

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

May 10, 2021

**USPS PRIORITY MAIL
SIGNATURE CONFIRMATION**

Sue Dempsey, Drinking Water and Groundwater Division Administrator
Nebraska Department of Environment and Energy
P.O. Box 98922
Lincoln, NE 68509-8922

Class III UIC Permit NE0122611
April 2021 Monthly Restoration Report

Dear Ms. Dempsey:

Please find enclosed the April 2021 Monthly Restoration Reports for Mine Units 2, 3, 4, 5, 6 and 7. In addition, after receiving approval of the Mine Unit 8 restoration plan, CBO initiated IX treatment in Mine Unit 8 in April. 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

April 2021

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:

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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:

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													
	4/6/2021	157	1.81	45	0.26	123	68	617	8.14	383	0.01	0.86	0.01
I180P													
	4/6/2021	197	2.96	66	0.54	176	107	845	8.06	524	0.01	0.88	0.07
I188P													
	4/6/2021	194	5.33	57	0.97	154	98	783	8.36	485	0.00	0.45	-0.04
P118													
	4/6/2021	164	2.87	61	0.52	148	91	727	7.97	451	0.01	0.82	-0.05
P119													
	4/6/2021	195	4.63	70	1.00	172	110	837	8.04	519	0.01	1.51	-0.06
P97													
	4/6/2021	235	7.31	79	1.59	202	132	983	8.07	609	0.01	1.46	-0.05

CROW BUTTE MINE
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April 2021

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:

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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

April 2021

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:

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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-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													
	4/6/2021	308	7.95	66	1.99	218	126	1049	8.12	650	0.00	0.66	0.15
CM1-7													
	4/6/2021	279	6.52	71	1.66	219	136	1046	7.7	649	0.01	0.99	-0.05
I536P													
	4/6/2021	415	23.15	134	6.23	342	276	1676	8.06	1039	0.00	2.35	-0.03
I538P													
	4/6/2021	369	15.41	139	4.00	327	240	1564	8.24	970	0.00	0.72	0.07
I544P													
	4/6/2021	387	15.69	100	4.20	308	213	1448	7.69	898	0.00	1.54	0.09
I548P													
	4/6/2021	421	18.31	110	5.02	347	251	1623	7.59	1006	0.01	0.74	0.07
I549P													
	4/6/2021	859	68.84	297	19.18	864	842	3812	7.23	2363	0.07	7.02	0.07
I550P													
	4/6/2021	604	39.72	180	10.39	540	465	2472	7.54	1533	0.01	2.96	0.21
I551P													
	4/6/2021	340	12.38	81	2.81	263	181	1262	7.87	782	0.01	1.20	0.19
I552P													
	4/6/2021	308	6.99	69	1.42	235	151	1101	7.75	683	0.01	1.12	0.45

CROW BUTTE MINE
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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:

No in-house samples were collected during the month.

CROW BUTTE MINE
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April 2021

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		I1274P, P1337, P1399, P1461, P1532, P1628, 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:

I1274P, P1399, P1461, P1532, P1628, P1843.

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I1274P													
	4/6/2021	477	15.31	185	3.99	472	362	2149	8.07	1332	0.02	1.16	0.12
P1399													
	4/6/2021	458	24.66	186	5.80	447	379	2101	8.04	1303	0.01	1.64	0.04
P1461													
	4/6/2021	409	17.76	184	4.63	432	387	2022	8.22	1254	0.00	1.16	0.21
P1532													
	4/6/2021	378	14.65	181	3.71	430	386	2015	8.03	1249	0.00	0.33	-0.11
P1628													
	4/6/2021	294	7.06	113	1.94	277	209	1326	8.48	822	0.00	0.73	0.43
P1843													
	4/6/2021	382	10.59	136	2.74	358	262	1658	8.38	1028	0.00	2.43	1.20

CROW BUTTE MINE
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April 2021

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, P1972, I1973P, I1975P, I1978P, I1982P, P1986, P2014, P2038, P2040, P2103, I2183P, I2185P, P2188, P2197, P2216, P2226, I2244P, P2264, P2316, P2359, P2384, P2401, I2429P, P2470, P2476, I2502P, P2505, P2510, P2523, P2538, P2601, P2610, 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, P1957, I1971P, P1972, I1973P, I1975P, I1977P, I1978P, I1982P, I1985P, P1986, P2014, P2038, P2040, P2108, P2125, I2183P, I2185P, P2188, P2216, P2219, P2226, I2244P, P2264, P2303,

P2316, P2331, P2340, P2359, P2384, P2401, I2429P, P2468, P2470, P2476, P2481, I2502P, P2505, P2510, P2523, P2538, P2540, P2541, P2601, P2610, P2612, P2614, P2615, P2624, P2660, P5230, P5250, P5258, P5271, P5278, P5283.

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17													
	4/6/2021	629	23.86	175	6.74	552	364	2429	7.94	1506	0.00	1.00	1.32
CM3-7													
	4/6/2021	391	19.64	150	4.84	392	299	1828	8.11	1133	0.00	0.28	0.03
CM4-12													
	4/6/2021	442	20.43	116	5.74	369	301	1746	7.49	1083	0.15	0.97	0.02
CM4-13													
	4/6/2021	451	26.60	101	6.17	337	261	1628	7.73	1009	0.01	0.80	0.17
CM4-14													
	4/6/2021		114.30	388	34.55	1102	1162	4921	7.33	3051	0.00	2.84	0.28
CM4-15													
	4/6/2021	812	60.39	230	17.55	747	662	3350	7.56	2077	0.00	2.27	0.47
CM4-16													
	4/6/2021	933	72.74	301	22.58	860	857	4058	7.49	2516	0.00	1.71	0.06
CM4-17													
	4/6/2021	955	98.97	342	29.98	929	846	4187	7.49	2596	0.06	0.66	-0.11
CM4-18													
	4/6/2021	532	35.22	170	9.54	469	343	2207	7.81	1368	0.01	0.46	0.30
I1971P													
	4/6/2021	855	63.60	221	17.40	711	708	3426	7.5	2124	0.02	2.18	0.06
I1973P													
	4/6/2021	809	54.24	208	13.26	690	602	3212	7.57	1991	0.01	4.95	0.51
I1975P													
	4/6/2021	825	54.28	224	16.65	695	621	3364	7.67	2086	0.01	5.37	0.14
I1977P													
	4/6/2021	360	29.87	65	4.98	236	154	1263	7.82	783	0.02	0.48	0.12
I1978P													
	4/6/2021	604	58.78	129	11.26	446	375	2197	7.56	1362	0.00	2.12	0.31
I1982P													
	4/6/2021	383	20.85	105	4.05	321	227	1510	7.66	936	0.00	1.38	0.56
I1985P													
	4/6/2021	356	28.08	66	3.94	234	159	1240	7.74	769	0.00	0.61	0.34
I2183P													
	4/6/2021	635	44.56	172	10.60	540	479	2580	7.69	1600	0.00	6.33	0.72
I2185P													
	4/6/2021	1101	79.65	307	24.46	1018	1014	4505	7.47	2793	0.00	7.56	2.24
I2244P													
	4/6/2021	261	17.60	170	4.44	340	320	1719	7.45	1066	0.06	0.82	0.25

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I2429P													
	4/6/2021	515	29.41	141	8.41	453	349	2078	7.47	1288	0.00	5.70	0.41
I2502P													
	4/6/2021	317	38.52	199	9.65	815	777	1994	8.23	1236	0.00	0.61	-0.14
	4/6/2021	311	38.52	195	9.65	815	777	2031	8.23	1259	0.00	0.61	-0.14
P1957													
	4/6/2021	209	10.40	62	1.35	181	148	925	7	574	0.10	0.08	-0.05
P1972													
	4/6/2021	731	59.08	200	15.68	660	656	3113	7.48	1930	0.04	4.52	0.35
P1986													
	4/6/2021	585	39.48	235	11.90	606	549	2803	7.62	1738	0.00	1.77	0.48
P2014													
	4/6/2021	222	11.33	54	1.92	159	116	852	7.45	528	0.10	0.01	0.05
P2038													
	4/6/2021	646	42.61	182	12.16	567	501	2720	7.55	1686	0.00	2.32	0.06
P2040													
	4/6/2021	873	71.85	274	23.53	835	773	3849	7.6	2386	0.00	3.71	0.04
P2108													
	4/6/2021	281	15.99	60	3.04	208	141	1053	7.38	653	0.31	0.23	0.13
P2125													
	4/6/2021	311	10.98	79	2.35	257	203	1297	7.29	804	0.32	0.50	-0.08
P2188													
	4/6/2021	302	10.27	67	2.02	232	164	1136	7.6	704	0.00	0.58	1.63
P2216													
	4/6/2021	395	31.34	211	7.06	455	425	2187	8	1356	0.00	3.02	0.46
P2219													
	4/6/2021	197	14.50	44	1.12	134	89	724	7.28	449	0.27	0.04	-0.08
P2226													
	4/6/2021	504	11.07	106	3.90	399	241	1754	8.06	1087	0.01	1.88	0.48
P2264													
	4/6/2021	257	12.69	102	3.00	264	217	1286	7.66	797	0.01	0.42	0.48
P2303													
	4/6/2021	208	18.22	62	2.53	168	143	908	7.1	563	1.34	0.11	-0.08
P2316													
	4/6/2021	868	78.65	237	21.03	731	700	3483	7.59	2159	0.00	7.25	0.60
P2331													
	4/6/2021	221	20.29	59	2.98	166	137	905	7.17	561	0.12	0.05	-0.11

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2340	4/6/2021	251	22.45	61	3.90	181	146	1000	7.34	620	0.34	0.16	-0.08
P2359	4/6/2021	355	10.82	63	2.56	258	153	1240	7.83	769	0.05	0.97	0.27
P2384	4/6/2021	636	41.14	168	11.59	555	446	2622	7.71	1626	0.00	2.87	0.24
P2401	4/6/2021	453	43.74	105	9.44	322	308	1755	7.9	1088	0.00	0.61	0.23
P2468	4/6/2021	386	16.14	159	4.09	396	343	1951	7.97	1210	0.00	0.76	0.79
P2470	4/6/2021	402	24.22	157	5.82	381	326	1856	7.79	1151	0.00	1.00	0.76
P2476	4/6/2021	540	34.74	151	10.04	483	403	2247	7.69	1393	0.02	1.46	0.55
P2481	4/6/2021	768	36.52	204	10.88	689	543	3011	7.57	1867	0.00	2.68	1.49
P2505	4/6/2021	315	18.38	140	3.77	328	277	1605	7.78	995	0.00	0.35	0.47
P2510	4/6/2021	395	23.21	158	5.10	391	325	1876	8.1	1163	0.00	1.22	0.50
P2523	4/6/2021	460	24.40	115	6.15	367	280	1801	7.79	1117	0.00	2.35	0.40
P2538	4/6/2021	369	20.88	121	5.29	336	296	1703	7.58	1056	0.02	0.68	1.04
P2540	4/6/2021	336	23.65	78	3.38	246	175	1280	7.75	794	0.04	0.95	0.29
P2541	4/6/2021	242	23.74	55	4.26	166	118	916	7.49	568	0.05	0.22	0.03
P2601	4/6/2021	409	23.55	184	6.16	443	381	2107	7.91	1306	0.05	0.35	0.54
P2610	4/6/2021	739	37.44	209	11.33	665	513	2952	7.6	1830	0.00	2.92	1.18
P2612	4/6/2021	298	12.63	65	2.33	228	177	1163	7.49	721	0.03	0.31	0.51
P2614	4/6/2021	378	18.83	113	4.58	319	235	1581	8.15	980	0.00	0.44	0.15
P2615	4/6/2021	222	13.84	50	1.99	159	103	854	7.5	529	0.03	0.23	0.22

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2624													
	4/6/2021	224	12.13	55	1.47	171	117	894	7.49	554	0.01	0.14	0.73
P2660													
	4/6/2021	532	31.96	131	7.51	439	362	2111	7.66	1309	0.00	2.15	0.33
P5230													
	4/6/2021	740	48.19	183	12.72	643	535	2936	7.45	1820	0.14	4.35	0.35
P5250													
	4/6/2021	637	42.04	181	11.86	556	464	2643	7.57	1639	0.00	1.40	1.13
P5258													
	4/6/2021	194	13.79	48	1.16	148	103	758	7.24	470	0.23	0.10	0.03
P5271													
	4/6/2021	426	43.30	78	5.18	294	228	1533	7.16	950	0.05	0.48	0.17
P5278													
	4/6/2021	427	16.87	70	3.13	305	183	1440	7.89	893	0.03	1.60	0.45
P5283													
	4/6/2021	778	51.52	210	15.34	701	619	3046	7.78	1889	0.01	3.53	1.40

CROW BUTTE MINE
MONTHLY RESTORATION REPORT

April

MINE UNIT 8

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 P2689, P2715, P2716, P2717, P2737, P2762, P2765, P2770, P2774, P2776, P2814, P3166, P3168, P3170, P3173, P3189, P3192, P3209, P3235, P3441.
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:

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