1R - 2

Closure

9/26/14

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division

September 26, 2014

Myna Letlow
Baker Hughes, Inc.
2929 Allen Parkway, Suite 2100
Houston, Texas 77019

RE: Former Hobbs Fracmaster Facility (1RP-2) Located at 1329 NW County Road in Hobbs, New Mexico

Ms. Letlow,

I have reviewed the closure request submitted on your behalf by Brown and Caldwell dated September 24, 2014 regarding the above-referenced site. The available information indicates Baker Huges has met the requirements of 19.15.29 NMAC and no further corrective action is required. You are hereby notified remediation case 1RP-2 is closed. Please proceed with the proper plugging and abandonment of any remaining groundwater monitoring wells per requirements of the New Mexico Office of the State Engineer.

This determination by the Oil Conservation Division does not relieve Baker Hughes of responsibility should future information indicate a threat to ground water, surface water, human health, or the environment. Furthermore, it does not relieve Baker Hughes of responsibility for compliance with any federal, state, or local laws and/or regulations.

Respectfully,

Jim Griswold
Environmental Bureau Chief

One Westchase Center
10777 Westheimer Rd, Suite 925
Houston, Texas 77042

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September 24, 2014

Jim Griswold
State of New Mexico
Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Subject: March and June 2014 Groundwater Sampling Event and Request for Site Closure for the Baker Hughes, Inc., Hobbs FracMaster Facility

Dear Mr. Griswold:

On behalf of Baker Hughes Inc., Brown and Caldwell is pleased to submit the results of the June 2014 Groundwater Sampling Event Report 1RP-2 for the Baker Hughes Hobbs FracMaster Facility. The report summarizes the results from the most recent groundwater sampling event conducted at the site on June 5, 2014. Figure 1 shows the location of the Baker Hughes FracMaster facility. A site map depicting the locations of the current and previously existing monitor wells at the facility is provided as Figure 2.

BACKGROUND

In 1997, a field waste tank was removed by BJ Services and analysis of post-excavation soil samples indicated the presence of soil affected by gasoline- and diesel-range total petroleum hydrocarbons (TPH-G and TPH-D), volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). Three monitor wells were installed in the area of the former field waste tank in February 2006 to determine the direction of groundwater flow and to evaluate groundwater quality at the facility. Table 1 presents cumulative groundwater analytical results including the results of recent sampling at the facility monitoring wells.

On August 21, 2008, New Mexico Oil Conservation Division (NMOCD) requested that BJ Services submit a work plan for installation and sampling of three additional soil borings and the installation of monitor wells to further assess affected soil and groundwater in the vicinity of the formerly excavated area. Monitor wells MW-4, MW-5 and MW-6 were installed in April-May 2009. There were no detections of constituents at concentrations exceeding applicable NMOCD criteria in soil samples collected from the interval immediately above the top of the saturated zone in these monitor well borings. Benzene was detected at concentrations exceeding the applicable New Mexico Water Quality Control Commission (NMWQCC) standard in the groundwater samples collected from monitor wells MW-2 and MW-4. The benzene concentration in the groundwater sample collected from monitor well MW-4 was greater than in the sample from monitor well MW-2. MW-4 is located closer to the area of the former field waste tank than the downgradient monitor well MW-2. Naphthalene and xylenes were also detected at concentrations exceeding applicable NMWQCC standards in the groundwater sample from monitor well MW-4 in May 2009.

Oxygen-Release Compound (ORC®) socks were installed in monitor well MW-2 and MW-4 to address previously detected hydrocarbons in these wells. After removal of the ORC socks from these wells, at least 8 consecutive groundwater sampling events were conducted where benzene, naphthalene, and xylenes concentrations were below their applicable NMWQCC standards in MW-2 and MW-4. Table 1 presents recent cumulative groundwater analytical results for facility monitoring wells.

GROUNDWATER MONITORING

Based on email correspondence on February 24, 2014 between Ricardo Banda (Brown and Caldwell) and Jim Griswold (NMOCD), it was determined that sufficient data had been collected for MW-2; therefore, Baker Hughes conducted groundwater sampling for MW-4 only for the 1st and 2nd quarter groundwater sampling events in 2014.

Hydrologic Monitoring Inc. (HMI) mobilized to the site to conduct groundwater sampling on March 10, 2014 and June 5, 2014. HMI's field activities reports are presented in Attachment 1. The laboratory analytical reports for the March 2014 and June 2014 groundwater sampling events are provided in Attachment 2.

GROUNDWATER ANALYTICAL RESULTS

During the March 2014 and June 2014 events, benzene concentrations in MW-4 were below the method quantitation limit and below the NMWQCC standard. Benzene has not been detected in groundwater samples from MW-4 in eleven consecutive sampling events since May 2009 and eight consecutive events following the removal of the ORC socks in May 2012. Benzene has never been detected in samples from any other site monitor wells.

Naphthalene and xylenes were detected in the samples from MW-4 at concentrations below the applicable NMWQCC standards for 11 consecutive sampling events since May 2009 and eight consecutive events following the removal of the ORC socks in May 2012. Naphthalene and xylenes have never been detected above the NMWQCC standard in samples from any other site monitor wells.

CONCLUSIONS

The results from the sampling in March 2014 and June 2014 for MW-4 are consistent with data from previous sampling events, indicating that the concentrations of the chemicals of concern in groundwater remain below the NMWQCC standard.

RECOMMENDATIONS

This report provides evidence that the March 2014 and June 2014 data are consistent with previous data and that concentrations of chemicals of concern in groundwater have been below the NMWQCC for ten consecutive events in samples from MW-4 and for nine consecutive events in samples from MW-2. Based on these results, Baker Hughes respectfully requests closure for the site and to proceed with well abandonment activities.

If you have any questions regarding the information contained herein, please contact Greg Seifert at (713) 646-1119 (gseifert@brwncald.com) or Myna Letlow at (713) 439-8139.

Yours very truly,

BROWN AND CALDWELL

Greg Seifert
Managing Geologist

cc: Myna Letlow, Baker Hughes
Brown and Caldwell Project File

TABLES

Table 1
Cumulative Analytical Results[1] for Detected Constituents in Groundwater Samples
Baker Hughes (Former FracMaster) Facility
Hobbs, New Mexico

Monitor Well Sample ID	Sample Date	Volatile Organic Compounds (VOCs)				
		Benzene	Naphthalene	m,p-Xylene	o-Xylene	Xylenes, Total
NMWQCC Standard (mg/L)		0.01	0.03[3]	NL	NL	0.62
MW-1	2/23/2006	<0.005	<0.005	<0.005	<0.005	<0.005
	4/7/2009	<0.005	<0.005	<0.005	<0.005	<0.005
	3/21/2011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6/29/2011	<0.001	<0.001	NA	NA	NA
	11/3/2011	<0.001	<0.001	<0.0021	0.0019 J	<0.0031
	9/4/2012	<0.0005	<0.001	<0.001	<0.001	<0.001
	12/6/2012	<0.0005	<0.001	<0.0005	<0.0005	<0.0005
	2/26/2013	<0.0005	<0.001	<0.0015	<0.0015	<0.0015
	5/9/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	8/21/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	11/4/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	3/10/2014	NA	NA	NA	NA	NA
	6/5/2014	NA	NA	NA	NA	NA
MW-2	2/23/2006	<0.005	0.006	0.056	<0.005	0.056
	4/7/2009	**0.018**	0.009	0.11	0.026	0.136
	3/22/2011	0.0036 J	0.002 J	<0.0005	<0.0005	<0.0005
	6/30/2011	0.0023 J	<0.001	NA	NA	NA
	11/3/2011	0.0014 J	0.0012 J	<0.0021	0.0015 J	<0.0031
	9/5/2012	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	12/6/2012	0.0013 J	<0.001	<0.001	<0.0005	<0.0015
	2/26/2013	0.0012 J	<0.001	<0.001	<0.0005	<0.0015
	5/9/2013	0.001 J	<0.001	<0.001	<0.0005	<0.0015
	8/21/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	11/4/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	3/10/2014	NA	NA	NA	NA	NA
	6/5/2014	NA	NA	NA	NA	NA
MW-3	2/23/2006	<0.005	<0.005	<0.005	<0.005	<0.005
	4/8/2009	<0.005	<0.005	<0.005	<0.005	<0.005
	3/21/2011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6/29/2011	<0.001	<0.001	NA	NA	NA
	11/3/2011	<0.001	<0.001	0.0033 J	0.0023 J	0.0057 J
	9/4/2012	<0.0005	<0.001	<0.001	<0.001	<0.001
	12/6/2012	<0.0005	<0.001	<0.0005	<0.0005	<0.0005
	2/26/2013	<0.0005	<0.001	<0.0015	<0.0015	<0.0015
	5/9/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	8/21/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	11/4/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	3/10/2014	NA	NA	NA	NA	NA
	6/5/2014	NA	NA	NA	NA	NA
MW-4	5/2/2009	**0.081**	**0.086**	0.73	0.22	**0.95**
	3/22/2011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6/30/2011	<0.001	<0.001	NA	NA	NA
	11/3/2011	<0.001	<0.001	0.0023 J	0.0021 J	0.0043 J
	9/5/2012	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	12/6/2012	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	2/26/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	5/9/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	8/21/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	11/4/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	3/10/2014	<0.0006	<0.0007	<0.0006	<0.0005	<0.0015
	6/5/2014	<0.0005	<0.0005	<0.010	<0.005	<0.015
MW-5	4/9/2009	<0.005	<0.005	<0.005	<0.005	<0.005
	3/21/2011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6/29/2011	<0.001	<0.001	NA	NA	NA
	11/3/2011	<0.001	<0.001	0.0026 J	0.0022 J	0.0048 J
	9/5/2012	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	12/6/2012	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	2/26/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	5/9/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	8/21/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	11/4/2013	<0.0005	<0.001	<0.001	<0.0005	<0.0015
	3/10/2014	NA	NA	NA	NA	NA
	6/5/2014	NA	NA	NA	NA	NA
MW-6	5/1/2009	<0.005	<0.005	<0.005	<0.005	<0.005
	3/21/2011	WD	WD	WD	WD	WD
	6/5/2014	WD	WD	WD	WD	WD

Notes
[1] - in milligrams per liter (mg/L)
[2] - NL = Not Listed
[3] - Total naphthalene plus monomethylnaphthalenes
[4] - NA = No Analysis for constituent during indicated sampling event
[5] - WD = Well destroyed
BOLD concentration indicates exceedance of NMWQCC Standard

Table 2
Cumulative Groundwater Elevation Data
Baker Hughes (Former FracMaster) Facility
Hobbs, New Mexico

Well Number	Date	Top-of-Casing Elevation (ft)[1]	Depth to Groundwater (ft)	Groundwater Elevation (ft)[1]	Depth to Product	Product Thickness
MW-1	2/23/06	103.21	53.64	49.57	-	-
	5/2/09	103.21	55.40	47.81	-	-
	3/21/11	99.66	59.52	40.14	-	-
	6/29/11[2]	99.66	56.60	43.06	-	-
	11/3/11	99.66	57.12	42.54	-	-
	9/4/12	99.66	57.63	42.03	-	-
	12/6/12	99.66	58.05	41.61	-	-
	2/26/13	99.66	58.21	41.45	-	-
	5/9/13	99.66	58.38	41.28	-	-
	8/21/13	99.66	58.63	41.03	-	-
	11/4/13	99.66	58.79	40.87	-	-
	3/10/14	99.66	59.06	40.60	-	-
MW-2	2/23/06	102.05	52.78	49.27	-	-
	5/2/09	102.05	54.50	47.55	-	-
	3/21/11[3]	100.01	57.38	42.63	-	-
	6/29/11[2]	100.01	56.66	43.35	-	-
	11/3/11	100.01	56.91	43.10	-	-
	9/4/12	100.01	57.63	42.38	-	-
	12/6/12	100.01	57.86	42.15	-	-
	2/26/13	100.01	58.04	41.97	-	-
	5/9/13	100.01	58.20	41.81	-	-
	8/21/13	100.01	58.46	41.55	-	-
	11/4/13	100.01	58.59	41.42	-	-
	3/10/14	100.01	58.89	41.12	-	-
MW-3	2/23/06	102.41	53.22	49.19	-	-
	5/2/09	102.41	54.95	47.46	-	-
	3/21/11	100.06	56.09	43.97	-	-
	6/29/11[2]	100.06	56.31	43.75	-	-
	11/3/11	100.06	56.66	43.40	-	-
	9/4/12	100.06	57.36	42.70	-	-
	12/6/12	100.06	57.60	42.46	-	-
	2/26/13	100.06	57.78	42.28	-	-
	5/9/13	100.06	57.94	42.12	-	-
	8/21/13	100.06	58.19	41.87	-	-
	11/4/13	100.06	58.32	41.74	-	-
	3/10/14	100.06	58.81	41.25	-	-
MW-4	5/2/09	102.21	54.26	47.95	-	-
	3/21/11	100.86	55.41	45.45	-	-
	6/29/11[2]	100.86	55.61	45.25	-	-
	11/3/11	100.86	55.95	44.91	-	-
	9/4/12	100.86	56.64	44.22	-	-
	12/6/12	100.86	56.88	43.98	-	-
	2/26/13	100.86	57.05	43.81	-	-
	5/9/13	100.86	57.22	43.64	-	-
	8/21/13	100.86	57.47	43.39	-	-
	11/4/13	100.86	57.59	43.27	-	-
	3/10/14	100.86	57.89	42.97	-	-
MW-5	5/2/09	102.41	55.05	47.36	-	-
	3/21/11	100.00	56.19	43.81	-	-
	6/29/11[2]	100.00	55.41	44.59	-	-
	11/3/11	100.00	56.77	43.23	-	-
	9/4/12	100.00	57.43	42.57	-	-
	12/6/12	100.00	57.68	42.32	-	-
	2/26/13	100.00	57.86	42.14	-	-
	5/9/13	100.00	57.98	42.02	-	-
	8/21/13	100.00	58.26	41.74	-	-
	11/4/13	100.00	58.41	41.59	-	-
	3/10/14	100.00	58.71	41.29	-	-
MW-6	5/2/09	102.48	53.69	48.79	-	-
	3/21/11	Not Measured (well destroyed)				

[1] - Relative to an arbitrary site datum of 100.00 feet

[2] - Top-of-casing (TOC) elevations of monitor wells MW-1 through MW-5 were re-surveyed 6/29/11; these new data were also applied to the March 2011 sampling event.

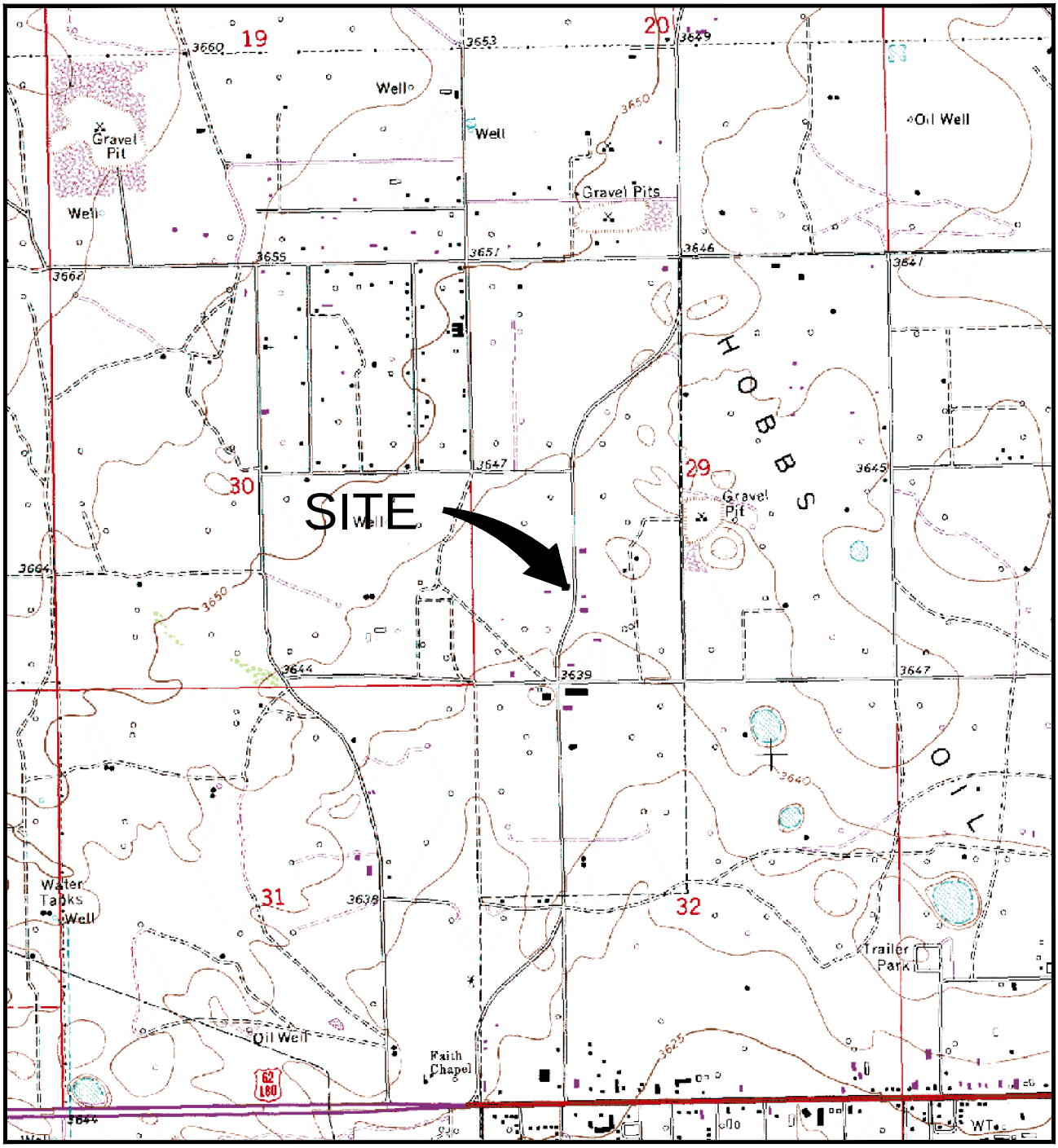
[3] - MW-2 was damaged and repaired after May 2009

Table 3
Groundwater Geochemical Data
Baker Hughes (Former FracMaster) Facility
Hobbs, New Mexico

Well Number	Sample Date	pH (std. units)	Specific Conductivity (mS/cm)	Oxidation-Reduction Potential (mv)	Dissolved Oxygen (mg/L)		Ferrous Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Alkalinity (mg/L)	Total Organic Carbon (mg/L)
					YSI Meter	Hach Test						
MW-1	2/23/06	7.01	3.056	-426.7	0.60	1.7	> 10	NM[(1)]	NM	NM	NM	NM
	4/7/09	7.15	2.059	-4.7	4.73	1.4	2.2	4	128	0.0014	198	NM
	3/21/11	5.77	2.106	403.8	4.04	1.2	0.8	<0.0300	<0.500	<0.000100	260	3.31
	6/29/11	6.72	2.310	42.9	4.00	1.0	0.75	4.70	211	<0.000500	227	5.06
	11/3/11	6.93	1.765	-165.2	MF[(3)]	3.2	0.0	3.54	142	<0.000500	217	1.88
	9/4/12	6.91	1.758	270.0	3.64	NM	NM	2.25	149	<0.0004	209	1.7
	12/6/12	6.76	1.458	-26.9	2.20	NM	0.0	1.73	132	<0.0002	216	1.76
	2/26/13	6.84	1.101	1.9	2.00	NM	0.0	1.82	122	<0.0002	214	1.13
	5/9/13	6.84	1.029	44.8	2.80	NM	0.0	1.50	109	0.00187	208	0.98
	8/21/13	7.06	1.175	1.0	2.70	NM	0.0	1.89	125	<0.0002	218	1.20
	11/4/13	6.99	0.882	125.8	4.50	NM	0.0	1.75	107	<0.0002	214	0.77
	3/10/14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-2	2/23/06	7.16	2.366	-334.6	4.36	4.2	5 to 6	NM	NM	NM	NM	NM
	4/7/09	6.69	2.057	-72.1	3.78	0.8	2.2	0.564	5.25	0.23	585	NM
	3/22/11	6.89	2.197	20.2	3.62	0.8	1.5	<0.0300	13.4	0.139	558	15.9
	6/30/11	6.71	2.140	-70.0	5.70	1.0	1.5	<0.0300	25.1	0.189	641	16.0
	11/3/11	6.77	2.384	-80.9	6.82	4.8	0.5	0.409 H[(2)]	32.7	0.133	682	15.5
	9/5/12	6.87	1.730	38.4	0.36	NM	NM	<0.030	38.3	0.246	552	9.35
	12/6/12	6.96	1.791	-191.3	1.20	NM	1.3	<0.030	43.5	0.702	558	10.8
	2/26/13	6.70	1.650	-166.2	1.00	NM	1.2	<0.030	49.3	0.93	592	9.27
	5/9/13	6.81	1.337	-93.9	0.80	NM	0.6	0.103	54.2	0.327	525	7.3
	8/21/13	7.10	1.356	-102.3	0.90	NM	0.4	<0.030	78.1	0.0187	457	5.00
	11/4/13	6.95	1.013	-132.8	0.90	NM	0.6	<0.030	71.7	0.0149	420	3.90
	3/10/14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-3	2/23/06	7.31	0.801	-298.5	0.64	7.6	1	NM	NM	NM	NM	NM
	4/8/09	7.80	0.547	14.0	1.92	0.6	0	<0.5	83.6	<0.0012	174	NM
	3/21/11	6.40	0.649	381.1	0.69	0.25	0.25	0.420	68.8	0.00134	256	1.09
	6/29/11	7.04	0.653	14.9	1.25	0.25	0.25	0.397	71.1	0.00175	252	1.65
	11/3/11	7.16	0.777	-182.8	MF	4.0	0.0	0.573 H	75.0	0.000389 J	260	0.952
	9/4/12	6.98	1.113	264.2	-0.28	NM	NM	0.675	70.9	0.00272 J	278	1.36
	12/6/12	6.67	0.947	2.9	4.10	NM	0.0	0.568	79.4	0.000804	302	2.40
	2/26/13	6.76	0.843	29.3	1.90	NM	0.0	0.677	78.4	<0.0002	332	2.21
	5/9/13	6.82	0.878	61.9	1.70	NM	0.0	0.706	77.9	<0.0002	323	2.20
	8/21/13	7.11	0.858	-11.8	1.70	NM	0.0	0.729	80.3	<0.0002	337	2.20
	11/4/13	6.93	0.705	124.2	2.00	NM	0.0	0.814	74.1	0.0013	342	2.00
	3/10/14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-4	5/2/09	6.72	1.938	-128	0.54	0.4	0.0	0.553	46.4	<0.0012	477	NM
	3/22/11	6.96	1.481	-76.2	2.80	1.0	1.5	0.0950 J	106	0.00262	279	6.25
	6/30/11	8.75	1.280	-93.9	8.05	0.75	1.0	<0.0300	106	0.00110	323	5.32
	11/3/11	6.96	1.556	-294.8	MF	1.4	5.0	0.258	96.7	<0.000500	311	2.88
	9/5/12	6.85	1.420	30.2	0.01	NM	NM	<0.030	92.9	<0.000400	308	2.22
	12/6/12	7.04	1.059	-110.1	0.90	NM	2.2	<0.030	90.7	<0.0002	318	2.52
	2/26/13	6.70	1.097	-80.6	1.10	NM	2.2	<0.030	84.7	<0.0002	342	2.2
	5/9/13	6.81	1.041	-169.3	1.50	NM	1.8	<0.030	79.2	<0.0002	312	2.0
	8/21/13	7.10	1.011	-77.3	1.50	NM	1.2	<0.030	81.8	<0.0002	330	1.70
	11/4/13	6.81	0.782	-49.1	0.90	NM	2.0	0.047 J	71	0.00262	331	1.40
	3/10/14	6.30	0.730	-53.1	1.90	NM	0.7	0.117 H		<0.0002	370	1.30
MW-5	4/9/09	8.04	0.583	-56.9	3.46	0	NM	<0.5	89	0.0039	195	NM
	3/21/11	6.67	0.769	8.8	0.48	0	0	0.514	78.1	0.000315 J	278	2.21
	6/29/11	7.05	0.754	-17.9	1.40	0.0	0.0	0.593	82.5	<0.000500	291	2.55
	11/3/11	7.04	0.927	-216.8	MF	0.0	0.8	2.70 H	80.3	<0.000500	314	2.30
	9/5/12	6.96	1.260	229.0	0.41	NM	NM	0.790	73.4	<0.0004	295	1.95
	12/6/12	7.06	0.951	61.2	2.30	NM	0.0	0.408	84.3	<0.0002	318	2.67
	2/26/13	6.72	1.030	59.2	2.00	NM	0.0	0.614	80.5	<0.0002	322	2.57
	5/9/13	6.92	0.761	40.1	1.70	NM	0.0	0.628	78.9	<0.0002	299	2.40
	8/21/13	7.25	0.852	-37.9	2.30	NM	0.0	0.658	78.9	<0.0002	300	2.00
	11/4/13	7.09	0.703	93.3	1.80	NM	0.0	0.724	70.8	0.00254	294	1.90
	3/10/14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-6	5/1/09	6.77	2.330	72	8.79	9.2	0.0	<0.5	91.9	<0.0012	192	NM
	3/21/11	Not Sampled (well destroyed)										

(1) - NM = Not Measured
(2) - H indicates that holding time was exceeded (due to laboratory error).
(3) - MF indicates instrument malfunction

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE - HOBBS, NEW MEXICO; 1979

SCALE: 1" = 2000'

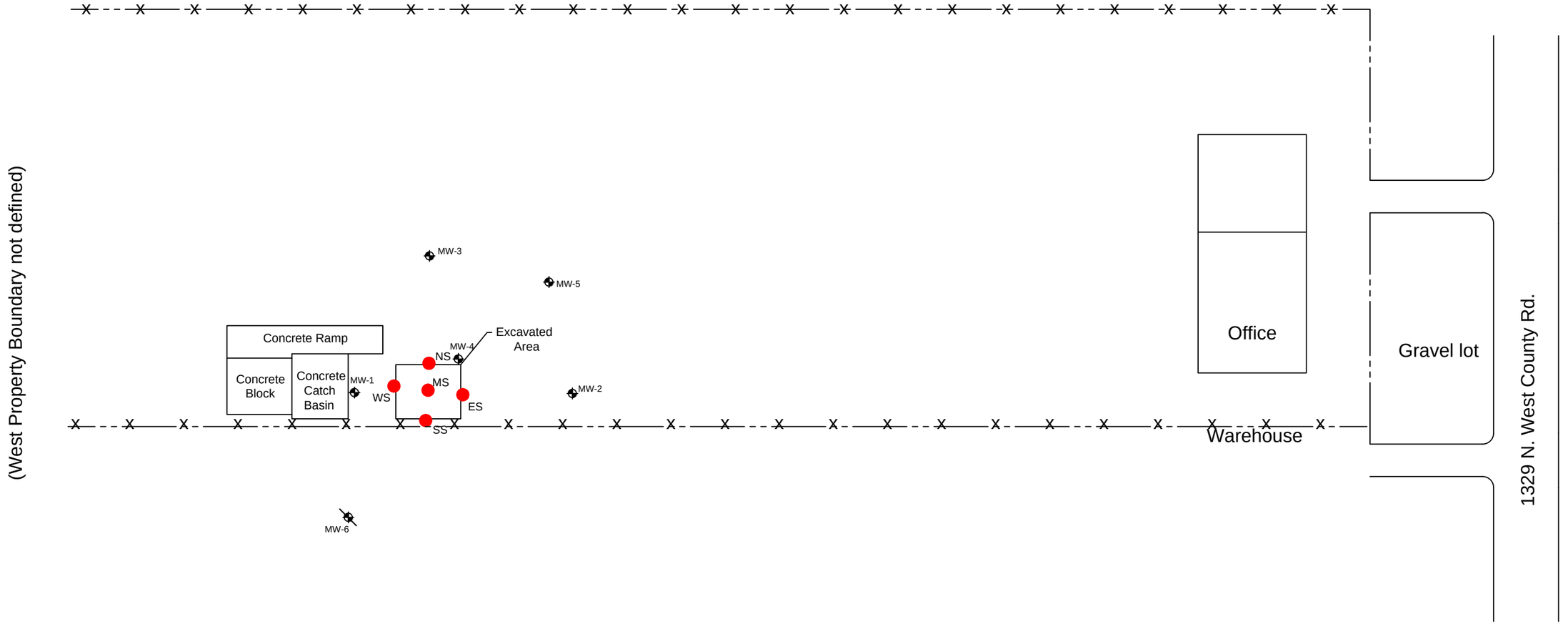
Figure 1

SITE LOCATION MAP
FORMER FRACMASTER FACILITY
BAKER HUGHES, INC.
1329 N. WEST COUNTY ROAD
HOBBS, NEW MEXICO

Brown AND Caldwell

Dec 13, 2011 – 8:09am bmason

P:\BJ Services Co USA\128125 – BJ FracMaster Hobbs\Drawings\ES\November2011\Fig1–SiteLocMap.dwg



0 25 50

SCALE IN FEET

SITE PLAN LEGEND

- MONITOR WELL LOCATIONS
- DESTROYED MONITOR WELL
- NS — SOIL BORING LOCATIONS
- FENCE LINE

BC_logo_2Line_blk_word.bmp

Aug 19, 2014 - 11:32am
C:\Users\vrodriguez\AppData\Local\Temp\AcPublish_5656\Fig2-SiteMap.dwg

Figure 2

SITE MAP
FORMER FRACMASTER FACILITY
BAKER HUGHES, INC.

1329 N. WEST COUNTY ROAD
HOBBS, NEW MEXICO

ATTACHMENTS

Attachment 1: HMI Field Activities Reports
Attachment 2: Laboratory Analytical Reports

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

March 13, 2014

Mr. Ricardo Banda
Brown and Caldwell
One Westchase Center
10777 Westheimer, Suite 925
Houston, Texas 770426

Subject: HMI Quarterly Groundwater Monitoring, 1Q14
Baker Hughes-FracMaster Site, Hobbs, New Mexico

Dear Mr. Banda:

This document summarizes groundwater monitoring field activities conducted by HMI on behalf of Baker Hughes at the BJS-FracMaster Site, Hobbs, New Mexico.

Contents

Field Activities Narrative

1. HMI collected sitewide fluid levels on March 10, 2014 at the BJS-FracMaster Site in Hobbs, New Mexico. No LNAPL or DNAPL was present at any of the five wells at the site.

2. Low-flow groundwater sampling was conducted at just one well (MW-4) for analytes shown on the attached COC, in accordance with EPA guidance (Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling) and the attached HMI Low-Flow Groundwater Sampling Memo. Low-flow purging was conducted at EPA-recommended purge rates. Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential were monitored every ½-liter, in an air-tight flow-through cell. Turbidity was measured outside the cell. Depth-to-water was measured with each set of field parameters. Upon stabilization of field parameters, the water input tube was disconnected from the flow-through cell, and groundwater samples were collected directly into laboratory-supplied bottles. Filled sampled bottles were

immediately placed in an ice-filled cooler. Groundwater monitoring activities are documented on the attached groundwater sampling forms.

3. HMI shipped samples via Fedex to ALS-Houston on March 10, 2014. Proper chain-of-custody was maintained.

4. Site notes: There is no site fence. Upright well completions are locked with B&C Master Locks (#2001).

   Per Brown and Caldwell, purgewater was contained in a labeled, sealed drum staged adjacent to MW-05 (approximately 16 gallons). There is a deteriorating full drum (appears to be soil from a well installation perhaps? It looks years old, and is located near the building located to the east of the monitoring well network (photos attached, 1Q14 deliverables)

   HMI installed dedicated bladder pumps in the five site wells in 4Q12. Dedicated bladder pumps were retrieved from MW-1, 2, 3, and 5 during the 1Q14 event.

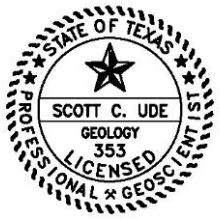
HMI appreciates the opportunity to assist Baker Hughes and Brown and Caldwell with this project. If you have any questions or require additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

Scott C. Ude, P.G.



The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on March 13, 2014.

Attachments

cc: Myna Letlow, Baker Hughes

Table 1
Water Levels and Groundwater Field Parameters

Baker Hughes
FracMaster, Hobbs, New Mexico
March 10, 2014

Well I.D.	# Wells Sampled	Top of Casing Elevation (ft-msl)	Depth to Product (ft-toc)	Depth to Water (ft-toc)	GW Elev (ft-msl)	Total Depth (ft-toc)	Screen Interval (ft-bgs)	Sample Intake (ft-toc)	Stickup (ft)	pH (S.U.)	Temp. (C)	S.C. (umhos)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)	Water Color / Clarity	Comments
MW-1	1	99.66	NP	59.06	40.60	67.82	44-64	NS	2.4	NS	NS	NS	NS	NS	NS	NS		
MW-2	2	100.01	NP	58.89	41.12	68.04	44-64	NS	3.2	NS	NS	NS	NS	NS	NS	NS		
MW-3	3	100.06	NP	58.81	41.25	65.80	43-63	NS	2.4	NS	NS	NS	NS	NS	NS	NS		
MW-4	4	100.86	NP	57.89	42.97	63.73	45-60	62.73	2.2	6.30	22.2	730	1.9	-53.1	8.1	0.7	Clear	Sample scope reduced to MW-4, 1Q14
MW-5	5	100.00	NP	58.71	41.29	62.90	45-60	NS	2.7	NS	NS	NS	NS	NS	NS	NS		

Notes:
Monitoring completed by HMI for Baker Hughes and Brown and Caldwell
D.O. measured in the field using Hanna Instrumentation within air-tight flow-through cell following purging, immediately prior to sampling
Ferrous Iron measured in the field using Hach Test Kit
NS = Not sampled, per Brown and Caldwell
NM = Not measured, NR = Not Reported
NP = No product, NS = Not sampled
HMI installed HMI-owned dedicated bladder pumps in 4Q12; then retrieved pumps from MW-1, 2, 3, and 5 on March 10, 2014

	DTW
MW-1	59.06
MW-2	58.89
MW-3	58.81
MW-5	58.71

Monitoring Well Purging and Sampling Record

Well: **MW-4**

Baker Hughes
BJS-FracMaster
1329 N. West County Road, Hobbs, New Mexico

Hydrologic Monitoring
Houston, Texas

Initials: SLu
Well Condition: Good

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	DNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Pump Intake (Ft-TOC)	Stickup (Ft)				Comments
3/10/14	1135	NA	57.89	0	0	63.73	62.73	2.2				Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Purging and Sampling Method	Water Color / Clarity
3/10/14	1140	57.93	0.5	5.94	22.4	775	2.5	-18.0	11.2	Dedicated bladder pump	clear
	1142	57.93	1.0	6.12	22.4	776	2.1	-24.7	10.3	with dedicated 1/4-in	"
	1145	57.93	1.5	6.20	22.3	762	2.0	-27.1	9.8	polyethylene tubing	"
	1147	57.93	2.0	6.23	22.2	753	1.9	-30.9	9.6		"
	1150	57.93	2.5	6.27	22.2	741	1.9	-43.1	8.6		"
	1152	57.93	3.0	6.29	22.2	736	1.9	-48.7	8.3		"
	1155	57.93	3.5	6.30	22.3	732	1.9	-51.4	8.1		"
↓	1157	57.93	4.0	6.30	22.2	730	1.9	-53.1	8.1		↓

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ALS, Houston, TX
3/10/14	1200	MW-4	57.93	6.30	22.2	730	1.9	-53.1	8.1	VOC	HCL	8260 (Benzene, Naphthalene, Xylenes)
										NO_3, SO_4, Alk	Neat	E-300.0, E-300.0, SM2320B
										Methane	Neat	RSK 175 (3 vials)
										TOC	H2SO4	9060 (2 vials)
										Ferrous Fe (Hach Field Kit):		0.7 mg/l

Instrument Calibration Log

Baker Hughes
BJS-FracMaster
1329 N. West County Road, Hobbs, New Mexico

Hydrologic Monitoring

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)		Initials / Comments
12/6/12	705	4.01/7.00	1,000	100%	10.0	241.6		JRS
12/6/12	710	4.01/7.00	1000	100%	10.0	251.8		RS
2/26/13	645	4.01/7.00	1,000	100%	10.0	247.3		JRS
5/9/13	915	4.01/7.00	1,000	100%	10.0	239.1		SCH
5/9/13	920	4.01/7.00	1,000	100%	10.0	250.2		RS
8/21/13	630	4.01/7.00	1,000	100%	10.0	239.6		RS
11/4/13	945	4.01/7.00	1,000	100%	10.0	245.1		SCH
3/10/14	1005	4.01/7.00	1,000	100%	10.0	237.4		SCH

ALS Environmental

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 103169

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	BJS-FracMaster, Hobbs,NM	A	VOC (8260) Benzene, Naphthalene, & Xylenes
Work Order		Project Number		B	Gases (RSK-175) Methane
Company Name	Brown & Caldwell	Bill To Company	Baker Hughes	C	Anions (300) Nitrate
Send Report To	Ricardo Banda	Invoice Attn	Myra Letlow	D	Alkalinity
Address	10777 Westheimer Suite 925	Address	2929 Allen Pkwy Suite 2100	E	TOC (9060)
				F	
City/State/Zip	Houston, TX 77042	City/State/Zip	Houston, TX 77019	G	
Phone	(713) 759-0999	Phone	(713) 439-8329	H	
Fax	(713) 308-3686	Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-4	3/10/14	1200	Water	1,8,8,3	9	X	X	X	X	X						☐
2	Trip Blank-01	↓	—	Water	1	2	X										☐
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Scott Udi / Scott Udi

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☑ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by: Scott Udi	Date: 3/10/14	Time: 1345	Received by:	Notes: 10 Day TAT.
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other / EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Low-Flow Groundwater Sampling Procedures
Baker Hughes-FracMaster, Hobbs, NM

HMI conducts low-flow groundwater sampling in accordance with TCEQ and EPA guidelines (Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling).

Groundwater Sampling Methodology

HMI conducted low-flow groundwater sampling using bladder pumps and polyethylene tubing dedicated in the five wells at the site, during its first groundwater sampling event at the site in December 2012. Pumps were dedicated in the wells to increase sample quality and field efficiency, and remain property of HMI. We would appreciate the opportunity to retrieve the pumps at such time that HMI no longer conducts monitoring at the site.

Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), selected to limit the monitored drawdown during the purging process. Each HMI flow-through cell has a volume of 0.5 liters. Field parameter readings are collected at 0.5-liter intervals (the equivalent of one cell volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside of the cell. Purging continues until a requisite volume of groundwater is purged (a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with the EPA guidance below:

> *Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)*

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Groundwater samples are collected directly into laboratory-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI custody prior to delivery to the laboratory.

Decontamination Procedures

Non-dedicated equipment, (i.e., only the electronic water level probe for this project) is properly decontaminated prior to use and between wells. The decontamination procedure for the water level probe consists of a spray of isopropanol (likely not warranted at this site), followed by a thorough wash in distilled water and Liquinox non-phosphate soap, with a final distilled water. The probe is allowed to air dry.

HMI Deliverables

HMI provides thorough field documentation of groundwater monitoring activities performed, including groundwater sampling forms, field equipment calibration logs, a brief field narrative, and an Excel table summarizing gauging data and groundwater field parameters.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

June 9, 2014

Mr. Ricardo Banda, P.G.
Brown and Caldwell
One Westchase Center
10777 Westheimer, Suite 925
Houston, Texas 770426

Subject: HMI Quarterly Groundwater Monitoring, 2Q14
Baker Hughes-FracMaster Site, Hobbs, New Mexico

Dear Mr. Banda:

This document summarizes groundwater monitoring field activities conducted by HMI on behalf of Baker Hughes at the BJS-FracMaster Site, Hobbs, New Mexico.

Contents

Field Activities Narrative

1. HMI collected sitewide fluid levels on June 5, 2014 at the BJS-FracMaster Site in Hobbs, New Mexico. No LNAPL or DNAPL was present at any of the five wells at the site.

2. Low-flow groundwater sampling was conducted at just one well (MW-4) for analytes shown on the attached COC, in accordance with EPA guidance (Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling) and the attached HMI Low-Flow Groundwater Sampling Memo. Low-flow purging was conducted at EPA-recommended purge rates. Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential were monitored every ½-liter, in an air-tight flow-through cell. Turbidity was measured outside the cell. Depth-to-water was measured with each set of field parameters. Upon stabilization of field parameters, the water input tube was disconnected from the flow-through cell, and groundwater samples were collected directly into laboratory-supplied bottles. Filled sampled bottles were

immediately placed in an ice-filled cooler. Groundwater monitoring activities are documented on the attached groundwater sampling forms.

3. HMI shipped samples via Fedex to ALS-Houston on June 5, 2014. Proper chain-of-custody was maintained.

4. Site notes: There is no site fence. Upright well completions are locked with B&C Master Locks (#2001).

   Per Brown and Caldwell, purgewater was contained in a labeled, sealed drum staged adjacent to MW-05 (approximately 17 gallons). There is a deteriorating full drum (appears to be soil from a former well installation).

   HMI installed HMI-owned dedicated bladder pumps in the five site wells in 4Q12. Pumps were retrieved from MW-1, 2, 3, and 5, during 1Q14. The dedicated bladder pump from MW-4 was retrieved during the 2Q14 event.

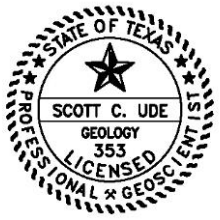
HMI appreciates the opportunity to assist Baker Hughes and Brown and Caldwell with this project. If you have any questions or require additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

Scott C. Ude, P.G.



The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on June 9, 2014.

Attachments

cc: Myna Letlow, P.G., - Baker Hughes

Table 1
Water Levels and Groundwater Field Parameters

Baker Hughes
FracMaster, Hobbs, New Mexico
June 5, 2014

Well I.D.	# Wells Sampled	Top of Casing Elevation (ft-msl)	Depth to Product (ft-toc)	Depth to Water (ft-toc)	GW Elev (ft-msl)	Total Depth (ft-toc)	Screen Interval (ft-bgs)	Sample Intake (ft-toc)	Stickup (ft)	pH (S.U.)	Temp. (C)	S.C. (umhos)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)	Water Color / Clarity	Comments
MW-1	1	99.66	NP	59.24	40.42	67.82	44-64	NS	2.4	NS	NS	NS	NS	NS	NS	NS		
MW-2	2	100.01	NP	59.06	40.95	68.04	44-64	NS	3.2	NS	NS	NS	NS	NS	NS	NS		
MW-3	3	100.06	NP	58.79	41.27	65.80	43-63	NS	2.4	NS	NS	NS	NS	NS	NS	NS		
MW-4	4	100.86	NP	58.07	42.79	63.73	45-60	62.73	2.2	6.81	23.2	950	1.6	-51.9	8.1	2.0	Clear	Sample scope reduced to MW-4, 1Q14
MW-5	5	100.00	NP	58.88	41.12	62.90	45-60	NS	2.7	NS	NS	NS	NS	NS	NS	NS		

Notes:
Monitoring completed by HMI for Baker Hughes and Brown and Caldwell
D.O. measured in the field using Hanna Instrumentation in air-tight flow-through cell, at the end of the purging event, immediately prior to sampling
Ferrous Iron measured in the field using Hach Test Kit
NS = Not sampled, per Brown and Caldwell
NM = Not measured, NR = Not Reported
NP = No product, NS = Not sampled
HMI installed HMI-owned dedicated bladder pumps in 4Q12; then retrieved pumps from MW-1, 2, 3, and 5 on March 10, 2014; and from MW-4 on June 5, 2014

Monitoring Well Purging and Sampling Record

DTW
MW-1 59.24
MW-2 59.06
MW-3 58.79
MW-5 58.88

Baker Hughes
BJS-FracMaster
1329 N. West County Road, Hobbs, New Mexico

Well: **MW-4**

Hydrologic Monitoring
Houston, Texas

Well Inspection Information

Initials: TAB
Well Condition: good

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	DNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Pump Intake (Ft-TOC)	Stickup (Ft)				Comments
6/5/14	1350	NA	58.07	0.0	0.0	63.73	62.73	2.2				Weather: Sunny 90s

Well Purging Record (1+m1 removed its dedicated bladder pump in preparation for site closure)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Purging and Sampling Method	Water Color / Clarity
6/5/14	1355	58.11	0.5	6.70	25.2	1010	2.9	44.0	12.2	Dedicated bladder pump	Clear
	1357	58.11	1.0	6.66	24.3	989	2.5	10.9	9.8	with dedicated 1/4-in	
	1400	58.11	1.5	6.90	23.8	978	2.1	-14.8	9.6	polyethylene tubing	
	1403	58.11	2.0	6.78	23.2	955	1.9	-45.8	8.8		
	1405	58.11	2.5	6.79	23.2	953	1.8	-46.1	8.6		
	1407	58.11	3.0	6.80	23.2	952	1.7	-50.8	8.4		
	1410	58.11	3.5	6.81	23.2	950	1.7	-52.2	8.4		
↓	1413	58.11	4.0	6.81	23.2	950	1.6	-51.9	8.1		↓

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ALS, Houston, TX
6/5/14	1415	MW-4	58.11	6.81	23.2	950	1.6	-51.9	8.1	VOC	HCL	8260 (Benzene, Naphthalene, Xylenes)
										NO_3, SO_4, Alk	Neat	E-300.0, E-300.0, SM2320B
										Methane	Neat	RSK 175
										TOC	H_2SO_4	9060
										Ferrous Fe (Hach Field Kit):		2.0 mg/l

Instrument Calibration Log

Baker Hughes
BJS-FracMaster
1329 N. West County Road, Hobbs, New Mexico

Hydrologic Monitoring

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)		Initials / Comments
12/6/12	705	4.01/7.00	1,000	100%	10.0	241.6		JRS
12/6/12	710	4.01/7.00	1,000	100%	10.0	251.8		RS
2/26/13	645	4.01/7.00	1,000	100%	10.0	247.3		JRS
5/9/13	915	4.01/7.00	1,000	100%	10.0	239.1		SCM
5/9/13	920	4.01/7.00	1,000	100%	10.0	250.2		RS
8/21/13	630	4.01/7.00	1,000	100%	10.0	239.6		RS
11/4/13	945	4.01/7.00	1,000	100%	10.0	245.1		SCM
3/10/14	1005	4.01/7.00	1,000	100%	10.0	237.4		SCM
6/5/14	1330	4.01/7.00	1,000	100%	10.0	245.9		TAB

ALS Environmental

Cincinnati, OH +1 513 733 5336
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Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 103170

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	BJS-FracMaster, Hobbs,NM	A	VOC (8260) Benzene, Naphthalene, & Xylenes
Work Order		Project Number		B	Gases (RSK-175) Methane
Company Name	Brown & Caldwell	Bill To Company	Baker Hughes	C	Anions (300) Nitrate
Send Report To	Ricardo Banda	Invoice Attn	Myna Lellow	D	Alkalinity
Address	10777 Westheimer Suite 925	Address	2929 Allen Pkwy Suite 2100	E	TOC (9060)
				F	
City/State/Zip	Houston, TX 77042	City/State/Zip	Houston, TX 77019	G	
Phone	(713) 759-0999	Phone	(713) 439-8329	H	
Fax	(713) 308-3866	Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-4	6/5/14	1415	Water	1,8,8,3	10	X	X	X	X	X						☐
2	Trip Blank-01	↓	—	Water	1	2	X										☐
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Scott Ude / Scott Ude

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☑ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Scott Ude	Date: 6/5/14	Time: 1500	Received by:	Notes: 10 Day TAT.	
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ Level III Std QC/Raw Data ☐ Level IV SW846/CLP ☐ Other / EDD ☐ TRRP CheckList ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Low-Flow Groundwater Sampling Procedures
Baker Hughes-FracMaster, Hobbs, NM

HMI conducts low-flow groundwater sampling in accordance with TCEQ and EPA guidelines (Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling).

Groundwater Sampling Methodology

HMI conducted low-flow groundwater sampling using bladder pumps and polyethylene tubing dedicated in the five wells at the site, during its first groundwater sampling event at the site in December 2012. Pumps were dedicated in the wells to increase sample quality and field efficiency, and remain property of HMI. We would appreciate the opportunity to retrieve the pumps at such time that HMI no longer conducts monitoring at the site.

Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), selected to limit the monitored drawdown during the purging process. Each HMI flow-through cell has a volume of 0.5 liters. Field parameter readings are collected at 0.5-liter intervals (the equivalent of one cell volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside of the cell. Purging continues until a requisite volume of groundwater is purged (a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with the EPA guidance below:

> *Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)*

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Groundwater samples are collected directly into laboratory-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI custody prior to delivery to the laboratory.

Decontamination Procedures

Non-dedicated equipment, (i.e., only the electronic water level probe for this project) is properly decontaminated prior to use and between wells. The decontamination procedure for the water level probe consists of a spray of isopropanol (likely not warranted at this site), followed by a thorough wash in distilled water and Liquinox non-phosphate soap, with a final distilled water. The probe is allowed to air dry.

HMI Deliverables

HMI provides thorough field documentation of groundwater monitoring activities performed, including groundwater sampling forms, field equipment calibration logs, a brief field narrative, and an Excel table summarizing gauging data and groundwater field parameters.

21-Mar-2014

Ricardo Banda
Brown & Caldwell
10777 Westheimer
Suite 925
Houston, TX 77042

Tel: (713) 646-1114
Fax: (713) 308-3886

Re: Hobbs Frackmaster Site Work Order: **14030390**

Dear Ricardo,

ALS Environmental received 2 samples on 11-Mar-2014 09:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 16.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Electronically approved by: Dayna.Fisher

Sonia West
Project Manager

Certificate No: T104704231-13-12

ALS Environmental

Date: 21-Mar-14

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site
Work Order: **14030390**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
14030390-01	MW-4	Water		3/10/2014 12:00	3/11/2014 09:15	☐
14030390-02	Trip Blank-01	Water		3/10/2014	3/11/2014 09:15	☐

Client:	Brown & Caldwell
Project:	Hobbs Frackmaster Site
Work Order:	14030390

Case Narrative

Batch R163066, Anions - EPA 300.0 (1993), Sample MW-4 (14030390-01D): due to a laboratory error, this sample was analyzed for Nitrate outside of the method holding time. The client was notified on March 20, 2014 via voice message.

Batch 163066, nions - EPA 300.0 (1993), Sample 14030412-13A: MS/MSD are for an unrelated sample.

ALS Environmental

Date: *21-Mar-14*

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site
Sample ID: MW-4
Collection Date: 3/10/2014 12:00 PM

Work Order: 14030390
Lab ID: 14030390-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DISSOLVED GASES - RSK-175		Method: **RSK-175**					Analyst: **NPI**
Methane	U		0.200	0.500	ug/L	1	3/14/2014 08:39
VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
Benzene	U		0.00060	0.0050	mg/L	1	3/13/2014 16:26
m,p-Xylene	U		0.00060	0.010	mg/L	1	3/13/2014 16:26
Naphthalene	U		0.00070	0.0050	mg/L	1	3/13/2014 16:26
o-Xylene	U		0.00050	0.0050	mg/L	1	3/13/2014 16:26
Xylenes, Total	U		0.0015	0.015	mg/L	1	3/13/2014 16:26
Surr: 1,2-Dichloroethane-d4	*89.0*			*70-125*	*%REC*	1	3/13/2014 16:26
Surr: 4-Bromofluorobenzene	*90.3*			*72-125*	*%REC*	1	3/13/2014 16:26
Surr: Dibromofluoromethane	*95.2*			*71-125*	*%REC*	1	3/13/2014 16:26
Surr: Toluene-d8	*97.3*			*75-125*	*%REC*	1	3/13/2014 16:26
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Nitrogen, Nitrate (As N)	**0.117**	H	**0.030**	**0.100**	**mg/L**	1	3/13/2014 06:56
ALKALINITY-SM2320B		Method: **SM2320B**					Analyst: **PPM**
Alkalinity, Bicarbonate (As CaCO3)	**370**		**10**	**10.0**	**mg/L**	1	3/13/2014
Alkalinity, Carbonate (As CaCO3)	U		10	10.0	mg/L	1	3/13/2014
Alkalinity, Hydroxide (As CaCO3)	U		10	10.0	mg/L	1	3/13/2014
Alkalinity, Total (As CaCO3)	**370**		**10**	**10.0**	**mg/L**	1	3/13/2014
TOTAL ORGANIC CARBON - SW9060A		Method: **SW9060**					Analyst: **KKB**
Organic Carbon, Total	**1.3**		**0.20**	**0.50**	**mg/L**	1	3/20/2014 13:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *21-Mar-14*

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site
Sample ID: Trip Blank-01
Collection Date: 3/10/2014

Work Order: 14030390
Lab ID: 14030390-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
Benzene	U		0.00060	0.0050	mg/L	1	3/13/2014 16:49
m,p-Xylene	U		0.00060	0.010	mg/L	1	3/13/2014 16:49
Naphthalene	U		0.00070	0.0050	mg/L	1	3/13/2014 16:49
o-Xylene	U		0.00050	0.0050	mg/L	1	3/13/2014 16:49
Xylenes, Total	U		0.0015	0.015	mg/L	1	3/13/2014 16:49
Surr: 1,2-Dichloroethane-d4	*94.1*			*70-125*	*%REC*	1	3/13/2014 16:49
Surr: 4-Bromofluorobenzene	*92.9*			*72-125*	*%REC*	1	3/13/2014 16:49
Surr: Dibromofluoromethane	*100*			*71-125*	*%REC*	1	3/13/2014 16:49
Surr: Toluene-d8	*102*			*75-125*	*%REC*	1	3/13/2014 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Work Order: 14030390
Client: Brown & Caldwell
Project: Hobbs Frackmaster Site

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
Batch ID: R162800	**Test Name:** Alkalinity-SM2320B					
14030390-01D	MW-4	Water	3/10/2014 12:00:00 PM			3/13/2014
Batch ID: R162843	**Test Name:** Volatiles - SW8260C					
14030390-01A	MW-4	Water	3/10/2014 12:00:00 PM			3/13/2014 04:26 PM
14030390-02A	Trip Blank-01		3/10/2014			3/13/2014 04:49 PM
Batch ID: R162868	**Test Name:** Dissolved Gases - RSK-175					
14030390-01B	MW-4	Water	3/10/2014 12:00:00 PM			3/14/2014 08:39 AM
Batch ID: R163066	**Test Name:** Anions - EPA 300.0 (1993)					
14030390-01D	MW-4	Water	3/10/2014 12:00:00 PM			3/13/2014 06:56 AM
Batch ID: R163214	**Test Name:** Total Organic Carbon - SW9060A					
14030390-01C	MW-4	Water	3/10/2014 12:00:00 PM			3/20/2014 01:28 PM

QC BATCH REPORT

Batch ID: **R162868** Instrument ID **FID-4** Method: **RSK-175**

MBLK Sample ID: **GBLKW1-140314-R162868** Units: **ug/L** Analysis Date: **3/14/2014 08:28 AM**

Client ID: Run ID: **FID-4_140314A** SeqNo: **3565409** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	U	0.500								

LCS Sample ID: **GLCSW1-140314-R162868** Units: **ug/L** Analysis Date: **3/14/2014 07:16 AM**

Client ID: Run ID: **FID-4_140314A** SeqNo: **3565407** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	8.157	0.500	9.647	0	84.5	75-125				

LCSD Sample ID: **GLCSDW1-140314-R162868** Units: **ug/L** Analysis Date: **3/14/2014 07:35 AM**

Client ID: Run ID: **FID-4_140314A** SeqNo: **3565408** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	9.265	0.500	9.647	0	96	75-125	8.157	12.7	30	

The following samples were analyzed in this batch: 14030390-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Brown & Caldwell
Work Order: 14030390
Project: Hobbs Frackmaster Site

QC BATCH REPORT

Batch ID: **R162843** Instrument ID **VOA7** Method: **SW8260**

MBLK Sample ID: **VBLKW-140313-R162843** Units: **µg/L** Analysis Date: **3/13/2014 12:18 PM**
Client ID: Run ID: **VOA7_140313A** SeqNo: **3565021** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
m,p-Xylene	U	10								
Naphthalene	U	5.0								
o-Xylene	U	5.0								
Xylenes, Total	U	15								
Surr: 1,2-Dichloroethane-d4	46.51	5.0	*50*	*0*	*93*	*70-125*	*0*			
Surr: 4-Bromofluorobenzene	45.28	5.0	*50*	*0*	*90.6*	*72-125*	*0*			
Surr: Dibromofluoromethane	48.24	5.0	*50*	*0*	*96.5*	*71-125*	*0*			
Surr: Toluene-d8	49.17	5.0	*50*	*0*	*98.3*	*75-125*	*0*			

LCS Sample ID: **VLCSW-140313-R162843** Units: **µg/L** Analysis Date: **3/13/2014 11:08 AM**
Client ID: Run ID: **VOA7_140313A** SeqNo: **3565020** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.82	5.0	50	0	99.6	73-121				
m,p-Xylene	108.9	10	100	0	109	78-121				
Naphthalene	47.2	5.0	50	0	94.4	65-135				
o-Xylene	53.34	5.0	50	0	107	80-120				
Xylenes, Total	162.3	15	150	0	108	80-120				
Surr: 1,2-Dichloroethane-d4	47.31	5.0	*50*	*0*	*94.6*	*70-125*	*0*			
Surr: 4-Bromofluorobenzene	50.61	5.0	*50*	*0*	*101*	*72-125*	*0*			
Surr: Dibromofluoromethane	50.12	5.0	*50*	*0*	*100*	*71-125*	*0*			
Surr: Toluene-d8	50.53	5.0	*50*	*0*	*101*	*75-125*	*0*			

MS Sample ID: **14030476-01AMS** Units: **µg/L** Analysis Date: **3/13/2014 03:17 PM**
Client ID: Run ID: **VOA7_140313A** SeqNo: **3565028** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	4854	500	5000	33.4	96.4	73-121				
m,p-Xylene	9739	1,000	10000	0	97.4	78-121				
Naphthalene	4441	500	5000	0	88.8	65-135				
o-Xylene	4901	500	5000	0	98	80-120				
Xylenes, Total	14640	1,500	15000	0	97.6	80-120				
Surr: 1,2-Dichloroethane-d4	4528	500	*5000*	*0*	*90.6*	*70-125*	*0*			
Surr: 4-Bromofluorobenzene	4970	500	*5000*	*0*	*99.4*	*72-125*	*0*			
Surr: Dibromofluoromethane	4847	500	*5000*	*0*	*96.9*	*71-125*	*0*			
Surr: Toluene-d8	4967	500	*5000*	*0*	*99.3*	*75-125*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Brown & Caldwell
Work Order: 14030390
Project: Hobbs Frackmaster Site

QC BATCH REPORT

Batch ID: **R162843** Instrument ID **VOA7** Method: **SW8260**

MSD Sample ID: **14030476-01AMSD** Units: **µg/L** Analysis Date: **3/13/2014 03:40 PM**
Client ID: Run ID: **VOA7_140313A** SeqNo: **3565029** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	5042	500	5000	33.4	100	73-121	4854	3.79	20	
m,p-Xylene	10280	1,000	10000	0	103	78-121	9739	5.37	20	
Naphthalene	4727	500	5000	0	94.5	65-135	4441	6.23	20	
o-Xylene	5081	500	5000	0	102	80-120	4901	3.6	20	
Xylenes, Total	15360	1,500	15000	0	102	78-121	14640	4.78	20	
Surr: 1,2-Dichloroethane-d4	4510	500	*5000*	*0*	*90.2*	*70-125*	*4528*	*0.395*	*20*	
Surr: 4-Bromofluorobenzene	4874	500	*5000*	*0*	*97.5*	*72-125*	*4970*	*1.96*	*20*	
Surr: Dibromofluoromethane	4806	500	*5000*	*0*	*96.1*	*71-125*	*4847*	*0.862*	*20*	
Surr: Toluene-d8	4936	500	*5000*	*0*	*98.7*	*75-125*	*4967*	*0.633*	*20*	

The following samples were analyzed in this batch: 14030390-01A 14030390-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Brown & Caldwell
Work Order: 14030390
Project: Hobbs Frackmaster Site

QC BATCH REPORT

Batch ID: **R162800** Instrument ID **ManTech01** Method: **SM2320B** **(Dissolve)**

MBLK Sample ID: **WBLKW1-140313-R162800** Units: **mg/L** Analysis Date: **3/13/2014**
Client ID: Run ID: **MANTECH01_140313A** SeqNo: **3563987** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	10.0								
Alkalinity, Carbonate (As CaCO3)	U	10.0								
Alkalinity, Hydroxide (As CaCO3)	U	10.0								
Alkalinity, Total (As CaCO3)	U	10.0								

LCS Sample ID: **WLCSW1-140313-R162800** Units: **mg/L** Analysis Date: **3/13/2014**
Client ID: Run ID: **MANTECH01_140313A** SeqNo: **3563988** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1032	10.0	1000	0	103	80-120				

LCSD Sample ID: **WLCSDW1-140313-R162800** Units: **mg/L** Analysis Date: **3/13/2014**
Client ID: Run ID: **MANTECH01_140313A** SeqNo: **3564009** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1081	10.0	1000	0	108	80-120	1032	4.64	20	

DUP Sample ID: **14030415-01FDup** Units: **mg/L** Analysis Date: **3/13/2014**
Client ID: Run ID: **MANTECH01_140313A** SeqNo: **3564011** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	129	10.0					130	0.772	0	
Alkalinity, Carbonate (As CaCO3)	U	10.0					0	0	0	
Alkalinity, Hydroxide (As CaCO3)	U	10.0					0	0	0	
Alkalinity, Total (As CaCO3)	129	10.0					130	0.772	20	

The following samples were analyzed in this batch: 14030390-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Brown & Caldwell
Work Order: 14030390
Project: Hobbs Frackmaster Site

QC BATCH REPORT

Batch ID: **R163066** Instrument ID **ICS2100** Method: **E300**

MBLK Sample ID: **WBLKW5-R163066** Units: **mg/L** Analysis Date: **3/13/2014 01:36 AM**
Client ID: Run ID: **ICS2100_140312A** SeqNo: **3569455** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	U	0.100								

LCS Sample ID: **WLCSW5-R163066** Units: **mg/L** Analysis Date: **3/13/2014 01:51 AM**
Client ID: Run ID: **ICS2100_140312A** SeqNo: **3569456** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	4.059	0.100	4	0	101	90-110				

MS Sample ID: **14030412-13AMS** Units: **mg/L** Analysis Date: **3/13/2014 05:58 AM**
Client ID: Run ID: **ICS2100_140312A** SeqNo: **3569473** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	39.99	0.100	2	38.56	71.6	80-120				SEOH

MSD Sample ID: **14030412-13AMSD** Units: **mg/L** Analysis Date: **3/13/2014 06:13 AM**
Client ID: Run ID: **ICS2100_140312A** SeqNo: **3569474** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	40.26	0.100	2	38.56	84.9	80-120	39.99	0.663	20	EOH

The following samples were analyzed in this batch: 14030390-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Brown & Caldwell
Work Order: 14030390
Project: Hobbs Frackmaster Site

QC BATCH REPORT

Batch ID: **R163214** Instrument ID **TOC_02** Method: **SW9060** **(Dissolve)**

MBLK Sample ID: **WBLKW1-R163214** Units: **mg/L** Analysis Date: **3/20/2014 11:32 AM**
Client ID: Run ID: **TOC_02_140320A** SeqNo: **3572596** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.50								

LCS Sample ID: **WLCSW1-R163214** Units: **mg/L** Analysis Date: **3/20/2014 11:48 AM**
Client ID: Run ID: **TOC_02_140320A** SeqNo: **3572597** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.546	0.50	10	0	95.5	80-120				

LCSD Sample ID: **WLCSDW1-R163214** Units: **mg/L** Analysis Date: **3/20/2014 12:02 PM**
Client ID: Run ID: **TOC_02_140320A** SeqNo: **3572598** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.39	0.50	10	0	93.9	80-120	9.546	1.65	20	

MS Sample ID: **14030390-01CMS** Units: **mg/L** Analysis Date: **3/20/2014 01:42 PM**
Client ID: **MW-4** Run ID: **TOC_02_140320A** SeqNo: **3572600** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.83	0.50	10	1.337	94.9	80-120				

The following samples were analyzed in this batch: 14030390-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 21-Mar-14

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site
WorkOrder: **14030390**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Units Reported	Description
mg/L	Milligrams per Liter
ug/L	Micrograms per Liter

ALS Environmental

Sample Receipt Checklist

Client Name: **B&C-HOU** Date/Time Received: **11-Mar-14 09:15**

Work Order: **14030390** Received by: **LOT**

Checklist completed by Paresh M. Giga (eSignature) 12-Mar-14 (Date) Reviewed by: Sonia West (eSignature) 12-Mar-14 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3c/1.3c C/U	IR1	
Cooler(s)/Kit(s):	4392		
Date/Time sample(s) sent to storage:	3/12/14 08:50		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

SRC Page 1 of 1

ALS Environmental

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Chain of Custody For

Page 1 of 1

COC ID: 10316

14030390

B&C-HOU: Brown & Caldwell

Project: Hobbs Frackmaster Site (N.M.)

ton, WV 68

80

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	BJS-FracMaster, Hobbs,NM	A	VOC (8260) Benzene, Naphthalene, & Xylenes
Work Order		Project Number		B	Gases (RSK-175) Methane
Company Name	Brown & Caldwell	Bill To Company	Baker Hughes	C	Anions (300) Nitrate
Send Report To	Ricardo Banda	Invoice Attn	Myna Letlow	D	Alkalinity
Address	10777 Westheimer Suite 925	Address	2929 Allen Pkwy Suite 2100	E	TOC (9060)
				F	
City/State/Zip	Houston, TX 77042	City/State/Zip	Houston, TX 77019	G	
Phone	(713) 759-0999	Phone	(713) 439-8329	H	
Fax	(713) 308-3886	Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-4	3/10/14	1200	Water	1,8,8,3	9	X	X	X	X	X						☐
2	Trip Blank-01	↓	—	Water	1	2	X										☐
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Scott Uda / Scott Uda

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☑ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by: Scott Uda Date: 3/10/14 Time: 1345 Received by:

Relinquished by: Date: Time: Received by (Laboratory): MS 3/11/14 0915.

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

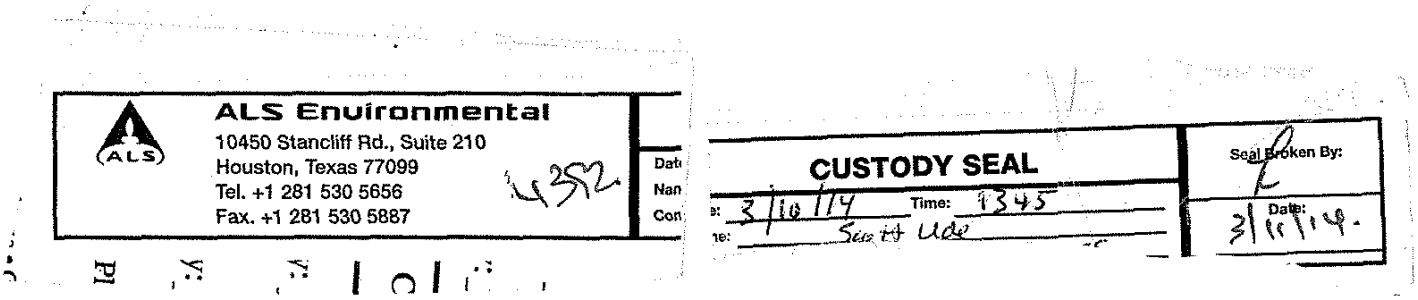
Notes: 10 Day TAT.

Cooler ID: 4392 Cooler Temp: 4.3°

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other / EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.


ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Time: 1345
Seal Broken By:
Date:
3/11/14.


TRK# 0215 8042 5198 8912
TUE – 11 MAR AA
STANDARD OVERNIGHT
AB SGRA
77099
TX–US · IAH

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July 02, 2014

Ricardo Banda
Brown & Caldwell
10777 Westheimer
Suite 925
Houston, TX 77042

Work Order: **HS14060280**

Laboratory Results for: **Hobbs Frackmaster Site (N.M.)**

Dear Ricardo,

ALS Environmental received 2 sample(s) on Jun 06, 2014 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: Sonia.West
Sonia West
Project Manager

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site (N.M.)
Work Order: HS14060280

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS14060280-01	MW-4	Water		05-Jun-2014 14:15	06-Jun-2014 09:25	☐
HS14060280-02	Trip Blank-01	Water		05-Jun-2014 00:00	06-Jun-2014 09:25	☐

Client: Brown & Caldwell **CASE NARRATIVE**
Project: Hobbs Frackmaster Site (N.M.)
Work Order: HS14060280

GC Semivolatiles by Method RSK-175

Batch ID: R235382

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R235227

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R235132

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9060

Batch ID: R236261

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R236062

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R235509

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E300

Batch ID: R235125

Sample ID: **HS14050225-06**
• MS/MSD are for an unrelated sample.

Sample ID: **MW-4 (HS14060280-01)**
• The analysis for Nitrate was performed outside of the method holding time.

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site (N.M.)
Sample ID: MW-4
Collection Date: 05-Jun-2014 14:15

ANALYTICAL REPORT
WorkOrder:HS14060280
Lab ID:HS14060280-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY-SM2320B		**Method:SM2320B**				Analyst: MYC
Alkalinity, Bicarbonate (As CaCO3)	**302**		**10.0**	**mg/L**	1	12-Jun-2014 12:17
Alkalinity, Carbonate (As CaCO3)	ND		10.0	mg/L	1	12-Jun-2014 12:17
Alkalinity, Hydroxide (As CaCO3)	ND		10.0	mg/L	1	12-Jun-2014 12:17
Alkalinity, Total (As CaCO3)	**302**		**10.0**	**mg/L**	1	12-Jun-2014 12:17
VOLATILES - SW8260C		**Method:SW8260**				Analyst: PC
Benzene	ND		0.0050	mg/L	1	06-Jun-2014 16:27
Naphthalene	ND		0.0050	mg/L	1	06-Jun-2014 16:27
m,p-Xylene	ND		0.010	mg/L	1	06-Jun-2014 16:27
o-Xylene	ND		0.0050	mg/L	1	06-Jun-2014 16:27
Xylenes, Total	ND		0.015	mg/L	1	06-Jun-2014 16:27
Surr: 1,2-Dichloroethane-d4	*104*		*70-125*	*%REC*	*1*	*06-Jun-2014 16:27*
Surr: 4-Bromofluorobenzene	*94.9*		*72-125*	*%REC*	*1*	*06-Jun-2014 16:27*
Surr: Dibromofluoromethane	*87.8*		*71-125*	*%REC*	*1*	*06-Jun-2014 16:27*
Surr: Toluene-d8	*96.2*		*75-125*	*%REC*	*1*	*06-Jun-2014 16:27*
DISSOLVED GASES - RSK-175		**Method:RSK-175**				Analyst: MYA
Methane	ND		0.500	ug/L	1	11-Jun-2014 11:29
TOTAL ORGANIC CARBON - SW9060A		**Method:SW9060**				Analyst: KKB
Organic Carbon, Total	**1.7**		**1.0**	**mg/L**	1	24-Jun-2014 20:40
ANIONS - EPA 300.0 (1993)		**Method:E300**				Analyst: KKB
Nitrogen, Nitrate (As N)	ND	H	0.100	mg/L	1	07-Jun-2014 21:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell

ANALYTICAL REPORT

Project: Hobbs Frackmaster Site (N.M.) WorkOrder:HS14060280

Sample ID: Trip Blank-01 Lab ID:HS14060280-02

Collection Date: 05-Jun-2014 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES - SW8260C	**Method:SW8260**					Analyst: PC
Benzene	ND		0.0050	mg/L	1	10-Jun-2014 08:51
Naphthalene	ND		0.0050	mg/L	1	10-Jun-2014 08:51
m,p-Xylene	ND		0.010	mg/L	1	10-Jun-2014 08:51
o-Xylene	ND		0.0050	mg/L	1	10-Jun-2014 08:51
Xylenes, Total	ND		0.015	mg/L	1	10-Jun-2014 08:51
Surr: 1,2-Dichloroethane-d4	*93.7*		*70-125*	*%REC*	*1*	*10-Jun-2014 08:51*
Surr: 4-Bromofluorobenzene	*98.2*		*72-125*	*%REC*	*1*	*10-Jun-2014 08:51*
Surr: Dibromofluoromethane	*93.6*		*71-125*	*%REC*	*1*	*10-Jun-2014 08:51*
Surr: Toluene-d8	*98.9*		*75-125*	*%REC*	*1*	*10-Jun-2014 08:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site (N.M.)
WorkOrder: HS14060280

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R235125	**Test Name :** ANIONS - EPA 300.0 (1993)			**Matrix:** Water		
hs14060280-01	MW-4	05 Jun 2014 14:15			07 Jun 2014 21:22	1
Batch ID R235126	**Test Name :** ANIONS - EPA 300.0 (1993)			**Matrix:** Water		
hs14060280-01	MW-4	05 Jun 2014 14:15			06 Jun 2014 15:59	1
Batch ID R235132	**Test Name :** VOLATILES - SW8260C			**Matrix:** Water		
HS14060280-01	MW-4	05 Jun 2014 14:15			06 Jun 2014 16:27	1
Batch ID R235227	**Test Name :** VOLATILES - SW8260C			**Matrix:** Water		
HS14060280-02	Trip Blank-01	05 Jun 2014 00:00			10 Jun 2014 08:51	1
Batch ID R235382	**Test Name :** DISSOLVED GASES - RSK-175			**Matrix:** Water		
HS14060280-01	MW-4	05 Jun 2014 14:15			11 Jun 2014 11:29	1
Batch ID R235509	**Test Name :** ALKALINITY-SM2320B			**Matrix:** Water		
HS14060280-01	MW-4	05 Jun 2014 14:15			12 Jun 2014 12:17	1
Batch ID R236261	**Test Name :** TOTAL ORGANIC CARBON - SW9060A			**Matrix:** Water		
HS14060280-01	MW-4	05 Jun 2014 14:15			24 Jun 2014 20:40	1

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235382 **Instrument: FID-4** **Method: RSK-175**

MBLK Sample ID: **GBLKW1-140611** Units: **ug/L** Analysis Date: **11-Jun-2014 10:04**
Client ID: Run ID: **FID-4_235382** SeqNo: **2875415** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	ND	0.500								

LCS Sample ID: **GLCSW1-140611** Units: **ug/L** Analysis Date: **11-Jun-2014 09:35**
Client ID: Run ID: **FID-4_235382** SeqNo: **2875413** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	8.577	0.500	9.065	0	94.6	75 - 125				

LCSD Sample ID: **GLCSDW1-140611** Units: **ug/L** Analysis Date: **11-Jun-2014 09:49**
Client ID: Run ID: **FID-4_235382** SeqNo: **2875414** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	8.489	0.500	9.065	0	93.6	75 - 125	8.577	1.03	30	

The following samples were anayzed in this batch: HS14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235132 **Instrument: VOA1** **Method: SW8260**

MBLK Sample ID: **VBLKW-140606** Units: **ug/L** Analysis Date: **06-Jun-2014 15:31**
Client ID: Run ID: **VOA1_235132** SeqNo: **2870776** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	5.0								
m,p-Xylene	ND	10								
Naphthalene	ND	5.0								
o-Xylene	ND	5.0								
Xylenes, Total	ND	15								
Surr: 1,2-Dichloroethane-d4	*54.64*	*5.0*	*50*	*0*	*109*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*46.15*	*5.0*	*50*	*0*	*92.3*	*72 - 125*				
Surr: Dibromofluoromethane	*39.44*	*5.0*	*50*	*0*	*78.9*	*71 - 125*				
Surr: Toluene-d8	*48.73*	*5.0*	*50*	*0*	*97.5*	*75 - 125*				

LCS Sample ID: **VLCSW-140606** Units: **ug/L** Analysis Date: **06-Jun-2014 14:06**
Client ID: Run ID: **VOA1_235132** SeqNo: **2870775** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	48.88	5.0	50	0	97.8	73 - 121				
m,p-Xylene	96.59	10	100	0	96.6	78 - 121				
Naphthalene	47.5	5.0	50	0	95.0	65 - 135				
o-Xylene	50.03	5.0	50	0	100	80 - 120				
Xylenes, Total	146.6	15	150	0	97.7	80 - 120				
Surr: 1,2-Dichloroethane-d4	*51.59*	*5.0*	*50*	*0*	*103*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*49.83*	*5.0*	*50*	*0*	*99.7*	*72 - 125*				
Surr: Dibromofluoromethane	*45.12*	*5.0*	*50*	*0*	*90.2*	*71 - 125*				
Surr: Toluene-d8	*48.55*	*5.0*	*50*	*0*	*97.1*	*75 - 125*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235132 **Instrument: VOA1** **Method: SW8260**

MS Sample ID: **HS14060280-01MS** Units: **ug/L** Analysis Date: **06-Jun-2014 17:51**
Client ID: **MW-4** Run ID: **VOA1_235132** SeqNo: **2870778** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	44.25	5.0	50	0	88.5	73 - 121				
m,p-Xylene	97.48	10	100	0	97.5	78 - 121				
Naphthalene	47.32	5.0	50	0	94.6	65 - 135				
o-Xylene	49.74	5.0	50	0	99.5	80 - 120				
Xylenes, Total	147.2	15	150	0	98.1	80 - 120				
Surr: 1,2-Dichloroethane-d4	*50.78*	*5.0*	*50*	*0*	*102*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*50.02*	*5.0*	*50*	*0*	*100*	*72 - 125*				
Surr: Dibromofluoromethane	*40.85*	*5.0*	*50*	*0*	*81.7*	*71 - 125*				
Surr: Toluene-d8	*49.8*	*5.0*	*50*	*0*	*99.6*	*75 - 125*				

MSD Sample ID: **HS14060280-01MSD** Units: **ug/L** Analysis Date: **06-Jun-2014 18:19**
Client ID: **MW-4** Run ID: **VOA1_235132** SeqNo: **2870779** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	45.9	5.0	50	0	91.8	73 - 121	44.25	3.65	20	
m,p-Xylene	94.06	10	100	0	94.1	78 - 121	97.48	3.58	20	
Naphthalene	49.56	5.0	50	0	99.1	65 - 135	47.32	4.63	20	
o-Xylene	47.39	5.0	50	0	94.8	80 - 120	49.74	4.84	20	
Xylenes, Total	141.4	15	150	0	94.3	78 - 121	147.2	4	20	
Surr: 1,2-Dichloroethane-d4	*58.66*	*5.0*	*50*	*0*	*117*	*70 - 125*	*50.78*	*14.4*	*20*	
Surr: 4-Bromofluorobenzene	*47.89*	*5.0*	*50*	*0*	*95.8*	*72 - 125*	*50.02*	*4.35*	*20*	
Surr: Dibromofluoromethane	*50.28*	*5.0*	*50*	*0*	*101*	*71 - 125*	*40.85*	*20.7*	*20*	R
Surr: Toluene-d8	*50.6*	*5.0*	*50*	*0*	*101*	*75 - 125*	*49.8*	*1.61*	*20*	

The following samples were anayzed in this batch: HS14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235227 **Instrument: VOA6** **Method: SW8260**

MBLK Sample ID: **VBLKW-140609** Units: **ug/L** Analysis Date: **10-Jun-2014 01:13**
Client ID: Run ID: **VOA6_235227** SeqNo: **2873092** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	5.0								
m,p-Xylene	ND	10								
Naphthalene	ND	5.0								
o-Xylene	ND	5.0								
Xylenes, Total	ND	15								
Surr: 1,2-Dichloroethane-d4	*45.87*	*5.0*	*50*	*0*	*91.7*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*49.4*	*5.0*	*50*	*0*	*98.8*	*72 - 125*				
Surr: Dibromofluoromethane	*47.16*	*5.0*	*50*	*0*	*94.3*	*71 - 125*				
Surr: Toluene-d8	*48.95*	*5.0*	*50*	*0*	*97.9*	*75 - 125*				

LCS Sample ID: **VLCSW-140609** Units: **ug/L** Analysis Date: **10-Jun-2014 00:00**
Client ID: Run ID: **VOA6_235227** SeqNo: **2873091** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	44.67	5.0	50	0	89.3	73 - 121				
m,p-Xylene	92.6	10	100	0	92.6	78 - 121				
Naphthalene	57.38	5.0	50	0	115	65 - 135				
o-Xylene	40.12	5.0	50	0	80.2	80 - 120				
Xylenes, Total	132.7	15	150	0	88.5	80 - 120				
Surr: 1,2-Dichloroethane-d4	*48.59*	*5.0*	*50*	*0*	*97.2*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*44.27*	*5.0*	*50*	*0*	*88.5*	*72 - 125*				
Surr: Dibromofluoromethane	*49.56*	*5.0*	*50*	*0*	*99.1*	*71 - 125*				
Surr: Toluene-d8	*47.98*	*5.0*	*50*	*0*	*96.0*	*75 - 125*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235227 **Instrument: VOA6** **Method: SW8260**

MS Sample ID: **HS14060125-08MS** Units: **ug/L** Analysis Date: **10-Jun-2014 02:25**
Client ID: Run ID: **VOA6_235227** SeqNo: **2873094** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	222.3	25	250	0	88.9	73 - 121				
m,p-Xylene	439.7	50	500	0	87.9	78 - 121				
Naphthalene	223.2	25	250	0	89.3	65 - 135				
o-Xylene	219.7	25	250	0	87.9	80 - 120				
Xylenes, Total	659.4	75	750	0	87.9	80 - 120				
Surr: 1,2-Dichloroethane-d4	*225.2*	*25*	*250*	*0*	*90.1*	*70 - 125*				
Surr: 4-Bromofluorobenzene	*261.2*	*25*	*250*	*0*	*104*	*72 - 125*				
Surr: Dibromofluoromethane	*235.4*	*25*	*250*	*0*	*94.2*	*71 - 125*				
Surr: Toluene-d8	*252.9*	*25*	*250*	*0*	*101*	*75 - 125*				

MSD Sample ID: **HS14060125-08MSD** Units: **ug/L** Analysis Date: **10-Jun-2014 02:49**
Client ID: Run ID: **VOA6_235227** SeqNo: **2873095** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	226.9	25	250	0	90.7	73 - 121	222.3	2.04	20	
m,p-Xylene	444.4	50	500	0	88.9	78 - 121	439.7	1.05	20	
Naphthalene	244	25	250	0	97.6	65 - 135	223.2	8.91	20	
o-Xylene	222.2	25	250	0	88.9	80 - 120	219.7	1.13	20	
Xylenes, Total	666.6	75	750	0	88.9	78 - 121	659.4	1.08	20	
Surr: 1,2-Dichloroethane-d4	*221.3*	*25*	*250*	*0*	*88.5*	*70 - 125*	*225.2*	*1.75*	*20*	
Surr: 4-Bromofluorobenzene	*256.6*	*25*	*250*	*0*	*103*	*72 - 125*	*261.2*	*1.75*	*20*	
Surr: Dibromofluoromethane	*233.2*	*25*	*250*	*0*	*93.3*	*71 - 125*	*235.4*	*0.952*	*20*	
Surr: Toluene-d8	*251.9*	*25*	*250*	*0*	*101*	*75 - 125*	*252.9*	*0.401*	*20*	

The following samples were anayzed in this batch: HS14060280-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235125 **Instrument: ICS3000** **Method: E300**

MBLK Sample ID: **WBLKW2** Units: **mg/L** Analysis Date: **07-Jun-2014 16:19**
Client ID: Run ID: **ICS3000_235125** SeqNo: **2870437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	ND	0.100								

LCS Sample ID: **WLCSW2** Units: **mg/L** Analysis Date: **07-Jun-2014 16:43**
Client ID: Run ID: **ICS3000_235125** SeqNo: **2870438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	4.291	0.100	4	0	107	90 - 110				

MS Sample ID: **HS14060225-06MS** Units: **mg/L** Analysis Date: **07-Jun-2014 19:49**
Client ID: Run ID: **ICS3000_235125** SeqNo: **2870446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.993	0.100	2	1.872	106	80 - 120				

MSD Sample ID: **HS14050225-06MSD** Units: **mg/L** Analysis Date: **07-Jun-2014 20:59**
Client ID: Run ID: **ICS3000_235125** SeqNo: **2870449** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	4.058	0.100	2	0	203	80 - 120	0	0	20	SH

The following samples were anayzed in this batch: hs14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235126 **Instrument: ICS3000** **Method: E300**

MBLK Sample ID: **WBLKW1** Units: **mg/L** Analysis Date: **06-Jun-2014 10:56**
Client ID: Run ID: **ICS3000_235126** SeqNo: **2870523** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	0.500								

LCS Sample ID: **WLCSW1** Units: **mg/L** Analysis Date: **06-Jun-2014 11:19**
Client ID: Run ID: **ICS3000_235126** SeqNo: **2870524** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	21.18	0.500	20	0	106	90 - 110				

MS Sample ID: **HS14050225-06MS** Units: **mg/L** Analysis Date: **06-Jun-2014 14:26**
Client ID: Run ID: **ICS3000_235126** SeqNo: **2870532** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	43.81	0.500	10	34.16	96.5	80 - 120				

MSD Sample ID: **HS14050225-06MSD** Units: **mg/L** Analysis Date: **06-Jun-2014 15:36**
Client ID: Run ID: **ICS3000_235126** SeqNo: **2870535** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	44.22	0.500	10	34.16	101	80 - 120	43.81	0.916	20	

The following samples were anayzed in this batch: hs14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R235509 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-140612** Units: **mg/L** Analysis Date: **12-Jun-2014 10:51**
Client ID: Run ID: **ManTech01_235509** SeqNo: **2878799** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	10.0								
Alkalinity, Carbonate (As CaCO3)	ND	10.0								
Alkalinity, Hydroxide (As CaCO3)	ND	10.0								
Alkalinity, Total (As CaCO3)	ND	10.0								

LCS Sample ID: **LCS-ALK-140612** Units: **mg/L** Analysis Date: **12-Jun-2014 10:56**
Client ID: Run ID: **ManTech01_235509** SeqNo: **2878800** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	966.7	10.0	1000	0	96.7	80 - 120				

LCSD Sample ID: **ALK-LCSD** Units: **mg/L** Analysis Date: **12-Jun-2014 13:19**
Client ID: Run ID: **ManTech01_235509** SeqNo: **2878831** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	973.1	10.0	1000	0	97.3	80 - 120	966.7	0.661	20	

DUP Sample ID: **HS14060225-05DUP** Units: **mg/L** Analysis Date: **12-Jun-2014 13:00**
Client ID: Run ID: **ManTech01_235509** SeqNo: **2878827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	554.4	10.0					555.6	0.218		
Alkalinity, Carbonate (As CaCO3)	ND	10.0					0	0		
Alkalinity, Hydroxide (As CaCO3)	ND	10.0					0	0		
Alkalinity, Total (As CaCO3)	554.4	10.0					555.6	0.218	20	

The following samples were anayzed in this batch: HS14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
WorkOrder: HS14060280
Project: Hobbs Frackmaster Site (N.M.)

QC BATCH REPORT

Batch ID: R236261 **Instrument: TOC_02** **Method: SW9060**

MBLK Sample ID: **WBLKW1** Units: **mg/L** Analysis Date: **24-Jun-2014 19:41**
Client ID: Run ID: **TOC_02_236261** SeqNo: **2895493** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	ND	1.0								

LCS Sample ID: **WLCSW1** Units: **mg/L** Analysis Date: **24-Jun-2014 19:56**
Client ID: Run ID: **TOC_02_236261** SeqNo: **2895494** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.09	1.0	10	0	101	80 - 120				

LCSD Sample ID: **WLCSDW1** Units: **mg/L** Analysis Date: **24-Jun-2014 20:12**
Client ID: Run ID: **TOC_02_236261** SeqNo: **2895495** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.05	1.0	10	0	100	80 - 120	10.09	0.397	20	

MS Sample ID: **HS14060600-01MS** Units: **mg/L** Analysis Date: **24-Jun-2014 21:08**
Client ID: Run ID: **TOC_02_236261** SeqNo: **2895498** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	16.98	1.0	10	7.102	98.8	80 - 120				

The following samples were anayzed in this batch: HS14060280-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site (N.M.)
WorkOrder: **HS14060280**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter
ug/L	Micrograms per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	AR - 2014	27-Mar-2015
California	06248CA 2013-2014	31-Jul-2014
Dept of Defense	L2231 Rev 3-20-2014	22-Dec-2015
Illinois	003403	09-May-2015
Kansas	E-10352 8/15/2013-2014	31-Jul-2014
Kentucky	KY 2014-2015	30-Apr-2015
North Carolina	624 - 2014	31-Dec-2014
North Dakota	R-193 2025	30-Apr-2015
Oklahoma	2013-024	31-Aug-2014
Texas	TX104704231-14-13	30-Apr-2015

Client: Brown & Caldwell
Project: Hobbs Frackmaster Site (N.M.)
Work Order: HS14060280

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS14060280-01	MW-4	Login	06-Jun-14 11:15	PMG	28C
HS14060280-01	MW-4	Login	06-Jun-14 11:15	PMG	28C
HS14060280-01	MW-4	Login	06-Jun-14 11:15	PMG	VW-3
HS14060280-01	MW-4	Login	06-Jun-14 11:15	PMG	C2
HS14060280-01	MW-4	Login	06-Jun-14 11:15	PMG	C2
HS14060280-02	Trip Blank-01	Login	06-Jun-14 11:19	PMG	VW-3

Sample Receipt Checklist

Client Name: BC_HOU
Work Order: HS14060280

Date/Time Received: **06-Jun-2014 09:25**
Received by: **JDE**

Checklist completed by: *Paresh M. Giga* eSignature — 6-Jun-2014 Date

Reviewed by: *Sonia West* eSignature — 12-Jun-2014 Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☑	Not Present ☐
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.4c/0.4c C/U	IR1	
Cooler(s)/Kit(s):	5930		
Date/Time sample(s) sent to storage:	6/6/2014 11:30		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: 0 Regarding:

Comments:

Corrective Action:

ALS Environmental

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Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 103170

HS14060280

Brown & Caldwell

Hobbs Frackmaster Site (N.M.)

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	BJS-FracMaster, Hobbs,NM	A	VOC (8260) Benzene, Naphthalene, & Xylenes
Work Order		Project Number		B	Gases (RSK-175) Methane
Company Name	Brown & Caldwell	Bill To Company	Baker Hughes	C	Anions (300) Nitrate
Send Report To	Ricardo Banda	Invoice Attn	Myna Letlow	D	Alkalinity
Address	10777 Westheimer Suite 925	Address	2929 Allen Pkwy Suite 2100	E	TOC (9060)
				F	
City/State/Zip	Houston, TX 77042	City/State/Zip	Houston, TX 77019	G	
Phone	(713) 759-0999	Phone	(713) 439-8329	H	
Fax	(713) 308-3886	Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-4	6/5/14	1415	Water	1,1,8,8,3	9 10	X	X	X	X	X						☐
2	Trip Blank-01	↓	—	Water	1	2	X										☐
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Scott Ude / Scott Ude

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☑ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by: Scott Ude	Date: 6/5/14	Time: 1500	Received by:	Notes: 10 Day TAT.	
Relinquished by:	Date: 06.06.14	Time: 9:25	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other / EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.