

**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 18, 2019

**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
November 2019 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the November 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: Ron Burrows – NRC
CBO - File
cc: CR – Electronic File
Kory Winters – NDEQ Field Office
Amanda Jones – NDEQ Program Coordinator

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 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

November 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:

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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 in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 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:

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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 in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 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

November 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, I1267P, I1272P, P1318, P1358, P1376, P1377, I1398P, P1461, P1494, I1581P, P1611, P1628, P1658.
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:

P1314, P1315, P1348, P1402, P1428, P1439, P1624.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

CM5-17, I1272P, P1314, P1315, P1318, P1348, P1376, I1398P, P1402, P1428, P1439, P1461, P1494, I1581P, P1611, P1624.

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM5-17													
	11/12/2019	533	35.01	253	9.19	571	478	2698	7.78	1673	0.09	0.07	0.018
I1272P													
	11/12/2019	401	18.73	159	4.88	389	307	1915	7.91	1187	0.00	0.95	0.059
I1398P													
	11/12/2019	258	3.95	67	0.93	197	104	939	8.65	582	0.01	0.57	0.992
I1581P													
	11/12/2019	324	12.96	154	3.11	338	270	1663	8.33	1031	0.00	1.46	1.066
P1314													
	11/12/2019	479	12.40	130	3.52	377	221	1765	8.05	1094	0.00	3.33	1.271
P1315													
	11/12/2019	449	21.90	192	5.92	460	360	2202	7.87	1365	0.02	0.59	0.149
P1318													
	11/12/2019	322	4.35	73	1.16	240	125	1116	8.34	692	0.00	1.07	2.4
P1348													
	11/12/2019	461	13.66	140	3.93	405	274	1888	7.78	1171	0.02	2.32	0.313
P1376													
	11/12/2019	222	2.73	62	0.56	180	105	869	8.09	539	0.01	0.44	0.326
P1402													
	11/12/2019	427	13.48	143	3.43	375	247	1767	7.84	1096	0.02	2.12	0.302
P1428													
	11/12/2019	325	16.23	192	4.05	413	363	1986	7.84	1231	0.00	2.14	0.106
P1439													
	11/12/2019	515	10.19	124	2.95	391	219	1811	8.14	1123	0.00	2.30	1.09
P1461													
	11/12/2019	397	20.31	198	5.54	450	386	2183	7.93	1353	0.00	1.45	0.374
P1494													
	11/12/2019	339	10.14	131	2.59	324	230	1532	7.96	950	0.02	1.50	0.253
P1611													
	11/12/2019	339	15.29	179	4.17	396	348	1942	8	1204	0.10	4.45	0.144
P1624													
	11/12/2019	280	3.65	62	0.93	201	102	948	8.58	588	0.00	1.09	1.451

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

November 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, P1986, P2014, P2038, P2040, P2108, P2125, P2188, P2219, P2226, P2264, P2303, P2316, P2331, P2340, P2359, P2361, P2384, P2395, P2399, P2401, I2429P, P2470, P2476, P2510, P2523, P2538, P2541, P2588, P2601, P2610, P2612, P2614, P2615, P2624, P2660, 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, P2264, P2303, P2316, P2331, P2359, P2361, P2384, P2395, P2399, P2401, I2429P, P2470, P2476, P2510, P2523, P2538, P2541, P2588, P2601, P2610, P2612, P2614, P2624, P2660, P5250, P5271, P5278.

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17													
	11/12/2019	930	50.47	312	15.30	827	632	3886	7.64	2409	0.00	2.51	1.473
I2429P													
	11/12/2019	601	25.58	13	7.54	444	308	2144	7.71	1329	0.01	5.93	0.776
P1957													
	11/12/2019	360	20.39	89	5.25	288	230	1422	7.13	882	0.02	2.37	0.335
P1972													
	11/12/2019	548	37.93	154	11.18	480	430	2343	7.37	1453	0.02	3.34	0.531
P1986													
	11/12/2019	762	53.74	303	17.25	758	680	3661	7.66	2270	0.00	3.93	0.923
P2014													
	11/12/2019	405	20.51	91	5.65	302	203	1478	7.27	916	0.04	0.65	0.363
P2038													
	11/12/2019	738	44.01	184	13.32	607	489	2948	7.37	1828	0.00	3.26	0.246
	11/12/2019	734	44.01	175	13.32	607	489	2911	7.37	1805	0.00	3.26	0.246
P2040													
	11/12/2019		89.96	37	29.49	1017	966	4873	7.23	3021	0.00	6.68	0.158
P2108													
	11/12/2019	589	33.55	154	9.68	497	401	2381	7.48	1476	0.10	2.36	0.176
P2125													
	11/12/2019	1012	82.02	322	23.32	978	913	4431	7.21	2747	0.11	7.57	0.107
P2188													
	11/12/2019	554	33.46	236	9.99	588	528	2892	7.86	1793	0.00	5.29	1.094
P2264													
	11/12/2019	286	14.48	90	3.71	235	158	1236	7.86	766	0.01	0.43	0.543
P2303													
	11/12/2019	599	42.14	174	12.20	526	449	2598	7.24	1611	0.14	1.44	0.277
P2316													
	11/12/2019	1111	88.97	347	27.23	1002	906	4581	7.37	2840	0.00	4.95	0.889
P2331													
	11/12/2019	1017	78.42	306	24.45	948	879	4496	7.19	2788	0.04	7.20	0.076
P2359													
	11/12/2019	905	63.00	250	18.39	797	714	3879	7.23	2405	0.01	8.47	0.377
P2361													
	11/12/2019	992	70.67	250	20.18	863	762	4071	7.65	2524	0.00	5.75	0.861
P2384													
	11/12/2019	883	73.62	251	22.41	783	740	3829	7.21	2374	0.00	3.38	0.718

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2395	11/12/2019	487	38.81	79	8.78	312	217	1619	7.58	1004	0.02	1.84	0.379
P2399	11/12/2019	742	66.06	219	17.07	655	592	3078	7.5	1908	0.01	14.21	0.689
P2401	11/12/2019	492	21.36	72	4.15	307	165	1471	7.82	912	0.01	1.43	0.433
P2470	11/12/2019	416	18.17	101	4.20	315	202	1564	7.59	970	0.00	1.71	1.312
P2476	11/12/2019	950	64.46	287	21.02	881	780	4140	7.41	2567	0.00	3.35	1.14
P2510	11/12/2019	450	22.24	155	5.77	397	303	1997	7.75	1238	0.00	1.99	0.866
P2523	11/12/2019	541	29.49	159	7.45	456	345	2271	7.63	1408	0.00	3.69	0.603
P2538	11/12/2019	493	27.68	137	8.00	395	302	2012	7.62	1247	0.02	1.34	1.489
P2541	11/12/2019	259	18.91	40	1.14	135	48	741	7.7	459	0.08	0.34	0.272
P2588	11/12/2019		85.55	353	27.95	1059	1002	4918	7.54	3049	0.00	5.03	1.093
P2601	11/12/2019	651	41.14	235	11.32	589	475	2974	7.59	1844	0.06	1.59	0.792
P2610	11/12/2019		109.60	432	31.62	1148	1100	5521	7.46	3423	0.01	4.52	1.164
P2612	11/12/2019	716	38.17	171	11.25	592	466	2804	7.45	1738	0.00	4.34	1.132
P2614	11/12/2019	584	32.46	181	9.65	487	369	2465	7.84	1528	0.00	1.11	0.266
P2624	11/12/2019	453	9.40	75	2.40	290	132	1397	8.02	866	0.01	0.97	2.084
P2660	11/12/2019	985	93.12	307	24.12	894	853	4377	7.56	2714	0.00	3.89	0.54
P5250	11/12/2019		117.60	409	33.84	1201	1218	5717	7.46	3545	0.00	6.95	1.673
P5271	11/12/2019	724	56.78	201	16.50	628	554	3009	7.39	1866	0.00	2.87	1.02
P5278	11/12/2019	913	70.88	251	20.12	802	716	3702	7.29	2295	0.00	3.70	1.451