1R - 427-338

APPROVALS

YEAR(S):

2013

Hansen, Edward J., EMNRD

From: Hansen, Edward J., EMNRD
Sent: Tuesday, March 19, 2013 3:09 PM
To: Hack Conder (hconder@riceswd.com)
Cc: Leking, Geoffrey R, EMNRD; Laura Pena (lpena@riceswd.com); Katie Jones <kjones@riceswd.com> (kjones@riceswd.com); Scott Curtis (scurtis@riceswd.com)
Subject: Remediation Plan (1R427-338) Termination - ROC EME Jct F-10 Site

RE: Termination Request
for the Rice Operating Company's
EME Jct F-10 Site
Unit Letter F, Section 10, T21S, R36E, NMPM, Lea County, New Mexico
Remediation Plan (1R427-338) Termination

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's report and request to close the above-referenced site, dated March 1, 2013 (received March 4, 2013). The reports are acceptable to the OCD.

The above-referenced report, submitted in accordance with 19.15.29 NMAC (Rule 29; formally, Rule 116), indicates that Rice Operating Company has met the requirements of 19.15.29 NMAC; therefore, the OCD approves the report and hereby notifies you that the remediation plan (1R427-338) is terminated in accordance with 19.15.29 NMAC.

Please be advised that OCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

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

Edward J. Hansen
Hydrologist
Environmental Bureau

RICE *Operating Company*
112 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax: (575) 397-1471

CERTIFIED MAIL
RETURN RECEIPT NO. 7007 2560 0000 4569 9262

March 1, 2013

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: Termination Request
EME Jct. F-10 (1R427-338): UL/F, Sec. 10, T21S, R36E
RICE Operating Company – Eunice Monument Eumont SWD System

Mr. Hansen:

Rice Operating Company (ROC) is the service provider (agent) for the EME Saltwater Disposal (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
In 2010, ROC initiated work on the former F-10 junction box. The site is located in UL/F, Sec. 10, T21S, R36E. NM OSE records indicate that groundwater would likely be encountered at a depth of approximately 200 +/- feet. The site was delineated using a backhoe to collect soil samples at regular intervals, creating a 30x30x12 ft deep excavation. Each sample was field titrated for chlorides and field screened using a PID for hydrocarbons, resulting in concentrations that did not relent with depth. The excavated soil was blended on site and representative samples were collected from the excavation walls, bottom and blended backfill and sent to a commercial laboratory for analysis. The 4-wall sample resulted in a chloride concentration of 160 mg/kg and concentrations of gasoline range organics (GRO) and diesel range organics (DRO) below detectable limits. The bottom composite sample resulted in a chloride concentration of 2,120 mg/kg and GRO and DRO concentrations below detectable limits. The blended backfill resulted in a chloride concentration of 432 mg/kg and GRO and DRO concentrations below detectable limits. The blended backfill samples was also analyzed for BTEX, resulting in a benzene, ethyl benzene and total xylenes concentration below detectable limits and a toluene concentration of 0.07 mg/kg.

The excavation was backfilled with the blended backfill to 5 ft below ground surface (BGS). From 5 – 4 ft BGS, a 1 foot thick clay barrier was installed and a compaction test was performed on November 8, 2010. The remaining excavation was backfilled using the blended backfill to 2 ft BGS and clean imported soil was used to backfill the excavation to ground surface and contoured to the surrounding area. On November 11, 2010, the site was seeded with a blend of native vegetation.

To further investigate the depth of chloride presence, a soil bore was initiated on November 18, 2010 at 15 ft east of the former junction box site. The boring was advanced to a depth of 35 ft BGS with soil samples collected every 5 ft. Each sample was field titrated for chlorides and field screened using a PID for hydrocarbons, resulting in concentrations that did relent with depth. The 20 ft and 35 ft samples were sent to a commercial laboratory for analysis. The 15 ft sample resulted in a chloride concentration of 2,280 mg/kg and GRO and DRO concentrations below detectable limits. The 35 ft sample resulted in a chloride concentration of 128 mg/kg and GRO and DRO concentrations below detectable limits. The entire bore hole was plugged with bentonite to ground surface.

A junction box is no longer needed at the site. The site is adjacent to a working lease road and facility, so no re-vegetation efforts are needed.

The junction box site location map, final report, photodocumentation, soil bore log, laboratory analysis, PID sheet, compaction test, hydraulic conductivity, proctor, cross-section diagram, chloride graph and current photodocumentation are attached.

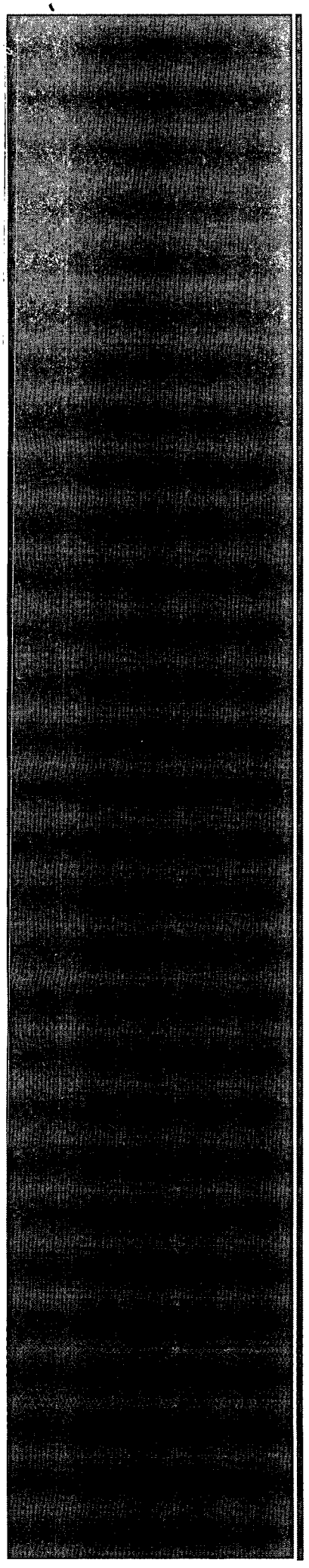
Recommendations
Site investigation demonstrates that residual chloride and hydrocarbons in the vadose zone will not with reasonable probability contaminate groundwater in excess of NMOCD standards. This site meets the requirements of the NMOCD-approved Revised Junction Box Upgrade Work Plan (July 16, 2003). As such, ROC request termination of the regulatory file, or similar closure status.

Please contact me at (575)393-9174 if you have any questions or wish to discuss this site. Thank you for your time and consideration.

Sincerely,
RICE Operating Company

Hack Conder
Environmental Manager

enclosures



Site Location Map

RICE *Operating Company* (ROC)
112 West Taylor Hobbs, NM 88240
Phone: (575) 393-9174 Fax: (575) 397-1471

Site Location Map

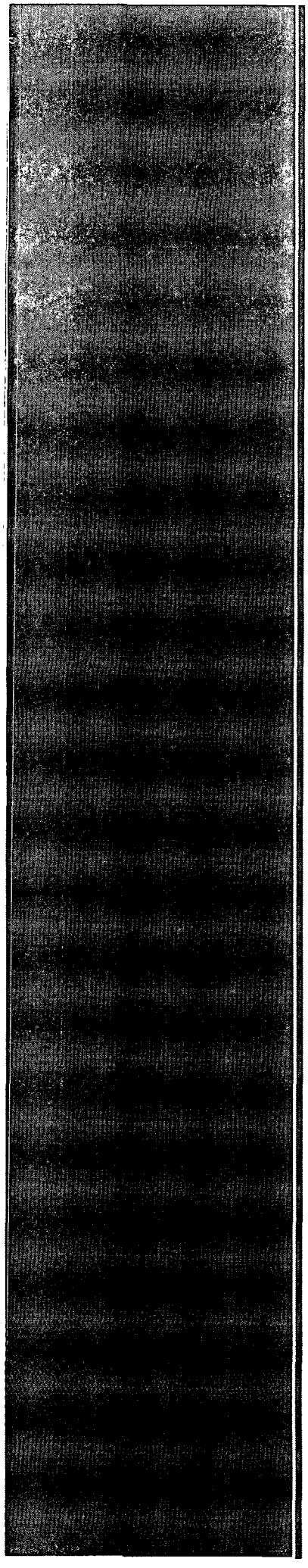
RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME Jct. F-10 (1R427-338)

UL F, Sec. 10,
T-21-S, R-36-E
LEA COUNTY, NM

N
W E
S

0 0.9 1.8 Miles



Junction Box Report

RICE *Operating Company* (ROC)
112 West Taylor Hobbs, NM 88240
Phone: (575) 393-9174 Fax: (575) 397-1471

RICE OPERATING COMPANY
JUNCTION BOX FINAL REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET
Eunice Monument Eumont (EME)	Jct. F-10	F	10	21S	36E	Lea	Eliminated

LAND TYPE: BLM ___ STATE ___ FEE LANDOWNER Millard Deck OTHER ___

Depth to Groundwater 200 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20*

Date Started 10/15/2010 Date Completed 11/18/2010 OCD Witness no

Soil Excavated 400.0 cubic yards Excavation Length 30 Width 30 12 feet

Soil Disposed 286 cubic yards Offsite Facility Sundance Location Eunice, NM

FINAL ANALYTICAL RESULTS:

Sample Date 10/26/2010, 11/18/2010 **Sample Depth** 12 ft, 15 ft, 35 ft

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH, BTEX and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Total Xylenes mg/kg	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	57.3	N/A	N/A	N/A	N/A	<10.0	<10.0	160
BOTTOM COMP.	6.7	N/A	N/A	N/A	N/A	<10.0	<10.0	2120
BACKFILL	104	<0.050	0.07	<0.050	<0.150	<10.0	<10.0	432
SB # 1 @ 15ft	0.1	N/A	N/A	N/A	N/A	<10.0	<10.0	2280
SB # 1 @ 35ft	0	N/A	N/A	N/A	N/A	<10.0	<10.0	128

General Description of Remedial Action: This junction and line were eliminated during the pipeline replacement/upgrade program. After the former junction box was removed, an investigation was conducted using a backhoe to collect soil samples at regular intervals creating a 30X30X12-ft. deep excavation. Chloride field test performed on each sample yielded chloride concentrations that did not relent with depth. Organic vapors were measured using a PID, which yielded some elevated concentrations. 286 yards of excavated soil was hauled to a NMOCD approved facility. The remaining excavated soil was blended on site and representative samples were collected from the blended backfill, the bottom of the excavation, and excavation walls. The representative samples were sent to a commercial laboratory for analysis of chloride, TPH, and BTEX. The excavation was backfilled with the blended backfill to 5 ft. below ground surface (BGS).

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
4-Wall Comp.	n/a	2580
Bottom Comp.	12'	2352
Backfill	n/a	1584
SB at 15' east of the junction box (source)	15'	1889
	20'	950
	25'	273
	30'	178
	35'	181

At 5-4 ft., a 1-ft. thick clay barrier was installed with compaction test performed on 11/08/2010. The remaining excavation was backfilled using the blended backfill to 2 ft. BGS and the remaining excavation was backfilled with clean imported soil to ground surface and contoured to the surrounding area. On 11/11/2010, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. An identification plate was placed on the surface of the former junction box site to mark the presence of clay below. To further investigate the depth of chloride presence, a soil bore was initiated on 11/18/2010 at 15 ft. east of the former junction box. The boring was advanced to a depth of 35 ft. BGS with soil samples collected every 5 ft. between 15-35 ft. Chloride field test performed on each sample yielded chloride concentrations that did relent with depth. Organic vapors were measured using a PID, which yielded low concentrations. The 20 ft. and 35 ft. sample were sent to a commercial laboratory for analysis of chloride and TPH. The entire bore was plugged with bentonite to ground surface.

* Housing and windmill 700 ft. north west

enclosures: photos, soil bore log, lab results, PID (field) screening, compaction results, hydraulic conductivity, proctor, cross-section, chloride curve

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SITE SUPERVISOR Dak Harris SIGNATURE Dak Harris COMPANY RICE OPERATING COMPANY

REPORT ASSEMBLED BY Larry Bruce Baker Jr. INITIAL LBB

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr. DATE 3-23-11

EME Jct F-10

Unit F, Section 10, T21S, R36E

Site prior to delineation 10/15/2010

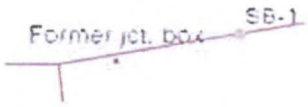
Final Excavation 10/26/2010

Backfilling excavation above clay liner 11/8/2010

Seeding site 11/11/2010

Installing Soil Bore 11/18/2010

Plugging the soil bore with bentonite 11/18/2010

Logger:	Tony Grieco		RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC RECS
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		Project Name: EME jct. F-10 Well ID: SB-1
Start Date:	11/18/2010		
End Date:	11/18/2010		Project Consultant: None
Comments: Located 15 ft east of the former junction box site. DRAFTED BY: L. Weinheimer TD = 35 ft GW = 200 ft			Location: UL/F sec. 10 T21S R36E Lat: 32°29'44.515"N Long: 103°15'25.958"W County: LEA State: NM

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red/tan unconsolidated very fine sand/silt. Scattered large caliche pieces. Dry.		
15 ft	1889	Cl- 2280	0.1			
		GRO <10		Tan unconsolidated very fine sand/silt. Scattered large to medium consolidated pieces. Dry.		bentonite seal
		DRO <10				
20 ft	950		0.1			
25 ft	273		0			
30 ft	178		0			
35 ft	181	Cl- 128	0			
		GRO <10				
		DRO <10				

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:	11/19/2010	Sampling Date:	11/18/2010
Reported:	11/29/2010	Sampling Type:	Soil
Project Name:	EME F-10	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #1 15' (H021354-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2280**	16.0	11/22/2010	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/25/2010	ND	204	102	200	15.6	
DRO >C10-C28	<10.0	10.0	11/25/2010	ND	201	100	200	8.12	
Surrogate: 1-Chlorooctane	*89.0 %*	*70-130*							
Surrogate: 1-Chlorooctadecane	*89.9 %*	*70-130*							

Sample ID: SB #1 35' (H021354-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	11/22/2010	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/25/2010	ND	204	102	200	15.6	
DRO >C10-C28	<10.0	10.0	11/25/2010	ND	201	100	200	8.12	
Surrogate: 1-Chlorooctane	*94.7 %*	*70-130*							
Surrogate: 1-Chlorooctadecane	*94.5 %*	*70-130*							

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES

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: [illegible]
Project Manager: [illegible]
Address: [illegible]
City: [illegible] State: NM Zip: [illegible]
Phone #: [illegible] Fax #: [illegible]
Project #: Project Owner:
Project Name: EME F-12
Project Location:
Sampler Name: [illegible]

BILL TO

P.O. #:
Company:
Attn:
Address:
City:
State: Zip:
Phone #:
Fax #:

ANALYSIS REQUEST

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX: GROUNDWATER, WASTEWATER, SOIL, OIL, SLUDGE, OTHER: ACID/BASE	PRESERV: ICE / COOL, OTHER:	SAMPLING: DATE, TIME	BTEX 8021B	TPH 8015M
[illegible]	[illegible]	G	1	X	X	[illegible]	X	X
2	[illegible]	G	1	X	X	[illegible]	X	X

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 client for 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: [illegible]
Date: [illegible]
Time:
Received By: [illegible]

Relinquished By:
Date:
Time:
Received By:

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

Sample Condition: Cool: Yes / No; Intact: Yes / No
CHECKED BY: (Initials)

Turnaround Time: Standard / Rush
Bacteria (only) Sample Condition: Cool: Yes / No; Intact: Yes / No
Thermometer ID #:
REMARKS:

Results: Yes / No Add'l Phone #:
Fax Results: Yes / No Add'l Fax #:

[illegible]@[illegible].com
[illegible]@[illegible].com
[illegible]@[illegible].com
[illegible]@[illegible].com

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

RICE OPERATING COMPANY

122 West Taylor ~ Hobbs, NM 88240
PHONE: (575) 393-9174 FAX: (575) 397-1471

PID METER CALIBRATION & FIELD REPORT FORM

CK MODEL NO.			
	✓	MODEL: PGM 7300	SERIAL NO: 590-000183
		MODEL: PGM 7300	SERIAL NO: 590-000504
		MODEL: PGM 7600	SERIAL NO: 110-12383
		MODEL: PGM 7600	SERIAL NO: 110-02920

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO: 430152	EXPIRATION DATE: 4/23/13
FILL DATE:	METER READING ACCURACY: 97.1

ACCURACY: +/- 2%

SYSTEM	SITE	UNIT	SECTION	TOWNSHIP	RANGE
EMI	JCT F-1C	F	10	21S	36E

SAMPLE ID: SB 1

DEPTH	PID
15	0.1
20	0.1
25	0.0
30	0.0
35	0.0

DEPTH	PID

DEPTH	PID

DEPTH	PID

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

Signature _____ Date 4/23/13

SITE MAP

N

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/26/2010	Sampling Date:	10/26/2010
Reported:	11/01/2010	Sampling Type:	Soil
Project Name:	EME JCT F-10 (21/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: 5 PT. BOTTOM COMP @ 12' (H021148-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2120	16.0	10/27/2010	ND	416	104	400	3.92	

TPH 8015M mg/kg Analyzed By: AB

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/27/2010	ND	168	84.1	200	2.09	
DRO >C10-C28	<10.0	10.0	10/27/2010	ND	221	111	200	0.403	

Surrogate: 1-Chlorooctane	*87.8 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*83.3 %*	*70-130*

Sample ID: 4-WALL COMP 30' X 30' (H021148-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	10/27/2010	ND	416	104	400	3.92	

TPH 8015M mg/kg Analyzed By: AB

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/27/2010	ND	168	84.1	200	2.09	
DRO >C10-C28	<10.0	10.0	10/27/2010	ND	221	111	200	0.403	

Surrogate: 1-Chlorooctane	*105 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*101 %*	*70-130*

Cardinal Laboratories *=Accredited Analyte

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
Bruce Baker
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	10/26/2010	Sampling Date:	10/26/2010
Reported:	11/01/2010	Sampling Type:	Soil
Project Name:	EME JCT F-10 (21/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: BLENDED BACKFILL (H021148-03)

BTEX 8021B mg/kg **Analyzed By: cms**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/29/2010	ND	2.05	102	2.00		
Toluene*	**0.070**	0.050	10/29/2010	ND	1.85	92.4	2.00		
Ethylbenzene*	<0.050	0.050	10/29/2010	ND	1.75	87.3	2.00		
Total Xylenes*	<0.150	0.150	10/29/2010	ND	5.25	87.4	6.00		

Surrogate: 4-Bromofluorobenzene (PIL *87.3 %* *80-120*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**432**	16.0	10/27/2010	ND	416	104	400	3.92	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/27/2010	ND	168	84.1	200	2.09	
DRO >C10-C28	<10.0	10.0	10/27/2010	ND	221	111	200	0.403	

Surrogate: 1-Chlorooctane *104 %* *70-130*

Surrogate: 1-Chlorooctadecane *99.5 %* *70-130*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES

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

Company Name:
Project Manager:
Address:
City: State: Zip:
Phone #: Fax #:
Project #: Project Owner:
Project Name:
Project Location:
Sampler Name:

BILL TO

P.O. #:
Company:
Attn:
Address:
City:
State: Zip:
Phone #:

ANALYSIS REQUEST

Lab I.D.	Sample I.D.	GRAB/COMP	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	ACID/BASE	ICE/COOL	OTHER	PRESERV	DATE	TIME
H21148-1															
2															
3															

Relinquished By:
Date:
Received By:
Time:
Relinquished By:
Date:
Received By:
Time:
Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition
Cool Intact
Yes Yes
No No

REMARKS:

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

26

RICE OPERATING COMPANY

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
		MODEL: PGM 7300	SERIAL NO: 590-000504
		MODEL: PGM 7320	SERIAL NO: 592-903518
		MODEL: PGM 7300	SERIAL NO: 590-000183

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO: 12F601	EXPIRATION DATE: 9/6/12
METER READING ACCURACY: 100	

ACCURACY : +/- 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
EME	E-10	F	10	21	36

SAMPLE ID	PID	SAMPLE ID	PID
5-pt Bottom Composite	6.7		
4 wall Composite	57.3		
Blended Backfill	103.6		

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

SIGNATURE: [signature] DATE: 10-24-11

LABORATORY TEST REPORT

PETTIGREW & ASSOCIATES, P.A.
1110 N. GRIMES
HOBBS, NM 88240
(575) 393-9827

AASHTO R18
DEBRA P. HICKS, P.E./L.S.I.
WILLIAM M. HICKS, III, P.E./P.S.

To: Rice Operating Company
122 W. Taylor
Hobbs, NM 88240

Material: Wallach Red Clay

Test Method: ASTM: D 2922

Project: EME Junction F-10
Project No. 2010.1333

Date of Test: November 8, 2010

Depth: See Below

Depth of Probe: 12"

Test No.	Location	Dry Density % Max	% Moisture	Depth
SG 1	EME Junction F-10; 10' N. & 15' W. of SE Corner	84.2	18.0	FG

Control Density: 101.1
ASTM: D 698

Optimum Moisture: 19.0%

Required Compaction: 90-95%

Densometer ID: 5071

Lab No.: 10 11054-11055

Copies To: Rice Operating

PETTIGREW & ASSOCIATES

BY: _____

BY: _____ P.E.

Home Office - 1717 East Erwin Street
Tyler, Texas 75702-6398
Office: (903) 595-4421 Lab: (903) 595-6402 Fax: (903) 595-6113
Area Offices
210 Beech Street Texarkana, AR 71854 (870) 772-0013
707 West Cotton St. Longview, TX 75604 (903) 758-0402

Acct ID: PETTIGREW File ID: C4535-101 Date Sampled: 08/19/2010
Report Date: 08/27/2010 Sampled By: Client
Project: Pettigrew Associates - Project #2010.1026, Hobbs, NM By Order Of: Erica Hart
Location: Material Origin: Wallach Pit, Sample Location: N/G Order Number:
Client: Pettigrew & Associates, Hobbs, NM
Contractor: Not Given

REPORT: **FLEXIBLE WALL PERMEAMETER** LAB NO: 9881
Test Method: See Below

TEST RESULTS Report No: 1-1201-000005
Page 2 of 2

TEST READINGS

Z1(Mercury Height Difference @ t1): 5.1 cm Hydraulic Gradient = 9.20

Date	elapsed t (seconds)	Z (pipet @ t)	□□□ (cm)	temp (deg C)	□ (temp corr)	k (cm/sec)	k (ft./day)	Reset = *
8/23/2010	960	6.1	0.5571305	25	0.889	5.01E-08	1.42E-04	
8/23/2010	1200	6	0.6571305	25	0.889	4.78E-08	1.35E-04	
8/23/2010	1500	5.9	0.7571305	25	0.889	4.46E-08	1.26E-04	
8/23/2010	1800	5.8	0.8571305	25	0.889	4.25E-08	1.21E-04	

SUMMARY

ka = 4.62E-08 cm/sec Acceptance criteria = 25 %

ki		Vm	
k1 =	5.01E-08 cm/sec	8.3	%
k2 =	4.78E-08 cm/sec	3.3	%
k3 =	4.46E-08 cm/sec	3.6	%
k4 =	4.25E-08 cm/sec	8.0	%

$$Vm = \frac{|ka - ki|}{ka} \times 100$$

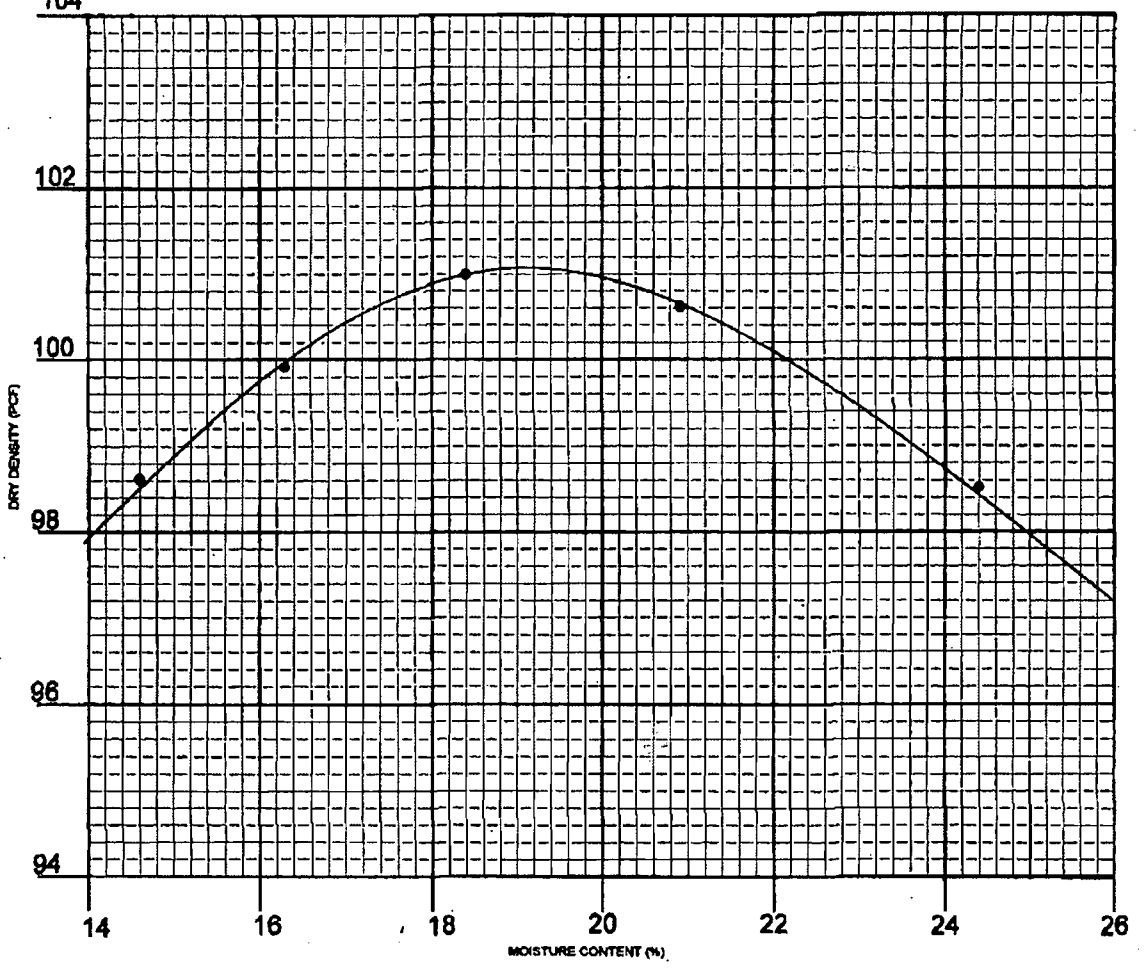
Hydraulic conductivity	k =	4.62E-08	cm/sec	1.31E-04	ft/day
Void Ratio	e =	0.73			
Porosity	n =	0.42			
Bulk Density	□□□	1.84	g/cm3	121.2	pcf
Water Content	W =	0.42	cm3/cm3	(at 20 deg C)	
Intrinsic Permeability	kint =	4.74E-13	cm2	(at 20 deg C)	

Remarks: **These tests were performed solely at the request of the Client for his own use. No warranties are expressed or implied regarding the suitability of the site for construction or whether or not the reported data represents all conditions of the site.**

COPY

Charge: Pettigrew & Associates Attn: Erica Hart
Orig: Pettigrew & Associates, Hobbs, NM Attn: Erica Hart
1-ec Pettigrew & Associates, Hobbs, NM Attn: Erica Hart
E-Mail: ehart@pettigrew.us

PETTIGREW & ASSOCIATES, P.A.
1110 N. GRIMES ST.
HOBBS, NM 88240
(575) 393-9827



General Information

CLIENT: Rice Operating PROJECT: Project No. 2010.1026

SAMPLE LOCATION: Wallach Pit

SOIL DESCRIPTION: Wallach Red Clay

SOIL CLASSIFICATION: _____ TEST METHOD: ASTM: D 698

ATTERBERG: LL ____ PI ____ Sampled & Delivered 8/13/10

DATE: 8/13/10 LAB NO. 10 5904-5906

DRY WEIGHT LB/CU. FT. 101.1 MOISTURE CONTENT % 19.0

SIEVE ANALYSIS - % PASSING									

PETTIGREW & ASSOCIATES

COPY

BY: Erica Hart

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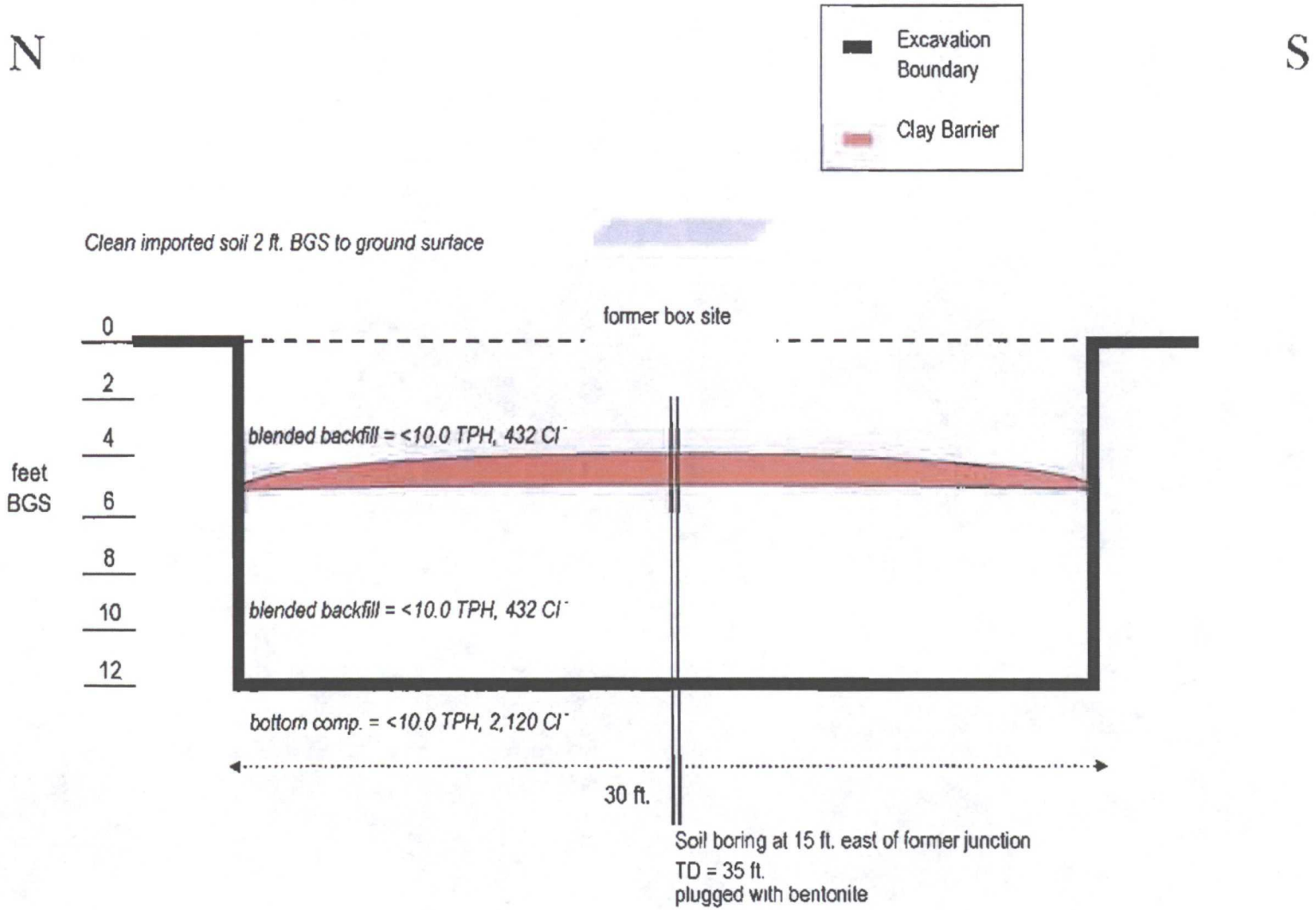
BY: _____ P.E

EME Jct. F-10
Unit 'F', Sec. 10, T21S, R36E

Excavation Cross-Section

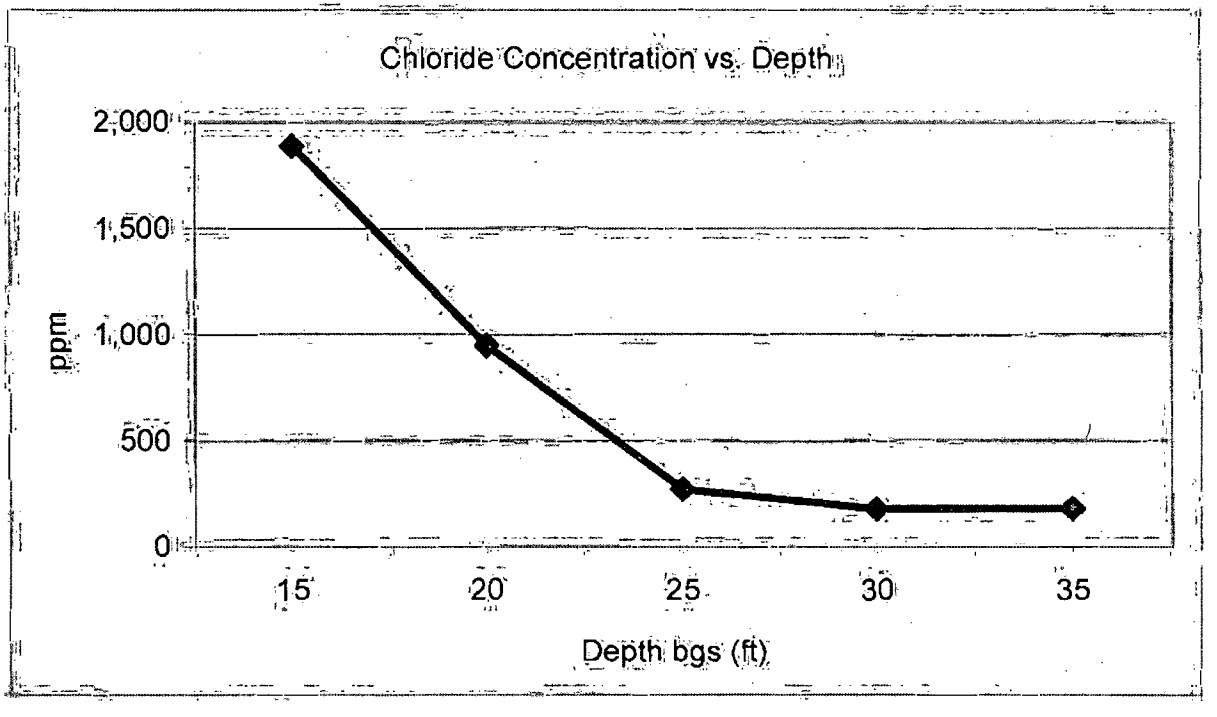


EME Jct. F-10

Unit 'F', Sec. 10, T21S, R36E

Soil bore at 15 ft. east of the junction (source)

Depth bgs (ft)	[Cl] ppm
15	1,889
20	950
25	273
30	178
35	181



Groundwater = 200 ft

Current Photodocumentation

RICE *Operating Company* (ROC)
112 West Taylor Hobbs, NM 88240
Phone: (575) 393-9174 Fax: (575) 397-1471

EME Jct. F-10

UL/F, Section 10, T21S, R36E

Facing west 2/11/2013

Facing east 2/11/2013