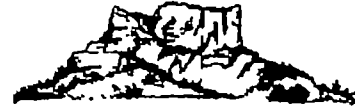


**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

January 7, 2020

**USPS PRIORITY MAIL
SIGNATURE CONFIRMATION**

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

Class III UIC Permit NE0122611
December 2019 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the December 2019 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 Unit 6 as well as Mine Unit 7.

Mine Unit 2, 3, 4, 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: **Kon Burrows** – NRC
CBO - File
cc: CR – Electronic File
Kory Winters – NDEQ Field Office
Amanda Jones – NDEQ Program Coordinator

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

December 2019

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	
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:

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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:

No wells were sampled during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

December 2019

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):			

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

December 2019

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	
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:

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

December 2019

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):			

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

December 2019

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		IX and RO CM5-17, I1272P, P1318, P1358, P1376, I1398P, P1461, P1494, I1581P, P1611, P1628, P1658, P1706.
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:

P1314, P1315, P1348, P1402, P1439, P1624.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

CM5-17, I1272P, P1314, P1315, P1318, P1348, P1358, P1376, I1398P, P1402, P1439, P1461, P1494, I1581P, P1611, P1624, P1628, P1706.

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM5-17													
	12/10/2019	525	32.00	238	8.22	529	449	2631	7.93	1631	0.08	0.12	0.012
I1272P													
	12/10/2019	387	17.92	169	4.68	379	306	1926	7.9	1194	0.00	0.90	0.059
I1398P													
	12/10/2019	225	4.15	51	1.06	161	92	827	8.52	513	0.01	0.45	0.579
I1581P													
	12/10/2019	353	13.26	155	3.57	356	278	1802	8.38	1117	0.01	1.09	0.804
P1314													
	12/10/2019	463	12.14	126	3.48	370	222	1780	8.03	1104	0.01	3.11	1.26
P1315													
	12/10/2019	432	21.23	193	5.61	438	358	2204	7.87	1366	0.02	0.57	0.141
P1318													
	12/10/2019	291	3.67	57	1.05	209	100	976	8.24	605	0.03	1.03	3.02
P1348													
	12/10/2019	421	11.50	137	3.28	368	255	1774	7.74	1100	0.03	2.06	0.303
P1358													
	12/10/2019	266	8.49	102	2.31	249	190	1295	7.94	803	0.04	0.72	0.523
P1376													
	12/10/2019	201	2.57	59	0.61	168	94	808	7.72	501	0.05	0.46	0.362
P1402													
	12/10/2019	415	11.76	131	3.04	357	226	1716	7.67	1064	0.02	2.15	0.315
P1439													
	12/10/2019	481	9.49	15	2.82	360	193	1693	7.96	1050	0.01	2.04	1.238
P1461													
	12/10/2019	384	19.46	208	5.32	446	391	2219	7.84	1376	0.00	1.44	0.376
P1494													
	12/10/2019	316	9.28	113	2.41	292	217	1457	7.84	903	0.05	1.47	0.27
P1611													
	12/10/2019	322	14.49	182	4.00	387	348	1969	8.01	1221	0.06	2.85	0.279
P1624													
	12/10/2019	244	3.00	48	0.82	168	79	835	8.7	518	0.02	1.01	1.722
P1628													
	12/10/2019	312	8.75	135	2.80	316	238	1578	8.35	978	0.00	0.83	0.755
P1706													
	12/10/2019	378	4.62	91	1.56	288	158	1372	8.15	851	0.01	2.22	2.088

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

December 2019

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, P1957, P1972, I1973P, P1986, P2014, P2038, P2040, P2108, P2125, I2183P, P2188, P2216, P2219, P2226, I2244P, P2264, P2303, P2316, P2331, P2340, P2359, P2361, P2384, P2395, P2399, P2401, I2429P, P2468, P2470, P2476, I2502P, P2505, P2510, P2523, P2538, P2540, P2541, P2588, P2601, P2610, P2612, P2614, P2615, P2624, P2660, P5230, P5250, P5258, P5271, P5278, P5279, P5283.
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-17, P1957, P1972, P1986, P2014, P2038, P2040, P2108, P2125, P2188, P2219, P2226,

P2264, P2303, P2316, P2331, P2340, P2359, P2361, P2384, P2395, P2399, P2401, I2429P, P2468, P2470, P2476, I2502P, P2510, P2523, P2538, P2540, P2541, P2588, P2601, P2610, P2612, P2614, P2615, P5250, P5258, P5271, P5278, P5279, P5283.

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17													
	12/10/2019	901	46.34	287	13.78	775	573	3712	7.58	2301	0.00	1.96	1.452
I2429P													
	12/10/2019		12.34	342	3.70	311	164	4975	7.3	3085	0.01	2.40	0.815
I2502P													
	12/10/2019	367	20.96	196	5.60	416	367	2142	8.03	1328	0.01	1.44	0.059
P1957													
	12/10/2019	357	21.04	88	5.40	288	241	1485	7.15	921	0.04	2.39	0.309
P1972													
	12/10/2019	475	31.47	136	9.05	400	352	2061	7.27	1278	0.02	2.83	0.487
P1986													
	12/10/2019	739	51.03	306	16.46	737	661	3539	7.52	2194	0.03	3.57	0.868
P2014													
	12/10/2019	409	23.24	102	6.13	302	209	1565	7.29	970	0.04	0.67	0.332
P2038													
	12/10/2019	701	40.74	164	11.64	547	432	2691	7.35	1668	0.00	3.12	0.223
P2040													
	12/10/2019	1068	84.30	328	27.14	952	912	4599	7.2	2851	0.00	6.59	0.149
P2108													
	12/10/2019	570	32.36	152	9.16	461	376	2363	7.34	1465	0.09	2.34	0.164
P2125													
	12/10/2019	991	81.50	346	22.41	936	897	4459	7.22	2765	0.05	7.66	0.101
P2188													
	12/10/2019	495	20.29	149	5.99	431	321	2100	7.84	1302	0.00	3.61	1.253
P2219													
	12/10/2019	223	8.80	38	0.93	136	67	710	7.13	440	1.39	0.14	0.199
P2226													
	12/10/2019	469	84.79	78	25.31	1082	982	1500	7.9	930	0.02	21.40	0.415
P2264													
	12/10/2019	267	12.71	97	3.30	225	160	1194	7.7	740	0.01	0.44	0.471
P2303													
	12/10/2019	577	40.94	164	11.58	490	436	2509	7.07	1556	0.13	1.50	0.24
P2316													
	12/10/2019	1047	79.82	325	24.27	910	826	4414	7.36	2737	0.00	5.11	0.874
P2331													
	12/10/2019	769	54.06	220	16.82	672	618	3325	7.13	2062	0.04	4.54	0.062
P2340													
	12/10/2019	609	47.88	167	13.12	502	441	2535	7.29	1572	0.08	2.67	1.195

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2359	12/10/2019	866	59.30	238	17.56	771	704	3641	7.08	2257	0.01	8.64	0.384
P2361	12/10/2019	969	66.66	249	19.07	806	729	3895	7.57	2415	0.00	6.15	0.857
P2384	12/10/2019	861	71.61	249	20.96	739	710	3654	7.24	2265	0.02	3.53	0.676
P2395	12/10/2019	469	39.08	88	8.85	297	216	1635	7.6	1014	0.02	1.90	0.348
P2399	12/10/2019	774	67.70	222	17.35	679	622	3339	7.33	2070	0.01	15.82	0.684
P2401	12/10/2019	573	32.55	112	7.07	392	276	2025	7.97	1256	0.01	1.56	0.49
P2468	12/10/2019	331	6.04	55	0.87	206	86	1004	8.18	622	0.00	0.49	1.73
P2470	12/10/2019	384	15.06	95	3.56	284	175	1395	7.69	865	0.01	1.50	1.253
P2476	12/10/2019	917	57.79	292	18.89	825	715	3933	7.56	2438	0.01	3.30	1.082
P2510	12/10/2019	477	26.14	168	6.79	423	332	2115	7.68	1311	0.01	2.15	0.85
P2523	12/10/2019	523	26.94	147	6.63	436	327	2127	7.7	1319	0.00	3.53	0.619
P2538	12/10/2019	482	26.87	143	7.76	394	316	2015	7.54	1249	0.02	1.33	1.471
P2540	12/10/2019	767	48.47	243	12.39	686	575	3282	7.91	2035	0.02	8.52	1.384
P2541	12/10/2019	262	16.54	41	2.97	136	50	756	7.67	469	0.08	0.36	0.247
P2588	12/10/2019	1031	43.24	348	25.80	1032	969	4775	7.78	2961	0.00	4.89	1.064
P2601	12/10/2019	607	37.41	227	10.33	562	448	2784	7.49	1726	0.07	1.20	0.775
P2610	12/10/2019		100.70	446	28.99	1211	1100	5562	7.23	3448	0.01	4.80	1.134
P2612	12/10/2019	680	33.81	149	9.90	548	410	2599	7.49	1611	0.00	4.02	1.123
P2614	12/10/2019	540	29.37	185	8.64	457	354	2324	7.84	1441	0.00	1.03	0.26

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2615													
	12/10/2019	487	14.15	91	4.00	329	194	1614	8.02	1001	0.02	2.14	1.846
P5250													
	12/10/2019	1089	87.27	319	24.39	965	882	4634	7.41	2873	0.00	4.65	1.655
P5258													
	12/10/2019	844	68.73	236	17.78	747	688	3558	7.72	2206	0.01	4.02	1.362
P5271													
	12/10/2019	713	54.73	223	15.82	632	566	3018	7.73	1871	0.00	2.75	1.033
P5278													
	12/10/2019	909	69.53	275	19.72	800	731	3782	7.33	2345	0.00	3.93	1.436
P5279													
	12/10/2019	357	14.66	68	2.47	226	120	1153	8.08	715	0.01	1.97	1.028
P5283													
	12/10/2019	729	44.14	179	12.25	561	447	2734	7.86	1695	0.02	6.49	1.74