



**March 31, 2016**

**Tomáš Oberding, PhD**

Environmental Bureau, Oil Conservation Division

New Mexico Energy, Minerals, & Natural Resources Department

1220 S. St. Francis Drive

Santa Fe, New Mexico 87505

**RE: 2015 Annual Groundwater Monitoring Report  
Rice Operating Company – Hobbs SWD System  
Hobbs K-29 EOL boot (1R428-50): UL/K, Sec. 29, T18S, R38E**

Dr. Oberding:

RICE Operating Company (ROC) has retained Basin Environmental Service Technologies (Basin) 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 4<sup>th</sup>, 2008 and approved on May 21<sup>st</sup>, 2008. According to the ICP, the site was investigated through vertical and soil bore installation resulting in elevated chloride concentrations that decreased with depth. Based on the investigation, two monitoring wells were installed to determine groundwater quality and the wells have been sampled quarterly since installation. A Corrective Action Plan (CAP) was submitted and approved by NMOCD on February 5<sup>th</sup>, 2015. According to the NMOCD approved CAP, a 63 ft x 53 ft 20-mil reinforced liner was installed and properly seated at 4 ft bgs. The site was backfilled and seeded with a blend of native vegetation. A CAP Report and Soil Closure Request detailing this work was submitted to the NMOCD on September 8<sup>th</sup>, 2015. The report also requested an additional monitoring well (MW-3) be installed down-gradient of the site. NMOCD approved this report and granted 'Soil Closure' on September 15<sup>th</sup>, 2015.

On October 2<sup>nd</sup>, 2015, the down-gradient well (MW-3) was installed, and lithology soil samples were collected at regular intervals. The well was developed and sampled in conjunction with the quarterly monitoring well sampling. The first sample collected in 2015 resulted in a chloride concentration of 220 mg/L. Concentrations in MW-1 have decreased since the well was installed in 2009, resulting in a concentration of 252 mg/L in the 4<sup>th</sup> quarterly sample of 2015. Concentrations in the up-gradient well (MW-2) have remained low since installation, below 72 mg/L.

ROC will continue quarterly groundwater sampling through 2016 and will evaluate the data for a proposed path forward.

Attached is the Appendix, which contains:

1. A Site Location Map.
2. A map showing well locations.
3. A table and graph presenting all laboratory results and depth to groundwater for each well at the site.
4. The laboratory analytical results for the most recent sampling event.
5. MW-3 Installation Log with Photo Page.

Basin appreciates the opportunity to work with you on this project. Please contact me at (575) 393-2967 or Katie Jones Davis at (575) 393-9174 if you have any questions or wish to further discuss this site. Thank you for your time and consideration.

Sincerely,

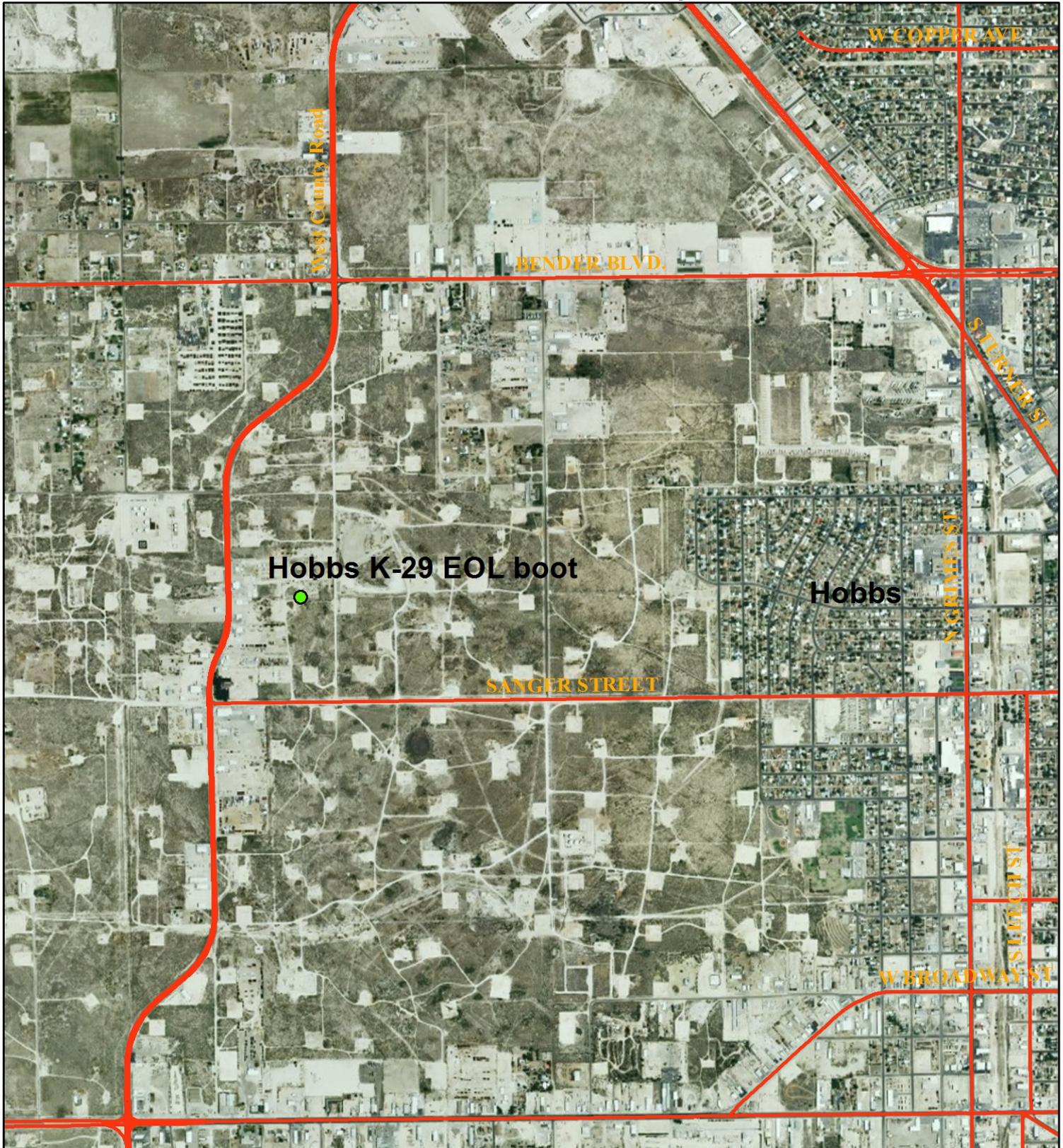
A handwritten signature in black ink that reads "Kyle Norman" followed by a horizontal line.

Kyle Norman  
Basin Environmental Service Technologies  
Project Manager

Cc – Katie Jones Davis (ROC)

appendix

# Site Location Map

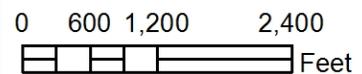


## ***Hobbs K-29 EOL boot***

NMOCD Case #: 1R428-50

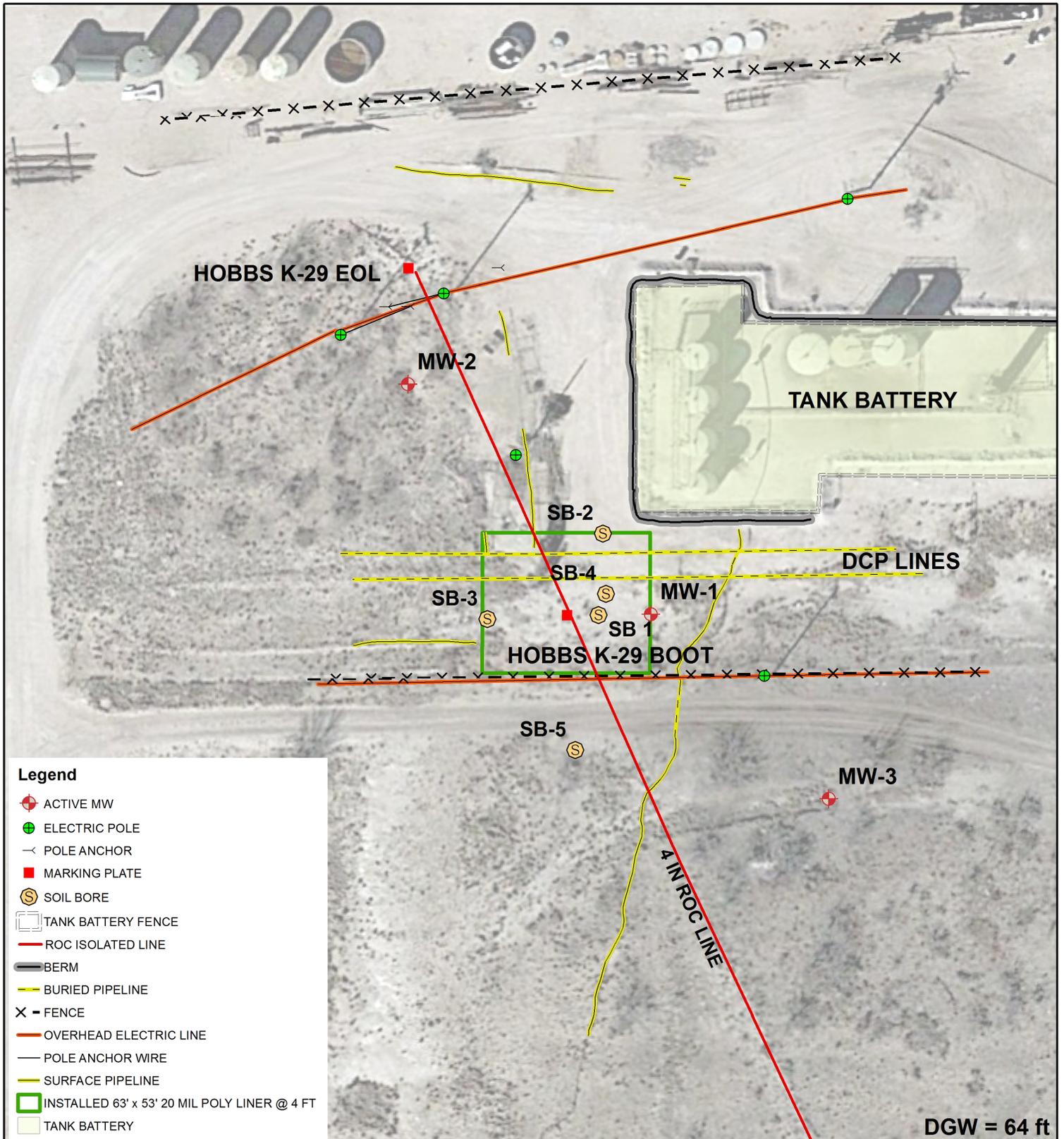
LEGALS: UL/K sec. 29  
T-18-S R-38-E

### Figure 1



Drawing date: 1/20/12  
Drafted by: L. Weinheimer

# Site Map



DGW = 64 ft

**Legend**

- ACTIVE MW
- ELECTRIC POLE
- POLE ANCHOR
- MARKING PLATE
- SOIL BORE
- TANK BATTERY FENCE
- ROC ISOLATED LINE
- BERM
- BURIED PIPELINE
- FENCE
- OVERHEAD ELECTRIC LINE
- POLE ANCHOR WIRE
- SURFACE PIPELINE
- INSTALLED 63' x 53' 20 MIL POLY LINER @ 4 FT
- TANK BATTERY



**HOBBS**  
**K-29 BOOT & EOL**  
 1R428-50  
 UL K & N SECTION 29  
 T-18-S R-38-E  
 LEA COUNTY, NM

GPS: 32.714915 -103.172174

0 25 50  
 Feet

GPS date: 11/03/14 TG  
 Drawing date: 3/30/16  
 Drafted by: T. Grieco

**ROC - Hobbs K-29 EOL boot (1R428-50)**

**Unit Letter K, Section 29, T18S, R38E**

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	Silt to clear Slight odor
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	Silt to clear Slight odor
1	65.15	73.62	1.4	6	12/12/2013	352	1130	<0.001	<0.001	<0.001	<0.003	194	Silt to clear Slight odor
1	65.29	73.62	1.3	6	3/19/2014	352	1080	<0.001	<0.001	<0.001	<0.003	112	Silt to clear Slight odor
1	65.49	73.62	1.3	6	6/16/2014	264	864	<0.001	<0.001	<0.001	<0.003	64.2	Silt to clear Slight odor
1	65.78	73.62	1.3	6	9/10/2014	352	1150	<0.001	<0.001	<0.001	<0.003	250	Silt to clear Slight odor
1	65.63	73.62	1.3	6	12/17/2014	300	904	<0.001	<0.001	<0.001	<0.003	158	Silt to clear Slight odor
1	65.78	73.62	1.3	6	3/17/2015	264	904	<0.001	<0.001	<0.001	<0.003	73	Silt to clear Slight odor
1	65.88	73.62	1.2	6	6/16/2015	320	1020	<0.001	<0.001	<0.001	<0.003	86	Silt to clear Slight odor
1	65.93	73.62	1.2	6	9/7/2015	316	1050	<0.001	<0.001	<0.001	<0.003	144	Silt to clear Slight odor
1	65.65	73.62	1.3	6	12/1/2015	252	764	<0.001	<0.001	<0.001	<0.003	79.9	Silt to clear Slight odor

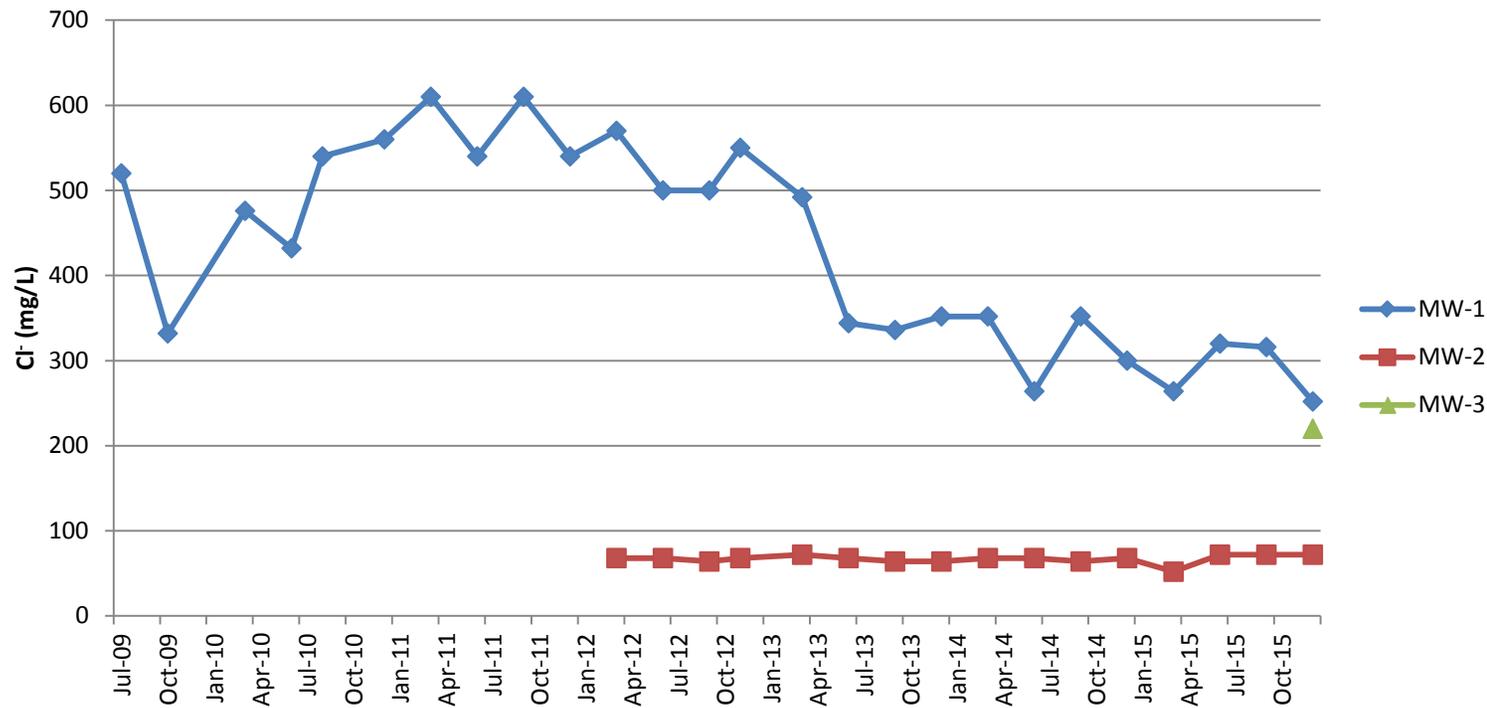
**ROC - Hobbs K-29 EOL boot (1R428-50)**

**Unit Letter K, Section 29, T18S, R38E**

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	Silt to clear Slight odor
2	65.51	77.41	1.9	8	6/16/2014	68	572	<0.001	<0.001	<0.001	<0.003	82.5	Silt to clear Slight odor
2	65.74	77.41	1.9	8	9/10/2014	64	512	<0.001	<0.001	<0.001	<0.003	98.1	Silt to clear Slight odor
2	65.57	77.41	1.9	8	12/17/2014	68	482	<0.001	<0.001	<0.001	<0.003	87	Silt to clear Slight odor
2	65.72	77.41	1.9	8	3/17/2015	52	452	<0.001	<0.001	<0.001	<0.003	77	Silt to clear Slight odor
2	65.84	77.41	1.9	8	6/16/2015	72	518	<0.001	<0.001	<0.001	<0.003	70	Silt to clear Slight odor
2	65.88	77.41	1.8	8	9/7/2015	72	546	<0.001	<0.001	<0.001	<0.003	63.3	Silt to clear Slight odor
2	65.57	77.41	1.9	8	12/1/2015	72	558	<0.001	<0.001	<0.001	<0.003	72	Silt to clear Slight odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	64.23	110.22	29.9	120	12/1/2015	220	784	<0.001	<0.001	<0.001	<0.003	65	Silt to clear Slight odor

### Hobbs K-29 EOL boot (1R428-50)





December 11, 2015

KATIE JONES

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 12/04/15 13:44.

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](http://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 524.4	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,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, flowing "C" and "K".

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	12/04/2015	Sampling Date:	12/01/2015
Reported:	12/11/2015	Sampling Type:	Water
Project Name:	HOBBS K-29 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T18S-R38E-SEC29 K-LEA CTY., NM		

**Sample ID: MONITOR WELL #1 (H503168-01)**

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/10/2015	ND	0.020	97.8	0.0200	1.23		
Toluene*	<0.001	0.001	12/10/2015	ND	0.020	98.3	0.0200	0.102		
Ethylbenzene*	<0.001	0.001	12/10/2015	ND	0.020	99.4	0.0200	0.402		
Total Xylenes*	<0.003	0.003	12/10/2015	ND	0.058	96.0	0.0600	0.312		
Total BTEX	<0.006	0.006	12/10/2015	ND						

Surrogate: Dibromofluoromethane 96.8 % 86.5-122

Surrogate: Toluene-d8 107 % 85.7-112

Surrogate: 4-Bromofluorobenzene 98.6 % 86.3-117

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	252	4.00	12/09/2015	ND	104	104	100	0.00		

Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	79.9	10.0	12/09/2015	ND	21.9	109	20.0	1.59		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	764	5.00	12/10/2015	ND	472	89.6	527	4.63		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	12/04/2015	Sampling Date:	12/01/2015
Reported:	12/11/2015	Sampling Type:	Water
Project Name:	HOBBS K-29 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T18S-R38E-SEC29 K-LEA CTY., NM		

**Sample ID: MONITOR WELL #2 (H503168-02)**

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/10/2015	ND	0.020	97.8	0.0200	1.23		
Toluene*	<0.001	0.001	12/10/2015	ND	0.020	98.3	0.0200	0.102		
Ethylbenzene*	<0.001	0.001	12/10/2015	ND	0.020	99.4	0.0200	0.402		
Total Xylenes*	<0.003	0.003	12/10/2015	ND	0.058	96.0	0.0600	0.312		
Total BTEX	<0.006	0.006	12/10/2015	ND						

Surrogate: Dibromofluoromethane 101 % 86.5-122

Surrogate: Toluene-d8 105 % 85.7-112

Surrogate: 4-Bromofluorobenzene 96.0 % 86.3-117

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	72.0	4.00	12/09/2015	ND	104	104	100	0.00		

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	12/09/2015	ND	21.9	109	20.0	1.59		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	558	5.00	12/10/2015	ND	472	89.6	527	4.63		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	12/04/2015	Sampling Date:	12/01/2015
Reported:	12/11/2015	Sampling Type:	Water
Project Name:	HOBBS K-29 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T18S-R38E-SEC29 K-LEA CTY., NM		

**Sample ID: MONITOR WELL #3 (H503168-03)**

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/11/2015	ND	0.020	97.8	0.0200	1.23		
Toluene*	<0.001	0.001	12/11/2015	ND	0.020	98.3	0.0200	0.102		
Ethylbenzene*	<0.001	0.001	12/11/2015	ND	0.020	99.4	0.0200	0.402		
Total Xylenes*	<0.003	0.003	12/11/2015	ND	0.058	96.0	0.0600	0.312		
Total BTEX	<0.006	0.006	12/11/2015	ND						

Surrogate: Dibromofluoromethane 99.3 % 86.5-122

Surrogate: Toluene-d8 108 % 85.7-112

Surrogate: 4-Bromofluorobenzene 93.2 % 86.3-117

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	220	4.00	12/09/2015	ND	104	104	100	0.00		

Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	65.0	25.0	12/09/2015	ND	21.9	109	20.0	1.59		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	784	5.00	12/10/2015	ND	472	89.6	527	4.63		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**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

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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



<b>Logger:</b>	Kyle Norman		
<b>Driller:</b>	HCI Drilling		
<b>Drilling Method:</b>	Air rotary		
<b>Start Date:</b>	10/2/2015		
<b>End Date:</b>	10/2/2015		
<b>Project Name:</b> Hobbs K-29 EOL Boot <b>Well ID:</b> MW-3 <b>Project Consultant:</b> Basin Environmental			
<b>Comments:</b> MW-3 is located 120 FT southeast of the source. No samples were taken as the well was installed. <b>DRAFTED BY:</b> B. Cooper TD = 109 FT                      GW = 62 FT		<b>Location:</b> UL/K sec. 29 T-18-S R-38-E <b>Lat:</b> 32°42'52.36"N <b>County:</b> Lea <b>Long:</b> 103°10'18.461"W <b>State:</b> NM	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS				Caliche		Cement  4 in PVC  Bentonite Seal
5 ft						
10 ft						
15 ft						
20 ft						
25 ft						
30 ft				Tan Sand with Layers of Sandstone		
35 ft						
40 ft						

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
45 ft				Tan Sand with Caliche and Sandstone		<p>4 in PVC</p> <p>Bentonite Seal</p> <p>Sand</p>
50 ft						
55 ft						
60 ft				Tan Sand with Caliche		<p>4 in PVC</p> <p>Bentonite Seal</p> <p>Sand</p>
65 ft						
70 ft						
75 ft						
80 ft						
85 ft				Sandstone		<p>4 in PVC</p> <p>Bentonite Seal</p> <p>Sand</p>
90 ft						
95 ft						
100 ft						
105 ft						
109 ft						

**Hobbs K-29 EOL boot (1R428-50)  
Unit K&N, Section 29, T18S, R38E**



Drilling MW-3, facing north 10/2/2015



Installing casing in MW-3, facing northeast  
10/2/2015



Adding the sand pack and bentonite seal  
10/2/2015



Concreteing in well, facing southeast  
10/2/2015



Completed MW-3, facing north 10/2/2015