

1R - 425-26

REPORTS

DATE:

5-27-08

**Vacuum Mobil State 'P' EOL**

1R425-6A  
26

RECEIVED  
MAR 25 2008  
Environmental Bureau  
Oil Conservation Division

**CLOSURE**

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RICE OPERATING COMPANY  
JUNCTION BOX CLOSURE REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
Vacuum	Mobil State 'P' EOL	A	26	17S	35E	Lea	Length	Width	Depth
							no box; System Abandonment		

LAND TYPE: BLM \_\_\_\_\_ STATE X FEE LANDOWNER \_\_\_\_\_ OTHER \_\_\_\_\_

Depth to Groundwater 55 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 8/2/2005 Date Completed 2/22/2008 NMOCD Witness no

Soil Excavated 267 cubic yards Excavation Length 30 Width 20 Depth 12 feet

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

General Description of Remedial Action:

Refer to enclosed "ICP Report & Closure Request" by consultant Peter Galusky for details.

On 5/27/2008, OCD granted closure; Remediation plan #1R0425-26 is terminated.

enclosures: ICP & Closure Request, closure email from OCD

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

REPORT ASSEMBLED BY Kristin Farris Pope

SIGNATURE Kristin Farris Pope

DATE 5/27/2008

TITLE Project Scientist

**Kristin Pope**

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**From:** "Hansen, Edward J., EMNRD" <edwardj.hansen@state.nm.us>  
**To:** "Kristin Pope" <kpope@riceswd.com>  
**Cc:** "Hack Conder" <hconder@riceswd.com>; <lpg@texerra.com>; "Marvin Burrows" <mburrows@riceswd.com>; "Price, Wayne, EMNRD" <wayne.price@state.nm.us>  
**Sent:** Tuesday, May 27, 2008 3:27 PM  
**Subject:** RE: Rice Operating Company - Vacuum SWD State P EOL - ICP Report & Closure Request

**RE: "Investigation and Characterization Plan Report"  
for the Rice Operating Company's  
Vacuum SWD State P EOL Site  
Unit Letter A, Section 26, T17S, R58E, Lea County, New Mexico  
Remediation Plan (1R0425-26) Termination**

Dear Ms. Pope:

The New Mexico Oil Conservation Division (OCD) has received the closure report for the Vacuum SWD State P EOL site, dated May 1, 2008, and has conducted a review of the report. The closure report, submitted for the above reference site, indicates that the Rice Operating Company has met the closure requirements. Therefore, the OCD hereby approves the closure report and gives notice that the Remediation Plan (1R0425-26) is terminated.

Please be advised that NMOCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen  
Hydrologist  
Environmental Bureau

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**From:** L. Peter Galusky, Jr. P.E. [mailto:lpg@texerra.com]  
**Sent:** Thursday, May 01, 2008 2:53 PM  
**To:** Hansen, Edward J., EMNRD  
**Cc:** Kristin Pope; Hack Conder  
**Subject:** Rice Operating Company - Vacuum SWD State P EOL - ICP Report & Closure Request

Edward,

Please find attached (in .pdf format) an ICP report and closure request for the above referenced site near Buckeye, NM. A hard copy will follow in the mail.

Thank you for your review of our report and for your consideration of our request. I look forward to your reply.

Sincerely,

Pete G.

L. Peter Galusky, Jr. Ph.D.  
Principal  
Texerra  
Energy Square  
505 N. Big Spring, Suite 404  
Midland, Texas 79701  
E-mail: [lpg@texerra.com](mailto:lpg@texerra.com)  
Web: [www.texerra.com](http://www.texerra.com)  
Office Telephone/Fax: 877-534-9001

"The workers should become scholars, so that the scholars may become workers". Peter Maurin.

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**L. Peter Galusky, Jr. Ph.D., P.G.**

*Texerra*

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**May 1st, 2008**

**Mr. Edward Hansen**

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

**RE: Investigation and Characterization Plan Report  
Rice Operating Company – Vacuum SWD System  
State P EOL: T 17S R 35E Section 26 Unit A  
OCD Case No.: 1R425-26**

Sent via E-mail and U.S. Mail, Certified Return Receipt No. 7002 2410 0001 5818 8906

**Dear Mr. Hansen:**

My company completed a soils evaluation for the above-referenced site per the approved Investigation and Characterization Plan dated May 4th of 2007.

A soil boring was advanced at the former junction box location using an air rotary bit on February 22nd of this year (Figure 1). Samples were analyzed at five foot increments and field titrated for chlorides (Table 1). Two sub-samples were sent to Cardinal Laboratories for a quality-check of the field results (Figures 2a & 2b). Soil chlorides concentrations dropped quickly from above 1,000 ppm (parts per million) at 20 and 25 ft bgs (below ground surface), to below 1,000 ppm at 30 ft bgs and then below 200 ppm from 40 ft bgs to the limit of drilling at 55 ft, where the capillary fringe was encountered.

The relatively low levels of chlorides found in the twenty feet of unsaturated material above the water table and the impedance against downward movement of chlorides provided by the compacted clay barrier (installed following the removal of the former junction box) indicate that the former junction box at this location does not pose a threat to groundwater; (see middle photo on page 12 and cross section on page 14). On behalf of my client, Rice Operating Company, I therefore request that this project be considered "closed" and dropped from OCD's list of potentially impacted sites.

I welcome your thoughts on this matter, and would be pleased to discuss any details with you at your convenience.

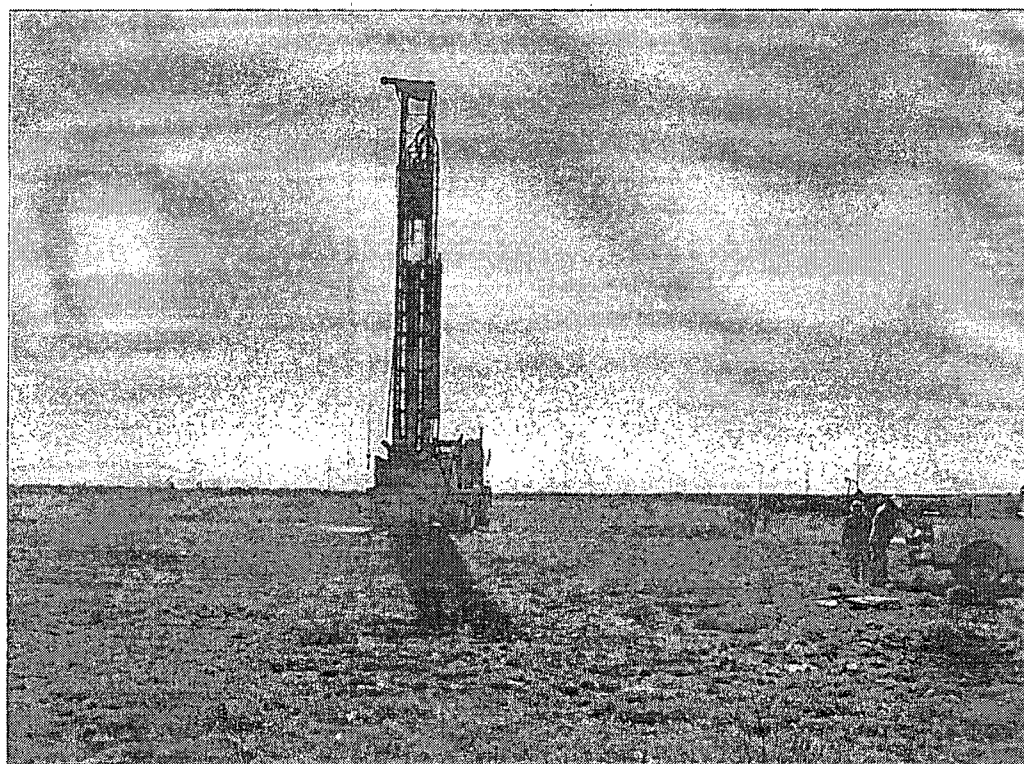
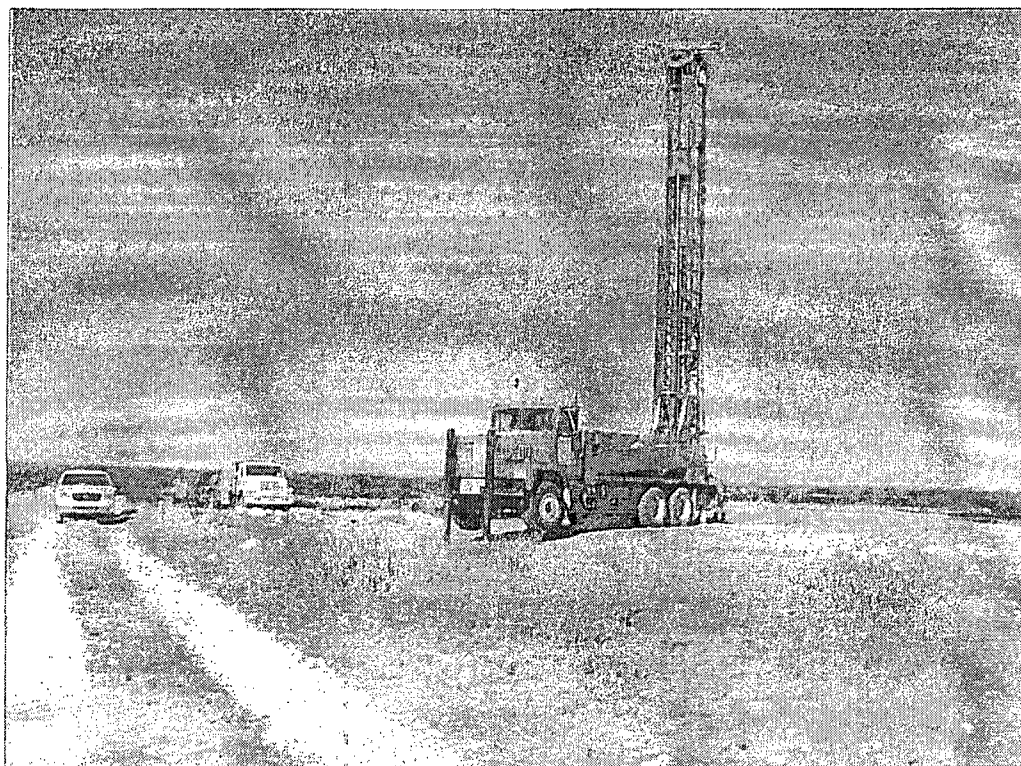
Thank you for your consideration.

Sincerely,



L. Peter Galusky, Jr. Ph.D.  
Principal

Enclosures: Investigation and Characterization Plan of May 4th, 2007  
Copies: Kristin Pope, Rice Operating Company



Figures 1a (above) & 1b (below) – Harrison & Cooper drill rig at VAC State P EOL on February 22<sup>nd</sup>, 2008.

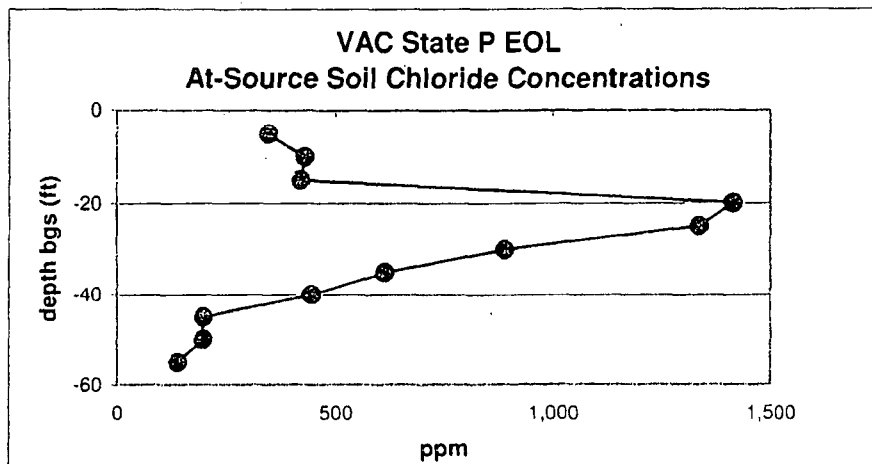
# Texerra

**Table 1** – Soil boring log and chemical parameters at the site of the former junction box at EME L-15-1.

## VAC State P EOL

**Identification:** SB-1  
**Location:** At former junction box location.  
**Date:** 2/22/2008  
**Driller:** Harrison & Cooper, Inc. (Leonard supervising)  
**Drill method:** Air rotary  
**Logged by:** L. Peter Galusky, Jr., Texerra  
**Total depth:** 55 ft below ground surface  
**Screened interval:** n/a (no well installed)  
**Pipe diameter:** "

<u>Depth (ft)</u>	<u>Field</u>	<u>Lab</u>				
<u>below</u>	<u>Chloride</u>	<u>Chloride</u>	<u>Field PID</u>	<u>Lab GRO</u>	<u>Lab DRO</u>	
<u>ground</u>	<u>Test (ppm)</u>	<u>Test (ppm)</u>	<u>test (ppm)</u>	<u>test (ppm)</u>	<u>test (ppm)</u>	<u>Cutting Description</u>
<u>surface)</u>						
-5	346		n/a			tan caliche backfill
-10	429		"	15	1,190	"
-15	419		"			"
-20	1,414	1,440	"			"
-25	1,336		"			light tan caliche
-30	889		"			light brown sand
-35	612		"			light brown fine gravelly sand
-40	445		"			light brown fine sand
-45	197		"	70	288	"
-50	196		"			brown loamy sand
-55	139	128	"			brown loamy sand, damp





Texerra



PHONE: (505) 397-2542 • FAX: (505) 397-1471 • 120829, NM 90240

ANALYTICAL RESULTS FOR  
RICE OPERATING CO.  
ATTN: KRISTIN FARRIS-POPE  
122 WEST TAYLOR  
HOBBS, NM 88240  
FAX TO: (575) 397 1471

Receiving Date: 02/22/08  
Reporting Date: 02/25/08  
Project Number: NOT GIVEN  
Project Name: VACUUM STATE 'P' EOL  
Project Location: VACUUM STATE 'P' EOL

Analysis Date: 02/22/08  
Sampling Date: 02/22/08  
Sample Type: SOIL  
Sample Condition: INTACT  
Sample Received By: ML  
Analyzed By: KS

LAB NO.	SAMPLE ID	Ct (mg/kg)
H14306-1	SB #1 @ 20'	1,410
H14306-2	SB #1 @ 55'	125
Quality Control		500
Initial Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods

4500-CIB

Note: Analyses performed on 1:4 w/v aqueous extracts.

*Kristin Pope*  
Chemist

*02/25/08*  
Date

#### H14306 RICE

Method 4500-CIB is a standard method for the determination of inorganic carbon in water. It is based on the principle that inorganic carbon reacts with acid to form carbon dioxide gas, which is then measured. The method is suitable for the determination of inorganic carbon in water samples with a concentration range of 0.1 to 100 mg/L. The method is based on the principle that inorganic carbon reacts with acid to form carbon dioxide gas, which is then measured. The method is suitable for the determination of inorganic carbon in water samples with a concentration range of 0.1 to 100 mg/L.

Figure 2a – Laboratory analyses.

**ARDINAL LABORATORIES**

1001 East Garland, Hobbs, NM 88240 211 Beechwood, Abilene, TX 79603  
(505) 393-2328 FAX (505) 393-2478 (525) 673-7001 FAX (325) 673-7020

Cardinal called accept verbal changes. Please fax within 48 hours to 616-333-2478.

**Figure 2b -- Laboratory chain-of-custody form.**

**L. Peter Galusky, Jr. Ph.D., P.G.**

---

*Texerra*

**May 4th, 2007**

**Mr. Edward Hansen**

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

**RE: Investigation and Characterization Plan  
Rice Operating Company – Vacuum SWD  
State P EOL T 17S R 35E Section 26 Unit A**

Sent via E-mail and U.S. Certified Mail w/ Return Receipt 7006 0100 0001 2438 3838

**Dear Mr. Hansen:**

RICE Operating Company (ROC) has retained L. Peter Galusky, Jr. Ph.D. to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Vacuum 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. Environmental projects of this magnitude require System Partner AFE approval, and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission would be greatly appreciated.

For all such 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 generally have three submissions, as described below:

1. An Investigation and Characterization Plan (ICP) is proposed 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) if this is warranted.
3. Finally, after implementing the remedy, a Closure Report with final documentation will be submitted.

## **Background and Previous Work**

The site is located approximately one mile north/northeast of the intersection of Lea County Roads 50 and 53, approximately 4 miles east of Buckeye (Figure 1). The topography is gently sloping toward the southeast. Soils on the site are mapped (as KO) in the Lea County Soil Survey as belonging to the Kimbrough gravelly loam soil series. These are characterized by gravelly loam to a depth of approximately 6 inches, and this is underlain by several feet of calcium indurated caliche. Groundwater is estimated to occur at a depth of approximately 55+/- feet, occurring in unconsolidated Tertiary alluvium of the Ogallala Formation.

As part of the abandonment and closure of the Vacuum SWD system, Rice Operating Company (ROC) investigated soils beneath the former wood junction box at the Mobil P EOL location; (See Appendix A: Rice Junction Box Disclosure Report). Beginning on August 2<sup>nd</sup>, 2005, the wood junction box was removed and soils were sampled using a trackhoe, creating a 30 by 20 by 12 ft deep excavation. Potential organic contaminants were ruled out, based upon low (< 10 ppm) PID readings throughout the sampled area and depth. However, chloride concentrations increased with depth from 290 ppm at the surface to 2189 ppm at 12 ft. The excavated soil was blended on site and then returned to the hole up to 6 ft below ground surface, where a one foot thick clay barrier was installed. The remaining fill was then placed on top of the clay. Some additional, clean fill was imported to provide enough material to fill the excavation to the ground surface (allowing some overage for settling). The disturbed surface was seeded with a native vegetation mix on April 24<sup>th</sup>, 2006. A photographic chronology of these activities is provided in Appendix B. OCD was notified that this site has potential for groundwater impacts.

The surface (ecological) impact of this release was relatively small. However, as the potential for groundwater contamination exists, further evaluation is warranted for chlorides, the constituent of concern. Therefore, ROC proposes additional investigative work, as outlined in the Investigation and Characterization Plan (ICP) below, to more definitively evaluate the extent of contamination caused by the release, and to then evaluate the potential for groundwater degradation. Yet, it should be noted that the source of this impact is historical. There is no longer a threat of continued, compounded impact at this site as the former junction box has been removed and the Vacuum SWD system closed.

## **Proposed Work Elements**

1. Summarize information and data collected by ROC to date.
2. Summarize additional, publicly available regional and local hydrological information.
3. Complete vertical and lateral delineation of soil chloride concentrations, and prepare graphics to illustrate the horizontal and vertical extent of contamination.

## Texerra

4. If warranted, install monitor wells sufficient to determine up-gradient, zone-of-release and down-gradient groundwater chloride concentrations. [All monitoring wells will be constructed (with the annular space sealed with a cement/bentonite mix) per NM Dept. Environment standards].
5. Evaluate the risk of groundwater impact in light of the information obtained.

If the evaluation demonstrates that residual constituents pose no threat to ground water quality, then only a surface restoration plan will be proposed to OCD. If, as a result of this work, it is believed that this produced water leak does pose a present or future risk of impacting groundwater quality, then a corrective action plan (CAP) will be developed and proposed to OCD.

I appreciate the opportunity to work with you and your staff on this project. Please call either myself, at the number below, or Kristin Farris Pope (ROC) at 505-393-9174, if you have any questions or wish to discuss these matters.

Thank you for your consideration.

Sincerely,



L. Peter (**Pete**) Galusky, Jr. Ph.D., P.G.  
*Principal*

## Texerra

505 N. Big Spring, Suite 404  
Midland, Texas 79701  
Tel: 432-634-9257  
E-mail: [lpq@texerra.com](mailto:lpq@texerra.com)  
Web site: [www.texerra.com](http://www.texerra.com)

cc: CDH, KFP, file  
Attachments: site location map

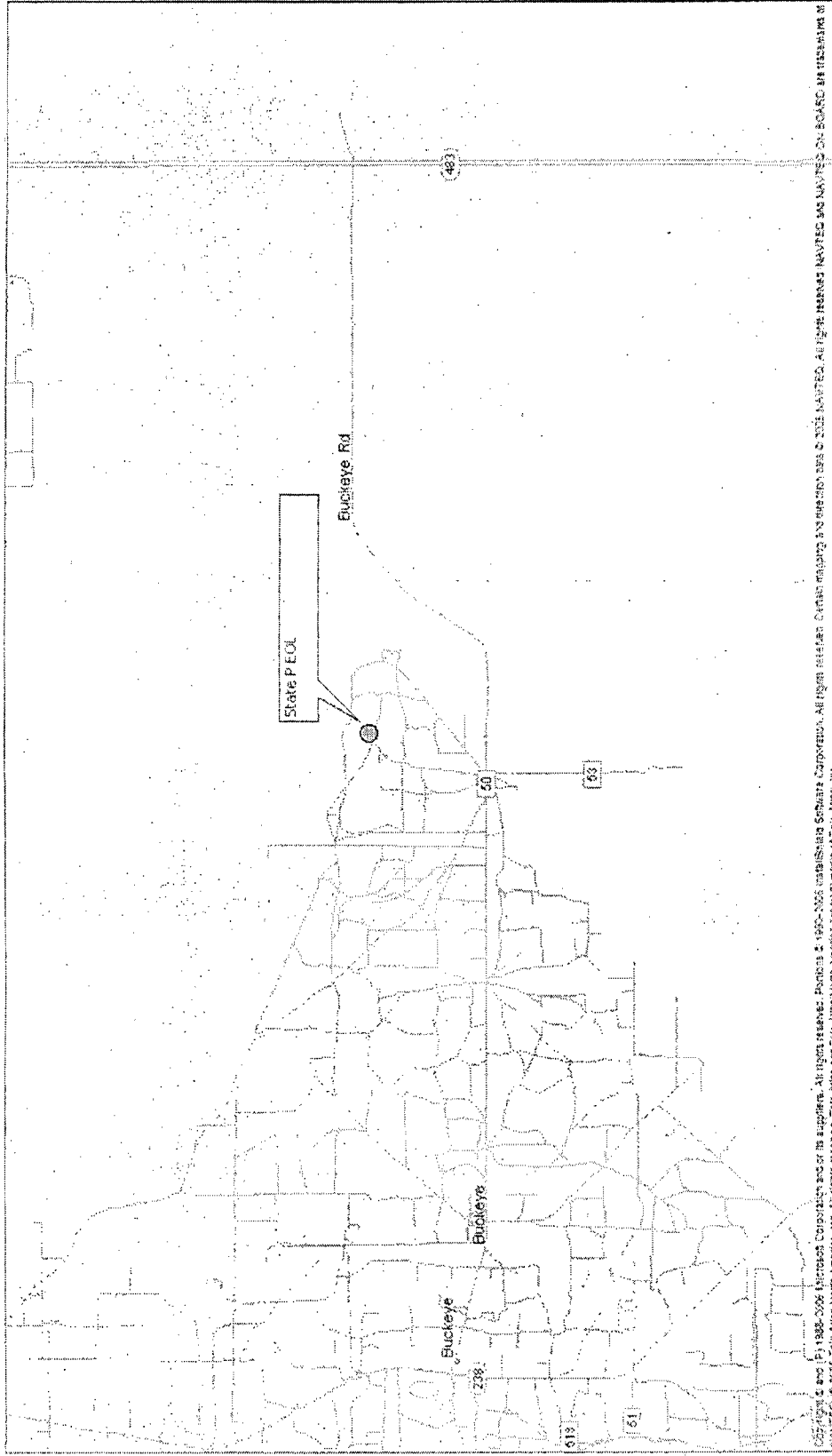


Figure 1 – Site Location Map. Scale: 1 inch = approx. 1 mile. North is “up”.

## Appendix A – Junction Box Disclosure Report

RICE OPERATING COMPANY JUNCTION BOX DISCLOSURE* REPORT									
BOX LOCATION									
SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	Mobil 'P' EOL	A	26	17S	35E	Lea	System Abandoned--no box		

LAND TYPE: BLM \_\_\_\_\_ STATE X FEE LANDOWNER \_\_\_\_\_ OTHER \_\_\_\_\_

Depth to Groundwater 50 feet NMOC SITE ASSESSMENT RANKING SCORE: 20

Date Started 8/2/2005 Date Completed 4/20/2006 NMOC Witness no

Soil Excavated 267 cubic yards Excavation Length 30 Width 20 Depth 12 feet

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

**FINAL ANALYTICAL RESULTS:** Sample Date 3/27/2006 Sample Depth 12 ft

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 NMOC guidelines.

CHLORIDE FIELD TESTS				
LOCATION	DEPTH (ft)	ppm		
delineation trench at junction	3	290		
	4	299		
	5	686		
	6	709		
	7	872		
	8	1286		
	9	1601		
	10	1733		
	11	1999		
	12	2189		
4-wall comp.	n/a	1050		
bottom comp.	12	1554		
backfill comp.	n/a	1404		

Sample Location	PID ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	0.1	<10.0	<10.0	1480
BOTTOM COMP.	0.1	<10.0	<10.0	1750
REMED. BACKFILL	0.1	<10.0	<10.0	1950

**General Description of Remedial Action:** This junction box was addressed as part of the abandonment of the Vacuum SWD system. After the box lumber was removed, the site was delineated using a trackhoe to collect soil samples at regular intervals, producing a 30 x 20 x 12-ft-deep excavation. Chloride and organic vapors were measured in the field for each sample. All PID readings yielded very low concentrations (<10 ppm), however, chloride concentrations increased with depth. The excavated soil was blended on site and then returned to the hole up to 6 ft BGS where a 1-ft-thick clay barrier was installed. The remaining fill was placed on top of the clay. Additional fill was needed so clean, imported fill was used to backfill the remainder of the excavation. An identification plate was placed on the surface of the site to mark the location of the former junction for future environmental consideration and the presence of the clay below. The disturbed surface was seeded with a blend of native vegetation on 4/24/2006 and is expected to return to productive capacity at a normal rate. On 4/3/2006, OCD was notified of potential groundwater impact at this site. ROC has retained the consultant, L. Peter Galusky Jr., Ph.D. to address environmental concerns at this site.

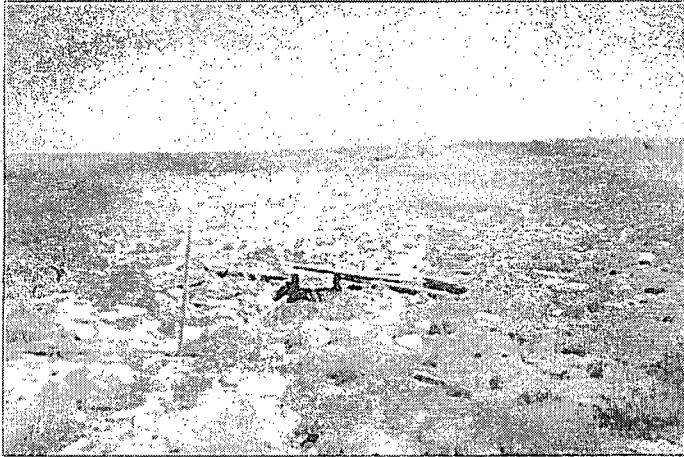
enclosures: photos, lab results, PID field screenings, cl- graph, excavation cross-section

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

SITE SUPERVISOR Jorge Hernandez SIGNATURE not available COMPANY RICE Operating Company

REPORT ASSEMBLED BY Kristin Farris Pope SIGNATURE \_\_\_\_\_

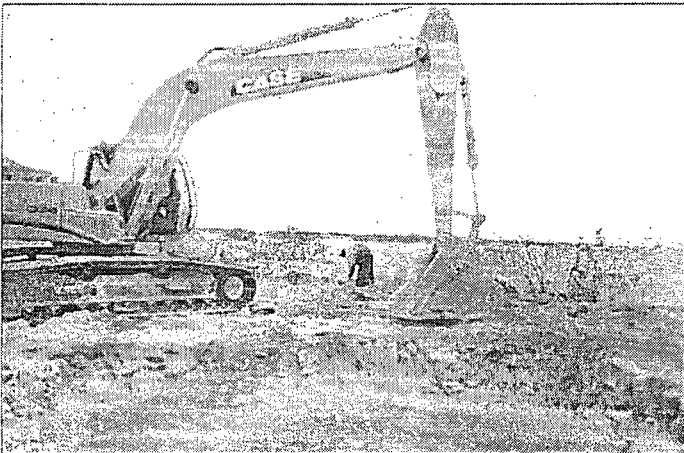
Appendix B – Photo chronology.



Junction box prior to excavation: 7/11/2005



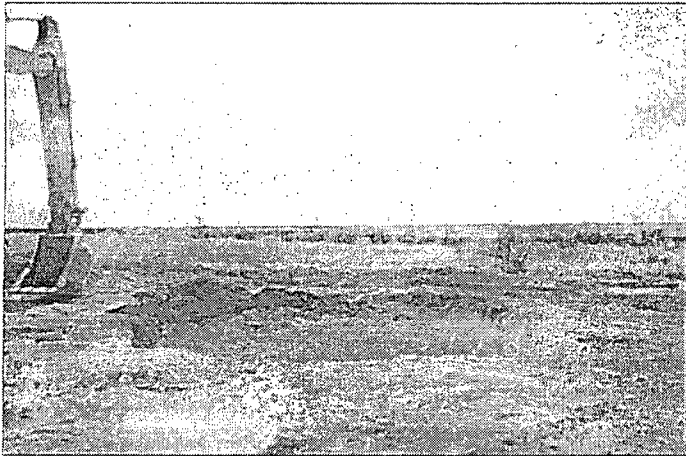
Beginning delineation with trackhoe: 8/2/2005



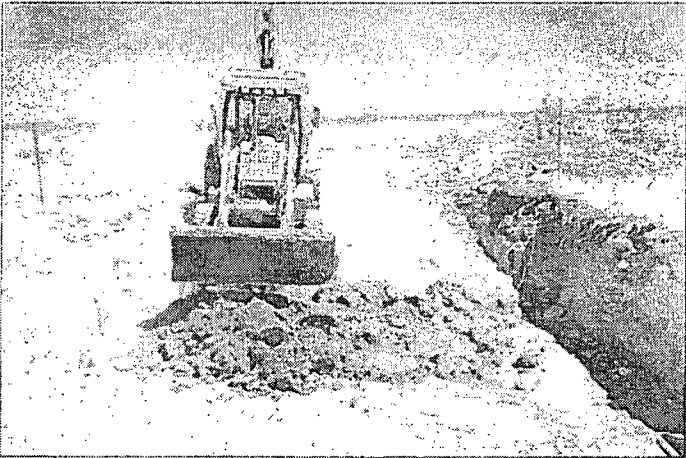
Collecting soil samples from excavation: 3/23/2006



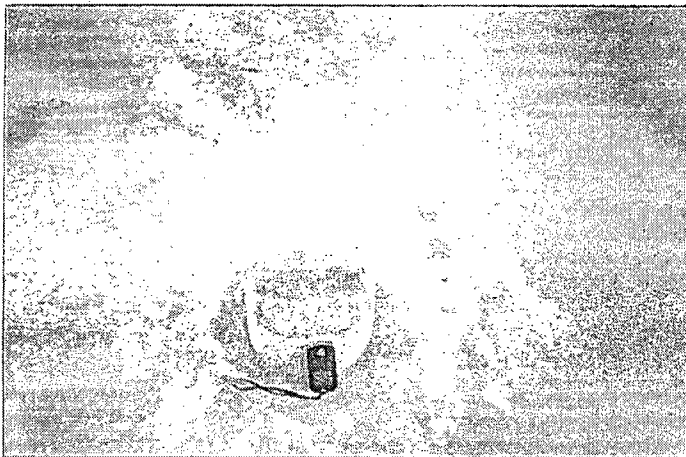
Texerra



Final 30 x 20 x 12 ft deep excavation



Installing clay barrier at 6 ft: 4/13/2006



Identification plate to mark former junction site and clay barrier below.

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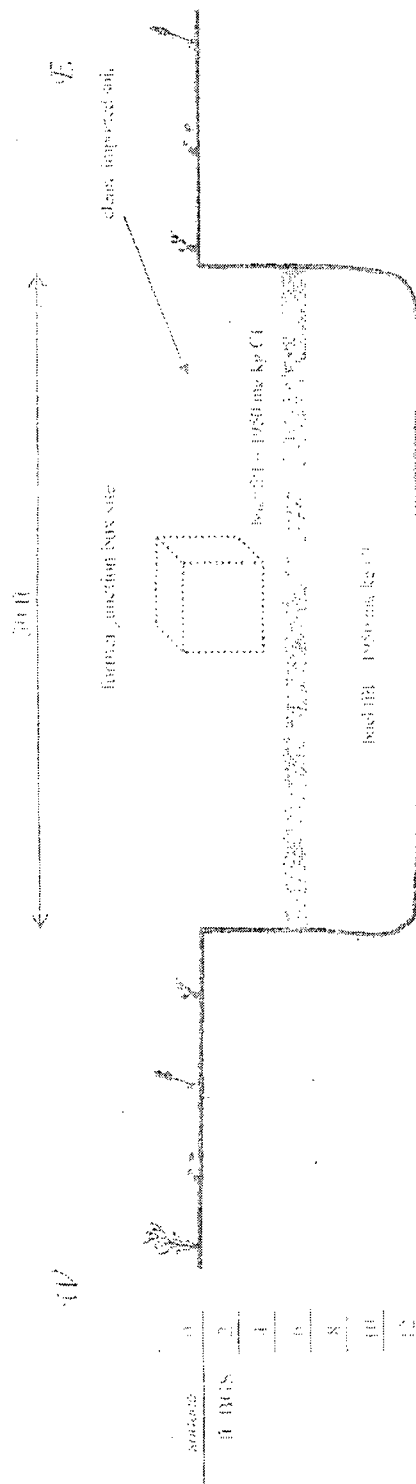
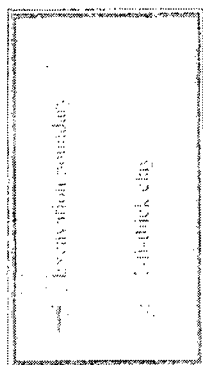
Seeding disturbed area at backfilled site: 4/24/2006

**Texera**

Vacuum Mobil P. EOL

SECRET

**THE UNIVERSITY OF CHICAGO**



## Vacuum State P EOL