

**CAMECO RESOURCES  
CROW BUTTE OPERATION**



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

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

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September 20, 2016

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

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

Class III UIC Permit NE0122611  
September 2016 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the September 2016 Monthly Restoration Reports for Mine Units 2, 3, 4, 5 and 6. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Units 4, 5, and 6 with groundwater sweep continuing in portions of the three mine units.

Mine Units 2 and 3 remain in stability monitoring.

If you have any questions regarding this submittal, please feel free to contact me at (308) 665-2215, ext. 114.

Sincerely,  
Cameco Resources  
Crow Butte Operation

Larry Teahon  
SHEQ Manager

Enclosures: As Stated

cc: ~~Ron Binrows - NRC~~  
CBO - File  
cc: CR – Electronic File  
Nancy Harris – NDEQ Program Coordinator  
Kory Winters – NDEQ Field Office

**CROW BUTTE MINE**  
**MONTHLY RESTORATION REPORT**  
**AUGUST 2016**  
**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:**

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

**4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:**

No samples were collected during the month.

CROW BUTTE MINE  
 MONTHLY RESTORATION REPORT  
 AUGUST 2016  
 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 samples were collected during the month.

CROW BUTTE MINE  
 MONTHLY RESTORATION REPORT  
 AUGUST 2016  
 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		RO and Reductant I536P, I539P, and I546P.
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:

BL-8, BL-9, CM2-4, P372, P392, P410, I535P, I543P, I544P, I545P, P6023, P6024, and P6029.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL-8, BL-9, CM2-4, P372, I536P, I539P, I543P, I544P, I545P, I546P, P6023, P6024 and P6029.

Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-8	8/9/2016	17.57	4.71	383.3	239.3	2.242	0.237	0.000					
	8/23/2016	16.93	4.44	339.2	226.7	2.063	0.210	0.000					
BL-9	8/9/2016	14.16	3.63	307.2	200.3	1.481	0.099	0.000					
	8/23/2016	12.48	3.14	249.6	170.2	1.330	0.064	0.000					
CM2-4	8/9/2016	15.30	3.79	354.4	250.5	0.575	0.047	0.000					
	8/23/2016	15.13	3.73	315.3	239.6	0.564	0.046	0.000					
1536P	8/9/2016	28.36	7.62	427.2	335.6	6.926	0.145	0.000					
	8/23/2016	28.15	7.40	377.1	334.2	6.722	0.140	0.000					
1539P	8/9/2016	20.70	5.61	414.6	280.2	1.884	0.174	0.000					
1543P	8/9/2016	74.26	19.34	730.5	625.9	7.932	0.153	0.000					
	8/23/2016	67.36	17.67	637.5	567.8	6.762	0.143	0.000					
1544P	8/9/2016	114.40	30.49	871.4	831.8	9.476	0.376	0.000					
	8/23/2016	113.50	29.18	816.7	805.4	9.239	0.371	0.000					
1545P	8/9/2016	53.25	13.86	595.0	477.1	4.078	0.374	0.000					
	8/23/2016	52.10	13.94	551.9	466.8	4.042	0.369	0.000					
1546P	8/9/2016	84.35	21.37	799.3	701.3	2.625	0.073	0.000					
	8/23/2016	76.77	19.42	702.7	662.2	2.504	0.060	0.000					
P372	8/9/2016	19.21	4.63	412.9	297.4	7.352	0.123	0.000					
	8/23/2016	18.58	4.57	367.2	286.9	7.005	0.110	0.000					
P6023	8/23/2016	32.44	8.29	492.6	439.9	1.441	0.012	0.000					

# Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P6024	8/9/2016		47.63		11.56	575.9	475.2				1.237	0.029	0.000
	8/23/2016		45.69		11.15	518.2	462.5				1.196	0.024	0.000
P6029	8/9/2016		186.80		43.87	1183.0	1223.0				9.466	0.089	0.000
	8/23/2016		166.00		41.69	1155.0	1260.0				9.746	0.059	0.000

CROW BUTTE MINE  
 MONTHLY RESTORATION REPORT  
 AUGUST 2016  
 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		RO and Reductant I676P, I685P, and P1117.
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:  
 BL5-3, BL5-4, BL5-5, I693P, P694, P699, I698P, P849, and P1002.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL5-3, BL5-4, BL5-5, I685P, I693P, P694, P849, and P1002.

# Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL5-3	8/9/2016		22.09		5.38	413.3	342.4				0.041	0.009	0.000
	8/23/2016		21.25		5.16	360.4	322.9				0.042	0.009	0.000
BL5-4	8/9/2016		17.38		4.17	393.5	298.9				0.192	0.023	0.000
	8/23/2016		17.57		4.25	355.8	306.4				0.212	0.007	0.000
BL5-5	8/9/2016		13.67		3.14	340.1	278.1				0.133	0.008	0.000
	8/23/2016		13.64		3.14	303.7	279.6				0.141	0.002	0.000
I685P	8/9/2016		21.43		5.76	502.5	415.9				2.378	0.355	0.000
	8/23/2016		20.29		5.42	439.7	403.2				2.366	0.332	0.000
I693P	8/9/2016		11.04		2.47	385.1	316.5				5.524	0.538	0.000
	8/23/2016		10.68		2.39	331.4	298.8				5.248	0.554	0.000
P1002	8/9/2016		17.63		4.41	438.2	392.1				1.271	0.320	0.000
	8/23/2016		17.24		4.37	386.3	378.8				1.259	0.267	0.000
P694	8/9/2016		16.77		4.21	440.7	345.9				1.823	0.195	0.000
	8/23/2016		16.82		4.22	395.0	335.0				1.920	0.206	0.000
P849	8/9/2016		14.13		3.32	400.3	351.8				0.738	0.014	0.000
	8/23/2016		14.16		3.29	357.8	338.0				0.809	0.020	0.000



CROW BUTTE MINE  
 MONTHLY RESTORATION REPORT  
 AUGUST 2016  
 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		RO and Reductant P1374, P1377, P1399, P1439, P1467, P1598, and P1624.
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:

P1273, P1288, P1312, P1314, P1315, P1402, P1404, P1426, P1440, P1449, P1461, P1476, P1494, P1532, P1582, P1590, P1611, P1704, and P1721.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

P1273, P1312, P1314, P1315, P1374, P1377, P1399, P1402, P1404, P1426, P1439, P1440, P1449, P1461, P1467, P1476, P1494, P1582, and P1624.

# MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1273	8/9/2016			63.68	15.78	928.0	725.8					21.01	0.229	0.000
	8/23/2016			58.02	14.33	825.8	675.4					19.88	0.228	0.000
P1312	8/9/2016			20.50	5.04	412.6	276.7					6.81	1.820	0.000
	8/23/2016			17.38	4.17	338.3	244.6					5.92	1.681	0.000
P1314	8/23/2016			39.32	12.10	748.5	646.9					3.86	1.068	0.000
	8/23/2016			42.87	10.52	584.9	550.6					0.74	0.235	0.000
P1374	8/9/2016			13.84	3.78	439.7	266.2					4.09	1.678	0.000
	8/23/2016			12.00	3.29	361.8	232.7					3.67	1.710	0.000
P1377	8/9/2016			27.76	6.55	462.4	391.2					1.80	0.372	0.000
	8/23/2016			24.94	5.89	386.3	353.8					1.68	0.354	0.000
P1399	8/9/2016			46.50	10.41	601.7	482.2					2.24	0.398	0.000
	8/23/2016			44.28	9.65	541.5	467.4					2.20	0.392	0.000
P1402	8/9/2016			27.91	6.66	584.6	402.3					7.09	0.147	0.000
	8/23/2016			25.91	6.12	487.1	370.0					6.37	0.148	0.000
P1404	8/9/2016			51.54	12.81	811.6	639.6					6.47	0.129	0.000
	8/23/2016			49.27	11.93	740.4	619.0					6.39	0.134	0.000
P1426	8/9/2016			16.61	4.16	390.7	317.0					3.55	0.215	0.000
	8/23/2016			17.40	4.32	360.0	316.9					3.43	0.201	0.000
P1439	8/9/2016			18.09	5.29	530.5	316.2					3.79	1.657	0.000
	8/23/2016			16.22	4.91	459.3	290.3					3.60	1.756	0.000
P1440	8/9/2016			24.02	7.19	499.6	337.3					2.50	2.476	0.000
	8/23/2016			22.64	6.59	433.5	311.9					2.40	2.514	0.000
P1449	8/9/2016			34.16	9.42	764.7	535.0					15.17	0.525	0.000

# MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1461	8/23/2016			32.11	8.67	657.9	503.5					15.08	0.573	0.000
P1467	8/23/2016			27.01	6.96	496.3	483.3					2.87	0.572	0.000
	8/9/2016			25.08	7.85	684.8	500.8					6.34	1.504	0.000
P1476	8/23/2016			21.94	6.89	589.2	456.2					6.21	1.754	0.000
P1494	8/23/2016			17.18	4.29	414.2	328.7					9.76	0.611	0.000
	8/9/2016			52.18	13.32	873.5	685.8					7.20	0.402	0.000
P1582	8/23/2016			43.97	11.92	757.1	636.3					6.87	0.400	0.000
P1624	8/23/2016			16.18	4.22	409.9	397.5					1.60	0.659	0.000
	8/23/2016			12.44	3.72	380.9	294.9					2.23	1.307	0.000