

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

December 14, 2020

**USPS PRIORITY MAIL
SIGNATURE CONFIRMATION**

Marty Link, Water Quality Division Administrator
Nebraska Department of Environment and Energy
P.O. Box 98922
Lincoln, NE 68509-8922

Class III UIC Permit NE0122611
November 2020 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the November 2020 Monthly Restoration Reports for Mine Units 2, 3, 4, 5, 6 and 7. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Units 2, 4, 6 and 7.

Mine Unit 3 and 5 remained in stability monitoring.

If you have any questions regarding this submittal, please feel free to contact me at (308) 665-2215, ext. 117.

Sincerely,
Cameco Resources
Crow Butte Operation

Walter D. Nelson
SHEQ Coordinator

Enclosures: As Stated

cc: Ron Burrows – NRC
CBO - File
cc: CR – Electronic File
Kory Winters – NDEE Field Office
Amanda Jones – NDEE Program Coordinator

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 2020

MINE UNIT 2

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		P97, P118, P119, I175P, I180P, I188P
d. Wellfield Recirculation		X	
e. Other (explain):			

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

P97, P118, P119, I175P, I180P, I188P.

Mine Unit 2 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I175P													
	11/12/2020	186	2.46	52	0.27	149	89	748	7.71	464	0.00	1.08	0.04
I180P													
	11/12/2020	219	3.19	63	0.45	185	116	905	7.87	561	-0.01	1.25	0.07
I188P													
	11/12/2020	217	6.63	64	1.07	171	110	879	7.9	545	-0.01	0.76	-0.03
P118													
	11/12/2020	215	4.72	81	0.79	191	130	984	7.75	610	0.01	1.38	-0.03
P119													
	11/12/2020	260	8.15	99	1.81	232	166	1180	7.61	732	0.00	2.18	-0.04
P97													
	11/12/2020	345	12.86	105	2.97	286	192	1431	7.75	887	0.00	3.71	-0.04

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 2020

MINE UNIT 3

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment		X	
d. Wellfield Recirculation		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring.

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 2020

MINE UNIT 4

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		BL-8, CM1-7, I536P, I538P, I544P, I548P, I549P, I550P, I551P, I552P
d. Wellfield Recirculation		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL-8, CM1-7, I536P, I538P, I544P, I548P, I549P, I550P, I551P, I552P.

Mine Unit 4 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-8													
	11/12/2020	316	6.87	71	1.48	229	121	1111	7.96	689	-0.01	1.14	0.33
CM1-7													
	11/12/2020	333	8.80	94	2.16	270	180	1341	7.53	831	-0.01	1.97	0.00
I536P													
	11/12/2020	467	30.04	169	8.09	408	331	2117	7.86	1313	-0.01	4.64	0.03
I538P													
	11/12/2020	352	14.78	117	3.48	286	190	1477	7.86	916	-0.01	1.11	0.18
I544P													
	11/12/2020	414	15.71	108	4.00	333	232	1625	7.77	1008	-0.01	1.73	0.17
I548P													
	11/12/2020	474	22.14	131	6.12	388	302	1928	7.44	1195	-0.01	0.84	0.10
I549P													
	11/12/2020	877	65.25	272	18.37	833	807	3960	7.22	2455	0.07	10.74	0.08
I550P													
	11/12/2020	780	71.96	252	18.97	717	699	3504	7.18	2172	0.01	6.44	0.22
I551P													
	11/12/2020	461	25.78	133	6.10	378	304	1953	7.44	1211	-0.01	2.54	0.29
I552P													
	11/12/2020	422	14.96	100	3.45	341	259	1684	7.5	1044	0.00	3.57	0.46

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 2020

MINE UNIT 5

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep	X		(if yes, complete part 3)
c. Groundwater Treatment		X	
d. Wellfield Recirculation		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring.

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 2020

MINE UNIT 6

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep	X		(if yes, complete part 3)
c. Groundwater Treatment	X		CM5-17, P1268, I1270P, I1274P, P1318, P1399, P1439, P1457, P1461, P1532, I1602P, P1612, P1625, P1628, P1658, P1843
d. Wellfield Recirculation		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

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3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

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4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

CM5-14, CM5-15, CM5-16, CM5-17, P1265, I1266P, I1267P, P1268, P1269, I1270P, I1272P, P1273, I1274P, I1285P, P1318, P1348, P1355, I1356P, I1357P, P1358, P1376, P1396, I1397P, I1398P, P1399, I1423P, P1426, P1439, P1446, P1457, P1494, P1532, I1581P, P1584, P1590, I1600P, I1601P, I1602P, P1611, P1612, P1624, P1625, P1628, P1663, I1667P, P1689, P1690, P1703, P1706, P1751, P1765, P1800, P1832, P1843.

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM5-14	11/12/2020	294	22.19	193	4.13	405	385	1992	7.92	1235	0.00	0.05	-0.09
CM5-15	11/12/2020	357	12.03	80	1.96	276	168	1298	7.93	805	0.00	1.88	0.11
CM5-16	11/12/2020	379	12.58	99	2.49	308	192	1452	8.12	900	0.02	1.68	0.48
CM5-17	11/12/2020	456	19.51	149	4.61	415	309	1993	7.94	1236	0.03	0.57	-0.06
I1266P	11/12/2020	293	17.33	94	2.55	246	172	1233	8.2	764	0.02	0.74	0.10
I1267P	11/12/2020	270	8.78	93	2.02	247	168	1213	8.06	752	0.00	0.79	0.03
I1270P	11/12/2020	304	6.42	76	1.28	226	128	1146	8.39	711	-0.01	0.81	2.40
I1272P	11/12/2020	412	17.92	146	4.06	392	289	1830	7.8	1135	-0.01	0.66	-0.07
I1274P	11/12/2020	420	12.47	141	2.66	388	282	1887	7.87	1170	0.02	1.30	0.21
I1285P	11/12/2020	353	4.31	63	0.64	243	115	1147	8.32	711	0.02	2.33	0.83
I1356P	11/12/2020	263	5.75	83	0.83	218	145	1087	8.07	674	0.00	1.29	-0.05
I1357P	11/12/2020	326	25.30	151	5.05	355	327	1819	7.42	1128	0.03	2.01	-0.07
I1397P	11/12/2020	274	7.37	80	0.83	226	147	1114	8.06	691	0.05	1.83	0.25
I1398P	11/12/2020	255	10.43	78	1.89	203	134	1049	8.18	650	-0.01	0.52	0.21
I1423P	11/12/2020	293	5.98	73	1.06	237	147	1144	8.21	709	0.00	1.90	0.78
I1581P	11/12/2020	325	11.30	153	2.72	354	287	1735	8.26	1076	-0.01	1.02	0.33
I1600P	11/12/2020	367	11.52	111	1.31	314	197	1493	8.25	926	0.02	6.61	0.41
I1601P	11/12/2020	403	6.95	104	1.53	331	197	1579	8.77	979	0.00	3.18	1.89
I1602P	11/12/2020	282	12.51	90	2.26	244	171	1254	8.07	777	0.00	0.35	0.06

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I1667P													
	11/12/2020	315	21.98	103	4.33	274	205	1402	8.03	869	0.01	0.46	-0.02
P1265													
	11/12/2020	322	11.64	135	2.82	325	267	1626	8.12	1008	-0.01	1.12	-0.02
P1268													
	11/12/2020	306	5.18	71	0.93	225	122	1120	8.29	694	0.01	0.98	2.45
P1269													
	11/12/2020	274	5.84	75	0.91	224	145	1113	8.05	690	0.00	0.68	0.11
P1273													
	11/12/2020	416	10.70	136	2.54	380	262	1752	7.73	1086	0.01	4.30	-0.01
P1318													
	11/12/2020	303	5.59	87	1.11	253	151	1213	8.27	752	-0.01	0.95	1.00
P1348													
	11/12/2020	232	4.50	75	0.71	200	117	974	7.96	604	0.04	0.72	0.17
P1355													
	11/12/2020	435	14.59	119	3.35	364	243	1719	7.95	1066	-0.01	3.34	0.32
P1358													
	11/12/2020	270	7.31	99	1.60	247	181	1253	8.09	777	0.02	0.96	0.27
P1376													
	11/12/2020	297	6.74	96	1.13	261	185	1278	8.03	792	0.00	1.50	0.00
P1396													
	11/12/2020	278	21.56	161	3.28	345	319	1733	8.06	1074	0.02	0.06	-0.07
P1399													
	11/12/2020	456	22.87	159	4.93	404	311	2027	7.69	1257	0.00	1.93	0.12
P1426													
	11/12/2020	309	21.49	164	3.21	365	326	1807	7.97	1120	0.04	1.95	-0.06
P1439													
	11/12/2020	540	13.81	145	3.66	434	269	2050	8.04	1271	-0.01	2.40	1.12
P1446													
	11/12/2020	277	22.04	184	4.36	390	385	1972	7.94	1223	0.00	0.04	-0.09
P1457													
	11/12/2020	395	5.09	80	1.20	290	147	1364	8.47	846	0.01	0.82	2.47
P1494													
	11/12/2020	272	4.21	60	0.56	206	116	976	8.05	605	0.01	0.71	0.56
P1532													
	11/12/2020	371	16.31	197	3.91	449	401	2223	7.75	1378	-0.01	0.36	-0.07
P1584													
	11/12/2020	255	6.50	72	0.78	203	127	995	8.5	617	-0.01	1.21	0.66

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P1590	11/12/2020	288	11.75	89	1.97	242	161	1208	8.06	749	0.01	8.72	-0.05
P1611	11/12/2020	309	14.32	173	3.49	390	350	1916	7.98	1188	0.01	2.06	0.69
P1612	11/12/2020	313	4.55	49	0.50	209	95	993	8.63	616	-0.01	1.32	2.14
P1624	11/12/2020	210	4.83	61	0.66	160	87	820	8.32	508	-0.01	0.75	0.07
P1625	11/12/2020	353	11.93	119	2.93	312	219	1561	8.08	968	-0.01	1.45	0.56
P1628	11/12/2020	323	9.09	133	2.44	321	243	1597	8.25	990	-0.01	0.91	0.45
P1663	11/12/2020	312	3.48	52	0.62	220	105	1035	8.51	642	0.01	1.93	0.60
P1689	11/12/2020	300	18.67	229	3.95	405	348	2121	8	1315	0.00	0.77	-0.06
P1690	11/12/2020	233	6.22	91	1.15	223	158	1146	8.49	711	-0.01	0.57	-0.01
P1703	11/12/2020	232	15.50	75	2.65	186	129	983	8.02	609	0.05	1.58	-0.01
P1706	11/12/2020	310	3.48	56	0.57	224	117	1064	8.47	660	0.00	1.74	1.34
P1751	11/12/2020	168	4.21	61	0.40	142	77	713	7.84	442	0.07	0.17	-0.05
P1765	11/12/2020	420	8.47		1.78	341	209	1596	8.13	990	0.05	1.72	0.30
P1800	11/12/2020	284	9.69	106	1.43	253	186	1281	8.2	794	-0.01	1.59	0.07
P1832	11/12/2020	384	10.89	89	2.54	289	170	1367	8.17	848	0.01	2.02	0.25
P1843	11/12/2020	352	9.08	126	2.28	324	228	1630	8.22	1011	-0.01	2.32	1.23

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 November 2020
 MINE UNIT 7

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		IX and RO BL-17, CM3-7, CM4-14, CM4-15, CM4-16, CM4-17, CM4-18, I1971P, I1973P, I1975P, I1978P, I1982P, I1985P, P1986, P2038, P2040, P2103, P2125, I2183P, I2185P, P2188, P2197, P2216, P2226, I2244P, P2264, P2316, P2384, I2429P, P2468, P2470, P2476, P2505, P2510, P2523, P2538, P2540, P2601, P2610, P2612, P2614, P2615, P2624, P2660, P5220, P5230, P5250, P5283.
d. Wellfield Recirculation		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

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3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

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4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL-17, CM3-7, CM4-12, CM4-13, CM4-14, CM4-15, CM4-16, CM4-17, CM4-18, I1971P, I1973P, I1975P, I1978P, I1982P, I1985P, P1986, P2038, P2040, P2125, I2183P, P2188, P2216,

P2226, I2244P, P2264, I2429P, P2468, P2470, P2476, P2481, P2505, P2510, P2523, P2538,
P2540, P2601, P2610, P2612, P2614, P2615, P2624, P5230, P5250.

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17													
	11/12/2020	707	32.74	218	9.28	647	440	2818	7.61	1747	-0.01	1.19	1.56
CM3-7													
	11/12/2020	403	24.10	174	5.85	414	334	2009	7.91	1246	-0.01	0.35	0.11
CM4-12													
	11/12/2020	504	25.78	124	7.48	417	339	2095	7.28	1299	0.10	1.27	0.06
CM4-13													
	11/12/2020	621	39.17	161	11.11	542	482	2649	7.18	1642	0.04	1.82	0.09
CM4-14													
	11/12/2020	967	81.97	284	25.64	875	840	4275	7.22	2651	-0.01	1.60	0.35
CM4-15													
	11/12/2020	999	77.36	309	23.21	902	832	4288	7.43	2659	-0.01	4.47	0.62
CM4-16													
	11/12/2020		111.10	375	34.10	1120	1133	5215	7.43	3233	-0.01	3.43	0.11
CM4-17													
	11/12/2020	1040	130.80	427	38.37	1019	976	4846	7.14	3005	0.06	0.45	-0.07
CM4-18													
	11/12/2020	579	41.17	195	10.82	516	380	2436	7.28	1510	0.00	0.47	0.44
I1971P													
	11/12/2020	976	79.01	265	22.17	906	867	4244	7.23	2631	-0.01	2.84	0.16
I1973P													
	11/12/2020	837	56.38	204	13.40	692	586	3327	7.36	2063	-0.01	6.46	0.54
I1975P													
	11/12/2020	814	51.97	205	15.53	664	563	3252	7.49	2016	-0.01	6.72	0.19
I1978P													
	11/12/2020	603	46.14	122	10.27	431	347	2240	7.37	1389	-0.01	1.90	0.37
I1982P													
	11/12/2020	503	33.34	129	7.23	402	316	2017	7.56	1251	-0.01	3.62	0.68
I1985P													
	11/12/2020	490	40.30	74	6.33	305	217	1591	7.74	986	-0.01	1.32	0.59
I2183P													
	11/12/2020	672	44.28	168	10.39	548	464	2711	7.49	1681	-0.01	7.24	0.76
I2244P													
	11/12/2020	269	11.61	109	2.61	252	201	1327	7.56	823	-0.01	0.54	0.38
I2429P													
	11/12/2020	476	22.30	111	6.09	366	274	1829	7.63	1134	-0.01	4.25	0.59
P1986													
	11/12/2020	677	48.56	262	15.15	678	603	3220	7.74	1996	-0.01	2.14	0.58

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2038													
	11/12/2020	665	46.99	188	13.42	586	531	2851	7.41	1768	-0.01	2.37	0.12
P2040													
	11/12/2020	934	76.71	295	24.51	827	809	4140	7.3	2567	-0.01	4.54	0.06
P2125													
	11/12/2020	381	22.88	78	2.80	282	195	1431	7.32	887	0.09	0.93	0.03
P2188													
	11/12/2020	315	12.20	70	1.85	227	146	1161	7.62	720	-0.01	0.84	0.86
P2216													
	11/12/2020	353	27.51	167	6.15	367	323	1856	7.9	1151	-0.01	3.43	0.55
P2226													
	11/12/2020	543	19.77	118	5.74	416	291	2025	7.57	1256	-0.01	2.52	0.51
P2264													
	11/12/2020	267	25.17	169	6.43	320	321	1736	7.65	1076	0.01	0.53	0.25
P2468													
	11/12/2020	347	14.01	132	3.42	323	258	1647	7.65	1021	-0.01	0.73	0.97
P2470													
	11/12/2020	449	36.32	163	7.81	398	350	2075	7.55	1287	-0.01	1.44	0.63
P2476													
	11/12/2020	809	75.52	241	19.24	681	646	3478	7.41	2156	-0.01	2.31	0.72
P2481													
	11/12/2020	1000	62.74	292	18.08	886	780	4169	7.5	2585	-0.01	3.96	1.52
P2505													
	11/12/2020	305	19.02	155	3.87	333	294	1690	7.68	1048	-0.01	0.46	0.59
P2510													
	11/12/2020	384	28.33	154	5.55	366	312	1850	7.92	1147	-0.01	1.30	0.66
P2523													
	11/12/2020	452	23.84	109	5.89	351	262	1733	7.57	1074	-0.01	2.36	0.50
P2538													
	11/12/2020	503	22.63	197	5.88	395	289	2462	7.61	1526	-0.01	2.49	1.00
P2540													
	11/12/2020	472	39.47	108	6.82	338	246	1745	7.9	1082	-0.01	1.96	0.56
P2601													
	11/12/2020	397	22.26	187	5.37	427	352	2078	7.57	1288	0.03	0.34	0.69
P2610													
	11/12/2020	904	60.26	253	16.98	804	644	3669	7.2	2275	0.00	4.06	1.05
P2612													
	11/12/2020	515	37.71	115	10.13	493	456	1928	7.6	1195	0.06	1.30	1.32

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2614													
	11/12/2020	367	17.38	123	4.26	332	234	1590	7.84	986	-0.01	0.50	0.21
P2615													
	11/12/2020	287	14.33	69	2.70	216	132	1073	7.62	665	0.00	0.39	1.13
P2624													
	11/12/2020	346	12.19	95	2.92	280	177	1345	7.46	834	-0.01	0.43	1.13
P5230													
	11/12/2020	353	16.01	80	2.79	273	192	1346	7.58	835	0.20	1.72	0.30
P5250													
	11/12/2020	768	72.75	228	19.33	645	589	3260	7.59	2021	-0.01	3.13	1.42