AP - 009

STAGE 1 & 2 REPORTS

DATE:

Aug. 20, 1998

GROUND WATER MONITORING REPORT

HDO-90-23
SECTION 6, TOWNSHIP 20 SOUTH, RANGE 37 EAST
LEA COUNTY, NEW MEXICO

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GROUND WATER MONITORING REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
SECTION 6, TOWNSHIP 20 SOUTH, RANGE 37 EAST
LEA COUNTY, NEW MEXICO

PREPARED FOR:

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

MR. TONY SAVOIE

PREPARED BY:

KEI

Theresa Nix
Project Manager

Daryl Stacey
Project Manager

KEI Job No. 810005-1

August 20, 1998

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INTRODUCTION

This binder presents results of ground water monitoring events conducted for Texas - New Mexico Pipe Line Company (TNMPL) site HDO-90-23 located in Lea County, New Mexico from the second quarter of 1998 to present. Ground water monitoring is conducted to assess the concentrations and extent of petroleum hydrocarbon constituents in ground water. The monitoring events consist of some or all of the following:

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

PURPOSE AND SCOPE

This binder presents results of ground water events conducted for TNMPL site HDO-90-23. The scope of this binder includes all sampling events conducted at this site since the second quarter of 1998, 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 3 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 first quarter of 1998 were also submitted for analysis in accordance with the following methods:

- metals concentrations by EPA Method 6010
- polycyclic aromatic hydrocarbon (PAH) concentrations by EPA Method 8270

- Total Dissolved Solids (TDS) concentrations by EPA Method 160.1
- bicarbonate and carbonate concentrations by SM4500CO2D
- anions concentrations by EPA Method 300.0.

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, 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 tab.

PSH MONITORING

PSH thickness is gauged regularly. PSH thickness across the site for each gauging event is graphically presented on FIG. 2.

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection or reporting limit.
PSH - Phase-separate hydrocarbons.
SHEEN - Indicates a visible phase separation with a thickness less than 0.01 feet.

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

Ground water elevations in monitoring wells containing PSH have been corrected for PSH density. (Correction Factor = 0.85 prior to 07/08/98, Correction Factor = 0.858 as of 07/08/98)

Method detection/reporting limits: BTEX - 0.001 to 0.009 mg/l

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

TABLE I

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

MONITORING WELL	DATE SAMPLED OR MEASURED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
Standard	---	0.01	0.75	0.75	0.62	---
MW-1	03/03/98	ND	ND	ND	ND	ND
MW-1	07/08/98	ND	ND	ND	ND	ND
MW-2	03/03/98	1.362	1.863	0.773	0.753	4.751
MW-3	03/03/98	0.398	0.124	0.452	0.045	1.019
MW-3	07/08/98	0.832	0.006	1.320	0.012	2.170
MW-4	03/03/98	ND	ND	ND	ND	ND
MW-4	07/08/98	ND	ND	ND	ND	ND
MW-5	04/07/98	ND	ND	ND	ND	ND
MW-5	07/08/98	ND	ND	ND	ND	ND
Windmill	03/03/98	ND	ND	ND	ND	ND

NOTE:
Standard listed is the New Mexico Water Quality Control Commission Ground Water Standard.

TABLE II

MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,465.61	45.99	3419.62	---	---
04/07/98	3,465.61	46.00	3419.61	---	---
05/01/98	3,465.61	45.97	3419.64	---	---
06/02/98	3,465.61	46.01	3419.60	---	---
07/01/98	3,465.61	46.05	3419.56	---	---
07/08/98	3,465.61	46.11	3419.50	---	---
08/04/98	3,465.61	46.11	3419.50	---	---

TABLE II
(continued)

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		DEPTH TO PSH (feet)	PSH ELEVATION (feet)	PSH THICKNESS (feet)
			Actual	Corrected			
03/03/98	3,465.44	46.06	3419.38	---		---	---
04/07/98	3,465.44	46.08	3419.36	---		---	---
05/01/98	3,465.44	46.05	3419.39	---		---	---
06/02/98	3,465.44	46.28	3419.16	3419.34	46.07	3419.37	0.21
06/26/98	3,465.44	47.07	3418.37	3419.31	45.96	3419.48	1.11
07/01/98	3,465.44	46.30	3419.14	3419.31	46.10	3419.34	0.20
07/08/98	3,465.44	46.29	3419.15	3419.29	46.13	3419.31	0.16
07/16/98	3,465.44	46.51	3418.93	3419.27	46.11	3419.33	0.40
07/22/98	3,465.44	46.45	3418.99	3419.26	46.13	3419.31	0.32
07/29/98	3,465.44	46.49	3418.95	3419.26	46.13	3419.31	0.36
08/04/98	3,465.44	46.51	3418.93	3419.25	46.14	3419.30	0.37
08/12/98	3,465.44	46.67	3418.77	3419.22	46.14	3419.30	0.53

TABLE II
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,464.68	45.46	3419.22	---	---
04/07/98	3,464.68	45.48	3419.20	---	---
05/01/98	3,464.68	45.45	3419.23	---	---
06/02/98	3,464.68	45.51	3419.17	---	---
06/26/98	3,464.68	45.54	3419.14	---	---
07/01/98	3,464.68	45.53	3419.15	---	---
07/08/98	3,464.68	45.58	3419.10	---	---
08/04/98	3,464.68	45.54	3419.14	---	---

TABLE II
(continued)

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

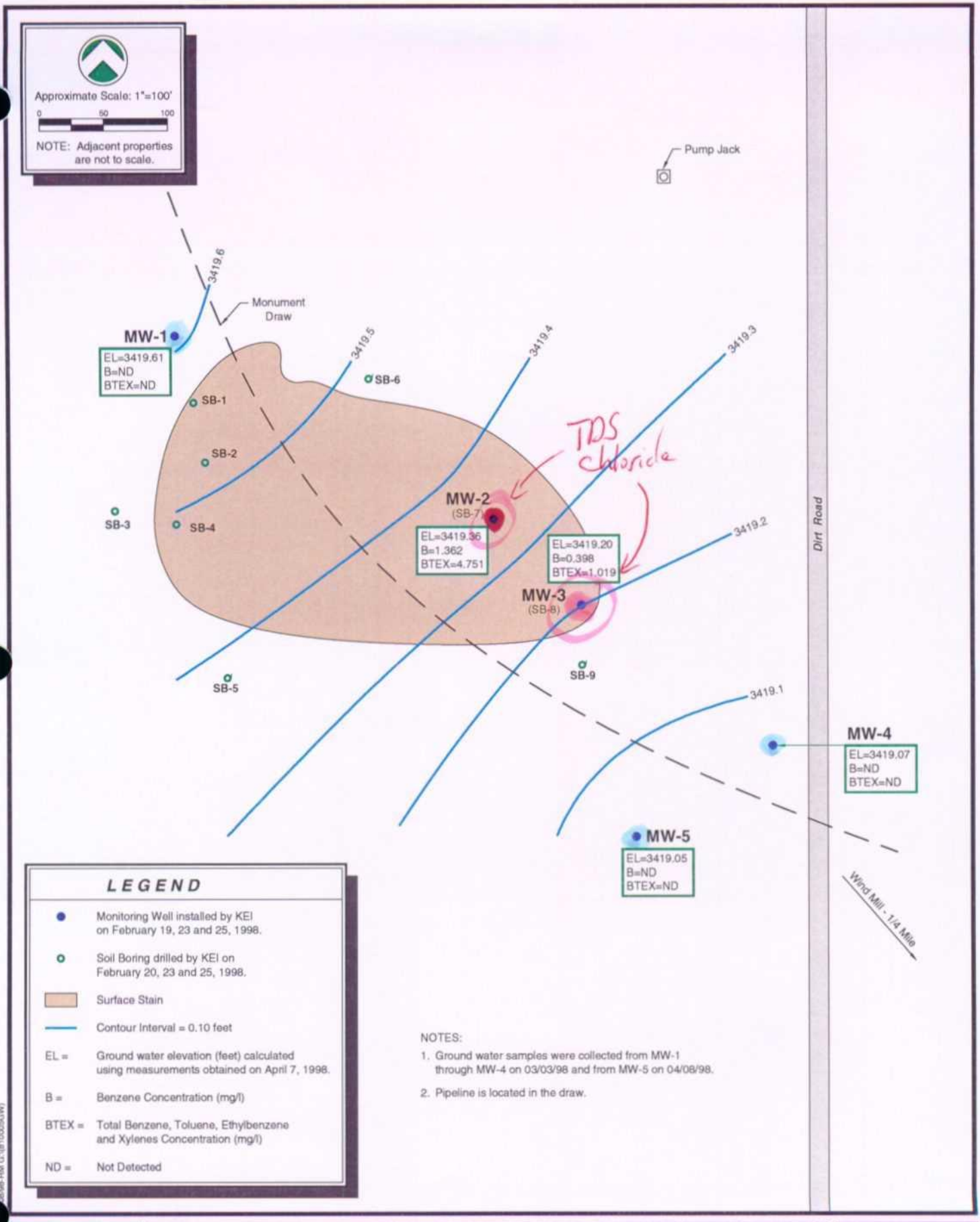
DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,465.76	46.66	3419.10	---	---
04/07/98	3,465.76	46.69	3419.07	---	---
05/01/98	3,465.76	46.66	3419.10	---	---
06/02/98	3,465.76	46.71	3419.05	---	---
07/01/98	3,465.76	46.74	3419.02	---	---
07/08/98	3,465.76	46.80	3418.96	---	---
08/04/98	3,465.76	46.81	3418.95	---	---

TABLE II
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/07/98	3,467.40	48.35	3419.05	---	---
04/08/98	3,467.40	48.34	3419.06	---	---
05/01/98	3,467.40	48.33	3419.07	---	---
06/02/98	3,467.40	48.38	3419.02	---	---
07/01/98	3,467.40	48.41	3418.99	---	---
07/08/98	3,467.40	48.47	3418.93	---	---
08/04/98	3,467.40	48.47	3418.93	---	---

NOTE:
MW-5 was not monitoring 03/03/98 due to casing problem.



k·e·i

GROUND WATER CONTOURS / CONCENTRATION MAP - APRIL 1998	810005
TEXAS - NEW MEXICO PIPE LINE CO. HDO-90-23 LEA COUNTY, NEW MEXICO	FIG 1

ANALYTICAL REPORT 1-80827

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNMPL

Project Id: 810005

April 7, 1998

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

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.: 1-80827**
Project Name: TNMPL
Project ID: 810005
Project Address: Monument Draw (Eunice)

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 1-80827. 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. 1-80827 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

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-80827

K.E.I. Consultants, Inc.

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Monument Draw (Eunice)

Project Name: TNMPL

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:*	180827 001		180827 002		180827 003		180827 004		180827 005	
	Field ID:	MW-1		MW-2		MW-3		MW-4		Wind Mill	
	Depth:										
	Matrix:	Liquid		Liquid		Liquid		Liquid		Liquid	
	Sampled:	03/03/98 12:35		03/03/98 13:00		03/03/98 13:20		03/03/98 13:40		03/03/98 14:13	
Metals by ICP EPA 6010	*Analyzed:*	03/19/98		03/19/98		03/19/98		03/19/98			
	Units:	mg/L	R.L.	mg/L	R.L.	mg/L	R.L.	mg/L	R.L.		
Aluminum		0.80	(0.56)	< 0.56	(0.56)	2.15	(0.56)	< 0.56	(0.56)		
Barium		0.14	(0.09)	0.82	(0.09)	0.55	(0.09)	0.19	(0.09)		
Beryllium		< 0.022	(0.022)	< 0.022	(0.022)	< 0.022	(0.022)	< 0.022	(0.022)		
Boron		0.36	(0.22)	0.37	(0.22)	3.45	(0.22)	< 0.22	(0.22)		
Calcium		1010	(2.2)	762	(2.2)	472	(2.2)	590	(2.2)		
Chromium		< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)		
Cobalt		< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)		
Copper		< 0.11	(0.11)	< 0.11	(0.11)	< 0.11	(0.11)	< 0.11	(0.11)		
Iron		0.32	(0.22)	0.76	(0.22)	5.51	(0.22)	< 0.22	(0.22)		
Magnesium		25.7	(0.2)	49.2	(0.2)	117	(0.2)	30.8	(0.2)		
Manganese		0.18	(0.06)	0.47	(0.06)	0.42	(0.06)	0.20	(0.06)		
Molybdenum		< 0.56	(0.56)	< 0.56	(0.56)	< 0.56	(0.56)	< 0.56	(0.56)		
Nickel		< 0.11	(0.11)	< 0.11	(0.11)	0.55	(0.11)	< 0.11	(0.11)		
Potassium		3.38	(1.11)	6.37	(1.11)	31.41	(1.11)	7.31	(1.11)		
Silicon		41.1	(0.6)	36.3	(0.6)	30.0	(0.6)	33.5	(0.6)		
Silver		< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)	< 0.05	(0.05)		
Sodium		76.4	(2.2)	327	(2.2)	1460	(2.2)	68.1	(2.2)		
Strontium		3.34	(0.22)	6.92	(0.22)	4.82	(0.22)	3.25	(0.22)		
Tin		< 0.22	(0.22)	0.24	(0.22)	1.96	(0.22)	< 0.22	(0.22)		
Vanadium		< 0.11	(0.11)	< 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)	< 1.11	(1.11)		

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-80827

K.E.I. Consultants, Inc.

Project ID: 810005
Project Name: TNMPL
Date Received in Lab : Mar 4, 1998 11:00
Project Manager: Theresa Nix
Date Report Faxed: Apr 7, 1998
Project Location: Monument Draw (Eunice)
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:* / *Field ID:* / *Depth:* / *Matrix:* / *Sampled:*	180827 001 MW-1 Liquid 03/03/98 12:35	180827 002 MW-2 Liquid 03/03/98 13:00	180827 003 MW-3 Liquid 03/03/98 13:20	180827 004 MW-4 Liquid 03/03/98 13:40	180827 005 Wind Mill Liquid 03/03/98 14:13
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.	03/18/98 mg/L R.L.	
Arsenic		< 0.22 (0.22)	< 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)	< 0.022 (0.022)	
Lead		< 0.11 (0.11)	< 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)	< 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.	03/16/98 mg/L R.L.	
Mercury		< 0.0011 (0.0011)	< 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.	03/06/98 ppm R.L.	03/06/98 ppm R.L.
Benzene		< 0.001 (0.001)	1.362 (0.005)	0.398 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Toluene		< 0.001 (0.001)	1.863 (0.005)	0.124 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Ethylbenzene		< 0.001 (0.001)	0.773 (0.005)	0.452 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
m,p-Xylenes		< 0.002 (0.002)	0.511 (0.009)	0.027 (0.008)	< 0.008 (0.008)	< 0.008 (0.008)
o-Xylene		< 0.001 (0.001)	0.242 (0.005)	0.018 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Total BTEX		N.D.	4.751	1.019	N.D.	N.D.
PAHs by GC-MS (610 List) EPA 8270	*Analyzed:* / *Units:*	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.	
Acenaphthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Acenaphthylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(a)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	
Benzo(a)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-80827

K.E.I. Consultants, Inc.

Project ID: 810005
Project Name: *TNMPL*
Project Manager: Theresa Nix
Project Location: Monument Draw (Eunice)

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:	180827 001 MW-1 Liquid 03/03/98 12:35	180827 002 MW-2 Liquid 03/03/98 13:00	180827 003 MW-3 Liquid 03/03/98 13:20	180827 004 MW-4 Liquid 03/03/98 13:40	180827 005 Wind Mill Liquid 03/03/98 14:13	
EPA 8270	Analyzed: / Units:	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.	03/11/98 mg/L R.L.		
Benzo(b)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Benzo(g,h,i)perylene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Benzo(k)fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Chrysene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Dibenzo(a,h)anthracene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Fluoranthene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Fluorene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Indeno(1,2,3-cd)pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Naphthalene		< 0.002 (0.002)	0.017 (0.002)	0.010 (0.002)	< 0.002 (0.002)		
Phenanthrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Pyrene		< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)	< 0.002 (0.002)		
Bicarbonate SM 4500CO2D	Analyzed: / Units:	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.		
Bicarbonate		225 (1.0)	460 (1.0)	1190 (1.0)	181 (1.0)		
Carbonate SM4500CO2D	Analyzed: / Units:	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.	03/09/98 mg/L R.L.		
Carbonate		< 1.0 (1.0)	< 1.0 (1.0)	< 1.0 (1.0)	< 1.0 (1.0)		
Total Dissolved Solids EPA 160.1	Analyzed: / Units:	03/10/98 mg/L R.L.	03/10/98 mg/L R.L.	03/10/98 mg/L R.L.	03/10/98 mg/L R.L.		
Total Dissolved Solids		458 (4.0)	1400 (4.0)	4890 (4.0)	470 (4.0)		

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-80827

K.E.I. Consultants, Inc.

Project ID: 810005
Project Name: TNMPL
Project Manager: Theresa Nix
Project Location: Monument Draw (Eunice)

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:*	180827 001		180827 002		180827 003		180827 004		180827 005		
	Field ID:	MW-1		MW-2		MW-3		MW-4		Wind Mill		
	Depth:											
	Matrix:	Liquid		Liquid		Liquid		Liquid		Liquid		
	Sampled:	03/03/98 12:35		03/03/98 13:00		03/03/98 13:20		03/03/98 13:40		03/03/98 14:13		
Anions by Ion Chromatography EPA 300.0	*Analyzed:*	03/13/98	R.L.	03/13/98	R.L.	03/13/98	R.L.	03/13/98	R.L.	03/13/98	R.L.	
	Units:	mg/L		mg/L		mg/L		mg/L		mg/L		
Chloride		17.11	(1.00)	394	(2.00)	1820	(8.00)	65.79	(1.00)	55.04	(1.00)	
Sulfate		63.59	(1.00)	34.82	(2.00)	164	(8.00)	51.05	(1.00)			

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A18B93

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

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE 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] 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	%	%	
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*(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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A18B93

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

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 180826- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC	[I] LIMITS	[G]
Parameter			Detection Limit	Relative Difference	Relative Difference			Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
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*(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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A18C04

SW846/6010 RCRA Metals

Date Validated: Mar 23, 1998 17:45
Date Analyzed: Mar 18, 1998 14:37
QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E] QC LIMITS Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
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*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

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

XENCO Laboratories

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]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
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*(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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A05A79

SW846- 7470 Total Mercury

Date Validated: Mar 18, 1998 09:23
Date Analyzed: Mar 16, 1998 15:30
QA/QC Manager: Sunil Ajai, M.S.

Analyst: CG
Matrix: Liquid

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

Blank Spike Recovery [E] = 100*(B-A)/(C)
N[illegible] Not calculated, data below detection limit
N[illegible] 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

XENCO Laboratories

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	[A] Sample Result	[B] Duplicate Result	[C] 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	< 0.0011	< 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*(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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25A80

SW- 846 5030/8020 BTEX

Date Validated: Mar 9, 1998 11:00
Date Analyzed: Mar 6, 1998 09:32
QA/QC Manager: Sunil Ajai, M.S.

Analyst: HL
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
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*(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. Tonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A34B23

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

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

Analyst: LC
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

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

Spike Relative Difference [F] = 200*(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 T. Shemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A31

SM 4500C02D Bicarbonate

Date Validated: Mar 10, 1998 09:38
Date Analyzed: Mar 9, 1998 14:00
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Bicarbonate	< 1.00	270	250	1.00	108.0	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 E. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A31

SM 4500CO2D Bicarbonate

Date Validated: Mar 10, 1998 09:38
Date Analyzed: Mar 9, 1998 14:30
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

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

elative 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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A32

SM4500CO2D Carbonate

Date Validated: Mar 10, 1998 09:38
Date Analyzed: Mar 9, 1998 14:30
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 180826- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A19A89

EPA 160.1 Total Dissolved Solids

Date Validated: Mar 10, 1998 13:39
Date Analyzed: Mar 10, 1998 13:25
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

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

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

Edward H. Yonemoto, Ph.D.
Technical Director

XEN Laboratories

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] 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	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*(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.
Technical Director

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Monument Draw (Eunice)

Project Name: TNMPL

XENCO COC#: 1-80827
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	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW-1	180827-001	BTEX	SW-846	ppm	Standard	Mar 3, 1998 12:35		Mar 6, 1998 by HL	Mar 6, 1998 11:27 by HL
2			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 12:35		Mar 10, 1998 by RK	Mar 11, 1998 21:34 by LC
3			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 12:35		Mar 13, 1998 by OR	Mar 13, 1998 17:38 by OR
4			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 12:35		Mar 9, 1998 by IF	Mar 9, 1998 15:10 by IF
5			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 12:35		Mar 9, 1998 by IF	Mar 9, 1998 15:10 by IF
6			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 12:35		Mar 9, 1998 by IF	Mar 10, 1998 13:35 by IF
7			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 12:35		Mar 16, 1998 by AO	Mar 19, 1998 11:39 by CG
8			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 12:35		Mar 16, 1998 by CG	Mar 16, 1998 16:04 by CG
9			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 12:35		Mar 16, 1998 by CG	Mar 18, 1998 15:13 by CG
10	MW-2	180827-002	BTEX	SW-846	ppm	Standard	Mar 3, 1998 13:00		Mar 6, 1998 by HL	Mar 6, 1998 13:03 by HL
11			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 13:00		Mar 10, 1998 by RK	Mar 11, 1998 22:21 by LC
12			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 13:00		Mar 13, 1998 by OR	Mar 13, 1998 17:54 by OR
13			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 13:00		Mar 9, 1998 by IF	Mar 9, 1998 15:20 by IF
14			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 13:00		Mar 9, 1998 by IF	Mar 9, 1998 15:20 by IF
15			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 13:00		Mar 9, 1998 by IF	Mar 10, 1998 13:40 by IF
16			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 13:00		Mar 16, 1998 by AO	Mar 19, 1998 11:54 by CG
17			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 13:00		Mar 16, 1998 by CG	Mar 16, 1998 16:05 by CG
18			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 13:00		Mar 16, 1998 by CG	Mar 18, 1998 15:26 by CG
19	MW-3	180827-003	BTEX	SW-846	ppm	Standard	Mar 3, 1998 13:20		Mar 6, 1998 by HL	Mar 6, 1998 13:22 by HL
20			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 13:20		Mar 10, 1998 by RK	Mar 11, 1998 23:07 by LC
21			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 13:20		Mar 13, 1998 by OR	Mar 13, 1998 18:12 by OR
22			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 13:20		Mar 9, 1998 by IF	Mar 9, 1998 15:30 by IF
23			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 13:20		Mar 9, 1998 by IF	Mar 9, 1998 15:30 by IF
24			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 13:20		Mar 9, 1998 by IF	Mar 10, 1998 13:45 by IF
25			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 13:20		Mar 16, 1998 by AO	Mar 19, 1998 11:57 by CG
26			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 13:20		Mar 16, 1998 by CG	Mar 16, 1998 16:06 by CG
27			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 13:20		Mar 16, 1998 by CG	Mar 18, 1998 15:30 by CG
28	MW-4	180827-004	BTEX	SW-846	ppm	Standard	Mar 3, 1998 13:40		Mar 6, 1998 by HL	Mar 6, 1998 13:41 by HL

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Monument Draw (Eunice)

Project Name: TNMPL

XENCO COC#: 1-80827
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	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
29			PAHs	SW846-8270	mg/L	Standard	Mar 3, 1998 13:40		Mar 10, 1998 by RK	Mar 11, 1998 23:53 by LC
30			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 13:40		Mar 13, 1998 by OR	Mar 13, 1998 18:28 by OR
31			Carbonate	SM4500CO2D	mg/L	Standard	Mar 3, 1998 13:40		Mar 9, 1998 by IF	Mar 9, 1998 15:40 by IF
32			Bicarbonate	SM 4500CO2D	mg/L	Standard	Mar 3, 1998 13:40		Mar 9, 1998 by IF	Mar 9, 1998 15:40 by IF
33			TDS	EPA 160.1	mg/L	Standard	Mar 3, 1998 13:40		Mar 9, 1998 by IF	Mar 10, 1998 13:25 by IF
34			Metals (ICP)	EPA 6010	mg/L	Standard	Mar 3, 1998 13:40		Mar 16, 1998 by AO	Mar 19, 1998 12:01 by CG
35			Mercury, Tot	SW846-7470	mg/L	Standard	Mar 3, 1998 13:40		Mar 16, 1998 by CG	Mar 16, 1998 16:15 by CG
36			RCRA Metals	SW846/6010	mg/L	Standard	Mar 3, 1998 13:40		Mar 16, 1998 by CG	Mar 18, 1998 15:35 by CG
37	Wind Mill	180827-005	BTEX	SW-846	ppm	Standard	Mar 3, 1998 14:13		Mar 6, 1998 by HL	Mar 6, 1998 14:19 by HL
38			Anions	EPA 300.0	mg/L	Standard	Mar 3, 1998 14:13		Mar 13, 1998 by OR	Mar 13, 1998 18:36 by OR

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 1

Lab. Batch # 180827-SA

Contractor: Kleinfelder Consultants Phone: (210) 680-3767

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

Project Name: TNMPL Project Director: Mike Hawthorne

Project Location: Monument Draw (Eunice) Project Manager: Theresa

Sampler Signature: Stanley Grover Project No.: 810005

No. coolers this shipment: Contractor COC #

Carrier: UPS Quote #:

Airbill No. P.O. No.: CALL Theresa NIX

	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 (8020 or 602)	TPH (418.1)	TPH EPA method 8100 or 2270	Cations/Anions	TDS	EPA method 160.1 Heavy metals (ICP scan)	EPA method 6010 Chlorides	Please Hold	LAB ONLY ID #
1	MW-1	Mar 3, 98	12:35			X		X			X	HCl HNO3		6	X		X	X	X	X			1
2	MW-2	Mar 3, 98	1300			X		X			X	HCl HNO3		6	X		X	X	X	X			2
3	MW-3	3-3-98	1320			X		X			X	HCl HNO3		6	X		X	X	X	X			3
4	MW-4	3-3-98	1340			X		X			X	HCl HNO3		6	X		X	X	X	X			4
5	wind mill	3-3-98	14:13			X		X			X	HCl		3	X						X		5
6																							6
7																							7
8																							8
9																							9
10																							10

Unl Dies Ker Unknown

Waste Oil

PIT No: Tank No:

Turn-around: ASAP / 24 hrs / 48 hrs / Standard

Remarks

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Stanley Grover	3-3-98	1600			
			Received For Laboratory by: Dawnie Yorkey	3/4/98	11:00

Remarks: Fax Analytical to Theresa at 210-680-3763 and to Stan Grover 505-392-2065

Heavy metals (ICP SCAN)

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

* Pre-scheduling is recommended

Precision Analytical Services

ANALYTICAL REPORT 1-81314

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: Eunice Historical Site

Project Id: 810005

April 21, 1998

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

April 21, 1998

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

Reference: **XENCO Report No.: 1-81314**
Project Name: Eunice Historical Site
Project ID: 810005
Project Address: Eunice, NM

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-81314. 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. 1-81314 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

XENCO Laboratories

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Lab. Batch # 181314-98

Contractor: KET CONSULTANTS
Phone: (210) 680-3767
Address: 5309 WURZBACH RD, STE 100, SAN ANTONIO, TX 78238
Project Name: EUNICE HISTORICAL SITE 810005
Project Director: MIKE HAWTHORNE
Project Location: EUNICE, NM
Project Manager: THERESA NIX
Sampler Signature: [signature]
Project No.: 810005

No. coolers this shipment: 1
Carrier: UPS
Airbill No.:
Contractor COC #
Quote #:
P.O. No.: CALL T. NIX FOR PO

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

Row	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Ice	Other	Sample Description (Unl Dies Ker Unknown / Waste Oil / PIT No: / Tank No:)	No. of Containers Total	EPA M?? SW 846 8020 / BTEX (5030/8020-602)	TPH (418.1)	PAH (8100 or 8270)	TDS (160.1)	CATIONS/ANIONS	HEAVY METALS (ICP-SCAN)				Please Hold	Remarks	LAB ONLY ID #
1	MW5	4/8/98	1306			/		/			/	HCL HNO3		6	/		/	/	/	/						1
2																										2
3																										3
4																										4
5																										5
6																										6
7																										7
8																										8
9																										9
10																										10

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
[signature]	4/8/98				
			Received For Laboratory by: [signature]	4/9/98	10:30

Remarks:
FAX RESULTS TO: T. NIX @ (210) 680-3763
• ICP SCAN FOR HEAVY METALS
→ via UPS

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

* Pre-scheduling is recommended

Precision Analytical Services

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Eunice, NM

Project Name: Eunice Historical Site

XENCO COC#: 1-81314
Date Received in Lab: Apr 9, 1998 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	Addition Requested	Extraction	Analysis
1	MW-5	181314-001	BTEX	SW-846	ppm	3 days	Apr 8, 1998 13:06		Apr 10, 1998 by HL	Apr 10, 1998 11:35 by HL
2			PAHs	SW846-8270	mg/L	5 days	Apr 8, 1998 13:06		Apr 10, 1998 by SS	Apr 11, 1998 02:34 by LC
3			TDS	EPA 160.1	mg/L	5 days	Apr 8, 1998 13:06		Apr 13, 1998 by IF	Apr 14, 1998 10:10 by IF
4			Carbonate	SM4500CO2D	mg/L	7 days	Apr 8, 1998 13:06		Apr 13, 1998 by IF	Apr 13, 1998 14:30 by IF
5			Metals (ICP)	EPA 6010	mg/L	7 days	Apr 8, 1998 13:06		Apr 14, 1998 by AO	Apr 14, 1998 19:02 by MB
6			Anions	EPA 300.0	mg/L	7 days	Apr 8, 1998 13:06		Apr 14, 1998 by SA	Apr 14, 1998 10:46 by SS
7			Bicarbonate	SM 4500CO2D	mg/L	7 days	Apr 8, 1998 13:06		Apr 13, 1998 by IF	Apr 13, 1998 14:30 by IF
8			Mercury, Tot	SW846-7470	mg/L	Standard	Apr 8, 1998 13:06		Apr 14, 1998 by AO	Apr 15, 1998 14:54 by AO

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-81314

K.E.I. Consultants, Inc.

Project Name: Eunice Historical Site

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Eunice, NM

Date Received in Lab : Apr 9, 1998 10:30
Date Report Faxed: Apr 21, 1998
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:* / *Field ID:* / *Depth:* / *Matrix:* / *Sampled:*	181314 001 / MW-5 / / Liquid / 04/08/98 13:06			
Metals by ICP **EPA 6010**	*Analyzed:* / *Units:*	04/14/98 / mg/L	R.L.		
Aluminum		< 0.50	(0.50)		
Arsenic		< 0.10	(0.10)		
Barium		0.15	(0.08)		
Beryllium		< 0.020	(0.020)		
Boron		0.38	(0.20)		
Cadmium		< 0.010	(0.010)		
Calcium		188	(2.0)		
Chromium		< 0.050	(0.050)		
Cobalt		< 0.050	(0.050)		
Copper		< 0.10	(0.10)		
Iron		< 0.20	(0.20)		
Lead		< 0.050	(0.050)		
Magnesium		39.2	(0.2)		
Manganese		0.12	(0.05)		
Molybdenum		< 0.50	(0.50)		
Nickel		< 0.10	(0.10)		
Potassium		4.30	(1.00)		
Selenium		< 0.050	(0.050)		
Silicon		45.0	(0.5)		
Silver		< 0.050	(0.050)		
Sodium		94.3	(2.0)		
Strontium		4.47	(0.20)		
Tin		< 0.20	(0.20)		
Vanadium		< 0.10	(0.10)		
Zinc		< 1.00	(1.00)		
Total Mercury **EPA 7470**	*Analyzed:* / *Units:*	04/15/98 / mg/L	R.L.		
Mercury		< 0.0011	(0.0011)		
BTEX **EPA 8020**	*Analyzed:* / *Units:*	04/10/98 / ppm	R.L.		
Benzene		< 0.001	(0.001)		
Toluene		< 0.001	(0.001)		
Ethylbenzene		< 0.001	(0.001)		
m,p-Xylenes		< 0.002	(0.002)		

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-81314

K.E.I. Consultants, Inc.

Project Name: Eunice Historical Site

Project ID: 810005
Project Manager: Theresa Nix
Project Location: Eunice, NM

Date Received in Lab : Apr 9, 1998 10:30
Date Report Faxed: Apr 21, 1998
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:* / *Field ID:* / *Depth:* / *Matrix:* / *Sampled:*	181314 001 / MW-5 / / Liquid / 04/08/98 13:06			
EPA 8020	*Analyzed:* / *Units:*	04/10/98 / ppm	R.L.		
o-Xylene		< 0.001	(0.001)		
Total BTEX		N.D.			
PAHs by GC-MS (610 List) EPA 8270	*Analyzed:* / *Units:*	04/11/98 / mg/L	R.L.		
Acenaphthene		< 0.002	(0.002)		
Acenaphthylene		< 0.002	(0.002)		
Anthracene		< 0.002	(0.002)		
Benzo(a)anthracene		< 0.002	(0.002)		
Benzo(a)pyrene		< 0.002	(0.002)		
Benzo(b)fluoranthene		< 0.002	(0.002)		
Benzo(g,h,i)perylene		< 0.002	(0.002)		
Benzo(k)fluoranthene		< 0.002	(0.002)		
Chrysene		< 0.002	(0.002)		
Dibenzo(a,h)anthracene		< 0.002	(0.002)		
Fluoranthene		< 0.002	(0.002)		
Fluorene		< 0.002	(0.002)		
Indeno(1,2,3-cd)pyrene		< 0.002	(0.002)		
Naphthalene		< 0.002	(0.002)		
Phenanthrene		< 0.002	(0.002)		
Pyrene		< 0.002	(0.002)		
Bicarbonate SM 4500CO2D	*Analyzed:* / *Units:*	04/13/98 / mg/L	R.L.		
Bicarbonate		291	(1.0)		
Carbonate SM4500CO2D	*Analyzed:* / *Units:*	04/13/98 / mg/L	R.L.		
Carbonate		< 1.0	(1.0)		
Total Dissolved Solids EPA 160.1	*Analyzed:* / *Units:*	04/14/98 / mg/L	R.L.		
Total Dissolved Solids		485	(4.0)		
Anions by Ion Chromatography EPA 300.0	*Analyzed:* / *Units:*	04/14/98 / mg/L	R.L.		
Chloride		113	(1.00)		
Sulfate		75.5	(1.0)		

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A18C63

EPA 6010 Metals by ICP

Date Validated: Apr 14, 1998 23:45
Date Analyzed: Apr 14, 1998 18:51
QA/QC Manager: Sunil Ajai, M.S.

Analyst: MB
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Aluminum	< 0.100	0.976	1.000	0.100	97.6	70-125	
Arsenic	< 0.100	1.112	1.000	0.100	111.2	70-125	
Barium	< 0.0100	0.5995	0.5000	0.0100	119.9	70-125	
Beryllium	< 0.0100	0.2125	0.2000	0.0100	106.3	70-125	
Cadmium	< 0.0200	0.2315	0.2000	0.0200	115.8	70-125	
Calcium	< 0.03	2.50	2.00	0.03	125.0	70-125	
Chromium	< 0.0500	0.5745	0.5000	0.0500	114.9	70-125	
Cobalt	< 0.0100	0.5300	0.5000	0.0100	106.0	70-125	
Copper	< 0.015	0.531	0.500	0.015	106.2	70-125	
Iron	< 0.013	1.202	1.000	0.013	120.2	70-125	
Lead	< 0.0500	1.1115	1.0000	0.0500	111.2	70-125	
Magnesium	< 0.025	2.406	2.000	0.025	120.3	70-125	
Manganese	< 0.0125	1.0680	1.0000	0.0125	106.8	70-125	
Nickel	< 0.050	0.535	0.500	0.050	107.0	70-125	
Potassium	< 0.05	1.94	2.00	0.05	97.0	70-125	
Selenium	< 0.1000	1.0900	1.0000	0.1000	109.0	70-125	
Silicon	0.422	12.533	15.000	0.100	80.7	70-125	
Silver	< 0.0200	0.8035	0.8000	0.0200	100.4	70-125	
Sodium	0.79	6.32	6.00	0.05	92.2	70-125	
Strontium	< 0.050	1.207	1.000	0.050	120.7	70-125	
Vanadium	< 0.015	0.505	0.500	0.015	101.0	70-125	
Zinc	< 0.015	0.562	0.500	0.015	112.4	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

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

Xenco Laboratories

Certificate Of Quality Control for Batch : 18A18C63

EPA 6010 Metals by ICP

Date Validated: Apr 14, 1998 23:45
Date Analyzed: Apr 14, 1998 19:08
QA/QC Manager: Sunil Ajai, M.S.

Analyst: MB
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 181314- 001	[A] Sample Result	[B] Duplicate Result	[C] 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	%	%	
Aluminum	0.130	0.131	0.100	0.8	25.0	1.133	1.00	100.3	70-125	
Arsenic	< 0.100	< 0.100	0.100	N.C	25.0	0.979	1.00	97.9	70-125	
Barium	0.151	0.152	0.010	0.7	25.0	0.603	0.50	90.4	70-125	
Beryllium	< 0.0100	< 0.0100	0.0100	N.C	25.0	0.1740	0.200	87.0	70-125	
Cadmium	< 0.0200	< 0.0200	0.0200	N.C	25.0	0.1770	0.200	88.5	70-125	
Calcium	188	190	0.03	1.1	25.0	186	2 0	100.0	70-125	
Chromium	< 0.0500	< 0.0500	0.0500	N.C	25.0	0.4665	0.500	93.3	70-125	
Cobalt	< 0.0100	< 0.0100	0.0100	N.C	25.0	0.5165	0.500	103.3	70-125	
Copper	< 0.015	< 0.015	0.015	N.C	25.0	0.441	0.50	88.2	70-125	
Iron	< 0.200	< 0.200	0.200	N.C	25.0	1.164	1.00	109.6	70-125	
Lead	< 0.0500	< 0.0500	0.0500	N.C	25.0	0.9080	1.000	90 8	70-125	
Magnesium	39.18	39.78	0.03	1.5	25.0	38.74	2.0	22.0	70-125	A,B
Manganese	0.122	0.128	0.013	4.8	25.0	1.149	1.00	102.7	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.
Technical Director

XEDO Laboratories

Certificate Of Quality Control for Batch : 18A18C63

EPA 6010 Metals by ICP

Date Validated: Apr 14, 1998 23:45
Date Analyzed: Apr 14, 1998 19:08
QA/QC Manager: Sunil Ajai, M.S.

Analyst: MB
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 18I314- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC	[I] LIMITS	[G]
Parameter			Detection Limit	Relative Difference	Relative Difference			Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Nickel	< 0.050	< 0.050	0.050	N.C	25.0	0.423	0.50	84.6	70-125	
Potassium	4.303	4.663	0.050	8.0	25.0	5.403	2.00	55.0	70-125	A,B
Selenium	< 0.1000	< 0.1000	0.1000	N.C	25.0	0.9550	1.000	95.5	70-125	
Silicon	44.98	44.37	0.10	1.4	25.0	42.65	15.0	15.5	70-125	B
Silver	< 0.0200	< 0.0200	0.0200	N.C	25.0	0.0580	0.800	7.3	70-125	B
Sodium	94.31	96.80	0.05	2.6	25.0	82.76	6.0	192.5	70-125	A,B
Strontium	4.470	4.612	0.050	3.1	25.0	5.539	1.00	106.9	70-125	
Vanadium	0.038	0.038	0.015	0.0	25.0	0.538	0.50	100.0	70-125	
Zinc	< 1.00	< 1.00	1.00	N.C	25.0	0.498	0.50	89.6	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A05B20

SW846- 7470 Total Mercury

Date Validated: Apr 16, 1998 10:31
Date Analyzed: Apr 16, 1998 14:46
QA/QC Manager: Sunil Ajai, M.S.

Analyst: AO
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E] QC LIMITS Blank Spike Recovery %	[F] QC LIMITS Recovery Range %	[G] Qualifier
Mercury	< 0.0011	0.0027	0.0028	0.0011	96.4	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A05B20

SW846- 7470 Total Mercury

Date Validated: Apr 16, 1998 10:31
Date Analyzed: Apr 15, 1998 14:55
QA/QC Manager: Sunil Ajai, M.S.

Analyst: AO
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 181314- 001	[A] Sample Result	[B] Duplicate Result	[C] 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	< 0.0011	< 0.0011	0.0011	N.C	25.0	0.0022	0.0028	78.6	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

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

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25B14

SW- 846 5030/8020 BTEX

Date Validated: Apr 10, 1998 16:00
Date Analyzed: Apr 10, 1998 10:37
QA/QC Manager: Sunil Ajai, M.S.

Analyst: HL
Matrix: Liquid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 181315- 004	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.0010	0.1010	0.0984	0.1000	0.0010	20.0	2.6	101.0	98.4	65-135	
Toluene	< 0.0010	0.0980	0.0986	0.1000	0.0010	20.0	0.6	98.0	98.6	65-135	
Ethylbenzene	< 0.0010	0.1020	0.1010	0.1000	0.0010	20.0	1.0	102.0	101.0	65-135	
m,p-Xylenes	< 0.0020	0.2120	0.2060	0.2000	0.0020	20.0	2.9	106.0	103.0	65-135	
o-Xylene	< 0.0010	0.1040	0.1030	0.1000	0.0010	20.0	1.0	104.0	103.0	65-135	

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

Edward B. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25B14

SW- 846 5030/8020 BTEX

Date Validated: Apr 10, 1998 16:00
Date Analyzed: Apr 10, 1998 09:40
QA/QC Manager: Sunil Ajai, M.S.

Analyst: HL
Matrix: Liquid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Detection Limit ppm	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Benzene	< 0.0010	0.0967	0.0971	0.1000	0.0010	20.0	0.4	96.7	97.1	65-135	
Toluene	< 0.0010	0.0987	0.0955	0.1000	0.0010	20.0	3.3	98.7	95.5	65-135	
Ethylbenzene	< 0.0010	0.0986	0.0968	0.1000	0.0010	20.0	1.8	98.6	96.8	65-135	
m,p-Xylenes	< 0.0020	0.2040	0.1980	0.2000	0.0020	20.0	3.0	102.0	99.0	65-135	
o-Xylene	< 0.0010	0.0993	0.0981	0.1000	0.0010	20.0	1.2	99.3	98.1	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A02B41

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

Date Validated: Apr 14, 1998 11:56
Date Analyzed: Apr 10, 1998 23:33
QA/QC Manager: Sunil Ajai, M.S.

Analyst: LC
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Acenaphthene	< 0.0040	0.0750	0.0742	0.1000	0.0040	31.0	1.1	75.0	74.2	46-118	
4-Chloro-3-Methylphenol	< 0.0040	0.0646	0.0674	0.1000	0.0040	42.0	4.2	64.6	67.4	23-97	
2-Chlorophenol	< 0.0040	0.0624	0.0638	0.1000	0.0040	40.0	2.2	62.4	63.8	27-123	
1,4-Dichlorobenzene	< 0.0040	0.0716	0.0732	0.1000	0.0040	28.0	2.2	71.6	73.2	36-97	
2,4-Dinitrotoluene	< 0.0040	0.0694	0.0738	0.1000	0.0040	38.0	6.1	69.4	73.8	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0676	0.0654	0.1000	0.0080	38.0	3.3	67.6	65.4	41-116	
4-Nitrophenol	< 0.0080	0.0218	0.0248	0.1000	0.0080	50.5	12.9	21.8	24.8	10-80	
Pentachlorophenol	< 0.0020	0.0392	0.0498	0.1000	0.0020	50.0	23.8	39.2	49.8	9-103	
Phenol	< 0.0020	0.0352	0.0364	0.1000	0.0020	42.0	3.4	35.2	36.4	12-89	
Pyrene	< 0.0040	0.0878	0.0904	0.1000	0.0040	31.0	2.9	87.8	90.4	26-127	
1,2,4-Trichlorobenzene	< 0.0020	0.0730	0.0738	0.1000	0.0020	28.0	1.1	73.0	73.8	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. Tonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A51

SM 4500C02D Bicarbonate

Date Validated: Apr 14, 1998 10:42
Date Analyzed: Apr 13, 1998 14:00
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Detection Limit mg/L	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Bicarbonate	< 1.00	100	106	1.00	94.3	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A51

SM 4500CO2D Bicarbonate

Date Validated: Apr 14, 1998 10:42
Date Analyzed: Apr 13, 1998 14:30
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 131314- 001	[A] Sample Result	[B] Duplicate Result	[C] Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Bicarbonate	291	296	1.00	1.7	25.0	

elative 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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A20A50

SM4500CO2D Carbonate

Date Validated: Apr 14, 1998 10:42
Date Analyzed: Apr 13, 1998 14:30
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 181314- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Carbonate	< 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 T. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A19B27

EPA 160.1 Total Dissolved Solids

Date Validated: Apr 14, 1998 10:45
Date Analyzed: Apr 14, 1998 10:15
QA/QC Manager: Sunil Ajai, M.S.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 181315- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Total Dissolved Solids	1370	1380	4.00	0.7	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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A10A69

EPA 300.0 Anions by Ion Chromatography

Date Validated: Apr 14, 1998 13:00
Date Analyzed: Apr 14, 1998 12:02
QA/QC Manager: Sunil Ajai, M.S.

Analyst: SS
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 181358- 001	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Nitrate	430	433	0.10	0.7	20.0	

elative 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.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A10A69

EPA 300.0 Anions by Ion Chromatography

Date Validated: Apr 14, 1998 13:00
Date Analyzed: Apr 14, 1998 11:21
QA/QC Manager: Sunil Ajai, M.S.

Analyst: SS
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 181315- 004	[A] Sample Result	[B] Duplicate Result	[C]	[D] QC	[E] LIMITS	[F]
Parameter			Detection Limit	Relative Difference	Relative Difference	Qualifier
	mg/L	mg/L	mg/L	%	%	
Chloride	187	185	0.050	1.1	20.0	
Sulfate	315	314	0.10	0.3	20.0	

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

Edward H. Yonemoto, Ph.D.
Technical Director

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A10A69

EPA 300.0 Anions by Ion Chromatography

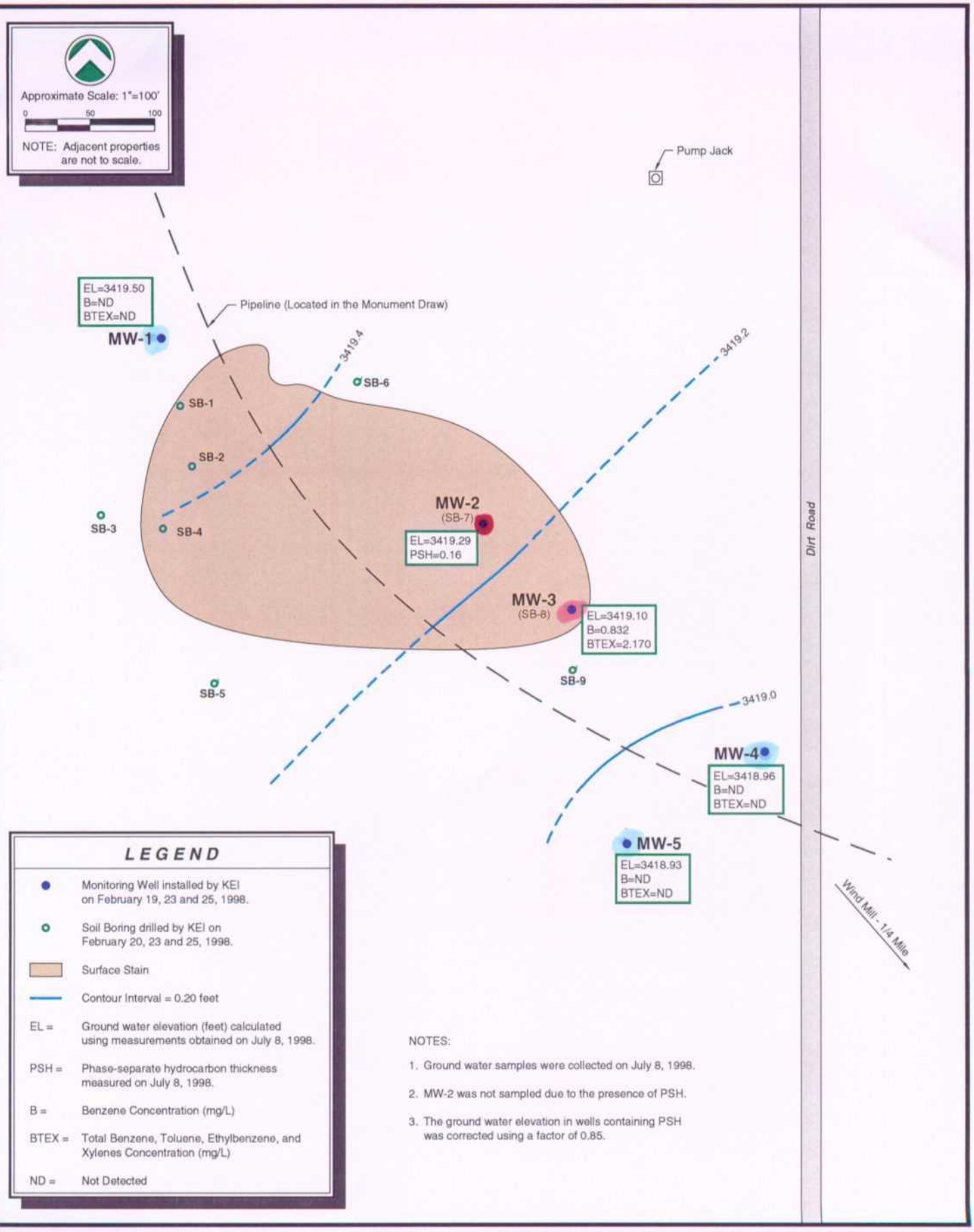
Date Validated: Apr 14, 1998 13:00
Date Analyzed: Apr 14, 1998 10:15
QA/QC Manager: Sunil Ajai, M.S.

Analyst: SS
Matrix: Liquid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Chloride	< 0.050	9.010	9.162	10.000	0.050	20.0	1.7	90.1	91.6	70-125	
Nitrate	< 0.10	8.97	8.87	10.00	0.10	20.0	1.1	89.7	88.7	70-125	
Sulfate	< 0.10	8.45	8.42	10.00	0.10	20.0	0.4	84.5	84.2	70-125	

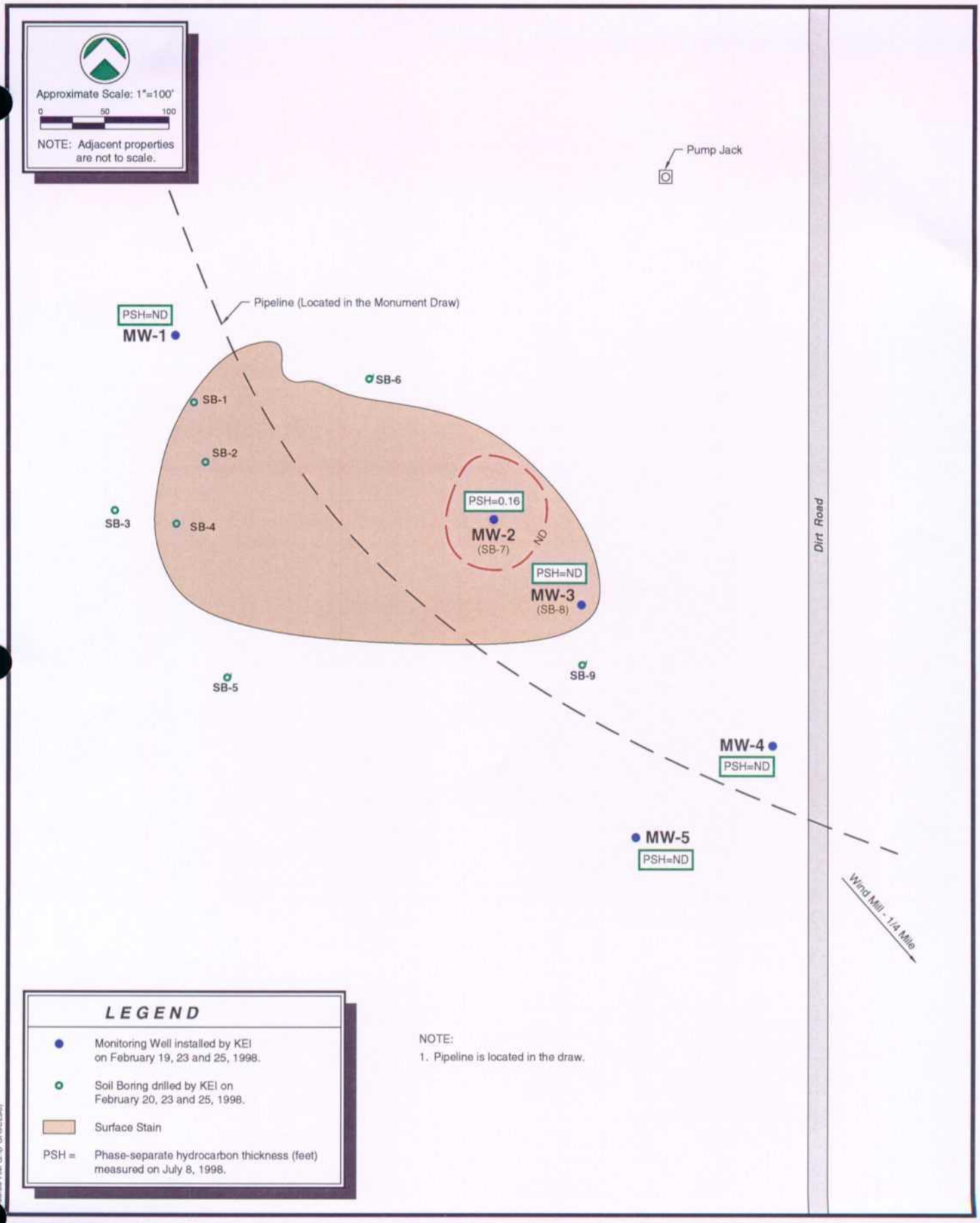
Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
Technical Director



k·e·i

GROUND WATER CONTOURS / CONCENTRATION - JULY 1998	810005
TEXAS - NEW MEXICO PIPE LINE CO. HDO-90-23 LEA COUNTY, NEW MEXICO	FIG 1



k·e·i

PSH THICKNESS MAP - JULY 1998	810005
TEXAS - NEW MEXICO PIPE LINE CO. HDO-90-23 LEA COUNTY, NEW MEXICO	FIG 2

ANALYTICAL REPORT 1-82562

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: TNMPL

Project Id: 810005-1-0

July 14, 1998

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

July 14, 1998

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

Reference: **XENCO Report No.: 1-82562**
Project Name: TNMPL
Project ID: 810005-1-0
Project Address: Eunice, NM

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-82562. 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. 1-82562 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

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

Sincerely,

Eddie L. Clemons, II
QA/QC Manager

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

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Lab. Batch # 182562-SA

Contractor: K•e•i Consultants
Phone (210) 680-3767
Address: 5304 Wurzbach, Ste 100 San Antonio, TX 78238
Project Name: TNMPL
Project Director: Mike Hawthorne
Project Location: [illegible] Eunice, NM
Project Manager: Theresa Nix
Sampler Signature: [signature]
Project No. 810005-1-0

No. coolers this shipment:
Carrier: UPS
Airbill No.
Contractor COC # [illegible] 157
Quote #:
P.O. No: 810005-1-0

Row	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description (Unl Dies Ker Unknown / Waste Oil / PIT No: Tank No:)	No of Containers (Total 8)	BTEX (5030/8020-602) BTEX: SW846-8020	TPH (418.1)	Please Hold	Remarks (Turn-around: * ASAP, * 24 hrs, 48 hrs, Standard)	LAB ONLY ID #
1	MW-1	8 July 98				/		/	40mL		/	HCl		2	/			Questions on Analyses call TN at 210-680-3767	1
2	MW-3	8 July 98				/		/	40mL		/	HCl		2	/			"	2
3	MW-4	8 July 98				/		/	40mL		/	HCl		2	/			"	3
4	MW-5	8 July 98				/		/	40mL		/	HCl		2	/			"	4
5																		"	5
6																			6
7																			7
8																			8
9																			9
10																			10

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
[signature]	7-8-98	1400			
			Received For Laboratory by: UPS [signature] L Yorkey	7/9/98	9:10

Remarks
Fax Analytical Results to Theresa Nix: at 210-680-3763
• BTEX: EPA METHOD SW846-8020

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810005-1-0
Project Manager: Theresa Nix
Project Location: Eunice, NM

Project Name: TNMPL

XENCO COC#: 1-82562
Date Received in Lab: Jul 9, 1998 09:10 by LY
XENCO contact : Carlos Castro/Eddie Clemons

	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	182562-001	BTEX	SW-846	ppm	10 days	Jul 8, 1998		Jul 13, 1998 by HL	Jul 13, 1998 15:50 by HL
2	MW-3	182562-002	BTEX	SW-846	ppm	10 days	Jul 8, 1998		Jul 13, 1998 by HL	Jul 13, 1998 16:06 by HL
3	MW-4	182562-003	BTEX	SW-846	ppm	10 days	Jul 8, 1998		Jul 13, 1998 by HL	Jul 13, 1998 16:22 by HL
4	MW-5	182562-004	BTEX	SW-846	ppm	10 days	Jul 8, 1998		Jul 13, 1998 by HL	Jul 13, 1998 16:38 by HL

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-82562

K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 810005-1-0
Project Manager: Theresa Nix
Project Location: Eunice, NM

Date Received in Lab : Jul 9, 1998 09:10
Date Report Faxed: Jul 14, 1998
XENCO contact : Carlos Castro/Eddie Clemons

Analysis Requested	*Lab ID:*	182562 001	182562 002	182562 003	182562 004
	Field ID:	MW-1	MW-3	MW-4	MW-5
	Depth:				
	Matrix:	Liquid	Liquid	Liquid	Liquid
	Sampled:	07/08/98	07/08/98	07/08/98	07/08/98
BTEX	*Analyzed:*	07/13/98	07/13/98	07/13/98	07/13/98
EPA 8020	*Units:*	ppm R.L.	ppm R.L.	ppm R.L.	ppm R.L.
Benzene		< 0.004 (0.004)	0.832 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Toluene		< 0.004 (0.004)	0.006 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Ethylbenzene		< 0.004 (0.004)	1.320 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
m,p-Xylenes		< 0.008 (0.008)	< 0.008 (0.008)	< 0.008 (0.008)	< 0.008 (0.008)
o-Xylene		< 0.004 (0.004)	0.012 (0.004)	< 0.004 (0.004)	< 0.004 (0.004)
Total BTEX		N.D.	2.170	N.D.	N.D.

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25C24

SW- 846 5030/8020 BTEX

Date Validated: Jul 13, 1998 19:00
Date Analyzed: Jul 13, 1998 09:41

Analyst: HL
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Detection Limit ppm	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Benzene	< 0.0010	0.1090	0.1070	0.1000	0.0010	20.0	1.9	108.9	106.9	70-125	
Toluene	< 0.0010	0.0981	0.0938	0.1000	0.0010	20.0	4.5	98.1	93.8	70-125	
Ethylbenzene	< 0.0010	0.0990	0.0935	0.1000	0.0010	20.0	5.7	99.0	93.5	70-125	
m,p-Xylenes	< 0.0020	0.2060	0.1950	0.2000	0.0020	20.0	5.5	102.9	97.5	70-125	
o-Xylene	< 0.0010	0.1010	0.0954	0.1000	0.0010	20.0	5.7	100.9	95.4	70-125	

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

Eddie L. Clemons, II
QA/QC Manager

ENV-PI-GWV-98-5

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

December 21, 1998

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

Re: Ground Water Monitoring Event
Texas - New Mexico Pipe Line Company
HDO-90-23
Section 6, Township 20 South, Range 37 East
Lea County, New Mexico
Job No. 810005-1

Dear Mr. Savoie:

Transmitted with this letter is the ground water binder update packet for the fourth quarter of 1998 ground water monitoring event conducted at HDO-90-23, located in Lea County, New Mexico. A copy has been submitted to the OCD Hobbs and Santa Fe offices.

The packet contains the following:

- Updated gauging tables
- Updated ground water laboratory results tables
- Updated figures
- A copy of the laboratory ground water results and chain-of-custody documentation
- A dated "tab" for the new event

Please remove and replace the former tables. Add the new dated tab and place the updated figures, laboratory reports, and chain-of-custody documentation behind this tab.

Please call me at (210) 680-3767 if you have any questions or comments.

Respectfully,

Theresa Nix

Theresa Nix
Project Manager

Enclosure

cc: Marc Oler, Equilon
OCD Hobbs
OCD Santa Fe, William Olson ✓
J. Michael Hawthorne, KEI

tln\p\tnmp\810005\monitor\cgwb4q98.doc

TABLE I

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

MONITORING WELL	DATE SAMPLED OR MEASURED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
Standard	---	0.01	0.75	0.75	0.62	---
MW-1	03/03/98	ND	ND	ND	ND	ND
MW-1	07/08/98	ND	ND	ND	ND	ND
MW-1	10/01/98	ND	ND	ND	ND	ND
MW-2	03/03/98	1.362	1.863	0.773	0.753	4.751
MW-3	03/03/98	0.398	0.124	0.452	0.045	1.019
MW-3	07/08/98	0.832	0.006	1.320	0.012	2.170
MW-3	10/01/98	1.48	0.03	2.06	0.12	3.690
MW-4	03/03/98	ND	ND	ND	ND	ND
MW-4	07/08/98	ND	ND	ND	ND	ND
MW-4	10/01/98	ND	ND	ND	ND	ND
MW-5	04/07/98	ND	ND	ND	ND	ND
MW-5	07/08/98	ND	ND	ND	ND	ND
MW-5	10/01/98	ND	ND	ND	ND	ND
Windmill	03/03/98	ND	ND	ND	ND	ND

NOTE:
Standard listed is the New Mexico Water Quality Control Commission Ground Water Standard.

TABLE II

MONITORING WELL MW-1
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,465.61	45.99	3419.62	---	---
04/07/98	3,465.61	46.00	3419.61	---	---
05/01/98	3,465.61	45.97	3419.64	---	---
06/02/98	3,465.61	46.01	3419.60	---	---
07/01/98	3,465.61	46.05	3419.56	---	---
07/08/98	3,465.61	46.11	3419.50	---	---
08/04/98	3,465.61	46.11	3419.50	---	---
09/01/98	3,465.61	46.17	3419.44	---	---
10/01/98	3,465.61	46.15	3419.46	---	---
10/06/98	3,465.61	46.20	3419.41	---	---
11/11/98	3,465.61	46.21	3419.40	---	---
12/01/98	3,465.61	46.19	3419.42	---	---

TABLE II
(continued)

MONITORING WELL MW-2
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,465.44	46.06	3419.38	---	---
04/07/98	3,465.44	46.08	3419.36	---	---
05/01/98	3,465.44	46.05	3419.39	---	---
06/02/98	3,465.44	46.28	3419.16	3419.34	0.21
06/26/98	3,465.44	47.07	3418.37	3419.31	1.11
07/01/98	3,465.44	46.30	3419.14	3419.31	0.20
07/08/98	3,465.44	46.29	3419.15	3419.29	0.16
07/16/98	3,465.44	46.51	3418.93	3419.27	0.40
07/22/98	3,465.44	46.45	3418.99	3419.26	0.32
07/29/98	3,465.44	46.49	3418.95	3419.26	0.36
08/04/98	3,465.44	46.51	3418.93	3419.25	0.37
08/12/98	3,465.44	46.67	3418.77	3419.22	0.53
08/18/98	3,465.44	46.40	3419.04	3419.23	0.22
08/27/98	3,465.44	46.61	3418.83	3419.22	0.45
09/01/98	3,465.44	46.46	3418.98	3419.19	0.25
09/10/98	3,465.44	46.61	3418.83	3419.18	0.41
09/16/98	3,465.44	46.55	3418.89	3419.18	0.34
09/22/98	3,465.44	46.58	3418.86	3419.17	0.36
09/30/98	3,465.44	46.90	3418.54	3419.17	0.73
10/06/98	3,465.44	46.58	3418.86	3419.17	0.36
10/15/98	3,465.44	46.84	3418.60	3419.19	0.69
10/20/98	3,465.44	46.75	3418.69	3419.16	0.55
10/29/98	3,465.44	46.80	3418.64	3419.18	0.63
11/11/98	3,465.44	47.32	3418.12	3419.17	1.23
11/17/98	3,465.44	46.48	3418.96	3419.18	0.26
11/25/98	3,465.44	46.47	3418.97	3419.20	0.27
12/01/98	3,465.44	46.74	3418.70	3419.21	0.59

TABLE II
(continued)

MONITORING WELL MW-3
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,464.68	45.46	3419.22	---	---
04/07/98	3,464.68	45.48	3419.20	---	---
05/01/98	3,464.68	45.45	3419.23	---	---
06/02/98	3,464.68	45.51	3419.17	---	---
06/26/98	3,464.68	45.54	3419.14	---	---
07/01/98	3,464.68	45.53	3419.15	---	---
07/08/98	3,464.68	45.58	3419.10	---	---
08/04/98	3,464.68	45.54	3419.14	---	---
09/01/98	3,464.68	45.64	3419.04	---	---
10/01/98	3,464.68	45.63	3419.05	---	---
10/06/98	3,464.68	45.67	3419.01	---	---
12/01/98	3,464.68	45.63	3419.05	---	---

NOTE:
MW-3 was not gauged for the month of November due to surface water.

TABLE II
(continued)

MONITORING WELL MW-4
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

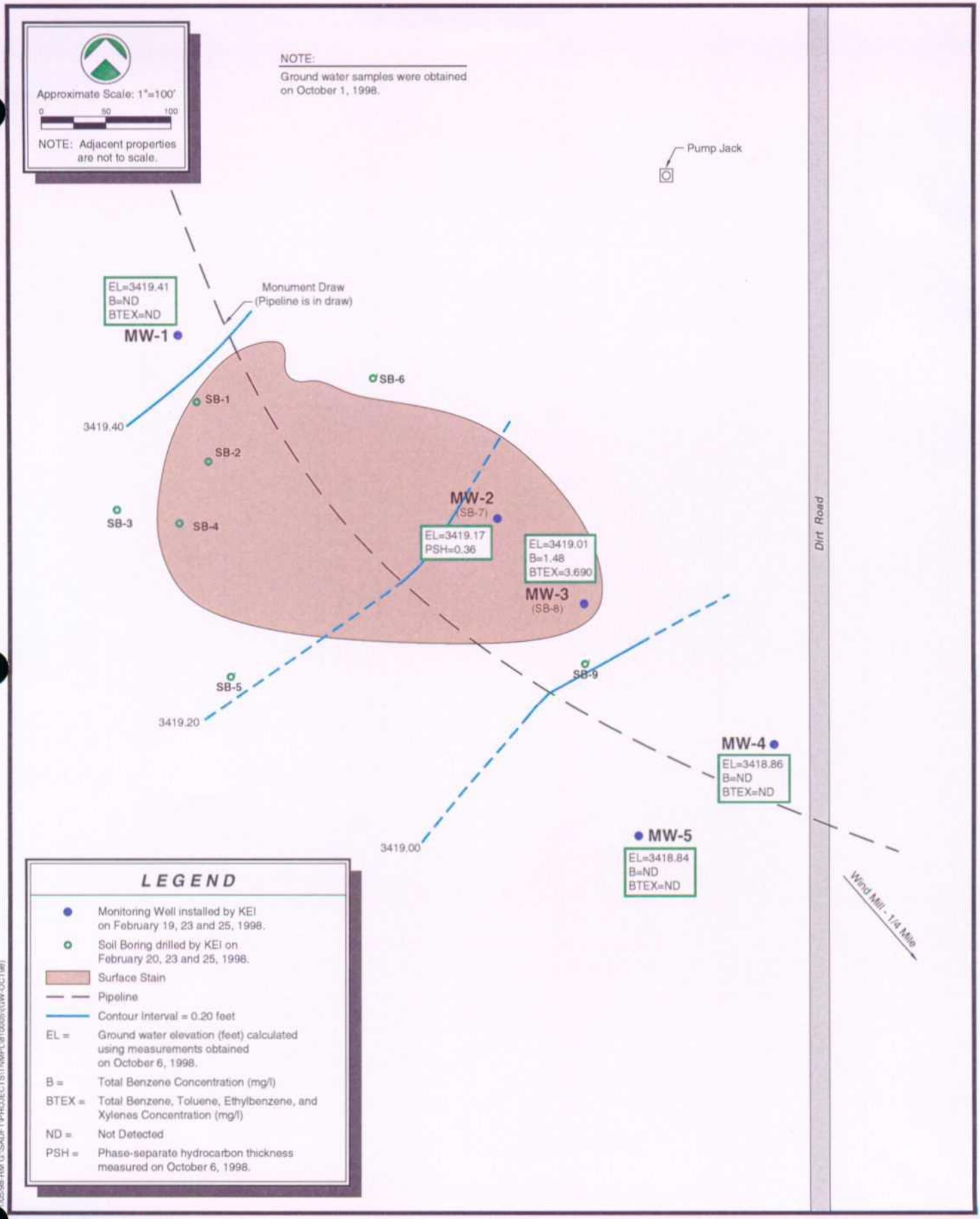
DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
03/03/98	3,465.76	46.66	3419.10	---	---
04/07/98	3,465.76	46.69	3419.07	---	---
05/01/98	3,465.76	46.66	3419.10	---	---
06/02/98	3,465.76	46.71	3419.05	---	---
07/01/98	3,465.76	46.74	3419.02	---	---
07/08/98	3,465.76	46.80	3418.96	---	---
08/04/98	3,465.76	46.81	3418.95	---	---
09/01/98	3,465.76	46.86	3418.90	---	---
10/01/98	3,465.76	46.84	3418.92	---	---
10/06/98	3,465.76	46.90	3418.86	---	---
11/11/98	3,465.76	46.92	3418.84	---	---
12/01/98	3,465.76	46.89	3418.87	---	---

TABLE II
(continued)

MONITORING WELL MW-5
SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
HDO-90-23
LEA COUNTY, NEW MEXICO

DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
			Actual	Corrected	
04/07/98	3,467.40	48.35	3419.05	---	---
04/08/98	3,467.40	48.34	3419.06	---	---
05/01/98	3,467.40	48.33	3419.07	---	---
06/02/98	3,467.40	48.38	3419.02	---	---
07/01/98	3,467.40	48.41	3418.99	---	---
07/08/98	3,467.40	48.47	3418.93	---	---
08/04/98	3,467.40	48.47	3418.93	---	---
09/01/98	3,467.40	48.52	3418.88	---	---
10/01/98	3,467.40	48.50	3418.90	---	---
10/06/98	3,467.40	48.56	3418.84	---	---
11/11/98	3,467.40	48.56	3418.84	---	---
12/01/98	3,467.40	48.54	3418.86	---	---

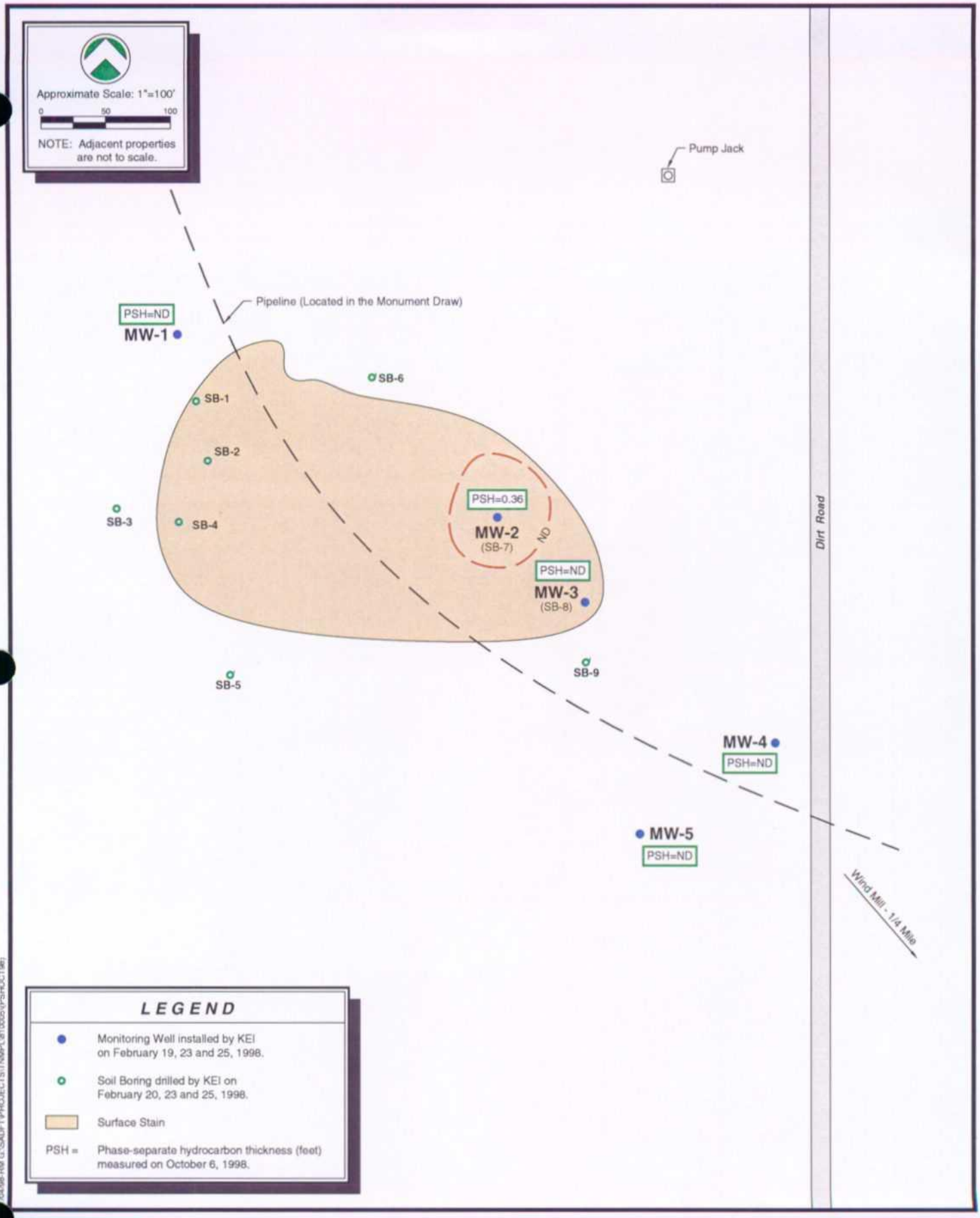
NOTE:
MW-5 was not monitoring 03/03/98 due to casing problem.



05/98-RM G:\SAD\FT\PROJECTS\TNMPL\810005\GW-OCT98\

k·e·i

GROUND WATER CONTOURS / CONCENTRATION - OCTOBER 1998	810005
TEXAS - NEW MEXICO PIPE LINE CO. HDO-90-23 LEA COUNTY, NEW MEXICO	FIG 1

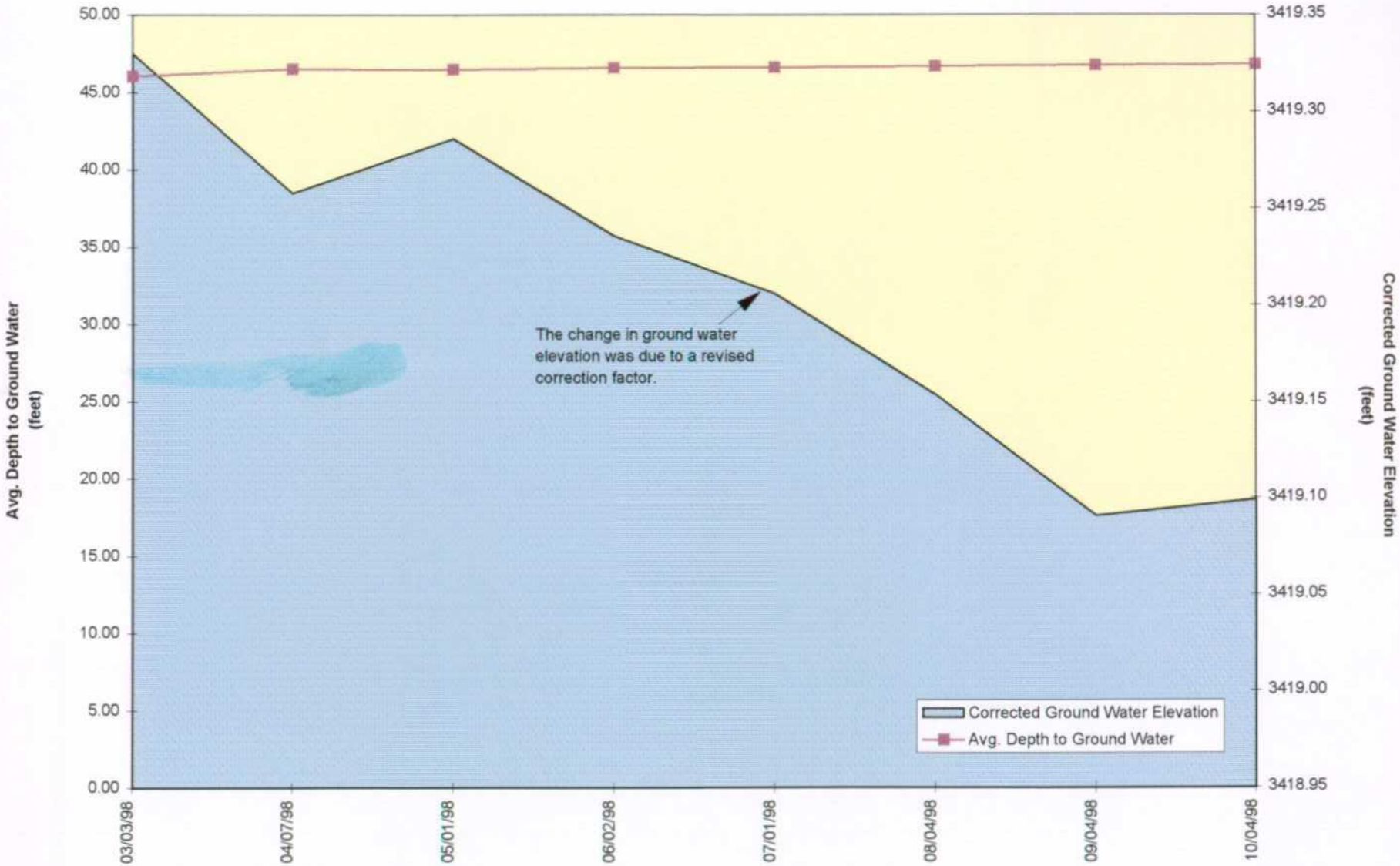


04/98-RM G:\SADFT\PROJECTS\TNMPL\810005\PSHOCT98)

k·e·i

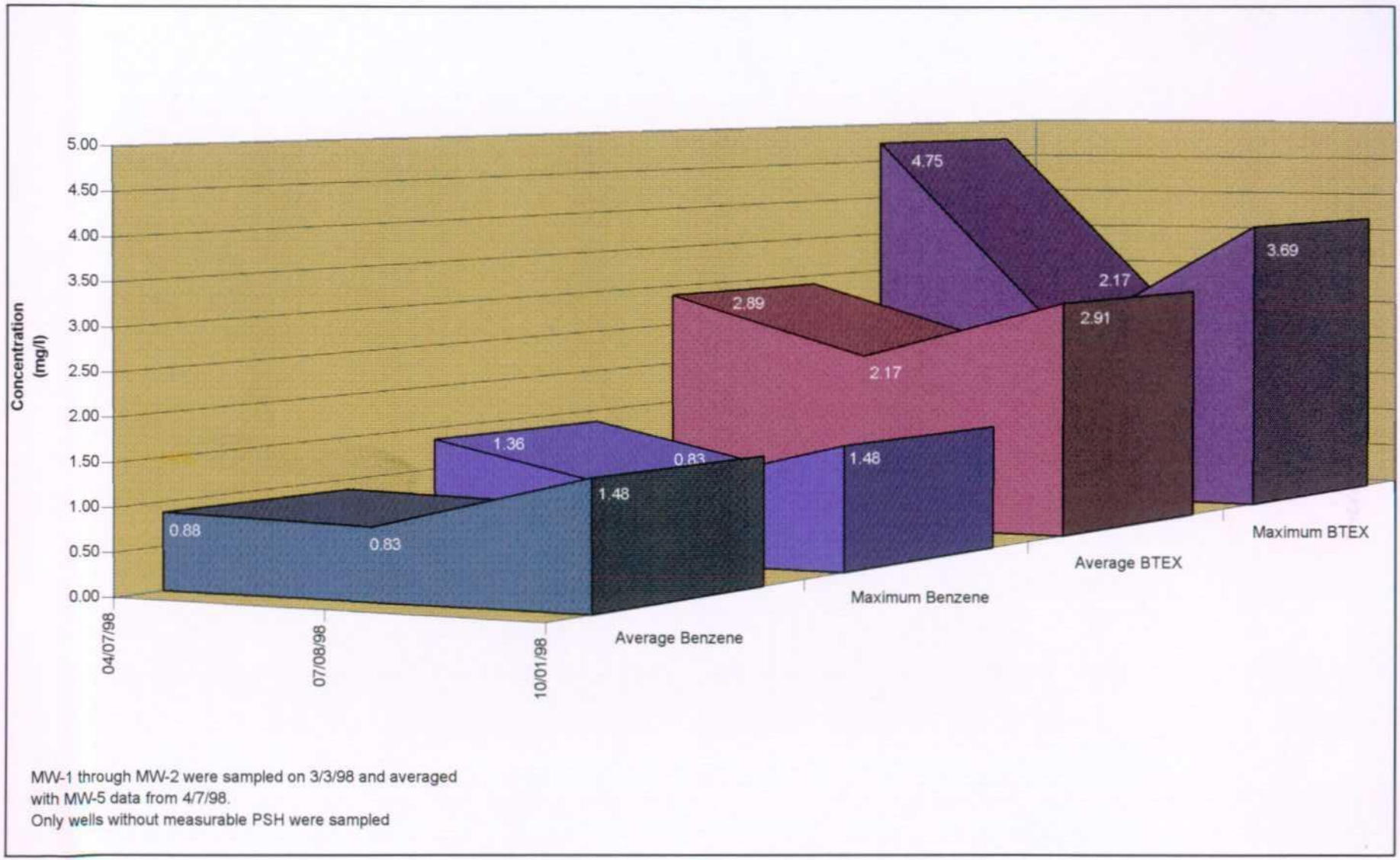
PSH THICKNESS MAP - OCTOBER 1998	810005-1
TEXAS - NEW MEXICO PIPE LINE CO. HDO-90-23 LEA COUNTY, NEW MEXICO	FIG 2

FIGURE 3
AVERAGE GROUND WATER DATA



HDO-90-23
Lea County, New Mexico
KEI Job No. 810005-1
p:\tnmpl\810005\monitor\sumaverg.xls

FIGURE 4
DISSOLVED PHASE CONCENTRATIONS



MW-1 through MW-2 were sampled on 3/3/98 and averaged with MW-5 data from 4/7/98.
Only wells without measurable PSH were sampled

HDO-90-23
Lea County, New Mexico
KEI Job No. 810005-1
p:\tnmpl\810005\monitor\sumaverg.xls

ANALYTICAL REPORT 1-83878

for

K.E.I. Consultants, Inc.

Project Manager: Theresa Nix

Project Name: Eunice Historical

Project Id: 810005-1-0

October 7, 1998

XENCO Laboratories

HOUSTON - DALLAS - SAN ANTONIO

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

XENCO Laboratories

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

October 7, 1998

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

Reference: **XENCO Report No.: 1-83878**
Project Name: Eunice Historical
Project ID: 810005-1-0
Project Address: Eunice, NM.

Dear Theresa Nix:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with XENCO Chain of Custody Number 1-83878. 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. 1-83878 will be filed for 60 days, and after that time they will be properly disposed of without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

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

Sincerely,

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-83878

K.E.I. Consultants, Inc.

Project Name: Eunice Historical

Project ID: 810005-1-0
Project Manager: Theresa Nix
Project Location: Eunice, NM.

Date Received in Lab : Oct 2, 1998 10:05
Date Report Faxed: Oct 7, 1998
XENCO contact : Carlos Castro/Karen Olson

Analysis Requested	*Lab ID:*	183878 001		183878 002		183878 003		183878 004	
	Field ID:	MW-1		MW-3		MW-4		MW-5	
	Depth:								
	Matrix:	Liquid		Liquid		Liquid		Liquid	
	Sampled:	10/01/98		10/01/98		10/01/98		10/01/98	
BTEX	*Analyzed:*	10/05/98		10/05/98		10/05/98		10/05/98	
EPA 8021B	*Units:*	ppm	R.L.	ppm	R.L.	ppm	R.L.	ppm	R.L.
Benzene		< 0.001	(0.001)	1.48	(0.02)	< 0.001	(0.001)	< 0.001	(0.001)
Toluene		< 0.001	(0.001)	0.03	(0.02)	< 0.001	(0.001)	< 0.001	(0.001)
Ethylbenzene		< 0.001	(0.001)	2.06	(0.02)	< 0.001	(0.001)	< 0.001	(0.001)
m,p-Xylenes		< 0.002	(0.002)	< 0.04	(0.04)	< 0.002	(0.002)	< 0.002	(0.002)
o-Xylene		< 0.001	(0.001)	0.12	(0.02)	< 0.001	(0.001)	< 0.001	(0.001)
Total BTEX		N.D.		3.690		N.D.		N.D.	

Eddie L. Clemons. II
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 18A25D47

SW- 846 5030/8021B BTEX

Date Validated: Oct 6, 1998 14:00
Date Analyzed: Oct 5, 1998 11:41

Analyst: HL
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Detection Limit ppm	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Benzene	< 0.0010	0.1070	0.1010	0.1000	0.0010	20.0	5.8	106.9	100.9	65-135	
Toluene	< 0.0010	0.1070	0.0979	0.1000	0.0010	20.0	8.9	106.9	97.9	65-135	
Ethylbenzene	< 0.0010	0.1050	0.0975	0.1000	0.0010	20.0	7.4	104.9	97.5	65-135	
m,p-Xylenes	< 0.0020	0.2140	0.1990	0.2000	0.0020	20.0	7.3	107.0	99.5	65-135	
o-Xylene	< 0.0010	0.1070	0.1010	0.1000	0.0010	20.0	5.8	106.9	100.9	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

Eddie L. Clemons, II
QA/QC Manager

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 810005-1-0
Project Manager: Theresa Nix
Project Location: Eunice, NM.

Project Name: Eunice Historical

XENCO COC#: 1-83878
Date Received in Lab: Oct 2, 1998 10:05 by JO
XENCO contact : Carlos Castro/Karen Olson

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW-1	183878-001	BTEX	SW-846	ppm	10 days	Oct 1, 1998		Oct 5, 1998 by HL	Oct 5, 1998 14:29 by HL
2	MW-3	183878-002	BTEX	SW-846	ppm	10 days	Oct 1, 1998		Oct 5, 1998 by HL	Oct 5, 1998 15:43 by HL
3	MW-4	183878-003	BTEX	SW-846	ppm	10 days	Oct 1, 1998		Oct 5, 1998 by HL	Oct 5, 1998 14:48 by HL
4	MW-5	183878-004	BTEX	SW-846	ppm	10 days	Oct 1, 1998		Oct 5, 1998 by HL	Oct 5, 1998 15:06 by HL

XENCO Laboratories

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

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

On-LINE Help & Technical Services at XENCO.com

10435

Company COC No: 184 Work Order No: 810005-1-0 Page 1 of 1

Company: KEI	Phone: (210) 688-3767
Project Name: EUNICE HISTORICAL ☒ Previously done at XENCO	Project ID: 810005-1-0
Location: EUNICE NM	
Project Manager (PM): T. NIX	Project Director (PD): M. HAWTHORNE
Fax Results to: ☒ PM and / or	Fax: (512) 364-3556
Invoice to: ☐ Accounting ☐ Include Invoice with Final Report Attn PM ☐ Invoice must have a P.O Bill to:	
Quote No.	P.O No 810005-1-0 ☐ Call for a P.O.
Special DLs (RRI RR II DW QAPP See Lab PM Call Proj. PM)	
Specifications	

Lab Only: 183878-SA

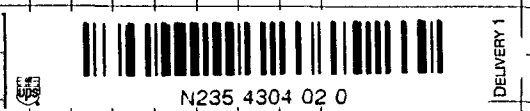
TAT: 5h 12h 20h 24h 48h 3d 5d 7d 14d 21d (Standard) TAT is 10 Working Days unless otherwise agreed in writing. But often reported in 5-7 Working Days

Lab Only Additions: From: Rcv by: Date

Sampler Name: KEN DUTTON Signature: Ken Dutton

	Sample ID	Sampling Date	Time	Depth (ft' in" m)	Matrix A P S W	Composite	Grab	# Containers	Container Size	Type	Preservatives	BTEX by 8020	BTEX-MTBE by 8020	TPH by TX1005 418.1 8015GRO 8015DRO 8015Jetf	PAHs by 8270 8100 8310	METALS by 6010 8RCRA Tot Pb TCLP8 13PP 23TAL See List	VOAs by 8260 624 BTEX MTBE PPs TCL See List Call PM	SVOAs by 8270 625 PAHs BN&A TCL PPs See List Call PM	Other 624 602 8260 8021	Other 624 602 8260 8021	TAT 5h 12h 20h 24h 48h 3d 5d 7d 10d 14d 21d	Addn: PAH above mg/L W. mg/Kg S Highest Hit	Hold Analysis
1	MW-1	01 OCT 98					X	2	V	GA	H,C4	X											
2	MW-3							2															
3	MW-4							2															
4	MW-5							2															
5																							
6																							
7																							
8																							
9																							
10																							

Remarks: CALL T. NIX IF THERE ARE QUESTIONS @ (512) 364-3699



Relinquished by (Initials and Signature)	Relinquished to (Initials and Signature)	Date & Time	
1 KD Ken Dutton		01 OCT 98 / 1500	Total Containers per COC: 8
2		Via U.P.S.	Rush TATs Fax Due: Final Fax Due:
3	Lab: Johnny Orona	10 2 98 10:05	Final Report Data Package Due Date:
			Rush Charges are Pre-Approved upon Requesting them. All Terms Apply

Preservatives - Various (V), HCl pH<2 (H), H2SO4 pH<2 (S), HNO4 pH<2 (N), NaOH+Asbc Acid (NAA), ZnAc+NaOH (ZA), (Cool,<4C) (C4), None (N), See Label (SL), Other (O) _____

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