

L Peter Galusky, Jr PE

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March 31st, 2016

Dr. Tomas Oberding

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

Re: **2015 Annual Report**
Rice Operating Company – Vacuum SWD System
Vacuum L-26 Vent (1R425-66): UL/L, Sec. 26, T17S, R35E

Sent via E-mail

Dr. Oberding:

This letter summarizes progress made over the past calendar year pursuant to the NMOCD approved Corrective Action Plan and Addendum of April 4th, 2011 for this site, which is operated by Rice Operating Company (ROC). The site is located approximately 2.5 miles east of Buckeye, New Mexico at UL/L, Sec. 26, T17S, R35E as shown on the Site Location Map (Appendix - Figure 1). Monitor well sampling at the site indicates that the water table is approximately 57 ft bgs.

Background and Previous Work

In 2008, ROC conducted field investigation on the former junction box. Soil samples were collected at regular intervals, creating a 30 x 30 x 12 ft deep excavation. Based on this investigation, a 30x30-ft geo-synthetic liner was installed at approximately 4.5 to 5 ft bgs. The liner was padded with a six inches of blow sand both above and below. The excavation was backfilled with blended, excavated soil and contoured to the surrounding area. NMOCD was notified of potential groundwater impact on December 1, 2008, and a disclosure report was submitted with all the 2008 Junction Box Closures and Disclosures.

Deeper soil sampling was initiated in 2010 which indicated elevated levels of soil chlorides throughout the vadose zone. This was summarized in the September 14th, 2010 Initial Characterization Report and Corrective Action Plan submitted to NMCOD and which recommended the installation of a near-source monitor well. A subsequent Corrective Action Plan and Addendum of April 4th, 2011 was submitted to NMOCD which proposed the installation of a sub-surface synthetic liner to isolate and prevent the downward migration of elevated soil chlorides and the installation of additional monitoring wells to further to fully delineate groundwater quality (Appendix – Figure 2). This was approved by NMOCD on April 4th, 2011 and two additional monitoring wells were installed on April 4th, 2011. The liner installation was completed in the summer 2011. A report detailing this work was submitted in August 2011 and NMOCD granted soil

Rice Operating Company

closure on October 13th, 2011. According to the Additional Groundwater Monitoring and CAP for Groundwater, MW-1 was plugged and replaced with a 4 inch well (MW-1R) and groundwater removal began in July 2012.

Results of Groundwater Monitoring

Results of groundwater sampling from November 2010 through 2015 are given in the Appendix (Figure 3, Tables 1 & 2). Groundwater chloride concentrations in the up-gradient monitor well (MW-2) have remained below 92 mg/l since sampling began in 2011. Chloride concentrations in the down-gradient monitor well (MW-3) averaged 250 mg/l in 2015, 248 mg in 2014 and 309 mg/l in 2013. Chloride concentrations in the near-source pumping well (MW-1R) averaged 167 mg/l in 2013, 127 mg/l in 2014 and 149 mg/l in 2015, all substantially below the NMENV groundwater chloride standard of 250 mg/l.

Recommendation

The withdrawal of groundwater is not removing a substantial mass of chloride due to the low chloride concentration in this water. However, this does appear to be causing an acceleration in downgradient chloride dilution. We thus plan to continue groundwater pumping and sampling groundwater through 2016 and will recommend a path forward after we have analyzed this data.

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 contact either myself or Katie Jones at Rice Operating Company if you have any questions or need additional information.

Thank you.

Sincerely,

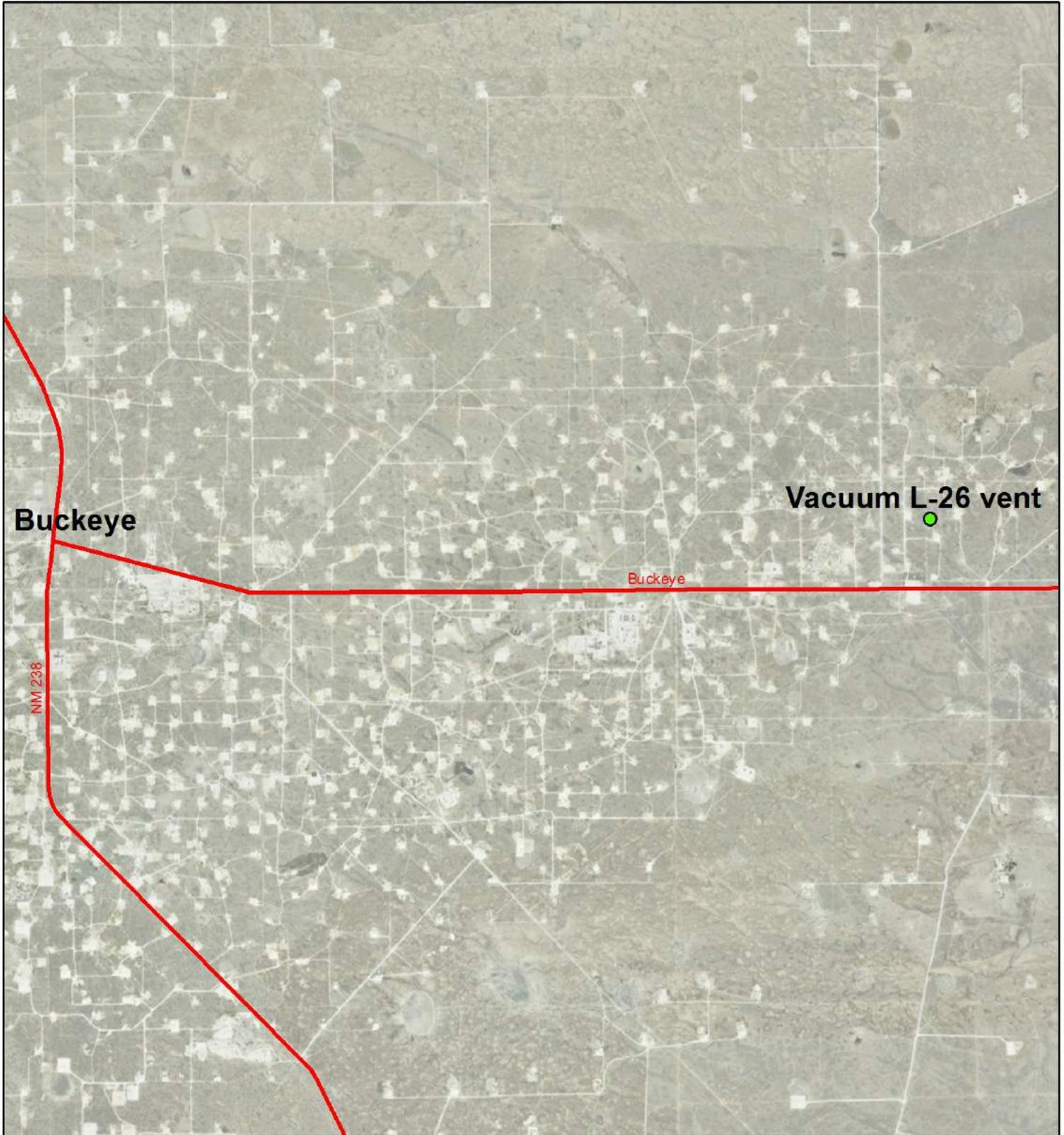


L. Peter (Pete) Galusky, Jr PE
NM Professional Engineer No. 22561

Copy: Rice Operating Company

Attachments as noted

Site Location Map

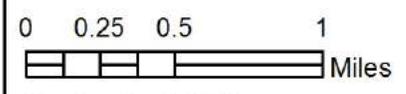


Vacuum L-26 vent

Case #: 1R425-66

Legals: UL/L sec. 26
T17S R35E

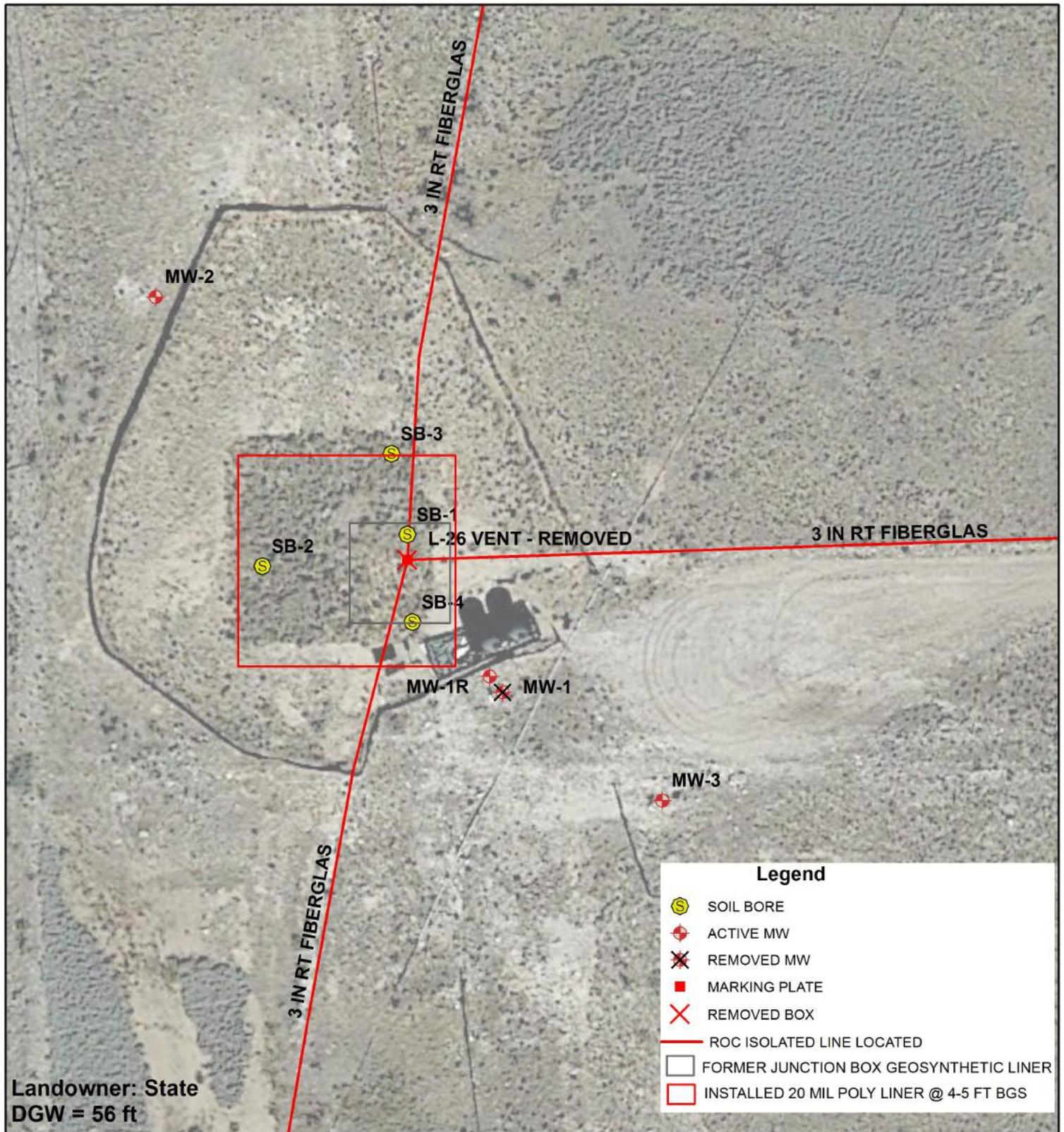
Figure 1



Drawing date: 1-11-12
Drafted by: L. Weinheimer

Figure 2

Site Map



Landowner: State
DGW = 56 ft

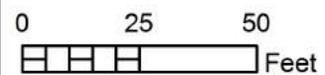


VACUUM L-26 VENT

1R425-66

UL L SECTION 26
T-17-S R-35-E
LEA COUNTY, NM

GPS: 32.803424 -103.432868



Drawing date: 3/24/16
Drafted by: T. Grieco



Figure 3

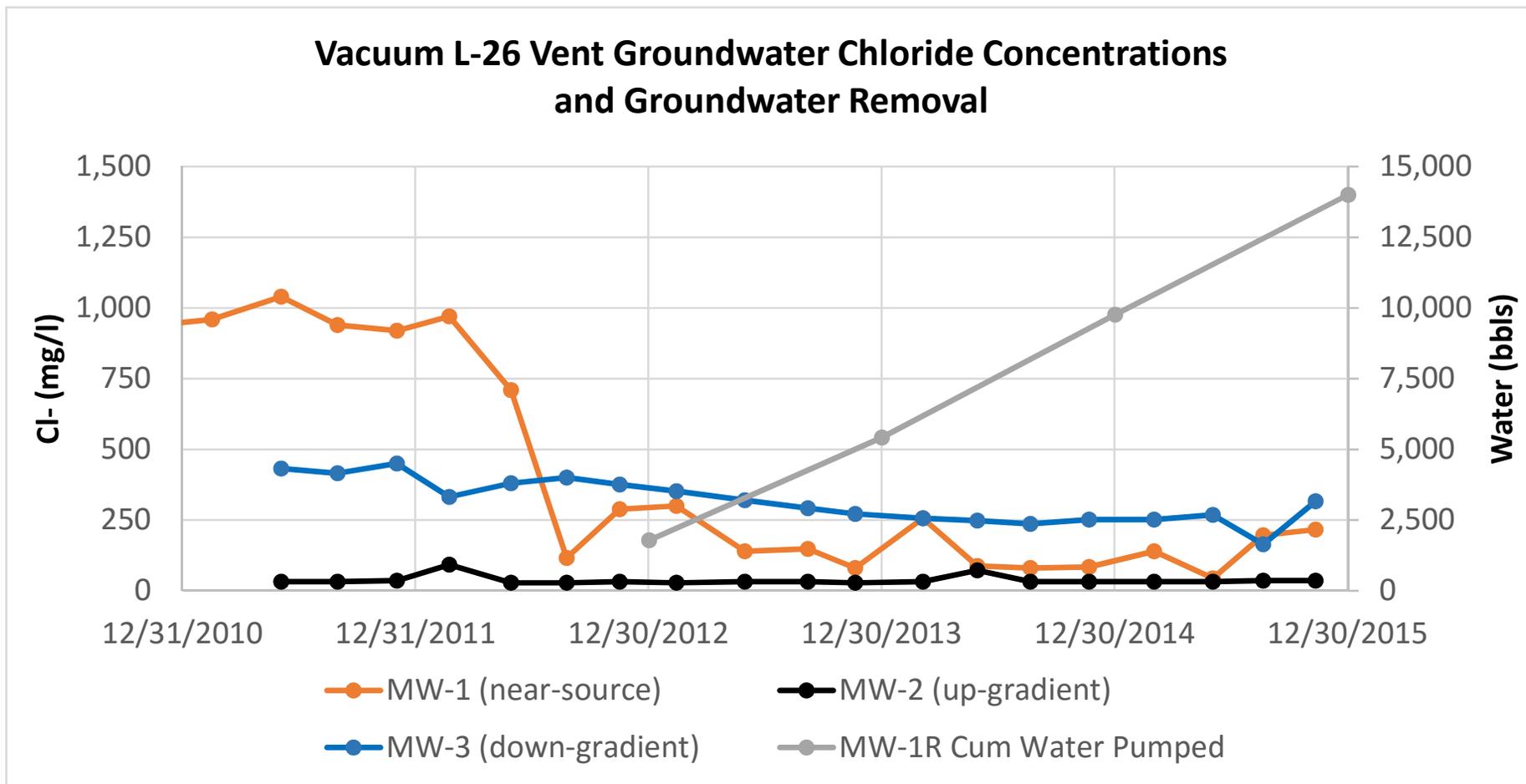


Table 1

Rice Operating Company

Vacuum L-26 Vent

Date	Groundwater Cl- conc (mg/l)		
	MW-1 (down-gradient)	MW-2 (up-gradient)	MW-3 (down-gradient)
11/22/2010	940		
2/16/2011	960		
6/4/2011	1,040	32	432
8/31/2011	940	32	416
12/2/2011	920	36	450
2/22/2012	970	92	332
5/29/2012	710	28	380
8/24/2012	116	28	400
11/15/2012	288	32	376
2/12/2013	300	28	352
5/30/2013	140	32	320
9/6/2013	148	32	292
11/19/2013	80	28	272
3/5/2014	256	32	256
5/29/2014	88	72	248
8/20/2014	80	32	236
11/20/2014	84	32	252
3/2/2015	140	32	252
6/2/2015	44	32	268
8/20/2015	196	36	164
11/10/2015	216	36	316

Groundwater Removed (bbls)	
Date	MW-1R Cum Water Pumped
12/31/2012	1,783
12/31/2013	5,424
12/31/2014	9,762
12/31/2015	14,007

Table 2a

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)
1	56.5	72.5	2.6	10	11/22/2010	940	2,120	<0.001	<0.001	<0.001	<0.003	80
1	56.6	72.6	2.6	10	2/16/2011	960	2,130	<0.001	<0.001	<0.001	<0.003	64
1	56.7	72.6	2.5	10	6/4/2011	1,040	2,710	<0.001	<0.001	<0.001	<0.003	65
1	56.8	72.6	2.5	10	8/31/2011	940	2,440	<0.001	<0.001	<0.001	<0.003	67
1	56.9	72.6	2.5	10	12/2/2011	920	2,230	<0.001	<0.001	<0.001	<0.003	74
1	57.0	72.6	2.5	10	2/22/2012	970	1,930	<0.001	<0.001	<0.001	<0.003	66
1	57.1	72.6	2.5	10	5/29/2012	710	1,910	<0.001	<0.001	<0.001	<0.003	66
1	XXX	XXX	0.0	Pumping	8/24/2012	116	551	<0.001	<0.001	<0.001	<0.003	64
1	XXX	XXX	0.0	Pumping	11/15/2012	288	960	<0.001	<0.001	<0.001	<0.003	60
1	XXX	XXX	0.0	Pumping	2/12/2013	300	958	<0.001	<0.001	<0.001	<0.003	55
1R	XXX	XXX	0.0	Pumping	5/30/2013	140	651	<0.001	<0.001	<0.001	<0.003	60
1R	XXX	XXX	0.0	Pumping	9/6/2013	148	692	<0.001	<0.001	<0.001	<0.003	50
1R	XXX	XXX	0.0	Pumping	11/19/2013	80	446	<0.001	<0.001	<0.001	<0.003	59
1R	XXX	XXX	0.0	90	3/5/2014	256	806	<0.001	<0.001	<0.001	<0.003	59
1R	XXX	XXX	0.0	Pumping	5/29/2014	88	490	<0.001	<0.001	<0.001	<0.003	59
1R	XXX	XXX	0.0	Pumping	8/20/2014	80	468	<0.001	<0.001	<0.001	<0.003	56
1R	XXX	XXX	0.0	90	11/20/2014	84	498	<0.001	<0.001	<0.001	<0.003	54
1R	XXX	XXX	0.0	90	3/2/2015	140	644	<0.001	<0.001	<0.001	<0.003	47
1R	XXX	XXX	0.0	Pumping	6/2/2015	44	590	<0.001	<0.001	<0.001	<0.003	37
1R	XXX	XXX	0.0	Pumping	8/20/2015	196	676	<0.001	<0.001	<0.001	<0.003	42
1R	XXX	XXX	0.0	Pumping	11/10/2015	216	654	<0.001	<0.001	<0.001	<0.003	47

Table 2b

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)
2	56.8	62.8	1.0	10	6/4/2011	32	457	<0.001	<0.001	<0.001	<0.003	37
2	56.9	62.8	0.9	10	8/31/2011	32	374	<0.001	<0.001	<0.001	<0.003	34
2	57.0	62.8	0.9	10	12/2/2011	36	405	<0.001	<0.001	<0.001	<0.003	41
2	57.1	62.8	0.9	10	2/22/2012	92	408	<0.001	<0.001	<0.001	<0.003	42
2	57.2	62.8	0.9	10	5/29/2012	28	411	<0.001	<0.001	<0.001	<0.003	41
2	57.4	62.8	0.9	10	8/24/2012	28	490	<0.001	<0.001	<0.001	<0.003	28
2	54.5	62.8	1.3	10	11/15/2012	32	518	<0.001	<0.001	<0.001	<0.003	20
2	57.5	62.8	0.8	10	2/12/2013	28	573	<0.001	<0.001	<0.001	<0.003	29
2	57.6	62.8	0.8	10	5/30/2013	32	611	<0.001	<0.001	<0.001	<0.003	29
2	57.8	62.8	0.8	10	9/6/2013	32	646	<0.001	<0.001	<0.001	<0.003	31
2	57.8	62.8	0.8	10	11/19/2013	28	587	<0.001	<0.001	<0.001	<0.003	32
2	57.9	62.8	0.8	10	3/5/2014	32	308	<0.001	<0.001	<0.001	<0.003	61
2	58.0	62.8	0.8	10	5/29/2014	72	454	<0.001	<0.001	<0.001	<0.003	52
2	58.0	62.8	0.8	10	8/19/2014	32	558	<0.001	<0.001	<0.001	<0.003	33
2	57.2	62.8	0.9	10	11/20/2014	32	526	<0.001	<0.001	<0.001	<0.003	31
2	57.1	62.8	0.9	10	3/2/2015	32	546	<0.001	<0.001	<0.001	<0.003	28
2	54.4	62.8	1.3	10	6/2/2015	32	586	<0.001	<0.001	<0.001	<0.003	41
2	57.6	62.8	0.8	10	8/20/2015	36	546	<0.001	<0.001	<0.001	<0.003	35
2	57.8	62.8	0.8	8	11/10/2015	36	510	<0.001	<0.001	<0.001	<0.003	39

Table 2c

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)
3	56.1	68.9	2.0	10	6/4/2011	432	1,210	<0.001	<0.001	<0.001	<0.003	69
3	52.2	68.9	2.7	10	8/31/2011	416	1,250	<0.001	<0.001	<0.001	<0.003	47
3	56.3	68.9	2.0	10	12/2/2011	450	1,330	<0.001	<0.001	<0.001	<0.003	57
3	56.4	68.9	2.0	10	2/22/2012	332	1,330	<0.001	<0.001	<0.001	<0.003	55
3	56.6	68.9	2.0	10	5/29/2012	380	1,220	<0.001	<0.001	<0.001	<0.003	57
3	56.7	68.9	1.9	10	8/24/2012	400	1,220	<0.001	<0.001	<0.001	<0.003	49
3	56.8	68.9	1.9	10	11/15/2012	376	1,240	<0.001	<0.001	<0.001	<0.003	49
3	56.8	68.9	1.9	10	2/12/2013	352	1,260	<0.001	<0.001	<0.001	<0.003	53
3	56.9	68.9	1.9	10	5/30/2013	320	1,220	<0.001	<0.001	<0.001	<0.003	49
3	56.9	68.9	1.9	10	9/6/2013	292	1,170	<0.001	<0.001	<0.001	<0.003	46
3	57.1	69.9	1.9	10	11/19/2013	272	1,150	<0.001	<0.001	<0.001	<0.003	45
3	57.2	68.9	1.9	10	3/5/2014	256	984	<0.001	<0.001	<0.001	<0.003	47
3	57.3	68.9	1.9	10	5/29/2014	248	826	<0.001	<0.001	<0.001	<0.003	86
3	57.3	68.9	1.9	10	08.19.14	236	1,090	<0.001	<0.001	<0.001	<0.003	39
3	56.5	68.9	2.0	10	11/20/2014	252	1,030	<0.001	<0.001	<0.001	<0.003	32
3	56.4	68.9	2.0	10	03.02.15	252	1,030	<0.001	<0.001	<0.001	<0.003	42
3	56.8	68.9	1.9	10	6/2/2015	268	1,060	<0.001	<0.001	<0.001	<0.003	45
3	57.0	68.9	1.9	10	8/20/2015	164	1,100	<0.001	<0.001	<0.001	<0.003	48
3	57.2	68.9	1.9	10	11/10/2015	316	1,090	<0.001	<0.001	<0.001	<0.003	51



November 19, 2015

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM L-26 VENT

Enclosed are the results of analyses for samples received by the laboratory on 11/11/15 14:36.

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 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

Analytical Results For:

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

Received:	11/11/2015	Sampling Date:	11/10/2015
Reported:	11/19/2015	Sampling Type:	Water
Project Name:	VACUUM L-26 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T17S-R35E-SEC26 L-LEA CTY., NM		

Sample ID: MONITOR WELL #1R (H502990-01)

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	11/17/2015	ND	0.020	100	0.0200	0.134	
Toluene*	<0.001	0.001	11/17/2015	ND	0.021	105	0.0200	1.34	
Ethylbenzene*	<0.001	0.001	11/17/2015	ND	0.019	95.9	0.0200	0.442	
Total Xylenes*	<0.003	0.003	11/17/2015	ND	0.062	103	0.0600	0.0650	
Total BTEX	<0.006	0.006	11/17/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.2 % 73.7-146

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	216	4.00	11/16/2015	ND	104	104	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*	47.0	25.0	11/19/2015	ND	20.7	104	20.0	3.83	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	654	5.00	11/18/2015	ND	478	90.7	527	7.36	

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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:	11/11/2015	Sampling Date:	11/10/2015
Reported:	11/19/2015	Sampling Type:	Water
Project Name:	VACUUM L-26 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T17S-R35E-SEC26 L-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H502990-02)

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	11/17/2015	ND	0.020	100	0.0200	0.134		
Toluene*	<0.001	0.001	11/17/2015	ND	0.021	105	0.0200	1.34		
Ethylbenzene*	<0.001	0.001	11/17/2015	ND	0.019	95.9	0.0200	0.442		
Total Xylenes*	<0.003	0.003	11/17/2015	ND	0.062	103	0.0600	0.0650		
Total BTEX	<0.006	0.006	11/17/2015	ND						

Surrogate: 4-Bromofluorobenzene (PID) 97.9 % 73.7-146

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	36.0	4.00	11/16/2015	ND	104	104	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*	38.6	10.0	11/19/2015	ND	20.7	104	20.0	3.83		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	510	5.00	11/18/2015	ND	478	90.7	527	7.36		

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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:	11/11/2015	Sampling Date:	11/10/2015
Reported:	11/19/2015	Sampling Type:	Water
Project Name:	VACUUM L-26 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Judy Garcia
Project Location:	T17S-R35E-SEC26 L-LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H502990-03)

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	11/17/2015	ND	0.020	100	0.0200	0.134		
Toluene*	<0.001	0.001	11/17/2015	ND	0.021	105	0.0200	1.34		
Ethylbenzene*	<0.001	0.001	11/17/2015	ND	0.019	95.9	0.0200	0.442		
Total Xylenes*	<0.003	0.003	11/17/2015	ND	0.062	103	0.0600	0.0650		
Total BTEX	<0.006	0.006	11/17/2015	ND						

Surrogate: 4-Bromofluorobenzene (PID) 97.4 % 73.7-146

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	316	4.00	11/16/2015	ND	104	104	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*	50.5	10.0	11/19/2015	ND	20.7	104	20.0	3.83		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	1090	5.00	11/18/2015	ND	478	90.7	527	7.36		

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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



Celey D. Keene, Lab Director/Quality Manager

