

AP - 013

**ANNUAL
MONITORING REPORT**

YEAR(S):

1999

**ADDITIONAL SUBSURFACE INVESTIGATION REPORT
AND
STAGE 1 ABATEMENT PLAN**

**EOTT ENERGY CORP
TNM 97-18 RELEASE SITE
LEA COUNTY, NEW MEXICO**

RECEIVED

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**ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION**

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

Environmental Technology Group, Inc. Project No. EOT1025C

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

December 1999

A Report Prepared for:

EOTT Energy Corp
5805 East Highway 80
Midland, Texas 79701

Additional Subsurface Investigation Report
And
Modified Stage 1 Abatement Plan

Environmental Technology Group, Inc. Project No. EOT1025C

Prepared by:

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December 1999

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1.0 INTRODUCTION AND SITE BACKGROUND

The site is located approximately five miles south of the town of Monument, New Mexico in Section 28, Township 20 South, Range 37 East. A site location map is provided as Figure 1. On September 10, 1997, an estimated 83 barrels of crude oil was released from the 16 inch pipeline at the site, none of which was recovered during the emergency response.

Approximately 799 cubic yards of impacted soil was excavated from the area and stockpiled on site as depicted on Figure 2, the Site Map. In November 1998, three ground water monitoring wells and one soil boring were installed at the release site as depicted on Figure 2. Data collected from the site were summarized in the Subsurface Investigation Report, dated March 10, 1999.

A review of this report indicates the following:

- Soil, impacted to above regulatory levels, was present from the surface to 22 feet below the ground surface (bgs) in soil boring SB-1;
- Soil, impacted to above regulatory levels, was present in all of the monitoring wells;
- The soil column consisted primarily of loose sand to a depth of approximately 12 feet bgs with a silty to moderately plastic clay extending to the water table;
- Ground water at the site occurs at a depth of approximately 20 feet bgs;
- The ground water gradient at the site is to the south-southeast at a gradient of approximately 0.007 ft/ft; and,
- Dissolved phase hydrocarbon constituents were detected in the ground water samples from monitoring wells MW-2 and MW-3, the most downgradient wells; and

The ground water conditions at the release point were un-documented and the downgradient extent of the dissolved phase plume were not defined. In order to resolve these issues, two monitoring wells were proposed for the site. One well was proposed for a point at which the dissolved phase plume was anticipated to terminate. The other proposed well was to be installed immediately downgradient of the release point.

2.0 RECENT FIELD ACTIVITIES

The monitoring wells were installed as proposed in October 1999. The well locations are depicted on Figure 2, the Site Map. The wells were drilled to a total depth of 36 feet bgs, as depicted on the soil boring log, included as Appendix A. The soil column consisted of a loose, tan, fine grained sand to a depth of approximately 25 feet bgs. Below that interval, the section consisted primarily of a light grey, silty, moderately plastic clay. In the boring for monitoring well MW-4, strong staining, petroleum odor and high PID readings

were present in the section from approximately 20 feet bgs to below the water table. The entire section, from the surface to below the water table appeared to be impacted in the

boring, subsequently completed as monitoring well MW-5.

The wells were completed as prescribed by OCD requirements and in accordance with protocols outlined in Section 6 of this report. The soil laboratory data is included in Table 1. Historical and recent ground water elevation data is provided as Table 2. Historical and recent ground water chemistry is included as Table 3. A ground water gradient map, as measured on November 30, 1999 is provided as Figure 3. Ground water chemistry data, from samples collected on that date are posted on Figure 4. Both soil and ground water laboratory reports are included in Appendix B.

3.0 RESULTS

Subsequent to drilling the wells, a minor amount of digging along the pipeline right-of-way, at a point east of monitoring well MW-4, revealed the presence of petroleum impacted soil near the surface. It appears that some crude flowed from the leak point, down the pipeline right-of-way, to a point near monitoring well MW-4, where it appears to have pooled and infiltrated the soil at that point. This would explain the presence of free product in monitoring well MW-4 and the absence of free product in monitoring wells MW-2 and MW-3. Given this scenario and the existing site data, it appears that the lateral extent of impacted soils and impacted ground water is not defined at the site.

4.0 RECOMMENDATIONS

It is recommended that a series of geoprobe points be installed in the vicinity of the impacted soil along the pipeline right-of-way to define the lateral extent of impacted soil associated with the observed surface staining. It is also recommended that additional monitoring wells be installed to determine the extent of ground water impact downgradient of monitoring well MW-5.

The location of the observed near-surface staining, the proposed location of the initial three geoprobe points and the proposed initial monitoring well are depicted on Figure 5. The area of the proposed activities is characterized by soft sand, sand dunes and thick underbrush. Ideal locations for geoprobe points and monitoring wells may not be possible given the conditions. However, every attempt will be made to define the lateral extent of impacted soil and ground water.

The concentration of petroleum constituents in the stockpiled soil is unknown. ETGI recommends that representative samples of the stockpiled soil be collected such that there is one composite sample for each of the stockpiles. If these samples are above regulatory limits, it is recommended that the stockpiled soil be subject to remediation similar to that proposed to the impacted soil in place.

These recommendations will be implemented upon approval within 30 days. In the interim, the ongoing ground water monitoring will continue as described in Section 5 below. All past activities and recommended activities will be in accordance with OCD regulations and

in accordance with Section 6 below.

5.0 MONITORING PROGRAM

During and subsequent to the recommended remedial activities, the ground water elevations in all site monitoring wells will be gauged and monitored for the presence of PSH on a monthly basis. All of the site monitoring wells will be sampled quarterly and the samples will be submitted for the analysis of BTEX (EPA Method 8020, 5030) and TPH (EPA Method 8015, modified for DRO and GRO). An annual report will be provided with a summary of all field activities and data results. The following developments at the site will warrant timely notification interim to the annual report:

- The detection of COCs in currently non-impacted monitoring wells for two consecutive monitoring periods;
- The detection of PSH in any well in which PSH has not been present previously;
- The recurrence of PSH in any well in which PSH was removed during remedial activities.

The monitoring plan will continue until such time that site closure is granted by the appropriate regulatory agency. Significant trends in COC concentrations or other significant developments at the site may have a bearing on the timing of a closure request.

6.0 QA/QC PROCEDURES

6.1 Soil Sampling

Samples of subsurface soils will be obtained utilizing either a split spoon sampler (air rotary drilling rig) or a two inch, continuous sampling tube with a clean polybuterate liner (geoprobe). Representative soil samples will be divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample will be placed in a disposable sample bag. The bag will be labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample will be allowed to volatilize for approximately thirty minutes at ambient temperature prior to conducting the analysis.

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

Soil samples will be delivered to Environmental Lab of Texas, Inc. in Midland, Texas for BTEX and TPH analyses using the methods described below. Soil samples will be analyzed for BTEX and TPH-DRO within fourteen days following the collection date.

The soil samples will be analyzed as follows:

- BTEX concentrations in accordance with EPA Method 8020, 5030
- TPH concentrations in accordance with modified EPA Method 8015-GRO/DRO

6.2 Ground Water Sampling

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

After purging the wells, ground water samples will be collected with a disposable Teflon sampler and polyethylene line by personnel wearing clean, disposable gloves. Ground water sample containers will be filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers will be filled first and PAH containers second).

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

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

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

The ground water samples will be analyzed as follows:

- BTEX concentrations in accordance with EPA Method 8020, 5030
- TPH concentrations in accordance with modified EPA Method 8015-GRO/DRO

6.3 Decontamination Of Equipment

Cleaning of drilling equipment will be the responsibility of the drilling company. In general, the cleaning procedures will consist of using high pressure steam to wash the drilling and sampling equipment prior to drilling and prior to starting each hole. Prior to use, the

sampling equipment will be cleaned with Liqui-Nox detergent and rinsed with distilled water.

6.4 Laboratory Protocol

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

7.0 LIMITATIONS

Environmental Technology Group, Inc. has prepared this Additional Subsurface Investigation Report and Stage 2 Abatement Plan to the best of its ability. No other warranty, expressed or implied, is made or intended.

Environmental Technology Group, Inc. has examined and relied upon documents referenced in the report and has relied on oral statements made by certain individuals. Environmental Technology Group, Inc. has not conducted an independent examination of the facts contained in referenced materials and statements. We have presumed the genuineness of the documents and that the information provided in documents or statements is true and accurate. Environmental Technology Group, Inc. has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Environmental Technology Group, Inc. also notes that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of EOTT Energy Corp. The information contained in this report including all exhibits and attachments, may not be used by any other party without the express consent of Environmental Technology Group, Inc. and/or EOTT Energy Corp.

DISTRIBUTION

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

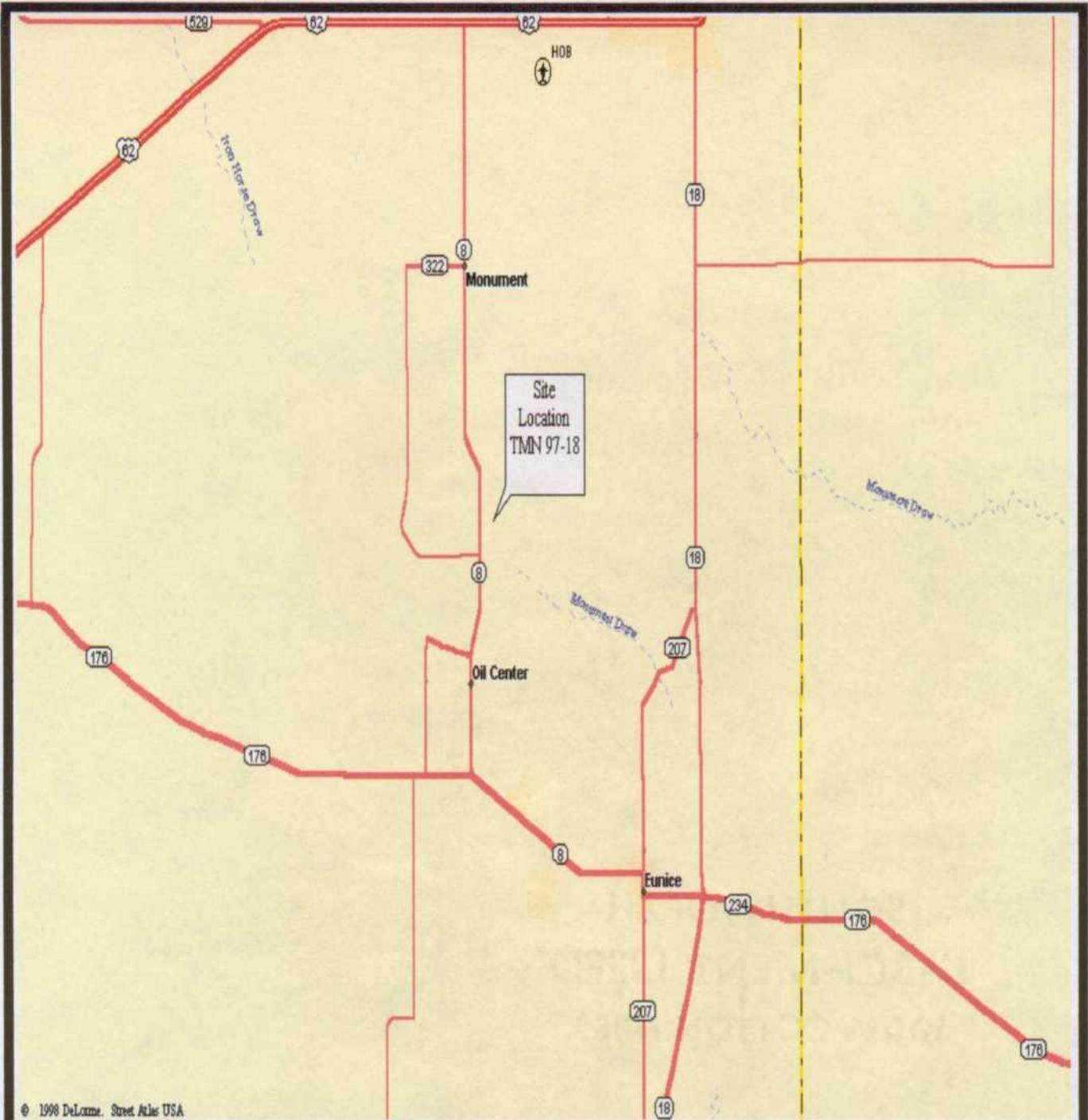
Copy 3 to: Environmental Technology Group, Inc.
4600 West Wall Street
Midland, Texas 79703

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

COPY NO.: 1

TABLES

FIGURES



**FIGURE
1**

Not To Scale

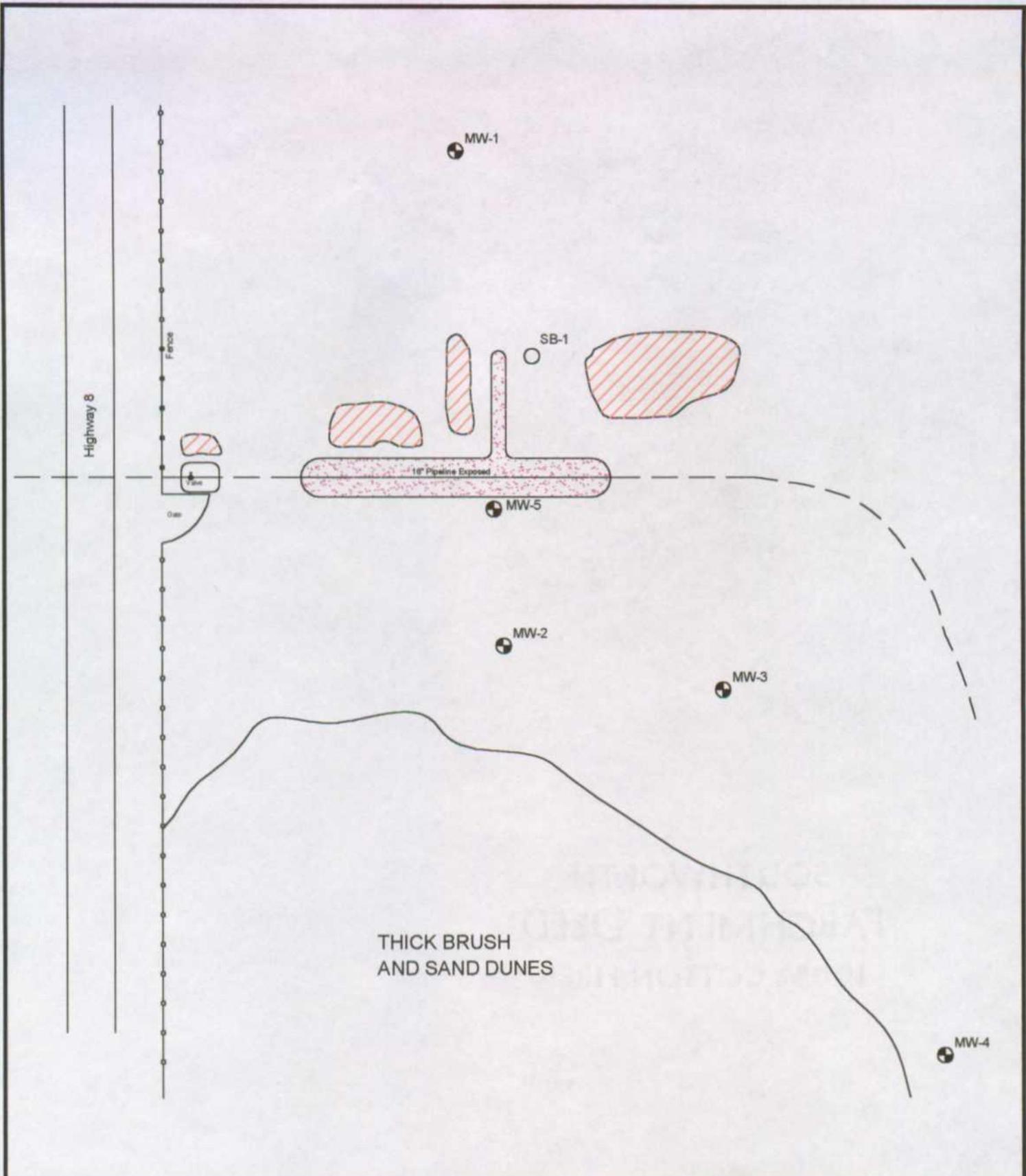
Site Location Map

**EOTT Energy Corp.
Eott Release Site 97-18
Lea County, NM**

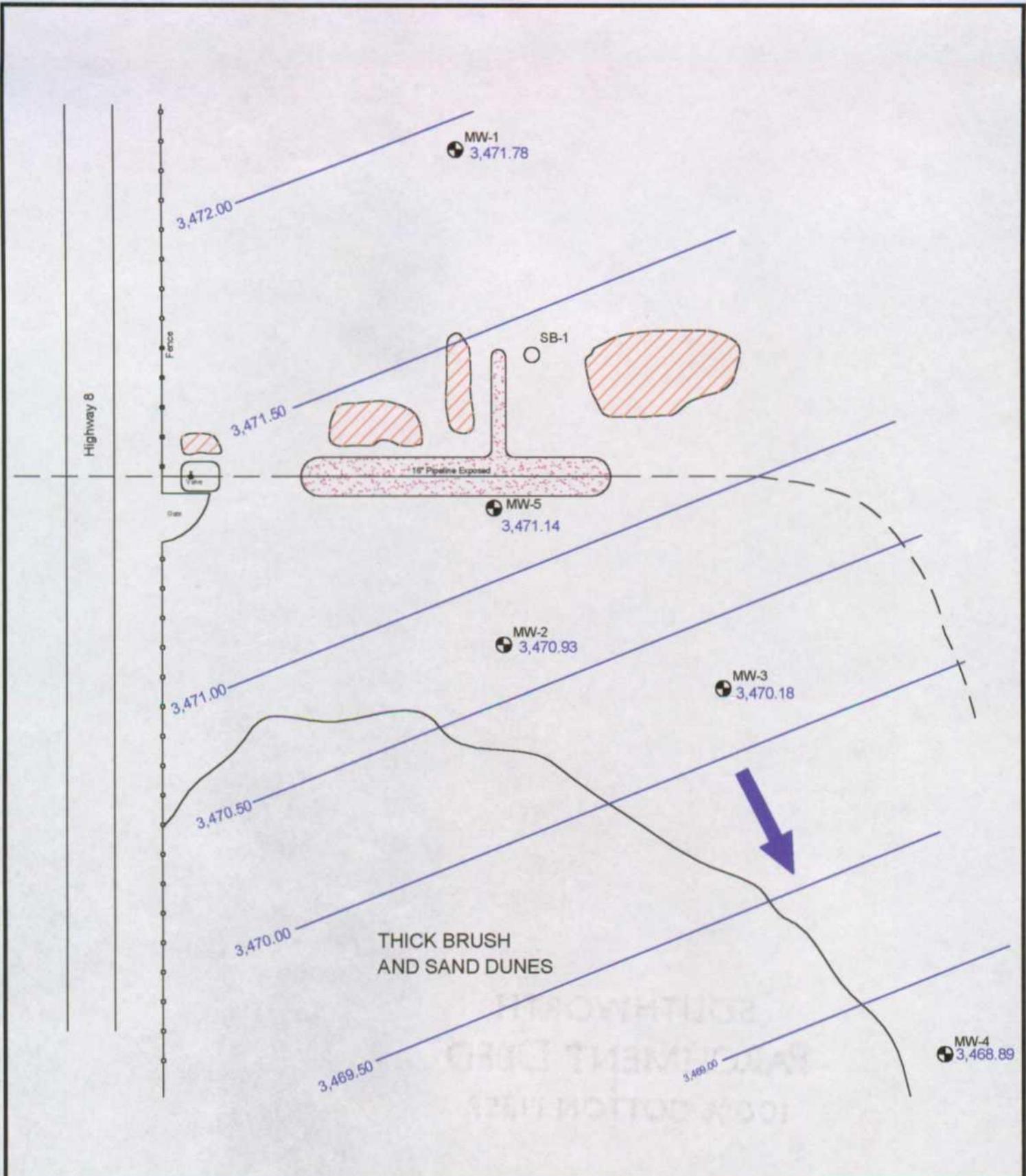
**Environmental
Technology
Group, Inc.**

11 - 22 - 99 RS

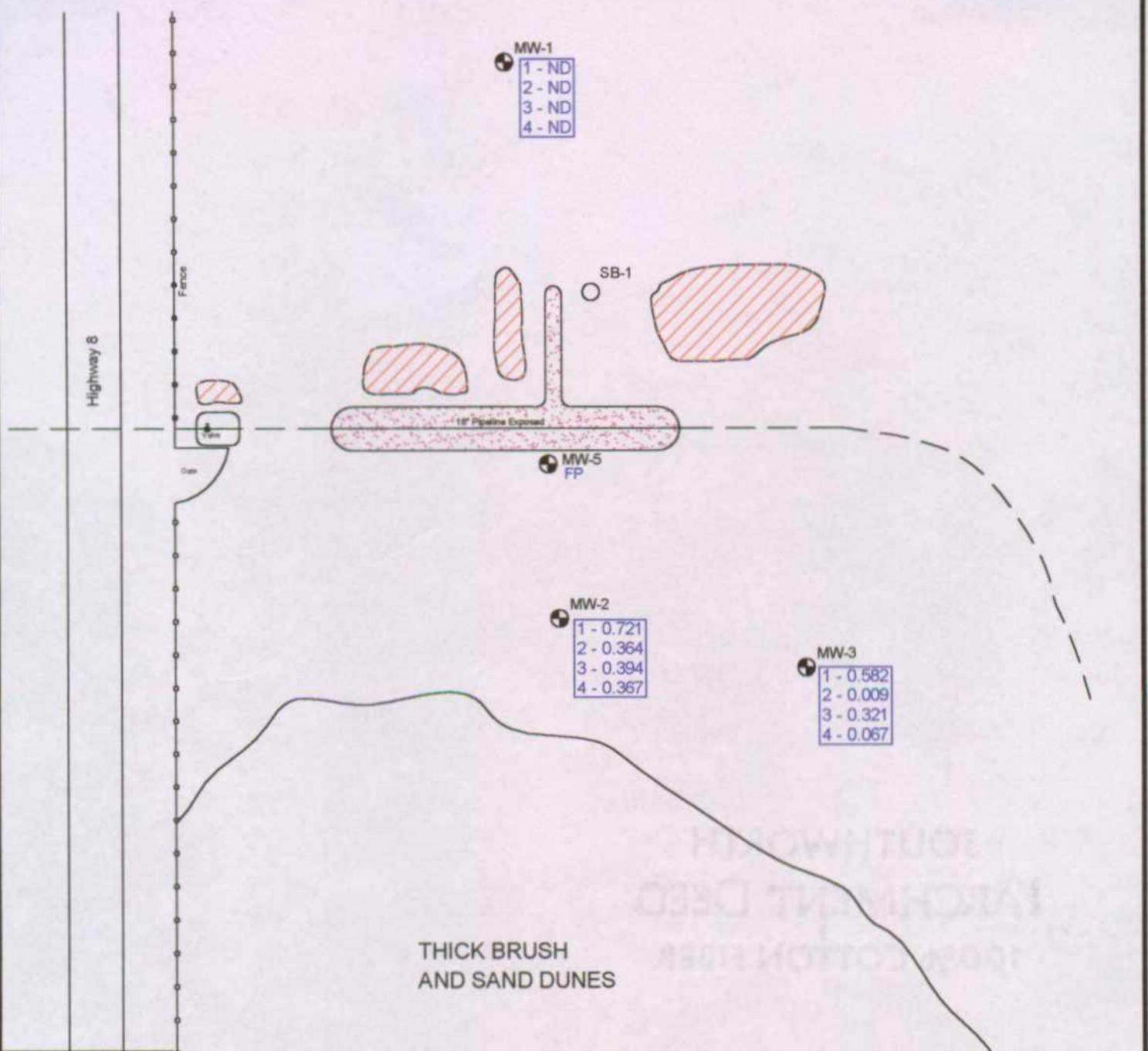
ETGI Project # EOT 1025C



LEGEND: Existing Monitoring Wells Existing Soil Boring	Stockpile Soil Excavated Area			Figure 2 Site Map	Environmental Technology Group, Inc.



LEGEND: Existing Monitoring Wells Existing Soil Boring Stockpile Soil Excavated Area Inferred Ground Water Gradient Contour Inferred Ground Water Gradient Contour 3,456.98 Ground Water Elevations			Figure 3 Inferred Ground Water Contours 11/30/99		Environmental Technology Group, Inc.
			TNM 97-18 Lea County, NM		



LEGEND:

1 Benzene (mg/l)
2 Toluene (mg/l)
3 Ethylbenzene (mg/l)
4 Xylene (mg/l)
Note: Detection Limit 0.001 mg/l

LEGEND:

● Existing Monitoring Wells

○ Existing Soil Boring

▨ Stockpile Soil

▩ Excavated Area

FP = Free Product

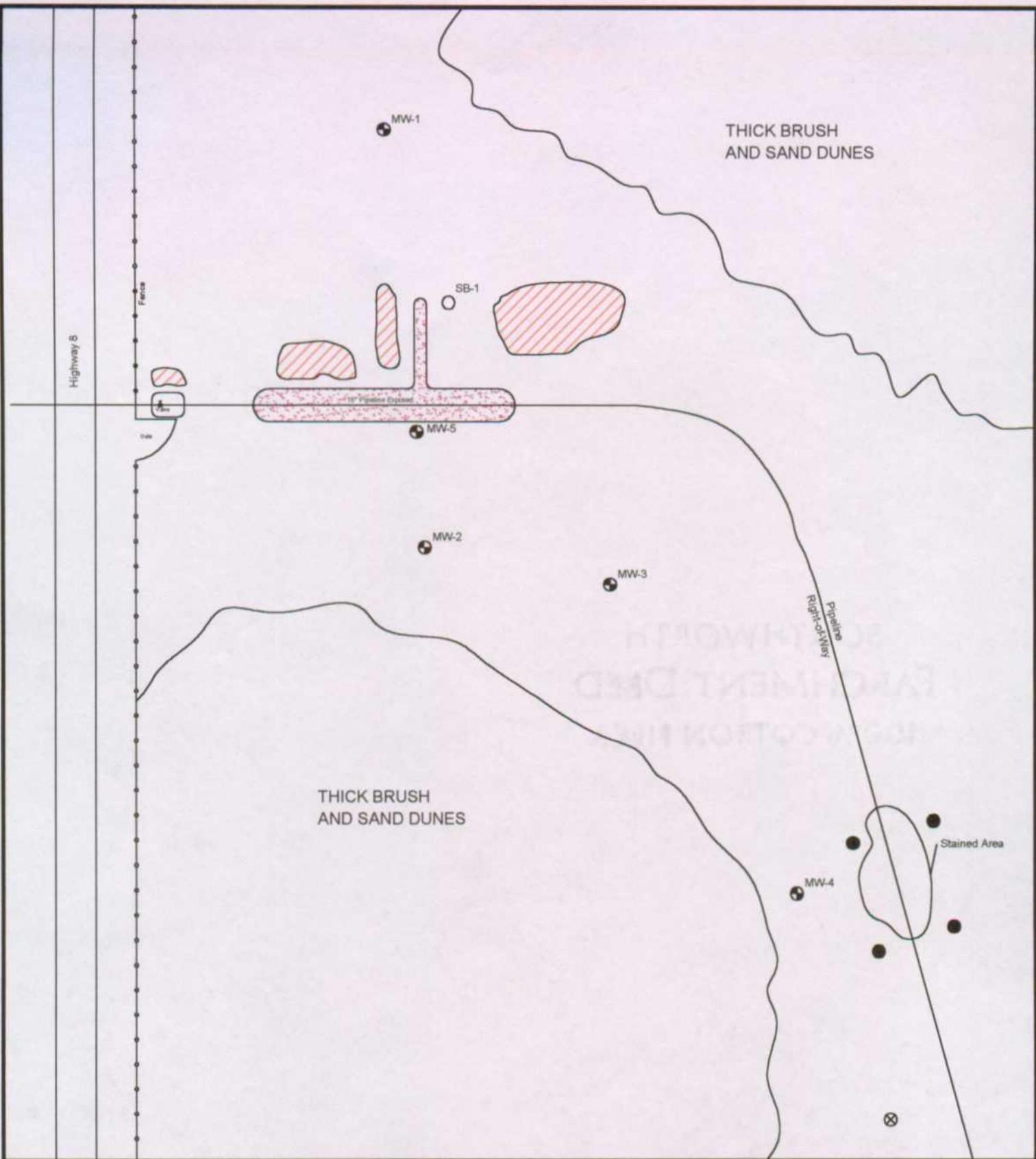



Figure 4
Ground Water Chemistry
Map 11/30/99

TNM 97-18
Lea County, NM

Environmental Technology Group, Inc.

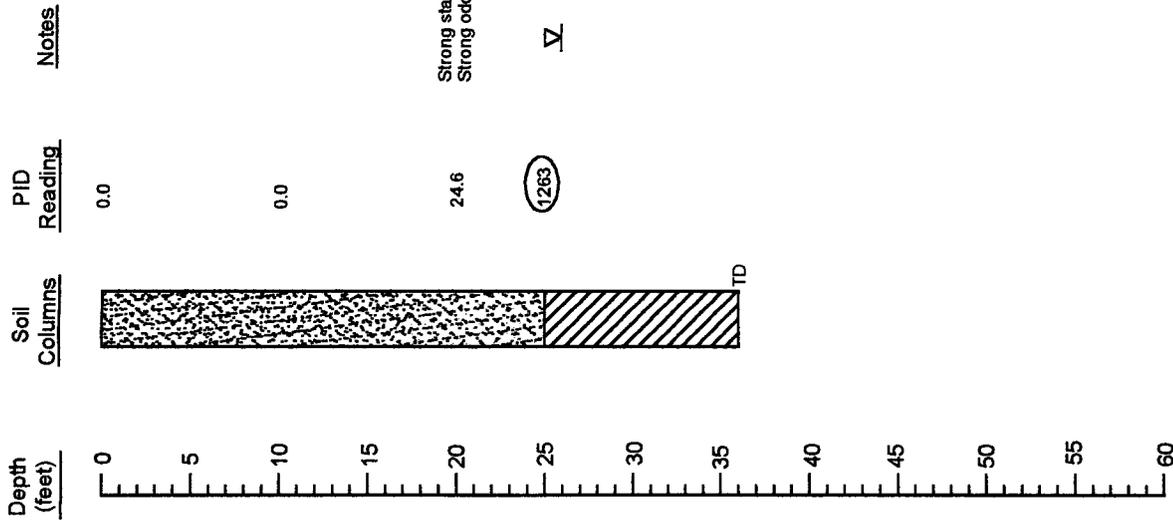
Scale: 1" = 50'	Prep By: RS	Checked By: JN
August 18, 1999	ETGI Project # EOT 1025C	



LEGEND: Existing Monitoring Wells Existing Soil Boring PROPOSED MONITIRING WELLS		Stockpile Soil Excavated Area	PROPOSED GEOPROBE POINTS		Figure 5 Proposed Geoprobe Points and Monitoring Wells Location TNM 97-18 Lea County, NM	Environmental Technology Group, Inc.		
						Scale: 1" = 90' August 19, 1998	Prep By: RS ETOI Project # EOT 1025C	Checked By: JH

APPENDIX A

Monitoring Well MVV-4



Monitoring Well Details

Date Drilled	10 - 28 - 99
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20 ft
Depth of PVC Well	36 ft
Depth of Exploratory Well	36 ft
Depth to Ground Water	27 ft

Legend

- Sand - (SM) - Tan, very fine grained, well sorted, dry, interbedded with caliche
- Clay - (ML) - White, Light Grey, silty, sandy, soft, slight to moderate plasticity, strong stain, strong odor

- Indicates the PSH level measured on date.
- Indicates the ground water level measured on date.
- PID Head-space reading in ppm obtained with a photo-ionization detector.
- ND Indicates the constituent was not detected

Legend

- Indicates samples selected for laboratory analysis.
- Grout Surface Seal
- Bentonite Pellet Seal
- Sand Pack
- Screen

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.010 inch factory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked slick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 4

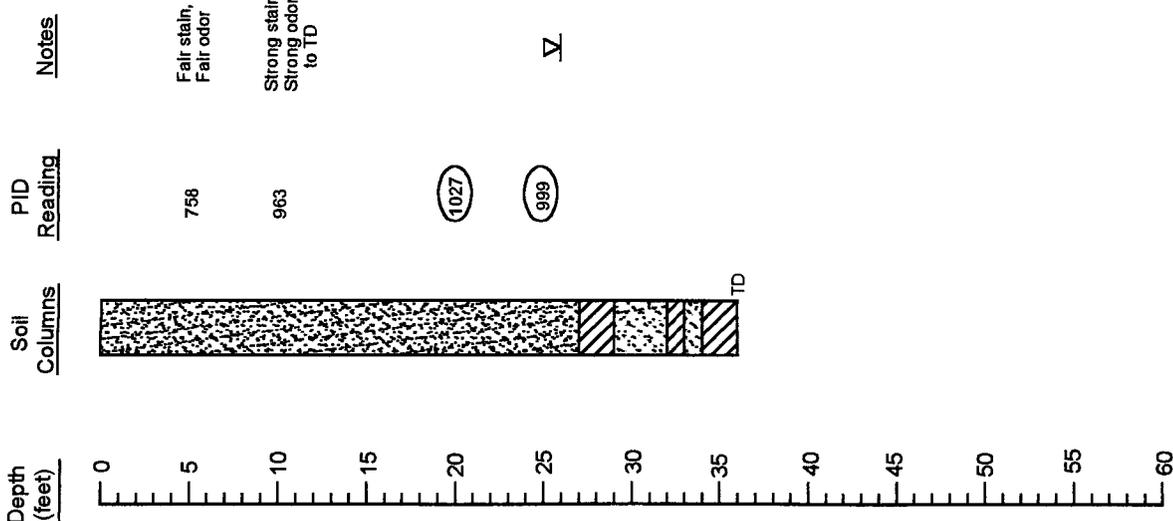
EOTT Energy Corp. TMN 97 - 18 Lea County, NM



Environmental Technology Group, Inc.

Scale: NTS
 November 12, 1999
 Prep By: RS
 Checked By: JT
 ETGI Project # EOT 1025C

Monitoring Well MVV-5



Monitoring Well Details

Date Drilled	10 - 28 - 99
Thickness of Bentonite Seal	2.0 ft
Length of PVC Well Screen	20 ft
Depth of PVC Well	36 ft
Depth of Exploratory Well	36 ft
Depth to Ground Water	26 ft

Legend

- Sand - (SM) - Tan, very fine grained, well sorted, dry, interbedded with caliche
- Clay - (ML) - White, Light Grey, silty, sandy, soft, slight to moderate plasticity, strong stain, strong odor

- Indicates the PSH level measured on date.
- Indicates the ground water level measured on date.
- PID Head-space reading in ppm obtained with a photo-ionization detector.
- ND Indicates the constituent was not detected

Legend

- Indicates samples selected for laboratory analysis.
- Grout Surface Seal
- Bentonite Pellet Seal
- Sand Pack
- Screen

1. The monitoring well was installed on date using air rotary drilling techniques.
2. The well was constructed with 2" ID, 0.010 inch jactory slotted, threaded joint, schedule 40 PVC pipe.
3. The well is protected with a locked slick up steel cover and a compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

Boring Log And Monitoring Well Details

Monitoring Well - 5

EOTT Energy Corp. TMN 97 - 18 Lea County, NM



Environmental Technology Group, Inc.

Scale: NTS
 November 12, 1999
 Prep By: RS
 Checked By: JT
 ETGI Project # EOT 1025C

APPENDIX B

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

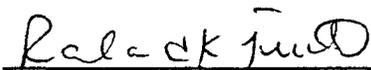
Sample Type: Soil
Sample Condition: Intact/Iced
Project #: TNM 97-18
Project Name: None Given
Project Location: Lea County, N.M.

Sampling Date: 10/28/99
Receiving Date: 10/30/99
Analysis Date: 11/01/99

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)
21153	MW-4	2.82	15.67	28.53	27.60	8.72
21154	MW-5 (10-12')	1.24	0.965	2.64	3.86	2.10
21155	MW-5 (22-24')	1.08	5.79	9.15	15.34	3.96

% IA	91	89	89	89	89
% EA	93	86	88	88	89
BLANK	<0.100	<0.100	<0.100	<0.100	<0.100

METHODS: SW 846-8021,5030


Ralank K. Tuttle

11-5-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

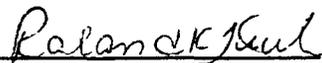
Sample Type: Soil
Sample Condition: Intact/Iced
Project #: TNM 97-18
Project Name: None Given
Project Location: Lea County, N.M.

Sampling Date: 10/28/99
Receiving Date: 10/30/99
Analysis Date: 11/02 & 11/03/99

ELT#	FIELD CODE	GRO	DRO
		C6-C10	>C10-C25
		mg/kg	mg/kg
21153	MW-4	764	1418
21154	MW-5 (10-12')	482	3996
21155	MW-5 (22-24')	364	472

% INSTRUMENT ACCURACY	110	100
% EXTRACTION ACCURACY	109	100
BLANK	<10	<10

Methods: EPA SW 846-8015M GRO/DRO


Raland K. Tuttle

11-5-99
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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

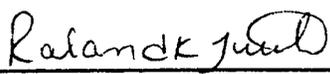
Sample Type: Water
Sample Condition: Intact/ Iced/HCl
Project #: TNM 97-18
Project Name: EOT 1015C
Project Location: Monument, N.M.

Sampling Date: 11/30/99
Receiving Date: 12/02/99
Analysis Date: 12/2 & 12/3/99

ELT#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)
21937	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
21938	MW-2	0.721	0.364	0.394	0.283	0.084
21939	MW-3	0.582	0.009	0.321	0.067	<0.001

% IA	101	96	97	97	95
% EA	96	95	96	97	96
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B,5030



Raland K. Tuttle

12-6-99
Date

Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763

(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Tesse Taylor

Phone #: (915) 664-9166
FAX #: (505) 392-3760

ANALYSIS REQUEST

Company Name & Address: EMI

P.O. Box 4845 Midland TX 79704

Project Name:

TMM 97-18

Project # 99204

FOI 1015C

Project Location:

Mulberry, NM

Sampler Signature:

Ann Coas

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX					PRESERVATIVE METHOD					DATE	TIME	REMARKS	
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER				
21937	MW1	2	V	X						X	X			11-30	1033	X	BTEX 8020 TPH 418.1
21938	MW2	2	V	X						X	X			1080			TCLP Metals Ag As Ba Cd Cr Pb Hg Se Total Metals Ag As Ba Cd Cr Pb Hg Se TCLP Volatiles TCLP Semi Volatiles TDS RCI
21939	MW3	2	V	X						X	X			1012			

Relinquished by:

Ann Coas

Date:

12-2-99

Times:

0900

Received by:

Ann Coas

REMARKS

Mail Result: W. Duration

Relinquished by:

Ann Coas

Date:

12-2-99

Times:

1320

Received by:

Ann Coas

Received by Laboratory:

Ann Coas

Invoice: Kenneth Frost 1015 PM