

# L Peter Galusky, Jr PE

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April 1, 2022

## Bradford Billings

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87504

Re: **2021 Annual Report**  
Rice Operating Company – Vacuum SWD System  
**Vacuum F-33 Boot** (1R425-37): UL/F, Sec. 33, T17S, R35E

Review of the 2021 Annual Report for  
Vacuum F-33 Boot: Content Satisfactory

1. Continue to monitor and sample groundwater quarterly for 2023.
2. Continue recovery for chlorinated impacted groundwater.
3. Submit Annual Report for 2023 no later than April 1, 2024.

Sent via E-mail

## Mr. Billings:

This letter summarizes progress made over the past calendar year pursuant to remedial actions approved for this site in 2015, which is operated by Rice Operating Company (ROC). The site is located approximately 2.5 miles east of Buckeye, New Mexico at UL/F, Sec. 33, T17S, R35E as shown on the Geographic Location Map (Figure 1). The depth to the water table averaged approximately 84 ft bgs during 2021.

## Background and Previous Work

In 2007, ROC initiated work on the former Vacuum F-33 boot junction box and a junction box disclosure report was submitted to NMOCD. An NMOCD approved Investigation and Characterization Plan (ICP) was implemented in 2009 to delineate residual soil chlorides and hydrocarbons and to evaluate groundwater quality beneath the site. The results of this work were reported to NMOCD in July 2013, along with a Corrective Action Plan (CAP), which proposed the installation of a 20-mil reinforced synthetic liner and an up-gradient groundwater monitor well. The CAP was approved by NMOCD on August 14<sup>th</sup>, 2013.

ROC completed the installation of the liner and restored the ground surface as specified in the CAP in early 2014. The results of this work were summarized and reported to NMOCD as an “Initial CAP Report and Soil Closure Request” on February 10<sup>th</sup>, 2014 and this was approved on March 28<sup>th</sup>, 2014. Following continued groundwater monitoring through 2014, ROC submitted a summary report “Proposed Groundwater Recovery and Project Update” to NMOCD which proposed limited groundwater removal from the near-source monitor well (MW-1) to reduce groundwater chloride mass. NMOCD approved this work on April 2<sup>nd</sup>, 2015. ROC subsequently began groundwater recovery in May 2015.

## Rice Operating Company Vacuum F-33 Boot Annual Report

### Groundwater Chlorides & BTEX

Results of groundwater sampling from March 2009 through December 2021 are given in the Appendix Figure 3, Table 1 (annual averages) and Table 2 (full dataset). Groundwater chloride concentrations in the down-gradient monitor well (MW-1) have varied widely since sampling began in 2009. Groundwater chloride concentrations averaged 563 mg/l over measurements taken in 2021, down slightly from the 2020 average of 580 mg/l. Groundwater chloride concentrations in the up-gradient monitor well (MW-2) averaged 55 mg/l in 2021, essentially unchanged since 2020 when it averaged 64 mg/l. NMOCD granted approval to cease BTEX sampling in 2020 since these had not been detected in groundwater samples from the beginning of sampling in 2009 through the first quarter of 2020.

A total of approximately 10,821 bbls of chloride impacted groundwater were pumped from the near-source monitor well (MW-1) from 2015 through 2021, resulting in the removal of an estimated 1,361 kg of chlorides. The removed groundwater was hauled to an off-site location and utilized for beneficial use.

On January 25<sup>th</sup>, 2022, NMOCD granted approval to cease sampling of MW-2. ROC will continue to grab samples, as needed, to ensure there are no non-ROC, up-gradient sources contributing to the degradation of groundwater quality. ROC will also continue groundwater recovery and quarterly monitoring well sampling in 2022.

ROC is the service provider (agent) for the Vacuum 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 Vacuum system is now abandoned. We thus submit this report for your review and consideration. Please call Rice Operating Company or me if you have any questions or need additional information.

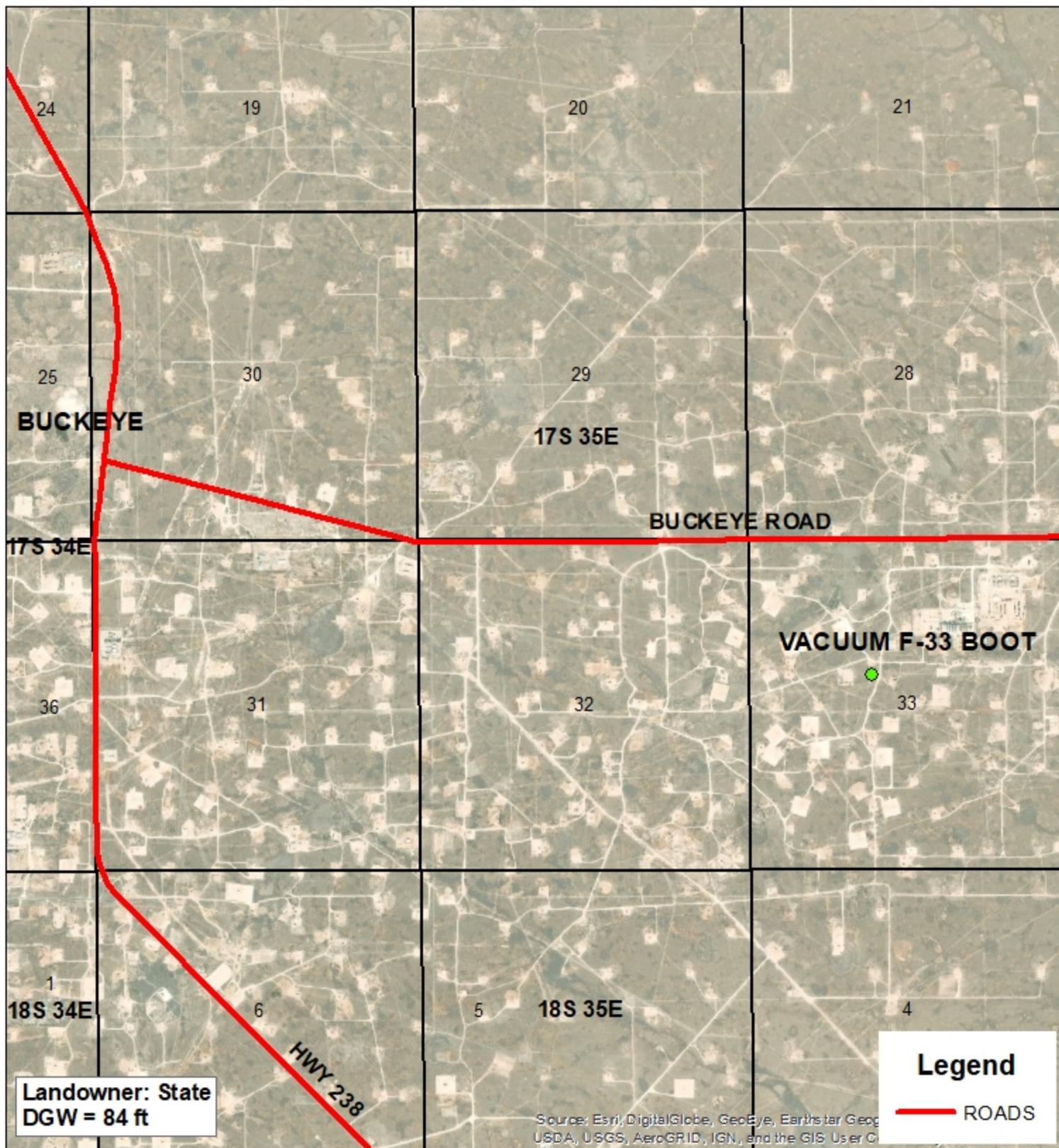
Sincerely,



L. Peter Galusky, Jr. P.E.  
NM Prof. Engineer No. 22561

Copy: Rice Operating Company  
Attachments: ... as noted, above.

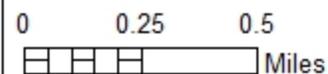
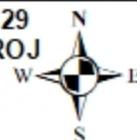
# Geographic Location



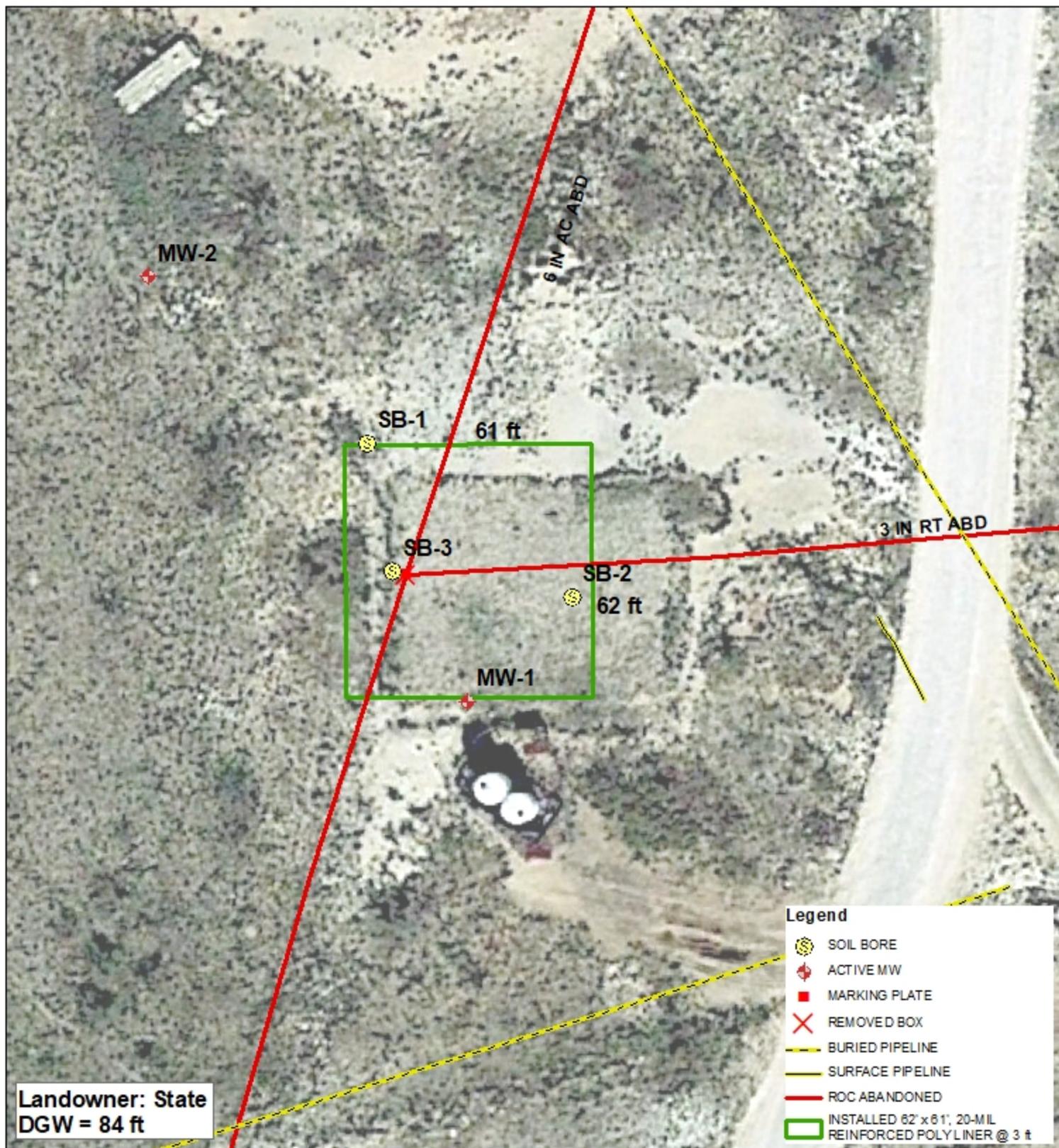
**VACUUM F-33  
BOOT**  
1R425-37

UL/F SECTION 33  
T-17-S R-35-E  
LEA COUNTY, NM

GPS: 32.792674 -103.464829  
NAD 83 STATE PLANE PROJ  
NM EAST ZONE



Drawing date: 2/4/20  
Drafted by: T. Grieco

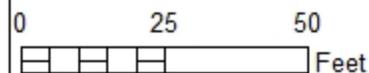


## VACUUM F-33 BOOT

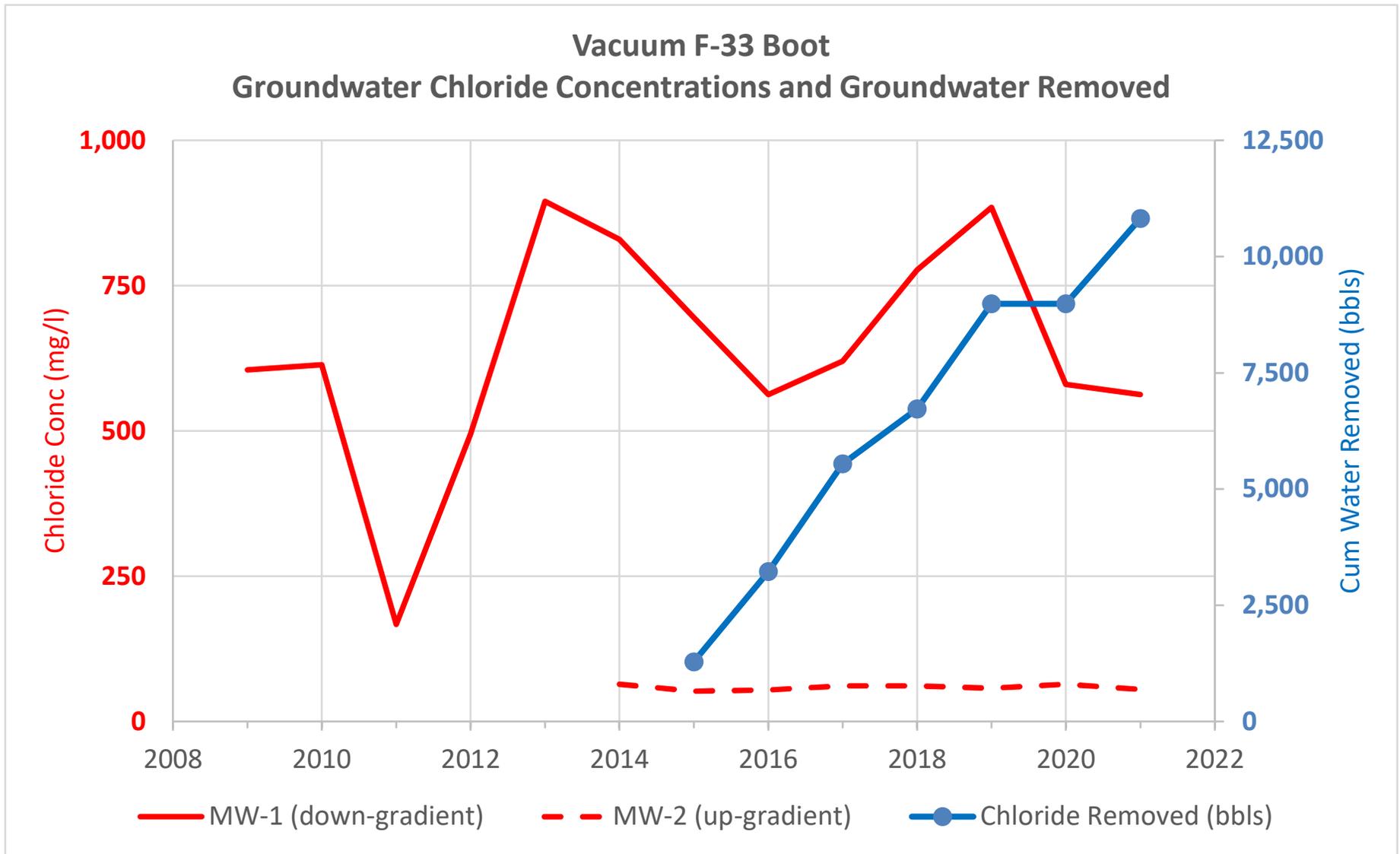
1R425-37

UL F SECTION 33  
T-17-S R-35-E  
LEA COUNTY, NM

GPS: 32.792674 -103.464829  
NAD 83 STATE PLANE PROJ  
NM EAST ZONE



Drawing date: 2/4/20  
Drafted by: T. Grieco



**Rice Operating Company  
Vacuum F-33 Boot  
Groundwater Chlorides - Annual Average Concentrations (mg/l)**

<b>Year</b>	<b>MW-1 (down-gradient)</b>	<b>MW-2 (up-gradient)</b>	<b>Groundwater Removed (bbls)</b>	<b>Chloride Removed (bbls)</b>
2009	605			
2010	614			
2011	167			
2012	495			
2013	895			
2014	830	64		
2015	695	52	1,285	113
2016	563	54	3,225	299
2017	620	61	5,545	666
2018	778	61	6,725	884
2019	885	57	8,985	1,172
2020	580	64	8,985	1,172
2021	563	55	10,821	1,361

**ROC - Vacuum F-33 boot (1R425-37)**  
**Groundwater Sampling - Full Dataset**

MW	Depth to Water	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
1	80.6	126.5	29.8	300.0	3/2/2009	432	1,070	<0.001	<0.001	<0.001	<0.003	56.0	Clear No Odor
1	80.7	126.5	29.8	150.0	4/28/2009	600	1,330	<0.001	<0.001	<0.001	<0.003	38.3	Clear No Odor
1	80.9	126.5	29.7	150.0	8/5/2009	308	845	<0.001	<0.001	<0.001	<0.003	25.2	Clear No Odor
1	81.0	126.5	29.6	150.0	11/23/2009	1,080	2,340	<0.001	<0.001	<0.001	<0.003	34.2	Clear No Odor
1	81.1	126.5	29.5	150.0	2/9/2010	1,160	2,240	<0.001	<0.001	<0.001	<0.003	54.6	Clear No Odor
1	81.3	126.5	29.4	150.0	5/28/2010	510	1,190	<0.001	<0.001	<0.001	<0.003	29.0	Clear No Odor
1	81.3	126.5	29.4	150.0	7/27/2010	710	1,500	<0.001	<0.001	<0.001	<0.003	40.8	Clear No Odor
1	81.4	126.5	29.3	250.0	10/27/2010	76	454	<0.001	<0.001	<0.001	<0.003	17.6	Clear No Odor
1	81.5	126.5	29.2	250.0	2/20/2011	68	365	<0.001	<0.001	<0.001	<0.003	17.2	Clear No Odor
1	81.7	126.5	29.2	400.0	6/3/2011	240	707	<0.001	<0.001	<0.001	<0.003	45.9	Clear No Odor
1	81.7	126.5	29.1	400.0	9/1/2011	308	825	<0.001	<0.001	<0.001	<0.003	56.6	Clear No Odor
1	81.8	126.5	29.1	400.0	12/12/2011	52	395	<0.001	<0.001	<0.001	<0.003	28.6	Clear No Odor
1	81.9	126.5	29.0	500.0	2/23/2012	188	605	<0.001	<0.001	<0.001	<0.003	45.2	Clear No Odor
1	81.8	126.5	29.0	500.0	5/30/2012	730	1,740	<0.001	<0.001	<0.001	<0.003	84.9	Clear No Odor
1	81.9	126.5	29.0	500.0	8/23/2012	580	1,280	<0.001	<0.001	<0.001	<0.003	81.2	Clear No Odor
1	81.9	126.5	29.0	500.0	11/19/2012	480	1,170	<0.001	<0.001	<0.001	<0.003	50.4	Clear No Odor
1	82.0	126.5	29.0	500.0	2/13/2013	870	1,680	<0.001	<0.001	<0.001	<0.003	59.7	Clear No Odor

MW	Depth to Water	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
1	82.0	126.5	28.9	500.0	5/29/2013	860	1,940	<0.001	<0.001	<0.001	<0.003	79.3	Clear No Odor
1	82.1	126.5	28.9	500.0	9/6/2013	840	2,000	<0.001	<0.001	<0.001	<0.003	227.0	Clear No Odor
1	82.2	126.5	28.8	500.0	11/14/2013	1,010	2,080	<0.001	<0.001	<0.001	<0.003	61.5	Clear No Odor
1	82.3	126.5	28.7	500.0	3/7/2014	550	1,390	<0.001	<0.001	<0.001	<0.003	63.4	Clear No Odor
1	82.3	126.5	28.7	500.0	6/4/2014	980	2,170	<0.001	<0.001	<0.001	<0.003	53.8	Clear No Odor
1	82.5	126.5	28.6	500.0	8/20/2014	910	2,220	<0.001	<0.001	<0.001	<0.003	50.9	Clear No Odor
1	82.2	126.5	28.8	250.0	12/5/2014	880	2,050	<0.001	<0.001	<0.001	<0.003	53.6	Clear No Odor
1	82.3	126.5	28.7	250.0	3/5/2015	940	2,010	<0.001	<0.001	<0.001	<0.003	50.3	Clear No Odor
1	XXX	126.5	XXX	Running	6/4/2015	540	1,360	<0.001	<0.001	<0.001	<0.003	55.5	Clear No Odor
1	XXX	126.5	XXX	Running	8/21/2015	670	1,480	<0.001	<0.001	<0.001	<0.003	51.0	Clear No Odor
1	XXX	126.5	0.0	200.0	11/13/2015	630	1,500	<0.001	<0.001	<0.001	<0.003	71.4	Clear No Odor
1	XXX	126.5	XXX	200.0	3/14/2016	590	1,370	<0.001	<0.001	<0.001	<0.003	65.3	Clear No odor
1	XXX	126.5	XXX	200.0	5/25/2016	620	1,730	<0.001	<0.001	<0.001	<0.003	68.1	Clear No odor
1	XXX	126.5	XXX	Running	9/13/2016	460	1,140	<0.001	<0.001	<0.001	<0.003	71.0	Clear No odor
1	XXX	126.5	XXX	200.0	11/17/2016	580	1,370	<0.001	<0.001	<0.001	<0.003	63.0	Clear No odor
1	XXX	126.5	XXX	200.0	3/2/2017	380	1,230	<0.001	<0.001	<0.001	<0.003	143.0	Clear No odor
1	XXX	126.5	XXX	Running	6/1/2017	440	1,180	<0.001	<0.001	<0.001	<0.003	68.0	Clear No odor
1	XXX	126.5	XXX	Running	9/11/2017	820	2,110	<0.001	<0.001	<0.001	<0.003	97.0	Clear No odor

MW	Depth to Water	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
1	XXX	126.5	XXX	100.0	12/1/2017	840	1,740	<0.001	<0.001	<0.001	<0.003	81.0	Clear No odor
1	XXX	126.5	XXX	200.0	3/5/2018	870	1,870	<0.001	<0.001	<0.001	<0.003	96.0	Clear No odor
1	XXX	126.5	XXX	200.0	6/4/2018	480	1,200	<0.001	<0.001	<0.001	<0.003	69.4	Clear No odor
1	XXX	126.5	XXX	200.0	9/10/2018	1,180	2,310	<0.001	<0.001	<0.001	<0.003	82.7	Clear No odor
1	XXX	126.5	XXX	200.0	11/16/2018	580	1,120	<0.001	<0.001	<0.001	<0.003	57.2	Clear No odor
1	XXX	126.5	XXX	100.0	3/11/2019	770	1,610	<0.001	<0.001	<0.001	<0.003	57.0	Clear No odor
1	XXX	126.5	XXX	Running	5/31/2019	990	1,940	<0.001	<0.001	<0.001	<0.003	66.0	Clear No odor
1	XXX	126.5	XXX	Running	8/30/2019	720	1,740	<0.001	<0.001	<0.001	<0.003	66.0	Clear No odor
1	XXX	126.5	XXX	100.0	11/21/2019	1,060	1,900	<0.001	<0.001	<0.001	<0.003	66.0	Clear No odor
1	XXX	126.5	XXX	Running	3/9/2020	500	1,160	<0.001	<0.001	<0.001	<0.003	52.7	Clear No odor
1	XXX	126.5	XXX	Running	9/14/2020	660	1,770	XXX	XXX	XXX	XXX	51.1	Clear No odor
1	XXX	126.5	XXX	100.0	3/12/2021	500	1,170	XXX	XXX	XXX	XXX	43.9	Clear No odor
1	XXX	126.5	XXX	Running	6/14/2021	700	1,630	XXX	XXX	XXX	XXX	57.1	Clear No odor
1	XXX	126.5	XXX	Running	9/9/2021	550	1,300	XXX	XXX	XXX	XXX	75.4	Clear No odor
1	XXX	126.5	XXX	100.0	11/11/2021	500	1,160	XXX	XXX	XXX	XXX	73.7	Clear No odor

MW	Depth to Water	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
2	82.0	95.1	2.1	10.0	3/7/2014	60	412	<0.001	<0.001	<0.001	<0.003	37.4	Clear No odor
2	82.0	95.1	2.1	10.0	6/4/2014	64	378	<0.001	<0.001	<0.001	<0.003	39.6	Clear No odor
2	82.1	95.1	2.1	10.0	8/20/2014	64	400	<0.001	<0.001	<0.001	<0.003	37.7	Clear No odor
2	81.7	95.1	2.1	10.0	12/5/2014	68	370	<0.001	<0.001	<0.001	<0.003	30.7	Clear No odor
2	81.9	95.1	2.1	10.0	3/5/2015	36	400	<0.001	<0.001	<0.001	<0.003	59.8	Clear No odor
2	82.1	95.1	2.1	10.0	6/4/2015	64	422	<0.001	<0.001	<0.001	<0.003	31.3	Clear No odor
2	82.3	95.1	2.0	10.0	8/21/2015	40	398	<0.001	<0.001	<0.001	<0.003	45.1	Clear No odor
2	82.3	95.1	2.0	10.0	11/13/2015	68	440	<0.001	<0.001	<0.001	<0.003	34.6	Clear No odor
2	82.4	95.1	2.0	10.0	3/14/2016	68	436	<0.001	<0.001	<0.001	<0.003	45.7	Clear No odor
2	82.4	95.1	2.0	10.0	5/25/2016	32	406	<0.001	<0.001	<0.001	<0.003	58.8	Clear No odor
2	82.4	95.1	2.0	10.0	9/13/2016	56	402	<0.001	<0.001	<0.001	<0.003	77.0	Clear No odor
2	82.5	95.1	2.0	10.0	11/17/2016	60	202	<0.001	<0.001	<0.001	<0.003	64.0	Clear No odor
2	82.6	95.1	2.0	10.0	3/2/2017	60	446	<0.001	<0.001	<0.001	<0.003	76.0	Clear No odor
2	82.7	95.1	2.0	10.0	6/1/2017	84	486	<0.001	<0.001	<0.001	<0.003	57.0	Clear No odor
2	82.9	95.1	1.9	10.0	9/11/2017	68	424	<0.001	<0.001	<0.001	<0.003	80.0	Clear No odor
2	82.8	95.1	2.0	10.0	12/1/2017	32	396	<0.001	<0.001	<0.001	<0.003	59.0	Clear No odor
2	82.9	95.1	1.9	10.0	3/5/2018	56	424	<0.001	<0.001	<0.001	<0.003	67.2	Clear No odor
2	83.0	95.1	1.9	10.0	6/4/2018	64	448	<0.001	<0.001	<0.001	<0.003	72.4	Clear No odor

MW	Depth to Water	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
2	83.1	95.1	1.9	8.0	9/10/2018	60	302	<0.001	<0.001	<0.001	<0.003	69.2	Clear No odor
2	83.4	95.1	1.9	10.0	11/16/2018	64	452	<0.001	<0.001	<0.001	<0.003	66.6	Clear No odor
2	83.5	95.1	1.8	10.0	3/11/2019	60	368	<0.001	<0.001	<0.001	<0.003	66.0	Clear No odor
2	83.6	95.1	1.8	10.0	5/31/2019	56	413	<0.001	<0.001	<0.001	<0.003	62.0	Clear No odor
2	83.6	95.1	1.8	10.0	8/30/2019	56	422	<0.001	<0.001	<0.001	<0.003	56.0	Clear No odor
2	83.7	95.1	1.8	10.0	11/21/2019	56	241	<0.001	<0.001	<0.001	<0.003	60.0	Clear No odor
2	83.7	95.1	1.8	10.0	3/9/2020	60	424	<0.001	<0.001	<0.001	<0.003	61.9	Clear No odor
2	83.8	95.1	1.8	10.0	9/14/2020	68	353	XXX	XXX	XXX	XXX	55.1	Clear No odor
2	84.3	95.1	1.7	10.0	3/12/2021	52	193	XXX	XXX	XXX	XXX	56.3	Clear No odor
2	84.3	95.1	1.7	10.0	6/14/2021	60	430	XXX	XXX	XXX	XXX	56.9	Clear No odor
2	84.4	95.1	1.7	10.0	9/9/2021	56	403	XXX	XXX	XXX	XXX	67.6	Clear No odor
2	84.4	95.1	1.7	10.0	11/11/2021	52	419	XXX	XXX	XXX	XXX	71.3	Clear No odor



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

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March 22, 2021

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-33 BOOT

Enclosed are the results of analyses for samples received by the laboratory on 03/16/21 13:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. 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".

Celey D. Keene

Lab Director/Quality Manager



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:	03/16/2021	Sampling Date:	03/12/2021
Reported:	03/22/2021	Sampling Type:	Water
Project Name:	VACUUM F-33 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T17S-R35E-SEC33 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #1 (H210660-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>500</b>	4.00	03/17/2021	ND	104	104	100	3.92		
Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>43.9</b>	10.0	03/17/2021	ND	19.2	96.0	20.0	14.2		
TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>1170</b>	5.00	03/19/2021	ND	546	109	500	2.49		

**Sample ID: MONITOR WELL #2 (H210660-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>52.0</b>	4.00	03/17/2021	ND	104	104	100	3.92		
Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>56.3</b>	10.0	03/17/2021	ND	19.2	96.0	20.0	14.2		
TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>193</b>	5.00	03/19/2021	ND	546	109	500	2.49		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- 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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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager





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

---

June 21, 2021

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-33 BOOT

Enclosed are the results of analyses for samples received by the laboratory on 06/15/21 13:31.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. 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".

Celey D. Keene

Lab Director/Quality Manager



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:	06/15/2021	Sampling Date:	06/14/2021
Reported:	06/21/2021	Sampling Type:	Water
Project Name:	VACUUM F-33 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC33 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #1 (H211525-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>700</b>	4.00	06/16/2021	ND	100	100	100	0.00		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>57.1</b>	10.0	06/16/2021	ND	21.4	107	20.0	12.4		
TDS 160.1		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>1630</b>	5.00	06/18/2021	ND	532	106	500	2.99		

**Sample ID: MONITOR WELL #2 (H211525-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>60.0</b>	4.00	06/16/2021	ND	100	100	100	0.00		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>56.9</b>	10.0	06/16/2021	ND	21.4	107	20.0	12.4		
TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>430</b>	5.00	06/17/2021	ND	532	106	500	2.99		

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Celey D. Keene, Lab Director/Quality Manager



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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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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager

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

# Cardinal Laboratories, Inc.

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # \_\_\_\_\_

Company Name: **RICE Operating Company**  
 Project Manager: **Katie Jones**  
 Address: **122 W Taylor Street ~ Hobbs, New Mexico 88240**  
 Phone #: **(575) 393-9174**  
 Project Name: **Vacuum F-33 Boot**  
 Project Location: **T17S-R35E-Sec33 F ~ Lea County New Mexico**

BILL TO Company: **RICE Operating Company**  
 Address: **122 W Taylor Street ~ Hobbs, New Mexico 88240**  
 Phone #: **(575) 393-9174**  
 Fax #: **(575) 397-1471**

Sampler Signature: **Rozanne Johnson (575)631-9310**

### ANALYSIS REQUEST

(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX				PRESERVATIVE METHOD					SAMPLING						
				WATER	SOIL	AIR	SLUDGE	HCL (4 40ml VOA)	HNO <sub>3</sub>	NaHSO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>	ICE (1-1Liter HDPE)	NONE	DATE (2021)	TIME				
<b>H211525</b>																			
<b>1</b>	Monitor Well #1	G	1	X															
<b>2</b>	Monitor Well #2	G	1	X															

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, SO <sub>4</sub> , CO <sub>3</sub> , HCO <sub>3</sub> )	
Sulfates	X
Total Dissolved Solids	X
Chlorides	X
Turn Around Time ~ 24 Hours	

Relinquished by: **Rozanne Johnson** Date: **6/15/2021** Time: **13:30**  
 Received by: **Jodi Johnson** Date: **6/15/21** Time: **13:31**

Delivered By: (Circle One) **Sampler** - UPS - Bus - Other:  
 Sample Condition: Cool  Yes Intact  Yes  
 Checked By: **JJA**

Phone Results: Yes  No   
 Fax Results: Yes  No  Additional Fax Number:  
 REMARKS:  
 Email Results: [kjones@riceswd.com](mailto:kjones@riceswd.com)  
[rozanne@sdacres.com](mailto:rozanne@sdacres.com)



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

---

September 15, 2021

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-33 BOOT

Enclosed are the results of analyses for samples received by the laboratory on 09/10/21 15:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-21-14. 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".

Celey D. Keene

Lab Director/Quality Manager



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:	09/10/2021	Sampling Date:	09/09/2021
Reported:	09/15/2021	Sampling Type:	Water
Project Name:	VACUUM F-33 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T17S-R35E-SEC33 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #1 (H212519-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>550</b>	4.00	09/13/2021	ND	104	104	100	3.92		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>75.4</b>	10.0	09/14/2021	ND	20.5	103	20.0	7.55		
TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>1300</b>	5.00	09/14/2021	ND	275	91.7	300	5.59		

**Sample ID: MONITOR WELL #2 (H212519-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>56.0</b>	4.00	09/13/2021	ND	104	104	100	3.92		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>67.6</b>	10.0	09/14/2021	ND	20.5	103	20.0	7.55		
TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>403</b>	5.00	09/14/2021	ND	275	91.7	300	5.59		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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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

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager

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

# Cardinal Laboratories, Inc.

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # \_\_\_\_\_

Company Name: **RICE Operating Company**  
 Project Manager: **Katie Jones**  
 Address: (Street, City, Zip) **122 W Taylor Street ~ Hobbs, New Mexico 88240**  
 Phone #: **(575) 393-9174**  
 Project Name: **Vacuum F-33 Boot**  
 Project Location: **T17S-R35E-Sec33 F ~ Lea County New Mexico**  
 Sampler Signature: *Rozanne Johnson* (575) 631-9310

### ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX				PRESERVATIVE METHOD				SAMPLING				
				WATER	SOIL	AIR	SLUDGE	HCL (4.40ml VOA)	HNO <sub>3</sub>	NaHSO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>	ICE (1-1 Liter HDPE)	NONE	DATE (2021)	TIME	
<b>H212519</b>																
<b>1</b>	<b>Monitor Well #1</b>	<b>G</b>	<b>1</b>	<b>X</b>						<b>1</b>	<b>9/9</b>	<b>10:40</b>				
<b>2</b>	<b>Monitor Well #2</b>	<b>G</b>	<b>1</b>	<b>X</b>						<b>1</b>	<b>9/9</b>	<b>10:00</b>				

MTBE 8021B/602	TCPLP Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	Turn Around Time ~ 24 Hours
BTEX 8021B/602	TCPLP Volatiles	
TPH 418.1/TX1005 / TX1005 Extended (C35)	TCPLP Semi Volatiles	
PAH 8270C	TCPLP Pesticides	
GC/MS Vol. 8260B/624	RCI	
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, SO <sub>4</sub> , CO <sub>3</sub> , HCO <sub>3</sub> )		
Sulfates		
Total Dissolved Solids		
Chlorides		

Relinquished by: *Rozanne Johnson* Date: **9/10/21** Time: **15:45**  
 Received by: *Rozanne Johnson* Date: **9-10-21** Time: **1555**  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received By: (Laboratory Staff) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Delivered By: (Circle One) **UPS**  
 Sample Condition: Cool  Yes Intact  Yes  
 Checked By: *JO*

Phone Results: Yes  No   
 Fax Results: Yes  No  Additional Fax Number: \_\_\_\_\_  
 REMARKS:  
 Email Results: [kjones@riceswd.com](mailto:kjones@riceswd.com)  
[rozanne@sdacres.com](mailto:rozanne@sdacres.com)



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

---

November 18, 2021

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-33 BOOT

Enclosed are the results of analyses for samples received by the laboratory on 11/15/21 14:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-21-14. 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".

Celey D. Keene

Lab Director/Quality Manager



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:	11/15/2021	Sampling Date:	11/11/2021
Reported:	11/18/2021	Sampling Type:	Water
Project Name:	VACUUM F-33 BOOT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T17S-R35E-SEC33 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #1 (H213251-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>500</b>	4.00	11/16/2021	ND	100	100	100	0.00		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>73.7</b>	10.0	11/18/2021	ND	22.1	110	20.0	7.07		
TDS 160.1		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>1160</b>	5.00	11/17/2021	ND	512	102	500	1.51		

**Sample ID: MONITOR WELL #2 (H213251-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride*</b>	<b>52.0</b>	4.00	11/16/2021	ND	100	100	100	0.00		
Sulfate 375.4		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate*</b>	<b>71.3</b>	10.0	11/18/2021	ND	22.1	110	20.0	7.07		
TDS 160.1		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS*</b>	<b>419</b>	5.00	11/17/2021	ND	512	102	500	1.51		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- 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

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



**District I**  
 1625 N. French Dr., Hobbs, NM 88240  
 Phone:(575) 393-6161 Fax:(575) 393-0720

**District II**  
 811 S. First St., Artesia, NM 88210  
 Phone:(575) 748-1283 Fax:(575) 748-9720

**District III**  
 1000 Rio Brazos Rd., Aztec, NM 87410  
 Phone:(505) 334-6178 Fax:(505) 334-6170

**District IV**  
 1220 S. St Francis Dr., Santa Fe, NM 87505  
 Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS

Action 90575

**CONDITIONS**

Operator: RICE OPERATING COMPANY 122 W Taylor Hobbs, NM 88240	OGRID: 19174
	Action Number: 90575
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

**CONDITIONS**

Created By	Condition	Condition Date
michael.buchanan	Review of the 2021 Annual Report for Vacuum F-33 Boot: Content Satisfactory 1. Continue to monitor and sample groundwater quarterly for 2023. 2. Continue recovery for chlorinated impacted groundwater. 3. Submit Annual Report for 2023 no later than April 1, 2024.	7/28/2023