SPILL REPORT





OCT 03 1997

Environmental Bureau Oil Conservation Division

COMPREHENSIVE ASSESSMENT REPORT

TEXAS - NEW MEXICO PIPELINE COMPANY MONUMENT SITE NO. 3 LEA COUNTY, NEW MEXICO



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COMPREHENSIVE ASSESSMENT REPORT

MONUMENT SITE NO. 3 LEA COUNTY, NEW MEXICO

PREPARED FOR:

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September 9, 1997

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EXECUTIVE SUMMARY

This report summarizes the results of subsurface assessment activities conducted at Monument Site No. 3, located in Lea County, New Mexico. Site No. 3 includes four separate areas of investigation designated as Site Nos. 3, 3A, 3B, and 3C. Activities were performed in general accordance with the work plan submitted with the Phase I - Preliminary Site Characterization Report and approved by the State of New Mexico Oil Conservation Division.

Field activities associated with the subsurface assessment consisted of advancing five soil borings for the collection of native soil samples for field screening and laboratory analysis. A sensitive receptor survey/migration pathway evaluation was also conducted.

Results of the assessment included the following:

- Soil analytical results indicated the presence of toluene, ethylbenzene, xylenes and total
 petroleum hydrocarbons (TPH) at concentrations noted within the report. Benzene was
 not detected.
- Ground water was not encountered during the subsurface assessment.
- Observed impact to soils from petroleum hydrocarbons extended from the ground surface to 14 feet below ground surface.
- Soils at Site 3A require remediation.

Recommended additional assessment and remediation activities to be conducted pursuant to final site closure include:

- Excavate impacted material as required to bring residual hydrocarbon concentrations to closure levels.
- Obtain OCD approval and transport excavated soil to an off-site landfarm.
- Backfill excavation with clean fill.
- Prepare closure report.

INTRODUCTION

This report summarizes assessment activities conducted in response to suspected crude oil impact at Monument Site No. 3, located in Lea County New Mexico. Site No. 3 consisted of four separate areas of investigation designated as Site Nos. 3, 3A, 3B, and 3C. Details of each site are presented on FIGs. 2, 3, 4, and 5. A site location map is presented as FIG. 1. Descriptions of each of the areas investigated are as follows:

- Site No. 3 consists of an excavation approximately 38 feet long, 24 feet wide, and 5 feet deep; a stockpile of soils recovered from the excavation; and a surface stain along a section of pipeline adjacent to the excavation.
- Site No. 3A consists of an excavation approximately 63 feet long, 27 feet wide, and 2 feet deep and a stockpile of soils recovered from the excavation.
- Site No. 3B consists of an excavation approximately 90 feet wide, 70 feet long, and 2 feet deep and a stockpile of soils recovered from the excavation.
- Site No. 3C consists of an excavation approximately 40 feet wide, 25 feet long, and 6 feet deep and a stockpile of soils recovered from the excavation.

A scope of work for the subsurface assessment was prepared based upon field observations obtained during a preliminary investigation of surface site conditions. The proposed work plan was presented in the Phase I - Preliminary Site Characterization report dated June 21, 1996, and was approved by the State of New Mexico Oil Conservation. Division in a letter dated August 16, 1996. The general scope of work for the subsurface investigation included:

- A sensitive receptor survey, migration pathway evaluation, and registered water well search.
- Soil borings within the excavations at each of the 4 sites described above.

SUBSURFACE INVESTIGATION

SENSITIVE RECEPTOR SURVEY/MIGRATION PATHWAY EVALUATION

A sensitive receptor survey/migration pathway evaluation was conducted at the site. No potential receptors were identified within a 500-foot radius of the site. Adjacent properties consisted of vacant range land to the north and east, a gas plant to the south, and a concrete batch plant to the west. An abandoned oil well was located approximately 400 feet to the southeast.

A search of State of New Mexico water well registrations indicated two registered water wells within a .5-mile radius of the site. A copy of the well registration data is presented in APPENDIX A. Approximate locations of the identified wells are presented on FIG. 1.

Migration Pathway Evaluation

Potential manmade migration pathways identified during the survey included the former location of a TNMPL pipeline extending north to south through the center of the site and an existing petroleum product pipeline extending east to west approximately 60 feet to the south.

Ground water was not observed during the assessment. Surface flow at the site is to the southeast.

FIELD ACTIVITIES

On March 5 and 6, 1997 soil borings B3-1, B3A-1, B3B-1, B3C-1 and B3C-2 were advanced utilizing a direct-push hydraulic sampling system. On April 2, 1997 Soil Boring B3AT-1 was advanced utilizing a tricone sampling system. The soil borings were advanced to depths ranging from 11 to 17 feet bgs. Field observations obtained during the soil boring advancement included the following:

- Ground water was not observed during soil boring advancement.
- Hydrocarbon impact extends from the ground surface to the total depth of each exploratory hole within each of the areas investigated.
- Hydrocarbon impact to vadose zone soils has been vertically delineated to concentrations which do not appear to require remediation.

Upon completion of sampling activities, each soil boring was backfilled to the ground surface with a cement/bentonite grout. Approximate locations of the soil borings are presented on FIGs. 2 through 5.

SOIL ASSESSMENT

The subsurface profile was classified in general accordance with the Unified Soil Classification System by visually observing soil samples obtained during drilling. In general, one soil type and limestone bedrock were encountered. A general description, approximate thickness, and head-space results of the soil type is discussed as follows:

Soil Type 1

This soil type consisted of a tan gravel with a high calcareous content (caliche) encountered at all soil boring locations. The gravel was silty and dry to moist. This soil type was encountered from the ground surface to the maximum depth investigated, approximately 17 feet bgs. Head-space readings ranged from below instrument detection limits (ND) to 48 ppm.

Limestone

A hard, grey limestone was encountered as sampler refusal at the bottom of soil borings B3A-1, B3B-1, and B3C-2 and beneath the upper clay at B3AT-1 to a depth of approximately 15 feet bgs. The limestone was encountered continuously from a depth of 0.5 feet to 15 feet bgs at B3AT-1. Head-space readings obtained from samples of the limestone were all ND.

Graphic logs indicating the subsurface soil profile, depths at which soil samples were obtained, head-space results, laboratory results, and the soil boring details are presented on FIGS. 6 and 7.

LABORATORY ANALYSIS

Soil samples were selected for laboratory analysis from sample intervals that, at a minimum, represented the high field screening result and the bottom of the hole of each soil boring. The selected soil samples were express mailed to Xenco Laboratories in San Antonio, Texas for determination of TPH concentrations by EPA METHOD 418.1 and BTEX concentrations by EPA Method SW846-8020.

Analytical results indicated the following range of constituent concentrations for the soil boring samples:

CONSTITUENT	RANGE OF CONCENTRATIONS
ТРН	26.5 to 2830 mg/kg
Benzene	ND
BTEX	ND to 0.706 mg/kg

A complete summary of analytical results for soil samples is presented in TABLE I. Copies of the certified laboratory reports and chain-of-custody documentation for soils are presented in APPENDIX B.

WASTE MANAGEMENT

Cuttings generated during soil boring advancement were placed in the existing stockpiles.

QA/QC PROCEDURES

DECONTAMINATION OF EQUIPMENT

Cleaning of drilling equipment was the responsibility of the drilling company. In general, the cleaning procedures consisted of using high pressure steam to wash the equipment prior to drilling and prior to starting each hole. Prior to each use, the sampling equipment was cleaned with Liqui-Nox detergent and rinsed with distilled water.

SOIL SAMPLING

Samples of the subsurface soils were obtained utilizing a direct-push continuous sampling device. Representative soil samples were divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample was placed in a disposable sample bag. The bag was labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample was allowed to volatilize for approximately 30 minutes at ambient temperature prior to conducting the analysis.

The other portion of the soil sample was placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container was filled to capacity to

limit the amount of head-space present. Each container was labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler was sealed for shipment to the laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

LABORATORY PROTOCOL

The laboratory was responsible for proper QA/QC procedures. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

CONCLUSIONS

The following conclusions are presented based on the field observations, drilling activities, and soil laboratory results:

- Soil impact extends from the ground surface to approximately 14 feet bgs.
- Standard New Mexico Oil and Conservation Division regulatory site closure concentrations for soils were exceeded by TPH concentrations in a sample collected from Soil Boring B3A-1.
- Hydrocarbon impact to vadose zone soils has been vertically delineated at each of the Site No. 3 areas of investigation to concentrations which do not appear to require remediation.

RECOMMENDATIONS

Recommendations for remediation of observed soil impact at the site consist of the following:

- Excavate impacted material as required to bring residual hydrocarbon concentrations to closure levels.
- Obtain OCD approval and transport impacted soil to an off-site landfarm.
- Backfill excavation with clean fill.
- Prepare closure report.



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MONUMENT SOUTH QUADRANGLE

NEW MEXICO - LEA COUNTY











LEGEND



Gravel (GM), silty gravel-sand-silt mixtures, calcareous (caliche), moist to dry, tan.



Limestone; hard, light grey.

Indicates the depth interval from which a soil sample was selected and prepared for field head-space and/or laboratory analysis. The soil samples were obtained continuously by advancing a plastic lined four-foot sampling barrel.



Indicates sample selected for laboratory analysis.



Indicates sampler refusal.

- B = benzene concentration (mg/kg)
- BTEX = total BTEX concentration (mg/kg)
- TPH = total petroleum hydrocarbon concentration (mg/kg)
- PID Head-space readings in ppm obtained with a photoionization detector.
- ND = Indicates the concentration was below laboratory detection limits.

NOTES:

- Borings B3-1, B3A-1, B3B-1, B3c-1, and B3C-2 were advanced utilizing a direct-push sampling system on March 5 and 6, 1997. Boring B3AT-1 was advanced on April 2, 1997 utilizing a 6" tricone sampling system.
- 2. No ground water was encountered during boring advancement.
- 3. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
- 4. The depths indicated are referenced from the ground surface.
- 5. The soil borings were grouted to the ground surface with cement grout containing 5 percent bentonite.



LEGEND AND NOTES FOR SOIL BORINGS

TEXAS - NEW MEXICO PIPE LINE CO. MONUME

MONUMENT SITE NO. 3 LEA COUNTY, NEW MEXICO



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GENERAL NOTES

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

Depth is referenced from ground surface.

Method detection limit

Benzene	-	0.020 to 0.050 mg/kg
Toluene	-	0.020 to 0.050 mg/kg
Ethylbenzene	-	0.020 to 0.050 mg/kg
Xylene	-	0.060 to 0.150 mg/kg
BTEX	-	0.120 to 0.300 mg/kg
TPH	-	10 mg/kg

Laboratory testing method

BTEX	-	EPA Method SW846-8020
TPH	-	EPA Method 418.1

TABLE I

SUMMARY OF LABORATORY BTEX/TPH RESULTS - SOIL MONUMENT SITE NO. 3 LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL- BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
B3-1	03/05/97	1-2	ND	ND	ND	ND	ND	48.0
	03/05/97	13-14	ND	ND	ND	ND	ND	38.0
B3A-1	03/05/97	4-5	ND	ND	ND	ND	ND	49.5
	03/05/97	6-7	ND	0.135	0.082	0.489	0.706	2830
	03/05/97	10-11	ND	ND	ND	ND	ND	31,5
B38-1	03/06/97	4-5	ND	ND	ND	ND	ND	37.0
	03/06/97	13-14	ND	ND	ND	ND	ND	52.0
B3C-1	03/05/97	1-2	ND	ND	ND	ND	ND	36.0
	03/05/97	13-14	ND	ND	NĎ	ND	ND	56.0
B3C-2	03/05/97	5-6	ND	ND	ND	ND	ND	30.5
	03/05/97	13-14	ND	ND	ND	ND	ND	26.5
3AT-1	04/02/97	3	ND	ND	ND	ND	ND	ND
	04/0 2/97	13	ND	ND	ND	ND	ND	ND

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ANALYTICAL REPORT 1-70560

for

K.E.I. Consultants, Inc.

Project Manager: Ann Baker

Project Name: TNMPL Monument

March 12, 1997



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 Meadowglen Lane
 Suite L * Houston, Texas 77082-2647

 Phone (713) 589-0692
 Fax (713) 589-0695



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March 12, 1997

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

Reference: XENCO Report No.: 1-70560 Project Name: TNMPL Monument Project ID: 610057-2-3,3A,3B,3C Project Address: Sites 3,3A,3B,3C

Dear Ann Baker:

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 1-70560. 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, and completeness.

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. 1-70560 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 Laboratories is accredited by the American Association for Laboratory Accreditation (A2LA) for technical competence in the field of Environmental Testing (Certificate No. 0343-01). In accordance with A2LA's guidelines, XENCO operates a Quality System that meets ISO/IEC Guide 25 requirements and 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,

Dhemoto. CAC Manager

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

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XENCO Tabarat

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19411-1010

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-3,3A,3B,3C

Project Manager: Ann Baker Project Location: Sites 3,3A,3B,3C

XENCO COC#: 1-70560 Date Received in Lab: Mar 7, 1997 10:10 by CB

xenco contact : Carlos Castro/Edward Yonemolo

								Date	e and Time	
	Field ID	l ah iD	Method	Method		Turn	Sample	Addition		
	<u> </u>		Name	0		Around	Collected	Requested	Extraction	Analysis
1 83-1(1-2')		170560-001	втех	SW-846	mqq	Standard N	Mar 5, 1997 15:45		Mar 10, 1997 by CB	Mar 10, 1997 22:53 by CB
2			HdT	EPA 418.1	mqq	Standard	Mar 5, 1997 15:45		Mar 10, 1997 by HL	Mar 10, 1997 17:23 by HL
3 83-1(13-1	(. Þ	170560-002	BTEX	SW-846	undd	Standard	Mar 5, 1997 16:15		Mar 10, 1997 by CB	Mar 10, 1997 23:10 by CB
4			Н	EPA 418.1	wdd	Standard	Mar 5, 1997 16:15		Mar 10, 1997 by HL	Mar 10, 1997 17:26 by HL
5 BJA-1(4-5		170560-003	BTEX	SW-846	bpm	Standard	Mar 5,1997 15:10		Mar 10, 1997 by CB	Mar 10, 1997 23:28 by CB
ę			HdT	EPA 418.1	undd	Standard	Mar 5, 1997 15:10		Mar 10, 1997 by HL	Mar 10, 1997 17:29 by HL
7 B3A-1(6-7		170560-004	BTEX	SW-846	mqq	Standard	Mar 5, 1997 15:10		Mar 11, 1997 by CB	Mar 11, 1997 11:57 by CB
•			Hdī	EPA 418.1	шdd	Standarti 1	Mar 5, 1987 15:10		Mar 10, 1997 by HL	Mar 10, 1997 17:34 by HL
9 B3A-1(10-	11)	170560-006	BTEX	SW-846	bpm .	Standard 1	Mar 5, 1997 15:25		Mar 10, 1997 by CB	Mar 10, 1997 23:45 by CB
10			Н	EPA 418.1	bpm	Standard	Mar 5, 1997 15:25	• •	Mar 10, 1997 by HL	Mar 10, 1997 17:37 by HL
11 838-1(4-5		170560-007	BTEX	SW-846	bþen	Standard 1	Mar 6, 1997 08:45		Mar 10, 1997 by CB	Mar 11, 1997 00:03 by CB
12			Hdī	EPA 418.5	bpm	Standard 9	far 6, 1997 08:45		Mar 10, 1997 by HL	Mar 10, 1997 17:41 by HL
13 838-1(13-	14']	170560-008	BTEX	SW-846	ppm	Standard N	Aar 6, 1997 08:55		Mar 10, 1997 by CB	Mar 11, 1997 00:20 by CB
14			TPH	EPA 418.1	шđđ	Standard N	Mar 6, 1997 08:55		Mar 10, 1997 by HL	Mar 10, 1997 17:44 by HL
15 B3C-1(1-2		170560-009	BTEX	SW-846	ppm	Standard 0	Mar 5, 1997 10:50		Mar 10, 1997 by CB	Mar 11, 1997 00:37 by CB
16			Нат	EPA 418.1	шđd	Standard	Aar 5, 1997 10:50		Mar 10, 1997 by HL	Mar t0, 1997 17:47 by HL
17 B3C-1(13-	14')	170560-010	втех	SW-846	, mqq	Standard	Aar 5, 1997 11:15	1	Mar 10, 1997 by CB	Mar 11, 1997 00:55 by CB
18			TPH	EPA 418.1	mqq	Standard	Mar 5, 1997 11:15		Mar 10, 1997 by HL	Mar 10, 1997 17:50 by HL
19 B3C-2(5-6		110-099011	BTEX	SW-846	шdd	Standard N	Aar 5, 1997 14:10		Mar 10, 1997 by CB	Mar 11, 1997 01:12 by CB
20			ТРН	EPA 418.1	u;dd	Standard N	Aar 5, 1997 14:10		Mar 10, 1997 by HL	Mar 10, 1997 17:53 by HL
21 B3C-2(13-	14')	170560-012	BTEX	SW-846	uudd	Standard N	Aar 5, 1997 14:50		Mar 10, 1997 by CB	Mar 10, 1997 16:00 by CB
22		_	трн	EPA 418.1	Шdd	Standard A	far 5, 1997 14:50		Mar 10, 1997 by HL	Mar 10, 1997 17:56 by HL

Houston - Dalles - San Antonio

Page

XENCO	Ū	ERTIFICAT	re of an	IALYSIS S	SUMMARY	1-70560					
	J [
Project ID: 610057-2-3,3A,3B,30	U		K.E.I. (Project Nam	Consultant re: TNMPL M	ls, Inc. Ionument	Date Re	sceived in La	ib : Mar 7,19	97 10:10 by (B	
Project Manager: Ann Baker Project Location: Sites 3,3A,3B,3C						Date	Report Fax XENCO conta	ed: Mar 12, 1 ct : Carlos Ca	997 istro/Edward Y	anemoto	
	Leb ID:	170560-001	170560-002	170560-003	170560-004	170560-006	170560-007	170560-008	170560-009	170560-010	
Analysis Requested	Field ID:	B3-1	B3-1	B3A-1	B3A-1	B3A-1	B3B-1	B3B-1	B3C-1	B3C-1	
	Depth:	1-2'	13-14'	4-5	6-7'	10-11'	4-5,	13-14'	1-2'	13-14	
BTEX by EPA 8020				Date Analy	zed - Anal	ytical Results	udd	(mg/L - mg/	Kg)		
		Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 11, 1997	Mar 10, 1997	Mar 11, 1997	Mar 11, 1997	Mar 11, 1997	Mar 11, 1997	
Benzene		< 0.020	< 0.020	< 0.020	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	
Takene		< 0.020	< 0.020	< 0.020	0.135	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	
Ethylbenzene		< 0.020	< 0.020	< 0.020	0.082	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	
m,p-Xylenes		< 0.040	< 0.040	< 0.040	0.387	< 0.040	< 0.040	< 0.040	< 0 040	< 0.040	
o-Xylene		< 0.020	< 0.020	< 0.020	0.102	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	
Total BTEX		< 0.120	< 0.120	< 0.120	0.706	< 0.120	< 0.120	< 0.120	< 0.120	< 0.120	
Total Petroleum Hvdrocarbons hv FP	A 418 1			Date Analy	'zed - Anal	ytical Results	mqq	(mg/L - mg/	Kg)		
		Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	Mar 10, 1997	
Total Petroleum Hydrocarbons		48.0	38.0	49.5	2830	31.5	37.0	52.0	36.0	56.0	
									6		
This report summary, and the entire report it repr	esents, has b	een made for the	exclusive and co	nlidentiat use of	K.E.I. Consul	ants, Inc					
The interpretations and results expressed throug XENCO Laboratories, however, assumes no resp.	h this analytic onsibility and	al report represe makes no warrar	nt the besI judgm Ny to the end use	ient of XENCO La	boratories. y presented.			Edval	AVQC Manag	to, Ph.D. Jer	

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XENCO Laboratories	្រ	ERTIFICAT	TE OF AN	ALYSIS SUMMARY	1-70560		
Project ID: 610057-2-3,3A,3B,3C Project Manager: Ann Baker Project Location: Sites 3,3A,3B,3C			K.E.I. C Project Nam	Consultants, Inc. &: TNMPL Monument	Date Receiv Date Reg	ved in Lab : Mar 7, 1997 10:10 by CB oort Faxed: Mar 12, 1997 co contact : Carlos Castro/Edward Yonemo	Q
Analysis Requested	Lab (D: Field (D: Depth:	170560-011 B3C-2 5-6'	170560-012 B3C-2 13-14'				
BTEX by EPA 8020	Ē			Date Analyzed - Anal	ytical Results	ppm (mg/L - mg/Kg)	Ī
Benzene		Mar 11, 1997 < 0.020	Mar 10, 1997 < 0.020				
Toluene		< 0.020	< 0.020				
Ethylbenzene		< 0.020	< 0.020				
m,p-Xylenes		< 0.040	< 0.040				<u> </u>
o-Xylene		< 0.020	< 0.020				
Total BTEX		< 0.120	< 0.120				·
Total Petroleum Hydrocarbons by EPA	418.1	-		Date Analyzed - Anal	tical Results	ppm (mg/L - mg/Kg)	
•		Mar 10, 1997	Mar 10, 1997				<u> </u>
Tolal Petroleum Hydrocarbons		30.5	26.5		vi		<u> </u>
					-	_	
							1
This report summary, and the entire report it reprea The interpretations and results expressed through I XENCO Laboratories, however, assumes no respon	ents, has b this analytic sibility and	een made for the l cal report represer makes no warran	exclusive and con rt the best Judgm ty to the end use	Identiat use of K.E.I. Consult ent of XENCO Laboratories. of the data hereby presented.	ants, Inc	Edward B. Fonemoto, Ph.	W.
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Page 2



Certificate Of Quality Control for Batch: 17A25A73

ALCONE 150 127 MILLING

SW- 846 5030/8020 BTEX

Date Validated: Mar 11, 1997 10:00 Date Analyzed: Mar 10, 1997 13:07 QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CB

Matrix: Solid

	-	-	MAIT	ax spike /	MATRIX S	PIKE DUPI	-ICATE AND F	RECOVERY			
Q.C. Sample 1D	[A]	8		(a)	[3]	Matrix	E	[6]	Ξ	E	Ξ
170565. 002	Sample	Matrix Spłke	Matrix Spike	Matrix	Method	Llmit	9	S	g	Matrix Spike	
	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Matrix Spike	M.S.D.	Recovery	Qualifier
Parameter			Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
	bpm	mqq	шdd	шdd	mqq	*	*	*	%	*	
Benzerie	< 0.020	2.160	2.020	2.000	0.020	250	67	108.0	101.0	65-135	T
Toluene	< 0.020	2.060	1.936	2.000	0.020	25.0	6	103.0	6.96	65-135	
Ethylbenzene	< 0.020	2.180	2.040	2.000	0.020	250	99	109.0	102.0	65-135	
m.p-Xylenes	< 0.040	4.440	4.180	4.000	0 040	25.0	60	111.0	104.5	65-135	
o-Xylene	< 0.020	2.180	2.040	2.000	0.020	25.0	6.6	109.0	102.0	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





Certificate Of Quality Control for Batch : 17A25A74

er and an internet way have a street in party

SW- 846 5030/8020 BTEX

Date Validated:Mar 11, 199711:00Date Analyzed:Mar 10, 199722:18QA/QC Manager:Edward H. Yonemoto, Ph.D.

Analyst: CB

Matrix: Solid

-			MATI	RIX SPIKE /	MATRIX S	PIKE DUPL	ICATE AND F	RECOVERY			
0.C. Samule ID	[¥]	1 82	D	6	E	Matrix) E	101	E		3 3
170562 001	Sample	Matrix Spike	Matrix Spike	Matrix	Method	Llmk	ac	ъ В	ос	Matrix Spike	
	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Matrix Spike	M.S.D.	Recovery	Qualifier
Parameter			Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
	mqq	mqq	mqq	mqq	шdd	*	~	*	%	*	
Benzene	< 0.020	1.762	1.798	2.000	0.020	25.0	2.0	88.1	89.9	65-135	
Toluene	< 0.020	1.784	1.842	2.000	0.020	25.0	3.2	89.2	92.1	65-135	
Elhylbenzene	< 0.020	1 856	1.934	2.000	0.020	25.0	4.1	92.8	96.7	65-135	
m.p.Xyienes	< 0.040	3.740	3.940	4 000	0.040	25.0	5.2	93.5	98.5	65-135	
o-Xylene	< 0.020	1 808	1.928	2.000	0.020	25.0	6.4	90,4	96.4	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

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XENCO

Certificate Of Quality Control for Batch: 17A25A75

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SW- 446 5030/8020 BTEX

Date Validated:Mar 11, 199716:30Date Analyzed:Mar 11, 199709:38QA/QC Manager:Edward H. Yonemoto, Ph.D.

Analyst: CB

Matrix: Solid

	• .		MATE	RIX SPIKE /	MATRIXS	PIKE DUP	LICATE AND F	RECOVERY			
0.C. Samula 10	[A]	6	<u>ច</u>	ē		Matrix	E	[0]	E	E	Ξ
	Sample	Matrix Spike	Matrix Spike	Matrix	Method	Limit	8	S	00	Matrix Spike	
	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Matrix Spike	M.S.D.	Recovery	Qualifier
Parameter			Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
	bpm	bpm	mqq	mqq	ррт	*	*	%	%	%	
Benzene	< 0.020	1.866	1.784	2.000	0.020	25.0	4	93.3	89.2	65-135	T
Toluene	< 0 020	1.884	1.810	2.000	0.020	25.0	4	94.2	90.5	65-135	
Ethylbenzene	< 0.020	1.872	1.800	2.000	0.020	25.0	3.9	93.6	0 06	65-135	
m.p-Xyleries	< 0.040	3.840	3.680	4.000	0.040	25.0	43	96.0	92.0	65-135	
o-Xylene	< 0.020	1.882	1.812	2 000	0.020	25.0	38	94.1	90.6	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. Stonemoto, Ph.D. ONOC Manager

Houston - Doltas - San Antonio



Certificate Of Quality Control for Batch: 17A30A82

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Mar 11, 1997 11:00 Date Analyzed: Mar 10, 1997 17:29 Analyst: HL

Matrix: Solid

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

			MATRIX SPI	KE ANALY	SIS		
Q.C. Sample ID	[A] Sample	[B] Matrix Spike	(C) Matrix	[D] Method	(E) QC	(F) Limits	[G]
170560- 003	Result	Result	Spike	Detection	Matrix Spike	Recovery	Qualifier
Parameter	ppm	ppm	Amount ppm	Limit ppm	Recovery %	Range %	
Total Petroleum Hydrocarbons	49.50	211	198	7.50	81.7	65-135	<u>.</u>

Matrix 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





EPA 418.1 Total Petroleum Hydrocarbons

Charles As we have been a second s

Date Validated: Mar 11, 1997 11:00 Date Analyzed: Mar 10, 1997 17:34 Analyst: HL

Matrix: Solid

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

			UPLICATI	EANALYS	IIS	
Q.C. Sample ID 170560- 004	(A) Sample Result	(8) Duplicate Result	[C] Method Detection	[D] QC Relative	[E] LIMITS Relative	(F) Qualifier
Parameter	ppm	ppm	Li mit ppm	Difference %	Difference %	
Total Petroseum Hydrocarbons	2830	3170	75.0	11,3	30.0	

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





Certificate Of Quality Control for Batch: 17A30A82

EPA 418.1 **Total Petroleum Hydrocarbons**

Date Validated: Mar 11, 1997 11:00

Analyst: HL

Date Analyzed: Mar 10, 1997 17:11

Matrix: Solid

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

			BLANK SPI	KE ANALYS			
	[A]	(B)	[C]	[D]	(5)	(F)	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	
Parameter	Result	Result	Spike	Detection	Blank Spike	Recovery	Qualifier
			Amount	Limit	Recovery	Range	
	ppm	ppm	ppm	ppm	%	%	
Total Petroleum Hydrocarbons	< 7.50	186	198	7.50	94,1	65-135	

Blank Spike Recovery [E] = 100*(8-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



ANALYTICAL REPORT 1-70811

for

K.E.I. Consultants, Inc.

Project Manager: Ann Baker Project Name: TNMPL

Project ld: 610057-2-3A

April 10, 1997



KEI CONSULTANTS APR 2 4 1997 -----

 11381 Meadowglen Lane
 Suite L * Houston, Texas 77082-2647

 Phone (281) 589-0692
 Fax (281) 589-0695



11381 Meadowglen Suite L Houston, Texas 77082-2647 (281) 589-0692 Fax: (281) 589-0695 Houston - Dolles - Son Antonio

April 10, 1997

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

Reference: XENCO Report No.: 1-70811 Project Name: TNMPL Project ID: 610057-2-3A Project Address: Site 3A

Dear Ann Baker:

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 1-70811. 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, and completeness.

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. 1-70811 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 Laboratories is accredited by the American Association for Laboratory Accreditation (A2LA) for technical competence in the field of Environmental Testing (Certificate No. 0343-01). In accordance with A2LA's guidelines, XENCO operates a Quality System that meets ISO/IEC Guide 25 requirements and 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,



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

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ANALYTICAL CHAIN OF CUSTODY REPORT

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CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 610057-2-3A

Project Manager: Ann Baker Project Location: Site 3A

XENCO COC#: 1-70811

Date Received in Lab: Apr 8, 1997 12:00 by CMC xeNCO contact : Carlos Castro/Edward Yonemoto

							Date	e and Time		
Field ID	Lah. ID	Method	Method	nite	Turn	Sample	Addition			
-		Name	e		Around	Collected	Requested	Extraction	Analysis	
1 3AT-1@3' Soil	170811-001	втех	SW-846	шdd	Standard	Apr 2, 1997 10:16		Apr 8, 1997 by HL	Apr 8, 1997 15:28 by HL	
2		НД	EPA 418.1	udd	Standard	Apr 2, 1997 10:16		Apr 9, 1997 by OL	Apr 9, 1997 15:06 by OL	
3 3AT-1@13' Soil	170811-002	BTEX	SW-846	urdd	Standard	Apr 2, 1997 10:38	•	Apr 8, 1997 by HL	Apr 8, 1997 16:19 by HL	
4		ТРН	EPA 418.1	mqq	Standard	Apr 2, 1997 10:38		Apr 9, 1997 by OL	Apr 9, 1997 15:09 by OL	ı
-					•	-	-	:		



K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 610057-2-3A Project Manager: Ann Baker Project Location: Site 3A

Date Received in Lab: Apr 8, 1997 12:00 by CMC Date Report Faxed: Apr 10, 1997

XENCO CONTACT: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: Field ID:	170811-001 3AT-1@3'	170811-002 3AT-1@13'		
	Depth:	3'	13'		
BTEX Analyzed by EPA 8020		Da	te Analyzed	- Analytical Res	uits ppm (mg/L - mg/Kg)
		Apr 8, 1997	Apr 8, 1997		
Benzene		< 0.020	< 0.020		
Toluene		< 0.020	< 0.020		
Ethylbenzene		< 0.020	< 0.020		
m,p-Xylenes		< 0.040	< 0.040		
o-Xylene		< 0.020	< 0.020		
Total BTEX	····	< 0.120	< 0.120		
TPH Analyzed by EPA 418.1		Dai	te Analyzed	- Analyticai Res	ults ppm (mg/L - mg/Kg)
		Apr 9, 1997	Apr 9, 1997		
Total Petroleum Hydrocarbons		< 10.0	< 10.0		

his report summary,	and the entire report it represents,	has been made for the	exclusive and confidentiat
se of K.E.I. Consult	ants, 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.



SBA Award of Excellence 1994 Certified by AR, KS, OK & Accredited by A2LA

Houston - Dallas - San Antonio



Certificate Of Quality Control for Batch: 17A25B11

INCOMENTAL OF CONTRACT OF CONTRACT.

- SMU MENN BY MUCH 12, CL

SW-846 5030/8020 BTEX

Date Validated: Apr 9, 1997 09:00

Analyst: HL

CONTRACTOR AND AND ADDRESS OF

Date Analyzed: Apr 8, 1997 15:10

Matrix: Solid

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

		Ē	BLANK SPI		SIS .	·. · · · · · · · · · · · · · · · · · ·	
<u>. </u>	[A]	[e]	[C]	[D]		(F)	[G]
Parameter	Blank Result	Blank Spike Result	Blank Spike Amount	Method Detection Limit	QC Blank Spike Recovery	Recovery Range	Qualifier
	ррт	ppm	ppm	ppm	%	%	
βenzena	< 0.0010	0.1050	0,1000	0.0010	105.0	65-135	
Toluene	< 0.0010	0.1080	0.1000	0.0010	108.0	65-135	
Ethylbenzene	< 0.0010	0.1090	0.1000	0.0010	0.601	65-135	
m,p-Xylenes	< 0.0020	0.2220	0.2000	0.0020	111.0	65-135	
o-Xylene	< 0.0010	0.1080	0.1000	0.0010	108.0	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 PF. Yonemoto, Ph.D QA/QC Manager



فالتكليمة فالمؤفيط فتقاطعه اللاطة فكرشماه فبالركم والمتعاطية بالمعاطية والمعالم Certificate Of Quality Control for Batch: 17A25B11

ISTRX SW- 846 5030/8020

QA/QC Manager: Edward H. Yonemoto, Ph.D. Date Analyzed: Apr 8, 1997 15:45 Date Validated: Apr 9, 1997 09:00

Analyst: HL

Matrix: Solid

		· · · ·	MATI	RIX SPIKE /	MATRIX S	PIKE DUP	CATE AND	RECOVERY
		[8]	[]	ē		Matrix	Ŀ	ତ୍ର
y.c. sample up	Sample	Matrix Spike	Matrix Spike	Matríx	Method	Limit	gc	gc
170311~ 00I	Result	Result	Duplicate	Spike	Detection	Relative	Spike Relative	Matrix Spike
			Result	Amount	Limit	Difference	Difference	Recovery
Larailleler	шdd	mqq	mqq	ррт	mqq	%	*	*
Benzene	< 0.020	2 100	2.140	2 000	0.020	25.0	19	105.
Toluene	< 0.020	2.120	2.100	2.000	0.020	25.0	0.9	106.
Ethylbenzene	< 0.020	2.100	2.140	2.000	0.020	25.0	1.9	105.1
m.p.Xylenes	< 0.040	4.300	4.360	4.000	0.040	25.0	14	107.
p-Xylene	< 0.020	2.100	2.140	2.000	D.020	25.0	1.9	105.0

Qualifier

65-135

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107.0 105.0 107.0

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Recovery M.S.D.

65-135

107.5 105.0

65-135

107.0 109.0

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Matrix Spike Recovery Range

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Sec. 1.6 S.

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







Certificate Of Quality Control for Batch: 17A30B30

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 9, 1997 17:00

Analyst: OL

Date Analyzed: Apr 9, 1997 14:45

Matrix: Solid

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

	· · · · · · ·		BLANK SPI	KE ÁNALY:	SIS SIS		
	[A]	[8]	[C]	[D]	[£]	[1]	[G]
	Blank	Blank Spike	Blank	Method	QC	LIMITS	1
Parameter	Result	Result	Spike	Detection	Blank Spike	Recovery	Qualifier
			Amount	Limit	Recovery	Range	1
	ppm	ppm	ppm	ppm	%	%	
Total Petroleum Hydrocarbons	< 7.50	177	198	7.50	89.6	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 Conemoto, Ph.D. OA/OC Manager



Certificate Of Quality Control for Batch: 17A30B30

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EPA 418.1 Total Petroleum Hydroenrhons

Date Validated: Apr 9, 1997 17:00 Date Analyzed: Apr 9, 1997 14:48 QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL

Matrix: Solid

			MATF	RIX SPIKE /	MATRIX S	PIKE DUPI	ICATE AND F	ECOVERY			
	[A]		[0]	ē	E	Matrix	[7]	<u>5</u>	ΕH	Ξ	2
	Sample	Matrix Spike	Matrix Spike	Matrix	Method	Limit	ac	90	ВC	Matrix Spike	
	Result	Result	Dupticate	Spike	Detection	Relative	Spike Relative	Matrix Spike	M.S.D.	Recovery	Qualifier
Decomotor			Result	Amount	Limit	Difference	Difference	Recovery	Recovery	Range	
	mqq	bpm	mqq	шdd	шdd	*	*	*	*	*	
Total Petroleum Hydrocarbons	< 7.50	153	160	198	7.50	30.0	4.5	77.4	81.0	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] M.D. = Below detection limit or not detected All results are based on MDL and validated for QC purposes

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