

**CAMECO RESOURCES  
CROW BUTTE OPERATION**



**86 Crow Butte Road  
P.O. Box 169  
Crawford, Nebraska 69339-0169**

**(308) 665-2215  
(308) 665-2341 – FAX**

January 29, 2018

Attn: Document Control Desk, Director  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Quarterly Excursion Monitoring Report  
Source Materials License No. SUA-1534, Docket No. 40-8943

Dear Sir or Madam:

Enclosed please find one copy of the Excursion Monitoring Report for the Crow Butte Uranium Project. The report is provided in accordance with License Condition 11.1(A) of Source Materials License SUA-1534. This report covers the fourth quarter of 2017.

If you have any questions concerning the report, please feel free to call me at (308) 665-2215 ext. 117.

Sincerely,  
CAMECO RESOURCES  
CROW BUTTE OPERATION

Walter D. Nelson  
SHEQ Coordinator

cc: Deputy Director, Division of Decommissioning  
Uranium Recovery and Waste Programs  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
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cc: CR – Electronic File

NM5520

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**CROW BUTTE URANIUM PROJECT**

**EXCURSION MONITORING  
REPORT**

**for**

**FOURTH QUARTER, 2017**

**USNRC Source Materials License SUA 1534**

**CAMECO RESOURCES  
CROW BUTTE OPERATION**



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P.O. Box 169  
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**Excursion Monitoring and Corrective Actions**

On August 30, 2017, well SM10-18 was placed on excursion status when the results of a confirmation sample exceeded the upper control limits. The well was removed from excursion status in October. The final weekly excursion monitoring sample was collected on October 24, 2017.

A summary of the weekly excursion indicator parameters and laboratory reports are included in Appendix A and Appendix B respectively.

**Appendix A**  
**Summary of**  
**Weekly Excursion Indicator Parameter Values**  
**Fourth Quarter, 2017**

Submitted by:  
Crow Butte Resources, Inc.  
P.O. Box 169  
Crawford, NE 69339

NRC  
Excursion Monitoring Report  
Quarter 4 of 2017

Submitted to:  
Document Control Desk, Director  
Office of Nuclear Material Safety &  
Safeguards  
U.S.Nuclear Regulatory Commission  
Washington, DC 20555-0001

Permit No. SUA-1534

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
BOW96-001	221	223	222	515	522	519	7.7	8	7.8
CM02-005	365	389	376	2196	2320	2250	210	223	215.7
CM02-006	270	279	275	979	1035	1003	56	65	60.2
CM02-007	276	286	281	1082	1136	1110	70	78	74.5
CM03-005	301	303	302	1951	1967	1959	183	188	184.7
CM03-006	294	298	296	1936	1942	1938	179	189	182.3
CM04-001	307	310	309	1841	1861	1852	174	179	176.2
CM04-002	305	310	308	1858	1867	1862	176	181	178
CM04-003	305	308	307	1862	1865	1863	173	177	174.8
CM04-004	316	328	322	1905	1954	1925	176	184	179.3
CM05-001	310	317	313	1860	1875	1866	169	175	171.3
CM05-002	302	308	305	1853	1859	1856	173	177	176
CM05-003	305	310	307	1854	1857	1856	175	180	177.7
CM05-004	310	313	311	1865	1869	1867	174	179	176.7
CM05-005	303	310	305	1853	1857	1855	174	179	176.7
CM05-006	302	307	304	1856	1861	1859	173	176	175
CM05-007	303	309	305	1857	1861	1860	173	177	176.3
CM05-008	303	308	305	1861	1874	1870	173	177	176
CM05-009	300	307	304	1869	1880	1874	174	178	175.8
CM05-010	292	297	294	1897	1902	1900	171	176	173.2
CM05-011	306	309	307	1915	1922	1919	176	180	177.7
CM05-012	293	300	297	1881	1896	1889	174	179	176.8
CM05-013	290	296	293	1886	1905	1896	173	182	176.3
CM05-018	298	308	301	1912	1926	1917	176	183	179.9
CM05-019	296	303	299	1761	1819	1777	153	164	158.4

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
CM05-020	315	326	320	1925	2048	1964	176	197	183.4
CM05-021	298	302	300	1921	1928	1923	177	183	180.1
CM05-022	300	302	301	1922	1931	1925	179	185	180.4
CM05-023	294	300	297	1911	1917	1914	177	185	179.7
CM05-024	299	301	300	1930	1941	1937	177	184	179.9
CM05-025	295	299	297	1934	1951	1941	170	177	173.4
CM05-026	300	302	301	1946	1956	1950	177	184	180.4
CM05-027	305	307	306	1964	1988	1975	182	189	185
CM06-001	289	296	293	1856	1873	1866	171	177	174
CM06-002	294	301	298	1907	1922	1916	174	179	176.7
CM06-003	290	295	293	1899	1915	1909	172	178	175.3
CM06-004	294	300	298	1911	1927	1921	174	180	176.2
CM06-005	287	291	289	1939	1962	1953	174	181	176.8
CM06-006	295	300	298	1910	1935	1927	172	177	175
CM06-007	278	282	280	1940	1959	1952	171	177	173.7
CM06-008	287	294	290	1917	1933	1926	172	177	174.2
CM06-009	282	293	286	1908	1930	1920	171	179	173.9
CM06-010	288	294	291	1929	1948	1935	171	179	176
CM06-012	294	300	298	1912	1926	1920	177	183	179.4
CM06-013	296	304	301	1916	1927	1923	177	183	179.9
CM06-014	295	305	298	1916	1926	1921	173	182	177.4
CM06-015	293	296	294	1924	1936	1931	172	179	176.3
CM06-016A	296	302	298	1909	1927	1921	171	180	176.3
CM06-017	294	304	300	1911	1920	1916	175	179	177.1
CM06-018	301	305	303	1900	1914	1911	173	181	177.4
CM06-019	303	309	306	1894	1908	1901	173	180	177
CM06-025	299	308	303	1882	1901	1896	174	183	178.4
CM06-026	301	310	306	1875	1891	1881	174	182	177.3
CM06-028	315	322	318	1815	1825	1819	167	176	171

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
CM06-029	307	309	308	1878	1885	1881	172	180	176.4
CM06-030	311	320	315	1840	1850	1845	171	176	173.1
CM06-031	312	318	314	1863	1870	1866	170	177	174.7
CM06-032	313	317	314	1871	1881	1874	172	177	174.6
CM07-010	294	297	295	1881	1896	1888	180	184	182
CM07-011	292	295	293	1896	1910	1906	179	184	182
CM07-012	291	298	294	1906	1920	1914	180	184	181.5
CM07-013	292	295	293	1927	1936	1932	178	184	180.5
CM07-014	292	295	294	1934	1938	1936	179	183	180.5
CM07-015	297	299	298	1940	1943	1942	181	184	182.5
CM07-016	297	298	298	1939	1950	1943	180	184	181
CM08-001	283	290	287	1940	1947	1944	171	177	173.9
CM08-002	283	298	290	1913	1923	1919	173	177	175.6
CM08-003	283	319	298	1920	2009	1950	178	185	181
CM08-004	289	295	293	1911	1918	1914	176	181	178.1
CM08-005	283	289	286	1893	1911	1901	174	180	177.4
CM08-006	293	298	296	1905	1920	1912	173	180	176.7
CM08-007	305	321	312	1905	1969	1928	179	182	180.1
CM08-008	303	308	306	1902	1907	1904	175	183	179.6
CM08-009	309	312	311	1859	1867	1865	172	175	173.3
CM08-010	313	330	323	1861	1912	1889	175	183	178.4
CM08-011	309	313	312	1840	1849	1844	167	177	172.6
CM08-012	312	316	314	1851	1863	1857	167	174	170.3
CM08-019	313	319	315	1815	1828	1823	164	169	167
CM08-020	315	320	318	1813	1827	1819	165	168	166.3
CM08-021	314	320	317	1823	1837	1830	167	169	168.2
CM08-022	318	324	321	1826	1839	1833	166	172	168.3
CM08-026	310	319	315	1828	1836	1831	168	170	168.8
CM08-027	314	320	316	1830	1837	1834	166	173	170.9

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
CM08-028	315	320	319	1822	1829	1827	167	173	170.4
CM09-008	294	297	296	1794	1807	1801	167	174	171.1
CM09-009	297	302	300	1784	1796	1793	170	175	173.3
CM09-010	297	305	300	1766	1784	1779	171	177	174
CM09-011	300	304	302	1782	1804	1798	176	179	177.7
CM09-012	299	302	301	1806	1817	1813	174	177	175.8
CM09-013	295	303	297	1810	1822	1814	173	179	176
CM09-014	300	306	302	1831	1833	1832	175	183	179.5
CM09-015	298	308	301	1819	1825	1822	173	178	176
CM09-016	299	305	302	1836	1842	1839	177	181	179
CM09-017	298	303	300	1827	1837	1831	174	180	177.3
CM09-018	297	302	299	1826	1831	1829	175	181	177.5
CM09-019	298	302	299	1837	1844	1841	175	181	177.8
CM09-020	292	299	295	1856	1869	1863	175	183	179.3
CM10-001	313	316	314	1850	1857	1853	168	174	171
CM10-002	315	318	316	1851	1869	1860	166	177	171.4
CM10-003	317	332	321	1898	1975	1916	180	188	182.9
CM10-004	316	320	318	1881	1905	1893	173	182	178.1
CM10-005	391	395	393	2280	2307	2295	237	248	242
CM10-006	313	318	315	1838	1852	1844	165	174	168.9
CM10-007	312	318	315	1840	1850	1845	164	171	167.6
CM10-008	322	343	327	1841	1952	1881	170	184	173.8
CM10-009	315	320	318	1831	1849	1841	165	169	167.2
CM10-010	351	364	360	2015	2063	2047	188	196	193.2
CM10-011	319	325	323	1813	1836	1829	163	166	163.8
CM10-012	325	330	329	1801	1826	1821	163	167	164.5
CM10-013	348	359	352	1752	1834	1792	164	171	165.5
CM10-014	344	348	346	1720	1734	1730	159	162	160.3
CM10-015	325	330	328	1759	1779	1771	159	163	161.2



Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
CM10-016	310	316	312	1838	1851	1846	156	160	158
CM10-017	322	327	325	1830	1849	1838	156	161	158.2
CM10-020	317	321	319	1798	1819	1809	160	166	162
CM10-021	315	325	319	1814	1834	1826	157	167	162.2
CM10-022	320	323	322	1822	1845	1837	161	169	164.2
CM10-023	323	329	325	1825	1856	1845	162	167	163.3
CM10-024	327	329	328	1847	1885	1867	165	176	169
CM10-025	319	327	322	1825	1841	1836	162	169	165.7
CM10-026	318	320	319	1816	1834	1829	163	170	164.8
CM10-027	312	317	315	1837	1848	1843	168	177	170.5
CM10-028	311	317	314	1836	1842	1840	166	170	167.3
CM10-029	313	321	316	1842	1846	1844	167	170	168.3
CM10-030	315	324	318	1836	1849	1842	166	169	167.7
CM10-031	313	317	315	1829	1839	1836	165	168	166.5
CM10-032	313	321	316	1855	1865	1862	157	164	160.2
CM10-033	328	335	331	1810	1830	1817	159	166	162
CM10-034	325	334	330	1797	1812	1801	159	166	162.3
CM11-001	298	301	300	1849	1871	1856	172	176	174.7
CM11-002A	295	301	298	1847	1862	1854	173	178	175.9
CM11-003	312	325	316	1892	1939	1908	175	186	179.4
CM11-004	300	310	307	1846	1876	1865	171	180	175.7
CM11-005	298	301	299	1833	1840	1836	171	174	172.1
CM11-006	315	328	322	1886	1929	1914	177	183	180
CM11-007	294	297	296	1818	1827	1821	169	173	170.9
CM11-008	310	319	314	1890	1912	1898	174	178	176.3
CM11-009	291	293	292	1825	1832	1828	166	171	168
CM11-010	294	297	295	1819	1829	1825	168	172	170.4
CM11-011	315	332	322	1886	1951	1911	173	184	177.7
CM11-012	295	299	298	1788	1807	1801	166	173	169.6

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
CM11-013	298	301	299	1799	1814	1804	170	175	172.6
CM11-014	298	302	300	1790	1806	1796	171	180	173.6
CM11-015	296	302	300	1789	1800	1794	167	174	170.3
CM11-016	294	302	299	1741	1778	1770	167	173	170.7
CM11-017	291	300	297	1768	1779	1773	167	174	170.4
CM11-018	302	306	303	1786	1806	1795	170	175	172
CM11-019	300	301	301	1789	1804	1796	170	175	172.3
IJ013P	324	331	328	1324	1379	1350	99	105	102
PR008	323	339	332	1365	1421	1395	104	107	106
PR015	291	295	294	1124	1167	1150	78	84	81.2
SM02-001	188	192	190	528	534	531	14	15	14.3
SM02-002	165	167	166	461	467	464	11	11	11
SM02-003	194	196	195	546	554	550	16	16	16
SM03-001	203	207	205	661	672	666	12	13	12.2
SM03-002	176	177	177	443	449	446	3.4	3.7	3.5
SM03-003	174	176	175	450	459	455	5.4	5.8	5.5
SM04-001	151	157	155	362	370	366	2.6	3	2.8
SM04-002	191	199	194	628	641	634	15	17	15.3
SM04-003	184	188	186	616	624	620	11	12	11.7
SM04-004	205	208	207	619	629	624	12	13	12.6
SM04-005A	194	196	195	531	543	536	11	11	11
SM04-006	264	267	266	645	656	653	13	14	13.2
SM04-007	178	184	181	519	526	524	17	18	17.5
SM04-008	288	293	290	692	696	695	11	12	11.2
SM04-009	277	286	282	671	693	680	11	12	11.8
SM04-010A	287	298	294	705	719	710	11	12	11.8
SM04-011A	289	293	291	691	712	701	10	11	10.8
SM05-001	232	234	233	598	606	603	12	12	12
SM05-002	190	192	191	449	453	451	5.3	5.8	5.5

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM05-003	224	225	224	578	588	584	12	12	12
SM05-004	207	210	208	559	563	561	16	16	16
SM05-005	234	235	234	595	603	598	10	11	10.8
SM05-006	207	208	207	571	574	573	13	13	13
SM05-007	211	214	213	565	576	573	9.4	9.7	9.5
SM05-008	205	207	206	553	559	556	12	13	12.2
SM05-009	203	207	205	546	555	549	11	12	11.1
SM05-010	207	209	208	550	557	554	10	11	10.1
SM05-011	215	217	216	568	576	573	10	11	10.4
SM05-012	207	210	209	548	563	557	10	11	10.1
SM05-013	196	200	198	542	551	545	12	12	12
SM05-014	179	183	180	478	487	484	7.9	8.5	8.1
SM05-015	202	204	203	540	549	546	11	12	11.9
SM05-016	181	183	182	448	460	455	5.2	5.6	5.4
SM05-017	166	169	167	411	420	417	2.1	2.4	2.3
SM05-018	171	173	172	429	438	434	2.9	3.4	3.1
SM05-019	182	185	183	476	487	481	4.5	4.9	4.7
SM05-020	176	179	177	475	485	481	4.9	5.2	5.1
SM05-021	178	178	178	454	463	459	4.5	4.9	4.7
SM05-022	181	184	182	461	469	464	3.5	3.9	3.6
SM05-023	180	182	181	458	464	461	3.2	3.7	3.4
SM05-024	171	173	173	438	450	443	5	5.3	5.1
SM05-025	170	173	171	455	470	462	6.1	6.6	6.4
SM06-001	208	212	210	537	544	541	7.9	8.2	8.1
SM06-002	205	206	206	545	550	548	10	11	10.3
SM06-003	200	203	202	536	541	540	9.6	11	10.0
SM06-004	206	211	208	523	533	526	8.2	8.7	8.3
SM06-005	212	214	213	515	518	517	7	7.3	7.1
SM06-006	221	223	222	471	476	474	3.2	3.4	3.3

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM06-007	223	225	224	490	497	494	6.5	7.1	6.7
SM06-008	206	207	206	491	496	493	8.1	9	8.5
SM06-009	218	220	219	480	484	482	5.6	6.3	5.9
SM06-010	203	204	204	493	499	497	8.2	8.7	8.5
SM06-011	209	213	212	523	528	526	12	13	12.1
SM06-012	233	236	235	514	520	517	6.5	7.1	6.8
SM06-013	239	243	241	517	521	519	5.9	6.3	6.1
SM06-014	202	205	204	546	552	549	12	12	12
SM06-015	205	207	206	534	541	537	10	12	10.9
SM06-016	208	210	208	444	448	446	3.7	4	3.8
SM06-017	232	233	233	482	485	484	3.9	4.5	4.1
SM06-018	198	200	199	547	554	551	15	15	15
SM06-019	205	208	206	491	498	495	8.9	9.4	9.1
SM06-020	210	213	211	523	548	534	11	12	11.3
SM06-021	216	220	217	541	556	549	12	13	12.4
SM06-022	207	209	208	471	479	476	7	7.3	7.1
SM06-023	241	244	242	526	533	530	6.5	6.8	6.6
SM06-024	234	238	236	540	551	545	8.2	8.7	8.4
SM06-025	213	215	214	536	542	540	12	13	12.4
SM06-026	204	207	204	474	480	477	7.6	7.9	7.8
SM06-027	221	222	222	500	506	503	7.6	7.8	7.7
SM06-028	267	271	269	638	650	645	11	12	11.6
SM07-001	174	186	179	436	474	454	3.5	5.4	4.4
SM07-002	163	164	164	400	403	402	3.1	3.3	3.2
SM07-003	168	169	169	433	437	435	4.3	4.6	4.5
SM07-004	163	164	163	401	403	402	3.5	3.8	3.6
SM07-005	167	168	168	421	437	426	3.8	4.2	4
SM07-006	152	154	153	365	370	368	4.4	4.8	4.6
SM07-007	167	169	168	430	434	433	4.4	4.8	4.6

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM07-008	167	168	168	472	492	479	8.1	8.8	8.3
SM07-009	166	169	167	421	424	423	4.3	4.5	4.4
SM07-010	166	168	167	435	441	439	3.8	4	3.9
SM07-011	141	143	142	341	345	344	2.9	3.2	3.1
SM07-012	165	167	166	436	442	439	4.2	4.6	4.4
SM07-013	149	152	150	367	372	370	4.6	5	4.8
SM07-014	134	136	135	334	337	336	3.2	3.6	3.4
SM07-015	139	142	140	327	334	331	3.1	3.8	3.4
SM07-016	138	139	139	325	332	329	2.9	3.2	3.1
SM07-017	168	176	174	382	404	396	2.9	3.5	3.3
SM07-018	137	138	137	333	338	336	2.6	3.4	2.9
SM07-019	140	142	141	345	352	349	3.3	3.5	3.5
SM07-020	145	147	146	337	343	340	1.8	2.2	2.0
SM07-021	142	143	143	336	343	340	2.3	2.4	2.3
SM07-022	146	148	147	337	348	343	2.3	2.7	2.5
SM07-023	176	178	176	446	464	454	3	4.1	3.8
SM07-024	185	187	186	574	591	581	7.9	8.2	8.1
SM07-025	154	155	154	356	362	360	2.8	3.4	3.1
SM08-001	232	236	234	502	513	507	6.1	6.6	6.3
SM08-002	238	240	239	512	522	519	5.9	6.3	6.1
SM08-003	230	234	231	505	516	511	6.8	7	6.9
SM08-004	221	223	222	513	523	518	8.4	9.3	9.1
SM08-005	240	244	242	541	559	549	7.9	8.9	8.2
SM08-006	238	243	241	550	574	560	8.5	9.2	8.8
SM08-007	242	245	243	561	577	569	8.7	9.3	9.0
SM08-008	237	241	239	511	521	515	5.9	6.2	6.0
SM08-009	237	240	238	509	521	515	6	6.5	6.2
SM08-010	233	239	234	539	553	549	8.3	8.5	8.5
SM08-011	229	233	231	541	549	545	8.4	8.8	8.6

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM08-012	240	243	241	566	573	570	8.5	9.2	8.9
SM08-013	227	229	228	536	547	541	9.8	11	10.1
SM08-014	229	233	230	543	554	549	9.5	9.7	9.6
SM08-015	221	224	222	529	540	535	8	8.4	8.2
SM08-016	225	228	226	551	562	557	8.3	8.7	8.5
SM08-017	236	238	237	556	565	562	8.3	8.8	8.6
SM08-018	227	230	228	540	546	544	9.4	9.9	9.6
SM08-019	234	235	235	546	558	554	8.4	9.2	8.8
SM08-020	223	225	224	545	551	549	8.2	8.7	8.5
SM08-021	222	225	224	542	549	546	7.6	8.7	8.4
SM08-022	229	236	232	568	591	579	8.6	9.1	8.8
SM08-023	222	224	223	539	545	542	8.3	8.6	8.5
SM08-024	221	222	222	539	544	542	8.5	9.2	8.9
SM08-025	239	243	241	597	613	605	9.8	10	9.9
SM08-026	220	223	221	521	527	524	8.6	9	8.7
SM08-027	222	225	223	498	504	500	6.3	6.7	6.5
SM08-028	228	229	229	518	530	524	6.5	7	6.8
SM08-029	253	255	254	618	645	627	12	13	12.3
SM08-030	192	195	193	445	450	448	10	11	10.7
SM08-031	230	231	231	510	518	513	6.1	6.9	6.6
SM09-001	167	169	168	413	422	417	3.5	3.8	3.6
SM09-002	159	162	161	378	388	383	3.2	3.5	3.4
SM09-003	163	165	164	380	388	383	3.6	3.9	3.7
SM09-004	145	148	146	364	371	366	4.3	4.7	4.5
SM09-005	140	145	142	307	315	311	2.3	2.9	2.7
SM09-006	139	142	141	305	308	307	2.1	2.8	2.5
SM09-007	161	162	162	396	400	398	3.3	3.5	3.4
SM09-008	160	162	161	391	394	393	2.4	2.6	2.5
SM09-009	151	152	151	368	372	370	3.1	3.3	3.2

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM09-010	144	145	145	345	348	346	2.4	2.8	2.6
SM09-011	146	147	146	351	355	353	2.6	3.1	2.8
SM09-012	160	160	160	389	391	390	2.5	2.8	2.7
SM09-013	143	144	143	335	339	337	3	3.5	3.3
SM09-014	139	140	139	318	322	320	1.5	2.6	2.0
SM09-015	139	141	140	318	322	320	1.6	2.5	2.0
SM09-016	140	141	141	302	305	303	1.3	2.1	1.6
SM09-017	139	140	139	321	324	322	2.8	3.3	3.0
SM09-018	141	142	141	317	321	319	1.1	1.9	1.6
SM09-019	135	136	136	308	312	310	2.4	3	2.6
SM09-020	138	139	138	314	317	315	2.4	3	2.6
SM10-001	282	288	284	680	706	692	14	15	14.6
SM10-002	220	224	222	515	523	520	7.8	8	7.9
SM10-003	254	256	255	558	567	563	6.8	7.3	7.2
SM10-004	236	238	237	524	534	529	6.9	7.2	7.0
SM10-005	238	239	238	526	534	531	6.3	7.1	6.7
SM10-006	277	320	288	631	748	674	11	13	11.6
SM10-007	271	283	275	651	681	658	12	13	12.3
SM10-008	248	261	256	582	612	601	9.9	11	10.6
SM10-009	228	246	235	526	548	534	7.8	8.5	8.1
SM10-010	232	236	233	530	537	534	7.5	8.5	8.2
SM10-011	233	240	236	550	566	559	8.6	9.3	9.0
SM10-012	247	253	249	586	602	593	9.7	10	10.0
SM10-013	234	239	237	544	564	554	8.6	9.6	9.2
SM10-014A	243	247	245	572	586	579	9.7	10	9.9
SM10-015	237	240	238	545	554	549	8.2	9.3	9.0
SM10-016	251	254	253	580	593	588	9.5	11	10.8
SM10-017	244	247	246	552	568	561	9.5	11	9.9
SM10-018	237	240	238	538	584	550	8.3	16	9.9

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM10-019	246	248	248	563	577	569	9.4	9.7	9.6
SM10-020	232	234	233	567	575	572	17	19	17.8
SM10-021	236	237	236	594	603	599	20	22	20.7
SM10-022	239	240	240	542	554	549	9.8	10	9.9
SM10-023	233	234	234	559	564	562	15	15	15
SM10-024	226	227	226	548	553	550	12	13	12.8
SM10-025	223	226	224	535	540	537	11	12	11.3
SM10-026	243	245	244	578	582	580	14	14	14
SM10-027	234	257	243	541	593	561	10	11	10.5
SM10-028A	230	234	232	604	613	608	26	27	26.7
SM10-029A	260	263	262	601	606	604	12	12	12
SM10-030	233	235	234	530	535	533	7.2	7.6	7.4
SM10-031	236	238	237	539	550	545	7.4	8.4	7.8
SM10-032	236	238	237	527	537	532	6.1	7.2	6.7
SM11-001	161	163	162	405	413	408	4.7	5.5	5.2
SM11-002	139	141	140	318	326	323	3.1	3.5	3.3
SM11-003	141	144	143	320	327	323	1.9	2.4	2.2
SM11-004	138	141	139	306	312	308	1.9	2.4	2.2
SM11-005	138	139	138	318	323	320	3.5	3.8	3.7
SM11-006	141	145	143	320	325	322	2.9	3.3	3.1
SM11-007	141	142	142	306	312	309	2.4	3	2.7
SM11-009	150	151	150	306	311	310	1	2	1.3
SM11-010	155	156	156	319	323	322	1.4	1.8	1.7
SM11-011	146	148	147	346	350	349	2.5	3.1	2.9
SM11-012	143	145	144	327	331	329	2.5	3.1	2.8
SM11-013	140	142	141	295	299	297	1.5	2.1	1.8
SM11-014	137	138	137	294	297	295	1.6	2	1.8
SM11-015	137	138	137	306	310	308	2.1	2.5	2.3
SM11-016	141	143	142	299	307	303	1.9	2.2	2.1



Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
SM11-017	141	144	142	293	303	297	2.8	3	2.9
SM11-018	137	139	138	303	310	306	4.4	4.9	4.7
SM11-019	139	141	140	313	322	316	1.4	2	1.7
SM11-020	160	162	161	404	410	406	4.9	5.3	5.1
SM11-022	166	170	168	459	468	463	6.9	7.4	7
SM11-023	165	167	166	405	412	409	5.9	6.1	6.0
SM11-024	153	156	154	397	402	400	3.7	4.4	3.9
SM11-025	156	160	158	392	411	406	2.7	3.2	3
SM11-026	142	150	147	323	361	351	1.7	3.2	2.6

**Appendix B**  
**Monitor Well Laboratory Reports**  
**Fourth Quarter, 2017**



**Crow Butte Project**  
**Monitor Well Laboratory Report**

Sample Date: 10/03/2017

Analysis Date: 10/03/2017

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM08-007	245	348	290	569	763	636	9.2	23	19
SM08-008	240	340	283	515	864	720	5.9	24	20
SM08-009	240	353	294	515	886	738	6.3	23	19
SM08-010	239	331	276	553	749	624	8.4	24	20
SM08-011	233	323	269	548	792	660	8.6	24	20
SM08-012	243	323	269	571	834	695	9	25	20
SM08-013	229	328	274	540	880	733	9.8	31	26
SM08-014	233	325	271	551	720	600	9.5	24	20
SM08-015	224	305	254	538	789	658	8	35	29
SM08-016	228	331	276	561	828	690	8.7	24	20
SM09-001	169	255	212	417	648	540	3.6	31	26
SM09-002	162	230	192	382	665	554	3.4	72	60
SM09-003	165	239	199	382	605	504	3.8	29	24
SM09-004	148	230	192	365	562	468	4.5	26	22
SM09-005	145	206	172	314	446	372	2.6	22	18
SM10-018	240	346	288	584	763	636	16	24	20
SM11-001	162	240	200	407	605	504	4.7	24	20
SM11-002	141	202	168	323	446	372	3.4	21	17
SM11-003	144	210	175	323	490	408	2.2	20	17
SM11-004	141	200	167	307	446	372	2.1	20	17
SM11-005	139	204	170	319	475	396	3.5	20	17
SM11-006	144	207	173	321	490	408	2.9	25	21



**Crow Butte Project**  
**Monitor Well Laboratory Report**

Sample Date: 10/10/2017

Analysis Date: 10/10/2017

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM07-023	176	278	232	446	850	708	4	59	50
SM07-024	186	259	216	575	809	674	8.1	45	37
SM07-025	155	202	168	356	645	538	3	52	44
SM10-016	253	382	318	593	850	708	11	28	23
SM10-017	246	374	312	568	835	696	9.8	28	23
SM10-018	239	346	288	556	763	636	10	24	20
SM10-019	248	369	307	577	778	648	9.7	25	21
SM10-020	232	360	300	567	792	660	19	27	22
SM10-021	236	360	300	594	806	672	21	27	23
SM10-022	239	360	300	542	778	648	9.8	23	20



**Crow Butte Project**  
**Monitor Well Laboratory Report**

Sample Date: 10/17/2017

Analysis Date: 10/17/2017

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM08-007	243	348	290	567	763	636	9.1	23	19
SM08-008	239	340	283	515	864	720	6.1	24	20
SM08-009	238	353	294	515	886	738	6.5	23	19
SM08-010	235	331	276	547	749	624	8.5	24	20
SM08-011	231	323	269	546	792	660	8.8	24	20
SM08-012	242	323	269	570	834	695	8.5	25	20
SM08-013	228	328	274	541	880	733	10	31	26
SM08-014	230	325	271	551	720	600	9.5	24	20
SM08-015	223	305	254	538	789	658	8.4	35	29
SM08-016	227	331	276	562	828	690	8.4	24	20
SM09-001	168	255	212	418	648	540	3.6	31	26
SM09-002	162	230	192	388	665	554	3.3	72	60
SM09-003	164	239	199	383	605	504	3.6	29	24
SM09-004	146	230	192	368	562	468	4.6	26	22
SM09-005	142	206	172	311	446	372	2.7	22	18
SM10-018	238	346	288	544	763	636	9.6	24	20
SM11-001	162	240	200	409	605	504	5.3	24	20
SM11-002	140	202	168	325	446	372	3.5	21	17
SM11-003	143	210	175	324	490	408	2	20	17
SM11-004	139	200	167	310	446	372	2.2	20	17
SM11-005	138	204	170	321	475	396	3.7	20	17
SM11-006	143	207	173	324	490	408	3.1	25	21



**Crow Butte Project**  
**Monitor Well Laboratory Report**

Sample Date: 10/24/2017

Analysis Date: 10/24/2017

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM07-023	176	278	232	449	850	708	3.7	59	50
SM07-024	186	259	216	574	809	674	7.9	45	37
SM07-025	154	202	168	360	645	538	3	52	44
SM10-016	253	382	318	585	850	708	11	28	23
SM10-017	247	374	312	559	835	696	9.5	28	23
SM10-018	238	346	288	544	763	636	9.3	24	20
SM10-019	248	369	307	564	778	648	9.5	25	21
SM10-020	234	360	300	571	792	660	18	27	22
SM10-021	236	360	300	596	806	672	21	27	23
SM10-022	240	360	300	549	778	648	10	23	20