1R - 427-171

WORKPLANS

DATE:
4-30-08

Highlander Environmental Corp.

Midland, Texas

CERTIFIED MAIL
RETURN RECIEPT NO. 7002 3150 0005 0508 7843

April 30, 2008

Mr. Wayne Price
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: **INVESTIGATION & CHARACTERIZATION WORK PLAN**
EME JCT. I-13
UNIT "I", SEC. 13, T20S, R36E
LEA COUNTY, NEW MEXICO
NMOCD #1R0427-171

Mr. Price:

RICE Operating Company (ROC) has retained Highlander Environmental Corp. (Highlander) to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Eunice Monument Eument (EME) SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is requested.

For all environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall have three submissions or a combination of:

1. This **Investigation and Characterization Plan** (ICP) is a proposal for data gathering and site characterization and assessment.

2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a **Corrective Action Plan** (CAP).

3. Finally, after implementing the remedy, a **closure report** with final documentation will be submitted.

BACKGROUND & PREVIOUS WORK

As part of the ROC Junction Box Upgrade Workplan, starting on August 13, 2004, the junction box was eliminated and the old asbestos-cement pipeline was slipped with a new 4-inch poly pipeline. The former junction box site was excavated to dimensions of 30 feet by 30 feet by 12 feet deep with a backhoe. PID readings and chloride field tests were conducted at regular intervals. All PID readings were below detection limits, while chloride levels increased with depth with only one sample exceeding 1,000 mg/Kg. The chlorides at 12 feet bgs in the excavation was 529 mg/Kg. No water wells were located within Section 13 which contains the Site. However, according to the New Mexico State Engineers Well Reports, one water well is located in adjacent Section 18 with a depth to groundwater of 34 feet bgs.

Upon completion of the excavation, the soils were blended on site and then backfilled within the excavation to a depth of 6 feet bgs. At 6 feet bgs, a 1 foot thick compacted clay barrier was installed to inhibit further downward migration of chlorides. The remaining soils were backfilled on top of the clay and brought up to surface grade, contoured and reseeded. On November 24, 2004, ROC submitted a Junction Box Disclosure Report to the NMOCD. A copy of the Junction Box Disclosure Report is included in Appendix A. A copy of the laboratory analysis is presented in Appendix B.

INVESTIGATION & CHARACTERIZATION PLAN

As discussed above, existing site data suggest a potential for impairment of groundwater quality. Therefore the work elements described below are designed to assist ROC in selecting an appropriate vadose zone remedy and, if necessary, a groundwater remedy.

Task 1 Collect Regional Hydrogeologic Data

A water well inventory will be performed to encompass a ½ mile radius around the release site. The inventory will include a review of water well records on the New Mexico Office of the State Engineer W.A.T.E.R.S. database and United States Geologic Survey (USGS) website. Any water wells denoted on the USGS 7.5 minute topographic quadrangle map within the search radius will be inspected. If viable wells are located, they will be evaluated for the possible incorporation of water level measurements and groundwater monitoring.

Task 2 Evaluate Concentrations of Constituents of Concern in Soil (and Ground Water)

Highlander proposes to conduct soil borings at the former junction box site for further evaluation. The soil borings will be placed appropriately to evaluate subsurface chloride impacts for vertical and horizontal delineation. The soil boring samples will be field screened for chloride concentrations. If chloride concentrations do not decline sufficiently with depth or exceed 250 mg/kg within 10 foot of the suspected groundwater depth, a monitor well will be installed in the area with the highest potential to impact groundwater.

If a monitoring well is installed, it will be constructed according to EPA and industry standards and developed either by bailing with a rig or hand bailer, or pumping with an electric submersible pump to remove fine grained sediment disturbed during drilling and to ensure

collection of representative groundwater samples. Water removed from any monitor well will be disposed of in the EME SWD System.

If a monitoring well is completed, it will be inspected for the presence of phase-separated hydrocarbons (PSH) and, if present, a sample will be collected and analyzed by gas chromatography (GC) to determine composition and origin. The well will be properly purged and sampled with a clean, dedicated, polyethylene bailer and disposable line. Groundwater samples will be submitted to a laboratory for analysis of Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) by method EPA 8021B, and chloride by method 300.0.

Task 3 Evaluate Flux from the Vadose Zone to Ground Water

As part of the ICP, the residual impact to vadose zone soils will be evaluated to determine what, if any remediation/isolation techniques will be required at the Site.

The information gathered from tasks 1-3 will be evaluated and utilized to design a groundwater remedy if needed. The groundwater remedy that offers the greatest environmental benefit while causing the least environmental impairment will be selected. If the evaluation demonstrates that residual constituents pose no threat to groundwater quality, only a vadose zone remedy will be proposed. Such recommendations and findings will be presented to NMOCD in a subsequent Corrective Action Plan (CAP). When evaluating any proposed remedy or investigative work, ROC will confirm that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Should you have any questions, please contact me at (432) 682-4559. Your prompt review of this submission is appreciated. Thank you for your attention to this matter.

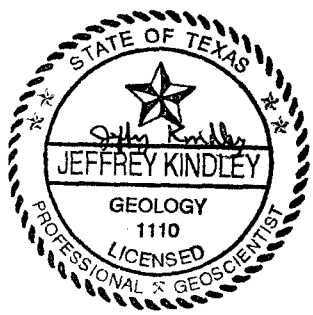
Highlander Environmental Corp.

Jeffrey Kindley

Jeffrey Kindley, P.G.
Senior Environmental Geologist

cc: ROC
Edward Hansen - NMOCD
Larry Johnson - NMOCD

enclosures: photos, disclosure report, laboratory analysis



FIGURES

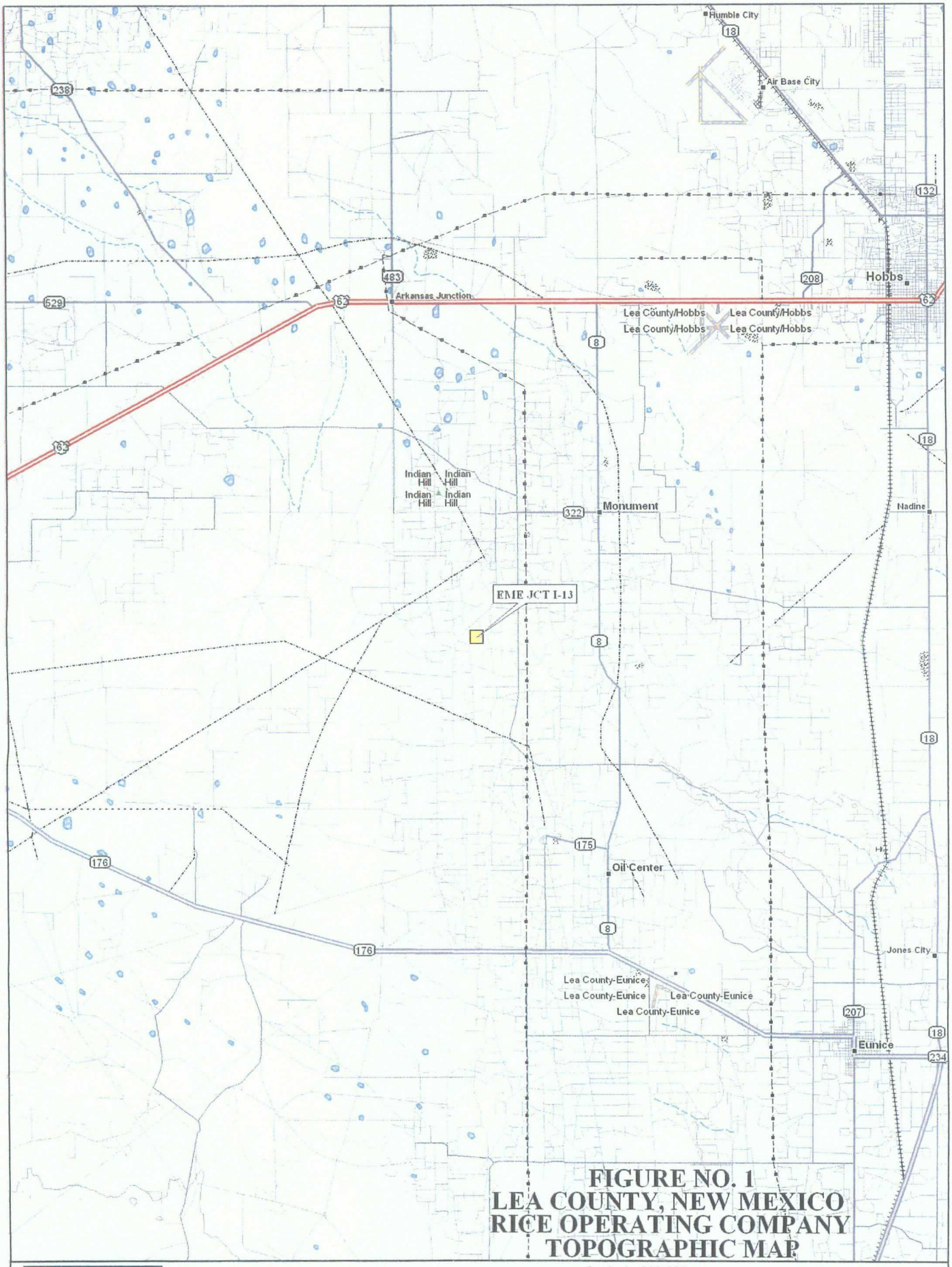


FIGURE NO. 1
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

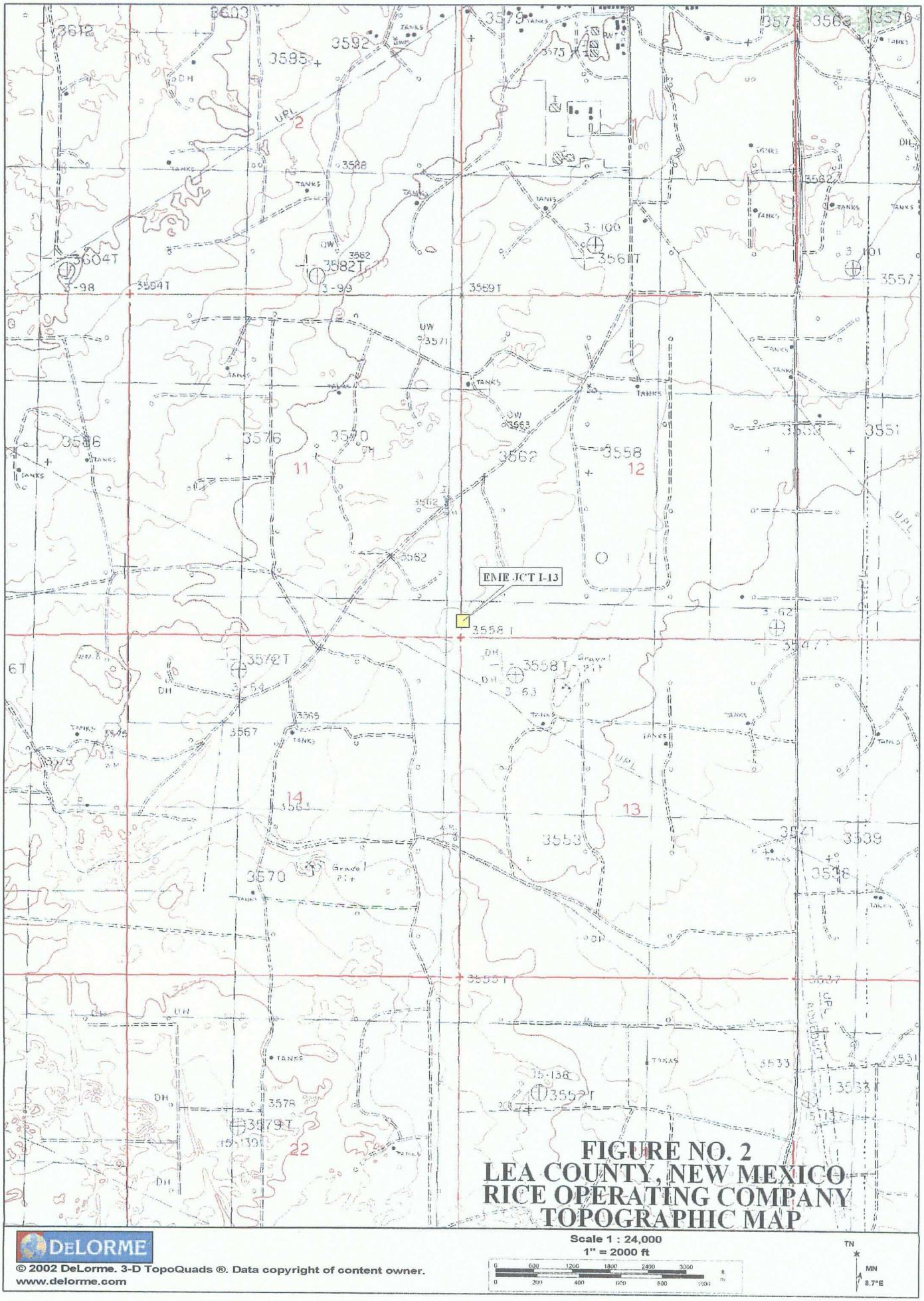
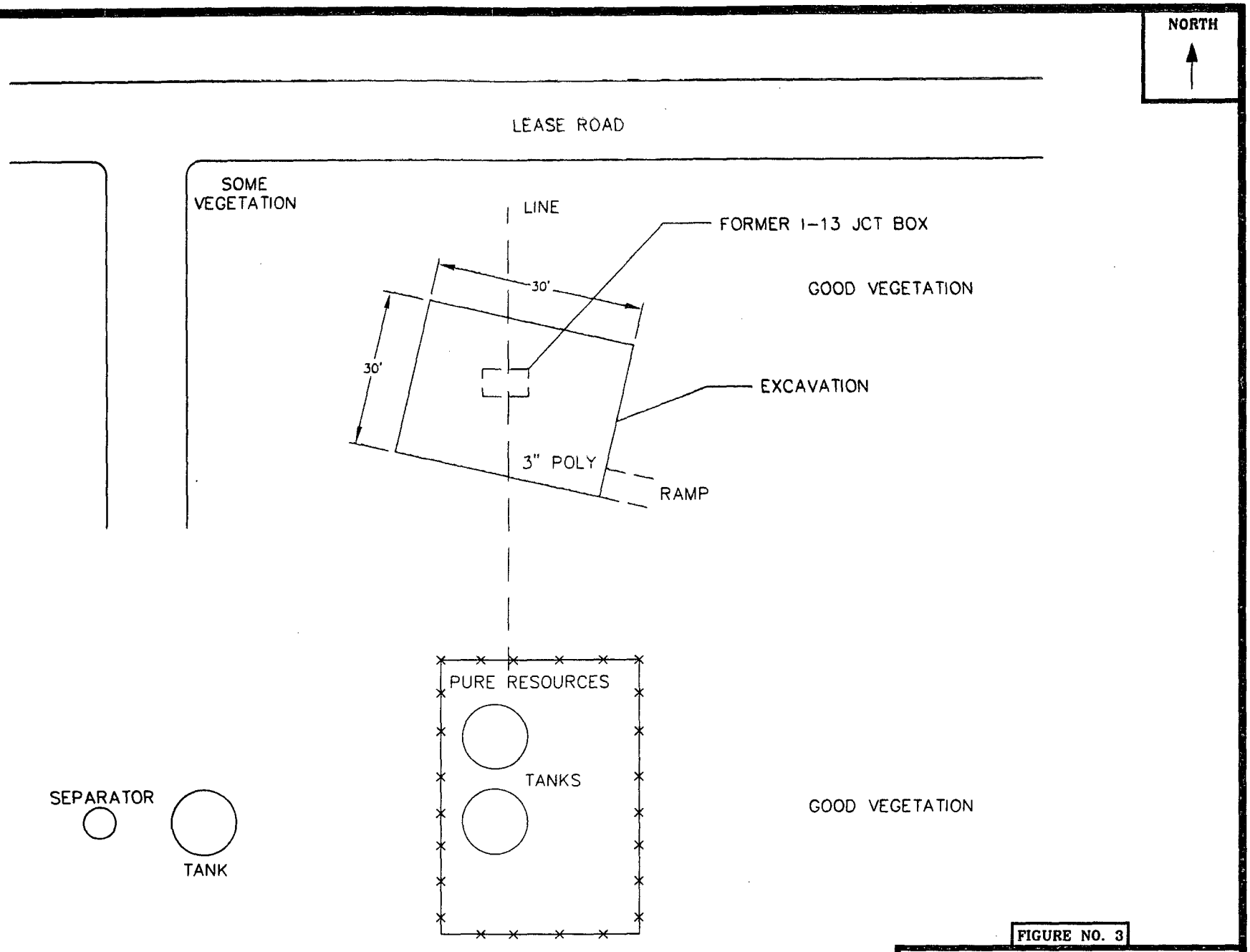


FIGURE NO. 2
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

Scale 1 : 24,000
1" = 2000 ft

TN
MN
8.7°E



NOT TO SCALE

FIGURE NO. 3

LEA COUNTY, NEW MEXICO

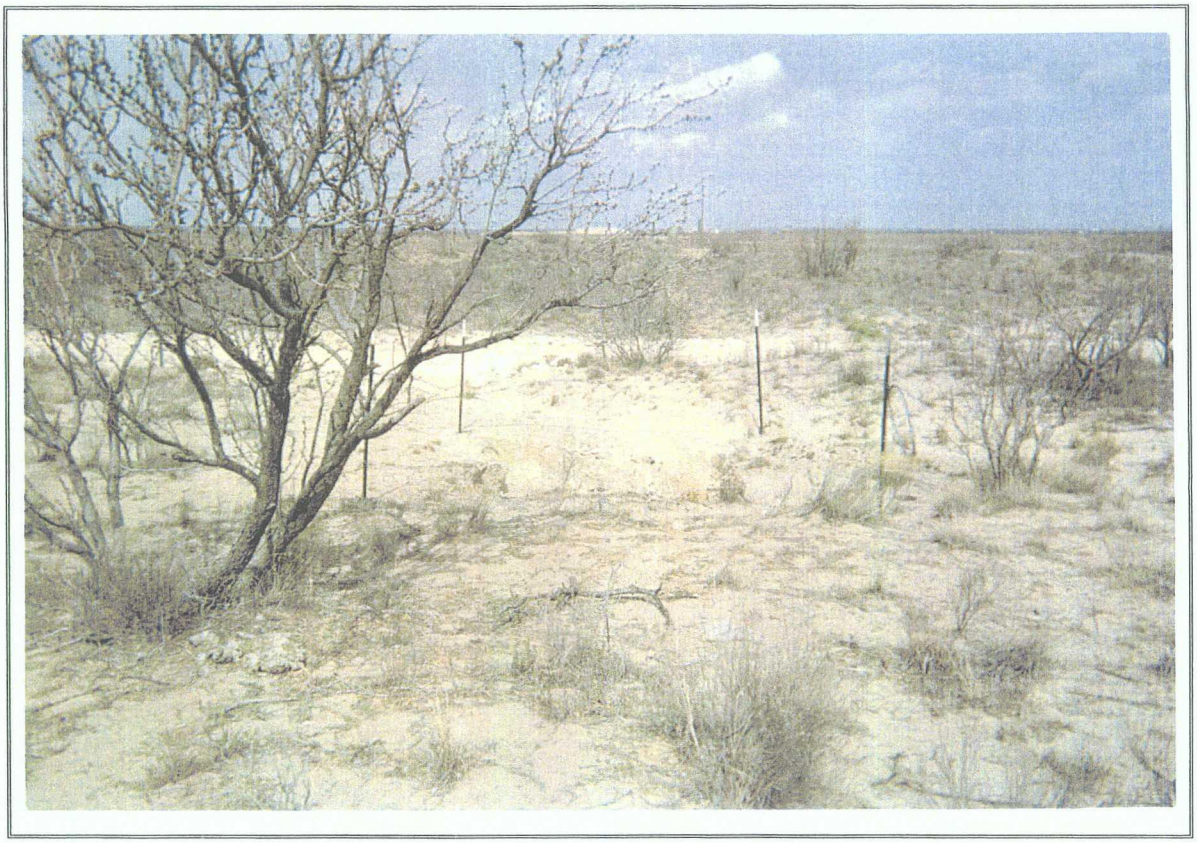
RICE OPERATING COMPANY
EME JCT. I-13

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

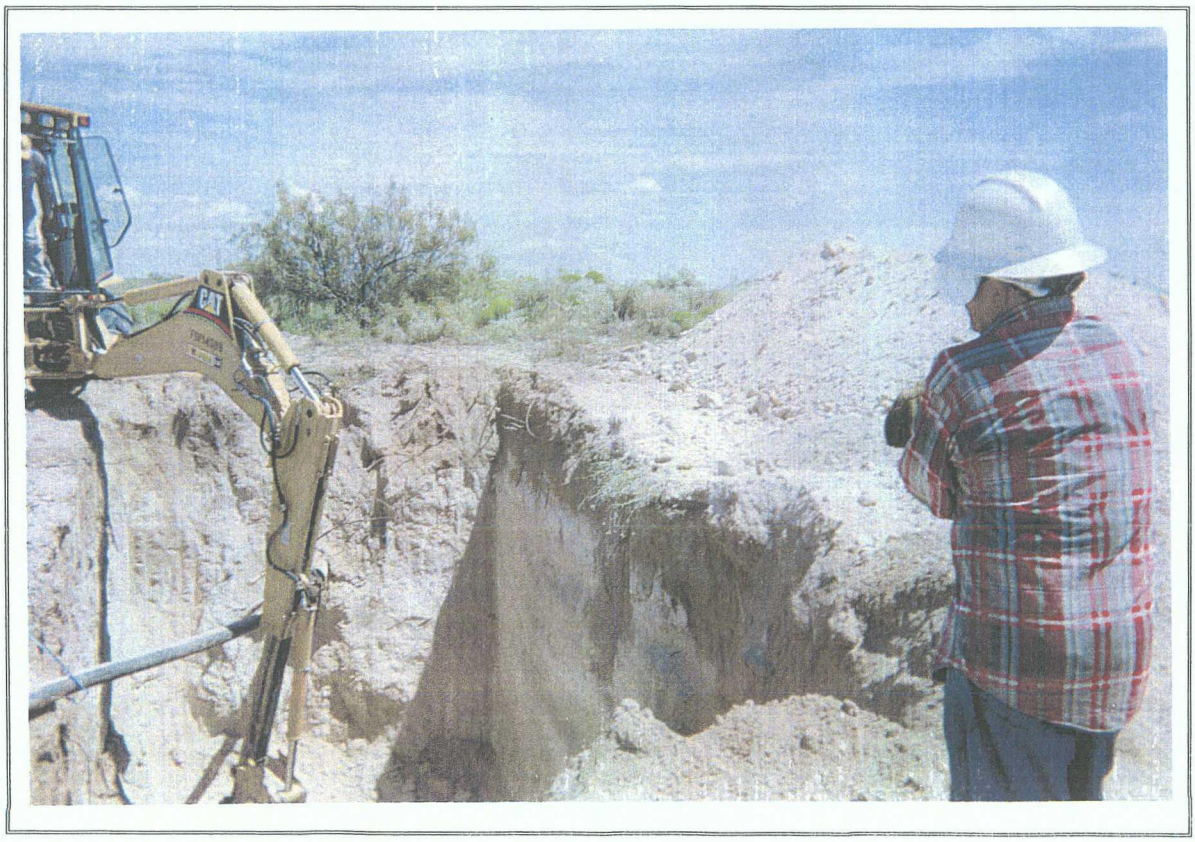
DATE: 4/21/08
DWN. BY: RC
FILE: C:\RICE\3483 EME JCT. I-13

PHOTOGRAPHS

PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico



1. View of site after removal of junction box.



2. Excavation of soils around junction box.

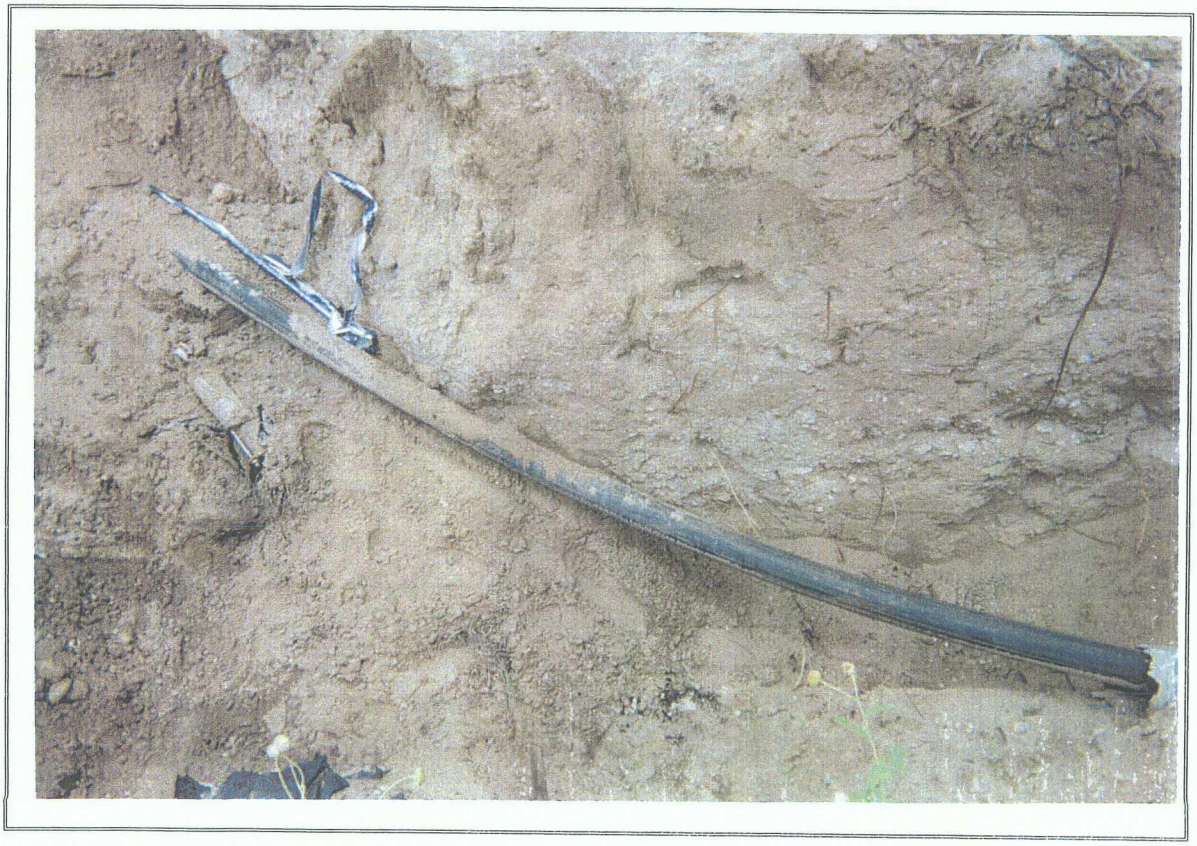
PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico.

3. Excavation of soils around junction box.

4. Excavation of soils around junction box.

PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico

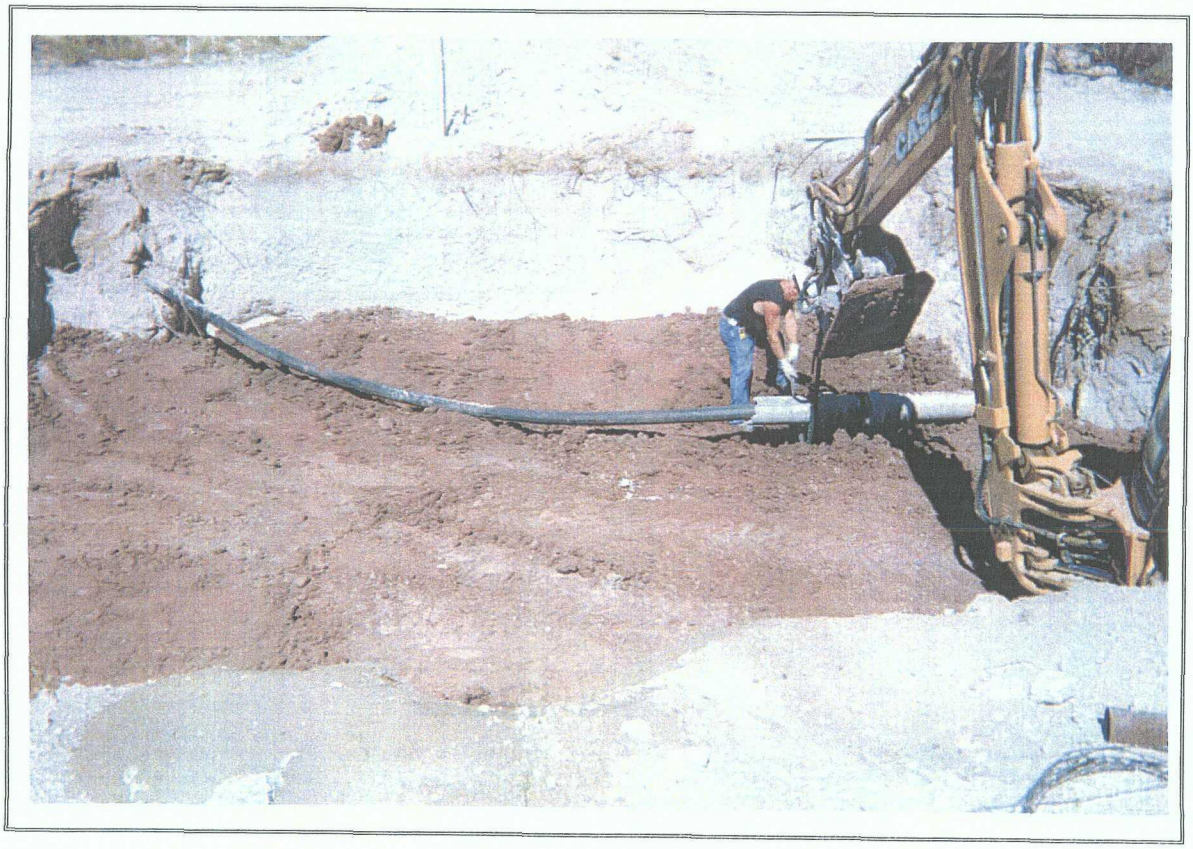
5. Excavation of soils around junction box.



6. Bottom of excavation.

PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico

7. Clay liner at 6 feet bgs in excavation.



8. Clay liner at 6 feet bgs in excavation.

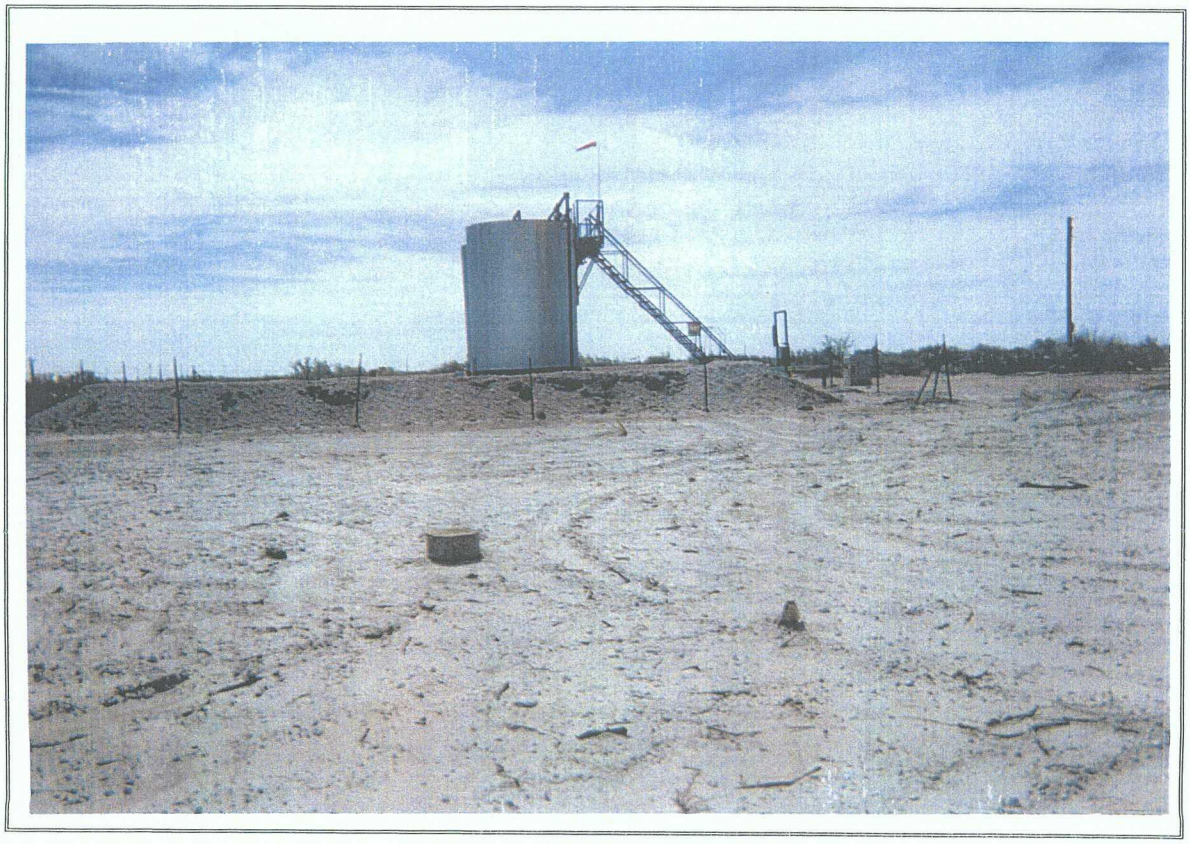
PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico

9. Nuclear density test being performed on clay liner.

10. View of site after completion of backfilling.

PHOTOGRAPHIC DOCUMENTATION
Rice Operating Company
EME jct. I-13, Lea County, New Mexico

11. Site being reseeded after completion of backfilling.



12. Concrete marker denoting center of former junction box location.

APPENDIX A

RICE OPERATING COMPANY
JUNCTION BOX **DISCLOSURE*** REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
EME	I-13	I	13	20S	36E	Lea	eliminated--no box		

LAND TYPE: BLM ____ STATE X FEE LANDOWNER ____ OTHER ____

Depth to Groundwater 35 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 8/13/2004 Date Completed 9/10/2004 OCD Witness No

Soil Excavated 400 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: **Sample Date** 8/26/2004 **Sample Depth** 12 ft

Procure 5-point composite sample of bottom and 4-point composite sample of excavation sidewalls. TPH and chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	0.1	<10.0	<10.0	304
BOTTOM COMP.	0.1	<10.0	<10.0	592
REMED. BACKFILL	0.1	<10.0	27.2	432

CHLORIDE FIELD TESTS

LOCATION	DEPTH (ft)	ppm
vertical at junction box	7	86
	8	116
	9	173
	10	204
	11	257
	12	344
5 ft *south* of junction	6	231
	8	1095
	10	843
	12	967
15 ft *south* of junction	4	115
	6	261
	8	401
	10	458
	12	578
4-wall comp.	n/a	344
bottom comp.	12	529
remed. backfill	n/a	407

General Description of Remedial Action: This junction was located between a lease road and an active production battery. The junction was eliminated and the old asbestos-cement pipeline was slipped with a new 4-in. poly pipeline. The site was delineated using a backhoe while PID readings and chloride field tests were conducted at regular intervals. All PID readings were non-detect throughout the 30 x 30 x 12-ft-deep excavation and lab results confirmed TPH concentrations well below NMOCD guidelines. Chloride concentrations generally increased with depth within the excavation (see graphs). The excavated soils were blended on site and then backfilled into the excavation up to 6 ft BGS. At 6 ft, a 1-ft-thick compacted clay barrier was installed to inhibit further downward migration of chloride. The remaining spoils were backfilled on top of the clay and the surface was contoured to the surrounding terrain. The disturbed surface was seeded with a blend of native vegetation and will be monitored for growth. An identification plate has been placed on the surface to mark the site for future considerations. NMOCD has been notified of potential groundwater impact at the location.

ADDITIONAL EVALUATION IS *HIGH* PRIORITY

enclosures: chloride graphs, photos, lab results, PID field screenings, clay test, diagram

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SITE SUPERVISOR Joe Gatts SIGNATURE Joe Gatts COMPANY RICE Operating Company

REPORT ASSEMBLED BY Kristin Farris Pope SIGNATURE Kristin Farris Pope

DATE 11/24/2004 TITLE Project Scientist

This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

APPENDIX B

CARDINAL LABORATORIES

PHONE (325) 673-7001 · 2111 BEECHWOOD · ABILENE, TX 79603
PHONE (505) 393-2326 · 101 E MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING
ATTN: ROY RASCON
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 08/26/04
Reporting Date: 08/30/04
Project Number: NOT GIVEN
Project Name: EME I-13
Project Location: NOT GIVEN

Sampling Date: 08/26/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	Cl* (mg/Kg)
ANALYSIS DATE		08/28/04	08/28/04	08/27/04
H9081-1	BOTTOM COMP @ 12'BGS	<10.0	<10.0	592
H9081-2	4 WALL COMP.	<10.0	<10.0	304
H9081-3	REMD. BACKFILL	<10.0	27.2	432
Quality Control		791	780	1010
True Value QC		800	800	1000
% Recovery		98.9	97.5	101
Relative Percent Difference		1.0	1.8	6.8

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl: Std. Methods 4500-Cl B
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

8/30/04
Date

H9081.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of ____

Company Name:	Rice Operating	BILL TO	
Project Manager:	Ray Reason	P.O. #:	
Address:	122 W. Taylor	Company:	
City:	Hobbs State: NM Zip: 88240	Attn:	
Phone #:	393-9174 Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:	EME T-13	State: Zip:	
Project Location:		Phone #:	
Sampler Name:		Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER :	PRESERV: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Cl.	TPH 8015
H9081-1	B.H. Comp at 12' bgs	C	1			X							3/26/04	12:30	X	X
-2	4 WALL comp	C	1			X							3/26/04	12:45	X	X
-3	REMD BACKFILL	C	1			X							3/26/04	1:00	X	X

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished:	Date:	Received By:	
	Time:		
Relinquished By:	Date: 3/26/04	Received By: (Lab Staff)	
	Time: 4:10		
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool ☒ Yes ☐ No; Intact ☒ Yes ☐ No	CHECKED BY: (Initials)	

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.