1R - 427-162

REPORTS

DATE:

4-17-12

Hansen, Edward J., EMNRD

From: Hansen, Edward J., EMNRD
Sent: Tuesday, June 05, 2012 1:00 PM
To: Hack Conder (hconder@riceswd.com)
Cc: Leking, Geoffrey R, EMNRD; Laura Pena (lpena@riceswd.com); Lara Weinheimer (lweinheimer@rice-ecs.com)
Subject: Remediation Plan (1R427-162) Further Information Required - ROC EME Jct G-18 Site

RE: Vadose Zone Remediation & Termination Request for the Rice Operating Company's EME Jct G-18 Site
Unit Letter G, Section 18, T19S, R37E, NMPM, Lea County, New Mexico
Remediation Plan (1R427-162) Further Information Required

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's (ROC) report and request to close the above-referenced site (dated April 17, 2012). The report indicates that additional information is required. Therefore, the OCD cannot approved the termination of the remediation plan at this time:

ROC must continue to monitor for chloride and TDS in the groundwater at MW-1R for at least two additional quarters.

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

Edward J. Hansen
Hydrologist
Environmental Bureau

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 9460

April 17th, 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: **Vadose Zone Remediation and Termination Request**
Rice Operating Company – EME SWD System
EME jct. G-18 (1R427-162): UL/G sec. 18 T19S R37E

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 3 miles northwest of Monument, New Mexico at UL/G sec. 18 T19S R37E as shown on the Site Location Map (Figure 1). Monitor well sampling at the site indicates that groundwater is located at 54 ft bgs.

In 2004, ROC initiated work on the former EME G-18 junction box. The site was delineated using a backhoe and soil samples were screened at regular intervals for both hydrocarbons and chlorides. The excavation reached dimensions of 20 ft x 18 ft x 12 ft below ground surface (bgs) where composite samples were collected for laboratory verification. Laboratory tests of the site resulted in chloride concentrations of 126 mg/kg in the 4-wall, 617 mg/kg in the bottom composite, and 298 mg/kg in the remediated backfill. Gasoline range organics (GRO) readings resulted in concentrations of 392 mg/kg in the 4-wall composite, 939 mg/kg in the bottom composite, and 302 mg/kg in the remediated backfill. Diesel range organics (DRO) ranged from 2690 mg/kg in the 4-wall composite, 6520 mg/kg in the bottom composite and 4570 mg/kg in the remediated backfill. BTEX was present in the 4-wall composite, the bottom composite and remediated backfill. At 6-5 feet bgs, a 1 ft thick clay layer was installed to inhibit further chloride migration and a compaction test was performed on April 16th, 2004. The soils were blended on site and then backfilled into the excavation. 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. A new junction box was not required at the site.

On June 2nd, 2004, a soil bore was drilled at the site to determine the vertical extent of the contamination. Two attempts were made to drill the soil bore; however, the bore could not be advanced past 20 feet due to a hard rock stratum. The 20 feet sample was taken for laboratory verification of the field numbers. The chloride laboratory reading was 896 mg/kg, GRO was non-detect, DRO was 266 mg/kg and BTEX was non-detect. NMOCD was notified of potential groundwater impact on September 14th, 2004 and a junction box disclosure report was submitted to NMOCD with all the 2004 junction box closures and disclosures.

ICP Investigative Results

As part of the Investigation and Characterization Plan approved by NMOCD on September 15th, 2010, five soil bores (SB-1 through SB-5) were advanced through the former junction box site on October 22nd and October 25th, 2010. ROC personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID). Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. Laboratory readings showed chloride numbers ranging from a high of 848 mg/kg at 50 ft bgs in SB-2 to a low of <16 mg/kg at 10 ft bgs in SB-2 and at 15 ft bgs in SB-3. Laboratory readings for GRO showed non-detect in all soil bores except for SB-2, which showed a GRO reading of 132 mg/kg at 10 ft bgs, and in SB-3, which showed a GRO reading of 111 mg/kg at 15 ft bgs. DRO readings showed non-detect in SB-4 and SB-5 and at 50 ft bgs in SB-1. Otherwise, DRO detectable readings ranged from 3,520 mg/kg at 15 ft bgs in SB-3 to 22.3 mg/kg at 50 ft bgs in SB-2.

On December 6th, 2010, three monitor wells were installed at the site. MW-1, the near-source monitor well, and MW-2, the up gradient monitor well, were field tested for chlorides and screened in the field with a photo-ionization detector (PID). Two samples from MW-1 (5 ft and 45 ft bgs) were taken to a commercial laboratory for confirmation of field numbers. MW-1 showed laboratory chloride readings of 16 mg/kg at 5 ft bgs and at 45 ft bgs. Both samples showed GRO readings of non-detect. The 5 ft bgs sample had a DRO reading of non-detect while the 45 ft bgs sample had a DRO reading of 131 mg/kg.

On July 7th, 2011, ROC submitted an ICP Report and Corrective Action Plan (CAP) to NMOCD, which was subsequently approved on July 18th, 2011. In the report, RECS recommended that ROC excavate the site to 44 ft x 49 ft to 4 to 5 ft bgs and properly seat a 20-mil reinforced liner in the bottom of the excavation. The proposed liner would cover the existing clay layer installed at 6 ft bgs and would extend 10 ft beyond SB-2, SB-3, and SB-4 and would extend past SB-4 up to the newly installed concrete junction box. The soils placed above the liner would have a laboratory chloride reading no greater than 500 mg/kg and a field PID measurement below 100 ppm. Excavated soil would be

evaluated for use as backfill and any soil requiring disposal will be properly disposed of at an NMOCD approved facility.

Upon completion of backfilling, the site would be prepared with soil amendments as needed and seeded with native vegetation. Vegetation above the liner would provide 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.

In addition, ROC proposed to conduct a 6-month source removal and test pumping program. The purpose of this pumping program was to determine if groundwater may be restored within a reasonable time and to assist in the evaluation of groundwater alternatives. The near-source monitor well (MW-1) would be plugged and replaced with a 4 inch monitor well. Removed groundwater would be used in pipeline maintenance operations.

Vadose Zone Remediation

On November 23rd, 2011, RECS personnel were on site to begin excavating for the liner installation. The site was excavated to 44 ft x 49 ft x 5 ft deep and the excavated soil was blended on site to use as backfill (Figure 2). A sample of this blended soil was tested in the field for hydrocarbons using a PID meter and returned a result of 4.0 ppm. The sample was then taken to a commercial laboratory for analysis of chlorides and returned a result of 80 mg/kg. Clean soil was imported to the site to pad the liner to protect it from punctures. A sample of the imported soil was PID field tested for hydrocarbons returned a result of 0.6 ppm. The sample was then taken to a commercial laboratory for analysis of chlorides and returned a result of non-detect. The excavation was padded with six inches of the imported sand and then the liner was properly seated into the excavation at approximately 4.5 ft bgs. The liner was padded on top with six inches of imported sand and then backfilled with the blended soil to six inches bgs. The remaining imported soil was used to complete the backfill and to contour the site to the surrounding area. A total of 132 yards of soil was imported to the site to use as padding and as backfill. The remainder of the blended soil, 228 yards, was taken to a NMOCD approved facility for disposal. The site was seeded with a blend of native vegetation and a silt net fence was placed around the area to maintain seed integrity. Documentation of these activities can be found in Appendix A.

Groundwater Remedy

On October 26th, 2011, MW-1 was plugged and abandoned with a 1-3% bentonite/concrete slurry and capped with three feet of concrete. MW-1 was then replaced with a 4 inch well (MW-1R) which was installed 9 ft southeast of the former MW-1 (Figure 3). The monitor well was not sampled as it was installed (Appendix B).

The monitor wells have been sampled quarterly since their installation (Figure 3). During the most recent sampling event on February 14th, 2012, MW-1R had a chloride reading of

192 mg/kg, MW-2 had a chloride reading of 24 mg/kg and MW-3 had a chloride reading of 85 mg/kg (Appendix C).

MW-1R was installed to conduct the NMOCD approved 6-month source removal and test pumping program. However, two quarters of monitor well sampling data showed chloride values below WQCC standards. Therefore, the source removal and test pumping program is not conducive for this site.

ROC has completed the vadose zone remediation approved by NMOCD in the CAP. The NMOCD approved 20-mil reinforced liner will inhibit the further migration of chlorides through the vadose zone to groundwater. The chloride plume beneath the site is limited, as evidenced by the below WQCC standards chloride concentrations in MW-1R, and, in combination with the installation of the liner, will decrease. Therefore, ROC requests 'remediation termination' status of the regulatory file.

Upon NMOCD's approval of this report, the monitor wells (MW-1R, MW-2, and MW-3) will be plugged and abandoned with a 1-3 % bentonite/concrete slurry with a three foot concrete cap.

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

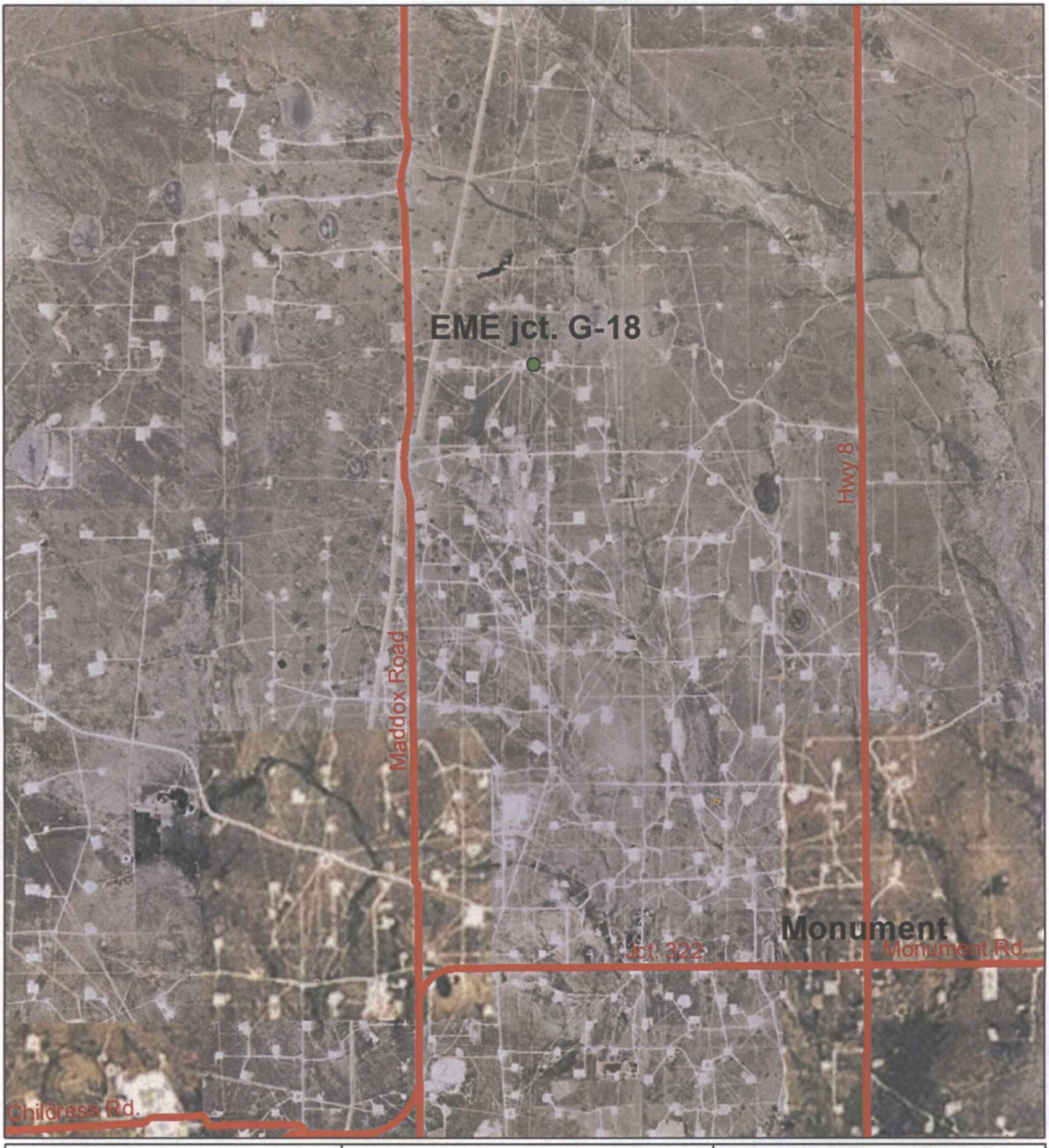
Attachments:

- Figure 1 – Site Location Map
- Figure 2 – NMOCD Approved Liner
- Figure 3 – MW-1R Installation and Monitor Well Sampling
- Appendix A – Liner Installation Documentation
- Appendix B – P& A MW-1 and MW-1R Installation Documentation
- Appendix C – MW Sampling Lab

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
RECS

EME jct. G-18

Legals: UL/G sec. 18
T19S R37E

Case #: 1R427-162

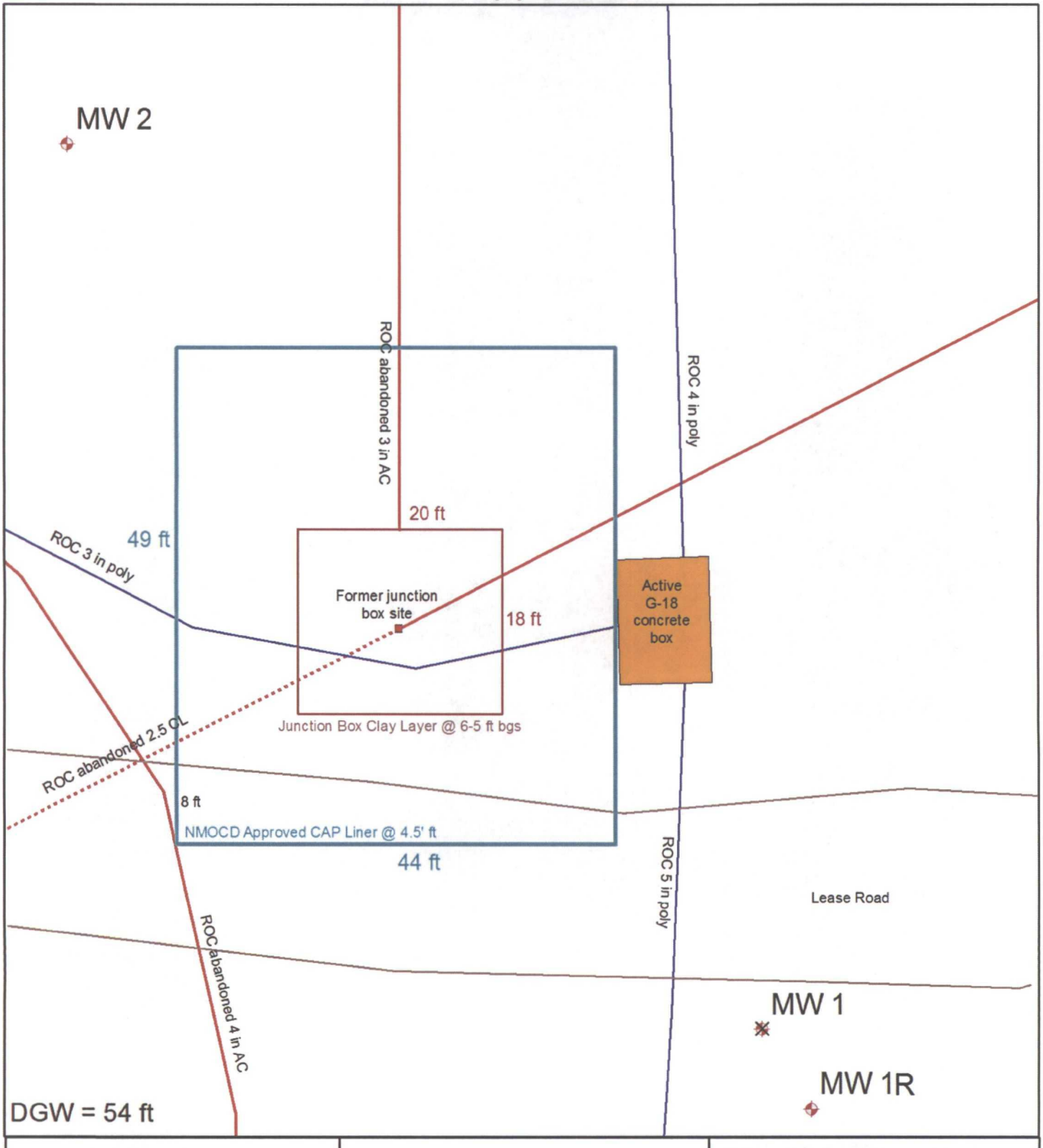
Figure 1

N
W E
S

0 1,500 3,000 6,000
Feet

Drawing date:7-6-11
Drafted by: L. Weinheimer

NMOCD Approved Liner



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME jct. G-18

Legals: UL/G sec. 18
T19S R37E

Case #: 1R427-162

Figure 2

N W E S

0 5 10 20 Feet

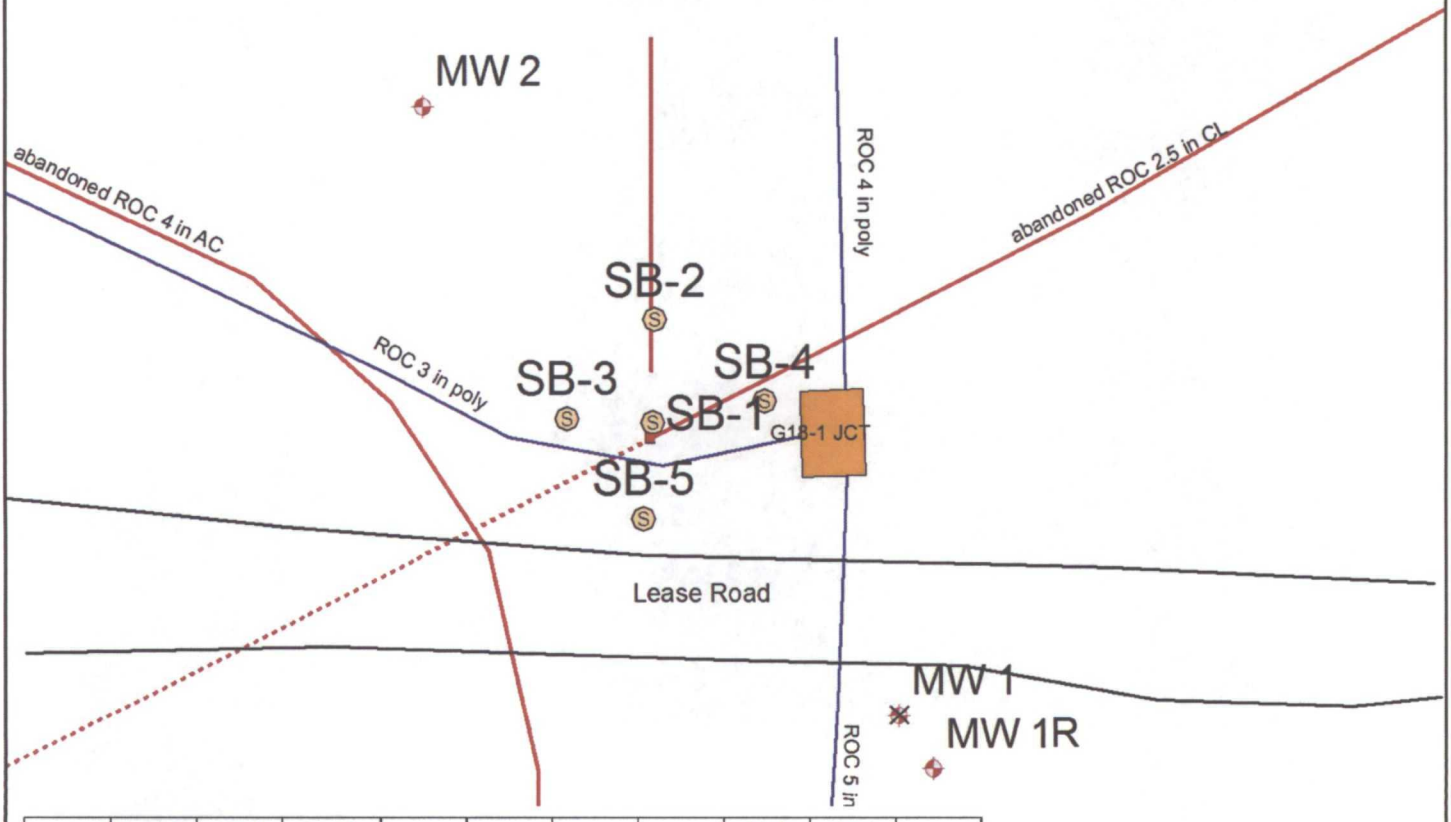
Drawing date: 3-27-12
Drafted by: L. Weinheimer

MW-1R Installation and Monitor Well Sampling

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-1	53.51	68.28	12/28/2010	630	1810	<0.001	<0.001	<0.001	<0.003	308
	53.71	68.28	3/4/2011	470	1670	<0.001	<0.001	<0.001	<0.003	282
	54.11	68.28	5/31/2011	550	1560	<0.001	<0.001	<0.001	<0.003	217
	54.33	68.28	8/29/2011	550	1420	<0.001	<0.001	<0.001	<0.003	174

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-1R	54.4	100.15	11/14/2011	200	768	<0.001	<0.001	<0.001	<0.003	98.2
	54.64	100.15	2/14/2012	192	713	<0.001	<0.001	<0.001	<0.003	78.1

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-2	53.38	70.22	12/28/2010	44	557	<0.001	<0.001	<0.001	<0.003	149
	53.58	70.22	3/4/2011	32	715	<0.001	<0.001	<0.001	<0.003	191
	53.98	70.22	5/31/2011	44	821	<0.001	<0.001	<0.001	<0.003	243
	54.21	70.22	8/29/2011	32	643	<0.001	<0.001	<0.001	<0.003	213
	54.39	70.22	11/14/2011	28	744	<0.001	<0.001	<0.001	<0.003	184
	54.39	70.22	2/14/2012	24	818	<0.001	<0.001	<0.001	<0.003	209



MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-3	52.33	70.2	12/28/2010	140	804	<0.001	<0.001	<0.001	<0.003	134
	52.55	70.23	3/4/2011	80	687	<0.001	<0.001	<0.001	<0.003	97
	52.96	70.23	5/31/2011	80	632	<0.001	<0.001	<0.001	<0.003	94.3
	53.17	70.23	8/29/2011	84	685	<0.001	<0.001	<0.001	<0.003	93.8
	53.34	70.23	11/14/2011	72	708	<0.001	<0.001	<0.001	<0.003	93.2
	53.58	70.23	2/14/2012	85	753	<0.001	<0.001	<0.001	<0.003	99.5

MW 3

DGW = 54 ft

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME jct. G-18

Legals: UL/G sec. 18
T19S R37E

Case #: 1R427-162

Figure 3

N W E S

0 12.5 25 50 Feet

Drawing date:5-9-10
Drafted by: L. Weinheimer

Appendix A

Liner Installation Documentation

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

CARDINAL Laboratories

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

December 06, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME G-18 JCT 19S-37E

Enclosed are the results of analyses for samples received by the laboratory on 12/02/11 16:10.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

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 (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:	12/02/2011	Sampling Date:	12/02/2011
Reported:	12/06/2011	Sampling Type:	Soil
Project Name:	EME G-18 JCT 19S-37E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: 8 PT. BLENDED COMP BACKFILL (H102594-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**80.0**	16.0	12/05/2011	ND	416	104	400	0.00	

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	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 G-18 Sec 19S-37E		Fax #:	
Sampler Name: Kyle Norman			

ANALYSIS REQUEST

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					
H102584																									
- 1	8 point Blended Composite Backfill	C	1			✓							12-2-11	11:30	✓										

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 Norman	Date: 12-2-11 Time: 4:10	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

RICE ENVIRONMENTAL CONSULTING & SAFETY

122 West Taylor Hobbs, NM 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471
PID METER CALIBRATION & FIELD REPORT FORM

CK. MODEL NO.			
		MODEL: PGM 7300	SERIAL NO: 590-000508
	x	MODEL: PGM 7300	SERIAL NO: 590-000504
		MODEL: PGM 7320	SERIAL NO: 592-903318
		MODEL: PGM 7300	SERIAL NO: 590-000183

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO : 930360	EXPIRATION DATE: 5/24/2013
METER READING ACCURACY: 100.0 PPM	

ACCURACY : +/- 2%

COMPANY
Rice

SITE	UNIT	SECTION	TOWN SHIP	RANGE
EME G-18 Jct.	G	18	19S	37E

SAMPLE ID	PID	SAMPLE ID	PID
8 point Blended Backfill	4		

I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

SIGNATURE: Kyle Norma

DATE: 12-2-2011

CARDINAL Laboratories

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

December 08, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME G-18 JCT 19S-37E

Enclosed are the results of analyses for samples received by the laboratory on 12/06/11 15:50.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

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Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (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:	12/06/2011	Sampling Date:	12/06/2011
Reported:	12/08/2011	Sampling Type:	Soil
Project Name:	EME G-18 JCT 19S-37E	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: BLOW SAND COOPERS PIT (H102601-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/07/2011	ND	416	104	400	0.00	

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	
Project Manager:	Mark Conder	P.O. #:	
Address:		Company:	
City:	State: NM Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	EME G-18 Sec 19 T17S R27E	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						
H17210D1																										
-1	Blind Sand Cooper Pit	G	1			1							12-6-11	11:30	✓											

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:	Date: 12-6-11	Received By:	
Kyle Norman	Time: 3:50	Jodi Henson	
Relinquished By:	Date:	Received By:	
	Time:		

Delivered By: (Circle One)	Sample Condition	CHECKED BY:
Sampler - UPS - Bus - Other:	Cool: ☐ Yes ☐ No	Intact: ☑ Yes ☐ No
		(Initials)

Phone Result:	☐ Yes	☑ No	Add'l Phone #:
Fax Result:	☐ Yes	☑ No	Add'l Fax #:

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

RICE ENVIRONMENTAL CONSULTING & SAFETY

122 West Taylor Hobbs, NM 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471
PID METER CALIBRATION & FIELD REPORT FORM

CK. MODEL NO.			
	MODEL: PGM 7300	SERIAL NO: 590-000508	
x	MODEL: PGM 7300	SERIAL NO: 590-000504	
	MODEL: PGM 7320	SERIAL NO: 592-903318	
	MODEL: PGM 7300	SERIAL NO: 590-000183	

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO : 930360	EXPIRATION DATE: 5/24/2013
METER READING ACCURACY: 100.0 PPM	

ACCURACY : +/- 2%

COMPANY
Rice

SITE	UNIT	SECTION	TOWN SHIP	RANGE
EME G-18 Jct.	G	18	19S	37E

SAMPLE ID	PID	SAMPLE ID	PID
Blow Sand Cooper's Pit	0.6		

I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

SIGNATURE:

DATE: 12-6-2011

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

PO Box 5630
Hobbs, NM 88241
Phone: (575) 393-4411
Fax: (575) 393-0293

REVEGETATION FORM

1. General Information

Site name: EME G-18 Jct						
U/L G	Section 18	Township 19S	Range 37E	County Lea	Latitude 32° 39.726'	Longitude 103° 17.374'
Contact Name: Hack Conder						
Email: hconder@rice-ecs.com						
Site size: 52'x39' 2,028 square feet			Map detail of site attached ☒			
Additional information:						

2. Soils **Do not rip caliche subsoils; caliche rocks brought to the surface by ripping shall be removed.*

Salvaged from site ☒	Bioremediated ☐	Imported ☒	Blended ☒	Depth (in):
Texture:	Describe soil & subsoil:	Sandy surface with caliche subsoil		
Soil prep methods:	Rip ☐ Depth(in):	Disc ☐ Depth (in):	Rollerpack ☐	
Date completed: 12/30/2011				

3. Bioremediation

Fertilizer ☐	Hay ☐	Other ☐
Type:		Describe:
Lbs/acre:		

4. Seeding **Attach seed bag tags to this form. Seed bag tags shall contain the site name and S-T-R.*

Custom seed mix ☒	Prescribed mix ☐	Seed mix name: 3 lbs. Blue Grama	Seeding date: 1/4/2012
Broadcast ☒ Method: By Hand			
Soil conditions during seeding: Dry ☒ Damp ☐ Wet ☐			
Photos attached ☐ Number of photos: 1	Observations:		

5. Certification I hereby certify that the information in this form and attachments is true and complete to the best of my knowledge and belief.

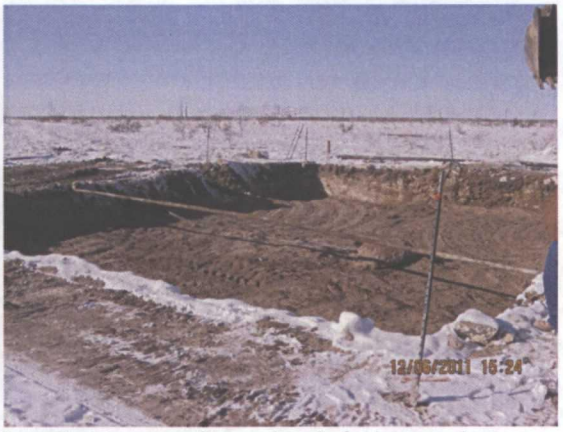
Name: Kyle Norman	Title: Environmental Tech	Date: 1/4/2012
Signature: Kyle Norman		

EME Jct. G-18 (1R427-162)
Unit G, Section 18, T19S, R37E

Site prior to excavation, facing east 10.27.11

Excavating site, facing east 12.1.11

Site excavated to 49x44x5-ft deep, facing north 12.2.11



Installed bottom 6" sand pad, facing northwest 12.6.11

20-mil reinforced plastic liner installed at 4.5 ft BGS, facing northeast 12.7.11

Installing 6" sand pad above liner with imported blow sand, facing east 12.7.11

Exporting soil, facing west 12.8.11

Backfilling with blended backfill, facing south 12.8.11

Importing blow sand, facing south 12.9.11

Backfilling top 6" with blow sand, facing east 12.9.11

Seeding site, facing northeast 1.4.12

Site completed, facing east 4.11.12

Appendix B

P&A MW-1 and MW-1R Installation Documentation

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

Plugging Report

Client	Rice Operating
Contractor	Harrison & Cooper
Date Completed	10/26/2011
Site	EME Jct. G-18
Well ID	MW-1
Casing Diameter	2"
Well Depth	65'
Casing Material	PVC
Plugging Material	Portland/Bentonite Slurry
Slurry Interval	3'-65'
Cement Interval	0'-3'

Copies: File
Email (Lara Weinheimer; Katie Jones)

Logger:	Kyle Norman		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Mud rotary		**Project Name:** EME jct. G-18 **Well ID:** MW-1R
Start Date:	10/26/2011		**Project Consultant:** RECS
End Date:	10/26/2011		

Comments: MW-1R is located 9 ft southeast for MW-1. No samples were taken during installation.

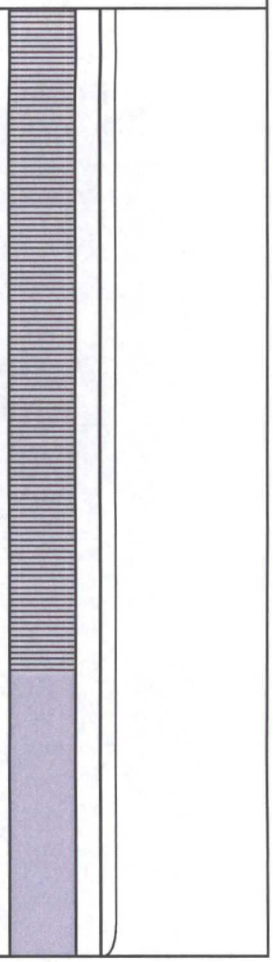
DRAFTED BY: L. Weinheimer

TD = 97 ft GW = 54 ft

Location: UL/G sec. 18 T19S R37E

Lat: 32°39'43.545"N **Long:** 103°17'23.023"W **County**: Lea **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				NO SAMPLES TAKEN		4 in PVC
SS						
5 ft						
10 ft						
15 ft						
20 ft						
25 ft						
30 ft						
35 ft						
40 ft						
45 ft						
50 ft						
55 ft						

Depth (feet)	Chloride field tests	LAB	PID	Description		Lithology		Well Construction
60 ft				NO SAMPLES TAKEN				
65 ft								
70 ft								
75 ft								
80 ft								
85 ft								
90								
95								
97 ft								

EME jct. G-18
Unit G, Section 18, T-19-S, R-37-E

Pulling MW-1, facing west 10/26/11

Plugging MW-1 with a 1 – 3% concrete/bentonite slurry 10/26/11

MW-1 plugged, facing east 10/26/11

Drilling MW-1R, facing northwest 10/26/11

Mudding in MW-1R, facing west 10/26/11

Installing casing in MW-1R, facing west 10/26/11

Adding the sand pack 10/26/11

Placing the bentonite seal 10/26/11

Concreting the well in, facing east 10/26/11

Completed MW-1R, facing west 10/26/11

Appendix C

MW Sampling Lab

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

CARDINAL Laboratories

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

February 29, 2012

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME JUNCTION G-18

Enclosed are the results of analyses for samples received by the laboratory on 02/20/12 10:36.

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:	02/20/2012	Sampling Date:	02/14/2012
Reported:	02/29/2012	Sampling Type:	Water
Project Name:	EME JUNCTION G-18	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC18 G - LEA CTY., NM		

Sample ID: MONITOR WELL #1R (H200450-01)

BTEX 8021B mg/L **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	02/26/2012	ND	0.050	101	0.0500	6.76	
Toluene*	<0.001	0.001	02/26/2012	ND	0.052	104	0.0500	6.98	
Ethylbenzene*	<0.001	0.001	02/26/2012	ND	0.053	106	0.0500	6.60	
Total Xylenes*	<0.003	0.003	02/26/2012	ND	0.163	108	0.150	7.07	

Surrogate: 4-Bromofluorobenzene (PIL *107 %* *70.7-118*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**192**	4.00	02/22/2012	ND	100	100	100	0.00	

Sulfate 375.4 mg/L **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**78.1**	10.0	02/28/2012	ND	18.8	94.0	20.0	9.62	

TDS 160.1 mg/L **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**713**	5.00	02/20/2012	ND	234	97.5	240	0.00	

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:	02/20/2012	Sampling Date:	02/14/2012
Reported:	02/29/2012	Sampling Type:	Water
Project Name:	EME JUNCTION G-18	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC18 G - LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H200450-02)

BTEX 8021B mg/L **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	02/26/2012	ND	0.050	101	0.0500	6.76	
Toluene*	<0.001	0.001	02/26/2012	ND	0.052	104	0.0500	6.98	
Ethylbenzene*	<0.001	0.001	02/26/2012	ND	0.053	106	0.0500	6.60	
Total Xylenes*	<0.003	0.003	02/26/2012	ND	0.163	108	0.150	7.07	

Surrogate: 4-Bromofluorobenzene (PIL *105 %* *70.7-118*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**24.0**	4.00	02/22/2012	ND	100	100	100	0.00	

Sulfate 375.4 mg/L **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**209**	10.0	02/28/2012	ND	18.8	94.0	20.0	9.62	

TDS 160.1 mg/L **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**818**	5.00	02/20/2012	ND	234	97.5	240	0.00	

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:	02/20/2012	Sampling Date:	02/14/2012
Reported:	02/29/2012	Sampling Type:	Water
Project Name:	EME JUNCTION G-18	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC18 G - LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H200450-03)

BTEX 8021B mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	02/26/2012	ND	0.050	101	0.0500	6.76	
Toluene*	<0.001	0.001	02/26/2012	ND	0.052	104	0.0500	6.98	
Ethylbenzene*	<0.001	0.001	02/26/2012	ND	0.053	106	0.0500	6.60	
Total Xylenes*	<0.003	0.003	02/26/2012	ND	0.163	108	0.150	7.07	

Surrogate: 4-Bromofluorobenzene (PIL *107 %* *70.7-118*

Chloride, SM4500Cl-B mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**85.0**	4.00	02/22/2012	ND	100	100	100	0.00	

Sulfate 375.4 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**99.5**	10.0	02/28/2012	ND	18.8	94.0	20.0	9.62	

TDS 160.1 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**753**	5.00	02/20/2012	ND	234	97.5	240	0.00	

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

101 East Marland - Hobbs, New Mexico 88240
Tel (575) 393-2326
Fax (575) 393-2476

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company — PO#
Project Manager: Hack Conder	Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 — Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575)397-1471
Project #:	Project Name: EME Junction G-18
Project Location: T19S-R37E-Sec18 G ~ Lea County - New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY) H20045O	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-1Liter HDPE)	NONE	SAMPLING: DATE (2012)	TIME
1	Monitor Well #1R	G	3	X				2				1		2-14	13:05
2	Monitor Well #2	G	3	X				2				1		2-14	8:55
3	Monitor Well #3	G	3	X				2				1		2-14	10:00

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005/TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																	X	X	X	
	X																	X	X	X	
	X																	X	X	X	

Relinquished by: Rozanne Johnson	Date: 2-20-2012	Time: 10:36	Received by: Jodi Henson — Date: 2/20/12 — Time: 10:36
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff) — Date: — Time:

Phone Results: Yes / No
Fax Results: Yes / No — Additional Fax Number:

REMARKS:

Email Results to: hconder@riceswd.com, lweinheimer@rice-ecs.com, kjones@riceswd.com, rozanne@valornet.com

Delivered By: (Circle One) Sampler - UPS - Bus - Other:

Sample Condition: Cool: Yes ✓ / No — Intact: Yes ✓ / No

CHECKED BY: (Initials)

#26