1R - 428 - 50

Approved CAP

DATE
January 22, 2015

From:	Lowe, Leonard, EMNRD
To:	"Laura Flores"
Cc:	"Hack Conder"; "Katie Jones"; "Catherine Ursanic"; "Sarah Edwards"; Ed Hansen (ehansen@rice-ecs.com)
Subject:	Approved ROC - Hobbs K-29 EOL boot (1R428-50) CAP
Date:	Thursday, February 05, 2015 9:35:00 AM
Importance:	High

Laura Flores
Project Manager
Rice Environmental Consulting & Safety (RECS)

Correction Action Plan (CAP)
Rice Operating Company (ROC) – Hobbs SWD System
Hobbs K – 29 EOL boot (1R428-50): UL/K, Sec. 29, T18S, R38E

OCD has reviewed the submitted Corrective Action Plan for Hobbs K – 29 EOL Boot **(1R – 428 – 50)**, dated January 22, 2015. OCD approves the Corrective Action Plan.

Please be advised that OCD approval of this plan 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.

Leonard Lowe
Environmental Engineer
[Environmental Bureau]
Oil **C**onservation **D**ivision
Energy **M**inerals and **N**atural **R**esources **D**epartment
1220 South St. Frances
Santa Fe, New Mexico 87004
Office: 505-476-3492
Fax: 505-476-3462
E-mail: leonard.lowe@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/

From: Laura Flores [mailto:lflores@rice-ecs.com]
Sent: Thursday, January 22, 2015 10:04 AM
To: Lowe, Leonard, EMNRD
Cc: 'Hack Conder'; 'Katie Jones'; 'Catherine Ursanic'; 'Sarah Edwards'
Subject: ROC - Hobbs K-29 EOL boot (1R428-50) CAP

Mr. Lowe,

Attached is the CAP for the Hobbs K-29 EOL boot (1R428-50) site.

If you have any questions or require any additional information, please contact Hack Conder, Katie

Jones or me.

Thank you,

Laura Flores
Project Manager
Rice Environmental Consulting & Safety (RECS)

RECS
RICE ENVIRONMENTAL
CONSULTING & SAFETY
PO Box 2948 | Hobbs, NM 88241 | Phone 575.393.2967

January 22, 2015

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

RE: **Corrective Action Plan (CAP)**
Rice Operating Company – Hobbs SWD System
Hobbs K-29 EOL boot (1R428-50): UL/K, Sec. 29, T18S, R38E

Mr. Lowe:

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the Hobbs Salt Water Disposal (SWD) system.

ROC is the service provider (agent) for the Hobbs 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. The system is now abandoned.

Background and Previous Work
The site is located approximately 2.37 miles west of Hobbs, New Mexico at UL/K, Sec. 29, T18S, R38E as shown on the Geographical Location Map (Figure 1). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 64 +/- feet.

An Investigation and Characterization Plan (ICP) was submitted to NMOCD on April 4th, 2008 and approved on May 21st, 2008. According to the ICP, a vertical was installed at the site to a depth of 12 ft below ground surface (bgs). The samples were field tested for chlorides and hydrocarbons, resulting in low chloride concentrations and elevated PID readings. Representative samples of the vertical were taken to a commercial laboratory for analysis. The 8 ft sample had a chloride reading of non-detect, Benzene reading of 0.054 mg/kg, Ethyl Benzene reading of 5.68 mg/kg, Total Xylenes reading of 37.1 mg/kg, and Toulene was non-detect. The 12 ft sample had a chloride reading of 16 mg/kg, Ethyl Benzene of 2.65 mg/kg, Total Xylenes of 24.9 mg/kg, and Benzene and Toulene had readings of non-detect.

To further delineate the site, a soil bore was installed on October 8th, 2008. The bore was drilled to a depth of 60 ft bgs, with soil samples field tested for chlorides and hydrocarbons

at regular intervals. Representative samples from the soil bore were taken to a commercial laboratory for analysis. Chloride concentrations resulted in 112 mg/kg at 30 ft bgs and 384 mg/kg at 50 ft and 60 ft bgs. GRO returned a reading of 1,860 mg/kg at 30 ft bgs but decreased to 30.6 mg/kg at 60 ft bgs. DRO returned a reading of 4,780 mg/kg at 30 ft bgs and decreased to 177 mg/kg at 60 ft bgs. The 30 ft sample had a Benzene reading of 1.16 mg/kg, a Toulene reading of 2.20 mg/kg, an Ethyl Benzene reading of 6.02 mg/kg, and a Total Xylenes reading of 24.1 mg/kg. The 50 ft bgs had a Benzene reading of non-detect, a Toulene reading of 0.315 mg/kg, an Ethyl Benzene reading of 1.21 mg/kg, and a Total Xylenes reading of 6.17 mg/kg. The 60 ft bgs had a Benzene reading of non-detect, a Toulene reading of 0.058 mg/kg, an Ethyl Benzene reading of 0.063 mg/kg, and a Total Xylenes reading of 0.555 mg/kg (Figure 2A).

Two monitoring wells have been installed at the site. The near-source well, MW-1, was installed on June 17th, 2009. Soil samples were collected at regular intervals and field tested for chloride and hydrocarbons. Representative samples were taken to a commercial laboratory for analysis. The 40 ft sample had a chloride reading of 256 mg/kg and a BTEX reading of non-detect. The 50 ft sample had a chloride reading of 272 mg/kg, a Toulene reading of 0.298 mg/kg, an Ethyl Benzene reading of 0.395 mg/kg, a Total Xylenes reading of 6.68 mg/kg and a Benzene reading of non-detect. The 60 ft sample had a chloride reading of 448 mg/kg, a Toulene reading of 0.103 mg/kg, an Ethyl Benzene reading of 0.206 mg/kg, a Total Xylenes reading of 3.11 mg/kg and a Benzene reading of non-detect (Figure 2B). To determine groundwater quality up-gradient of the site, MW-2, was installed on February 3rd, 2012. As the well was being installed, soil samples were collected every 5 ft and field tested for chloride and hydrocarbons. Representative samples were taken to a commercial laboratory for analysis. The chloride reading at 10 ft bgs was 688 mg/kg and decreased to a reading of non-detect at 55 ft bgs. DRO had a reading of 30.6 mg/kg at 10 ft bgs and decreased to 20.5 mg/kg at 55 ft bgs. GRO was non-detectable throughout (Figure 2A). These concentrations observed approximately 105 ft northwest of the site are representative of background concentrations.

To further delineate the site, four soil bores were drilled on November 3rd, 2014. Soil samples were collected at regular intervals, with each sample being field titrated for chloride and analyzed for hydrocarbons using a PID. Representative samples from each bore were analyzed by a commercial laboratory. Chloride concentrations decreased with depth in SB-2, with 2,040 mg/kg at the surface, 192 mg/kg at 15 ft bgs, and 160 mg/kg at 45 ft bgs. GRO and DRO were below detectable limits, except for a DRO reading of 373 mg/kg at 45 ft bgs. Chloride concentrations were low throughout SB-3, with 32 mg/kg at the surface, 352 mg/kg at 10 ft bgs, and 192 mg/kg at 15 ft bgs. GRO and DRO were non-detectable throughout. SB-4 had a chloride concentration of 112 mg/kg, a GRO concentration of 430 mg/kg, and a DRO concentration of 3,420 mg/kg at 15 ft bgs. The 15 ft bgs sample was also analyzed for BTEX, resulting in a Toulene reading of 0.373 mg/kg, an Ethyl Benzene reading of 2.35 mg/kg, a Total Xylenes reading of 12.1 mg/kg, and a Benzene reading of non-detect. The 55 ft sample resulted in a chloride reading of 1,120 mg/kg, a DRO reading of 1,770 mg/kg, a total xylenes reading of 0.774 mg/kg and a GRO, Benzene, Toluene, and Ethyl-Benzene reading below detectable limits. The 60 ft sample resulted in a chloride reading of 1,140 mg/kg, a DRO reading of 350 mg/kg, and readings

of GRO and BTEX below detectable limits. SB-5 had a chloride reading of 672 mg/kg at 5 ft bgs and decreased to 112 mg/kg at 20 ft bgs. GRO and DRO were non-detectable throughout, except for the DRO sample at 20 ft bgs, which resulted in a reading of 1,970 mg/kg. This data is summarized in Figures 2A and 2B and documentation of soil bore installation can be found in Appendix A.

Both wells have been sampled quarterly since installation. Chloride concentrations have remained low the last four quarters, with concentrations below 352 mg/L in MW-1 and below 72 mg/L in MW-2 since installation. The most recent sampling event, collected on December 17th, 2014, resulted in a chloride concentration of 300 mg/L in MW-1 and 68 mg/L in MW-2. BTEX concentrations have remained below detectable limits since installation of each well (Appendix B).

Corrective Action Plan

Based on the additional soil data, RECS recommends that ROC install a 20-mil reinforced poly liner with dimensions of 63 ft x 53 ft at a depth of 4–5 ft bgs (Figure 2A and 2B). The liner will inhibit the downward migration of residual constituents through the vadose zone. The excavation will be backfilled to ground surface with soil with a laboratory chloride reading no greater than 500 mg/kg and a field PID measurement below 100 ppm. Excavated soils will be evaluated for use as backfill and any soils that do not meet requirements will be properly disposed of at a NMOCD approved facility. The backfilled site will be seeded with a blend of native vegetation, and soil amendments will be added as necessary. Vegetation above the liner will provide a natural infiltration barrier for the site. Plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

In order to fully delineate groundwater quality, RECS recommends that ROC continue to monitor and quarterly sample MW-1 and MW-2 through 2015. Once groundwater quality has been determined, if warranted, a groundwater remedy will be submitted.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-2967 or me if you have any questions or wish to discuss the site.

Sincerely,

L Flores

Laura Flores
Project Manager
RECS

Attachments:

Figure 1 – Geographical Location Map
Figure 2A and 2B – Soil Bore Installation and Proposed Liner Map
Appendix A – Soil Bore Installation Documentation
Appendix B – MW-1 and MW-2 data

Figures

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

Geographical Location Map

RECS
RICE ENVIRONMENTAL
CONSULTING & SAFETY

HOBBS K-29 EOL BOOT

NMOCD Case #: 1R428-50

LEGALS: UL/K sec. 29
T-18-S R-38-E

Figure 1

N
W E
S

0 3,750 7,500
Feet

Drawing date: 1/14/15
Drafted by: S. Edwards

Soil Bore Data

SB-1

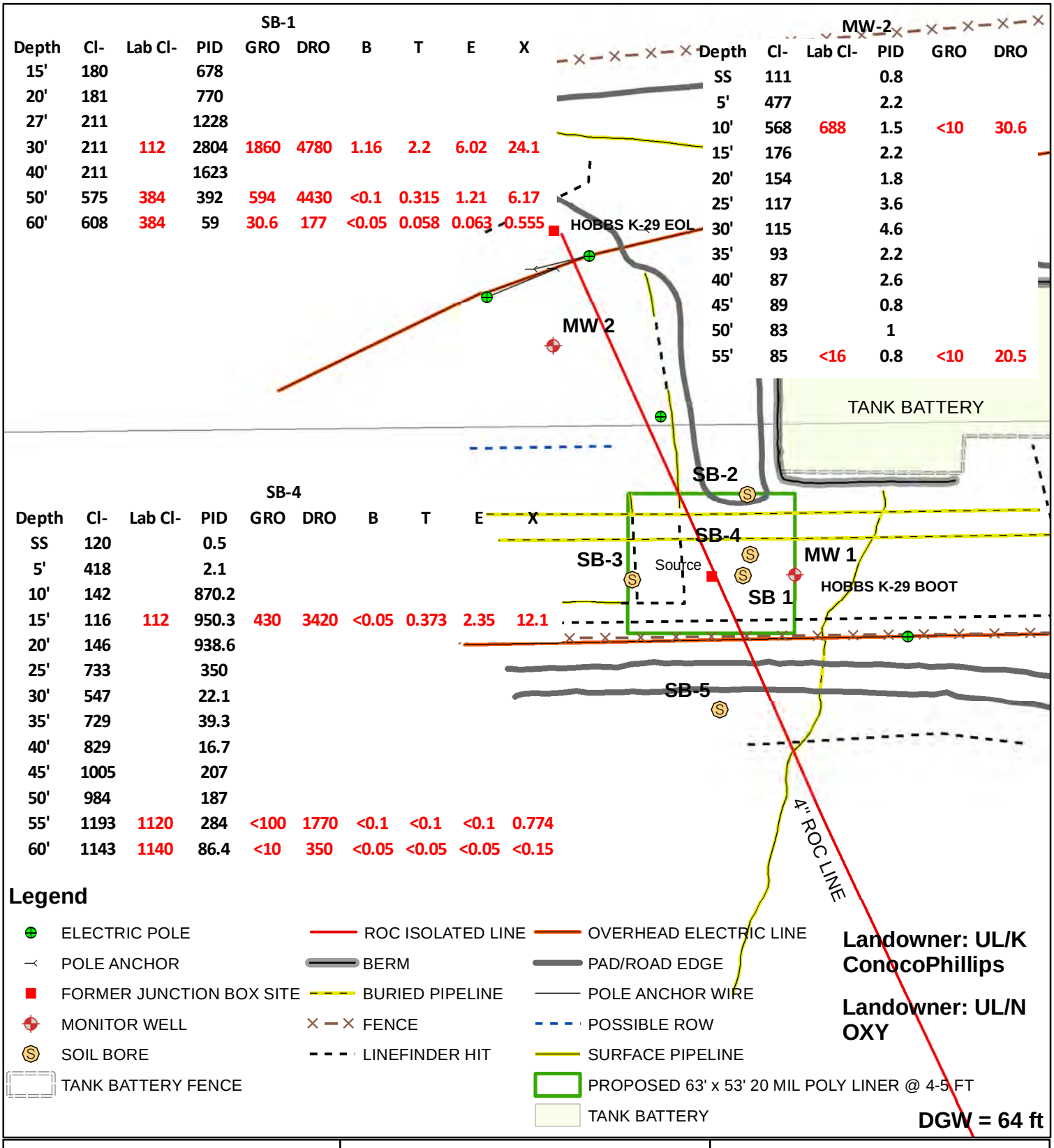
Depth	Cl-	Lab Cl-	PID	GRO	DRO	B	T	E	X
15'	180		678						
20'	181		770						
27'	211		1228						
30'	211	112	2804	1860	4780	1.16	2.2	6.02	24.1
40'	211		1623						
50'	575	384	392	594	4430	<0.1	0.315	1.21	6.17
60'	608	384	59	30.6	177	<0.05	0.058	0.063	0.555

MW-2

Depth	Cl-	Lab Cl-	PID	GRO	DRO
SS	111		0.8		
5'	477		2.2		
10'	568	688	1.5	<10	30.6
15'	176		2.2		
20'	154		1.8		
25'	117		3.6		
30'	115		4.6		
35'	93		2.2		
40'	87		2.6		
45'	89		0.8		
50'	83		1		
55'	85	<16	0.8	<10	20.5

SB-4

Depth	Cl-	Lab Cl-	PID	GRO	DRO	B	T	E	X
SS	120		0.5						
5'	418		2.1						
10'	142		870.2						
15'	116	112	950.3	430	3420	<0.05	0.373	2.35	12.1
20'	146		938.6						
25'	733		350						
30'	547		22.1						
35'	729		39.3						
40'	829		16.7						
45'	1005		207						
50'	984		187						
55'	1193	1120	284	<100	1770	<0.1	<0.1	<0.1	0.774
60'	1143	1140	86.4	<10	350	<0.05	<0.05	<0.05	<0.15



Legend

- ELECTRIC POLE
- POLE ANCHOR
- FORMER JUNCTION BOX SITE
- MONITOR WELL
- SOIL BORE
- TANK BATTERY FENCE
- ROC ISOLATED LINE
- BERM
- BURIED PIPELINE
- FENCE
- LINEFINDER HIT
- OVERHEAD ELECTRIC LINE
- PAD/ROAD EDGE
- POLE ANCHOR WIRE
- POSSIBLE ROW
- SURFACE PIPELINE
- PROPOSED 63' x 53' 20 MIL POLY LINER @ 4-5 FT
- TANK BATTERY

Landowner: UL/K ConocoPhillips

Landowner: UL/N OXY

DGW = 64 ft

RECS RICE ENVIRONMENTAL CONSULTING & SAFETY

HOBBS K-29 EOL boot

NMOCD Case #: 1R428-50

UL K & N SECTION 29
T-18-S R-38-E
LEA COUNTY, NM

Figure 2A

0 25 50 Feet

GPS date: 11/03/14 TG
Drawing date: 1/6/15
Drafted by: L. Weinheimer

N W E S

Soil Bore Data

SB-2

Depth	Cl-	Lab Cl-	PID	GRO	DRO
SS	2019	2040	0.6	<10	<10
5'	343		0.5		
10'	301		0.8		
15'	401	192	0.8	<10	<10
20'	392		1.3		
25'	366		0.8		
30'	381		1.3		
35'	378		1.7		
40'	463		3		
45'	226	160	56.4	<10	373

SB-3

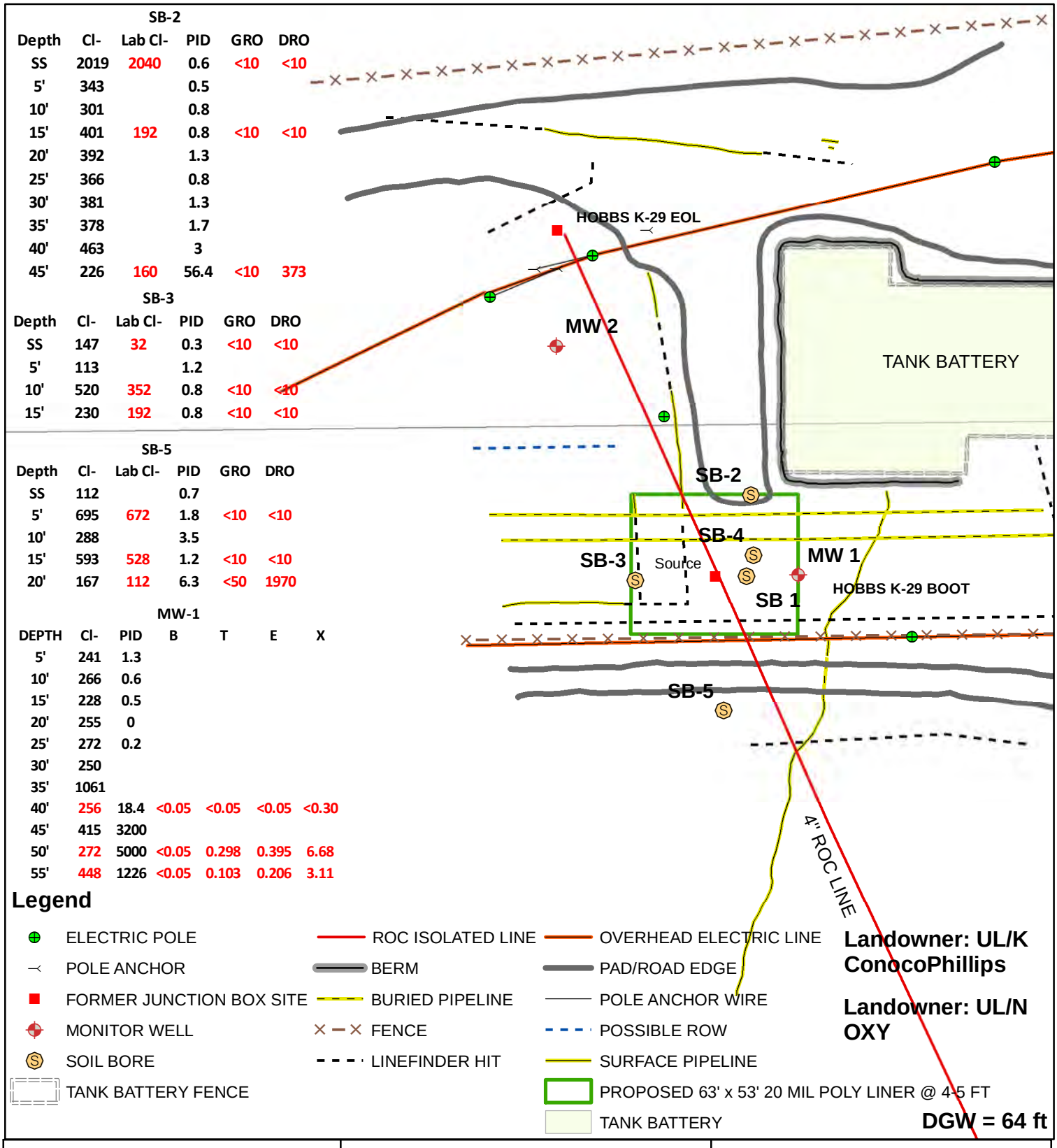
Depth	Cl-	Lab Cl-	PID	GRO	DRO
SS	147	32	0.3	<10	<10
5'	113		1.2		
10'	520	352	0.8	<10	<10
15'	230	192	0.8	<10	<10

SB-5

Depth	Cl-	Lab Cl-	PID	GRO	DRO
SS	112		0.7		
5'	695	672	1.8	<10	<10
10'	288		3.5		
15'	593	528	1.2	<10	<10
20'	167	112	6.3	<50	1970

MW-1

DEPTH	Cl-	PID	B	T	E	X
5'	241	1.3				
10'	266	0.6				
15'	228	0.5				
20'	255	0				
25'	272	0.2				
30'	250					
35'	1061					
40'	256	18.4	<0.05	<0.05	<0.05	<0.30
45'	415	3200				
50'	272	5000	<0.05	0.298	0.395	6.68
55'	448	1226	<0.05	0.103	0.206	3.11



Legend

- ELECTRIC POLE
- POLE ANCHOR
- FORMER JUNCTION BOX SITE
- MONITOR WELL
- SOIL BORE
- TANK BATTERY FENCE
- ROC ISOLATED LINE
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- POSSIBLE ROW
- SURFACE PIPELINE
- PROPOSED 63' x 53' 20 MIL POLY LINER @ 4-5 FT
- TANK BATTERY

Landowner: UL/K ConocoPhillips

Landowner: UL/N OXY

DGW = 64 ft

RECS
RICE ENVIRONMENTAL
CONSULTING & SAFETY

HOBBS K-29 EOL boot

NMOCD Case #: 1R428-50

UL K & N SECTION 29
T-18-S R-38-E
LEA COUNTY, NM

Figure 2B

0 25 50 Feet

GPS date: 11/03/14 TG
Drawing date: 1/6/15
Drafted by: L. Weinheimer

N W E S

Appendix A

Soil Bore Installation Documentation

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

LITHOLOGIC LOG (SOIL BORING)

R T Hicks Consultants Ltd

P O Box 7624
Midland, TX 79708
(432) 528-3878

MONITOR WELL NO.:	SB-1	TOTAL DEPTH:	65 Ft
SITE ID:	Hobbs SWD K-29 Boot	CLIENT:	Rice Operating Company
SURFACE ELEVATION:	3,642 (USGS Map)	COUNTY:	Lea County
CONTRACTOR:	Harrison & Cooper	STATE:	New Mexico
DRILLING METHOD:	Air-Rotary	LOCATION:	T-18-S, R-38-E, Sec. 29 (K)
INSTALLATION DATE:	10/8/08	FIELD REP.:	Dale Littlejohn
WELL PLACEMENT:	3' SW from fmr Jct. box	FILE NAME:	\Hobbs SWD\K-29 Lithlogs
COMMENTS:	Lat. 32º 42' 53.4" North, Long. 103º 10' 19.3" West (Hand-Held GPS)		

Lithology	TYPE	DEPTH	% REC	PID	Cl (Fld)	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE SORTING, ROUNDING, CONSOL., DIST. DEATURES
BENTONITE							FILL MATERIAL Silt, dark brown, poorly compacted, caving. Required installation of 8 ft conductor pipe.
						5	
	excav.	6	--	1	125		
	excav.	7	--	884	112		Lab Data: Chloride BTEX Benz
	excav.	8	--	1,332	119		(mg/kg) <16 43.2 0.054
	excav.	9	--	1,267	87	10	SILT Light greenish brown, with some very fine grain sand, strong hydrocarbon odor.
	excav.	10	--	1,173	86		
	excav.	11	--	1,176	120		
	excav.	12	--	1,098	141		Lab Data: Chloride BTEX Benz
							(mg/kg) 16 28.0 <0.01
						15	
	spoon	15-17	20%	678	180		
						20	
	spoon	20-22	50%	770	181		
						25	QUARTZITE Dark reddish brown, fine crystilline, hard drilling.
	cutting	27	--	1,228	211		SAND Dark brown (possibly discolored), medium grain, well-sorted, rounded, strong hydrocarbon odor.
						30	
	spoon	30-32	80%	2,804	211		Lab Data: Chloride BTEX Benz
							(mg/kg) 112 33.5 1.16
						35	
							SAND Dark brown, fine grain, poorly-sorted, sub-angular, hydrocarbon odor.
	spoon	40-42	90%	1,623	211	40	
						45	
							SAND Black (discolored), medium grain, poorly-sorted, rounded, very strong hydrocarbon odor, less discoloration with depth.
						50	
	spoon	50-52	100%	392	575		Lab Data: Chloride BTEX Benz
							(mg/kg) 384 7.8 <0.1
						55	
							SAND Brown, medium grain, well-sorted, subrounded, possible capillary fringe at 65 ft.
	spoon	60-62	100%	59	608	60	Lab Data: Chloride BTEX Benz
							(mg/kg) 384 0.73 <0.05
						65	

TD = 65 Feet

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 10/15/08
Reporting Date: 10/17/08
Project Number: NOT GIVEN
Project Name: HOBBS K-29 BOOT
Project Location: HOBBS K-29 BOOT

Sampling Date: 10/08/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE		10/16/08	10/16/08	10/16/08	10/16/08
H16124-1	SB #1 @ 30'	1.16	2.20	6.02	24.1
H16124-2	SB #1 @ 50'	<0.100	0.315	1.21	6.17
H16124-3	SB #1 @ 60'	<0.050	0.058	0.063	0.555
Quality Control		0.041	0.052	0.051	0.157
True Value QC		0.050	0.050	0.050	0.150
% Recovery		82.0	104	102	105
Relative Percent Difference		4.4	1.3	1.1	1.3

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

10/20/08
Date

H160124 B.RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 10/15/08
Reporting Date: 10/16/08
Project Number: NOT GIVEN
Project Name: HOBBS K-29 BOOT
Project Location: HOBBS K-29 BOOT

Analysis Date: 10/16/08
Sampling Date: 10/08/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: TR

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H16124-1	SB #1 @ 30'	112
H16124-2	SB #1 @ 50'	384
H16124-3	SB #1 @ 60'	384
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-Cl^-B

Note: Analyses performed on 1:4 w:v aqueous extracts.

Chemist

10-17-08
Date

H16124 RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 10/15/08
Reporting Date: 10/20/08
Project Number: NOT GIVEN
Project Name: HOBBS K-29 BOOT
Project Location: HOBBS K-29 BOOT

Sampling Date: 10/08/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)
ANALYSIS DATE		10/17/08	10/17/08
H16124-1	SB #1 @ 30'	1,860	4,780
H16124-2	SB #1 @ 50'	594	4,430
H16124-3	SB #1 @ 60'	30.6	177
Quality Control		551	549
True Value QC		500	500
% Recovery		110	110
Relative Percent Difference		19.7	2.7

METHODS: TPH GRO & DRO: EPA SW-846 8015 M

Lab Director

10/20/08
Date

H16124 T RICE

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 Operating Company	**BILL TO**
Project Manager: Hack Conder	**P.O. #:**
Address: 122 West Taylor	**Company:**
City: Hobbs **State:** NM **Zip:** 88240	**Attn:**
Phone #: 393-9174 **Fax #:** 397-1471	**Address:**
Project #: **Project Owner:**	**City:**
Project Name: Hobbs K-29 boot	**State:** **Zip:**
Project Location: Hobbs K-29 boot	**Phone #:**
Sampler Name: Lara Weinheimer/ Tony Grieco	**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							
H16124-1	SB #1 @ 30'	G	1			✓					✓		10-8-08	2:12	✓	✓	✓							
-2	SB #1 @ 50'	G	1			✓					✓		10-8-08	2:36	✓	✓	✓							
-3	SB #1 @ 60'	G	1			✓					✓		10-8-08	2:53	✓	✓	✓							

Relinquished By: L. Weinheimer	**Date:** 10-15-08 **Time:** 4:45	**Received By:** Misty LeBeau	
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)** MCB	

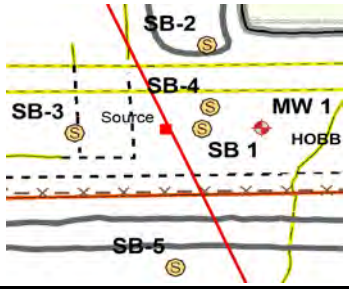
Phone Result: ☐ Yes ☑ No **Add'l Phone #:**
Fax Result: ☐ Yes ☑ No **Add'l Fax #:**
REMARKS:

email results

Hconder@riceswd.com; jpurvis@riceswd.com; Lweinheimer@riceswd.com

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

Need samples back, please

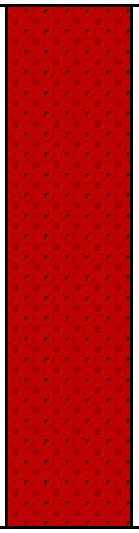
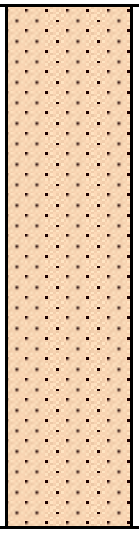
Logger:	Amber Groves		RECS RICE ENVIRONMENTAL CONSULTING & SAFETY
Driller:	Harrison & Cooper Inc.		**Company:** ROC
Drilling Method:	Air Rotary		**Project Name:** Hobbs K-29 EOL boot **Well ID:** SB-2
Start Date:	11/3/2014		**Project Consultant:** RECS
End Date:	11/3/2014		

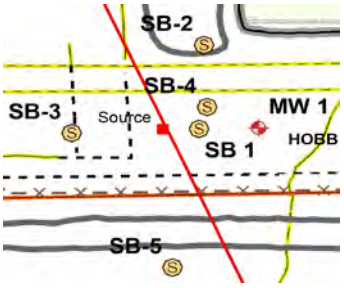
Comments: All samples taken from cuttings. SB-2 is located 33 FT NE of source.
DRAFTED BY: Brian Cooper
TD = 45 FT GW = 64 FT

Location: U/L N Sec. 29 T18S R38E
Lat: 32.714820 **County**: Lea
Long: -103.172069 **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
SS	2019	Cl-2040	0.6	Tan caliche with sand
		GRO <10		
		DRO <10		
5 ft	343		0.5	Tan caliche with sandstone
10 ft	301		0.8	Tan sand with some caliche
15 ft	401	Cl-192	0.8	Fine to medium tan sand
		GRO <10		
		DRO <10		
20 ft	392		1.3	Tan caliche with fine to medium sand
25 ft	366		0.8	Reddish brown fine to medium sand
30 ft	381		1.3	

Lithology / Well Construction: Bentonite Seal

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
35 ft	378		1.7	Reddish brown fine to medium sand		 Bentonite Seal
40 ft	463		3			
45 ft	226	Cl- 160	56.4			
		GRO <10				
		DRO 373				

Logger:	Amber Groves		RECS RICE ENVIRONMENTAL CONSULTING & SAFETY
Driller:	Harrison & Cooper Inc.		**Company:** ROC
Drilling Method:	Air Rotary		**Project Name:** Hobbs K-29 EOL boot **Well ID:** SB-3
Start Date:	11/3/2014		**Project Consultant:** RECS
End Date:	11/3/2014		

Comments: All samples taken from cuttings. SB-3 is located 30 FT W of source.

DRAFTED BY: Brian Cooper

TD = 20 FT GW = 64 FT

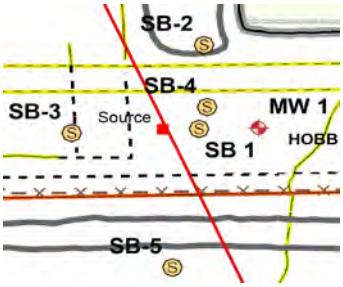
Location: U/L N Sec. 29 T18S R38E

Lat: 32.714734 **Long:** -103.172207

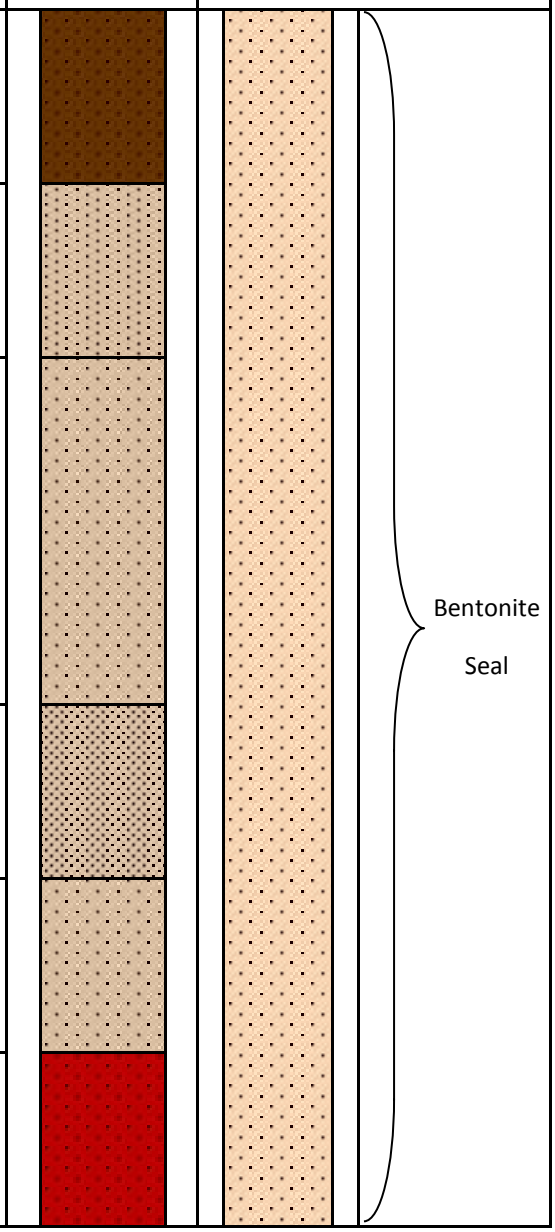
County: Lea **State**: NM

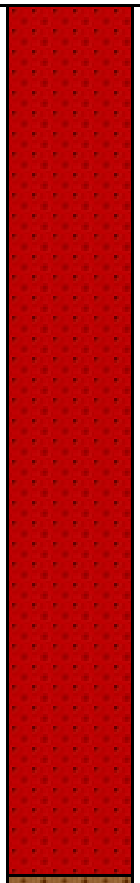
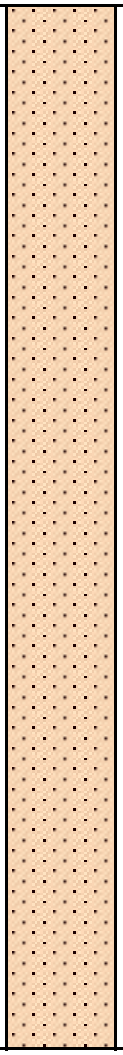
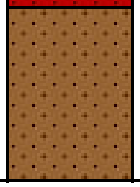
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS	147	Cl- 32	0.3	Tan caliche with sand		
		GRO <10				
		DRO <10				
5 ft	113		1.2	Tan caliche with sandstone		
10 ft	520	Cl- 352	0.8	Tan caliche with sand		
		GRO <10				
		DRO <10				
15 ft	230	Cl- 192	0.8	Fine to medium tan sand		
		GRO <10				
		DRO <10				

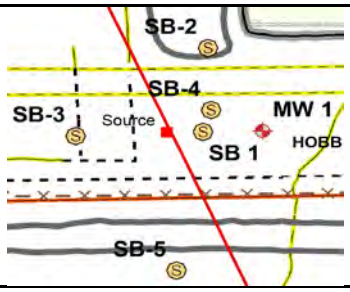
Bentonite Seal

Logger:	Amber Groves		RECS RICE ENVIRONMENTAL CONSULTING & SAFETY
Driller:	Harrison & Cooper Inc.		**Company:** ROC
Drilling Method:	Air Rotary		**Project Name:** Hobbs K-29 EOL boot **Well ID:** SB-4
Start Date:	11/3/2014		**Project Consultant:** RECS
End Date:	11/3/2014		**Location:** U/L N Sec. 29 T18S R38E
Comments: All samples taken fron cuttings. SB-4 is located 17 FT NE of source. **DRAFTED BY: Brian Cooper** TD = 60 FT GW = 64 FT			**Lat:** 32.714759 **Long:** -103.172064 **County**: Lea **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
SS	120		0.5	Brown topsoil
5 ft	418		2.1	Tan caliche with well cemented sandstone
10 ft	142		870.2	Tan fine to medium sand
15 ft	116	Cl- 112	950.3	
B <0.05 T 0.373		GRO 430		
E 2.35 X 12.1		DRO 3420		
20 ft	146		938.6	Tan sand with sandstone
25 ft	733		350	Tan fine to med sand
30 ft	547		22.1	Reddish brown fine to medium sand



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
35 ft	729		39.3	Reddish brown fine to medium sand		 Bentonite Seal
40 ft	829		16.7			
45 ft	1005		207			
50 ft	984		187			
55 ft	1193	Cl- 1120	284			
B <0.1 T <0.1		GRO <100				
E <0.1 X 0.774		DRO 1770				
60 ft	1143	Cl- 1140	86.4	Light brown fine to medium sand		
B <0.05 T <0.05		GRO <10				
E <0.05 X 0.15		DRO 350				

Logger:	Amber Groves		RECS RICE ENVIRONMENTAL CONSULTING & SAFETY
Driller:	Harrison & Cooper Inc.		**Company:** ROC
Drilling Method:	Air Rotary		**Project Name:** Hobbs K-29 EOL boot **Well ID:** SB-5
Start Date:	11/3/2014		**Project Consultant:** RECS
End Date:	11/3/2014		

Comments: All samples taken from cuttings. SB-5 is located 51 FT S of source.

DRAFTED BY: Brian Cooper

TD = 20 FT GW = 64 FT

Location: U/L N Sec. 29 T18S R38E

Lat: 32.714598 **County**: Lea

Long: -103.172103 **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS	112		0.7	Brown topsoil		
5 ft	695	Cl- 672	1.8	Tan caliche with some sandstone		
		GRO <10				
		DRO <10				
10 ft	288		3.5			
15 ft	593	Cl- 528	1.2	Caliche		
		GRO <10				
		DRO <10				
20 ft	167	Cl- 112	6.3	Fine to med tan sand		
		GRO <50				
		DRO 1970				

Bentonite Seal

CARDINAL Laboratories

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

November 06, 2014

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: HOBBS K-29 EOL BOOT

Enclosed are the results of analyses for samples received by the laboratory on 11/03/14 15:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 2 @ SURFACE (H403386-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2040**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/04/2014	ND	192	96.1	200	3.50	
DRO >C10-C28	<10.0	10.0	11/04/2014	ND	201	101	200	5.05	

Surrogate: 1-Chlorooctane	*89.7 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*101 %*	*52.1-176*

Sample ID: SB 2 @ 45' (H403386-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**160**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/04/2014	ND	192	96.1	200	3.50	
DRO >C10-C28	**373**	10.0	11/04/2014	ND	201	101	200	5.05	

Surrogate: 1-Chlorooctane	*93.4 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*111 %*	*52.1-176*

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 3 @ SURFACE (H403386-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane	*85.9 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*88.5 %*	*52.1-176*

Sample ID: SB 3 @ 10' (H403386-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**352**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane	*79.4 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*83.1 %*	*52.1-176*

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 3 @ 15' (H403386-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**192**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane	*92.9 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*97.4 %*	*52.1-176*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 4 @ 15' (H403386-06)

BTEX 8021B mg/kg Analyzed By: ms S-04

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2014	ND	1.95	97.6	2.00	4.89	
Toluene*	**0.373**	0.050	11/05/2014	ND	1.87	93.4	2.00	4.63	
Ethylbenzene*	**2.35**	0.050	11/05/2014	ND	1.83	91.7	2.00	4.50	
Total Xylenes*	**12.1**	0.150	11/05/2014	ND	5.47	91.2	6.00	4.92	
Total BTEX	**14.8**	0.300	11/05/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID *171 %* *61-154*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	11/04/2014	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**430**	100	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	**3420**	100	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane *165 %* *47.2-157*

Surrogate: 1-Chlorooctadecane *168 %* *52.1-176*

Cardinal Laboratories

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 4 @ 55' (H403386-07)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.100	0.100	11/05/2014	ND	1.95	97.6	2.00	4.89	
Toluene*	<0.100	0.100	11/05/2014	ND	1.87	93.4	2.00	4.63	
Ethylbenzene*	<0.100	0.100	11/05/2014	ND	1.83	91.7	2.00	4.50	
Total Xylenes*	**0.774**	0.300	11/05/2014	ND	5.47	91.2	6.00	4.92	
Total BTEX	**0.774**	0.600	11/05/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID *111 %* *61-154*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1120**	16.0	11/04/2014	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<100	100	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	**1770**	100	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane *107 %* *47.2-157*

Surrogate: 1-Chlorooctadecane *119 %* *52.1-176*

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 4 @ 60' (H403386-08)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2014	ND	1.95	97.6	2.00	4.89	
Toluene*	<0.050	0.050	11/05/2014	ND	1.87	93.4	2.00	4.63	
Ethylbenzene*	<0.050	0.050	11/05/2014	ND	1.83	91.7	2.00	4.50	
Total Xylenes*	<0.150	0.150	11/05/2014	ND	5.47	91.2	6.00	4.92	
Total BTEX	<0.300	0.300	11/05/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *61-154*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1140**	16.0	11/04/2014	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	183	91.7	200	1.47	
DRO >C10-C28	**350**	10.0	11/05/2014	ND	175	87.5	200	7.59	

Surrogate: 1-Chlorooctane *94.9 %* *47.2-157*

Surrogate: 1-Chlorooctadecane *104 %* *52.1-176*

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 5 @ 5' (H403386-09)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**672**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	193	96.4	200	0.670	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	216	108	200	0.360	

Surrogate: 1-Chlorooctane	*94.3 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*95.9 %*	*52.1-176*

Sample ID: SB 5 @ 15' (H403386-10)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**528**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	193	96.4	200	0.670	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	216	108	200	0.360	

Surrogate: 1-Chlorooctane	*94.4 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*102 %*	*52.1-176*

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

Received:	11/03/2014	Sampling Date:	11/03/2014
Reported:	11/06/2014	Sampling Type:	Soil
Project Name:	HOBBS K-29 EOL BOOT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NONE GIVEN		

Sample ID: SB 5 @ 20' (H403386-11)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	11/05/2014	ND	193	96.4	200	0.670	
DRO >C10-C28	**1970**	50.0	11/05/2014	ND	216	108	200	0.360	

Surrogate: 1-Chlorooctane	*94.8 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*146 %*	*52.1-176*

Sample ID: SB 2 @ 15' (H403386-12)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**192**	16.0	11/04/2014	ND	400	100	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	11/05/2014	ND	193	96.4	200	0.670	
DRO >C10-C28	<10.0	10.0	11/05/2014	ND	216	108	200	0.360	

Surrogate: 1-Chlorooctane	*94.0 %*	*47.2-157*
Surrogate: 1-Chlorooctadecane	*101 %*	*52.1-176*

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

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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 Operating	**BILL TO**	
Project Manager:	Katie Jones	**P.O. #:**	
Address:	419 W Cain	**Company:**	
City:	Hobbs **State:** NM **Zip:** 88240	**Attn:**	
Phone #:	**Fax #:**	**Address:**	
Project #:	**Project Owner:**	**City:**	
Project Name:	Hobbs L-29 SOL boot	**State:** **Zip:**	
Project Location:		**Phone #:**	
Sampler Name:	Amber Groves	**Fax #:**	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H403386																				
1	SB2 @ Surface	G	1			✓					✓		11-3-14	8:00	✓	✓				
2	SB2 @ 45ft	G	1			✓					✓		11-3-14	8:05	✓	✓				
3	SB3 @ Surface	G	1			✓					✓		11-3-14	9:00	✓	✓				
4	SB3 @ 10ft	G	1			✓					✓		11-3-14	9:05	✓	✓				
5	SB3 @ 15ft	G	1			✓					✓		11-3-14	9:10	✓	✓				
6	SB4 @ 15ft	G	1			✓					✓		11-3-14	10:30	✓	✓	✓			
7	SB4 @ 55ft	G	1			✓					✓		11-3-14	10:45	✓	✓	✓			
8	SB4 @ 60ft	G	1			✓					✓		11-3-14	11:00	✓	✓	✓			
9	SB5 @ 5ft	G	1			✓					✓		11-3-14	1:30	✓	✓				
10	SB5 @ 15ft	G	1			✓					✓		11-3-14	1:40	✓	✓				

Relinquished By:	Amber Groves	**Date:** 11-3-14	**Received By:**
		Time: 3:10	
Relinquished By:		**Date:**	**Received By:**
		Time:	

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: 4.8°C

Sample Condition		CHECKED BY: (Initials)
Cool: ☐ Yes ☐ No	Intact: ☑ Yes ☐ No	

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

REMARKS:

email results:
hconder@rice-ecs.com; knorman@rice-ecs.com;
jkamplain@rice-ecs.com; regans@rice-ecs.com; lflores@rice-ecs.com;
lweinheimer@rice-ecs.com; kjones@riceswd.com;
cursanic@rice-ecs.com
environmental tech: agroves@rice-ecs.com

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

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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

		BILL TO	
Company Name:	RICE Operating	P.O. #:	
Project Manager:	Katie Jones	Company:	
Address:	419 W Cain	Attn:	
City:	Hobbs State: NM Zip: 88240	Address:	
Phone #:	Fax #:	City:	
Project #:	Project Owner:	State: Zip:	
Project Name:	Hobbs K-29 EOL Dust	Phone #:	
Project Location:		Fax #:	
Sampler Name:	Amber Groves		

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							
H403386																											
11	SB5@30ft	G	1			✓					✓		11-3-14	1:50	✓	✓											
12	SB2@15ft	G	1			✓					✓		11-3-14	8:03	✓	✓											

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: Amber Groves	Date: 11-3-14 Time: 3:10	Received By: Cindy Keene	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	4.8°C	Sample Condition Cool: ☑ Yes ☐ No Intact: ☐ Yes ☐ No	CHECKED BY: (Initials)

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

email results:
hconder@rice-ecs.com; knorman@rice-ecs.com;
jkamplain@rice-ecs.com; regans@rice-ecs.com; lflores@rice-ecs.com;
lweinheimer@rice-ecs.com; kjones@riceswd.com;
cursanic@rice-ecs.com
environmental tech: agroves@rice-ecs.com

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

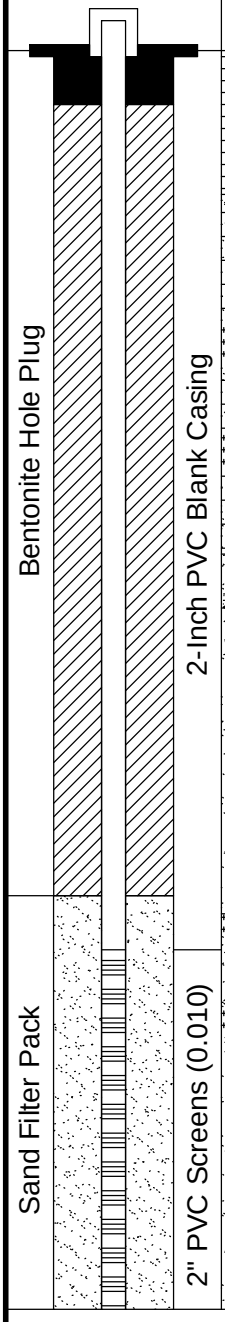
#54 Pg 2 of 2

RT Hicks Consultants Ltd

P O Box 7624
Midland, Texas 79708
(432) 528-3878
(432) 689-4578 (fax)

LITHOLOGIC LOG (Monitoring Well)

SOIL BORING NO.: MW-1
TOTAL DEPTH: 70 Feet
SITE ID: Hobbs K-29 Boot
CLIENT: Rice Operating Co.
SURFACE ELEVATION: 3,642 (USGS)
COUNTY: Lea County
CONTRACTOR: Harrison Cooper
STATE: New Mexico
DRILLING METHOD: Air-Rotary
LOCATION: T-18-S R-38-E 29 (K)
INSTALLATION DATE: 6/17/09
FIELD REP: D. Littlejohn
WELL PLACEMENT: 30 ft ESE of Marker
FILE NAME: \Hobbs SWD\K-29
BORING LAT /LONG: Lat. 32° 42' 53.1" North, Long. 103° 10' 19.4"



Lithology	Sample Data: Type	% Rec	Cl (mg/kg)	PID (ppm)	Depth (feet)	Lithologic Description: LITHOLOGY, Color, grain size, sorting, rounding, special features
	Spoon	10%	241	1.3	5	CALICHE Light brown to grayish brown with some light brown silt and sandstone beds. No hydrocarbon odor.
	Spoon	30%	266	0.6	10	SILT Light yellowish brown, with thin interbedded and broken gray, very fine crystilline quartzite. No hydrocarbon odor.
	Cutting	--	228	0.5	15	
	Spoon	50%	255	0	20	
	Spoon	30%	272	0.2	25	
	Cutting	--	250	--	30	SAND Light brown, fine grain, well sorted, angular. Switch to rock bit at 30 feet. No hydrocarbon odor.
	Cutting	--	1,061	--	35	SAND Medium brown, fine grain, well sorted, sub-rounded, with some interbedded sandstone. Slight hydrocarbon odor at 35 feet.
	Spoon	50%	943	18.4	40	
	Spoon	50%	415	3,200	45	
	Spoon	40%	495	5,000	50	SAND Medium brown, fine grain, well sorted, sub-rounded, with brown fine crystalline quartzite (decreasing with depth). Strong hydrocarbon odor to total depth.
	Spoon	50%	395	1,226	55	
					60	Saturated formation at 57 feet.
					65	
					70	

TD = 70 Feet

Laboratory Verification Results
(June 17, 2009)

Depth (feet)	Chloride (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
40-42	256	<0.05	<0.05	<0.05	<0.30
50-51	272	<0.05	0.298	0.395	6.68
55-57	448	<0.05	0.103	0.206	3.11

CARDINAL LABORATORIES

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

June 26, 2009

Hack Conder
Rice Operating Company
122 West Taylor
Hobbs, NM 88240

Re: Hobbs K-29 Boot

Enclosed are the results of analyses for sample number H17681, received by the laboratory on 06/22/09 at 4:55 pm.

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 Hydrocarbons

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

Total Number of Pages of Report: 4 (includes Chain of Custody)

Sincerely,

Celey D. Keene
Laboratory Director

This report conforms with NELAP requirements.

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/22/09
Reporting Date: 06/24/09
Project Owner: NOT GIVEN
Project Name: HOBBS K-29 BOOT
Project Location: HOBBS K-29 BOOT

Sampling Date: 06/17/09
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NO.	SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE:		06/23/09	06/23/09	06/23/09	06/23/09
H17681-1	MW#1 @ 40'	<0.050	<0.050	<0.050	<0.300
H17681-2	MW#1 @ 50'	<0.050	0.298	0.395	6.68
H17681-3	MW#1 @ 55'	<0.050	0.103	0.206	3.11
Quality Control		0.054	0.054	0.055	0.157
True Value QC		0.050	0.050	0.050	0.150
% Recovery		108	108	110	105
Relative Percent Difference		<1.0	<1.0	<1.0	<1.0

METHODS: BTEX - SW-846 8021B

TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES. Reported on wet weight.

Lab Director

06/24/09
Date

H17681 B RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/22/09
Reporting Date: 06/24/09
Project Number: NOT GIVEN
Project Name: HOBBS K-29 BOOT
Project Location: HOBBS K-29 BOT

Analysis Date: 06/23/09
Sampling Date: 06/17/09
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H17681-1	MW #1 @ 40'	256
H17681-2	MW #1 @ 50'	272
H17681-3	MW #1 @ 55'	448
Quality Control		490
True Value QC		500
% Recovery		98.0
Relative Percent Difference		2.0

METHOD: Standard Methods	4500-Cl^-B

Note: Analyses performed on 1:4 w:v aqueous extracts. Not accredited through NELAP for Chloride.

Chemist

06/26/09
Date

H17681 RICE

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:	ROC	**BILL TO**	
Project Manager:	Hack Conder	P.O. #:	
Address:		Company:	
City:	State: Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:	Hobbs K-29 boot	State: Zip:	
Project Location:	Hobbs K-29 boot	Phone #:	
Sampler Name:	Lara Weinheimer	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	Cl-	BTEX										
H17681-1	MW #1 @ 40'	G	1			✓					✓		6-17-09	7:54	✓	✓										
-2	MW #1 @ 50'	G	1			✓					✓		6-17-09	8:16	✓	✓										
-3	MW #1 @ 55'	G	1			✓					✓		6-17-09	8:28	✓	✓										

Relinquished By:	Date: 6-22-09	Received By:	
Weinheimer	Time: 4:55		
Relinquished By:	Date:	Received By:	
	Time:		

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

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

REMARKS:

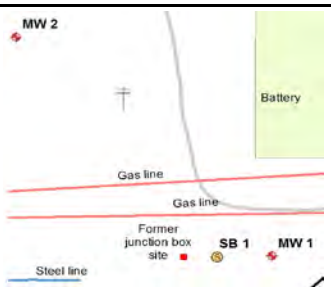
email

Hconder @ ricesud.com

jpurvis @ " "

Lweinheimer @ " "

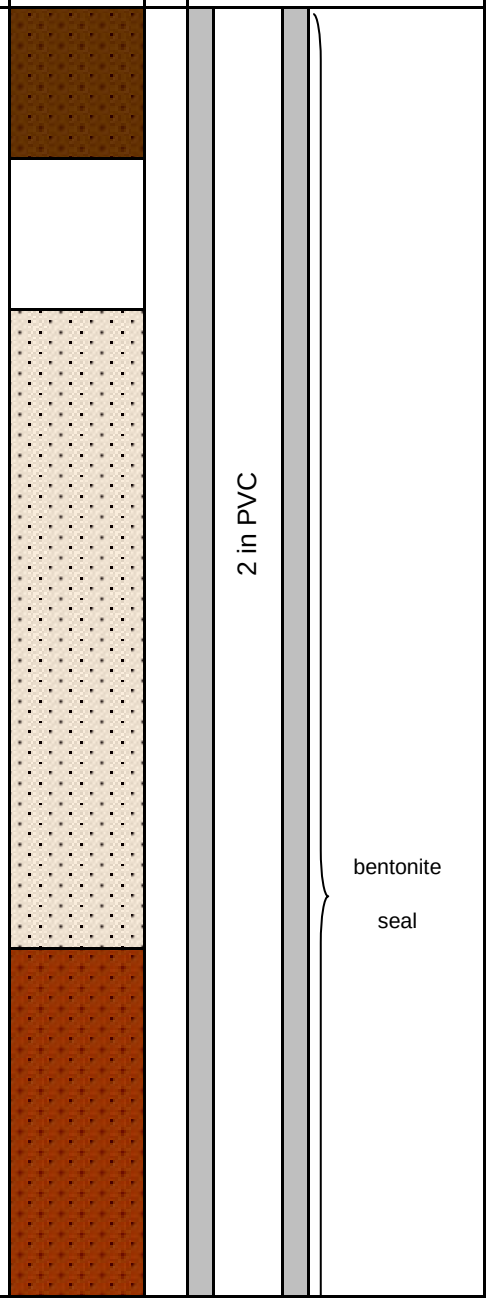
† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

Logger:	Kyle Norman		**Project Name:** Hobbs K-29 EOL boot **Well ID:** MW-2
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	2/3/2012		
End Date:	2/3/2012		

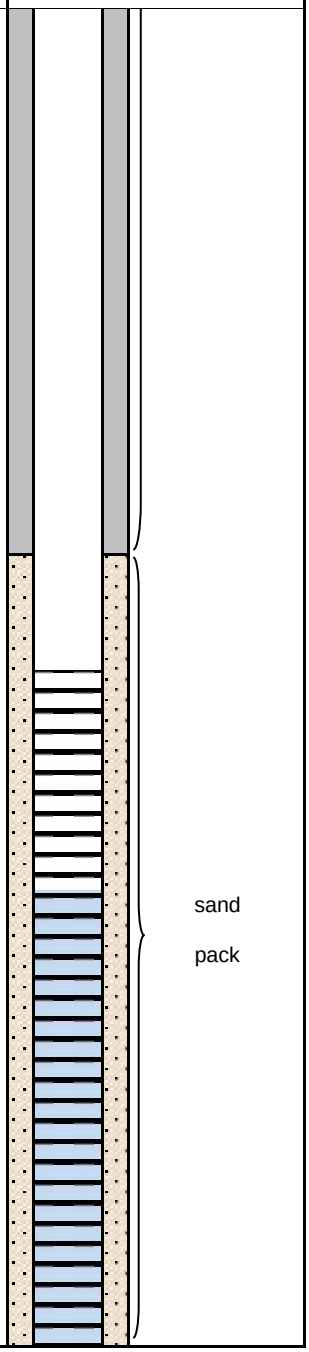
Comments: Located 105 ft northwest of the former junction box site. All samples from cuttings.
DRAFTED BY: L. Weinheimer
TD = 75 ft GW = 63 ft

Location: UL/K sec. 29 T18S R38E
Lat: 32°42'53.925"N
Long: 103°10'20.288"W
County: Lea
State: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	111		0.8	
				Caliche
5 ft	477		2.2	
				Tan Sand
10 ft	568	Cl- 688	1.5	
		GRO <10		
		DRO 30.6		
15 ft	176		2.2	
20 ft	154		1.8	
25 ft	117		3.6	
				Red/Brown Sand
30 ft	115		4.6	
35 ft	93		2.2	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red/Brown Sand		
40 ft	87		2.6			
45 ft	89		0.8			
50 ft	83		1.0			
55 ft	85	Cl- <16	0.8			
		GRO <10				
		DRO 20.5				
60 ft						
65 ft						
70 ft						
75 ft						



CARDINAL Laboratories

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

February 9, 2012

Hack Conder
Rice Operating Company
112 W. Taylor
Hobbs, NM 88240

Re: Hobbs K-29 EOL 18S-38E

Enclosed are the results of analyses for samples received by the laboratory on 02/03/12 12:20.

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 accredited 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 524.2	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.

Thank you.

Celey D. Keene
Laboratory Director/Quality Manager

CARDINAL Laboratories

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

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 02/03/12
Reporting Date: 02/09/12
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: HOBBS K-29 EOL 18S-38E

Sampling Date: 02/03/12
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: MS/AP

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)	Cl** (mg/kg)
ANALYSIS DATE		02/07/12	02/07/12	02/06/12
H200275-01	MW-2 @ 10'	<10.0	30.6	688
H200275-02	MW-2 @ 55'	<10.0	20.5	< 16
Quality Control		170	200	416
True Value QC		200	200	400
% Recovery		85.0	100	104
Relative Percent Difference		2.3	13.3	<0.1

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Std. Methods 4500-Cl^-B
**Analyses performed on 1:4 w:v aqueous extracts.

Chemist

02/09/12
Date

H200275TCL Rice

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:	State: NM Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	Hobbs K-29 E O L 18S-38E	Phone #:	
Sampler Name:	Kyle Norman	Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H200275																				
1	MW-2 @10'	G	1			✓					✓		2-3-12	11:50	✓	✓				
2	MW-2 @55'	G	1			✓					✓		2-3-12	12:00	✓	✓				

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 Norman	Date: 2-3-12 Time: 13:20	Received By: Jodi Henson	
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)	

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

Appendix B

MW-1 & MW-2 Data

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

ROC Hobbs K-29 EOL Boot													
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	62.34	73.6	1.8	6	7/14/2009	520	1310	<0.001	<0.001	<0.001	<0.003	57	Silt to clear Slight odor
1	62.43	73.6	1.8	6	10/27/2009	332	757	0.001	<0.001	0.002	<0.003	59.5	Silt to clear Slight odor
1	62.72	73.62	1.7	6	3/15/2010	476	1170	<0.001	<0.001	<0.001	<0.003	71.5	Slight Odor / Silt to Clear
1	62.81	73.62	1.7	6	6/4/2010	432	1320	<0.001	<0.001	<0.001	<0.003	78	Silt to clear Slight odor
1	62.56	73.62	1.8	6	8/30/2010	540	1400	<0.001	<0.001	<0.001	<0.003	51.7	Silt to clear Slight odor
1	62.91	73.62	1.7	6	12/10/2010	560	1280	<0.001	<0.001	<0.001	<0.003	67.9	Silt to clear Slight odor
1	63.05	73.62	1.7	6	3/23/2011	610	1620	<0.001	<0.001	<0.001	<0.003	76.9	Silt to clear Slight odor
1	63.22	73.62	1.7	6	6/20/2011	540	1280	<0.001	<0.001	<0.001	<0.003	71.9	Silt to clear Slight odor
1	63.44	73.62	1.6	6	9/20/2011	610	1470	<0.001	<0.001	<0.001	<0.003	82.1	Silt to clear Slight odor
1	63.62	73.62	1.6	6	12/15/2011	540	1320	<0.001	<0.001	<0.001	<0.003	87.2	Silt to clear Slight odor
1	63.78	73.62	1.6	6	3/13/2012	570	1360	0.003	<0.001	<0.001	<0.003	74.2	Silt to clear Slight odor
1	63.93	73.62	1.6	6	6/11/2012	500	1410	<0.001	<0.001	<0.001	<0.003	85.5	Silt to clear Slight odor
1	64.14	73.62	1.5	6	9/6/2012	500	1280	<0.001	<0.001	<0.001	<0.003	77.6	Silt to clear Slight odor
1	64.3	73.62	1.5	6	11/29/2012	550	1340	<0.001	<0.001	<0.001	<0.003	71.5	Silt to clear Slight odor
1	64.48	73.62	1.5	6	3/7/2013	492	1220	<0.001	<0.001	<0.001	<0.003	88	Silt to clear Slight odor
1	64.69	73.62	1.4	6	6/24/2013	344	1060	<0.001	<0.001	<0.001	<0.003	63	Silt to clear Slight odor
1	64.95	73.62	1.4	8	9/16/2013	336	987	<0.001	<0.001	<0.001	<0.003	88	Slight Odor/Silt to Clear
1	65.15	73.62	1.4	6	12/12/2013	352	1130	<0.001	<0.001	<0.001	<0.003	194	Slight Odor/Silt to clear

1	65.29	73.62	1.3	6	3/19/2014	352	1080	<0.001	<0.001	<0.001	<0.003	112	slight odor/silt to clear
1	65.49	73.62	1.3	6	6/16/2014	264	864	<0.001	<0.001	<0.001	<0.003	64.2	Slight odor/silt to clear
1	65.78	73.62	1.3	6	9/10/2014	352	1150	<0.001	<0.001	<0.001	<0.003	250	Slight odor/silt to clear
1	65.63	73.62	1.3	6	12/17/2014	300	904	<0.001	<0.001	<0.001	<0.003	158	Slight odor/silt to clear

ROC Hobbs K-29 EOL Boot													
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	63.67	77.41	2.2	8	3/13/2012	68	522	<0.001	<0.001	<0.001	<0.003	83.2	Silt to clear Slight odor
2	63.87	77.41	2.2	8	6/11/2012	68	474	<0.001	<0.001	<0.001	<0.003	86.4	Silt to clear Slight odor
2	64.02	77.41	2.1	8	9/6/2012	64	500	<0.001	<0.001	<0.001	<0.003	88.2	Silt to clear Slight odor
2	64.22	77.41	2.1	8	11/29/2012	68	521	<0.001	<0.001	<0.001	<0.003	88.5	Silt to clear Slight odor
2	64.41	77.41	2.1	8	3/7/2013	72	478	<0.001	<0.001	<0.001	<0.003	95	Silt to clear Slight odor
2	64.65	77.41	2	8	6/24/2013	68	504	<0.001	<0.001	<0.001	<0.003	83	Silt to clear Slight odor
2	64.86	77.41	2	8	9/16/2013	64	485	<0.001	<0.001	<0.001	<0.003	75.3	Silt to clear Slight odor
2	65.04	77.41	2	8	12/12/2013	64	473	<0.001	<0.001	<0.001	<0.003	93.4	Silt to clear Slight odor
2	65.24	77.41	1.9	8	3/19/2014	68	426	<0.001	<0.001	<0.001	<0.003	88.2	slight odor/silt to clear
2	65.51	77.41	1.9	8	6/16/2014	68	572	<0.001	<0.001	<0.001	<0.003	82.5	Slight odor/silt to clear
2	65.74	77.41	1.9	8	9/10/2014	64	512	<0.001	<0.001	<0.001	<0.003	98.1	Slight odor/silt to clear
2	65.57	77.41	1.9	8	12/17/2014	68	482	<0.001	<0.001	<0.001	<0.003	87	Slight odor/silt to clear

CARDINAL Laboratories

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

January 05, 2015

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: HOBBS K-29 BOOT

Enclosed are the results of analyses for samples received by the laboratory on 12/22/14 14:21.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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:	12/22/2014	Sampling Date:	12/17/2014
Reported:	01/05/2015	Sampling Type:	Water
Project Name:	HOBBS K-29 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R38E-SEC29 K-LEA CTY., NM		

Sample ID: MONITOR WELL #1 (H403908-01)

BTEX 8021B mg/L Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	12/24/2014	ND	0.016	81.6	0.0200	0.356	
Toluene*	<0.001	0.001	12/24/2014	ND	0.019	92.7	0.0200	0.330	
Ethylbenzene*	<0.001	0.001	12/24/2014	ND	0.019	96.1	0.0200	0.0260	
Total Xylenes*	<0.003	0.003	12/24/2014	ND	0.057	95.8	0.0600	0.0104	
Total BTEX	<0.006	0.006	12/24/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *66.2-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**300**	4.00	12/23/2014	ND	100	100	100	3.92	

Sulfate 375.4 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**158**	25.0	12/26/2014	ND	17.1	85.7	20.0	11.2	

TDS 160.1 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**904**	5.00	12/29/2014	ND	470	89.2	527	0.736	

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

Received:	12/22/2014	Sampling Date:	12/17/2014
Reported:	01/05/2015	Sampling Type:	Water
Project Name:	HOBBS K-29 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R38E-SEC29 K-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H403908-02)

BTEX 8021B mg/L Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	12/24/2014	ND	0.016	81.6	0.0200	0.356	
Toluene*	<0.001	0.001	12/24/2014	ND	0.019	92.7	0.0200	0.330	
Ethylbenzene*	<0.001	0.001	12/24/2014	ND	0.019	96.1	0.0200	0.0260	
Total Xylenes*	<0.003	0.003	12/24/2014	ND	0.057	95.8	0.0600	0.0104	
Total BTEX	<0.006	0.006	12/24/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *66.2-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**68.0**	4.00	12/23/2014	ND	100	100	100	3.92	

Sulfate 375.4 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**87.0**	25.0	12/26/2014	ND	17.1	85.7	20.0	11.2	

TDS 160.1 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**482**	5.00	12/29/2014	ND	470	89.2	527	0.736	

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

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

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

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: Hobbs K-29 Boot
Project Location: T18S-R38E-Sec29 K ~ Lea County - New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY) H403908	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 (2014)	TIME
1	Monitor Well #1	G	3	X				2				1		12/17	15:45
2	Monitor Well #2	G	3	X				2				1		12/17	14:40

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	

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

Relinquished by: Rozanne Johnson	Date: 12/22/2014	Time: 14:20
Relinquished by:	Date:	Time:
Received by:	Date:	Time:
Received By: (Labratory Staff) Jodi Henson	Date: 12/22/2014	Time: 14:21

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

Sample Condition: Cool: Yes / No; Intact: Yes / No

CHECKED BY: (Initials)

REMARKS:

Email Results to: hconder@riceswd.com
lweinheimer@rice-ecs.com
kjones@riceswd.com
rozanne11@windstream.net

#54