AP - 60

STAGE 1 & 2 REPORTS

DATE:

Dec. 12, 1995

NEED PA

INVESTIGATION PLAN STATUS
K-33-1
NMOCD CASE 1RO427-92

RICE OPERATING COMPANY
HOBBS, NM

Mike Griffin
President

Investigation Plan Status Report
K-33-1
Rice Operating Company
Hobbs, New Mexico

Prepared for:
Rice Operating Company

Prepared By:
Whole Earth Environmental, Inc.
2103 Arbor Cove
Katy, Texas 77494
Tel.: 281.394.2050
Fax.: 281.394.2051

Our Ref:
K-33-1

Date:
December 12, 1995

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1. Executive Summary

The subject sites are related to junction boxes on the EME salt water disposal system, operated by Rice Operating Company (ROC). The site is located in the NE ¼ of the SW ¼ Section 33, Township 19 South, Range 37East south of the town of Monument, New Mexico. The disposal system transports produced water from oil and gas leases to a permitted well for disposal by subsurface injection.

Identification of soil impacts occurred during line replacement performed as part of the approved Junction Box Upgrade Program. Soil investigation at the K-33-1 junction box was initiated in September, 2001with a backhoe by excavating a series of trenches around Junction Box K-33-1 to depths of up to 18' below ground surface (bgs) and soil borings to 22' bgs. A second soil investigation was conducted on February 14, 2005 to obtain background concentrations and delineate the areal extent of potential contamination.

A water monitor well was advanced at a location approximately 70' southeast of the K-33-1 junction box on November 3, 2001. Water samples have been extracted from the well each quarter and consistently display elevated chloride concentrations and non-detectable concentrations of BTEX. The depth to water at the site is recorded to be 32' bgs. The soil investigation conducted on February 14, 2005 indicated minor lateral movement of chlorides away from the junction boxes; the plumes appear to be nearly vertical in geometry.

2. Chronology of Events

Initial delineation began in November, 2001 and was performed as part of the Junction Box Upgrade Program. Soil samples were collected and analyzed in the field for chlorides. A monitor well was advanced on November 3, 2001 to a depth of 42' bgs, and soil samples were collected and submitted for laboratory analysis for BTEX and chlorides. The NMOCD was notified of groundwater impact in December, 2001. The monitor well has been sampled quarterly since installation , and a Monitor Well Report has been submitted annually. On May 5, 2005, the site was designated as falling under Rule 19 and was given a Case Number of 1R0427-93.

An investigation Work Plan was submitted to the NMOCD on March 23, 2005

3. Background

Identification of soil impacts occurred during line replacement being performed as part of the approved Junction Box Upgrade Program. Soil borings, excavations and a monitor well have been installed at the site, and the monitor well has been sampled quarterly since

installation. The latest Monitor Well Report was submitted to the NMOCD on January 19, 2005. An Investigation and Characterization Plan was submitted to the NMOCD on March 23, 2005.

4. Geology and Hydrogeology

4.1 Regional and Local Geology

The subject site lies in south central Lea County southeast of the city of Monument, New Mexico within the Eunice Plain. The topography is unremarkable sloping gently at an average dip of 10' per mile. An estimated 80% of Southern Lea County is covered by sand. Shin oak, bear grass, and burr grass dominate the areas of sand cover. Elsewhere, the vegetation is gramma grass, burr grass and mesquite. The primary land use in the area is the grazing of cattle however extensive oil and gas exploration and productivities are found in abundance.

4.2 Regional and Local Hydrogeology

The Ogallala Formation is the principal source of groundwater in the subject area. Depth to groundwater in Lea County ranges from approximately 12 to approximately 300 feet bgs. The Ogallala consists of predominately course fluvial conglomerate and sandstone and fine-grained Eolian siltstone and clay. Where present in the subject area, the Ogallala unconformably overlies Triassic redbeds. The regional groundwater gradient is to the east / southeast. Depth to groundwater at the subject site is approximately 22' bgs. Subsurface geology in the subject area consists of seven feet of fine grained sand underlain by calichi to a depth of approximately 22 feet bgs.

5. Subsurface Soils

Three separate sub surface investigations have been conducted at the two sites. The first was conducted for Rice Operating by ETGI of Hobbs, New Mexico and consisted of a series of nine individual holes or trenches radiating from the original location of the K-33-1 junction box and extending to maximum depths of 14' bgs. The investigation revealed the presence of elevated chloride levels within the soil throughout the tested vertical horizon. Extensive excavation and disposal of the soils surrounding the junction box was undertaken concurrent with this initial investigation activity.

The second site investigation was conducted by Whole Earth Environmental on February 14, 2005 and consisted of a series of thirteen vertical excavations to depths of 20' bgs. Soil samples were analyzed in the field by Rice Operating Company environmental testing specialists. This testing revealed that the contamination was limited to the areas immediately surrounding the old junction box locations.

6. Groundwater Quality

On November 3, 2001 a monitor well was installed southeast of the K-33-1 junction box.. The water level was measured to be approximately 32' bgs. The monitor well has been quarterly since installation.

6.1 Monitoring Program

One monitor well was installed on November 3, 2001 and monitored quarterly since its installation. Analysis of groundwater includes BTEX testing using USEPA Method 8021B and inorganic compounds (total alkalinity, total dissolved solids, sulfate, calcium magnesium, sodium and potassium) using USEPA Methods 310, 300, 160.1 and 6010B. Quarterly groundwater monitoring analytical results have been submitted annually to the NMOCD.

6.2 Hydrocarbons in Groundwater

No free phase hydrocarbons have been detected in groundwater. In fourteen consecutive sampling events, no BTEX constituents have been detected.

6.3 Other Constituents of Concern

Concentrations of inorganic compounds including chlorides, TDS, sulfate and sodium are elevated in the groundwater samples collected from the monitoring well. Background and up-gradient concentrations of these compounds are unknown.

7. Stage 1 Abatement Plan

7.1 Collect Regional Hydrogeologic Data

Depth to groundwater at the subject site is approximately 32' below ground surface. Subsurface geology in the subject area consists of approximately seven feet of loose, fine grained sand underlain by calichi to a depth of approximately 32' bgs.

A one-mile water well survey will be performed. The water well inventory will include a review of water well records listed on the New Mexico State Engineer Office and United States Geological Survey (USGS) websites and windmills indicated on applicable USGS topographical maps and visual site observation. ROC will locate each well listed on the one mile well inventory and will perform a well inspection to record water levels and to determine if each well can be sampled. ROC will also perform a one-mile physical search for observable water wells.

7.2 Evaluate Concentrations of Constituents of Concern in Soil and Groundwater

The vertical and lateral extent of contamination in soils has been determined. At least one additional delineation well will be advanced southeast of the Sarah Phillips EOL and one well advanced to the northeast of the site to provide background concentrations of Constituents of Concern (COC's).

If the COC's measured within the down-gradient well significantly exceed the background concentrations obtained from the up-gradient (control) well, additional monitoring well be advanced as required to effectively delineate the lateral extent of contamination within the water table.

7.3 Report

A report detailing investigation activities (completed to date and proposed) and results will be submitted to the NMOCD. The report will include recommendations for further action if necessary or for closure of the site.

8. Quality Assurance / Quality Control

Samples will be collected and analyzed in accordance with accepted practices and USEPA methods.

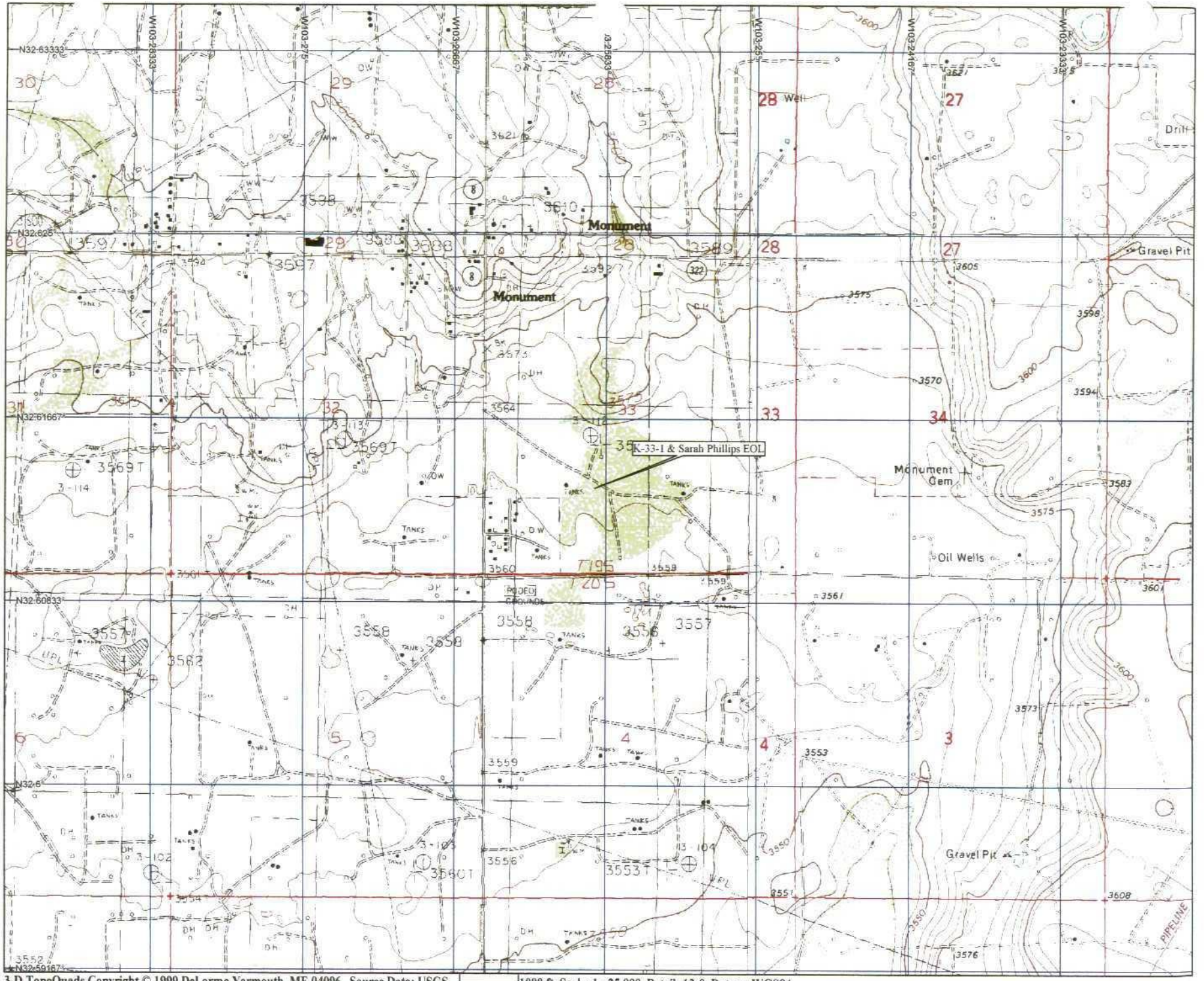
For collection of groundwater samples, conductivity, pH, and temperature will be measured until three successive readings show stabilization. Successive readings will be within 5% for conductivity, 0.1 pH units for pH, and 0.5^0C for temperature.

All samples, both soil and groundwater will be immediately placed on ice and maintained at 4^0C until received by the laboratory.

9. Proposed Schedule of Activities

Following approval of this Stage 1 Abatement Plan by the NMOCD, Whole Earth Environmental, Inc. will schedule a driller and conduct the investigation proposed in the Abatement Plan. Based on the availability of a driller, Whole Earth anticipates completing field activities within 30 days of NMOCD approval. However, we request flexibility to request an extension if a driller is not available. A Stage 1 Abatement Report will be submitted within ninety days of completion of field activities.

Figures



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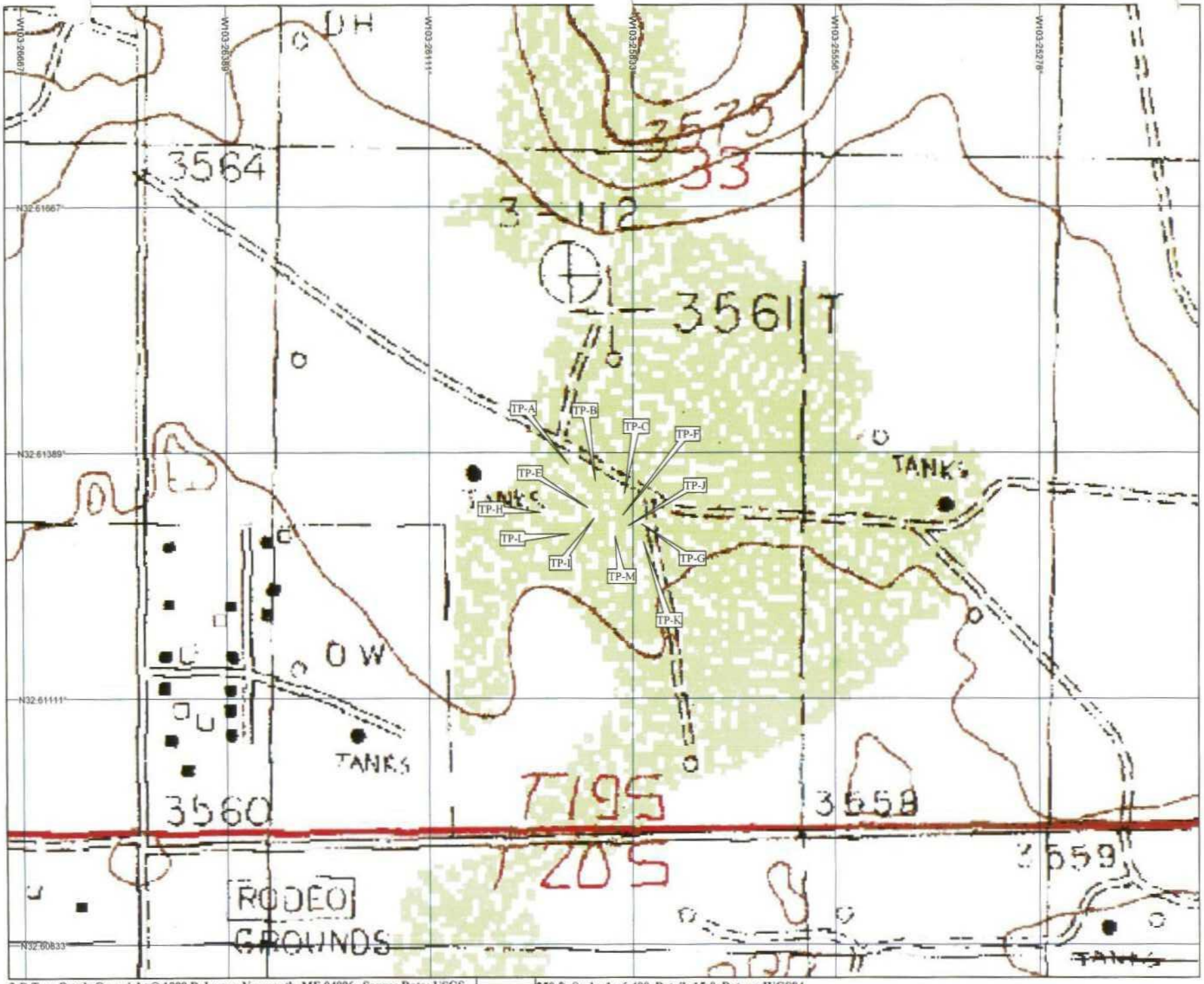

 250 ft Scale: 1 : 6,400 Detail: 15-0 Datum: WGS84


Monument, New Mexico
K 33 1 di Sarah Phillips EOL
K 33 Battery
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Image © 2005 DigitalGlobe
Google


K-33 Battery
K-33-1 Sarah Phillips EOL
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Image © 2005 DigitalGlobe
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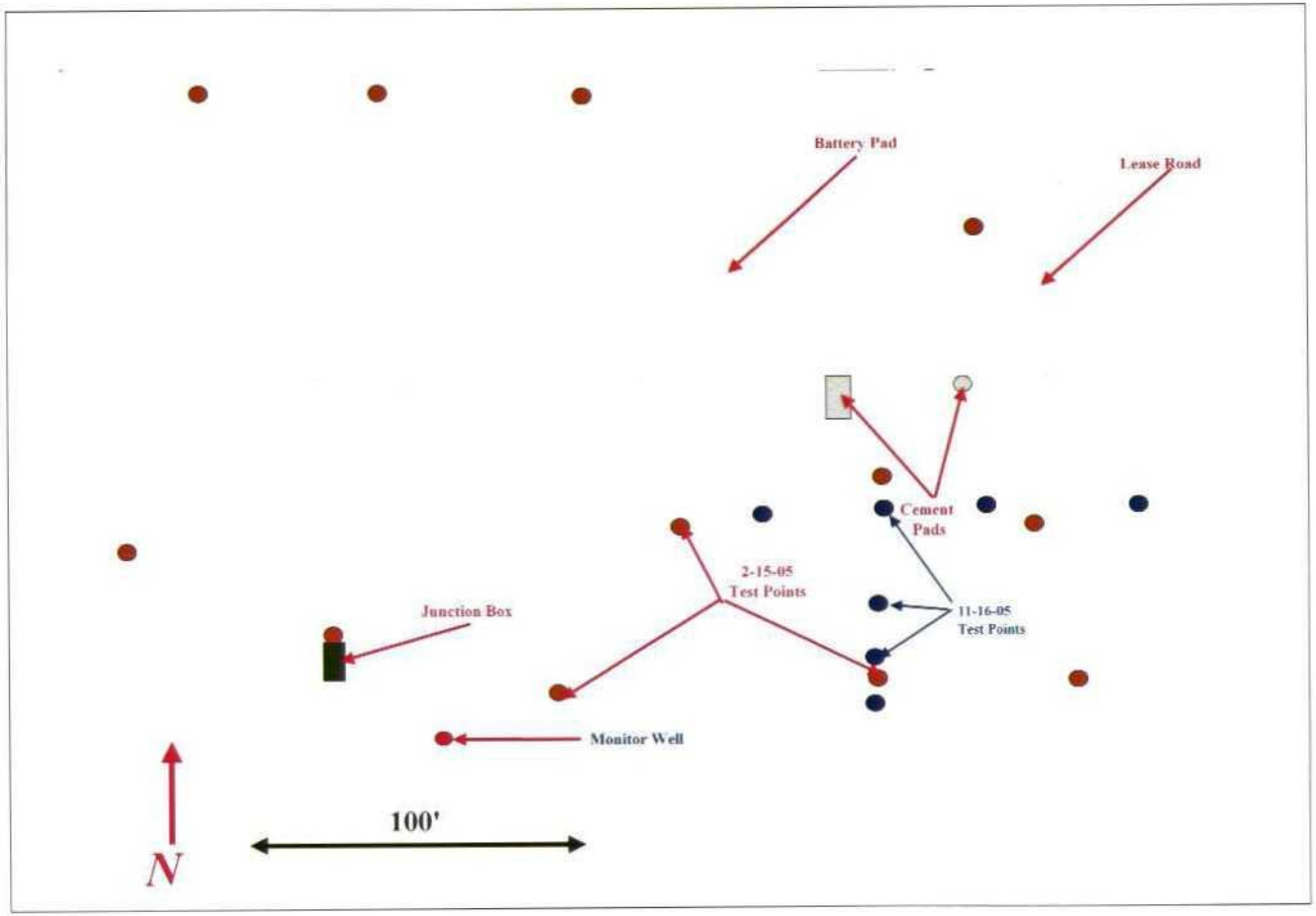
Rice Operating Company
K-33-1 Sarah Phillips EOL
Remediation Project Plat Map



Appendix A

Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156	LOG OF BORING Rice EME, K33-1 TH (Page 1 of 1)

Rice Operating Co.
122 W. Taylor
Hobbs, New Mexico 88240
Contact: Donnie Anderson
Job#: RICENGI.AIR.01

Date	: 10-03-01	Site Location	: South Monument
Drill Start	: 1530	Auger Type	: Hollow Stem
Drill End	: 1630	Logged By	: Mort Bates
Boring Location	: S. Monument 1mi & E ½ mi		

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab	
0		SP		Sand, tan, loose, damp		
5						
10				Caliche, white, firm, dry		
				Caliche w/ sand, tan, loose, damp		Bentonite
15						
		SP		Sand, tan, loose, damp		
20		SP		Sand w/ sandstone, tan, loose, damp		
				Total depth 22'		
25						

10-05-2001 C:\MTECH\RICENGI\RICE\K33-1.bor

Appendix B

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Mike Griffin

WHOLE EARTH ENVIRONMENTAL

2103 Arbor Cove

Katy, TX 77494

Project: K-33-1

Project Number: None Given

Location: Monument, NM

Lab Order Number: 5E02018

Report Date: 05/04/05

WHOLE EARTH ENVIRONMENTAL	Project: K-33-1	Fax: (281) 394-2051
2103 Arbor Cove	Project Number: None Given	**Reported:**
Katy TX, 77494	Project Manager: Mike Griffin	05/04/05 16:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	5E02018-01	Water	05/01/05 12:10	05/02/05 14:45

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

WHOLE EARTH ENVIRONMENTAL	Project: K-33-1	Fax: (281) 394-2051
2103 Arbor Cove	Project Number: None Given	**Reported:**
Katy TX, 77494	Project Manager: Mike Griffin	05/04/05 16:19

General Chemistry Parameters by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (5E02018-01) Water									
Chloride	**1030**	25.0	mg/L	50	EE50408	05/03/05	05/03/05	EPA 300.0	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EE50408 - General Preparation (WetChem)										
Blank (EE50408-BLK1)				Prepared & Analyzed: 05/03/05						
Chloride	ND	0.500	mg/L							
LCS (EE50408-BS1)				Prepared & Analyzed: 05/03/05						
Chloride	10.7		mg/L	10.0		107	80-120			
Calibration Check (EE50408-CCV1)				Prepared & Analyzed: 05/03/05						
Chloride	10.2		mg/L	10.0		102	80-120			
Duplicate (EE50408-DUP1)		**Source: 5E02018-01**		Prepared & Analyzed: 05/03/05						
Chloride	1020	25.0	mg/L		1030			0.976	20	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Raland K Tuttle Date: 5-05-05

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
James L. Hawkins, Chemist/Geologist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Company Name Whole Earth Environmental, Inc.

Company Address: 2103 Arbor Cove

City/State/Zip: Katy, Tx. 77494

Telephone No: 281.394.2050 **Fax No:** (281) 394.2051

Sampler Signature: M. C/1

Project Name: K-33-1

Project #:

Project Loc: Monument, NM

PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TCLP: / TOTAL: TDS / CL / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	Chlorides	RUSH TAT (Pre-Schedule)	Standard TAT
BE02018-01	MW-1	5-1-05	12:10	1						X		X												X		

Special Instructions: Invoice Rice Oper. Copy of results to Rice & Whole Earth.

Sample Containers Intact? (Y) N

Temperature Upon Receipt: 1.5°C

Laboratory Comments: 4oz glass on ice w/ label/seal seal on cooler

Relinquished by:	Date	Time	Received by:	Date	Time
M. C/1	5-2-05	2:45			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Jeanne McMurray	05-02-05	1445