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By OCD Dr Oberding at 10:14 am, Feb 03, 2017

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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 87505

RE: **2015 Annual Report**
Rice Operating Company
Vacuum N-6-1 Jct, UL N, Sec 6, T18S, R35E
OCD Case Number 1R0479

Sent by E-mail

Dr. Oberding:

This letter summarizes progress made over the past calendar year pursuant to the NMOCD approved Corrective Action Plan for this site (Appendix, Figure 1), which is operated by Rice Operating Company (ROC).

ROC submitted a Vadose Zone Corrective Action Plan (CAP) Update to NMOCD on November 8th, 2013, and approved on November 20th, 2013, which entailed the removal of high-chloride soils to 3 ft bgs and the installation of an impermeable, 20-mil reinforced synthetic liner to reduce the potential downward migration of residual soil chlorides (Figures 2). This work was completed in 2014 and is summarized in the Vadose Zone CAP Report & Soil Closure Request dated and submitted to NMOCD on August 12th, 2014. NMOCD approved the report and granted 'Soil Closure' on September 18th, 2014.

ROC continued to monitor groundwater chloride concentrations during 2015. In brief,

- Approximately 34,372 barrels of chloride-affected groundwater have been removed from the source area between January 2008 and November 2015, when the system was shut down for the winter (Appendix Figure 3, Table 1). This equates to approximately 5,028 kg of chloride removed from groundwater. This water was subsequently used for ROC SWD line and well maintenance purposes.
- Groundwater chloride concentrations in the near-source, down-gradient monitor well (MW-1) dropped considerably from their early values of greater than 15,000 mg/l in January 2008 to 5,100 mg/l in March 2014 (Appendix Figure 3, Tables 1&2). This well was replaced in summer 2014 with a new monitor well, MW-1R after being damaged during the installation of the sub-surface soil liner. Measured groundwater chloride concentrations in MW-1R averaged 1,350 mg in 2015 vs 960 mg/l in 2014 (Appendix Figure 3, Tables 1&2).

Vacuum N-6-1 2015 Annual Report

- Groundwater chloride concentrations in the other wells (MW-2, MW-3 and MW-4) have continued to remain low throughout 2015 with concentrations below 48 mg/l (Appendix Table 2).
- Groundwater chloride concentrations in the (down-gradient) recovery well (RW-1) continued their decline from 5,300 mg/l in January 2008 to 880 mg/l in November 2015 (Appendix Figure 3, Tables 1&2).

We plan to resume pumping chloride-affected groundwater from the recovery well with the highest chloride concentration and to continue the quarterly sampling of groundwater through 2016. However, we may be approaching the point where further groundwater removal is not necessary, due to the sealing of the vadose zone and to the effectiveness of groundwater chloride removal efforts.

ROC is the service provider (agent) for the Vacuum Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The Vacuum SWD 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.

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

Sincerely,

A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written over a light gray rectangular background.

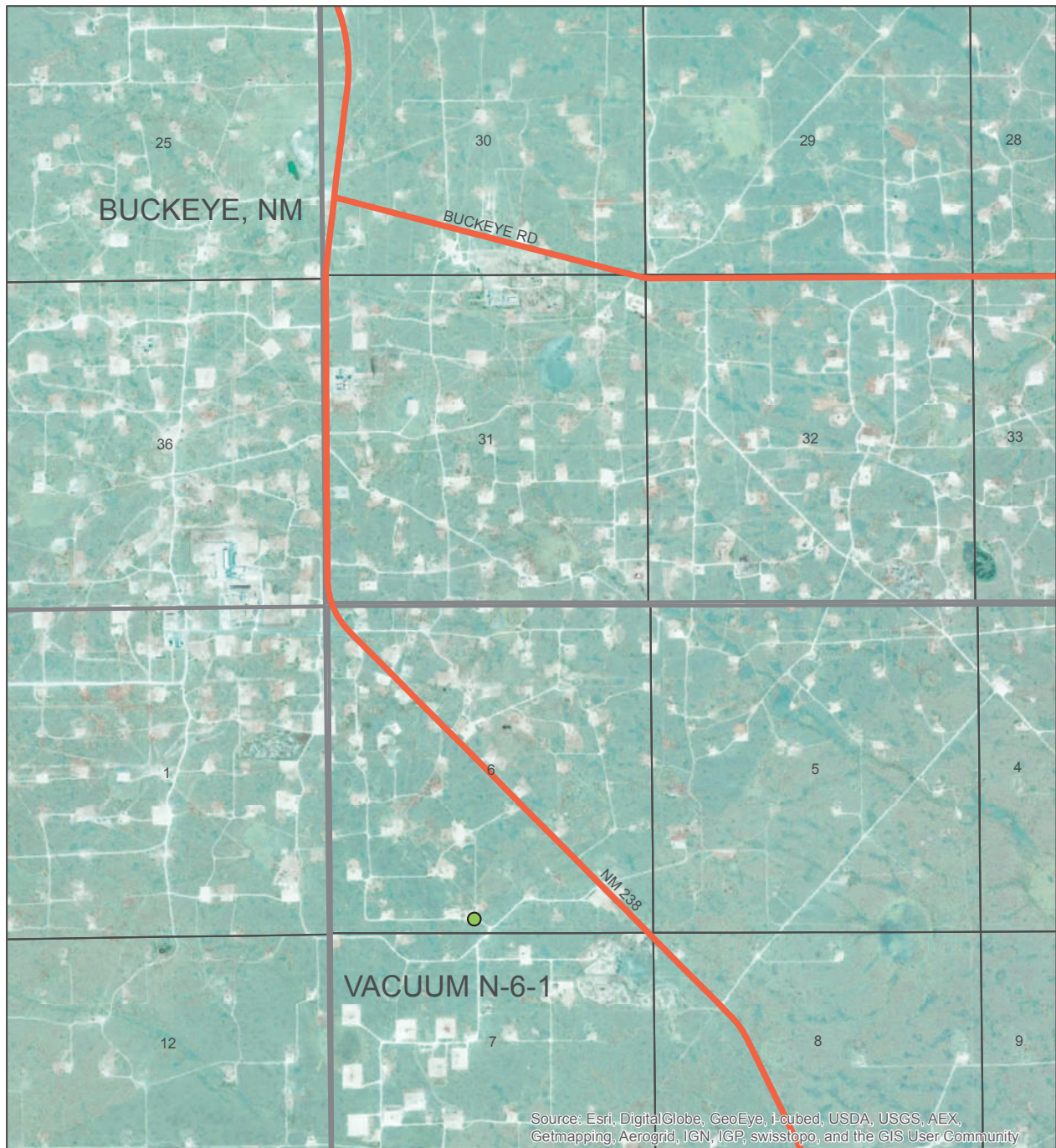
L. Peter Galusky, Jr. P.E.
NM Prof. Engineer No. 22561

Copy: Rice Operating Company

Attachments: Appendix

L Peter Galusky, Jr PE

Site Location Map

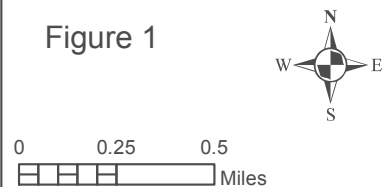


VACUUM N-6-1 JUNCTION BOX

**LEGALS: UL/N SEC 6
T-18-S R-35-E**

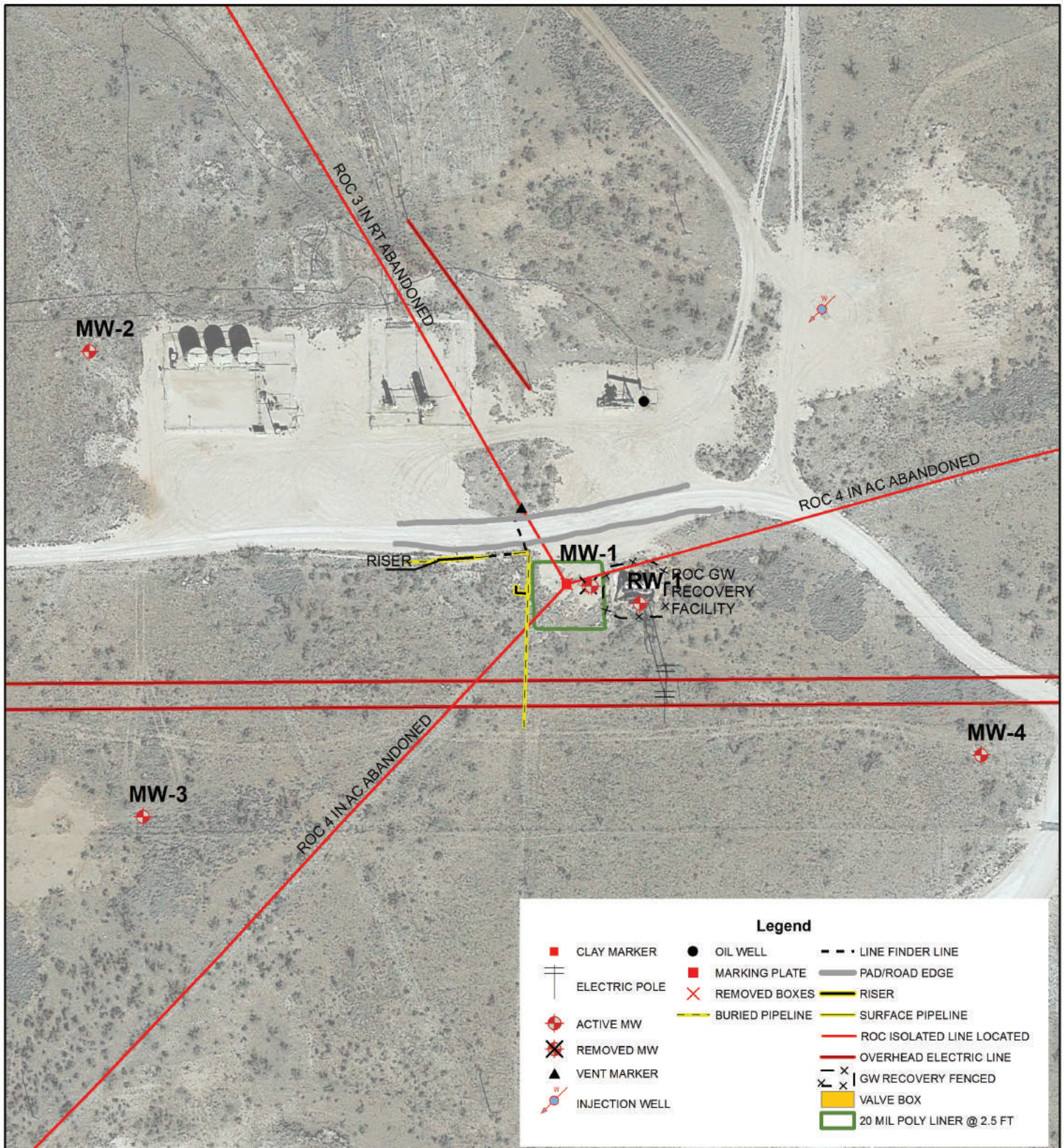
NMOCD CASE #: 1R0479

Figure 1



Drawing date: 10/7/13
Drafted by: T. Grieco

Installed Liner and Monitor Wells



VACUUM N-6-1 AREA

1R0479

UL/N SEC 6
T-18-S R-35-E
LEA COUNTY, NM

GPS: 32.770217 -103.498268

Figure 2

0 50 100
Feet



GPS date: 5/2/14 BC
Drawing date: 3/3/16
Drafted by: T. Grieco

Figure 3

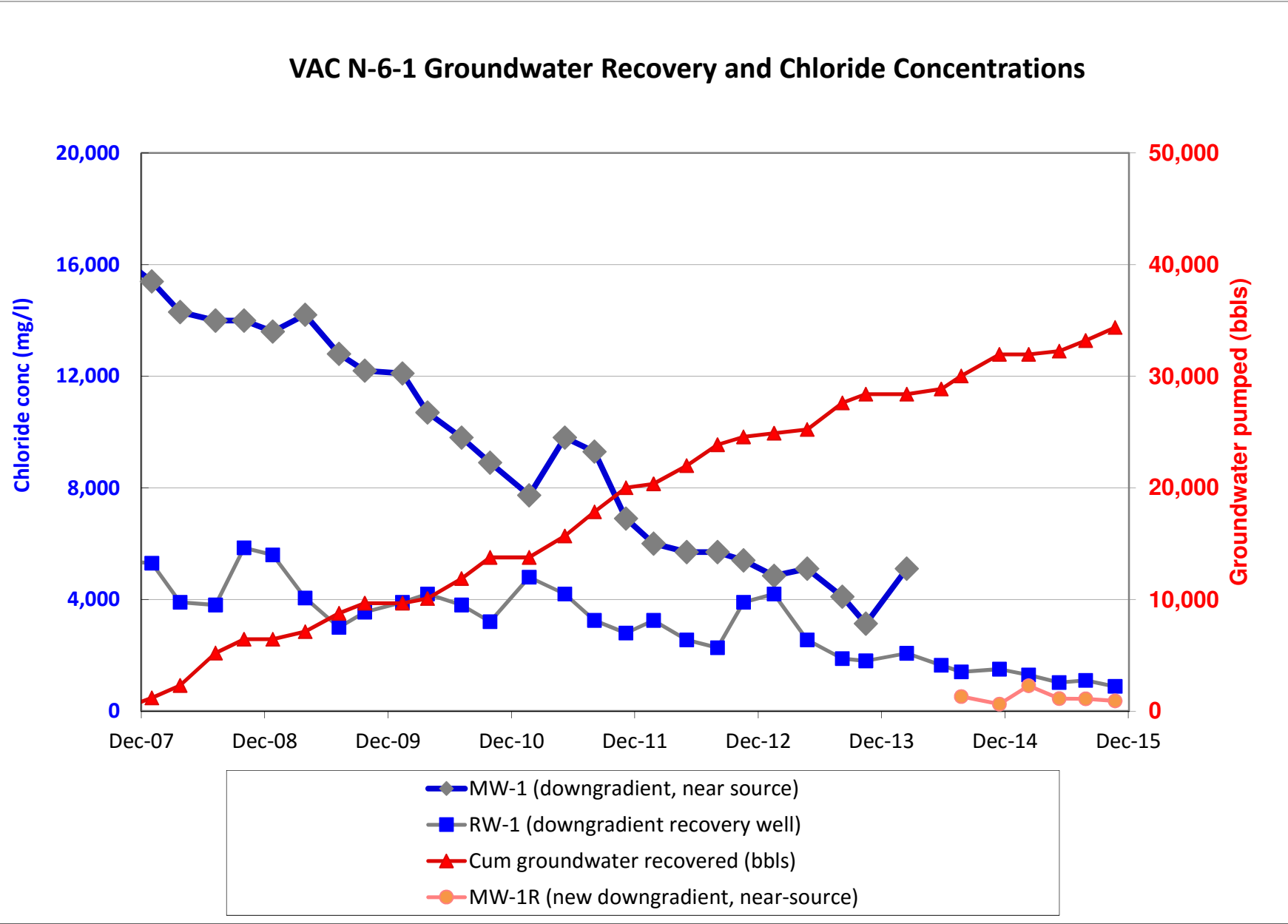


Table 1

Rice Operating Company Vacuum Field SWD System N-6-1 junction box Monitor Well Water Sample Analyses				
Groundwater Chloride Conc (mg/l)				Cum
date	MW-1 (downgradient, near source)	MW-1R (new downgradient, near-source)	RW-1 (downgradient recovery well)	groundwater recovered (bbls)
8/25/2006	21,900			
10/18/2006	21,400			
3/7/2007	20,200			
5/29/2007	18,500			
9/25/2007	15,795		5,398	
10/17/2007	16,400		5,400	0
1/31/2008	15,400		5,300	1,184
4/24/2008	14,300		3,900	2,302
8/7/2008	14,000		3,800	5,199
10/30/2008	14,000		5,850	6,438
1/23/2009	13,600		5,600	6,438
4/29/2009	14,200		4,050	7,109
8/7/2009	12,800		3,000	8,771
10/22/2009	12,200		3,550	9,665
2/11/2010	12,100		3,900	9,665
4/26/2010	10,700		4,200	10,070
8/5/2010	9,800		3,800	11,866
10/28/2010	8,900		3,200	13,773
2/21/2011	7,730		4,800	13,773
6/6/2011	9,800		4,200	15,682
9/2/2011	9,300		3,250	17,857
12/4/2011	6,900		2,800	20,003
2/24/2012	6,000		3,250	20,355
6/1/2012	5,700		2,550	21,994
8/31/2012	5,700		2,270	23,870
11/16/2012	5,400		3,900	24,560
2/14/2013	4,850		4,200	24,898
5/23/2013	5,100		2,550	25,235
9/4/2013	4,100		1,880	27,610
11/13/2013	3,130		1,800	28,390
3/14/2014	5,100		2,070	28,390
6/24/2014			1,640	28,860
8/22/2014		1,300	1,400	30,020
12/13/2014		620	1,500	31,972
3/9/2015		2,270	1,300	31,972
6/8/2015		1,110	1,020	32,252
8/25/2015		1,100	1,100	33,202
11/20/2015		920	880	34,372

Table

ROC - Vacuum N-6-1 (1R0479)

Unit Letter N, Section 6, T18S, R35E

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	CI	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	116.43	125.8	1.5	10	10/18/2006	21400	40100	<0.001	<0.001	<0.001	<0.001	475	Silt to clear
1	116.66	125.1	1.4	10	3/7/2007	20200	28100	<0.001	<0.001	<0.001	<0.001	584	Silt to clear Slight odor
1	116.61	125.1	1.4	10	5/29/2007	18500	35900	<0.001	<0.001	<0.001	<0.001	449	Silt to clear Slight odor
1	116.95	125.1	1.3	5	9/25/2007	15795	27714	<0.002	<0.002	<0.002	<0.006	152	Silt to clear Slight odor
1	116.98	125.1	1.3	5	10/17/2007	16400	27927	<0.001	0.004	<0.001	<0.001	143	Silt to clear Slight odor
1	117.02	125.1	1.3	5	1/31/2008	15400	28300	<0.001	<0.001	<0.001	<0.003	148	Silt to clear Slight odor
1	117.22	125.1	1.3	5	4/24/2008	14300	24800	<0.001	<0.001	<0.001	<0.003	128	Silt to clear Slight odor
1	117.67	125.1	1.2	5	8/7/2008	14000	24900	<0.001	<0.001	<0.001	<0.003	158	Silt to clear Slight odor
1	117.62	125.1	1.2	5	10/30/2008	14000	28200	<0.001	<0.001	<0.001	<0.003	126	Silt to clear Slight odor
1	117.78	125	1.1	5	1/23/2009	13600	24200	<0.001	<0.001	<0.001	<0.003	109	Silt to clear Slight odor
1	118.09	125	1.1	5	4/29/2009	14200	22800	<0.001	<0.001	<0.001	<0.003	110	Silt to clear Slight odor
1	118.08	125	1.1	5	8/7/2009	12800	21200	<0.001	<0.001	<0.001	<0.003	102	Silt to clear Slight odor
1	118.43	125	1	5	10/22/2009	12200	19700	<0.001	<0.001	<0.001	<0.003	76.4	Silt to clear Slight odor
1	118.78	125	1	5	4/26/2010	10700	18400	<0.001	<0.001	<0.001	<0.003	96	Silt to clear Slight odor
1	118.28	125	1.1	5	2/11/2010	12100	20700	<0.001	<0.001	<0.001	<0.003	94.4	Silt to clear Slight odor
1	118.6	125	1	5	8/5/2010	9800	15600	<0.001	<0.001	<0.001	<0.003	79.4	Silt to clear Slight odor
1	118.96	125	1	5	10/28/2010	8900	16800	<0.001	<0.001	<0.001	<0.003	81.7	Silt to clear Slight odor
1	118.89	125.2	1	5	2/21/2011	7730	13200	<0.001	0.001	<0.001	<0.003	60.3	Silt to clear Slight odor
1	119.35	125.2	0.9	5	6/6/2011	9800	13700	<0.001	<0.001	<0.001	<0.003	77.8	Silt to clear Slight odor
1	120.17	125.2	0.8	5	9/2/2011	9300	11800	<0.001	<0.001	<0.001	<0.003	94.9	Silt to clear Slight odor
1	119.72	125.2	0.9	5	12/4/2011	6900	11500	<0.001	<0.001	<0.001	<0.003	81	Silt to clear Slight odor
1	119.76	125.2	0.9	5	2/24/2012	6000	10400	<0.001	<0.001	<0.001	<0.003	77.5	Silt to clear Slight odor
1	119.78	125.2	0.9	5	6/1/2012	5700	10100	<0.001	<0.001	<0.001	<0.003	77.2	Silt to clear Slight odor
1	119.83	125.2	0.9	5	8/31/2012	5700	9330	<0.001	<0.001	<0.001	<0.003	66.3	Silt to clear Slight odor
1	119.98	125.2	0.8	5	11/16/2012	5400	9240	<0.001	<0.001	<0.001	<0.003	71.8	Silt to clear Slight odor
1	120.03	125.2	0.8	5	2/14/2013	4850	8110	<0.001	<0.001	<0.001	<0.003	65	Silt to clear Slight odor
1	120.4	125.2	0.8	5	5/23/2013	5100	8230	<0.001	<0.001	<0.001	<0.003	74	Silt to clear Slight odor
1	120.6	125.2	0.7	5	9/4/2013	4100	7160	<0.001	<0.001	<0.001	<0.003	55.2	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
1	120.61	125.2	0.7	5	11/13/2013	3130	6910	<0.001	<0.001	<0.001	<0.003	60.9	Silt to clear Slight odor
1	120.64	125.2	0.7	5	3/14/2014	5100	7250	<0.001	<0.001	<0.001	<0.003	72.8	Silt to clear Slight odor
MW-1R installed 7/17/2014													
1R	XXX	XXX	0	Running	8/22/2014	1300	2770	<0.001	<0.001	<0.001	<0.003	45.7	Silt to clear Slight odor
1R	XXX	168.3	0	100	12/13/2014	620	1360	<0.001	<0.001	<0.001	<0.003	37.1	Silt to clear Slight odor
1R	XXX	168.3	0	100	3/9/2015	2270	5920	<0.001	<0.001	<0.001	<0.003	180	Silt to clear Slight odor
1R	XXX	168	0	Running	6/8/2015	1110	2670	<0.001	<0.001	<0.001	<0.003	48	Silt to clear Slight odor
1R	XXX	168	0	Running	8/25/2015	1100	1970	<0.001	<0.001	<0.001	<0.003	36.1	Clear Slight Odor
1R	XXX	168	0	Running	11/17/2015	920	1780	<0.001	<0.001	<0.001	<0.003	40.2	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
2	117.32	125.8	1.4	10	10/18/2006	19.9	308	j[0.000837]	<0.001	<0.001	<0.001	32.7	Clear
2	117.56	126.9	1.5	8	3/7/2007	21.1	278	<0.001	<0.001	<0.001	<0.001	30.5	Sand to clear No odor
2	117.61	126.9	1.5	2	5/29/2007	23.5	296	<0.001	<0.001	<0.001	<0.001	34.2	Sand to clear No odor
2	117.89	126.9	1.4	6	9/25/2007	24	319	<0.002	<0.002	<0.002	<0.006	38	Sand to clear No odor
2	117.92	126.9	1.4	6	10/17/2007	28	289	<0.001	0.005	<0.001	0.004	37.8	Sand to clear No odor
2	117.96	126.6	1.4	6	1/31/2008	28	325	<0.001	<0.001	<0.001	<0.003	36.4	Sand to clear No odor
2	118.11	126.6	1.4	6	4/24/2008	28	286	<0.001	<0.001	<0.001	<0.003	30.7	Sand to clear No odor
2	118.35	126.6	1.3	6	8/7/2008	32	324	<0.001	<0.001	<0.001	<0.003	48	Sand to clear No odor
2	118.53	126.6	1.3	6	10/30/2008	40	342	<0.001	<0.001	<0.001	<0.003	47.3	Sand to clear No odor
2	118.65	126.6	1.3	6	1/23/2009	36	365	<0.001	<0.001	<0.001	<0.003	44.6	Sand to clear No odor
2	118.81	126.6	1.2	6	4/29/2009	24	346	<0.001	<0.001	<0.001	<0.003	34.2	Sand to clear No odor
2	118.96	126.6	1.2	6	8/7/2009	36.1	24	<0.001	<0.001	<0.001	<0.003	302	Silt to clear No odor
2	119.11	126.6	1.2	6	10/22/2009	24	314	<0.001	<0.001	<0.001	<0.003	32.8	Sand to clear No odor
2	119.49	126.5	1.1	6	4/26/2010	28	324	<0.001	<0.001	<0.001	<0.003	42.4	Sand to clear No odor
2	119.25	126.5	1.2	6	2/11/2010	28	343	<0.001	<0.001	<0.001	<0.003	42.6	Sand to clear No odor
2	119.55	126.5	1.1	6	8/5/2010	28	316	<0.001	<0.001	<0.001	<0.003	35	Sand to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	119.71	126.5	1.1	6	10/28/2010	24	336	<0.001	<0.001	<0.001	<0.003	39	Sand to clear No odor
2	119.96	127	1.1	6	2/21/2011	24	311	<0.001	<0.001	<0.001	<0.003	34.8	Sand to clear No odor
2	120.08	127	1.1	6	6/6/2011	28	309	<0.001	<0.001	<0.001	<0.003	39.3	Sand to clear No odor
2	120.31	127	1.1	6	9/2/2011	32	270	<0.001	<0.001	<0.001	<0.003	49	Sand to clear No odor
2	120.47	127	1	6	12/4/2011	24	303	<0.001	<0.001	<0.001	<0.003	40.1	Sand to clear No odor
2	120.56	127	1	6	2/24/2012	24	343	<0.001	<0.001	<0.001	<0.003	37.9	Sand to clear No odor
2	120.67	127	1	6	6/1/2012	32	311	<0.001	<0.001	<0.001	<0.003	40.2	Sand to clear No odor
2	120.93	127	1	6	8/31/2012	40	320	<0.001	<0.001	<0.001	<0.003	36.4	Sand to clear No odor
2	121.08	127	0.9	6	11/16/2012	28	303	<0.001	<0.001	<0.001	<0.003	30.4	Sand to clear No odor
2	121.11	127	0.9	6	2/14/2013	36	326	<0.001	<0.001	<0.001	<0.003	55.6	Sand to clear No odor
2	121.27	127	0.9	6	5/23/2013	24	255	<0.001	<0.001	<0.001	<0.003	43.5	Sand to clear No odor
2	121.54	127	0.9	6	9/4/2013	28	290	<0.001	<0.001	<0.001	<0.003	33.1	Sand to clear No odor
2	121.52	127	0.9	6	11/13/2013	32	300	<0.001	<0.001	<0.001	<0.003	46.6	Sand to clear No odor
2	121.65	127	0.9	6	3/14/2014	68	336	<0.001	<0.001	<0.001	<0.003	36.8	Sand to clear No odor
2	121.78	127	0.8	6	6/24/2014	60	368	<0.001	<0.001	<0.001	<0.003	57.6	Sand to clear No odor
2	121.89	127	0.8	6	8/22/2014	60	426	<0.001	<0.001	<0.001	<0.003	31.8	Sand to clear No odor
2	121.29	127	0.9	6	12/12/2014	68	370	<0.001	<0.001	<0.001	<0.003	28.1	Sand to clear No odor
2	122.04	127	0.8	6	3/9/2015	24	284	<0.001	<0.001	<0.001	<0.003	26.9	Sand to clear No odor
2	122.09	127	0.8	6	6/8/2015	48	276	<0.001	<0.001	<0.001	<0.003	34.3	Sand to clear No odor
2	122.27	127	4.73	6	8/25/2015	36	390	<0.001	<0.001	<0.001	<0.003	40.2	Sand to clear No odor
2	122.41	127	0.73	6	11/17/2015	40	356	<0.001	<0.001	<0.001	<0.003	43.5	Sand to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	117.1	129	1.9	10	10/18/2006	19.5	342	<0.001	<0.001	<0.001	<0.001	35.2	Clear
3	117.35	127.6	1.6	8	3/7/2007	20	236	<0.001	<0.001	<0.001	<0.001	33.9	Sand to clear No odor
3	117.4	127.6	1.6	8	5/29/2007	24.1	290	<0.001	<0.001	<0.001	<0.001	40.2	Sand to clear No odor
3	117.71	127.6	1.6	6	9/25/2007	24	332	<0.002	<0.002	<0.002	<0.006	40.7	Sand to clear No odor
3	117.76	127.6	1.6	6	10/17/2007	24	281	<0.001	0.004	<0.001	0.004	39.5	Sand to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	117.88	127.6	1.6	6	1/31/2008	24	291	<0.001	<0.001	<0.001	<0.003	38.3	Sand to clear No odor
3	118	127.6	1.5	6	4/24/2008	24	306	<0.001	<0.001	<0.001	<0.003	38	Sand to clear No odor
3	118.18	127.6	1.5	6	8/7/2008	24	264	<0.001	<0.001	<0.001	<0.003	51	Sand to clear No odor
3	118.31	127.6	1.5	6	10/30/2008	36	325	<0.001	<0.001	<0.001	<0.003	48	Sand to clear No odor
3	118.46	127.5	1.4	6	1/23/2009	36	328	<0.001	<0.001	<0.001	<0.003	46.3	Sand to clear No odor
3	118.46	127.5	1.4	6	4/29/2009	24	229	<0.001	<0.001	<0.001	<0.003	36.1	Sand to clear No odor
3	118.77	127.5	1.4	6	8/7/2009	24	313	<0.001	<0.001	<0.001	<0.003	37.5	Sand to clear No odor
3	119.02	127.5	1.4	6	10/22/2009	24	319	<0.001	<0.001	<0.001	<0.003	34.5	Sand to clear No odor
3	119.38	127.6	1.3	6	4/26/2010	24	312	<0.001	<0.001	<0.001	<0.003	42	Sand to clear No odor
3	119.09	127.6	1.4	6	2/11/2010	24	297	<0.001	<0.001	<0.001	<0.003	45.2	Sand to clear No odor
3	119.43	127.6	1.3	6	8/5/2010	24	257	<0.001	<0.001	<0.001	<0.003	34.2	Sand to clear No odor
3	119.55	127.6	1.3	6	10/28/2010	20	289	<0.001	<0.001	<0.001	<0.003	32.9	Sand to clear No odor
3	119.21	127.7	1.4	6	2/21/2011	24	294	<0.001	<0.001	<0.001	<0.003	33.5	Sand to clear No odor
3	119.93	127.7	1.2	6	6/6/2011	32	291	<0.001	<0.001	<0.001	<0.003	41.2	Sand to clear No odor
3	120.17	127.7	1.2	6	9/2/2011	20	263	<0.001	<0.001	<0.001	<0.003	46.4	Sand to clear No odor
3	120.36	127.7	1.2	6	12/4/2011	24	275	<0.001	<0.001	<0.001	<0.003	40.9	Sand to clear No odor
3	120.39	127.4	1.2	6	2/24/2012	24	294	<0.001	<0.001	<0.001	<0.003	37.5	Sand to clear No odor
3	120.5	127.7	1.1	6	6/1/2012	20	307	<0.001	<0.001	<0.001	<0.003	32.4	Sand to clear No odor
3	120.75	127.7	1.1	6	8/31/2012	28	289	<0.001	<0.001	<0.001	<0.003	41.8	Sand to clear No odor
3	120.81	127.7	1.1	6	11/16/2012	24	296	<0.001	<0.001	<0.001	<0.003	32.2	Sand to clear No odor
3	120.87	127.7	1.1	6	2/14/2013	28	278	<0.001	<0.001	<0.001	<0.003	38.4	Sand to clear No odor
3	121.04	127.7	1.1	6	5/23/2013	28	287	<0.001	<0.001	<0.001	<0.003	43.8	Sand to clear No odor
3	121.3	127.7	1	6	9/4/2013	24	305	<0.001	<0.001	<0.001	<0.003	34.8	Sand to clear No odor
3	121.26	127.7	1	6	11/13/2013	32	316	<0.001	<0.001	<0.001	<0.003	45.2	Sand to clear No odor
3	121.53	127.7	1	6	3/14/2014	40	138	<0.001	<0.001	<0.001	<0.003	46.8	Sand to clear No odor
3	121.67	127.7	1	6	6/24/2014	24	286	<0.001	<0.001	<0.001	<0.003	37.9	Sand to clear No odor
3	121.78	127.7	0.9	6	8/22/2014	24	300	<0.001	<0.001	<0.001	<0.003	33.8	Silt to clear No odor
3	121.18	127.7	1	6	12/12/2014	24	266	<0.001	<0.001	<0.001	<0.003	32.5	Sand to clear No odor
3	122.02	127.7	0.9	6	3/9/2015	24	296	<0.001	<0.001	<0.001	<0.003	30.4	Sand to clear No odor
3	122.06	127.7	0.9	6	6/8/2015	28	266	<0.001	<0.001	<0.001	<0.003	43.3	Sand to clear No odor
3	122.23	127.7	0.9	6	8/25/2015	28	270	<0.001	<0.001	<0.001	<0.003	26	Sand to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	122.36	127.7	0.85	6	11/17/2015	28	330	<0.001	<0.001	<0.001	<0.003	37	Sand to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
4	115.49	126	1.7	10	10/18/2006	38	288	<0.001	<0.001	<0.001	<0.001	44.9	Clear
4	115.79	125.3	1.5	8	3/7/2007	38.8	296	<0.001	<0.001	<0.001	<0.001	42.7	Silt to clear No odor
4	115.85	125.2	1.5	8	5/29/2007	37	316	<0.001	<0.001	<0.001	<0.001	40.4	Silt to clear No odor
4	116.1	125.2	1.5	6	9/25/2007	44	358	<0.002	<0.002	<0.002	<0.006	54.1	Silt to clear No odor
4	116.11	125.2	1.5	6	10/17/2007	44	337	<0.001	0.004	<0.001	<0.003	48.3	Silt to clear No odor
4	116.23	125	1.4	6	1/31/2008	40	326	<0.001	<0.001	<0.001	<0.003	50	Silt to clear No odor
4	116.4	125	1.4	6	4/24/2008	40	297	<0.001	<0.001	<0.001	<0.003	40.2	Silt to clear No odor
4	116.62	125	1.3	6	8/7/2008	44	357	<0.001	<0.001	<0.001	<0.003	52	Silt to clear No odor
4	116.76	125	1.3	6	10/30/2008	40	358	<0.001	<0.001	<0.001	<0.003	49.3	Silt to clear No odor
4	116.87	124.5	1.2	6	1/23/2009	36	354	<0.001	<0.001	<0.001	<0.003	45.4	Silt to clear No odor
4	117.08	124.5	1.2	6	4/29/2009	40	247	<0.001	<0.001	<0.001	<0.003	44.6	Silt to clear No odor
4	117.28	124.5	1.2	6	8/7/2009	24	351	<0.001	<0.001	<0.001	<0.003	37.3	Silt to clear No odor
4	117.24	124.5	1.2	6	10/22/2009	36	362	<0.001	<0.001	<0.001	<0.003	42.3	Silt to clear No odor
4	117.76	125	1.2	6	4/26/2010	36	330	<0.001	<0.001	<0.001	<0.003	71.4	Silt to clear No odor
4	117.54	125	1.2	6	2/11/2010	36	325	<0.001	<0.001	<0.001	<0.003	49.8	Silt to clear No odor
4	117.88	125	1.1	6	8/5/2010	40	284	<0.001	<0.001	<0.001	<0.003	43.7	Silt to clear No odor
4	117.96	125	1.1	6	10/28/2010	40	246	<0.001	<0.001	<0.001	<0.003	41.1	Silt to clear No odor
4	118.22	125.9	1.2	6	2/21/2011	40	338	<0.001	<0.001	<0.001	<0.003	40.8	Silt to clear No odor
4	118.36	125.9	1.2	6	6/6/2011	40	321	<0.001	<0.001	<0.001	<0.003	49.7	Silt to clear No odor
4	118.62	125.9	1.2	6	9/2/2011	24	268	<0.001	<0.001	<0.001	<0.003	44.2	Silt to clear No odor
4	118.81	125.9	1.1	6	12/4/2011	44	304	<0.001	<0.001	<0.001	<0.003	63.2	Silt to clear No odor
4	118.82	125.9	1.1	6	2/24/2012	36	323	<0.001	<0.001	<0.001	<0.003	38.6	Silt to clear No odor
4	118.94	125.9	1.1	6	6/1/2012	40	349	<0.001	<0.001	<0.001	<0.003	51.4	Silt to clear No odor
4	119.22	125.9	1.1	6	8/31/2012	36	302	<0.001	<0.001	<0.001	<0.003	42.8	Silt to clear No odor
4	119.33	125.9	1	6	11/16/2012	40	340	<0.001	<0.001	<0.001	<0.003	43.1	Silt to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
4	119.35	125.9	1	6	2/14/2013	44	317	<0.001	<0.001	<0.001	<0.003	52.4	Silt to clear No odor
4	119.54	125.9	1	6	5/23/2013	28	265	<0.001	<0.001	<0.001	<0.003	43.2	Silt to clear No odor
4	119.78	125.9	1	6	9/4/2013	24	296	<0.001	<0.001	<0.001	<0.003	33.4	Silt to clear No odor
4	119.75	125.9	1	6	11/13/2013	28	283	<0.001	<0.001	<0.001	<0.003	43.7	Silt to clear No odor
4	119.98	125.9	0.9	6	3/14/2014	40	316	<0.001	<0.001	<0.001	<0.003	45.7	Silt to clear No odor
4	120.12	125.9	0.9	6	6/24/2014	20	216	<0.001	<0.001	<0.001	<0.003	38	Silt to clear No odor
4	120.22	125.9	0.9	6	8/22/2014	28	294	<0.001	<0.001	<0.001	<0.003	34.2	Silt to clear No odor
4	119.62	125.9	1	6	12/12/2014	60	400	<0.001	<0.001	<0.001	<0.003	27.3	Silt to clear No odor
4	120.35	125.9	0.9	6	3/9/2015	36	338	<0.001	<0.001	<0.001	<0.003	25.3	Silt to clear No odor
4	120.38	125.9	0.9	6	6/8/2015	32	264	<0.001	<0.001	<0.001	<0.003	36.3	Silt to clear No odor
4	120.54	125.9	0.9	6	8/25/2015	24	318	<0.001	<0.001	<0.001	<0.003	35.8	Silt to clear No odor
4	120.73	125.9	0.83	6	11/17/2015	28	210	<0.001	<0.001	<0.001	<0.003	35.7	Silt to clear No odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
RW-1	116.16	143.3	17.6	70	6/20/2007	4220	8110	0.0022	<0.001	<0.001	<0.002	119	Silt to clear Slight odor
RW-1	116.25	143.3	17.6	60	9/25/2007	5398	9775	<0.002	<0.002	<0.002	<0.006	67.2	Silt to clear Slight odor
RW-1	XXX	XXX	XXX	60	10/17/2007	5400	9071	<0.001	0.004	<0.001	<0.003	56.5	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	1/31/2008	5300	9320	<0.001	<0.001	<0.001	<0.003	55.4	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	4/24/2008	3900	6870	<0.001	<0.001	<0.001	<0.003	44.9	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	8/7/2008	3800	7180	<0.001	<0.001	<0.001	<0.003	68	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	10/30/2008	5850	13700	<0.001	<0.001	<0.001	<0.003	82.8	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	1/26/2009	5600	10700	<0.001	<0.001	<0.001	<0.003	83.3	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	4/29/2009	4050	7700	<0.001	<0.001	<0.001	<0.003	54.3	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	8/7/2009	3000	5450	<0.001	<0.001	<0.001	<0.003	53.8	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	10/22/2009	3550	5820	<0.001	<0.001	<0.001	<0.003	55.8	Clear Slight odor
RW-1	XXX	XXX	XXX	XXX	4/26/2010	4200	7240	<0.001	<0.001	<0.001	<0.003	71.4	Clear Slight odor
RW-1	XXX	XXX	XXX	80	2/11/2010	3900	6600	<0.001	<0.001	<0.001	<0.003	88.5	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	8/5/2010	3800	6480	<0.001	<0.001	<0.001	<0.003	62.2	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
RW-1	XXX	XXX	XXX	Running	10/28/2010	3200	6970	<0.001	<0.001	<0.001	<0.003	53.7	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	5/23/2013	2550	4480	<0.001	<0.001	<0.001	<0.003	66.6	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	80	2/21/2011	4800	8430	<0.001	<0.001	<0.001	<0.003	77.6	Clear Slight odor
RW-1	XXX	XXX	XXX	80	6/6/2011	4200	5850	<0.001	<0.001	<0.001	<0.003	62.1	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	9/2/2011	3250	4850	<0.001	<0.001	<0.001	<0.003	63.3	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	12/4/2011	2800	4790	<0.001	<0.001	<0.001	<0.003	62.1	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	2/24/2012	3250	5170	<0.001	<0.001	<0.001	<0.003	59.7	Clear Slight odor
RW-1	XXX	XXX	XXX	Running	6/1/2012	2550	4960	<0.001	<0.001	<0.001	<0.003	59.5	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	Running	8/31/2012	2270	4150	<0.001	<0.001	<0.001	<0.003	58.6	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	Running	11/16/2012	3900	6800	<0.001	<0.001	<0.001	<0.003	77.5	Purged with Solar Pump Clear Slight odor
RW-1	Pump in Well	XXX	XXX	100	2/14/2013	4200	6840	<0.001	<0.001	<0.001	<0.003	72	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	Running	9/4/2013	1880	3730	<0.001	<0.001	<0.001	<0.003	65.2	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	Running	11/13/2013	1800	3550	<0.001	<0.001	<0.001	<0.003	60.2	Purged with Solar Pump Clear Slight odor
RW-1	XXX	XXX	XXX	100	3/14/2014	2070	3900	<0.001	<0.001	<0.001	<0.003	67.1	Purged with Solar Pump
RW-1	XXX	XXX	XXX	Running	6/24/2014	1640	3730	<0.001	<0.001	<0.001	<0.003	59.8	Purged with Solar Pump
RW-1	XXX	XXX	XXX	Running	8/22/2014	1400	3180	<0.001	<0.001	<0.001	<0.003	51.8	Purged with Solar Pump Clear Slight odor
RW-1	120.33	143.3	14.9	60	12/12/2014	1500	3140	<0.001	<0.001	<0.001	<0.003	54.3	Clear Slight odor
RW-1	120.44	143.3	14.9	60	3/10/2015	1300	2960	<0.001	<0.001	<0.001	<0.003	60.9	Clear Slight odor
RW-1	120.52	143.3	14.8	50	6/8/2015	1020	2670	<0.001	<0.001	<0.001	<0.003	49.4	Clear Slight odor
RW-1	120.69	143.5	14.7	50	8/25/2015	1100	2070	<0.001	<0.001	<0.001	<0.003	36.7	Clear Slight odor
RW-1	120.87	143.3	14.58	50	11/17/2015	880	1780	<0.001	<0.001	<0.001	<0.003	52.6	Clear Slight odor



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

December 01, 2015

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM N-6-1

Enclosed are the results of analyses for samples received by the laboratory on 11/19/15 14:51.

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.

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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, flowing style.

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:	11/19/2015	Sampling Date:	11/17/2015
Reported:	12/01/2015	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC6 N-LEA CTY., NM		

Sample ID: MONITOR WELL #1R (H503065-01)

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	11/23/2015	ND	0.025	98.8	0.0250	1.09	
Toluene*	<0.001	0.001	11/23/2015	ND	0.024	95.2	0.0250	1.76	
Ethylbenzene*	<0.001	0.001	11/23/2015	ND	0.025	98.2	0.0250	2.73	
Total Xylenes*	<0.003	0.003	11/23/2015	ND	0.075	99.9	0.0750	1.93	
Total BTEX	<0.006	0.006	11/23/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 100 % 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*	920	4.00	11/23/2015	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*	40.2	10.0	11/30/2015	ND	23.1	116	20.0	8.30	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	1780	5.00	11/25/2015	ND	524	99.4	527	1.93	

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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:	11/19/2015	Sampling Date:	11/17/2015
Reported:	12/01/2015	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC6 N-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H503065-02)

BTX 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	11/23/2015	ND	0.025	98.8	0.0250	1.09	
Toluene*	<0.001	0.001	11/23/2015	ND	0.024	95.2	0.0250	1.76	
Ethylbenzene*	<0.001	0.001	11/23/2015	ND	0.025	98.2	0.0250	2.73	
Total Xylenes*	<0.003	0.003	11/23/2015	ND	0.075	99.9	0.0750	1.93	
Total BTX	<0.006	0.006	11/23/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 100 % 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*	40.0	4.00	11/23/2015	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*	43.5	10.0	11/30/2015	ND	23.1	116	20.0	8.30	

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	356	5.00	11/25/2015	ND	524	99.4	527	1.93		

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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:	11/19/2015	Sampling Date:	11/17/2015
Reported:	12/01/2015	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC6 N-LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H503065-03)

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	11/23/2015	ND	0.025	98.8	0.0250	1.09	
Toluene*	<0.001	0.001	11/23/2015	ND	0.024	95.2	0.0250	1.76	
Ethylbenzene*	<0.001	0.001	11/23/2015	ND	0.025	98.2	0.0250	2.73	
Total Xylenes*	<0.003	0.003	11/23/2015	ND	0.075	99.9	0.0750	1.93	
Total BTEx	<0.006	0.006	11/23/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 101 % 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*	28.0	4.00	11/25/2015	ND	120	120	100	14.3	

Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	37.0	10.0	11/30/2015	ND	23.1	116	20.0	8.30		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	330	5.00	11/25/2015	ND	524	99.4	527	1.93		

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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:	11/19/2015	Sampling Date:	11/17/2015
Reported:	12/01/2015	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC6 N-LEA CTY., NM		

Sample ID: MONITOR WELL #4 (H503065-04)

BTX 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	11/23/2015	ND	0.025	98.8	0.0250	1.09	
Toluene*	<0.001	0.001	11/23/2015	ND	0.024	95.2	0.0250	1.76	
Ethylbenzene*	<0.001	0.001	11/23/2015	ND	0.025	98.2	0.0250	2.73	
Total Xylenes*	<0.003	0.003	11/23/2015	ND	0.075	99.9	0.0750	1.93	
Total BTX	<0.006	0.006	11/23/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 100 % 73.7-146

Chloride, SM4500CI-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	28.0	4.00	11/25/2015	ND	120	120	100	14.3	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	35.7	10.0	11/30/2015	ND	23.1	116	20.0	8.30	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	210	5.00	11/25/2015	ND	524	99.4	527	1.93	

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Analytical Results For:

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

Received:	11/19/2015	Sampling Date:	11/17/2015
Reported:	12/01/2015	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC6 N-LEA CTY., NM		

Sample ID: RECOVERY WELL #1 (H503065-05)

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	11/23/2015	ND	0.025	98.8	0.0250	1.09	
Toluene*	<0.001	0.001	11/23/2015	ND	0.024	95.2	0.0250	1.76	
Ethylbenzene*	<0.001	0.001	11/23/2015	ND	0.025	98.2	0.0250	2.73	
Total Xylenes*	<0.003	0.003	11/23/2015	ND	0.075	99.9	0.0750	1.93	
Total BTEx	<0.006	0.006	11/23/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.6 % 73.7-146

Chloride, SM4500CI-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	880	4.00	11/25/2015	ND	120	120	100	14.3	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	52.6	10.0	11/30/2015	ND	23.1	116	20.0	8.30	

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	1780	5.00	11/25/2015	ND	524	99.4	527	1.93		

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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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