AP - 43

STAGE 1 & 2 WORKPLANS

DATE:

July 8, 2005

ARCADIS
Infrastructure, environment, buildings

ARCADIS G&M, Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401

TRANSMITTAL LETTER

To:
Wayne Price

Copies:
Kristin Farris Pope
File

ENVIRONMENTAL

From:
Sharon Hall

Date:
8 July 2005

Subject:
EME Junction A-20 (NMOCD Case No. 1R0427-89)

ARCADIS Project No.:
MT000857.0001

We are sending you:

X **Attached** ☐ **Under Separate Cover Via _____ the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☐ Samples ☐ Copy of Letter X Reports
☐ Other:

Copies	Date	Drawing No.	Rev.	Description	Action*
1				EME Junction A-20 Stage 1 Abatement Plan	

Action*

☐ A Approved ☐ CR Correct and Resubmit ☐ Resubmit _____ Copies
☐ AN Approved As Noted ☐ F File ☐ Return _____ Copies
X AS As Requested ☐ FA For Approval ☐ Review and Comment
☐ Other:

Mailing Method

☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☐ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
X Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☐ Other:

Comments: Wayne, on behalf of Rice Operating Company I am submitting this Stage 1 Abatement plan for the above-referenced site. This is one of the sites for which Daniel Sanchez requested an abatement plan By July 15, 2005 in his letter dated May 5, 2005. If you have any questions or require additional information please contact me at your convenience.
Regards, Sharon

EME Junction A-20

NMOCD Case No. 1R0427-89

Stage 1 Abatement Plan

Rice Operating Company
Hobbs, New Mexico

ARCADIS
Infrastructure, environment, buildings

ARCADIS

Sharon E. Hall
Site Evaluation Department Manager

EME Junction A-20 Stage 1 Abatement Plan
Rice Operating Company
Hobbs, New Mexico

Prepared for:
Rice Operating Company

Prepared by:
ARCADIS G&M, Inc.
1004 N. Big Spring Street
Suite 300
Midland,
Texas 79701
Tel 432.687.5400
Fax 432.687.5401

Our Ref.:
MT000857.0001.00001

Date:
July 8, 2005

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Appendices

EME Junction A-20 Stage 1 Abatement Plan

Rice Operating Company
Hobbs, New Mexico

1. Executive Summary

The subject site is a junction box on the EME salt water disposal System, operated by Rice Operating Company (ROC). The site is located in Section 20, Township 20 south, Range 37 east, Lea County, New Mexico, near the town of Eunice (Figure 1). 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 being performed as part of the approved Junction Box Upgrade Program. Soil investigation at the A-20 junction box was initiated in October 2001 with a back hoe by trenching to 12 feet below ground surface (bgs) in three locations. To further delineate depth of impact, three soil borings were completed at the site.

On February 28, 2002, a monitor well was installed southwest of junction box A-20 (Figure 2). Water level was recorded at 24.53 feet below measuring point. The monitor well has been sampled quarterly since installation.

Soil impacts at the site include chlorides and hydrocarbons. Groundwater samples exhibit elevated chloride concentrations. This Stage 1 Abatement Plan proposes delineation of soil and groundwater impacts.

2. Chronology of Events

The following summarizes the chronology of events at the subject site:

- Initial delineation began on October 1, 2001 and was performed as part of the Junction Box Upgrade Program;
- A soil boring was installed on October 4, 2001 to a depth of 23 feet bgs;
- Soil samples were collected from excavations on December 27, 2001 January 8, 2002;
- A notice of groundwater impact, dated January 29, 2002 was submitted to NMOCD;
- On February 28, 2002 a monitor well was installed southeast of the junction box A-20;

- The monitor well has been sampled quarterly since installation, and a Monitor Well Report has been submitted annually;
- An Investigation & Characterization Plan was submitted to the NMOCD on March 21, 2005; and
- On May 05, 2005 Mr. Daniel Sanchez of the NMOCD wrote a letter to ROC indicating that several sites require abatement plans pursuant to NMOCD Rule 19.

3. Background

Initial delineation began on October 1, 2001 and was performed as part of the Junction Box Upgrade Program. Soil samples were collected and analyzed in the field for chlorides and total petroleum hydrocarbons (TPH). A soil boring was installed on October 4, 2001 to a depth of 23 feet bgs, and the soil sample collected from the depth of 23 feet bgs was submitted for laboratory analysis for gasoline range organics (GRO, diesel range organics (DRO), benzene, toluene, ethylbenzene and xylenes (BTEX) and chlorides. A soil sample sample was collected from a sample location on December 27, 2001 that was excavated to a depth of 22 feet bgs. The soil sample collected from a depth of 18 feet BGS was submitted for laboratory analysis for GRO, DRO, BTEX and chlorides. A notice of groundwater impact, dated January 29, 2002 was submitted to NMOCD. On February 28, 2002 a monitor well was installed southeast of the junction box A-20. A groundwater sample was submitted for laboratory analysis for chlorides. A soil sample was collected from the monitor well boring from a depth of 25 feet bgs submitted for laboratory analysis for chlorides, GRO, DRO and BTEX. The monitor well has been sampled quarterly since installation, and a Monitor Well Report has been submitted annually. An Investigation & Characterization Plan was submitted to the NMOCD on March 21, 2005. On May 05, 2005 Mr. Daniel Sanchez of the NMOCD wrote a letter to ROC indicating that several sites (including the subject site EME Junction A-20) require abatement plans pursuant to NMOCD Rule 19. The requested abatement plan was to be submitted by July 15, 2005.

4. Geology and Hydrogeology

4.1 Regional and Local Geology

The subject site lies in southern Lea County in the Pecos valley section of the Great Plains physiographic province. The site lies within the Eunice Plain, which is bounded

by the South Plain to the south, the Rattlesnake Ridge to the east, the High Plains to the northeast, the Laguna Valley and Gramma Ridge Area to the northwest, the San Simon Ridge and San Simon Sale to the west and the Antelope Ridge Area to the southwest. 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 grama grass, burr grass and mesquite.

Monument Draw is the only major surface drainage feature in southern Lea County. The draw runs north and south slightly over two miles east of the EME junction A-20 junction box. Generally, the topography in the area of the site slopes gently to Monument Draw at an approximate dip of 35 feet per mile.

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 predominantly coarse 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 24 feet bgs. Subsurface geology in the subject area consists of interbedded loose sand and calcareous sand and clay. Boring lithology logs are included in Appendix A.

5. Subsurface Soils

Soil delineation field activities were conducted beginning October 2001. Initial delineation was begun by ROC as part of the Junction Box Upgrade Program. Four sample locations (Figure 2) were excavated to depths of 15-25 feet. Soil samples were analyzed in the field for chlorides using field-adapted Method 9253. Field chlorides ranged from a concentration of 50 milligrams per kilogram (mg/kg) to 3,400 mg/kg. The presence of hydrocarbons was noted in field observations.

To further delineate depth of impact, a soil boring was installed to a depth of 23 feet bgs, and the soil sample collected from the depth of 23 feet bgs was submitted for laboratory analysis for GRO, DRO, (BTEX) and chlorides. The DRO concentration was 24 mg/kg, and no other hydrocarbon compounds analyzed for were detected. The chloride concentration was 213 mg/kg. Samples collected from the soil boring were

analyzed in the field for total petroleum hydrocarbons (TPH). The presence of hydrocarbons was noted in field observations.

Additional soil samples were collected from excavation to a depth of 22 feet bgs locations on December 27, 2001. The presence of hydrocarbons was noted in field observations. A soil sample collected from a depth of 18 feet BGS at sample location TP2 was submitted for laboratory analysis for chlorides GRO, DRO, BTEX and chlorides. Analytical results are as follows: GRO 881 mg/kg; DRO 7,090 mg/kg; chlorides 206 mg/kg; benzene 0.006 mg/kg; toluene 0.660 mg/kg, ethylbenzene 4.81 mg/kg and xylenes 16.5 mg/kg.

A monitor well was completed on February 28, 2002 and a soil sample from the monitor well boring at a depth of 25 feet bgs was submitted on March 5, 2002 for laboratory analysis for chlorides, GRO, DRO, BTEX, and chlorides. Elevated concentrations of hydrocarbons including GRO (111 mg/kg), and BTEX (ethylbenzene 28.4 mg/kg and p/m xylenes 122 mg/kg) were identified. The chloride concentration was 248 mg/kg.

The extent of delineation by backhoe and soil boring locations are shown in Figure 2.

6. Groundwater Quality

On February 28, 2002, a monitor well was installed southeast of junction box A-20 (Figure 2). The water level was recorded at 24.53 feet bgs. The monitor well has been sampled quarterly since installation.

6.1 Monitoring Program

One monitor well, installed in February 2002, has been monitored quarterly since its installation. Analysis of groundwater includes total alkalinity, chloride, total dissolved solids sulfate, calcium, magnesium, sodium and potassium using EPA Methods 310, 300, 160.1 and 6010B. Quarterly groundwater monitoring analytical results have been submitted annually to the NMOCD. First quarter 2005 (March 22, 2005) groundwater monitoring analytical results are included in Appendix B of the Abatement Plan.

6.2 Hydrocarbons in Groundwater

Free-phase hydrocarbons are present at the site. A groundwater sample from the monitor well at the A-20 site was collected and analyzed for BTEX on March 5th, 2002

following installation of the monitor well. Toluene, ethylbenzene and xylenes were detected at a concentration of 0.003 milligrams per liter (mg/L), 0.006 mg/L and 0.014 mg/L, respectively, well below the New Mexico drinking water standard. Subsequent to analysis of this sample, free-phase hydrocarbons were detected in the well. The well is no longer sampled for laboratory analysis due to the presence of free-phase hydrocarbons. The free-phase hydrocarbons (a skim of oil on the groundwater) are monitored and removed weekly using absorbent socks.

6.1 Other Constituents of Concern

Concentrations of inorganic compounds including chlorides and TDS are elevated in the groundwater samples collected from the monitoring well. Background and upgradient 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 24 feet bgs. Subsurface geology in the subject area consists of interbedded loose sand and calcareous sand and clay.

A one-mile water well inventory 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 topographic maps and visual site observation. ROC will locate each well listed on the one-mile well inventory and 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

Further delineation of the vertical and lateral extent of impact will be accomplished with soil borings and/or excavation with a backhoe. Soil samples will be collected from soil borings at regular intervals no less than five feet, screened in the field using a PID and field tested for chlorides. Soil lithology and the presence of any observed staining or odor will be recorded. 20% of the soil samples will be submitted for

laboratory analysis as confirmation of the field sampling. The soil impacts will be delineated to a TPH concentration of 100 mg/kg and a chloride concentration of 250 mg/kg.

Depth to groundwater at the site is approximately 24 feet bgs. If existing monitoring and water wells are present near the site, the well constructions are determined to be sufficient for representative sampling, and access to the wells can be obtained, the wells will be included in the sampling program in lieu of installing additional monitoring wells. Additional monitoring wells may be installed based on delineation results and the presence or absence of existing wells. If existing wells are not present or ROC can not obtain access to existing wells, one upgradient and one downgradient well will be installed. The proposed well locations are approximated in Figure 3.

NOT INCLUDED !!

7.3 Report

A report detailing investigation activities (completed to date and proposed) and results will be submitted to the OCD. 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°C for temperature.

Purge water and decontamination water will be collected, contained and transported to an ROC disposal well for disposal.

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

8.1 Decontamination Procedures

Non-disposable equipment will be decontaminated using the following procedures:

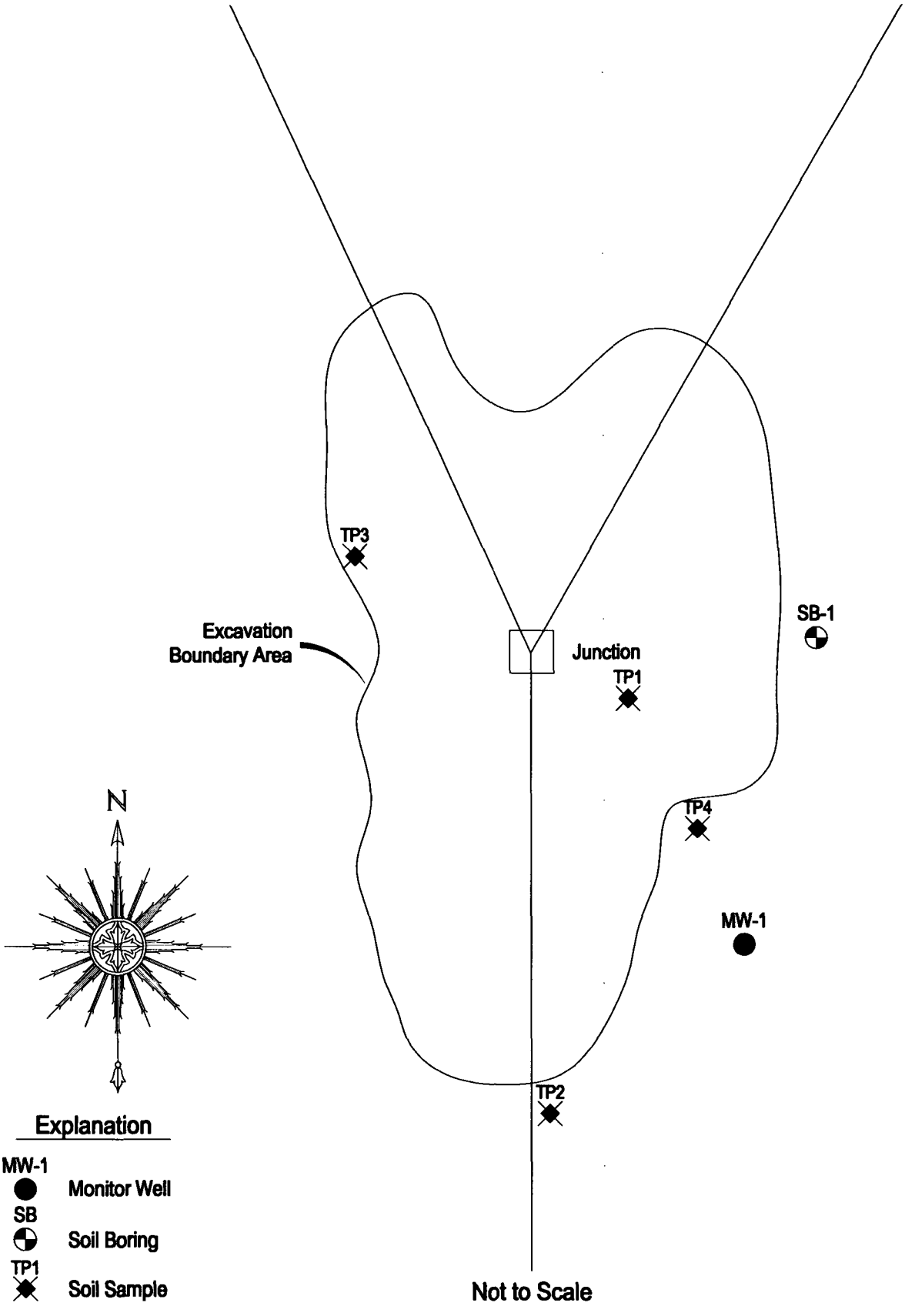
- Wash with Alconox® detergent and potable water solution;

- Rinse with potable water;
- Rinse with distilled water; and
- Allow to air dry.

It is anticipated that groundwater samples will be collected with disposable equipment (disposable bailers) and will, therefore do not require decontamination.

9. Proposed Schedule of Activities

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



Area Manager: A. Schmidt Project Manager: S. Hall Task Manager: D. Gann Technical Review: S. Tischer	ARCADIS 1004 North Big Spring Street Suite 300 Midland, TX 79701-3383 Tel: 432-687-5400 Fax: 432-687-5401 www.arcadis-us.com	Rice Operating Company Junction A-20 Eunice Monument Eumont (EME) SWD System **Soil Sample, Boring and Monitor Well Locations Unit 'A'** Lea County, New Mexico	Project Number: MT000857.0001 Drawing Date: 08 July 2005 Figure: 2	

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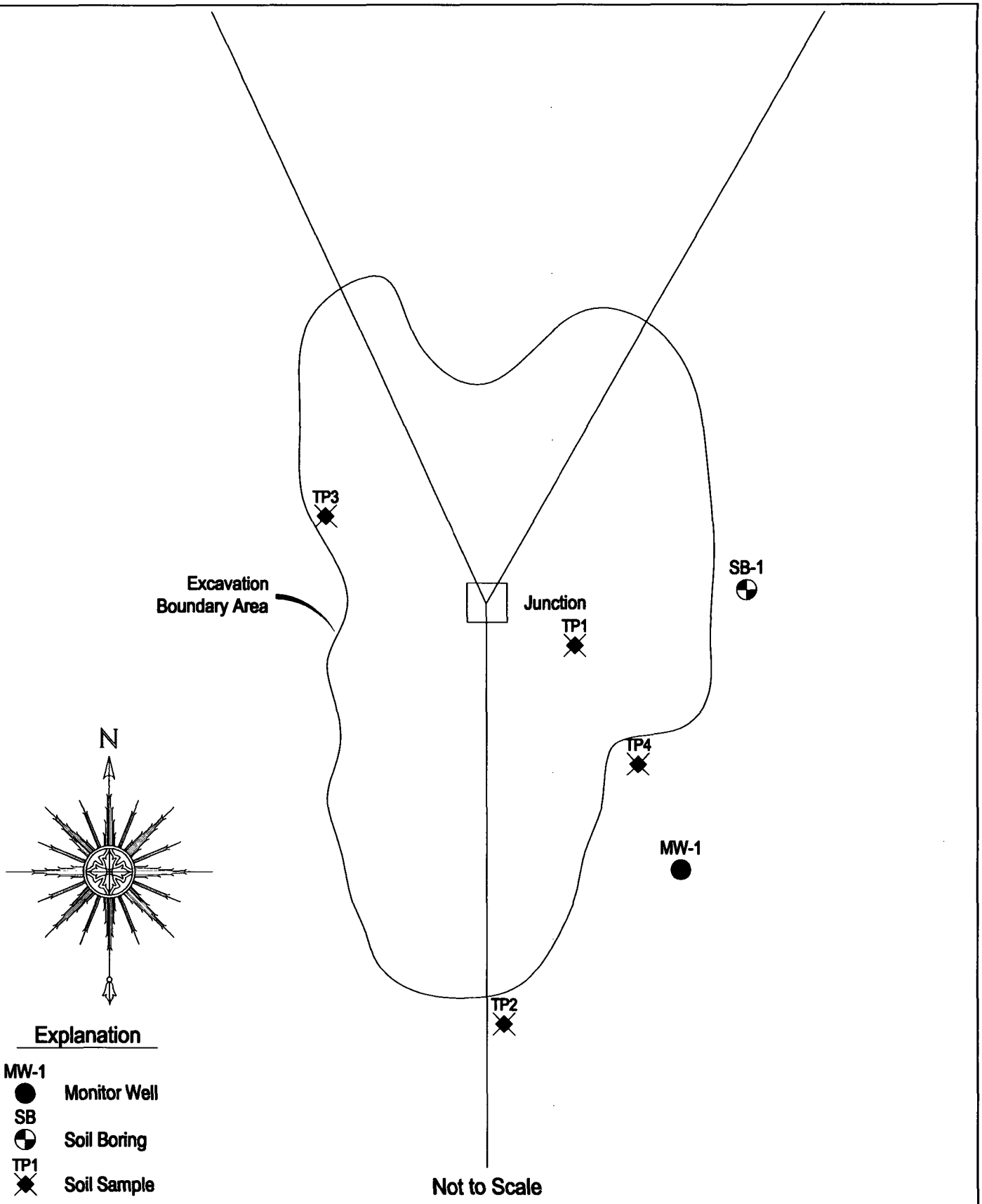
31-014-00712



Area Manager: A. Schmidt Project Manager: S. Hall Task Manager: D. Gann Technical Review: S. Tischer	ARCADIS 1004 North Big Spring Street Suite 300 Midland, TX 79701-3383 Tel: 432-687-5400 Fax: 432-687-5401 www.arcadis-us.com	Rice Operating Company Junction A-20 Eunice Monument Eumont (EME) SWD System **Soil Sample, Boring and Monitor Well Locations** **Unit 'A'** Lea County, New Mexico	Project Number: MT000857.0001 Drawing Date: 08 July 2005 Figure: 2

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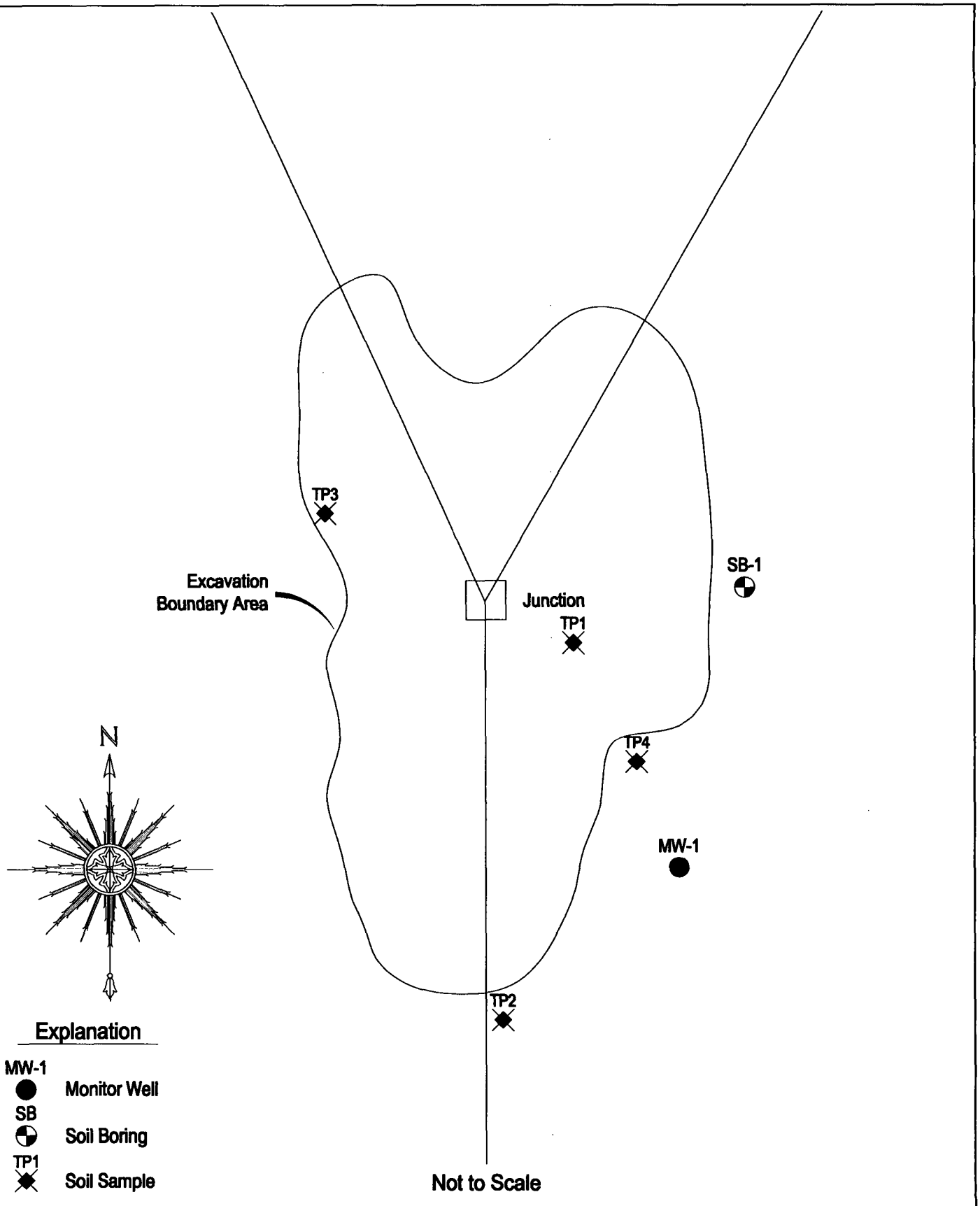

Area Manager: A. Schmidt Project Manager: S. Hall Task Manager: D. Genn Technical Review: S. Tischer	ARCADIS 1004 North Big Spring Street Suite 300 Midland, TX 79701-3383 Tel: 432-687-5400 Fax: 432-687-5401 www.arcadis-us.com	Rice Operating Company Junction A-20 Eunice Monument Eumont (EME) SWD System **Soil Sample, Boring and Monitor Well Locations** **Unit 'A'** Lea County, New Mexico	Project Number: MT000857.0001 Drawing Date: 06 July 2005 Figure: 2

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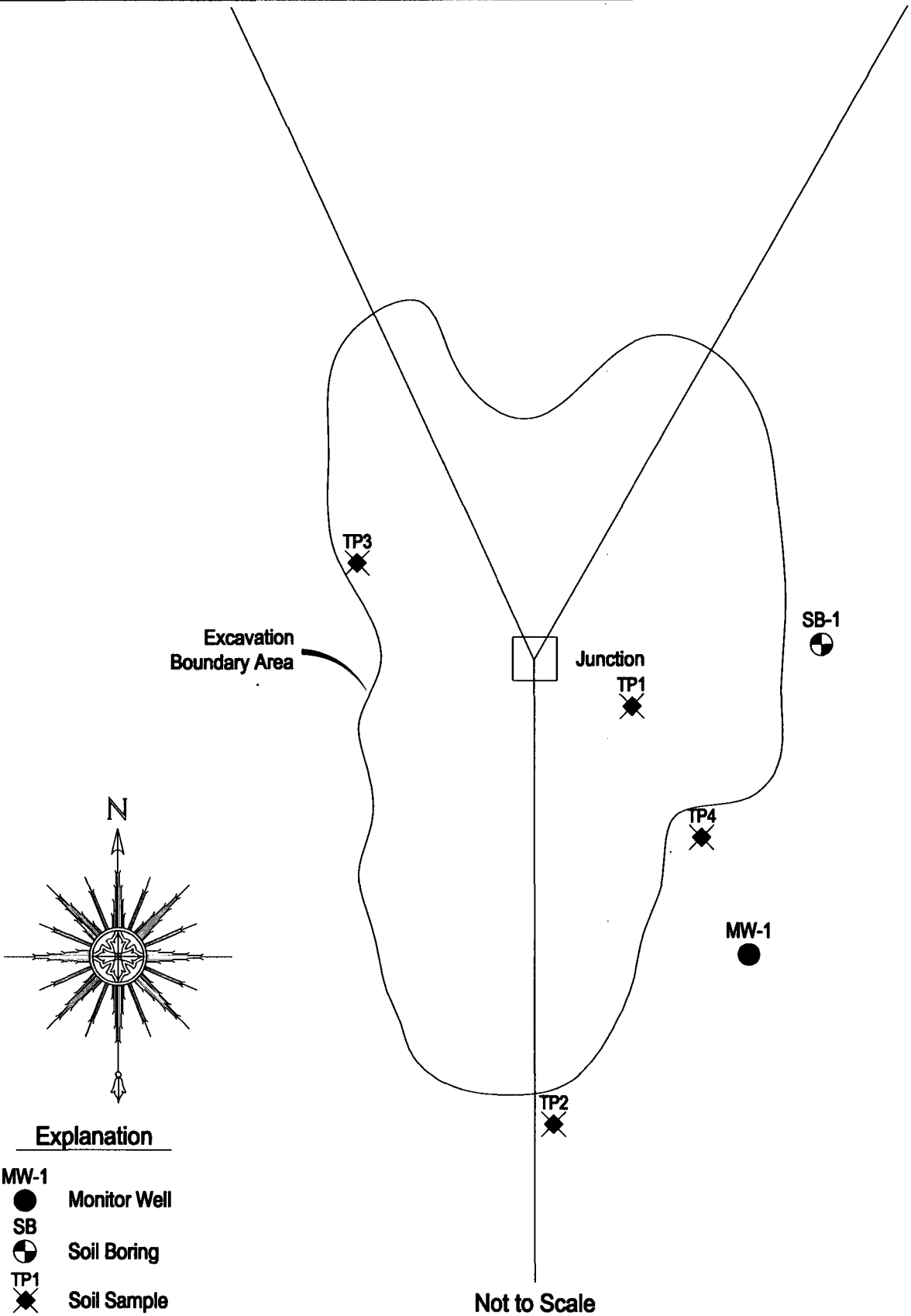

Area Manager: A. Schmidt Project Manager: S. Hall Task Manager: D. Gann Technical Review: S. Tischer	ARCADIS 1004 North Big Spring Street Suite 300 Midland, TX 79701-3383 Tel: 432-687-5400 Fax: 432-687-5401 www.arcadis-us.com	Rice Operating Company Junction A-20 Eunice Monument Eumont (EME) SWD System **Soil Sample, Boring and Monitor Well Locations Unit 'A'** Lea County, New Mexico	Project Number: MT000857.0001 Drawing Date: 08 July 2005 Figure: 2	

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31-014-00712

ARCADIS

Appendix A

Boring Lithology Log

DRILLING LOG	Site Name/Location					Logged by: DEA
RICE *Operarting Company* 122 West Taylor Hobbs, New Mexico 88240 Phone: (505) 393-9174 Fax (505) 397-1471	**Jct. Box A-20** **20-T20S-R37E** **EME** **SWD System** **Lea County, NM**	Well No.: MW1	Date Drilled: 2/28/02	Driller: Eades		Construction: Sand and bentonite above screen.
		Well Depth: 35'	Boring Depth: 35'	Well Material: PVC		
		Casing Length: 20	Boring Diameter: 4.75"	Casing Size: 2"		
		Screen Length: 15'	Drilling Method: Air Rotary	Slot Size: N/A		

DEPTH	SUBSURFACE LITHOLOGY	SAMPLE TYPE	TEST (ppm)	REMARKS	Boring
0	Ground surface		CT		
1	Topsoil				Cuttings
2	Caliche				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12	Sandy brown clay				
13					
14					
15					
16					
17					
18	Sand			TPH odor	
19				"	
20				"	
21				"	
22				"	
23				"	
24					
25					
26					
27					
28					
29					
30					
31	Sandy brown clay				
32					
33					
34					
35					

Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156	LOG OF BORING Rice A-20 TH (Page 1 of 1)
Rice Operating Co. 122 W. Taylor Hobbs, New Mexico 88240 Contact: Donnie Anderson Job#: RICENGI.AIR.01	Date : 10-04-01 Drill Start : 1300 Drill End : 1330 Boring Location : S. Monument 4.5 mi & W 0.5 mi Site Location : South Monument Auger Type : Hollow Stem Logged By : Mort Bates

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab
0				Sand, tan, loose, dry	
5		SP			
10				Sand, tan, loose, damp	
15		SP			
20					
25				Total depth 23'	

Bentonite

10-05-2001 C:\MTECH46\RICENGI\AIR01\a-20.bor

EADES DRILLING & PUMP SERVICE

LICENSES
Gene: TX 1853WI NM 982 Alan: TX 2330WI NM 1044
Irrigation - Domestic - Environmental - Test Holes
1200 E. Bender
Hobbs, N.M. 88240
(505) 392-2457

Rice Operating
A-20

WELL LOG

From	To	FORMATION
0	1	Top Soil
1	12	Caliche
12	18	Sandy Brown Clay
18	31	Sand
31	35	Sandy Brown Clay
		N 32° 33.933'
		W 103° 15.961'

Date 2-28-02 Driller Frederick D. Root WD1332

ARCADIS

Appendix B

March 2005 Laboratory Analytical Results

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Sharon Hall

ARCADIS

1004 N. Big Spring Street

Midland, TX 79701

Project: MT 000643 0001

Project Number: MT 000643 0001

Location: Jct A-20

Lab Order Number: 5C23003

Report Date: 04/04/05

ARCADIS	Project: MT 000643 0001	Fax: (432) 687-5401
1004 N. Big Spring Street	Project Number: MT 000643 0001	**Reported:**
Midland TX, 79701	Project Manager: Sharon Hall	04/04/05 16:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	5C23003-01	Water	03/22/05 09:40	03/22/05 18:30

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

ARCADIS	Project: MT 000643 0001	Fax: (432) 687-5401
1004 N. Big Spring Street	Project Number: MT 000643 0001	**Reported:**
Midland TX, 79701	Project Manager: Sharon Hall	04/04/05 16:48

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (5C23003-01) Water									
Total Alkalinity	**440**	2.00	mg/L	1	EC52908	03/23/05	03/23/05	EPA 310.2M	
Chloride	**2330**	25.0	"	50	EC52513	03/24/05	03/24/05	EPA 300.0	
Total Dissolved Solids	**4290**	5.00	"	1	EC52507	03/24/05	03/25/05	EPA 160.1	
Sulfate	**125**	25.0	"	50	EC52513	03/24/05	03/24/05	EPA 300.0	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

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

ARCADIS	Project: MT 000643 0001	Fax: (432) 687-5401
1004 N. Big Spring Street	Project Number: MT 000643 0001	**Reported:**
Midland TX, 79701	Project Manager: Sharon Hall	04/04/05 16:48

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (5C23003-01) Water									
Calcium	**46.4**	0.100	mg/L	10	EC53102	03/29/05	03/30/05	EPA 6010B	
Magnesium	**185**	0.100	"	100	"	"	"	"	
Sodium	**1610**	10.0	"	1000	"	"	"	"	
Potassium	**38.8**	0.500	"	10	EC53109	03/29/05	03/31/05	"	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

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 EC52507 - General Preparation (WetChem)										
Blank (EC52507-BLK1)				Prepared: 03/24/05 Analyzed: 03/25/05						
Total Dissolved Solids	ND	5.00	mg/L							
Duplicate (EC52507-DUP1)	**Source: 5C23001-01**			Prepared: 03/24/05 Analyzed: 03/25/05						
Total Dissolved Solids	1140	5.00	mg/L		1140			0.00	20	
Batch EC52513 - General Preparation (WetChem)										
Blank (EC52513-BLK1)				Prepared & Analyzed: 03/24/05						
Chloride	ND	0.500	mg/L							
Sulfate	ND	0.500	"							
Blank (EC52513-BLK2)				Prepared & Analyzed: 03/24/05						
Chloride	ND	0.500	mg/L							
Sulfate	ND	0.500	"							
LCS (EC52513-BS1)				Prepared & Analyzed: 03/24/05						
Chloride	10.4		mg/L	10.0		104	80-120			
Sulfate	9.53		"	10.0		95.3	80-120			
LCS (EC52513-BS2)				Prepared & Analyzed: 03/24/05						
Chloride	10.5		mg/L	10.0		105	80-120			
Sulfate	9.80		"	10.0		98.0	80-120			
Calibration Check (EC52513-CCV1)				Prepared & Analyzed: 03/24/05						
Chloride	10.6		mg/L	10.0		106	80-120			
Sulfate	9.93		"	10.0		99.3	80-120			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

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 EC52513 - General Preparation (WetChem)										
Calibration Check (EC52513-CCV2)				Prepared & Analyzed: 03/24/05						
Sulfate	9.80		mg/L	10.0		98.0	80-120			
Chloride	10.6		"	10.0		106	80-120			
Duplicate (EC52513-DUP1)		**Source: 5C23001-01**		Prepared & Analyzed: 03/24/05						
Chloride	216	5.00	mg/L		215			0.464	20	
Sulfate	216	5.00	"		215			0.464	20	
Duplicate (EC52513-DUP2)		**Source: 5C23018-07**		Prepared & Analyzed: 03/24/05						
Chloride	1540	12.5	mg/L		1530			0.651	20	
Sulfate	163	12.5	"		163			0.00	20	
Batch EC52908 - General Preparation (WetChem)										
Blank (EC52908-BLK1)				Prepared & Analyzed: 03/23/05						
Total Alkalinity	ND	2.00	mg/L							
Calibration Check (EC52908-CCV1)				Prepared & Analyzed: 03/23/05						
Carbonate Alkalinity	0.0500		mg/L	0.0500		100	80-120			
Duplicate (EC52908-DUP1)		**Source: 5C22002-01**		Prepared & Analyzed: 03/23/05						
Total Alkalinity	221	2.00	mg/L		220			0.454	20	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

Total Metals 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 EC53102 - 6010B/No Digestion										
Blank (EC53102-BLK1)				Prepared: 03/29/05 Analyzed: 03/30/05						
Calcium	ND	0.0100	mg/L							
Magnesium	ND	0.00100	"							
Sodium	ND	0.0100	"							
Calibration Check (EC53102-CCV1)				Prepared: 03/29/05 Analyzed: 03/30/05						
Calcium	2.25		mg/L	2.00		112	85-115			
Magnesium	1.93		"	2.00		96.5	85-115			
Sodium	2.18		"	2.00		109	85-115			
Duplicate (EC53102-DUP1)		**Source: 5C23001-01**		Prepared: 03/29/05 Analyzed: 03/30/05						
Calcium	47.7	0.100	mg/L		51.6			7.85	20	
Magnesium	62.7	0.0200	"		59.3			5.57	20	
Sodium	247	1.00	"		252			2.00	20	
Batch EC53109 - 6010B/No Digestion										
Blank (EC53109-BLK1)				Prepared: 03/29/05 Analyzed: 03/31/05						
Potassium	ND	0.0500	mg/L							
Calibration Check (EC53109-CCV1)				Prepared: 03/29/05 Analyzed: 03/31/05						
Potassium	2.02		mg/L	2.00		101	85-115			
Duplicate (EC53109-DUP1)		**Source: 5C23001-01**		Prepared: 03/29/05 Analyzed: 03/31/05						
Potassium	10.1	0.500	mg/L		10.7			5.77	20	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

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: 4/4/2005

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.

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ARCADIS GERAGHTY & MILLER Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name MT000643.0001

Project Location JCT A-20

Laboratory Enur Labs of Texas

Project Manager Sharon Hall

Sampler(s)/Affiliation Gerald Carrillo

Sample ID/Location	Matrix	Date/Time Sampled	~~Time Lab ID~~	ANALYSIS / METHOD / SIZE: 1-Liter Plastic Major-Anions/Cations TDS Nitrate						Remarks	Total
mw.1	L	3.22.05	0940	1						SC23003-01	1

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 1

Relinquished by: [signature]	Organization: ARCADIS	Date 3/22/05	Time 1830	Seal Intact?	
Received by: Jane McNeely	Organization: Env. Lab of TX	Date 3/22/05	Time 1830	(Yes) No N/A	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A	

Special Instructions/Remarks:

1.5°C Seals on containers + cooler

Email Kristin Pope

Delivery Method: ☐ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: ARCADIS

Date/Time: 3/23/05 8:15

Order #: 5C23003

Initials: CH

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	1.5 C
Shipping container/cooler in good condition?	(Yes)	No	
Custody Seals intact on shipping container/cooler?	(Yes)	No	Not present
Custody Seals intact on sample bottles?	(Yes)	No	Not present
Chain of custody present?	(Yes)	No	
Sample Instructions complete on Chain of Custody?	(Yes)	No	
Chain of Custody signed when relinquished and received?	(Yes)	No	
Chain of custody agrees with sample label(s)	(Yes)	No	
Container labels legible and intact?	(Yes)	No	
Sample Matrix and properties same as on chain of custody?	(Yes)	No	
Samples in proper container/bottle?	(Yes)	No	
Samples properly preserved?	(Yes)	No	
Sample bottles intact?	(Yes)	No	
Preservations documented on Chain of Custody?	(Yes)	No	
Containers documented on Chain of Custody?	(Yes)	No	
Sufficient sample amount for indicated test?	(Yes)	No	
All samples received within sufficient hold time?	(Yes)	No	
VOC samples have zero headspace?	(Yes)	No	Not Applicable

Other observations:

_____

_____

_____

Variance Documentation:

Contact Person: _____ Date/Time: _____ Contacted by: _____

Regarding:

_____

_____

_____

Corrective Action Taken:

_____

_____

_____

_____

_____

_____

_____

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