

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

June 24, 2022

Electronic Submittal

DOCUMENT CONTROL DESK, DIRECTOR
U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

The enclosed report was provided to NDEE.

Class III UIC Permit NE0122611
May 2022 Monthly Restoration Report

Please find enclosed the Crow Butte Monthly Restoration Reports for Mine Units 2, 3, 4, 5, 6, 7 and 8. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Units 6, 7, and 8. Mine Units 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. 121.

Sincerely,
Cameco Resources
Crow Butte Operation

A handwritten signature in blue ink that reads "Tate Hagman".

Tate Hagman
Restoration Manager

Enclosures: As Stated

cc: Ron Burrows; Document Control Desk; Deputy Director, Division of Decommissioning – NRC
CBO - File
ec: CR – Electronic File
Kory Winters – NDEE Field Office
Amanda Osborn – NDEE Program Coordinator

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 Recirculatoion		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 THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 Recirculatoion		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 THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 Recirculatoin		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 THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
 May 2022
 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 Recirculatoion		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 THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 P1399 P1461 P1532 P1628 P1663 P1742
d. Wellfield Recirculatoin		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 THE MONTH: (Assay results attached)

CM5-14	I1397P	P1358	P1625
CM5-15	I1398P	P1376	P1628
CM5-16	I1423P	P1396	P1663
CM5-17	I1581P	P1399	P1689
CM6-6	I1600P	P1426	P1690
CM6-7	I1601P	P1439	P1703
I1266P	I1602P	P1446	P1706
I1267P	I1667P	P1457	P1751
I1270P	P1265	P1494	P1765
I1272P	P1268	P1532	P1800
I1274P	P1269	P1584	P1832
I1274P	P1273	P1590	P1843
I1285P	P1318	P1611	
I1356P	P1348	P1612	
I1357P	P1355	P1624	

Mine Unit 6		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM5-14													
	5/11/2022	338	14.40	197	4.48	439	393	2104	8.24	1304	0.03	0.10	0.06
CM5-15													
	5/11/2022	328	14.55	90	2.58	282	187	1321	8.16	819	0.04	0.98	0.08
CM5-16													
	5/11/2022	374	10.36	85	2.16	298	170	1357	8.22	841	0.05	1.22	0.52
CM5-17													
	5/11/2022	423	23.44	194	6.21	484	411	2267	8.12	1406	0.05	0.12	0.06
CM6-6													
	5/11/2022	298	15.95	174	3.90	407	370	1922	8.47	1192	0.03	0.03	0.05
CM6-7													
	5/11/2022	283	18.45	175	4.24	404	385	1948	8.48	1208	0.03	0.03	0.05
I1266P													
	5/11/2022	219	2.98	45	0.29	161	69	706	8.82	438	0.03	0.74	0.56
I1267P													
	5/17/2022	274	5.38	69	1.28	221	132	1067	8.41	662	0.08	1.17	0.16
I1270P													
	5/11/2022	316	9.42	83	1.94	256	143	1175	8.44	729	0.02	0.55	0.95
I1272P													
	5/11/2022	405	16.95	134	4.12	380	288	1799	8.18	1115	0.03	0.48	0.06
I1274P													
	5/11/2022	434	12.34	155	3.22	430	322	1972	8.11	1223	0.02	1.62	0.27
	5/17/2022	426	12.22	153	3.25	419	314	1947	7.82	1207	0.02	1.55	0.27
I1285P													
	5/11/2022	371	5.98	80	1.14	294	165	1302	8.46	807	0.02	1.92	0.43
I1356P													
	5/11/2022	167	3.46	39	0.23	129	41	565	8.49	350	0.09	0.43	0.11
I1357P													
	5/11/2022	328	23.17	143	5.13	370	330	1776	7.58	1101	0.06	1.18	0.07
I1397P													
	5/11/2022	327	10.37	97	1.55	297	193	1374	8.36	852	0.02	1.43	0.40
I1398P													
	5/11/2022	328	15.35	86	3.25	272	175	1271	8.32	788	0.03	0.65	0.11
I1423P													
	5/11/2022	295	11.66	127	2.37	330	260	1538	8.09	954	0.03	1.55	0.45
I1581P													
	5/11/2022	308	13.88	172	3.49	393	334	1864	8.41	1156	0.02	1.16	0.12

Mine Unit 6		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I1600P													
	5/11/2022	363	11.16	101	1.40	309	195	1396	8.46	866	0.08	7.91	0.78
I1601P													
	5/11/2022	504	10.02	118	2.48	405	243	1803	8.48	1118	0.08	1.82	2.67
I1602P													
	5/11/2022	320	8.82	80	1.75	260	153	1203	8.31	746	0.03	0.90	0.21
I1667P													
	5/11/2022	359	26.47	117	5.52	311	231	1526	8.21	946	0.03	0.43	0.08
P1265													
	5/11/2022	357	8.07	77	1.95	278	152	1259	8.32	781	0.04	0.56	0.09
P1268													
	5/11/2022	392	8.64	93	2.04	316	187	1410	8.36	874	0.03	1.38	1.58
P1269													
	5/11/2022	245	4.90	59	0.72	208	122	936	8.16	580	0.03	0.41	0.14
P1273													
	5/11/2022	436	12.20	123	2.83	384	257	1747	8.13	1083	0.03	3.50	0.11
P1318													
	5/11/2022	302	6.11	81	1.31	263	164	1198	8.29	743	0.02	0.47	0.92
P1348													
	5/11/2022	252	5.59	73	0.90	219	135	1008	8.25	625	0.11	0.29	0.23
P1355													
	5/11/2022	358	8.54	84	1.80	291	164	1294	8.35	802	0.05	2.75	0.42
P1358													
	5/11/2022	261	5.41	75	1.11	227	135	1041	8.42	645	0.15	0.84	0.58
P1376													
	5/11/2022	167	2.65	38	0.14	127	52	565	8.42	350	0.10	0.25	0.18
P1396													
	5/11/2022	289	15.30	163	3.94	380	343	1804	8.18	1118	0.03	0.11	0.06
P1399													
	5/11/2022	510	26.85	183	6.42	496	385	2319	8.13	1438	0.03	1.03	0.13
P1426													
	5/11/2022	316	11.82	134	2.69	344	283	1629	7.98	1010	0.04	1.33	0.09
P1439													
	5/11/2022	510	10.76	123	2.63	410	235	1839	8.23	1140	0.04	1.99	0.69
P1446													
	5/11/2022	285	19.71	180	4.34	398	378	1927	8.19	1195	0.04	0.01	0.05
P1457													
	5/11/2022	437	12.26	102	2.23	345	205	1553	8.46	963	0.07	0.89	1.28

Mine Unit 6		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P1494													
	5/11/2022	306	6.28	66	1.10	246	144	1101	8.33	683	0.04	0.84	0.34
P1532													
	5/11/2022	389	18.51	198	4.70	479	405	2224	8.03	1379	0.03	0.15	0.05
P1584													
	5/11/2022	309	6.85	81	1.02	267	160	1193	8.56	740	0.04	1.43	0.33
P1590													
	5/11/2022	270	7.18	74	1.32	221	123	1038	8.81	644	0.04	4.18	0.09
P1611													
	5/11/2022	327	15.93	165	4.04	405	355	1910	8.13	1184	0.07	3.13	0.28
P1612													
	5/11/2022	300	4.52	55	0.75	225	114	1003	8.62	622	0.03	0.76	0.53
P1624													
	5/11/2022	256	8.55	63	1.51	200	105	926	8.5	574	0.02	0.85	0.15
P1625													
	5/11/2022	264	4.65	68	0.95	217	122	1004	8.48	622	0.02	1.12	0.27
P1628													
	5/17/2022	310	9.53	135	2.95	333	260	1594	8.36	988	0.01	0.59	0.41
P1663													
	5/11/2022	376	14.49	195	4.75	438	349	2075	8.35	1287	0.03	0.91	0.17
P1689													
	5/11/2022	311	17.68	202	4.38	421	356	2003	8.29	1242	0.03	0.79	0.10
P1690													
	5/11/2022	291	10.59	135	2.69	326	251	1543	8.37	957	0.02	0.78	0.09
P1703													
	5/11/2022	252	14.83	75	2.77	215	151	1044	8.02	647	0.06	1.05	0.09
P1706													
	5/11/2022	291	2.24	36	0.35	200	81	858	8.7	532	0.03	0.99	2.04
P1751													
	5/11/2022	151	4.65	36	0.42	120	57	525	8.2	326	0.20	0.13	0.10
P1765													
	5/11/2022	436	7.16	73	1.53	319	159	1381	8.49	856	0.12	1.78	0.43
P1800													
	5/11/2022	308	8.27	82	1.36	264	162	1191	8.44	738	0.02	1.41	0.27
P1832													
	5/11/2022	447	12.82	100	3.37	357	212	1588	8.35	985	0.02	2.34	0.48
P1843													
	5/11/2022	466	10.79	156	2.94	437	284	1970	8.43	1221	0.03	2.46	1.86

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 P1972 P5220 CM4-14 P2038 P5230 CM4-15 P2040 P5250 CM4-16 P2216 P5271 CM4-17 P2316 P5283 I1971P P2384 I1973P P2476 I1975P P2505 I2183P P2523 I2185P P2610
d. Wellfield Recirculatoion		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 THE MONTH: (Assay results attached)

BL-17	P2476
CM4-14	P2481
CM4-15	P2505
CM4-16	P2523
CM4-17	P2610
I1971P	P5230
I1973P	P5250
I1975P	P5271
I2183P	P5283
I2185P	
P2038	
P2040	
P2216	
P2316	
P2384	

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17	5/17/2022	374	7.23	55	1.65	242	97	1097	8.25	680	0.01	0.38	1.70
CM4-14	5/17/2022	781	50.68	191	14.48	660	553	3080	7.4	1910	0.01	2.25	0.39
CM4-15	5/17/2022	759	53.22	192	15.59	657	564	3056	7.33	1895	0.01	1.13	0.51
CM4-16	5/17/2022	681	43.25	158	12.42	557	443	2618	7.34	1623	0.01	0.86	0.33
CM4-17	5/17/2022	580	36.21	142	10.85	464	340	2221	7.77	1377	0.05	0.48	0.07
I1971P	5/17/2022	655	36.78	128	9.78	515	397	2396	7.44	1486	0.01	1.09	0.26
I1973P	5/17/2022	683	31.65	129	7.75	514	354	2394	7.63	1484	0.01	3.43	0.58
I1975P	5/17/2022	884	60.28	224	18.91	760	651	3502	7.67	2171	0.01	4.56	0.26
I2183P	5/17/2022	506	36.39	115	8.33	398	320	1934	7.62	1199	0.01	5.02	0.89
I2185P	5/17/2022	913	47.50	186	16.38	796	694	3478	7.52	2156	0.01	2.95	2.09
P2038	5/17/2022	580	38.50	143	11.26	484	403	2349	7.4	1456	0.02	1.98	0.19
P2040	5/17/2022	767	59.66	211	19.86	677	611	3221	7.34	1997	0.01	2.35	0.18
P2216	5/17/2022	366	14.41	134	3.38	359	278	1723	8.1	1068	0.01	1.71	0.62
P2316	5/17/2022	555	46.00	123	11.61	426	351	2109	7.4	1308	0.01	2.69	0.52
P2384	5/17/2022	664	53.88	185	16.05	584	542	2856	7.3	1771	0.02	3.42	0.53
P2476	5/17/2022	311	15.14	73	3.13	241	144	1166	7.65	723	0.04	0.67	0.68
P2481	5/17/2022	424	8.32	69	2.39	299	152	1350	7.96	837	0.01	0.73	2.17
P2505	5/17/2022	309	20.77	148	3.90	346	287	1694	7.84	1050	0.01	0.29	0.59
P2523	5/17/2022	237	5.96	39	1.27	156	54	717	7.82	445	0.01	0.26	0.71

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2610													
	5/17/2022	566	18.71	106	5.81	409	238	1872	7.8	1161	0.01	1.43	1.11
P5230													
	5/17/2022	760	50.48	184	13.87	648	529	2978	7.45	1846	0.02	2.97	0.54
P5250													
	5/17/2022	392	17.65	79	4.92	288	198	1391	7.58	862	0.01	0.63	1.17
P5271													
	5/17/2022	679	36.91	146	9.89	526	375	2463	7.4	1527	0.02	1.34	0.60
P5283													
	5/17/2022	593	34.52	131	9.91	465	355	2212	7.73	1371	0.02	1.30	1.44

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
May 2022
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 and RO CM6-11 P2734 P3166 CM6-21 P2764 P3170 CM6-24 P2770 P3173 I2671P P2774 P3178 I2685P P2844 P3189 P2686 P2855 P3192 P2689 P2880 P3209 P2700 P2904 P3441 P2702 P2908 P6104 P2724 P3153 P6140
d. Wellfield Recirculatoin		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 THE MONTH: (Assay results attached)

CM6-11	P2904
CM6-21	P2908
CM6-24	P3153
I2671P	P3166
I2685P	P3170
I2976P	P3173
P2686	P3178
P2689	P3189
P2700	P3192
P2724	P3209
P2734	P3441
P2764	P6104
P2770	P6140
P2844	
P2855	

Mine Unit 8		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM6-11													
	5/17/2022	352	18.52	155	4.62	396	325	1886	8.1	1169	0.01	0.38	0.04
CM6-21													
	5/17/2022	449	15.33	147	3.91	414	282	1907	8.18	1182	0.01	6.81	0.26
CM6-24													
	5/17/2022	405	10.29	124	3.48	364	242	1682	8.23	1043	0.01	1.04	0.99
I2671P													
	5/17/2022	633	17.96	184	5.53	560	347	2502	8.11	1551	0.02	3.22	0.81
I2685P													
	5/17/2022	382	7.26	105	2.15	335	209	1520	8.4	942	0.01	3.09	1.06
I2976P													
	5/17/2022	373	8.38	138	2.75	369	261	1722	8.37	1068	0.01	0.60	1.19
P2686													
	5/17/2022	219	3.34	60	0.81	185	108	863	8.37	535	0.01	1.01	0.62
P2689													
	5/17/2022	339	7.24	111	1.99	317	216	1473	8.24	913	0.03	1.63	0.10
P2700													
	5/17/2022	452	22.46	201	6.32	481	366	2264	8.1	1404	0.02	0.68	0.23
P2724													
	5/17/2022	544	12.32	187	4.82	518	361	2348	8.16	1456	0.01	3.18	1.84
P2734													
	5/17/2022	339	4.77	97	1.54	294	178	1361	8.26	844	0.01	2.61	1.44
P2764													
	5/17/2022	467	15.73	176	5.50	455	328	2120	8.07	1314	0.01	4.49	1.14
P2770													
	5/17/2022	327	5.73	96	1.80	285	167	1327	8.53	823	0.01	0.85	2.28
P2844													
	5/17/2022	389	13.17	170	4.14	404	282	1906	8.58	1182	0.01	0.95	0.78
P2855													
	5/17/2022	443	19.46	180	6.03	449	334	2109	8.13	1308	0.01	2.64	0.61
P2904													
	5/17/2022	484	27.77	207	7.93	489	369	2335	8	1448	0.02	1.22	0.56
P2908													
	5/17/2022	350	7.53	107	2.21	316	204	1452	8.29	900	0.01	4.65	0.67
P3153													
	5/17/2022	329	5.30	85	1.38	274	161	1254	8.47	777	0.04	1.91	0.40
P3166													
	5/17/2022	266	4.51	71	1.23	223	121	1035	8.51	642	0.01	1.05	0.41

Mine Unit 8 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P3170	5/17/2022	286	11.01	98	2.83	264	191	1272	8.08	789	0.02	0.90	0.30
P3173	5/17/2022	306	5.56	97	1.80	285	184	1304	8.15	808	0.01	2.01	0.82
P3178	5/17/2022	399	13.23	133	4.19	373	267	1738	8.23	1078	0.02	2.00	0.53
P3189	5/17/2022	341	20.55	134	4.96	331	253	1615	8.13	1001	0.03	0.64	0.14
P3192	5/17/2022	310	14.05	107	3.25	295	200	1410	8.23	874	0.02	0.50	0.10
P3209	5/17/2022	337	8.24	108	2.31	314	199	1463	8.3	907	0.02	3.32	0.28
P3441	5/17/2022	883	51.92	0	15.81	959	755	4296	7.82	2664	0.01	7.37	0.32
P6104	5/17/2022	344	10.22	113	3.16	312	203	1468	8.37	910	0.01	0.57	0.71
P6140	5/17/2022	286	7.83	86	2.22	253	158	1183	8.5	733	0.01	0.31	0.70