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March 26th, 2015

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: **Proposed Groundwater Recovery & Project Update**
Rice Operating Company – Vacuum SWD System
Vacuum F-33 boot (1R425-37): UL/F, Sec. 33, T17S, R35E

Sent via E-mail

Dr. Oberding:

Texerra LLC (Texerra) is submitting this Proposed Groundwater Recovery & Project Update on behalf of Rice Operating Company (ROC). This report is intended to briefly summarize the present status of the project and to propose a path forward to address elevated groundwater chloride concentrations. The site is located approximately 2.5 miles east of Buckeye, New Mexico at UL/F, Sec. 33, 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 82 ft bgs.

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.

Rice Environmental Consulting & Safety (RECS) began liner installation CAP work in December 2013. The site was excavated to 62 ft x 61 ft x 3.5 ft deep (Appendix - Figure 2). The excavated soil was rock screened and a total of 632 yards of soil was taken to a NMOCD approved facility for disposal. A total of 627 yards of blow sand was imported to the site to be used as padding for the liner and backfill. A sample of the imported blow sand was field tested for hydrocarbons using a PID and returned a result of 3.5 ppm. The sample was taken to a commercial laboratory for analysis and returned a laboratory chloride reading of non- detect.

The bottom of the excavation was padded with 6 inches of the imported blow sand and a 20-mil reinforced poly liner was installed and properly seated at a depth of 3 ft bgs. The top of the liner was then padded with 6 inches of imported blow sand. The screened rock was returned to the excavation and topped with the imported top soil. The site was tilled with soil amendments and seeded with a blend of native vegetation. A silt net fence was place around the site to reduce erosion and maintain soil integrity. The results of this work were summarized and reported to NMOCD as an "Initial CAP Report and Soil Closure Request" on February 10th, 2014 and this was approved and 'Soil Closure' was granted on March 28th, 2014.

Groundwater Monitoring

Results of groundwater sampling from March 2009 through 2014 are given in the Appendix - Figure 3 and Table 1. Groundwater chloride concentrations in the near-source monitor well (MW-1) have varied widely since sampling began in 2009, but averaged 830 mg/l over four quarterly measurements taken in 2014. In contrast, the up-gradient monitor well (MW-2) measured groundwater chlorides less than 68 mg/l over the four quarters of 2014. Water-soluble petroleum hydrocarbons (BTEX) have not been detected in any of the groundwater samples. This data is summarized in Table 1 of the Appendix.

We believe that the synthetic, impermeable soil liner installed in 2013 has effectively stopped the downward migration of residual soil chlorides from beneath the subject site and that natural attenuation (dilution) will effectively reduce down-gradient groundwater chloride concentrations. We may be able to expedite this process through the limited removal of chloride-impacted groundwater from the near-source monitor well (MW-1). We therefore propose to withdraw limited amounts of groundwater from this monitor well over the course of the next two years (through 2016) to determine if the chloride concentration can be effectively reduced through this means. Removed groundwater will be utilized for pipeline and well maintenance. We will report the results of this effort on an annual basis (by April 1st for the preceding calendar year) or sooner if warranted.

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. We thus submit this CAP for your review and consideration.

Please call Rice Operating Company or me if you have any questions or need additional information.

Thank you.

Sincerely,

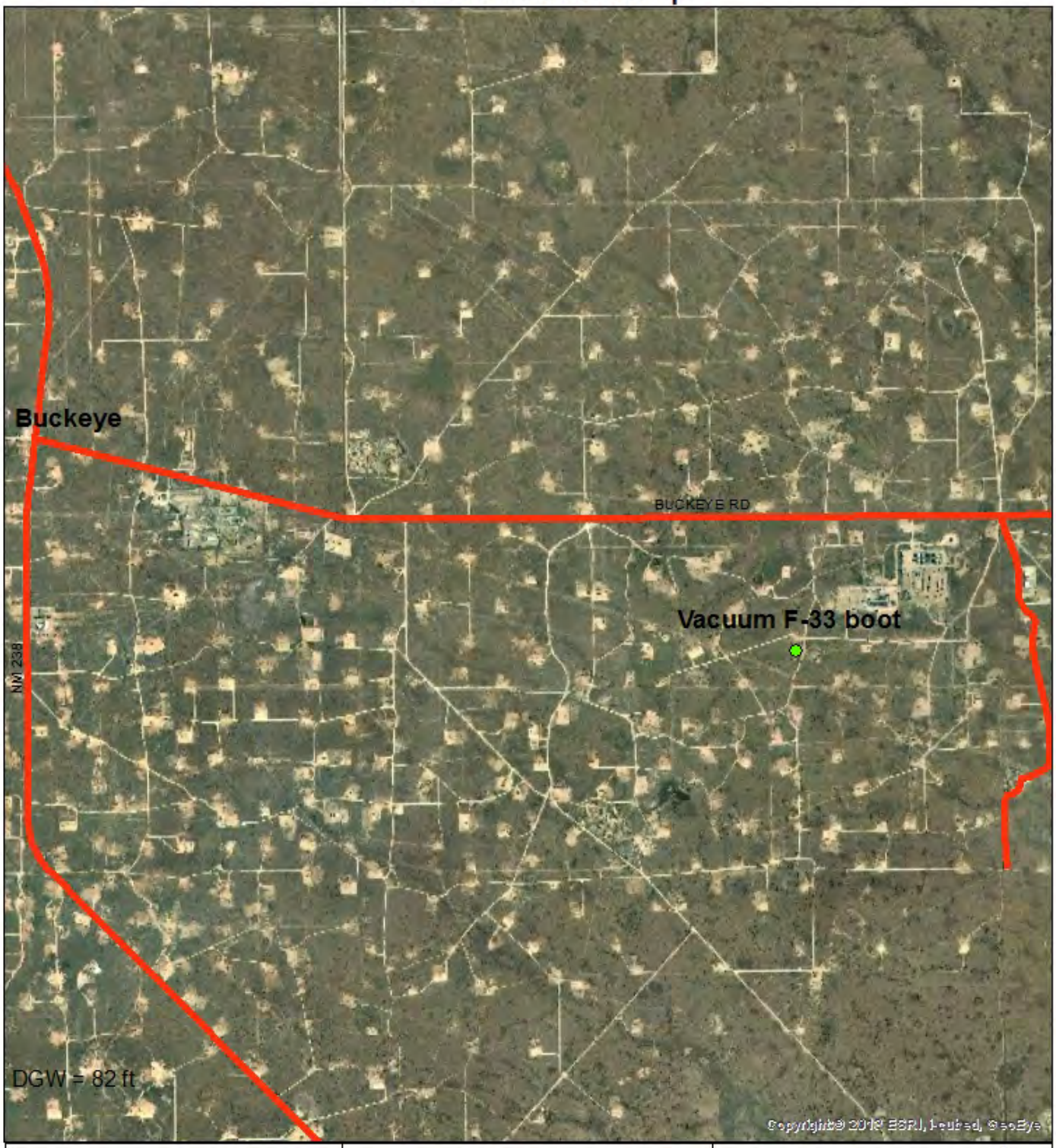
L. Peter (Pete) Galusky, Jr PE
NM Professional Engineer No. 22561

Copy: Rice Operating Company

Attachment List (Appendix)

Site Location Map
Site Map – Soil Bores, Monitor Wells and Liner Dimensions
Groundwater Chloride Monitoring Data - Figure & Table

Site Location Map



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

VACUUM F-33 BOOT

LEGALS: UL/F sec. 33
T-17-S R-35-E
LEA COUNTY, NM

NMOCD CASE #: 1R425-37

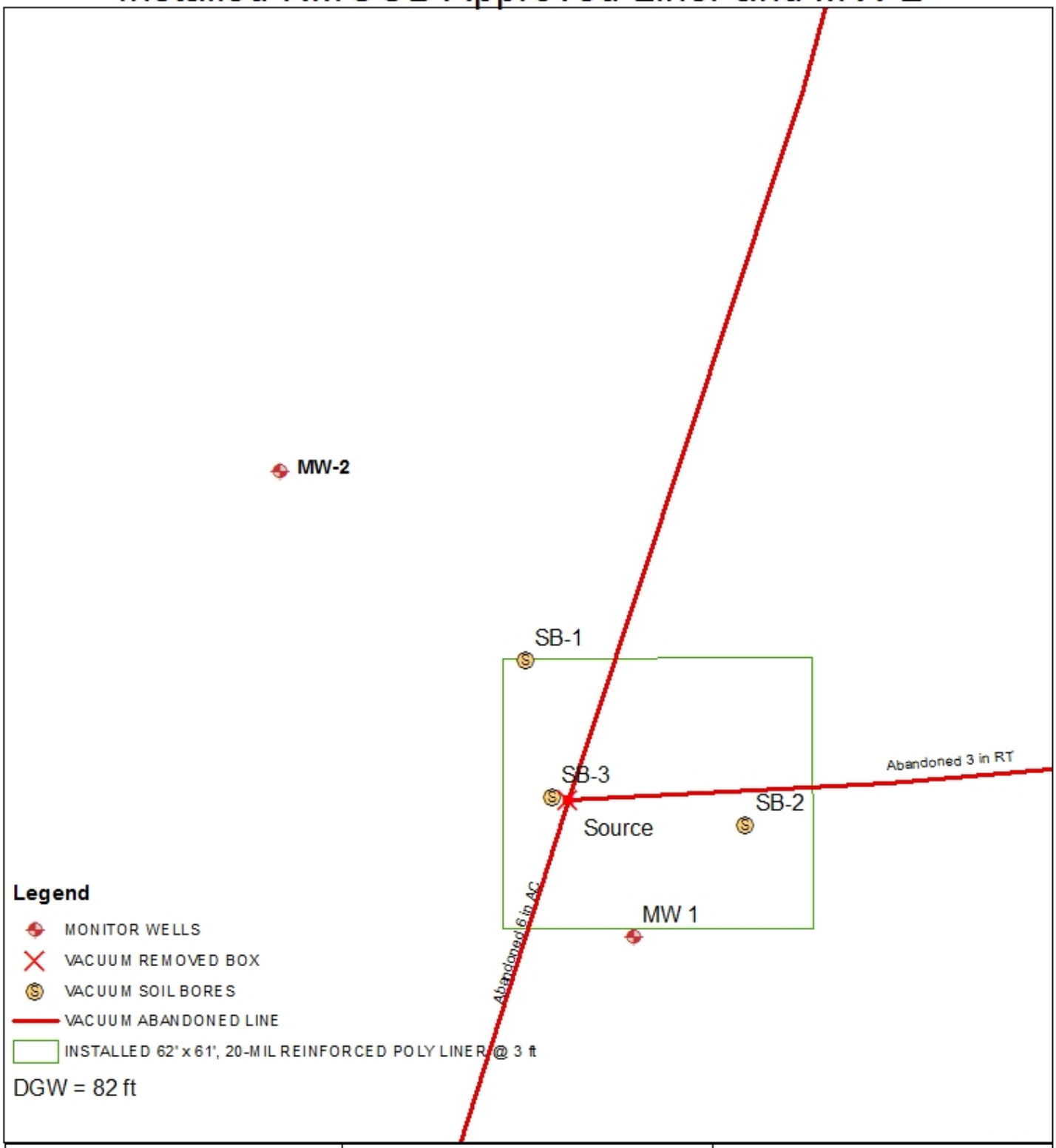
Figure 1

N
W E
S

0 0.4 0.8
Miles

Drawing date: 2/3/14
Drafted by: L. Flores

Installed NMOCD Approved Liner and MW-2



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

VACUUM F-33 BOOT

LEGALS: UL/F sec. 33
T-17-S R-35-E
LEA COUNTY, NM

NMOCD CASE #: 1R425-37

Figure 2

N W E S

0 30 60 Feet

Drawing date: 2/3/14
Drafted by: L. Flores

Figure 3

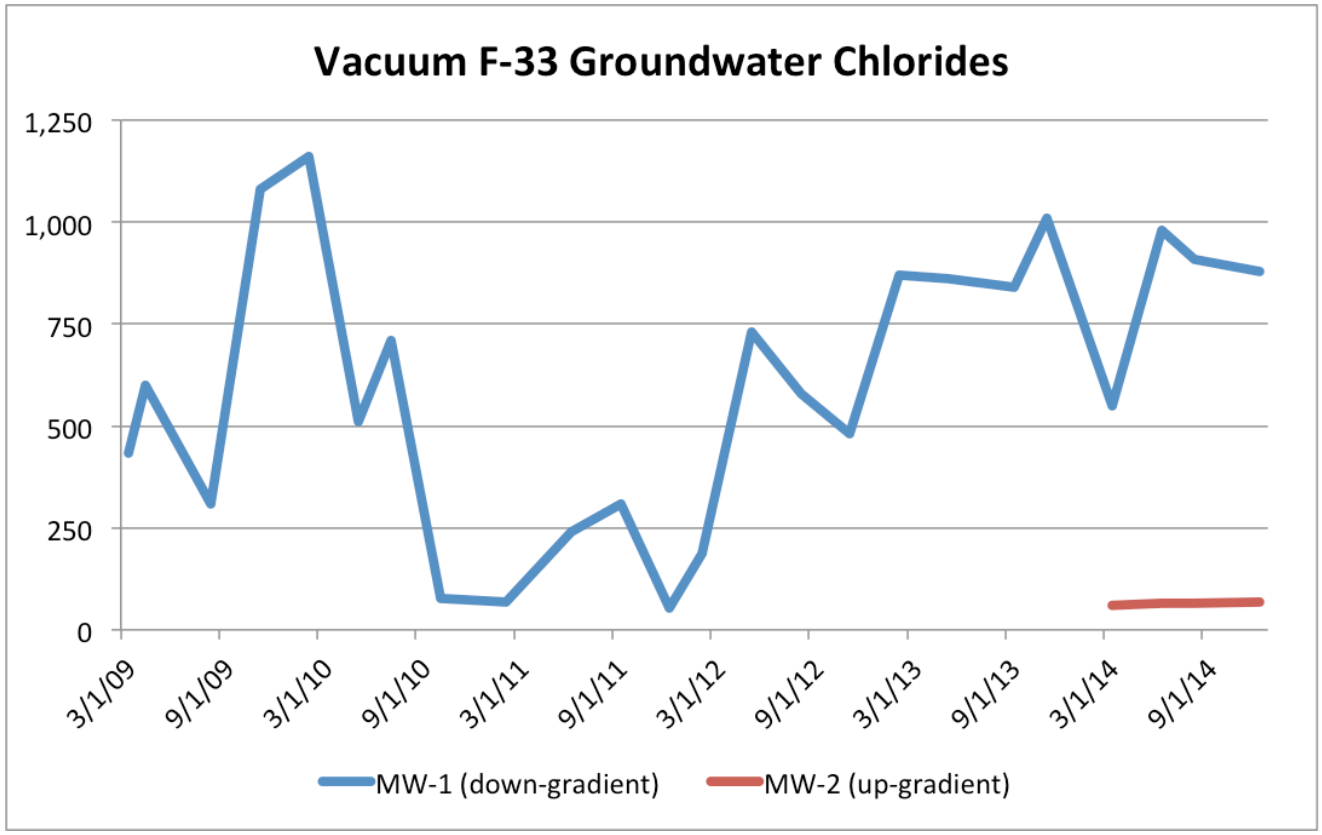

Vacuum F-33 Groundwater Chlorides
1,250
1,000
750
500
250
0
3/1/09
9/1/09
3/1/10
9/1/10
3/1/11
9/1/11
3/1/12
9/1/12
3/1/13
9/1/13
3/1/14
9/1/14
MW-1 (down-gradient)
MW-2 (up-gradient)

Table 1

ROC - Vacuum F-33 boot (1R425-37)
Unit Letter F, Section 33, T17S, R35E

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	80.63	126.5	29.8	300	3/2/2009	432	1070	<0.001	<0.001	<0.001	<0.003	56	Clear No odor
1	80.73	126.5	29.8	150	4/28/2009	600	1330	<0.001	<0.001	<0.001	<0.003	38.3	Clear No odor
1	80.85	126.5	29.7	150	8/5/2009	308	845	<0.001	<0.001	<0.001	<0.003	25.2	Clear No odor
1	80.98	126.5	29.6	150	11/23/2009	1080	2340	<0.001	<0.001	<0.001	<0.003	34.2	Clear No odor
1	81.11	126.5	29.5	150	2/9/2010	1160	2240	<0.001	<0.001	<0.001	<0.003	54.6	Clear No odor
1	81.29	126.5	29.4	150	5/28/2010	510	1190	<0.001	<0.001	<0.001	<0.003	29	Clear No odor
1	81.33	126.5	29.4	150	7/27/2010	710	1500	<0.001	<0.001	<0.001	<0.003	40.8	Clear No odor
1	81.4	126.5	29.3	250	10/27/2010	76	454	<0.001	<0.001	<0.001	<0.003	17.6	Clear No odor
1	81.53	126.5	29.2	250	2/20/2011	68	365	<0.001	<0.001	<0.001	<0.003	17.2	Clear No odor
1	81.66	126.5	29.2	400	6/3/2011	240	707	<0.001	<0.001	<0.001	<0.003	45.9	Clear No odor
1	81.74	126.5	29.1	400	9/1/2011	308	825	<0.001	<0.001	<0.001	<0.003	56.6	Clear No odor
1	81.78	126.5	29.1	400	12/12/2011	52	395	<0.001	<0.001	<0.001	<0.003	28.6	Clear No odor
1	81.9	126.5	29	500	2/23/2012	188	605	<0.001	<0.001	<0.001	<0.003	45.2	Clear No odor
1	81.82	126.5	29	500	5/30/2012	730	1740	<0.001	<0.001	<0.001	<0.003	84.9	Clear No odor
1	81.85	126.5	29	500	8/23/2012	580	1280	<0.001	<0.001	<0.001	<0.003	81.2	Clear No odor
1	81.89	126.5	29	500	11/19/2012	480	1170	<0.001	<0.001	<0.001	<0.003	50.4	Clear No odor
1	81.96	126.5	29	500	2/13/2013	870	1680	<0.001	<0.001	<0.001	<0.003	59.7	Clear No odor
1	82.03	126.5	28.9	500	5/29/2013	860	1940	<0.001	<0.001	<0.001	<0.003	79.3	Clear No odor
1	82.1	126.5	28.9	500	9/6/2013	840	2000	<0.001	<0.001	<0.001	<0.003	227	Clear No odor
1	82.18	126.5	28.8	500	11/14/2013	1010	2080	<0.001	<0.001	<0.001	<0.003	61.5	Clear No odor
1	82.28	126.5	28.7	500	3/7/2014	550	1390	<0.001	<0.001	<0.001	<0.003	63.4	Clear No odor
1	82.29	126.5	28.7	500	6/4/2014	980	2170	<0.001	<0.001	<0.001	<0.003	53.8	Clear No odor
1	82.46	126.5	28.6	500	8/20/2014	910	2220	<0.001	<0.001	<0.001	<0.003	50.9	Clear No odor
1	82.16	126.5	28.8	250	12/5/2014	880	2050	<0.001	<0.001	<0.001	<0.003	53.6	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	81.98	95.05	2.1	10	3/7/2014	60	412	<0.001	<0.001	<0.001	<0.003	37.4	Clear No odor
2	81.99	95.05	2.1	10	6/4/2014	64	378	<0.001	<0.001	<0.001	<0.003	39.6	Clear No odor
2	82.13	95.05	2.1	10	8/20/2014	64	400	<0.001	<0.001	<0.001	<0.003	37.7	Clear No odor
2	81.74	95.05	2.1	10	12/5/2014	68	370	<0.001	<0.001	<0.001	<0.003	30.7	Clear No odor