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REPORTS

DATE:

04-15-1998

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GROUND WATER MONITORING REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
MONUMENT, NEW MEXICO

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY
P. O. BOX 1030
JAL, NEW MEXICO 88252

MR. TONY SAVOIE

PREPARED BY:

KEI

Theresa Nix
Project Manager

J. Michael Hawthorne, P.G., REM
Senior Geologist

KEI Job No. 610057

December 1, 1997

TABLE OF CONTENTS

INTRODUCTION

This binder presents results of ground water monitoring events conducted for Texas - New Mexico Pipe Line Company (TNMPL) Monument Site No. 17 located near Monument, New Mexico from the second quarter of 1997 to present. Ground water monitoring is conducted to assess the concentrations and extent of petroleum hydrocarbon constituents in ground water. The monitoring events consist of some or all of the following:

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

PURPOSE AND SCOPE

This binder presents results of ground water events conducted for TNMPL Site No. 17. The scope of this binder includes all sampling events conducted at this site since the second quarter of 1997, and historical ground water levels and PSH thicknesses. Site details are presented on FIG. 1.

FIELD AND REPORTING PROTOCOLS

GROUND WATER MONITORING AND SAMPLING

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

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

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

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

LABORATORY RESULTS

Laboratory results for ground water samples obtained during each event are delivered to a qualified environmental analytical laboratory for determination of BTEX concentrations by EPA Method SW846-8020. The ground water samples obtained during the second quarter of 1997 were also submitted for determination of metals concentrations by EPA Method 6010, polycyclic aromatic hydrocarbon (PAH) concentrations by EPA Method 8100, Total Dissolved Solids (TDS) concentrations by EPA Method 160.1, bicarbonate and carbonate

concentrations by SM4500CO2D, anions concentrations by EPA Method 300.0, and total inorganic carbon (TIC) concentrations by Modified EPA Method 415.1.

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

GROUND WATER GRADIENT

Ground water elevation contours generated from the water level measurements collected from each event are presented on FIG. 1. Historical ground water measurements are summarized in TABLE II. TABLE II is presented behind the TABLES tab and FIG. 1 is presented behind the corresponding dated tabs.

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection limit.
PSH - Phase-separated hydrocarbons.

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

Ground water elevations in monitoring wells containing PSH have been corrected for PSH density. (Correction Factor = 0.85)

Method detection limits: BTEX - 0.001 to 0.006 mg/l

Laboratory test methods: BTEX - EPA Method SW846-8020, 5030

TABLE I

SUMMARY OF LABORATORY RESULTS - GROUND WATER
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYLBENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW17-1	05/02/97	ND	ND	ND	ND	ND
MW17-1	08/27/97	0.740	0.013	0.221	0.046	1.020
MW17-1	11/01/97	0.143	0.003	0.021	0.015	0.182
MW17-2	05/02/97	ND	ND	ND	ND	ND
MW17-2	08/27/97	0.980	0.278	0.229	0.091	1.578
MW17-2	11/01/97	0.194	0.050	0.049	0.033	0.326
MW17-3	05/02/97	0.685	ND	0.071	0.016	0.772
MW17-3	08/27/97	0.828	ND	0.096	0.016	0.940
MW17-3	11/01/97	0.438	0.006	0.068	0.025	0.537

TABLE II

MONITORING WELL MW17-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,607.03	19.82	3587.21	—	—
08/27/97	3,607.03	19.92	3587.11	—	—
10/23/97	3,607.03	19.85	3587.18	—	—
11/01/97	3,607.03	19.88	3587.15	—	—

TABLE II
(continued)

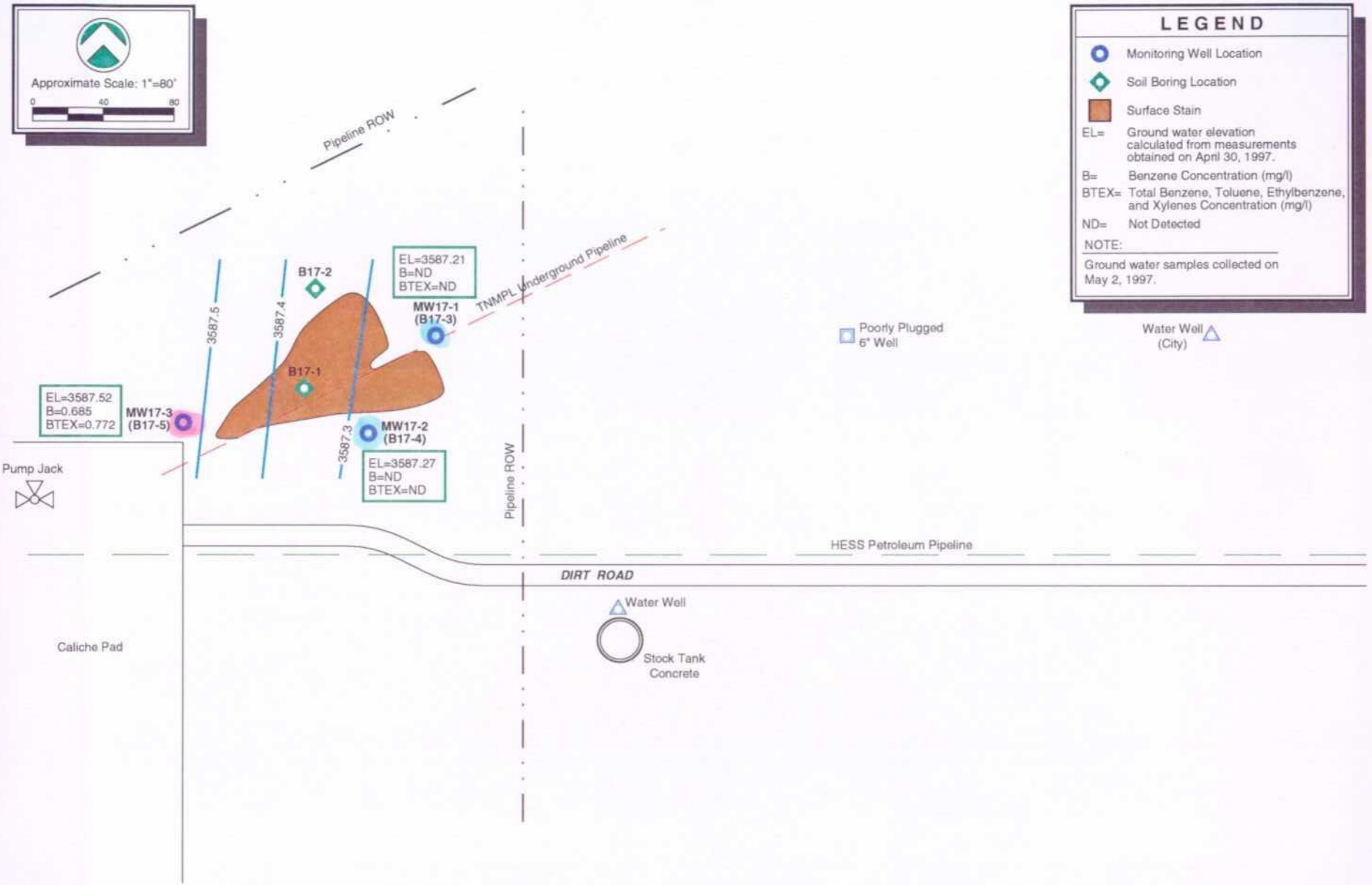
MONITORING WELL MW17-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,606.96	19.69	3587.27	—	—
08/27/97	3,606.96	19.79	3587.17	—	—
10/23/97	3,606.96	19.70	3587.26	—	—
11/01/97	3,606.96	19.75	3587.21	—	—

TABLE II
(continued)

MONITORING WELL MW17-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,608.31	20.79	3587.52	—	—
08/27/97	3,608.31	20.89	3587.42	—	—
10/23/97	3,608.31	20.81	3587.50	—	—
11/01/97	3,608.31	20.85	3587.46	—	—



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GROUND WATER CONTOURS / CONCENTRATION MAP - APRIL AND MAY 1997

TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO

610057

FIG 1

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 6, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID.* / *Field ID:* / *Depth:*	171051-001 MW-1	171051-002 MW-2	171051-003 MW-3			
Metals (ICP) Analyzed by EPA 6010	Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)	May 13, 1997	May 13, 1997	May 13, 1997			
Aluminum		21.2	8.07	2.36			
Arsenic		< 0.05	< 0.05	< 0.05			
Barium		0.75	0.64	0.35			
Beryllium		< 0.005	< 0.005	< 0.005			
Cadmium		< 0.01	< 0.01	< 0.01			
Calcium		1170	743	279			
Chromium		< 0.05	< 0.05	< 0.05			
Cobalt		< 0.10	< 0.10	< 0.10			
Iron		13.4	5.92	1.69			
Lead		< 0.05	< 0.05	< 0.05			
Magnesium		40.0	32.9	26.3			
Manganese		0.29	0.21	< 0.20			
Molybdenum		< 0.20	< 0.20	< 0.20			
Potassium		7.84	5.95	4.89			
Silver		< 0.02	< 0.02	< 0.02			
Sodium		80.7	69.7	95.8			
Tin		5.53	2.16	0.65			
Vanadium		0.05	< 0.05	< 0.05			
Zinc		< 0.25	< 0.25	< 0.25			
Nickel		< 0.10	< 0.10	< 0.10			
Copper		< 0.25	< 0.25	< 0.25			
Boron		< 0.25	< 0.25	< 0.25			
Silicon		24.5	12.9	13.3			
Strontium		2.16	1.69	1.30			

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

XENCO Laboratories

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Project ID: 610057 Site #17
Project Manager: Ann Baker
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Date Received in Lab: May 6, 1997 10:00 by RT
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XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID. / Field ID. / Depth:	171051-001 MW-1	171051-002 MW-2	171051-003 MW-3			
Mercury, Tot Analyzed by EPA 7470		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 12, 1997	May 12, 1997	May 12, 1997			
Mercury		< 0.0010	< 0.0010	< 0.0010			
BTEX Analyzed by EPA 8020		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 9, 1997	May 9, 1997	May 9, 1997			
Benzene		< 0.001	< 0.001	0.685			
Toluene		< 0.001	< 0.001	< 0.005			
Ethylbenzene		< 0.001	< 0.001	0.071			
m,p-Xylenes		< 0.002	< 0.002	0.016			
o-Xylene		< 0.001	< 0.001	< 0.005			
Total BTEX		< 0.006	< 0.006	0.772			
PAH Analyzed by EPA 8100		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 15, 1997	May 15, 1997	May 15, 1997			
Acenaphthene		< 0.002	< 0.002	< 0.002			
Acenaphthylene		< 0.002	< 0.002	< 0.002			
Anthracene		< 0.002	< 0.002	< 0.002			
Benzo(a)anthracene		< 0.002	< 0.002	< 0.002			
Benzo(a)pyrene		< 0.002	< 0.002	< 0.002			
Benzo(b)fluoranthene		< 0.002	< 0.002	< 0.002			
Benzo(g,h,i)perylene		< 0.002	< 0.002	< 0.002			
Benzo(k)fluoranthene		< 0.002	< 0.002	< 0.002			
Chrysene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,e)pyrene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)anthracene		< 0.002	< 0.002	< 0.002			
Dibenz(a,j)acridine		< 0.002	< 0.002	< 0.002			
Fluoranthene		< 0.002	< 0.002	< 0.002			
Fluorene		< 0.002	< 0.002	< 0.002			

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

XENCO Laboratories

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Date Received in Lab: May 6, 1997 10:00 by RT
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Analysis Requested	Lab ID. / Field ID. / Depth	171051-001 MW-1	171051-002 MW-2	171051-003 MW-3			
Indeno(1,2,3-cd)pyrene		< 0.002	< 0.002	< 0.002			
3-Methylcholanthrene		< 0.002	< 0.002	< 0.002			
Naphthalene		< 0.002	< 0.002	< 0.002			
Phenanthrene		< 0.002	< 0.002	< 0.002			
Pyrene		< 0.002	< 0.002	< 0.002			
Dibenz(a,h)acridine		< 0.002	< 0.002	< 0.002			
Benzo(j)fluoranthene		< 0.002	< 0.002	< 0.002			
7H-Dibenzo(c,g)carbazole		< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)pyrene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,i)pyrene		< 0.002	< 0.002	< 0.002			
Bicarbonate Analyzed by SM 4500CO2D		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)					
		May 10, 1997	May 10, 1997	May 10, 1997			
Bicarbonate		319	307	315			
Carbonate Analyzed by SM4500CO2D		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)					
		May 10, 1997	May 10, 1997	May 10, 1997			
Carbonate		< 1.0	1.0	1.3			
TDS Analyzed by EPA 160.1		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)					
		May 9, 1997	May 9, 1997	May 9, 1997			
Total Dissolved Solids		786	820	816			
Anions Analyzed by EPA 300.0		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)					
		May 8, 1997	May 8, 1997	May 8, 1997			
Sulfate		70.0	62.0	63.2			
Chloride		152	158	174			
TIC Mod. Analyzed by Mod. 415.1		Date Analyzed - Analytical Results ppm (mg/L - mg/Kg)					
		May 14, 1997	May 14, 1997	May 14, 1997			

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

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 8, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID	171051-001	171051-002	171051-003		
	Field ID	MW-1	MW-2	MW-3		
	Depth					
Total Inorganic Carbon		64.9	70.0	46.8		

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 T. Yonemoto, Ph.D
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Method Detection Limit mg/L	[E] QC LIMITS Blank Spike Recovery %	[F] QC LIMITS Recovery Range %	[G] Qualifier
Aluminum	< 0.01	0.72	1.00	0.01	72.0	70-125	
Arsenic	< 0.050	0.869	1.000	0.050	86.9	70-125	
Barium	< 0.002	0.429	0.500	0.002	85.8	70-125	
Beryllium	< 0.0050	0.1808	0.2000	0.0050	90.4	70-125	
Boron	< 0.03	1.20	1.56	0.03	76.9	70-125	
Cadmium	< 0.010	0.162	0.200	0.010	81.0	70-125	
Calcium	< 0.01	1.82	2.00	0.01	91.0	70-125	
Chromium	< 0.013	0.433	0.500	0.013	86.6	70-125	
Cobalt	< 0.003	0.423	0.500	0.003	84.6	70-125	
Copper	< 0.008	0.443	0.500	0.008	88.6	70-125	
Iron	< 0.006	0.814	1.000	0.006	81.4	70-125	
Lead	< 0.03	0.85	1.00	0.03	85.0	70-125	
Magnesium	< 0.01	1.79	2.00	0.01	89.5	70-125	
Nickel	< 0.03	0.46	0.50	0.03	92.0	70-125	
Potassium	< 0.0250	2.1275	2.0000	0.0250	106.4	70-125	
Silver	< 0.010	0.334	0.400	0.010	83.5	70-125	
Sodium	< 0.0250	1.8363	2.0000	0.0250	91.8	70-125	
Strontium	< 0.025	1.171	1.560	0.025	75.1	70-125	
Vanadium	< 0.00	0.44	0.50	0.00	88.0	70-125	
Zinc	< 0.008	0.431	0.500	0.008	86.2	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 19:46
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171051- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC LIMITS Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Aluminum	21.16	16.94	0.01	22.2	25.0	
Arsenic	< 0.050	< 0.050	0.050	N.C	25.0	
Barium	0.746	0.766	0.002	2.6	25.0	
Beryllium	< 0.0050	< 0.0050	0.0050	N.C	25.0	
Boron	0.148	0.139	0.025	6.3	25.0	
Cadmium	< 0.010	< 0.010	0.010	N.C	25.0	
Calcium	1170	1110	0.01	5.3	25.0	
Chromium	0.039	0.039	0.013	0.0	25.0	
Cobalt	0.011	0.013	0.003	16.7	25.0	
Copper	0.014	0.014	0.008	0.0	25.0	
Iron	13.43	13.26	0.01	1.3	25.0	
Lead	< 0.025	< 0.025	0.025	N.C	25.0	
Magnesium	39.95	37.77	0.01	5.6	25.0	
Manganese	0.291	0.300	0.006	3.0	25.0	
Molybdenum	< 0.025	< 0.025	0.025	N.C	25.0	
Nickel	< 0.025	0.157	0.025	N.C	25.0	
Potassium	7.841	7.730	0.025	1.4	25.0	
Silicon	24.49	16.18	0.03	40.9	25.0	A
Silver	< 0.010	< 0.010	0.010	N.C	25.0	

(A) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 19:46
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171051- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Sodium	80.69	76.85	0.03	4.9	25.0	
Strontium	2.164	2.036	0.025	6.1	25.0	
Tin	5.533	5.160	0.025	7.0	25.0	
Vanadium	0.054	0.058	0.003	7.1	25.0	
Zinc	0.090	0.087	0.008	3.4	25.0	

(A) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated. data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

Q.C. Sample ID 171046- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Method Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Aluminum	30.68	30.75	0.01	0.2	25.0	40.7	12.5	79.8	70-125	
Arsenic	< 0.050	< 0.050	0.050	N.C	25.0	0.89	1.00	88.7	70-125	
Barium	1.031	1.233	0.002	17.8	25.0	1.25	0.50	44.6	70-125	B
Beryllium	< 0.0050	< 0.0050	0.0050	N.C	25.0	0.179	0.200	89.3	70-125	
Boron	0.173	0.178	0.025	2.8	25.0	2.51	3.13	74.8	70-125	
Cadmium	< 0.010	< 0.010	0.010	N.C	25.0	0.16	0.20	79.5	70-125	
Calcium	114	134	0.01	16.1	25.0	133	12.5	152.0	70-125	A,B
Chromium	0.031	0.030	0.013	3.3	25.0	0.44	0.50	81.0	70-125	
Cobalt	0.037	0.032	0.003	14.5	25.0	0.39	0.50	69.8	70-125	B
Copper	0.026	0.030	0.008	14.3	25.0	0.46	0.50	86.8	70-125	
Iron	38.92	37.58	0.01	3.5	25.0	45.1	12.5	49.5	70-125	A,B
Lead	< 0.025	< 0.025	0.025	N.C	25.0	0.80	1.00	80.2	70-125	
Magnesium	21.29	23.91	0.01	11.6	25.0	31.9	12.5	85.0	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

Q.C. Sample ID 171046- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Parameter	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Method Detection Limit mg/L	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H] QC Matrix Spike Recovery %	[I] LIMITS Recovery Range %	[G] Qualifier
Manganese	1.263	1.503	0.006	17.4	25.0	12.16	12.50	87.2	70-125	
Molybdenum	< 0.025	< 0.025	0.025	N.C	25.0	0.55	0.63	88.6	70-125	
Nickel	< 0.025	< 0.025	0.025	N.C	25.0	0.40	0.50	80.2	70-125	
Potassium	7.715	8.064	0.025	4.4	25.0	19.08	12.50	90.9	70-125	
Silver	< 0.010	< 0.010	0.010	N.C	25.0	0.33	0.40	81.3	70-125	
Sodium	56.80	67.17	0.03	16.7	25.0	72.3	12.5	123.7	70-125	
Strontium	0.921	1.095	0.025	17.3	25.0	3.05	3.13	68.1	70-125	B
Vanadium	0.128	0.142	0.003	10.4	25.0	0.51	0.50	77.2	70-125	
Zinc	0.180	0.201	0.008	11.0	25.0	0.57	0.50	78.6	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 13:22
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171051- 002	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC LIMITS Relative Difference	[E] QC LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC LIMITS Matrix Spike Recovery	[I] QC LIMITS Recovery Range	[G] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	25.0	0.0025	0.0025	100.0	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 12:58
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC Matrix Spike Recovery	[I] LIMITS Recovery Range	[G] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	25.0	0.0026	0.0025	104.0	70-125	

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

Houston - Dallas - San Antonio

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 12:55
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Method Detection Limit mg/L	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Mercury	< 0.0010	0.0022	0.0025	0.0010	88.0	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A04B61

SW- 846 5030/8020 BTEX

Date Validated: May 12, 1997 14:50
Date Analyzed: May 9, 1997 10:17
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1130	0.1000	0.0010	113.0	65-135	
Toluene	< 0.0010	0.1160	0.1000	0.0010	116.0	65-135	
Ethylbenzene	< 0.0010	0.1170	0.1000	0.0010	117.0	65-135	
m,p-Xylenes	< 0.0020	0.2410	0.2000	0.0020	120.5	65-135	
o-Xylene	< 0.0010	0.1150	0.1000	0.0010	115.0	65-135	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A04B61

SW- 846 5030/8020 BTEX

Date Validated: May 12, 1997 14:50
Date Analyzed: May 9, 1997 13:42
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 171048- 001 / Parameter	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.0868	0.0864	0.1000	0.0010	25.0	0.5	86.8	86.4	65-135	
Toluene	< 0.0010	0.1160	0.1120	0.1000	0.0010	25.0	3.5	116.0	112.0	65-135	
Ethylbenzene	< 0.0010	0.1180	0.1130	0.1000	0.0010	25.0	4.3	118.0	113.0	65-135	
m,p-Xylenes	< 0.0020	0.2420	0.2330	0.2000	0.0020	25.0	3.8	121.0	116.5	65-135	
o-Xylene	< 0.0010	0.1160	0.1120	0.1000	0.0010	25.0	3.5	116.0	112.0	65-135	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A34B35

SW-846 8100 PAHs by GC-MS

Date Validated: May 15, 1997 17:56
Date Analyzed: May 14, 1997 22:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: MM
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Acenaphthene	< 0.0020	0.0658	0.0670	0.1000	0.0020	31.0	1.8	65.8	67.0	46-118	
4-Chloro-3-Methylphenol	< 0.0020	0.0398	0.0332	0.1000	0.0020	42.0	18.1	39.8	33.2	23-97	
2-Chlorophenol	< 0.0020	0.0630	0.0644	0.1000	0.0020	40.0	2.2	63.0	64.4	27-123	
1,4-Dichlorobenzene	< 0.0020	0.0702	0.0724	0.1000	0.0020	28.0	3.1	70.2	72.4	36-97	
2,4-Dinitrotoluene	< 0.0020	0.0628	0.0632	0.1000	0.0020	38.0	0.6	62.8	63.2	24-96	
N-Nitroso-di-n-propylamine	< 0.0040	0.0742	0.0738	0.1000	0.0040	38.0	0.5	74.2	73.8	41-116	
4-Nitrophenol	< 0.0040	0.0250	0.0248	0.1000	0.0040	50.5	0.8	25.0	24.8	10-80	
Pentachlorophenol	< 0.0010	0.0738	0.0706	0.1000	0.0010	50.0	4.4	73.8	70.6	9-103	
Phenol	< 0.0010	0.0222	0.0224	0.1000	0.0010	42.0	0.9	22.2	22.4	12-89	
Pyrene	< 0.0020	0.0852	0.0840	0.1000	0.0020	31.0	1.4	85.2	84.0	26-127	
1,2,4-Trichlorobenzene	< 0.0010	0.0736	0.0714	0.1000	0.0010	28.0	3.0	73.6	71.4	39-98	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A20A24

SM4500CO2D Carbonate

Date Validated: May 14, 1997 15:30
Date Analyzed: May 10, 1997 09:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC LIMITS Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	ppm	ppm	ppm	%	%	
Carbonate	< 1.00	< 1.00	1.00	N.C	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A20A22

SM 4500CO2D Bicarbonate

Date Validated: May 14, 1997 15:30
Date Analyzed: May 10, 1997 09:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Bicarbonate	127	127	0.5	0.0	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A19A95

EPA 160.1 Total Dissolved Solids

Date Validated: May 9, 1997 13:45
Date Analyzed: May 9, 1997 09:40
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171046- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Total Dissolved Solids	526	504	4.0	4.3	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A10A40

EPA 300.0 Anions by Ion Chromatography

Date Validated: May 9, 1997 12:00
Date Analyzed: May 8, 1997 12:55
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: JS
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171046- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Chloride	72.400	75.900	0.050	4.7	20.0	
Sulfate	59.60	62.30	0.10	4.4	20.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A10A40

EPA 300.0 Anions by Ion Chromatography

Date Validated: May 9, 1997 12:00
Date Analyzed: May 8, 1997 12:23
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: JS
Matrix: Liquid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Chloride	< 0.050	5.070	5.090	5.000	0.050	20.0	0.4	101.4	101.8	70-125	
Sulfate	< 0.10	4.97	5.06	5.00	0.10	20.0	1.8	99.4	101.2	70-125	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17Z99A23

MOD. 415.1 Total Inorganic Carbon

Date Validated: May 19, 1997 09:00
Date Analyzed: May 14, 1997 09:22
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] QC LIMITS Recovery Range %	[G] Qualifier
Total Inorganic Carbon	< 1.0	20.6	20.0	1.0	103.0	70-120	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17Z99A23

MOD. 415.1 Total Inorganic Carbon

Date Validated: May 19, 1997 09:00
Date Analyzed: May 14, 1997 11:41
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171049- 002	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC Matrix Spike Recovery	[I] LIMITS Recovery Range	[G] Qualifier
Parameter	ppm	ppm	ppm	%	%	ppm	ppm	%	%	
Total Inorganic Carbon	56.61	55.44	1.00	2.1	20.0	74.6	20.0	90.0	70-120	

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

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

XENCO Laboratories

ANALYTICAL CHAIN CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Project Name: Monument

XENCO COC#: 1-71051
Date Received in Lab: May 6, 1997 10:00 by RT
XENCO contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW-1	171051-001	BTEX	SW-846	ppm	Standard	May 2, 1997 13:45		May 9, 1997 by IF	May 9, 1997 16:04 by IF
2			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by CY	May 15, 1997 07:35 by MM
3			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 13:45		May 8, 1997 by CG	May 9, 1997 10:30 by CG
4			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 13:45		May 8, 1997 by JS	May 8, 1997 15:45 by JS
5			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 13:45		May 10, 1997 by CG	May 10, 1997 10:05 by CG
6			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 13:45		May 10, 1997 by CG	May 10, 1997 10:05 by CG
7			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by EZ	May 13, 1997 19:46 by SA
8			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by EZ	May 12, 1997 13:28 by EZ
9			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 13:45		May 14, 1997 by IF	May 14, 1997 13:54 by IF
10	MW-2	171051-002	BTEX	SW-846	ppm	Standard	May 2, 1997 13:55		May 9, 1997 by IF	May 9, 1997 16:22 by IF
11			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by CY	May 15, 1997 08:21 by MM
12			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 13:55		May 8, 1997 by CG	May 9, 1997 10:35 by CG
13			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 13:55		May 8, 1997 by JS	May 8, 1997 15:53 by JS
14			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 13:55		May 10, 1997 by CG	May 10, 1997 10:10 by CG
15			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 13:55		May 10, 1997 by CG	May 10, 1997 10:10 by CG
16			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by EZ	May 13, 1997 20:07 by SA
17			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by EZ	May 12, 1997 13:20 by EZ
18			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 13:55		May 14, 1997 by IF	May 14, 1997 14:02 by IF
19	MW-3	171051-003	BTEX	SW-846	ppm	Standard	May 2, 1997 14:05		May 9, 1997 by IF	May 9, 1997 17:17 by IF
20			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by CY	May 15, 1997 09:06 by MM
21			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 14:05		May 8, 1997 by CG	May 9, 1997 10:40 by CG
22			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 14:05		May 8, 1997 by JS	May 8, 1997 16:00 by JS
23			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 14:05		May 10, 1997 by CG	May 10, 1997 10:15 by CG
24			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 14:05		May 10, 1997 by CG	May 10, 1997 10:15 by CG
25			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by EZ	May 13, 1997 20:14 by SA
26			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by EZ	May 12, 1997 13:28 by EZ
27			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 14:05		May 14, 1997 by IF	May 14, 1997 14:09 by IF

XENCO Laboratories

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of

Lab. Batch # 171051-H

Contractor: KEI Consultants — Phone (800) 253-0507

Address: 4800 Wurzbach Drive Suite 100 San Antonio, Tx

Project Name: Monument — Project Director: Paul Hartnet

Project Location: Site #17 — Project Manager: Ann Baker

Sampler Signature: — Project No.: 610057 site #17

No. coolers this shipment: — Contractor COC #

Carrier: UPS — Quote #:

Airbill No. — P.O. No.:

SAMPLE CHARACTERIZATION

	Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of CONTAINERS Total	BTEX (5030/8020-602)	TPH (418.1)	HEAVY METALS	PAH (8100)	TDS (160.1)	CATIONS / ANIONS	Please Hold	LAB ONLY ID #
1	MW-1	5-2-97	1345			X					X			7	X	X	X	X	X	X		1
2	MW-2	5-2-97	1355			X					X			7	X	X	X	X	X	X		2
3	MW-3	5-2-97	1405			X					X			7	X	X	X	X	X	X		3
4																						4
5																						5
6																						6
7																						7
8																						8
9																						9
10																						10

Waste Oil — PIT No: — Tank No: — Unl Dies Ker Unknown

Turn-around: * ASAP, * 24 hrs, 48 hrs, (Standard)

Remarks

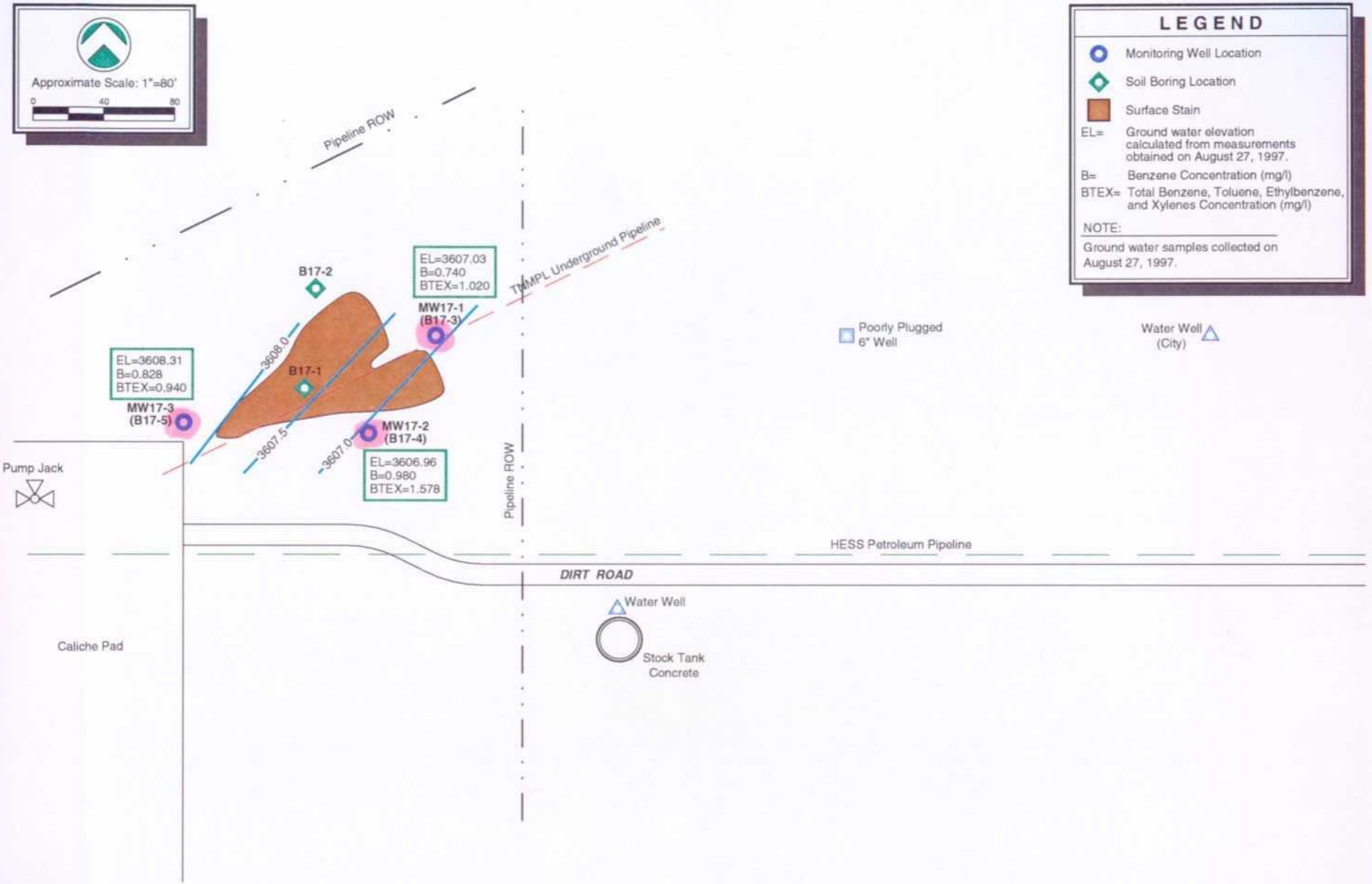
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
	5-5-97	0600			
			Received For Laboratory by	5-6-97	1000

Remarks

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

* Pre-scheduling is recommended

Precision Analytical Services



k·e·i

GROUND WATER CONTOURS / CONCENTRATION MAP - AUGUST 1997	610057
TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 1

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-72030

K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 610057-17
Project Manager: Mike Chapa
Project Location: Monument Site 17

Date Received in Lab: Aug 30, 1997 10:30 by CC
Date Report Faxed: Sep 3, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:* / *Field ID:* / *Depth:*	172030-001 MW17-1	172030-002 MW17-2	172030-003 MW17-3			
BTEX Analyzed by EPA 8020		Date Analyzed - Analytical Results **ppm (mg/L - mg/Kg)**					
		Sep 2, 1997	Sep 2, 1997	Sep 2, 1997			
Benzene		0.740	0.980	0.828			
Toluene		0.013	0.278	< 0.004			
Ethylbenzene		0.221	0.229	0.096			
m,p-Xylenes		0.035	0.070	0.016			
o-Xylene		0.011	0.021	< 0.004			
Total BTEX		1.020	1.578	0.940			

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25C97

SW- 846 5030/8020 BTEX

Date Validated: Sep 2, 1997 20:30
Date Analyzed: Sep 2, 1997 10:09
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Liquid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result	[B] Blank Spike Result	[C] Blank Spike Duplicate Result	[D] Blank Spike Amount	[E] Method Detection Limit	Blank Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Blank Spike Recovery	[H] QC B.S.D. Recovery	[I] Blank Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1080	0.1030	0.1000	0.0010	25.0	4.7	107.9	102.9	65-135	
Toluene	< 0.0010	0.1050	0.1010	0.1000	0.0010	25.0	3.9	104.8	100.8	65-135	
Ethylbenzene	< 0.0010	0.1090	0.1050	0.1000	0.0010	25.0	3.7	108.9	104.9	65-135	
m,p-Xylenes	< 0.0020	0.2240	0.2130	0.2000	0.0020	25.0	5.0	111.9	106.4	65-135	
o-Xylene	< 0.0010	0.1100	0.1040	0.1000	0.0010	25.0	5.6	109.9	103.9	65-135	

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

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

XENCO Laboratories

ANALYTICAL CHAIN CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057-17
Project Manager: Mike Chapa
Project Location: Monument Site 17

Project Name: TNMPL

XENCO COC#: 1-72030
Date Received in Lab: Aug 30, 1997 10:30 by CC
XENCO contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW17-1	172030-001	BTEX	SW-846	ppm	Standard	Aug 27, 1997 11:50		Sep 2, 1997 by HL	Sep 2, 1997 14:26 by HL
2	MW17-2	172030-002	BTEX	SW-846	ppm	Standard	Aug 27, 1997 12:10		Sep 2, 1997 by HL	Sep 2, 1997 14:45 by HL
3	MW17-3	172030-003	BTEX	SW-846	ppm	Standard	Aug 27, 1997 11:30		Sep 2, 1997 by HL	Sep 2, 1997 12:05 by HL

XENCO Laboratories

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page / of

Lab. Batch # 172030-SA

Contractor: KEI CONSULTANTS Phone: (210) 680-3767

Address: 5309 WURZBACH STE 100 SAN ANTONIO, TX 78238

Project Name: TUMPA Project Director: MIKE HAWTHORN

Project Location: MONUMENT SITE 17 Project Manager: MIKE CHAPA

Sampler Signature: Project No.: 610057-17

No. coolers this shipment: 1 Contractor COC #

Carrier: UPS Quote #:

Airbill No. N604-339-294-9 P.O. No.: 7746

Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of CONTAINERS Total	BTEX (5030/8020-602)	TPH (418.1)	Please Hold	Remarks	LAB ONLY ID #
1 MW17-1	8/27/97	1150			X		X	VOA	G	X	HCl	MW17-1	2	X				1
2 MW17-2	↓	1210			↓		↓	↓	↓	↓	↓	MW17-2	↓	↓				2
3 MW17-3	↓	1130			↓		↓	↓	↓	↓	↓	MW17-3	↓	↓				3
4																		4
5																		5
6																		6
7																		7
8																		8
9																		9
10																		10

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

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
	8/29/97	0900			
			Received For Laboratory by:	8/30/97	10:30

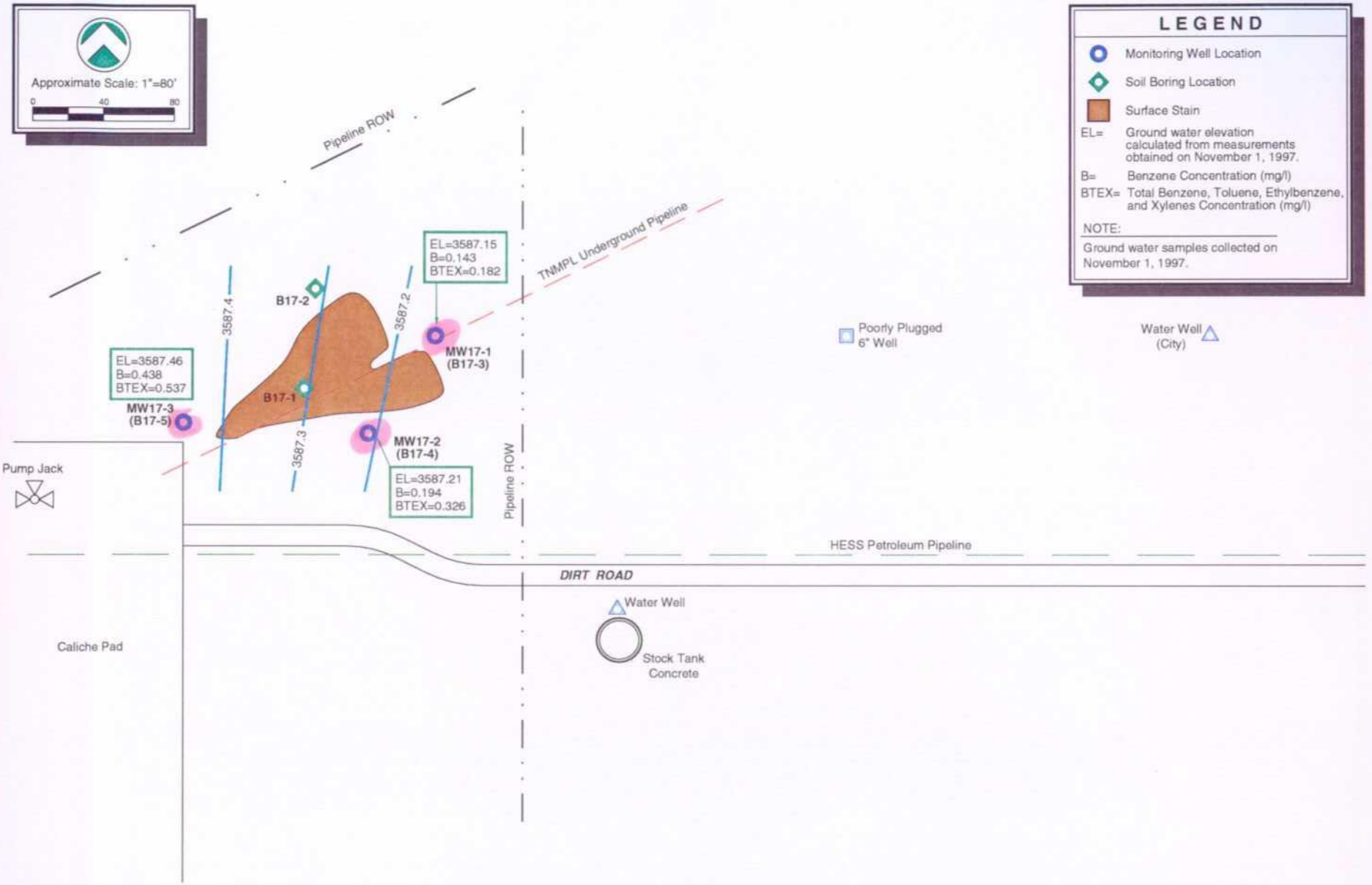
Remarks: (Via UPS)

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

* Pre-scheduling is recommended

Precision Analytical Services

12/02/97-RM G:\[615



k·e·i

GROUND WATER CONTOURS / CONCENTRATION MAP - NOVEMBER 1997	610057
TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 1

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-72737

K.E.I. Consultants, Inc.

Project Name: TNMPL-Site #17

Project ID: 610057
Project Manager: Theresa Nix
Project Location: Monument, NM

Date Received in Lab: Nov 4, 1997 10:30 by CC
Date Report Faxed: Nov 5, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:* / *Field ID:*	172737-001 MW-1	172737-002 MW-2	172737-003 MW-3			
BTEX Analyzed by EPA 8020		Date Analyzed - Analytical Results					**ppm (mg/L - mg/Kg)**
		Nov 4, 1997	Nov 4, 1997	Nov 4, 1997			
Benzene		0.143	0.194	0.438			
Toluene		0.003	0.050	0.006			
Ethylbenzene		0.021	0.049	0.068			
m,p-Xylenes		0.011	0.025	0.022			
o-Xylene		0.004	0.008	0.003			
Total BTEX		0.182	0.326	0.537			

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25D51

SW- 846 5030/8020 BTEX

Date Validated: Nov 5, 1997 09:00
Date Analyzed: Nov 4, 1997 13:07
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Liquid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 172734- 001	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.0846	0.0855	0.1000	0.0010	25.0	1.1	84.6	85.5	65-135	
Toluene	< 0.0010	0.0860	0.0857	0.1000	0.0010	25.0	0.3	86.0	85.7	65-135	
Ethylbenzene	< 0.0010	0.0871	0.0877	0.1000	0.0010	25.0	0.7	87.1	87.7	65-135	
m,p-Xylenes	< 0.0020	0.1720	0.1730	0.2000	0.0020	25.0	0.6	86.0	86.5	65-135	
o-Xylene	< 0.0010	0.0893	0.0898	0.1000	0.0010	25.0	0.6	89.3	89.8	65-135	

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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25D51

SW- 846 5030/8020 BTEX

Date Validated: Nov 5, 1997 09:00
Date Analyzed: Nov 4, 1997 12:28
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.0984	0.1000	0.0010	98.4	65-135	
Toluene	< 0.0010	0.1000	0.1000	0.0010	100.0	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1000	0.0010	102.0	65-135	
m,p-Xylenes	< 0.0020	0.2020	0.2000	0.0020	101.0	65-135	
o-Xylene	< 0.0010	0.1040	0.1000	0.0010	104.0	65-135	

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

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

Xenco Laboratories

ANALYTICAL CHAIN CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057
Project Manager: Theresa Nix
Project Location: Monument, NM

Project Name: TNMPL-Site #17

Xenco COC#: 1-72737
Date Received in Lab: Nov 4, 1997 10:30 by CC
Xenco contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW-1	172737-001	BTEX	SW-846	ppm	Standard	Nov 1, 1997 09:26		Nov 4, 1997 by HL	Nov 4, 1997 15:40 by HL
2	MW-2	172737-002	BTEX	SW-846	ppm	Standard	Nov 1, 1997 08:45		Nov 4, 1997 by HL	Nov 4, 1997 15:59 by HL
3	MW-3	172737-003	BTEX	SW-846	ppm	Standard	Nov 1, 1997 09:53		Nov 4, 1997 by HL	Nov 4, 1997 16:18 by HL

XENCO Laboratories

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page / of

Lab. Batch # 172737-SA

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

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

Project Name: TIMIP2 Project Director: Mike Hawthorn

Project Location: monument, NM Project Manager: Theresa Nix

Sampler Signature: Stanley Glover Project No.: 61057 site # 17

No. coolers this shipment: Contractor COC #

Carrier: UPS Quote #:

Airbill No. P.O. No: 8131

SAMPLE CHARACTERIZATION

	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (5030/8020)	TPH (418.1)	Please Hold	Lab ID #
1	MW-1	11-1-97	0926			/		/			/	HCl		2	/			1
2	MW-2	11-1-97	0845			/		/			/	HCl		2	/			2
3	MW-3	11-1-97	0953			/		/			/	HCl		2	/			3
4																		4
5																		5
6																		6
7																		7
8																		8
9																		9
10																		10

Preservative: Unl Dies Ker Unknown Waste Oil PIT No: Tank No:

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

Remarks

LAB ONLY ID #

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Stanley Glover	11-3-97	1600			
			Received For Laboratory by:		
			Cortez	11-4-97	10:30

Remarks: Please send Analytical to Theresa Nix Fax 830-591-1476 Phone 210-680-3767

UPS

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

* Pre-scheduling is recommended

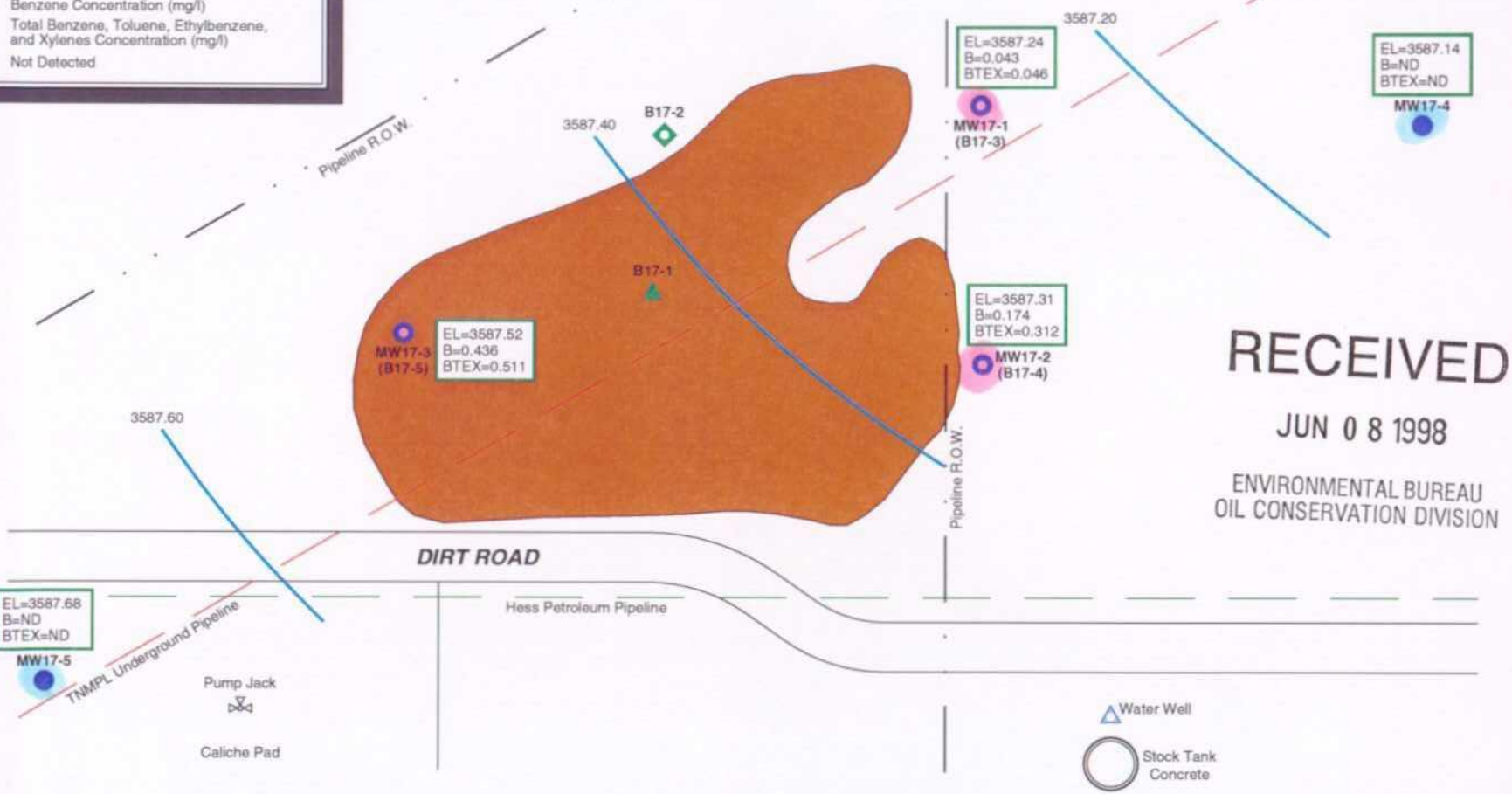
Precision Analytical Services

LEGEND

- Soil boring installed on March 17, 1997.
- Monitoring well installed on April 4, 1997.
- Soil boring installed on April 2, 1997.
- Monitoring well installed on January 22, 1998.
- Approximate location of surface stain.
- Contour Interval = 0.20 feet
- EL= Ground water elevation (feet) calculated from measurements obtained on February 19, 1998.
- B= Benzene Concentration (mg/l)
- BTEX= Total Benzene, Toluene, Ethylbenzene, and Xylenes Concentration (mg/l)
- ND= Not Detected

NOTE:
Ground water samples collected on February 19, 1998.

Approximate Scale: 1"=60'
0 30 60



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GROUND WATER CONTOURS / CONCENTRATION MAP - FEBRUARY 1998

TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO

610057

FIG 1

TABLE I

SUMMARY OF LABORATORY RESULTS - GROUND WATER
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

MONITORING WELL NO.	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW17-1	05/02/97	ND	ND	ND	ND	ND
MW17-1	08/27/97	0.740	0.013	0.221	0.046	1.020
MW17-1	11/01/97	0.143	0.003	0.021	0.015	0.182
MW17-1	02/19/98	0.043	0.001	0.002	ND	0.046
MW17-2	05/02/97	ND	ND	ND	ND	ND
MW17-2	08/27/97	0.980	0.278	0.229	0.091	1.578
MW17-2	11/01/97	0.194	0.050	0.049	0.033	0.326
MW17-2	02/19/98	0.174	0.066	0.047	0.025	0.312
MW17-3	05/02/97	0.685	ND	0.071	0.016	0.772
MW17-3	08/27/97	0.828	ND	0.096	0.016	0.940
MW17-3	11/01/97	0.438	0.006	0.068	0.025	0.537
MW17-3	02/19/98	0.436	0.015	0.045	0.015	0.511
MW17-4	02/19/98	ND	ND	ND	ND	ND
MW17-5	02/19/98	ND	ND	ND	ND	ND

TABLE II

MONITORING WELL MW17-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,607.03	19.82	3587.21	—	—
08/27/97	3,607.03	19.92	3587.11	—	—
10/23/97	3,607.03	19.85	3587.18	—	—
11/01/97	3,607.03	19.88	3587.15	—	—
12/03/97	3,607.03	20.87	3586.16	—	—
01/02/98	3,607.16	19.85	3587.31	—	—
02/06/98	3,607.16	19.87	3587.29	—	—
02/19/98	3,607.16	19.92	3587.24	—	—
03/04/98	3,607.16	19.89	3587.27	—	—
04/07/98	3,607.16	19.94	3587.22	—	—

TABLE II
(continued)

MONITORING WELL MW17-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,606.96	19.69	3587.27	—	—
08/27/97	3,606.96	19.79	3587.17	—	—
10/23/97	3,606.96	19.70	3587.26	—	—
11/01/97	3,606.96	19.75	3587.21	—	—
12/03/97	3,606.96	19.75	3587.21	—	—
01/02/98	3,607.08	19.71	3587.37	—	—
02/06/98	3,607.08	19.74	3587.34	—	—
02/19/98	3,607.08	19.77	3587.31	—	—
03/04/98	3,607.08	19.74	3587.34	—	—
04/07/98	3,607.08	19.80	3587.28	—	—

TABLE II
(continued)

MONITORING WELL MW17-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/30/97	3,608.31	20.79	3587.52	—	—
08/27/97	3,608.31	20.89	3587.42	—	—
10/23/97	3,608.31	20.81	3587.50	—	—
11/01/97	3,608.31	20.85	3587.46	—	—
12/03/97	3,608.31	19.89	3588.42	—	—
01/02/98	3,608.43	20.83	3587.60	—	—
02/06/98	3,608.43	20.86	3587.57	—	—
02/19/98	3,608.43	20.91	3587.52	—	—
03/04/98	3,608.43	20.85	3587.58	—	—
04/07/98	3,608.43	20.92	3587.51	—	—

TABLE II
(continued)

MONITORING WELL MW17-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
02/06/98	3,606.12	18.95	3587.17	—	—
02/19/98	3,606.12	18.98	3587.14	—	—
03/04/98	3,606.12	18.96	3587.16	—	—
04/07/98	3,606.12	19.00	3587.12	—	—

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JUN 0 8 1998

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

TABLE II
(continued)

MONITORING WELL MW17-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
02/06/98	3,610.17	22.46	3587.71	—	—
02/19/98	3,610.17	22.49	3587.68	—	—
03/04/98	3,610.17	22.46	3587.71	—	—
04/07/98	3,610.17	22.52	3587.65	—	—

RECEIVED

JUN 0 8 1998

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION