1R-427-01

WORKPLANS

Date:
1-13-12

Rice Environmental Consulting & Safety
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

CERTIFIED MAIL
RETURN RECEIPT NO. 7008 1140 0001 3070 6174

January 13th, 2011

Mr. Edward Hansen
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: **ICP Report and Corrective Action Plan (CAP)**
Rice Operating Company – EME SWD System
EME K-35 (1R427-01): UL/K sec. 35 T20S R36E

Mr. Hansen:

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the EME Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the 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 Parties, who provide all operating capital on a percentage ownership/usage basis.

Background and Previous Work

The site is located approximately 7.5 miles southwest of Monument, New Mexico at UL/K sec. 35 T20S R36E as shown on the Site Location Map (Figure 1). NM OSE records indicated that groundwater would likely be encountered at a depth of approximately 122 +/- feet. However, soil bore installation activities performed at the site showed that there was no groundwater located beneath the site.

In 2003, ROC initiated work on the former EME K-35 junction box. The site was delineated using a backhoe and soil samples were screened at regular intervals for chlorides. From the excavation, the four-wall composite, the bottom composite and the remediated soil were taken to a commercial laboratory for analysis. Laboratory tests of the four-wall composite showed a chloride reading of 922 mg/kg and gasoline range organics (GRO), diesel range organics (DRO) and BTEX readings of non-detect. The bottom composite showed a chloride laboratory reading of 939 mg/kg and GRO, DRO and BTEX readings of non-detect. Laboratory analysis of the remediated soil showed a chloride reading of 549 mg/kg and GRO, DRO and BTEX readings of non-detect. At 12-11 ft bgs, a 1 ft clay layer was installed to inhibit chloride migration through the vadose zone. The approximate dimensions of the clay layer are 21x27 ft. The area was

backfilled, contoured to the surrounding landscape and a new water tight junction box was placed at the site. NMOCD was notified of potential groundwater impact on March 4th, 2003 and a junction box disclosure report was submitted to NMOCD with all the 2003 junction box closures and disclosures.

ICP Investigative Results

As part of the Investigation and Characterization Plan (ICP) approved by NMOCD on November 17th, 2011, one soil bore was advanced through the former junction box site to a depth of 140 ft bgs on December 12th, 2011 (Figure 2). RECS personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector for hydrocarbons. Representative samples from the bore were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix A). Laboratory chloride numbers peaked at 95 ft bgs with a reading of 1,070 mg/kg and declined to 256 mg/kg at 120 ft bgs. GRO and DRO laboratory readings were non-detect throughout the bore.

Red bed clay was encountered at 85 ft bgs, which indicated the bottom of the aquifer. Since no groundwater was encountered, the bore was advanced to 140 ft bgs and packed open for 48 hours to allow any possible groundwater to accumulate. On December 14th, 2011, Harrison & Cooper Drilling, Inc. were on site to gauge the bore for groundwater accumulation. They found no water in the bore (Appendix B).

Corrective Action Plan

RECS submits the following as a Corrective Action Plan based on the data collected during the Investigation and Characterization phase of delineation.

Since there is no groundwater at the site, the former junction box will in no way contribute to the degradation of groundwater. The site has an existing clay barrier with approximate dimensions of 21x27 ft installed from 12-11 ft bgs, which will impede migration of residual chlorides and hydrocarbons. As such, RECS recommends that ROC scrape the site to approximately 6 inches to 1 foot to remove all rock and break up the soil for seeding. The site will then be backfilled with clean soil to bring it back up to the surrounding area. Soil amendments will be added as necessary to promote vegetative growth and the site will be seeded with native vegetation. The site will be expected to return to normal vegetative capacity. Vegetation will act as an evapo-transpiration barrier which will also inhibit the downward movement of chlorides and hydrocarbons. Plants capture water through their roots and so reduce the amount of water infiltrating below the root zone.

Upon completion of the CAP work elements, we anticipate ROC will submit a written report which will include a request for "remediation termination" of the regulatory file.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-9174 or me if you have any questions or wish to discuss the site.

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

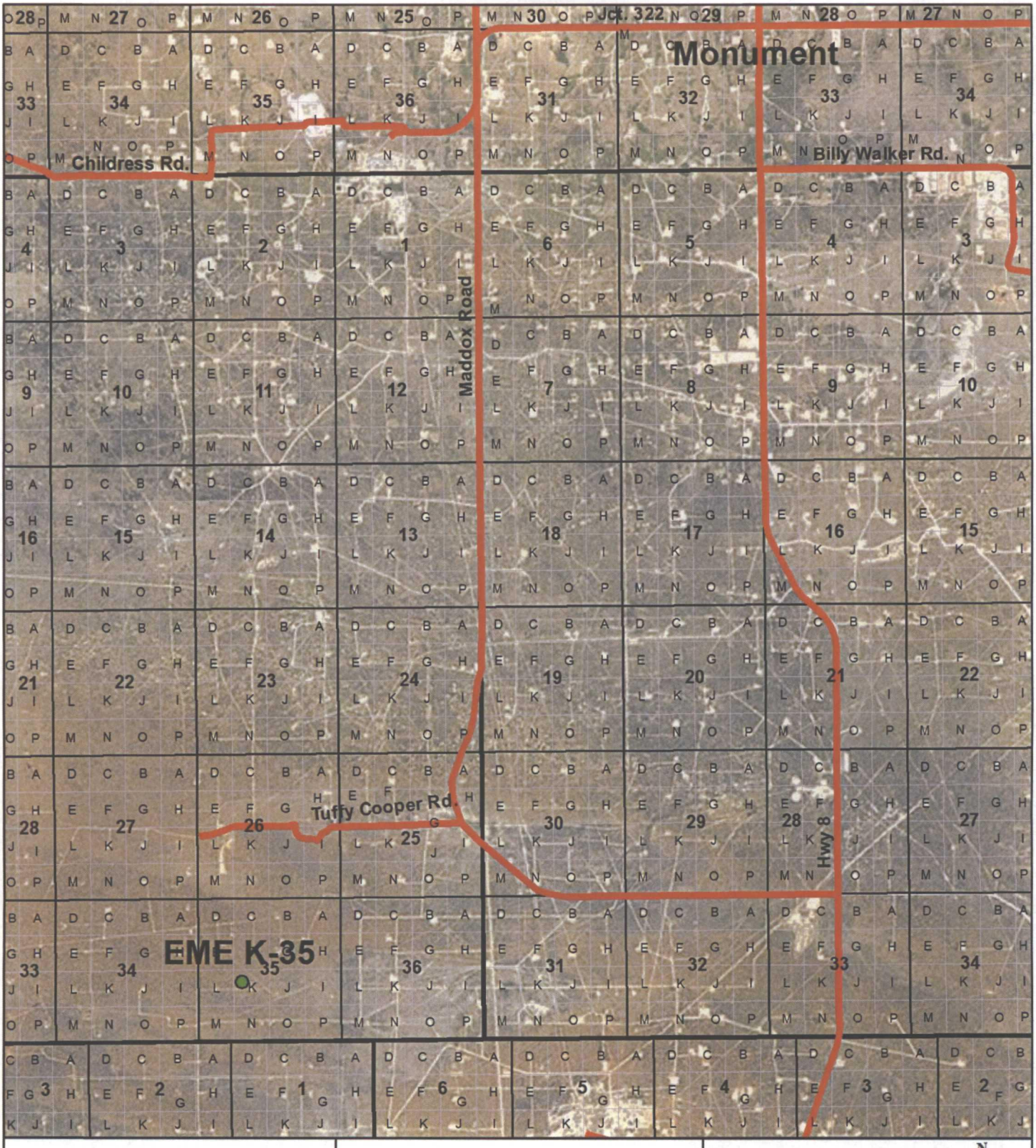
Attachments:

Figure 1 – Site Location Map
Figure 2 – Soil Bore Installation Map
Appendix A – Soil Bore Log and Laboratory Confirmation
Appendix B – Letter of Bore Hole Condition

Figures

RICE Environmental Consulting and Safety (RECS)
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

Site Location



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

EME K-35

LEGALS: UL/K sec. 35
T-20-S R-36-E

NMOCD Case #: 1R427-01

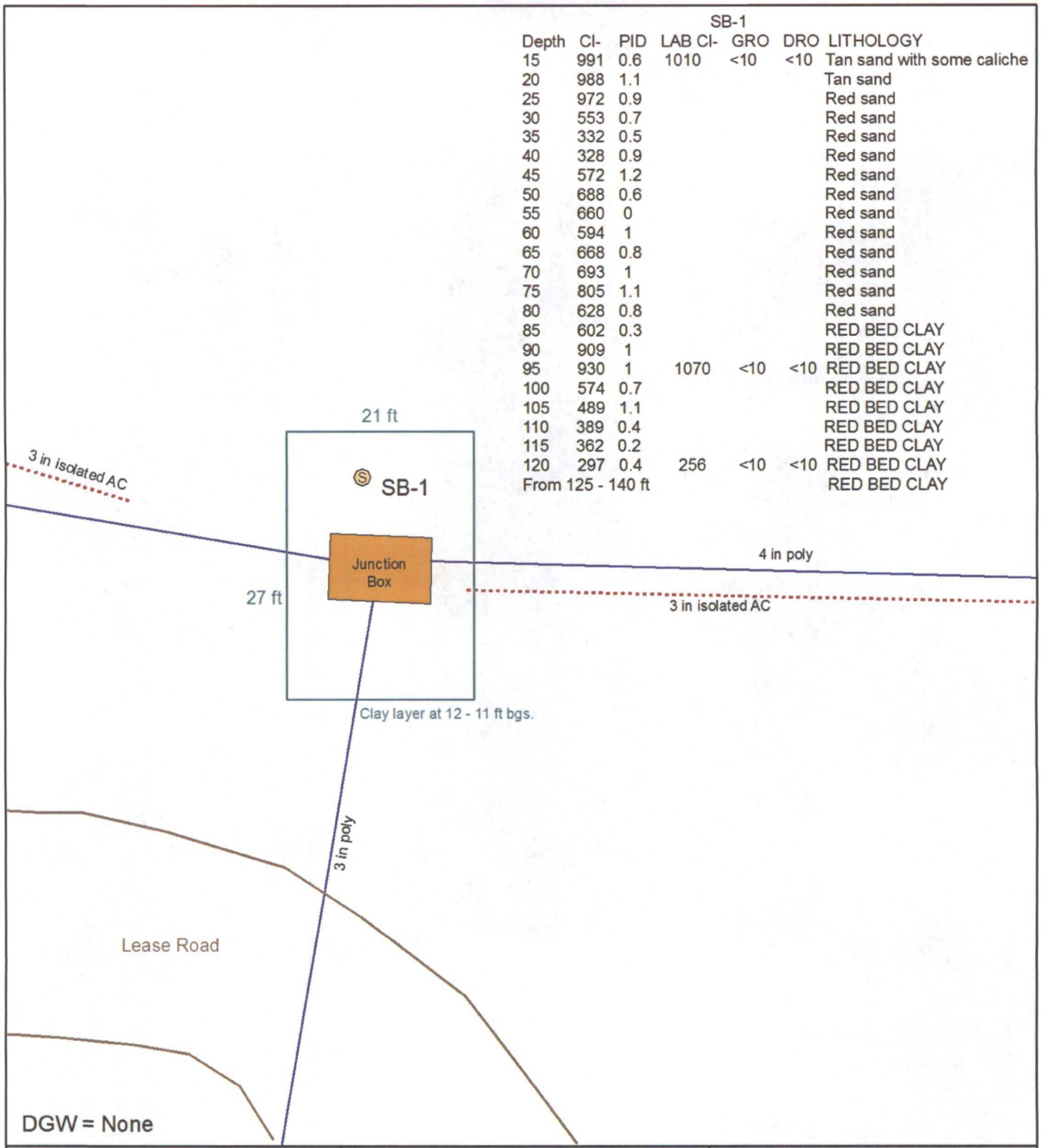
Figure 1

N
W E
S

0 0.3 0.6 1.2
Miles

Drawing date: 10/31/11
Drafted by: L. Weinheimer

Soil Bore Installation



SB-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO	LITHOLOGY
15	991	0.6	1010	<10	<10	Tan sand with some caliche
20	988	1.1				Tan sand
25	972	0.9				Red sand
30	553	0.7				Red sand
35	332	0.5				Red sand
40	328	0.9				Red sand
45	572	1.2				Red sand
50	688	0.6				Red sand
55	660	0				Red sand
60	594	1				Red sand
65	668	0.8				Red sand
70	693	1				Red sand
75	805	1.1				Red sand
80	628	0.8				Red sand
85	602	0.3				RED BED CLAY
90	909	1				RED BED CLAY
95	930	1	1070	<10	<10	RED BED CLAY
100	574	0.7				RED BED CLAY
105	489	1.1				RED BED CLAY
110	389	0.4				RED BED CLAY
115	362	0.2				RED BED CLAY
120	297	0.4	256	<10	<10	RED BED CLAY
From 125 - 140 ft						RED BED CLAY

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME K-35

LEGALS: UL/K sec. 35
T-20-S R-36-E

NMOCD Case #: 1R427-01

Figure 2

N W E S

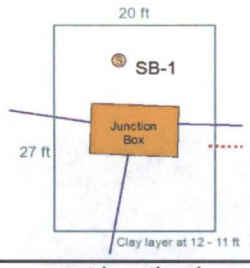
0 5 10 20 Feet

Drawing date: 12/19/11
Drafted by: L. Weinheimer

Appendix A

Soil Bore Log and Laboratory Confirmation

RICE Environmental Consulting and Safety (RECS)
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

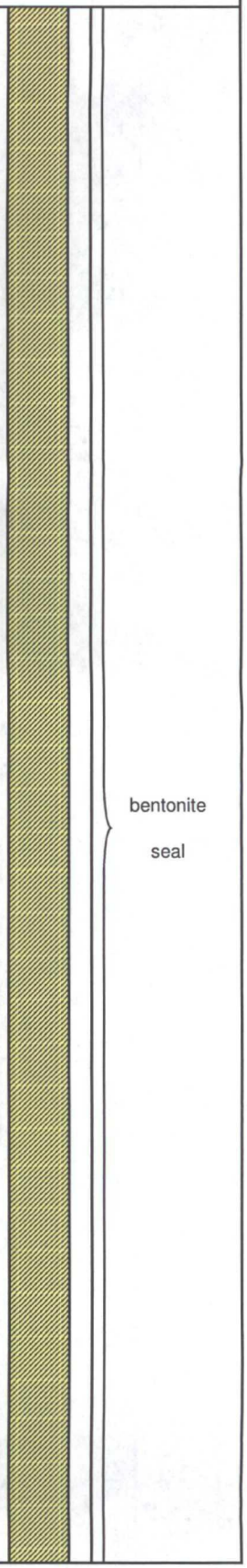
Logger:	Kyle Norman		**Project Name:** EME K-35 **Well ID:** SB-1
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/K sec. 35 T20S R36E
Start Date:	12/12/2011		**Lat:** 32°31'41.943"N **County**: Lea
End Date:	12/12/2011		**Long:** 103°19'42.99"W **State**: NM

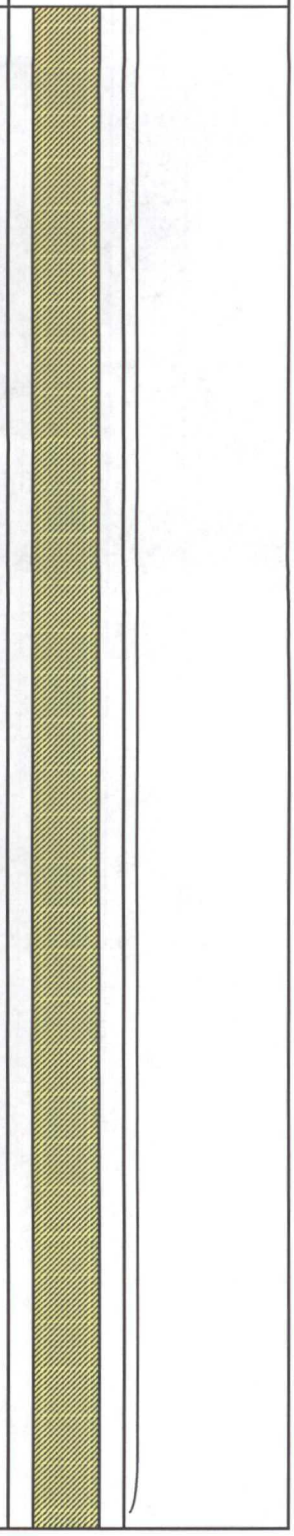
Comments: SB-1 is located 10 ft north of the current junction box. All samples were from cuttings.
DRAFTED BY: L. Weinheimer
TD = 140 ft GW = None

Depth (feet)	Chloride field tests	LAB	PID	Description
				Regolith
SS				
5 ft				
				Tan Sand
10 ft				
				Tan Sand With Some Caliche
15 ft	991	Cl-1010	0.6	
		GRO <10		
		DRO <10		
20 ft	988		1.1	
				Tan Sand
25 ft	972		0.9	
				Red Sand
30 ft	553		0.7	
35 ft	332		0.5	
40 ft	328		0.9	

Lithology

Well Construction

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red Sand		
45 ft	572		1.2			
50 ft	688		0.6			
55 ft	660		0.0			
60 ft	594		1.0			
65 ft	668		0.8			
70 ft	693		1.0			
75 ft	805		1.1			
80 ft	628		0.8			
85 ft	602		0.3			
				Red Bed Clay		
90 ft	909		1.0			
95 ft	930	Cl-1070	1.0			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
		GRO <10		Red Bed Clay		
		DRO <10				
100 ft	574		0.7			
105 ft	489		1.1			
110 ft	389		0.4			
115 ft	362		0.2			
120 ft	297	Cl- 256	0.4			
		GRO <10				
		DRO <10				
125 ft						
130 ft						
135 ft						
140 ft						

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

December 16, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME K-35 20S 36E

Enclosed are the results of analyses for samples received by the laboratory on 12/12/11 17:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	12/12/2011	Sampling Date:	12/12/2011
Reported:	12/16/2011	Sampling Type:	Soil
Project Name:	EME K-35 20S 36E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 1 @ 15' (H102658-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1010**	16.0	12/14/2011	ND	432	108	400	3.77	

TPH 8015M mg/kg **Analyzed By: ZZZ**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/14/2011	ND	183	91.4	200	9.64	
DRO >C10-C28	<10.0	10.0	12/14/2011	ND	214	107	200	6.10	

Surrogate: 1-Chlorooctane	*96.2 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*106 %*	*57.6-158*

Sample ID: SB 1 @ 95' (H102658-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1070**	16.0	12/14/2011	ND	432	108	400	3.77	

TPH 8015M mg/kg **Analyzed By: ZZZ**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/14/2011	ND	183	91.4	200	9.64	
DRO >C10-C28	<10.0	10.0	12/14/2011	ND	214	107	200	6.10	

Surrogate: 1-Chlorooctane	*95.1 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*106 %*	*57.6-158*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	12/12/2011	Sampling Date:	12/12/2011
Reported:	12/16/2011	Sampling Type:	Soil
Project Name:	EME K-35 20S 36E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 1 @ 120' (H102658-03)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**256**	16.0	12/14/2011	ND	432	108	400	3.77	

TPH 8015M mg/kg **Analyzed By: ZZZ**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/14/2011	ND	183	91.4	200	9.64	
DRO >C10-C28	<10.0	10.0	12/14/2011	ND	214	107	200	6.10	

Surrogate: 1-Chlorooctane	*96.0 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*106 %*	*57.6-158*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

Company Name: Rice	BILL TO	P.O. #:	
Project Manager: Hack Conder		Company:	
Address:		Attn:	
City: State: NM Zip:		Address:	
Phone #: Fax #:		City:	
Project #: Project Owner:		State: Zip:	
Project Name:		Phone #:	
Project Location: EME K-35 20S 36E		Fax #:	
Sampler Name: Kyle Norman			

FOR LAB USE ONLY				MATRIX							PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS						
H1D21658																										
1	SB 1 @ 15'	G	1			✓					✓		12-12-11	10:20	✓	✓										
2	SB1 @ 95'	G	1			✓					✓		12-12-11	11:30	✓	✓										
3	SB1 @ 120'	G	1			✓					✓		12-12-11	11:50	✓	✓										

Relinquished By: Kyle N	Date: 12/12/11 Time: 5:00	Received By: Jodi Henson	Phone Result: ☐ Yes ☑ No	Add'l Phone #:	
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☑ No	Add'l Fax #:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No	CHECKED BY: (Initials)	REMARKS: email results kjones@riceswd.com; knorman@rice-ecs.com; Zconder@rice-ecs.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com		

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

#26

Appendix B

Letter of Bore Hole Condition

RICE Environmental Consulting and Safety (RECS)
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

HARRISON & COOPER, INC.

Drilling & Pump Professionals

7414 85th Street, Lubbock, Texas 79424-4951

P.O. Box 96, Wolfforth, Texas 79382-0096

Ph: (806) 866-4026 Fax: (806) 866-4044 hcidrill.com

January 5, 2012

Rice Operating
112 W. Taylor
Hobbs, NM 88240

Attn: Lara Weinheimer

RE: EME K-35
Bore Hole Condition

To whom it may concern:

On December 12, 2011, Harrison and Cooper were contracted by Rice Operating to drill and sample a soil boring at the subject site. The soil boring was drilled to approximately 140 feet in an effort to determine whether or not a saturated interval existed. After a forty-eight hour holdover time the moisture content at that depth was NON-detectable.

If any questions arise from this issue, do not hesitate to contact a representative with Harrison and Cooper.

Sincerely,

Kenny Cooper
Operations Manager

Copies: File
Email (Lara Weinheimer)