (0.22)	
Cadmium		< 0.022 (0.022)	< 0.022 (0.022)	< 0.022 (0.022)	
Lead		< 0.11 (0.11)	< 0.11 (0.11)	< 0.11 (0.11)	
Selenium		< 0.22 (0.22)	< 0.22 (0.22)	< 0.22 (0.22)	
Total Mercury EPA 7470	Analyzed: Units:	03/16/98 mg/L R.L.	03/16/98 mg/L R.L.	03/16/98 mg/L R.L.	
Mercury		< 0.0011 (0.0011)	< 0.0011 (0.0011)	< 0.0011 (0.0011)	
BTEX EPA 8020	Analyzed: Units:	03/06/98 ppm R.L.	03/06/98 ppm R.L.	03/06/98 ppm R.L.	

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 Edward H. Yonemoto, Ph.D.
 Technical Director

K.E.I. Consultants, Inc.
Project Name: TNM 98-S01

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Date Received in Lab : Mar 4, 1998 11:00

Date Report Faxed: Apr 7, 1998

XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	180826 001	180826 002	180826 003	
	Field ID:	MW-1	MW-2	MW-3	
	Depth:				
	Matrix:	Liquid	Liquid	Liquid	
	Sampled:	03/03/98 10:18	03/03/98 09:40	03/03/98 10:00	
EPA 8020	Analyzed:	03/06/98 R.L.	03/06/98 R.L.	03/06/98 R.L.	
	Units:	ppm	ppm	ppm	
Benzene		0.001 (0.001)	< 0.001 (0.001)	0.005 (0.004)	
Toluene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.004 (0.004)	
Ethylbenzene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.004 (0.004)	
m,p-Xylenes		< 0.002 (0.002)	< 0.002 (0.002)	< 0.008 (0.008)	
o-Xylene		< 0.001 (0.001)	< 0.001 (0.001)	< 0.004 (0.004)	
Total BTEX		0.001	N.D.	0.005	
PAHs by GC-MS (610 List)	Analyzed:	03/11/98 R.L.	03/11/98 R.L.	03/11/98 R.L.	
EPA 8270	Units:	mg/L	mg/L	mg/L	
Acenaphthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Acenaphthylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(a)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(a)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(b)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(g,h,i)perylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(k)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Chrysene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Dibenzo(a,h)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Fluorene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Naphthalene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Phenanthrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Bicarbonate	Analyzed:	03/09/98 R.L.	03/09/98 R.L.	03/09/98 R.L.	
SM 4500CO2D	Units:	mg/L	mg/L	mg/L	
Bicarbonate		494 (1.0)	314 (1.0)	350 (1.0)	
Carbonate	Analyzed:	03/09/98 R.L.	03/09/98 R.L.	03/09/98 R.L.	
SM4500CO2D	Units:	mg/L	mg/L	mg/L	
Carbonate		< 1.0 (1.0)	< 1.0 (1.0)	< 1.0 (1.0)	
Total Dissolved Solids	Analyzed:	03/10/98 R.L.	03/10/98 R.L.	03/10/98 R.L.	
EPA 160.1	Units:	mg/L	mg/L	mg/L	
Total Dissolved Solids		844 (4.0)	601 (4.0)	701 (4.0)	

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 Edward H. Yonemoto, Ph.D.
 Technical Director

K.E.I. Consultants, Inc.**Project Name: TNM 98-S01****Project ID: 810004****Project Manager: Theresa Nix****Project Location: Monument****Date Received in Lab : Mar 4, 1998 11:00****Date Report Faxed: Apr 7, 1998****XENCO contact : Carlos Castro/Edward Yonemoto**

Analysis Requested	Lab ID:	180826 001	Lab ID:	180826 002	Lab ID:	180826 003	
	Field ID:	MW-1	Field ID:	MW-2	Field ID:	MW-3	
	Depth:		Depth:		Depth:		
	Matrix:	Liquid	Matrix:	Liquid	Matrix:	Liquid	
	Sampled:	03/03/98 10:18	Sampled:	03/03/98 09:40	Sampled:	03/03/98 10:00	
Anions by Ion Chromatography EPA 300.0	Analyzed:	03/13/98	Analyzed:	03/13/98	Analyzed:	03/13/98	
	Units:	mg/L	Units:	mg/L	Units:	mg/L	
Chloride		97.97 (1.00)		66.48 (1.00)		109 (1.00)	
Sulfate		40.67 (1.00)		52.95 (1.00)		30.62 (1.00)	

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Edward H. Yonemoto, Ph.D.
Technical Director

EPA 6010 Metals by ICP

Date Validated: Mar 23, 1998 09:57
Date Analyzed: Mar 19, 1998 11:23
QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
Matrix: Liquid

Q.C. Sample ID 180826- 001		MATRIX DUPLICATE ANALYSIS						MATRIX SPIKE ANALYSIS						
		[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Detection Limit mg/L	[D]		[E]		[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]		[I] LIMITS	[J] Qualifier
					QC	Relative Difference %	QC	LIMITS			Matrix Spike Recovery %	Recovery Range %		
Parameter														
Aluminum		5.10	5.05	0.22	1.0	25.0	6.13	2.2	46.4	70-125	A,B			
Barium		0.409	0.402	0.022	1.7	25.0	1.462	1.11	94.8	70-125				
Beryllium		< 0.0222	< 0.0222	0.0222	N.C	25.0	0.4344	0.444	97.7	70-125				
Calcium		871	869	0.06	0.2	25.0	833	4.4	855.9	70-125	A,B			
Chromium		< 0.111	< 0.111	0.111	N.C	25.0	1.094	1.11	98.5	70-125				
Cobalt		0.033	< 0.022	0.022	N.C	25.0	1.044	1.11	91.0	70-125				
Copper		< 0.033	< 0.033	0.033	N.C	25.0	1.078	1.11	97.0	70-125				
Iron		7.267	4.483	0.028	47.4	25.0	3.707	2.22	160.2	70-125	C,B			
Magnesium		34.32	34.45	0.06	0.4	25.0	37.23	4.4	65.5	70-125	A,B			
Manganese		0.448	0.454	0.028	1.3	25.0	0.419	2.22	1.3	70-125	B			
Nickel		< 0.111	< 0.111	0.111	N.C	25.0	1.006	1.11	90.5	70-125				
Potassium		5.711	5.827	0.111	2.0	25.0	10.224	4.44	101.6	70-125				
Silicon		166	140	0.22	17.0	25.0	188	2.2	990.0	70-125	A,B			

(A) High analyte concentration affects spike recovery.
(B) Post-digestion spike within acceptance limits.
(C) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = $200 \times (B-A)/(B+A)$
Matrix Spike Recovery [H] = $100 \times (F-A)/G$
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

EPA 6010 Metals by ICP

Date Validated: Mar 23, 1998 09:57
Date Analyzed: Mar 19, 1998 11:23
QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
Matrix: Liquid

Q.C. Sample ID 180826- 001		MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS					
		[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Detection Limit mg/L	[D]		[E] LIMITS	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[J] Qualifier
					QC	Relative Difference				QC	Recovery Range	
					Relative Difference %	%				Matrix Spike Recovery %	%	
Parameter												
Silver		< 0.044	< 0.044	0.044	N.C	25.0	< 0.044	0.89	N.C.	70-125		B
Sodium		79.68	82.73	0.11	3.8	25.0	84.85	4.4	116.4	70-125		
Strontium		2.442	2.502	0.111	2.4	25.0	4.308	2.22	84.0	70-125		
Vanadium		0.046	0.049	0.033	6.3	25.0	1.071	1.11	92.3	70-125		
Zinc		< 0.033	< 0.033	0.033	N.C	25.0	1.428	1.11	128.5	70-125		B

(A) High analyte concentration affects spike recovery.
(B) Post-digestion spike within acceptance limits.
(C) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = $200 \cdot (B-A)/(B+A)$
Matrix Spike Recovery [H] = $100 \cdot (F-A)/[G]$
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Sunil S. Ajai
Edward H. Yohemoto, Ph.D.
Resident Director

SW846/6010 RCRA Metals

Date Validated: Mar 23, 1998 17:45

Analyst: CG

Date Analyzed: Mar 18, 1998 14:37

Matrix: Liquid

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

BLANK SPIKE ANALYSIS

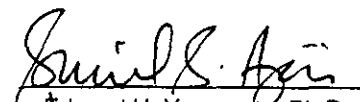
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Arsenic	< 0.222	2.032	2.222	0.222	91.4	70-125	
Cadmium	< 0.0222	0.4300	0.4444	0.0222	96.8	70-125	
Lead	< 0.111	2.140	2.222	0.111	96.3	75-125	
Selenium	< 0.222	2.147	2.222	0.222	96.6	70-125	

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

C. = Not calculated, data below detection limit

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director

Certificate Of Quality Control for Batch : 18A18C04

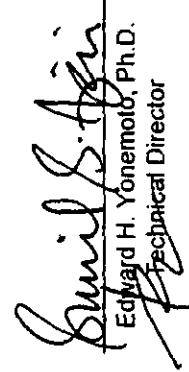
SW846/6010 RCRA Metals

Date Validated: Mar 23, 1998 17:45
 Date Analyzed: Mar 18, 1998 15:01
 QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
 Matrix: Liquid

Q.C. Sample ID 180826- 002		MATRIX DUPLICATE ANALYSIS						MATRIX SPIKE ANALYSIS					
		[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Detection Limit mg/L	[D]		[E] LIMITS	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H]	[I]	[G] Qualifier	
					QC	Relative Difference %				QC	Recovery Range %		
Parameter													
Arsenic		< 0.222	< 0.222	0.222	N.C	25.0	2.141	2.22	96.3		70-125		
Cadmium		< 0.0222	< 0.0222	0.0222	N.C	25.0	0.4500	0.444	101.3		70-125		
Lead		< 0.111	< 0.111	0.111	N.C	25.0	2.043	2.22	91.9		75-125		
Selenium		< 0.222	< 0.222	0.222	N.C	25.0	2.167	2.22	97.5		70-125		

Relative Difference [D] = $200 \cdot (B-A) / (B+A)$
 Matrix Spike Recovery [H] = $100 \cdot (F-A) / [G]$
 N C = Not calculated, data below detection limit
 N D = Below detection limit
 All results are based on MDL and validated for QC purposes only


 Edward H. Yonemoto, Ph.D.
 Technical Director

SW846- 7470 Total Mercury

Date Validated: Mar 18, 1998 09:23

Analyst: CG

Date Analyzed: Mar 16, 1998 15:30

Matrix: Liquid

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

BLANK SPIKE ANALYSIS

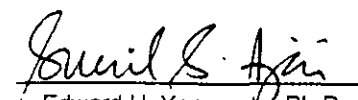
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G] Qualifier
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Mercury	< 0.0011	0.0028	0.0028	0.0011	100.0	70-125	

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

C. = Not calculated, data below detection limit

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director



Certificate Of Quality Control for Batch : 18A05A79

SW846- 7470 Total Mercury

Date Validated: Mar 18, 1998 09:23
Date Analyzed: Mar 16, 1998 15:33
QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
Matrix: Liquid

		MATRIX DUPLICATE ANALYSIS						MATRIX SPIKE ANALYSIS					
Q.C. Sample ID 180826- 001 Parameter		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]		
		Sample Result mg/L	Duplicate Result mg/L	Detection Limit mg/L	QC	LIMITS	Matrix Spike Result mg/L	Matrix Spike Amount mg/L	QC	Recovery Range %	Qualifier		
					Relative Difference %	Relative Difference %			Matrix Spike Recovery %				
Mercury		< 0.0011	< 0.0011	0.0011	N.C	20.0	0.0019	0.0028	67.9	70-125	A		

(A) Post-digestion spike within acceptance limits.
Relative Difference [D] = $200 \cdot (B-A) / (B+A)$
Matrix Spike Recovery [H] = $100 \cdot (F-A) / [G]$
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

SW- 846 5030/8020 BTEX

Date Validated: Mar 9, 1998 11:00

Analyst: HL

Date Analyzed: Mar 6, 1998 09:32

Matrix: Liquid

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

BLANK SPIKE ANALYSIS

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

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

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

N.D. = Below detection limit

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


 Edward H. Yonemoto, Ph.D.
 Technical Director

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

Date Validated: Mar 12, 1998 12:40
Date Analyzed: Mar 12, 1998 08:28
QA/QC Manager: Sunil Ajai, M.S.

Analyst: LC

Matrix: Liquid

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

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

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

B.S.D. = Blank Spike Duplicate

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

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes


Edward J. Monemoto, Ph.D.
Technical Director

SM 4500C02D Bicarbonate

Date Validated: Mar 10, 1998 09:38

Analyst: IF

Date Analyzed: Mar 9, 1998 14:30

Matrix: Liquid

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

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 180826- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	mg/L	mg/L	mg/L	%	%	
Parameter						
Bicarbonate	494	496	1.00	0.4	25.0	

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

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

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director

SM 4500CO2D Bicarbonate

Date Validated: Mar 10, 1998 09:38

Analyst: IF

Date Analyzed: Mar 9, 1998 14:00

Matrix: Liquid

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

BLANK SPIKE ANALYSIS							
Parameter	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Blank Result	Blank Spike Result	Blank Spike Amount	Detection Limit	QC	LIMITS	Qualifier
	mg/L	mg/L	mg/L	mg/L	Blank Spike Recovery %	Recovery Range %	
Bicarbonate	< 1.00	270	250	1.00	108.0	70-125	

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

C. = Not calculated, data below detection limit

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director

SM4500C02D Carbonate

Date Validated: Mar 10, 1998 09:38

Analyst: IF

Date Analyzed: Mar 9, 1998 14:30

Matrix: Liquid

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

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 180826- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
	ppm	ppm	ppm	%	%	
	Parameter					
Carbonate	< 1.00	< 1.00	1.00	N.C	25.0	

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

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

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director

EPA 160.1 Total Dissolved Solids

Date Validated: Mar 10, 1998 13:39

Analyst: IF

Date Analyzed: Mar 10, 1998 13:25

Matrix: Liquid

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

MATRIX DUPLICATE ANALYSIS						
Q.C. Sample ID 180827- 004	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC	[E] LIMITS	[F] Qualifier
	mg/L	mg/L	mg/L	Relative Difference %	Relative Difference %	
Parameter						
Total Dissolved Solids	470	470	4.00	0.0	25.0	

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

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

N.D. = Below detection limit

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


Edward H. Yonemoto, Ph.D.
Technical Director

Certificate Of Quality Control for Batch : 18A10A49

EPA 300.0 Anions by Ion Chromatography

Date Validated: Mar 23, 1998 10:16

Date Analyzed: Mar 13, 1998 15:38

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

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]		[G]	[H]		[I] Blank Spike Recovery Range %	[J] Qualifier
							QC	Spike Relative Difference %	QC	Blank Spike Recovery	B.S.D. Recovery		
Chloride	< 0.050	9.116	8.453	10.000	0.050	20.0	7.5	91.2	84.5		70-125		
Sulfate	< 0.100	8.546	8.025	10.000	0.100	20.0	6.3	85.5	80.3		70-125		

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

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

B.S.D. = Blank Spike Duplicate

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

N.D. = Below detection limit or not detected

All results are based on MDL and validated for QC purposes

Houston · Dallas · San Antonio


Edward H. Yonemoto, Ph.D.
Technical Director

K.E.I. Consultants, Inc.

Project ID: 810004

Project Manager: Theresa Nix

Project Location: Monument

Project Name: TNM 98-S01

XENCO COC#: 1-80826

Date Received in Lab: Mar 4, 1998 11:00 by LY

XENCO contact : Carlos Castro/Edward Yonemoto

Field ID		Lab ID	Method Name	Method ID	Units	Turn Around	Sample Collected	Addition Requested	Extraction	Analysis
1	MW-1 Cloudy	180826-001	BTEX	SW-846	ppm	Standard	Mar 3, 1998 10:18		Mar 6, 1998 by HL	Mar 6, 1998 12:25 by HL
2			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 10:18		Mar 10, 1998 by RK	Mar 11, 1998 13:13 by LC
3			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 10:18		Mar 16, 1998 by AO	Mar 19, 1998 11:20 by CG
4			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 10:18		Mar 16, 1998 by CG	Mar 16, 1998 15:32 by CG
5			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 10:18		Mar 9, 1998 by IF	Mar 10, 1998 13:10 by IF
6			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 10:18		Mar 13, 1998 by OR	Mar 13, 1998 17:15 by OR
7			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 10:18		Mar 9, 1998 by IF	Mar 9, 1998 14:30 by IF
8			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 10:18		Mar 9, 1998 by IF	Mar 9, 1998 14:30 by IF
9			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 10:18		Mar 16, 1998 by CG	Mar 18, 1998 14:52 by CG
10	MW-2 Cloudy	180826-002	BTEX	SW-846	ppm	Standard	Mar 3, 1998 09:40		Mar 6, 1998 by HL	Mar 6, 1998 11:08 by HL
11			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 09:40		Mar 10, 1998 by RK	Mar 11, 1998 20:00 by LC
12			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 09:40		Mar 16, 1998 by AO	Mar 19, 1998 11:31 by CG
13			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 09:40		Mar 16, 1998 by CG	Mar 16, 1998 15:41 by CG
14			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 09:40		Mar 9, 1998 by IF	Mar 10, 1998 13:15 by IF
15			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 09:40		Mar 13, 1998 by OR	Mar 13, 1998 17:23 by OR
16			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 09:40		Mar 9, 1998 by IF	Mar 9, 1998 14:50 by IF
17			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 09:40		Mar 9, 1998 by IF	Mar 9, 1998 14:50 by IF
18			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 09:40		Mar 16, 1998 by CG	Mar 18, 1998 14:56 by CG
19	MW-3 Cloudy	180826-003	BTEX	SW-846	ppm	Standard	Mar 3, 1998 10:00		Mar 6, 1998 by HL	Mar 6, 1998 12:44 by HL
20			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 10:00		Mar 10, 1998 by RK	Mar 11, 1998 20:47 by LC
21			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 10:00		Mar 16, 1998 by AO	Mar 19, 1998 11:35 by CG
22			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 10:00		Mar 16, 1998 by CG	Mar 16, 1998 15:42 by CG
23			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 10:00		Mar 9, 1998 by IF	Mar 10, 1998 13:20 by IF
24			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 10:00		Mar 13, 1998 by OR	Mar 13, 1998 17:30 by OR
25			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 10:00		Mar 9, 1998 by IF	Mar 9, 1998 15:00 by IF
26			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 10:00		Mar 9, 1998 by IF	Mar 9, 1998 15:00 by IF
27			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 10:00		Mar 16, 1998 by CG	Mar 18, 1998 15:09 by CG



1381 Meadowlark Suite L Houston, Texas 77082
(713) 589-0692

CHAIN OF CUSTODY RECORD
AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab Batch # 180826-8A

Contractor Kel Consultants		Phone (214) 680-3767		Contractor COC #									
Address 5309 WARZBURG RD, STE 100, SAN ANTONIO, TX 78238		Project Director MIKE NAUGHTON		Quote #:									
Project Name TNHPL		Project Manager THERESA NIX		P.O. No.: CALL THERESA NIX									
Project Location MONAHENT		Project No. 810004											
Sample Signature <i>[Signature]</i>		Project No. 810004											
SAMPLE CHARACTERIZATION													
Field ID	Date	Time	DEPT H	WATER	COMPA	G R A B	Container Size Type P, G	Preservative	Unl Dis Ker Unknown	Waste Oil	FTT No:	Tank No:	Sample Description
MW-1	3-3-98	1018						HCl					CLOUDY
MW-2	3-3-98	0940						HNO3					CLOUDY
MW-3	3-3-98	1000						HCl					CLOUDY
Total													
No. of CONTAINERS													
No. coolers this shipment:													
Carrier: ULPS													
Airbill No.													
Turn-around													
- ASAP													
- 24 hrs													
- 48 hrs													
Remarks													
Please Hold													
TDS (METHOD 1601)													
HEAVY METALS (ICP SCANNING)													
PAH (METHOD 8160)													
TFH (483)													
BTEX (METHOD 8210)													
SW 846 & 802													
ATTORNEYS/ANALYSTS													
LABORATORIES													
Remarks													
FAX ANALYTICALS TO THERESA @													
810-680-3763													
+ to STAN GRUBER													
505-392-2065													
HEAVY METALS (ICP SCANNING)													

Pre-scheduling is recommended

Pre-Contractor, Yellow & White (Lab)

Precision Analytical Services

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 device with split spoon samples at discrete intervals. 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 analysis.

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

Soil samples were express mailed to Xenco Laboratories of San Antonio, Texas for BTEX, TPH-DRO, SPLP SVOC, SPLP VOC, SPLP TPH, FOC, and moisture content analyses using the methods described below. Selected soil samples were also submitted for determination of chloride concentrations. Soil samples were analyzed for BTEX, TPH, and SPLP concentrations within 14 days following the collection date.

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

- BTEX concentrations in accordance with EPA Method SW846-8020
- TPH concentrations in accordance with modified EPA Method 8015-DRO
- SPLP TPH concentrations in accordance with EPA Method 1312/418.1
- SPLP VOC concentrations in accordance with EPA Method SW846-1312/8260
- SPLP SVOC concentrations in accordance with EPA Method SW846-1312/8270
- FOC concentrations in accordance with ASTM Method D2974
- moisture content in accordance with ASTM 2216-71

GROUND WATER SAMPLING

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

After purging the wells, ground water samples were collected with a disposable Teflon bailer and polyethylene line by personnel wearing clean, disposable gloves. Ground water

sample containers were filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers were filled first and PAH containers second).

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

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

Ground water samples collected for metal analysis were filled to capacity in 1 liter plastic containers equipped with Teflon-lined caps and pre-preserved with HNO₃. 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.

Purged water collected during each event is stored in drums on-site pending disposal.

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

- BTEX concentrations in accordance with EPA Method SW846-8020
- Metal concentrations in accordance with EPA ICP Method 6010
- PAH concentrations in accordance with EPA method 8270

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.