1R - 427-14

REPORTS

DATE:

7-19-12

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

CERTIFIED MAIL
RETURN RECEIPT NO. 7007 2560 0000 4569 9576

July 19th, 2012

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: **CAP Report for Groundwater and Termination Request**
Rice Operating Company – EME SWD System
EME D-2 boot (1R427-14): UL/D sec. 2 T20S R36E
Formerly the EME M-35-2 boot

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. The site was previously referred to as the EME M-35-2 boot at T19S R36E. However, GIS mapping shows the site to be located within unit letter D, section 2, Township 20S, and Range 36E. To reflect the geographical location of the site, the name has been changed to the EME D-2 boot at T20S R36E. All correspondence reference EME D-2 boot.

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 4 miles southwest of Monument, New Mexico at UL/D sec. 2 T20S R36E as shown on the Geographical Location Map (Figure 1). Monitor well sampling conducted at the site shows groundwater to be located at 51 +/- feet.

In 2003, ROC initiated work on the former EME D-2 boot junction box. The site was delineated using a backhoe to form a trench and soil samples were screened at regular intervals for both hydrocarbons and chlorides. From the excavation, a bottom grab sample was taken to a commercial laboratory for analysis. Laboratory tests of the 12 ft bottom grab sample showed a chloride laboratory reading of 2,690 mg/kg and negligible GRO (gasoline range organics), DRO (diesel range organics), and BTEX readings. The trench was backfilled with the excavated soils and capped with approximately 3 feet of topsoil.

The area was contoured to the surrounding landscape and an identification plate was placed on the surface of the site to mark its location for future environmental considerations. NMOCD was notified of potential groundwater impact on July 31st, 2003 and a junction box disclosure report was submitted to NMOCD with all the 2003 junction box closures and disclosures.

As part of the Investigation and Characterization Plan (ICP) approved by NMOCD on September 13th, 2011, eight soil bores were advanced through the former junction box site on August 29th and 31st, 2011. ROC personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID) for hydrocarbons. Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. Laboratory readings showed chloride numbers increasing with depth at the source bore, SB-1. In all the other bores, laboratory chloride readings decreased with depth. Laboratory GRO and DRO readings were low to non-detect in all the soil bores except for SB-4 at 5 ft bgs. In SB-4 at 5 ft bgs, the laboratory GRO reading was 67.2 mg/kg and the DRO reading was 556 mg/kg. Because the field sample for SB-4 at 5 ft bgs had a PID reading above 100 ppm, the sample was also submitted for BTEX analysis. The sample returned with a laboratory benzene reading of non-detect, a toluene reading of 0.153 mg/kg, an ethyl-benzene reading of 0.495 mg/kg and a xylene reading of 1.58 mg/kg.

On October 27th and 28th, 2011, two monitor wells and two additional soil bores were installed at the site. MW-1 is located 50 ft southeast of the former junction box and MW-2 is located 163 ft northwest of the former junction box site. As MW-2 was being installed, RECS personnel field tested the soil for chlorides and screened in the field with PID meter for hydrocarbons to determine background soil concentrations. As SB-9 and SB-10 were being advanced, RECS personnel field tested the soil for chlorides and screened in the field with a PID meter for hydrocarbons. Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. In SB-9, chloride numbers peaked at 10 ft bgs with a laboratory chloride reading of 2,240 mg/kg and decreased to 304 mg/kg at 45 ft bgs. In SB-10, chloride numbers peaked at 30 ft bgs with a laboratory chloride reading of 1,100 mg/kg and decreased to 304 mg/kg at 45 ft bgs. In both soil bores, GRO and DRO readings were non-detect.

An ICP Report and Corrective Action Plan (CAP) was submitted to NMOCD on November 9th, 2011 and approved on November 21st, 2011. In the report, RECS recommended that ROC install a 20-mil reinforced poly liner measuring 51 ft x 62 ft. The liner would act as an infiltration barrier that would inhibit the downward migration of chlorides to groundwater. Beginning on March 16th, 2012, RECS personnel excavated the site to 51 ft x 62 ft x 5 ft deep and installed the 20-mil reinforced poly liner throughout the excavation. The top and the bottom of the liner were padded with six inches of clean, imported soil and the excavation was backfilled with clean, imported caliche to two ft bgs. The remaining two feet were backfilled with clean, imported sand and then the site was seeded with a blend of native vegetation. A silt net fence was placed around the site to maintain seed integrity. Vegetation above the liner also

provides a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

On May 16th, 2012, ROC submitted a CAP Report for Vadose Zone Remediation and Proposed Groundwater Remedy to NMOCD which was approved on June 6th, 2012. Based on monitor well sampling at the site, it was evident that although the site is in a regionally impacted chloride area, the chlorides in the vadose zone have contributed slightly to the degradation of groundwater beneath the site. Therefore, ROC proposed to remove chloride impacted groundwater from the existing groundwater recovery system located at EME L-6. Removed water would be used for pipeline and well maintenance. The estimate conservatively reflected the net impact to groundwater at the site resulting from the former junction box site. It did not take into account other sources or regional conditions that may have existed up gradient from the site. The estimated chloride mass beneath the site was determined to be 269 kg and the system at EME L-6 was expected to remove the mass with 178 barrels over 12 days.

CAP Report for Groundwater

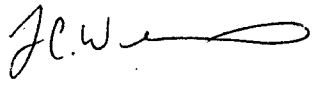
Groundwater recovery began at the EME L-6 on June 11th, 2012 and was completed on June 18th, 2012. During the recovery process, a total of 250 barrels of groundwater was extracted from the aquifer. Given that the RW-1 at EME L-6 had a chloride concentration of 10,200 mg/L (Appendix A), the 250 barrels equates to 405 kg of chlorides extracted from the aquifer.

ROC has completed the corrective actions as approved by NMOCD in the CAPs by installing a properly seating a 20-mil reinforced liner measuring 51 ft x 62 ft x 5 ft deep and by removing the necessary 269 kg of chlorides the site contributed to groundwater. Therefore, ROC requests 'remediation termination' status of the regulatory file.

Upon NMOCD's approval of this report, MW-1 will be plugged and abandoned with a 1-3 % bentonite/concrete slurry with a three foot concrete cap. The up-gradient well, MW-2, will remain open and will be used to monitor groundwater impact in the area.

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

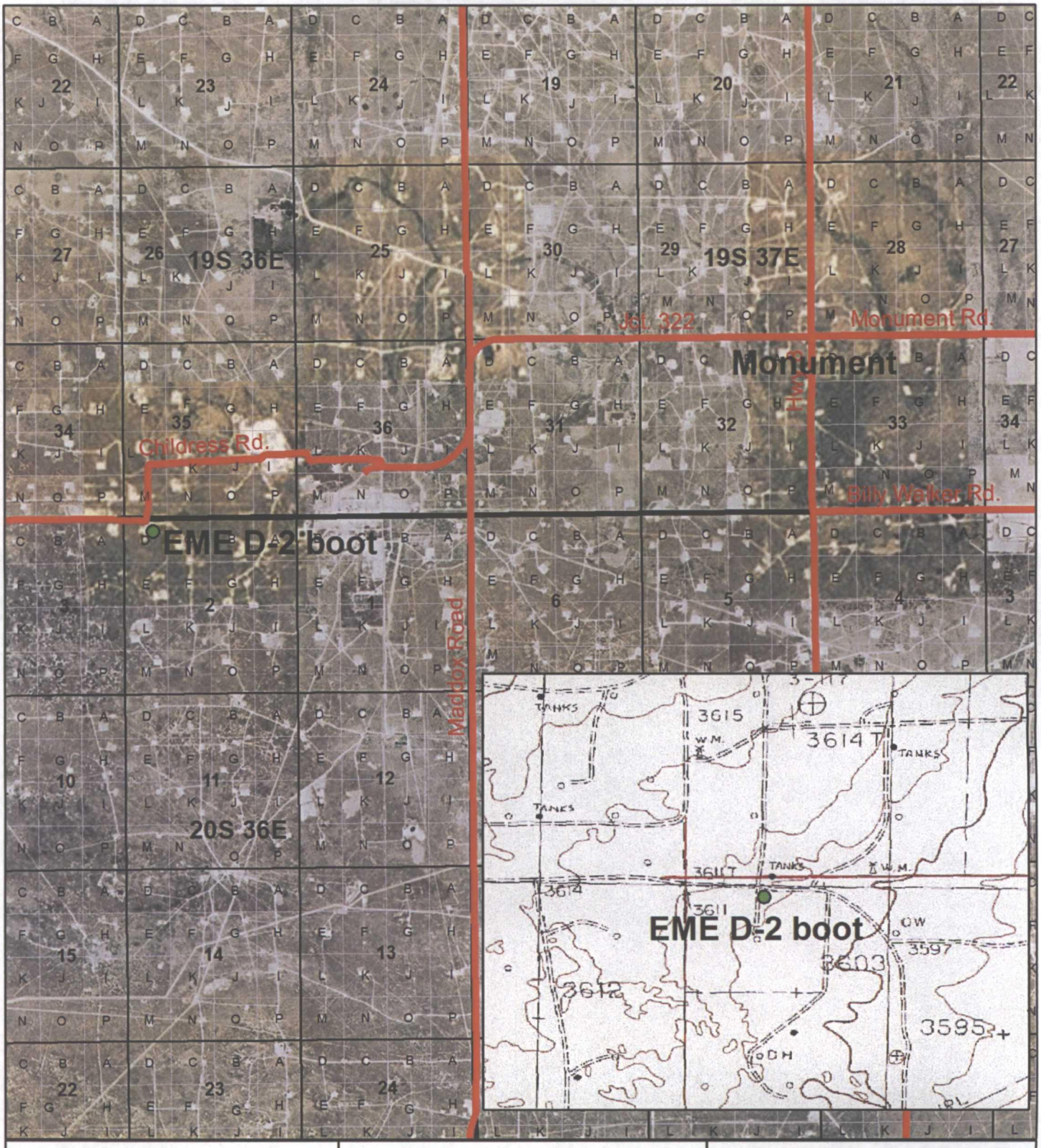
Attachments:

Figure 1 – Geographical Location Map
Appendix A – EME L-6 RW-1 Sampling Lab

Figures

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

Geographical Location Map



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME D-2 boot

LEGALS: UL/D sec. 2
T20S R36E

Case#: 1R427-14

Figure 1

N
W E
S

0 0.3 0.6 1.2
Miles

Drawing date: 8-3-11
Drafted by: L. Weinheimer

Appendix A

EME L-6 RW-1 Sampling Lab

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Phone 575.393.4411 Fax 575.393.0293

CARDINAL Laboratories

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

May 22, 2012

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME L-6

Enclosed are the results of analyses for samples received by the laboratory on 05/21/12 15:55.

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:	05/21/2012	Sampling Date:	05/21/2012
Reported:	05/22/2012	Sampling Type:	Water
Project Name:	EME L-6	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EME L-6		

Sample ID: WATER FROM RW-1 (H201131-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**10200**	4.00	05/22/2012	ND	100	100	100	3.92	

Sample ID: MW - 2R (H201131-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**10000**	4.00	05/22/2012	ND	100	100	100	3.92	

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

Cardinal Laboratories

*=Accredited Analyte

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**	
Project Manager: Hack Conder		P.O. #:	
Address:		Company:	
City: Hobbs	State: NM Zip: 88240	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location: EME L-6		Phone #:	
Sampler Name: Kyle Norman		Fax #:	

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					
H201131																									
1	RW-1	G	1	✓									5-21-12	9:55	✓										
2	MW-2 R	G	1	✓									5-21-12	10:00	✓										

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.

Relinquished By: Kyle N	Date: 5-21-12 Time: 3:55	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: zconder@rice-ecs.com Knorman@rice-ecs.com; lpena@riceswd.com Kjones@riceswd.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

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