2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
HW-1L (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.75	0.45	1.29	1.29
ORP	mV	-	274.5	-298.6	-284.1	-291.9
pH	SU	8.14-9.14	8.49	8.48	8.33	8.54
Specific Conductance	uS/cm	-	382.5	385.1	377.6	390
Temperature	C	-	7.9	9.69	9.03	8.1
Turbidity	NTU	-	3.54	2.99	4.65	1.92
Water Elevation	ft MSL	-	1458.45	1512.15	-	1446.68
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.18**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	745.21	-	-	**621**	-
Cadmium	ug/L	3.000	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	1186.83	**446**	**831**	**795**	**861**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	23.04	-	-	**15.7**	-
Manganese	ug/L	200	< 50	< 50	<1.1	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20	**0.17**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.8	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	109.06	**80**	**80.3**	**81.6**	**82.9**
Alkalinity, Carbonate	mg/L	7.8	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	57.2	**44.8**	**44.5**	**44.4**	**42.2**
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.1	< 0.025	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.10	<0.0089	< 0.10
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.10	**0.007**	< 0.10
Sulfate	mg/L	33.01	**25.4**	**27.3**	**25.1**	**27.7**
Sulfide	mg/L	0.8	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	34.39	**25.4**	**25.9**	**27.5**	**25.7**
Magnesium	mg/L	14.63	**10.4**	**10.8**	**11.1**	**11.4**
Potassium	mg/L	6.17	**1.8**	**1.8**	**1.8**	**1.8**
Sodium	mg/L	28.01	**21.9**	**22.9**	**22.6**	**23.0**
General						
Hardness	mg/L	155.68	**139**	**120**	**114**	**111**
		-				
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2018 Q4 Mine Permit Groundwater Quality Monitoring Data
HW-1U LLA (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.68	0.54	1.28	1.64
ORP	mV	-	-91.4	-183.4	-215.6	-238.1
pH	SU	8.06-9.06	9.43	8.95	8.31	8.42
Specific Conductance	uS/cm	-	523.1	449.1	432.8	449.1
Temperature	C	-	6.4	10.24	9.34	6.8
Turbidity	NTU	-	893	126.4	4.52	6.98
Water Elevation	ft MSL	-	1521.55	1475.83	1490.34	1478.88
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<2.0	-
Arsenic	ug/L	9.6	**8.6**	< 5.0	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	<8.4	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.99**	-
Cobalt	ug/L	80	-	-	<20.0	-
Copper	ug/L	8.56	**7.7**	< 4.0	<4.0	<4.0
Iron	ug/L	56769.6	**45200**	< 200	<13.0	**262**
Lead	ug/L	15.0	**86.7**	< 3.0	<0.10	<3.0
Lithium	ug/L	17.39	-	-	**13.0**	-
Manganese	ug/L	672.84	**455**	< 50.0	<1.1	<50.0
Mercury	ng/L	14.2	**3.95**	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.78**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.20	-
Thallium	ug/L	2.0	-	-	<2.0	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	44.15	**33.8**	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	156.67	**48.5**	**93.6**	**111**	**116**
Alkalinity, Carbonate	mg/L	64.24	**82.8**	**21.7**	<2.0	<2.0
Chloride	mg/L	61.2	**90.1**	**21.4**	**20.8**	**17.6**
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.299	**0.567**	**0.266**	**0.177**	**0.156**
Nitrogen, Nitrate	mg/L	0.57	**0.129**	< 0.10	<0.0089	< 0.10
Nitrogen, Nitrite	mg/L	0.78	< 0.1	**0.115**	**0.006**	< 0.10
Sulfate	mg/L	395.42	**299**	**84.9**	**58.0**	**56.0**
Sulfide	mg/L	0.80	< 5.0	< 1.0	<0.011	<0.20
Major Cations						
Calcium	mg/L	61.29	**64**	**6.5**	**25.1**	**25.0**
Magnesium	mg/L	25.82	**26.4**	**2**	**9.3**	**8.9**
Potassium	mg/L	16.88	**5.3**	**3.4**	**3.6**	**3.0**
Sodium	mg/L	134.27	**136**	**80.2**	**42.8**	**42.7**
General						
Hardness	mg/L	170.91	**30**	**28**	**101**	**99.0**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
HW-1U UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.48	0.52	1.2	1.17
ORP	mV	-	-281.4	-291.1	-364.5	-353.5
pH	SU	8.4-9.4	8.94	8.67	8.77	8.7
Specific Conductance	uS/cm	-	182.8	158.5	202.2	243.7
Temperature	C	-	5.7	8.95	10.63	8.0
Turbidity	NTU	-	4.72	29.32	5.06	7.83
Water Elevation	ft MSL	-	1531.72	1532.65	1533.35	1534.85
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	9.3	< 5.0	< 5.0	**0.37**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**51.6**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.44**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	1364.17	<200	< 200	**344**	**449**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	16.74	-	-	<4.6	-
Manganese	ug/L	80.14	< 50	**79**	**54.7**	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.31**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	121.72	**81.0**	**141.0**	**70.6**	**102**
Alkalinity, Carbonate	mg/L	17.08	< 2.0	< 2.0	**8.0**	<2.0
Chloride	mg/L	96.09	< 10	< 10.0	<0.72	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.058**	<1.0
Nitrogen, Ammonia	mg/L	0.097	**0.028**	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.005**	< 0.1
Sulfate	mg/L	72.34	**2.1**	**1.5**	<0.86	**1.4**
Sulfide	mg/L	2.47	< 0.20	< 0.20	**0.023**	<0.20
Major Cations						
Calcium	mg/L	34.03	**14.8**	**14.6**	**19.6**	**24.9**
Magnesium	mg/L	15.63	**5.5**	**4.3**	**5.4**	**6.8**
Potassium	mg/L	20.91	**3.4**	**2.9**	**3.1**	**3.6**
Sodium	mg/L	67.74	**7.7**	**6**	**5.8**	**5.5**
General						
Hardness	mg/L	146.74	**88.2**	**56**	**71.1**	**90.1**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
HW-2 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.49	1.36	1.35	1.42
ORP	mV	-	-231.9	-227.1	-243.6	-256.2
pH	SU	7.29-8.29	8.07	8.29	8.21	8.72
Specific Conductance	uS/cm	-	699.2	675.1	613.3	594.5
Temperature	C	-	10.1	10.41	9.43	8.5
Turbidity	NTU	-	356.1	29.15	19.91	80.4
Water Elevation	ft MSL	-	1533.17	1534.04	1534.96	1536.18
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.25**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**99.5**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.42**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	2594.79	**912**	**426**	**683**	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	333.37	**304**	**282**	**284**	**136**
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.36**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	141.40	**99**	**95.6**	**88.6**	**87.3**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	34.7	**33.5**	**32.8**	**28.9**	**27.3**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.088**	<1.0
Nitrogen, Ammonia	mg/L	0.083	<0.025	< 0.025	<0.004	0.0376
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.10	<0.0089	< 0.10
Nitrogen, Nitrite	mg/L	0.4	<0.1	< 0.10	<0.0037	< 0.10
Sulfate	mg/L	175.33	**135**	**169**	**154**	**163**
Sulfide	mg/L	0.52	< 0.20	< 0.20	<0.20	**0.54**
Major Cations						
Calcium	mg/L	71.88	**57**	**56.3**	**54.6**	**48.1**
Magnesium	mg/L	26.49	**22.7**	**22.5**	**20.6**	**19.9**
Potassium	mg/L	6.12	**5.1**	**4.6**	**4.3**	**4.4**
Sodium	mg/L	29.55	**33.8**	**30.6**	**34.6**	**37.8**
General						
Hardness	mg/L	296.9	**161**	**246**	**221**	**202**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
HW-8U (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	2.87	2.05	1.59	1.50
ORP	mV	-	-86.4	-82.7	-96.6	-116.6
pH	SU	6.4-7.4	6.84	6.8	6.6	6.75
Specific Conductance	uS/cm	-	454.6	430.1	474.8	486.2
Temperature	C	-	6.1	8.95	9.54	8.5
Turbidity	NTU	-	7.35	2.97	2.36	4.32
Water Elevation	ft MSL	-	1533.04	1534.72	1534.5	-
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4	-	-	<0.80	-
Arsenic	ug/L	8.8	**8.5**	**8.3**	**9.9**	**8.2**
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**29.7**	-
Cadmium	ug/L	3	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.59**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	22048.83	**8810**	**9490**	**9740**	**9820**
Lead	ug/L	9	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	14.39	-	-	<4.6	-
Manganese	ug/L	6267.76	**5820**	**6220**	**6040**	**5940**
Mercury	ng/L	4	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.8	-	-	<0.10	-
Thallium	ug/L	2	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	26.73	< 10	< 10.0	**3.4**	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	214.17	**154**	**154**	**160**	**170**
Alkalinity, Carbonate	mg/L	8	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	18.35	**18.9**	**18.6**	**20.3**	**20.5**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.091**	<1.0
Nitrogen, Ammonia	mg/L	0.041	< 0.025	< 0.025	**0.0417**	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	12.26	**13.2**	**13**	**13.7**	**15.7**
Sulfide	mg/L	0.8	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	45.93	**40.2**	**43**	**45.1**	**46.8**
Magnesium	mg/L	18.68	**12.5**	**13.2**	**13.4**	**13.6**
Potassium	mg/L	3.64	**3.1**	**3.5**	**3.4**	**3.6**
Sodium	mg/L	4.26	**4.2**	**4.5**	**4.5**	**4.6**
General						
Hardness	mg/L	203.47	**157**	**188**	**168**	**173**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
HYG-1 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.66	0.51	1.29	0.27
ORP	mV	-	33.4	19.5	-30.6	91.6
pH	SU	6.29-7.29	6.81	6.76	6.79	6.72
Specific Conductance	uS/cm	-	761.3	714.1	567.4	621.4
Temperature	C	-	7.6	7.61	9.26	8.7
Turbidity	NTU	-	1.11	1.39	1.59	0.95
Water Elevation	ft MSL	-	1532.87	1533.26	1534.55	1531.03
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	**8.9**	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.37**	<5.0
Barium	ug/L	400	-	-	**68.2**	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**83.1**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.22**	-
Cobalt	ug/L	80	-	-	**0.98**	-
Copper	ug/L	9.22	**12.3**	< 4.0	**4.0**	<4.0
Iron	ug/L	481.9	<200	< 200	<13.0	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	627.41	**671**	**653**	**587**	**647**
Mercury	ng/L	37.3	**7.99**	**22.1**	**36.0**	**39.3**
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.55**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	**0.044**	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	25.31	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	372.91	**259**	**253**	**177**	**189**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	21.5	**11**	**12.9**	**15.5**	**17.3**
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.56	**0.333**	**0.306**	**0.266**	**0.215**
Nitrogen, Nitrate	mg/L	0.08	< 0.1	< 0.10	**0.239**	< 0.10
Nitrogen, Nitrite	mg/L	0.40	< 0.1	< 0.10	**0.005**	< 0.10
Sulfate	mg/L	136.69	**122**	**78.3**	**87.6**	**105**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	65.21	**58.1**	**47.6**	**47.6**	**48.5**
Magnesium	mg/L	34.32	**28.1**	**23.8**	**22.8**	**25.6**
Potassium	mg/L	12.96	**11.1**	**10.6**	**9.8**	**10.3**
Sodium	mg/L	80.47	**49**	**54.6**	**28.5**	**30.3**
General						
Hardness	mg/L	321.93	**284**	**234**	**213**	**227**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
KMW-5R (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q3 2018 Filtered	Q4 2018
Field							
D.O.	ppm	-	5.08	2.87	7.57	7.57	4.93
ORP	mV	-	14	84.7	131.6	131.6	184.3
pH	SU	6.67-7.67	7.15	6.98	6.99	6.99	7.02
Specific Conductance	uS/cm	-	868.5	906.3	848.1	848.1	897.5
Temperature	C	-	7.7	14.4	14.86	14.86	7.9
Turbidity	NTU	-	2076.5	761.66	89.6	89.6	254.79
Water Elevation	ft MSL	-	1554.17	1557.56	1560.68	1560.68	1562.48
Metals							
Aluminum	ug/L	200	-	-	**623**	<31.0	-
Antimony	ug/L	4	-	-	<0.80	<0.80	-
Arsenic	ug/L	7.5	**18.4**	**15.6**	<0.10	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	<0.10	-
Beryllium	ug/L	2.5	-	-	<1.0	<0.10	-
Boron	ug/L	1200	-	-	**95.7**	**99.5**	-
Cadmium	ug/L	3	-	-	<0.10	<0.10	-
Chromium	ug/L	40	-	-	**0.86**	**0.13**	-
Cobalt	ug/L	80	-	-	<0.40	**0.42**	-
Copper	ug/L	28.32	**51.8**	**43.6**	<4.0	**0.42**	<4.0
Iron	ug/L	52956	**91200**	**129000**	**3940**	<13.0	**1560**
Lead	ug/L	9	**6.4**	**6.1**	**0.31**	<0.10	<3.0
Lithium	ug/L	31.39	-	-	**10.9**	**14.2**	-
Manganese	ug/L	2789	**2330**	**2070**	**1200**	**1190**	**1010**
Mercury	ng/L	14.89	**24.1**	**17.8**	<1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	<0.20	-
Nickel	ug/L	80	**47.4**	**48.8**	<20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	<1.0	-
Silver	ug/L	0.8	-	-	<0.10	<0.10	-
Thallium	ug/L	2	-	-	<2.0	<0.040	-
Vanadium	ug/L	-	-	-	<4.0	<1.4	-
Zinc	ug/L	23.65	**33.9**	**22.8**	**1.9**	**1.8**	<10.0
Major Anions							
Alkalinity, Bicarbonate	mg/L	480.97	**372**	**384**	**386**	-	**394**
Alkalinity, Carbonate	mg/L	8	< 2.0	< 2.0	<2.0	-	<2.0
Chloride	mg/L	191.74	< 10	< 10.0	<0.72	-	<10.0
Fluoride	mg/L	2.5	<1.0	< 1.0	**0.053**	-	<1.0
Nitrogen, Ammonia	mg/L	0.063	<0.025	<0.025	<0.004	-	<0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	**0.026**	-	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.005**	-	< 0.1
Sulfate	mg/L	138.86	**86.9**	**91.4**	**84.5**	-	**75.2**
Sulfide	mg/L	0.8	<0.62	< 1.0	<0.011	-	<0.20
Major Cations							
Calcium	mg/L	166.39	**123**	**115**	**119**	-	**111**
Magnesium	mg/L	65.48	**55.4**	**63.3**	**44.0**	-	**40.4**
Potassium	mg/L	8.30	**7.8**	**8.2**	**7.1**	-	**7.2**
Sodium	mg/L	7.71	**8.5**	**8.2**	**8.9**	-	**9.3**
General							
Hardness	mg/L	757.06	**490**	**512**	**479**	-	**443**
		-					
		-					

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-9R (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	1.81	1.63	3.08	3.00
ORP	mV	-	215.7	161.4	170.6	136.4
pH	SU	5.4-6.4	5.89	6.11	5.87	6.04
Specific Conductance	uS/cm	-	364.3	238.9	435.2	405.1
Temperature	C	-	5.8	11.01	13.45	10.8
Turbidity	NTU	-	2.57	4.02	2.14	3.61
Water Elevation	ft MSL	-	1595.96	1597.1	1595.05	1596.77
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**76.4**	-
Cadmium	ug/L	3.0	-	-	**0.10**	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	**0.73**	-
Copper	ug/L	38.92	**5.4**	< 4.0	<0.20	<4.0
Iron	ug/L	4098.78	< 200	< 200	**15.5**	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	1376.02	**124**	< 50.0	**66.0**	**53.4**
Mercury	ng/L	10.07	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	185.91	**116**	**76.1**	**66.0**	**86.9**
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	38.14	**37.1**	**30.5**	**18.1**	**20.5**
Major Anions						
Alkalinity, Bicarbonate	mg/L	85.44	**28.8**	**28.3**	**78.6**	**46.0**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	184.87	**20**	**12.4**	**13.0**	**31.4**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.098**	<1.0
Nitrogen, Ammonia	mg/L	0.22	< 0.025	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	3.8	**0.949**	**0.355**	**0.279**	**0.683**
Nitrogen, Nitrite	mg/L	0.4	<0.1	< 0.10	<0.004	< 0.10
Sulfate	mg/L	334.5	**135**	**46.6**	**97.9**	**96.2**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	116.03	**35.9**	**18**	**47.1**	**42.1**
Magnesium	mg/L	41.43	**12.5**	**6.8**	**16.4**	**13.8**
Potassium	mg/L	5.21	**2.6**	**1.6**	**3.0**	**2.7**
Sodium	mg/L	47.56	**6.7**	**6.5**	**10.6**	**9.3**
General						
Hardness	mg/L	479.44	**161**	**76**	**185**	**162**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-701 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	4.15	6.29	6.02	3.7
ORP	mV	-	179.8	271.5	207.6	155.8
pH	SU	-	6.11	5.92	5.58	5.53
Specific Conductance	uS/cm	-	222.4	131.4	883.5	1905.3
Temperature	C	-	4.24	8.61	10.68	7.0
Turbidity	NTU	-	2.57	1.49	1.79	1.75
Water Elevation	ft MSL	-	1531.67	1533.00	1533.69	1534.91
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.32**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**17.3**	-
Cadmium	ug/L	3	-	-	**0.15**	-
Chromium	ug/L	40	-	-	**0.80**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	**0.53**	<4.0
Iron	ug/L	497.99	< 200	< 200	<13.0	<200
Lead	ug/L	9	< 3.0	< 3.0	<3.0	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	5262.51	**50.4**	< 50.0	<1.1	<50.0
Mercury	ng/L	8.44	**1.34**	< 1.0	<1.0	**1.64**
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.8	-	-	<0.10	-
Thallium	ug/L	2	-	-	**0.048**	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	117.82	**58.6**	**36.1**	**34.5**	**33.8**
Alkalinity, Carbonate	mg/L	8	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	22.96	**13.2**	< 10.0	**243**	**602**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.071**	<1.0
Nitrogen, Ammonia	mg/L	0.402	< 0.025	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	1.87	**0.777**	**0.65**	**0.779**	**0.899**
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.10	0.004	< 0.10
Sulfate	mg/L	85.65	**20.2**	**14.8**	**11.0**	**12.4**
Sulfide	mg/L	0.8	< 0.20	< 0.20	<0.20	<0.20
Major Cations						
Calcium	mg/L	43.04	**18.9**	**8.9**	**69.4**	**90.7**
Magnesium	mg/L	18.63	**7.3**	**4**	**28.7**	**35.6**
Potassium	mg/L	8.95	**3.0**	**2.1**	**6.2**	**12.5**
Sodium	mg/L	11.68	**7.2**	**6.3**	**46.8**	**251**
General						
Hardness	mg/L	199.04	**106**	**40**	**292**	**373**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-701 UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.50	0.81	1.33	1.32
ORP	mV	-	-207.2	-212.1	-219.7	-220.7
pH	SU	6.71-7.71	7.48	7.41	7.41	7.52
Specific Conductance	uS/cm	-	387.5	413.7	402.3	410.3
Temperature	C	-	6.7	8.78	8.45	7.3
Turbidity	NTU	-	76.07	16.54	35.51	37.03
Water Elevation	ft MSL	-	1532.06	1533.38	1533.88	1534.72
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.14**	<5.0
Barium	ug/L	157.47	-	-	**141**	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**53.5**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.14**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	45.38	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	24957.73	**15000**	**14800**	**14300**	**19400**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	12.91	-	-	**7.9**	-
Manganese	ug/L	4677.42	**2260**	**2170**	**2030**	**1880**
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	13.83	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	161.71	**145**	**147**	**157**	**150**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	48.85	< 10	**11.1**	**11.2**	**14.5**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.087**	<1.0
Nitrogen, Ammonia	mg/L	1.75	< 0.025	< 0.025	**0.0063**	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.004**	< 0.1
Sulfate	mg/L	52.19	**19.6**	**13.9**	**11.3**	**7.1**
Sulfide	mg/L	1.86	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	38.59	**34.6**	**36.1**	**38.7**	**37.4**
Magnesium	mg/L	16.16	**14.8**	**14.8**	**15.0**	**13.9**
Potassium	mg/L	8.53	**2.7**	**3.4**	**3.3**	**3.7**
Sodium	mg/L	33.46	**4.5**	**5.1**	**5.1**	**5.6**
General						
Hardness	mg/L	163.25	**176**	**154**	**158**	**151**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-702 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	1.3	1.89	1.75	0.58
ORP	mV	-	-47.1	112.1	-55.1	226.1
pH	SU	8.81-9.91	9.96	9.82	8.15	7.19
Specific Conductance	uS/cm	-	421.6	426.1	365.5	-
Temperature	C	-	6.8	7.41	7.81	-
Turbidity	NTU	-	1.78	4.15	34.37	-
Water Elevation	ft MSL	-	1530.82	1531.72	-	-
Metals						
Aluminum	ug/L	122.72	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	**5.3**	<0.10	<5.0
Barium	ug/L	195.71	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**22.6**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.65**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	800	< 200	< 200	<13.0	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	545.68	< 50	< 50.0	<1.1	<50.0
Mercury	ng/L	3.55	**1.49**	**1.92**	**2.05**	**2.30**
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.88**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	**3.2**	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	160.17	**75.8**	**35.5**	**111**	**110**
Alkalinity, Carbonate	mg/L	40.7	**8.1**	**39.4**	<2.0	<2.0
Chloride	mg/L	17.58	< 10	< 10.0	<10.0	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	<1.0	<1.0
Nitrogen, Ammonia	mg/L	0.042	<0.025	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	1.24	**1.06**	**0.837**	**0.352**	**0.266**
Nitrogen, Nitrite	mg/L	0.18	**0.127**	**0.103**	<0.1	<0.1
Sulfate	mg/L	133.19	**59.8**	**57.5**	**54.3**	**54.6**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.20	<0.20
Major Cations						
Calcium	mg/L	78.82	**28.9**	**23.4**	**24.1**	**22.9**
Magnesium	mg/L	14.06	**6.2**	**3.9**	**6.5**	**8.0**
Potassium	mg/L	22.00	**13.9**	**14.9**	**10.2**	**7.8**
Sodium	mg/L	60.14	**40.4**	**57.5**	**34.7**	**31.3**
General						
Hardness	mg/L	251.25	**114**	**80**	**87.1**	**90.0**
		-				
		-				

Explanations of abbreviations are included on the final page of this table.

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-702 UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	1.29	2.39	2.26	1.38
ORP	mV	-	-194.1	-176.1	185.6	-216.2
pH	SU	7.11-8.11	8.06	8.06	7.69	7.97
Specific Conductance	uS/cm	-	260.3	269.1	180.8	279.6
Temperature	C	-	7.02	13.68	8.92	6.7
Turbidity	NTU	-	5.01	11.84	11.72	18.05
Water Elevation	ft MSL	-	1518.19	1522.42	1519.93	1512.39
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.15**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**97.9**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	1328.38	**623**	**954**	**1240**	**791**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	12.91	-	-	**4.9**	-
Manganese	ug/L	118.08	**89.1**	**90**	**98.0**	**83.7**
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.11**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	76.03	< 10	<10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	111.84	**96.5**	**181**	**90.0**	**88.4**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10.0	<0.72	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.087	< 0.025	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.007**	< 0.1
Sulfate	mg/L	36.1	**33.1**	**30.9**	**28.7**	**29.2**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	38.98	**27.9**	**29.2**	**28.7**	**28.8**
Magnesium	mg/L	11.74	**8.8**	**9.2**	**9.2**	**9.3**
Potassium	mg/L	11.24	**2.7**	**3**	**3.3**	**3.0**
Sodium	mg/L	5.20	**2.8**	**3**	**3.0**	**3.0**
General						
Hardness	mg/L	139.94	**139**	**116**	**110**	**110**
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2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-703 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	6.00	5.83	6.18	8.75
ORP	mV	-	229.1	260.1	110.6	353.1
pH	SU	6.3-7.3	6.19	6.29	6.1	5.68
Specific Conductance	uS/cm	-	199.1	203.1	206.3	180.3
Temperature	C	-	5.90	7.04	7.48	5.9
Turbidity	NTU	-	1.49	1.47	1.57	1.63
Water Elevation	ft MSL	-	1533.96	1533.42	1533.02	1533.14
Metals						
Aluminum	ug/L	200	-	-	<50.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	<5.0	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	<300	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	<20.0	-
Copper	ug/L	16	< 4.0	< 4.0	**0.37**	<4.0
Iron	ug/L	286.57	< 200	< 200	<200	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<3.0	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	106.54	< 50	< 50.0	<50.0	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	**1.41**	<1.0
Molybdenum	ug/L	200	-	-	**0.23**	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	**1.1**	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	92.34	**54.5**	**54.7**	**54.0**	**53.3**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10.0	<0.72	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.059**	<1.0
Nitrogen, Ammonia	mg/L	0.082	< 0.025	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	1.81	**1.82**	**1.31**	**2.02**	**1.68**
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	40.56	**29**	**28.7**	**27.6**	**26.4**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	31.29	**18.5**	**18.9**	**19.5**	**17.0**
Magnesium	mg/L	9.83	**7.9**	**7.9**	**8.4**	**8.0**
Potassium	mg/L	2.57	**1.6**	**1.5**	**1.5**	**1.4**
Sodium	mg/L	7.74	**2**	**1.9**	**2.0**	**1.9**
General						
Hardness	mg/L	115.53	**106**	**84**	**83.2**	**75.5**
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2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-703 UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	2.61	0.87	1.6	1.32
ORP	mV	-	-231.5	-234.1	-234.7	-289.3
pH	SU	7.44-8.44	8.19	8.16	8.04	8.41
Specific Conductance	uS/cm	-	293.3	291.6	288.0	309.4
Temperature	C	-	5.1	11.11	8.72	6.1
Turbidity	NTU	-	2.32	2.58	2.03	0.92
Water Elevation	ft MSL	-	1532.09	1528.14	1512.14	1530.71
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.29**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**41.9**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.15**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	1902.7	**1630**	**1640**	**1420**	**1820**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	199.79	**189**	**157**	**116**	**165**
Mercury	ng/L	4.0	< 1.0	< 1.0	**2.28**	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.16**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	**2.8**	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	111.44	**83**	**82.2**	**80.0**	**81.4**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10.0	<0.72	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.084**	<1.0
Nitrogen, Ammonia	mg/L	0.75	< 0.025	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.004**	< 0.1
Sulfate	mg/L	49.32	**46.1**	**45.5**	**42.3**	**44.9**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	42.87	**30.5**	**32**	**30.3**	**30.0**
Magnesium	mg/L	13.90	**10**	**10.7**	**10.5**	**10.4**
Potassium	mg/L	4.23	**2.3**	**2.4**	**2.2**	**2.2**
Sodium	mg/L	17.31	**2.8**	**3.0**	**3.0**	**3.0**
General						
Hardness	mg/L	173.44	**147**	**130**	**119**	**118**
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2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-703 LLA (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.42	0.52	1.18	1.27
ORP	mV	-	-289.1	-298.1	-259.4	-275.9
pH	SU	8.08-9.08	8.43	8.31	8.13	8.48
Specific Conductance	uS/cm	-	279.6	281.2	276.8	298.9
Temperature	C	-	6.3	8.75	9.2	6.4
Turbidity	NTU	-	2.94	17.63	3.68	5.82
Water Elevation	ft MSL	-	1530.84	*	1534.52	1535.74
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.16**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	<8.4	-
Cadmium	ug/L	3	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.19**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	2081.98	**817**	**699**	**715**	**597**
Lead	ug/L	9	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	28.08	-	-	**7.4**	-
Manganese	ug/L	94.53	**81.2**	**92.4**	**81.1**	**59.6**
Mercury	ng/L	4	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20.0	< 20.0	**0.14**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.8	-	-	<0.10	-
Thallium	ug/L	2	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	40	< 10.0	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	92.11	**81**	**79.2**	**80.5**	**79.4**
Alkalinity, Carbonate	mg/L	10.41	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	96.57	**10.8**	**10.2**	**11.6**	**10.8**
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.076	< 0.025	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	< 0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	43.42	**33**	**32.4**	**32.9**	**32.1**
Sulfide	mg/L	0.8	< 0.20	< 0.20	**0.025**	<0.20
Major Cations						
Calcium	mg/L	33.74	**25.3**	**27.4**	**26.8**	**24.4**
Magnesium	mg/L	12.29	**10**	**10.3**	**10.4**	**10.5**
Potassium	mg/L	7.73	**3**	**2.9**	**2.7**	**2.9**
Sodium	mg/L	51.07	**6.3**	**5.9**	**6.4**	**7.5**
General						
Hardness	mg/L	134.66	**131**	**118**	**110**	**104**

*- Diver failed on 3/22/18, replaced 5/16/18

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-703 DBA (Monitoring)- Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.89	0.9	1.46	1.5
ORP	mV	-	-255.7	-239.6	-270	-226.4
pH	SU	8.89-9.89	8.98	8.38	8.81	8.41
Specific Conductance	uS/cm	-	300.4	308.4	293.8	316.3
Temperature	C	-	5.7	9.98	8.5	5.8
Turbidity	NTU	-	1.08	2.98	2.1	1.34
Water Elevation	ft MSL	-	1531.35	1532.32	1533.21	1534.4
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.31**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	<8.4	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.27**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	861.32	< 200	< 200	**257**	<200
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	19.81	-	-	**10.2**	-
Manganese	ug/L	200	< 50	< 50.0	<1.1	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20.0	< 20.0	**0.18**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	26.21	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	87.85	**82**	**81.8**	**69.0**	**84.4**
Alkalinity, Carbonate	mg/L	38.7	< 2.0	< 2.0	**8.0**	<2.0
Chloride	mg/L	20	**15.3**	**15.5**	**15.8**	**15.7**
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.12	< 0.025	**0.0352**	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	0.86	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	72.78	**99.8**	**34.3**	**31.0**	**30.5**
Sulfide	mg/L	1.27	< 0.20	**0.33**	<0.20	**0.62**
Major Cations						
Calcium	mg/L	27.00	**25**	**15**	**26.3**	**23.6**
Magnesium	mg/L	17.28	**11.1**	**6.2**	**10.3**	**11.3**
Potassium	mg/L	29.63	**7.6**	**24.9**	**8.1**	**7.4**
Sodium	mg/L	16.16	**7.5**	**13**	**7.9**	**7.2**
General						
Hardness	mg/L	139.55	**137**	**80**	**108**	**105**
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Explanations of abbreviations are included on the final page of this table.

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-704 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm		0.76	1.72	1.21	0.41
ORP	mV		147.6	137.7	153.5	-30.0
pH	SU	5.43-6.43	5.85	5.83	5.75	6.26
Specific Conductance	uS/cm		371.8	384.4	389.4	690.4
Temperature	C		5.2	10.52	11.21	8.7
Turbidity	NTU		17.89	5.22	8.46	1.54
Water Elevation	ft MSL		1533.29	1534.52	1534.57	1534.54
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.27**	**8.5**
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**25.7**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	**0.94**	<4.0
Iron	ug/L	84519.23	< 200	**3590**	<13.0	**78600**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	8782.76	**689**	**1900**	**594**	**5000**
Mercury	ng/L	34.7	< 1.0	**2.85**	**1.20**	**4.58**
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	37.8	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	264.36	**78.8**	**94.1**	**61.7**	**199**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	23.77	**16.9**	**14.3**	**19.6**	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.038**	<1.0
Nitrogen, Ammonia	mg/L	0.19	< 0.025	**0.29**	<0.004	**2.47**
Nitrogen, Nitrate	mg/L	1.47	**1.15**	**0.721**	**0.882**	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	44.8	**54.7**	**51.8**	**83.9**	**28.6**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Calcium	mg/L	47.35	**32.9**	**33.6**	**35.1**	**40.9**
Magnesium	mg/L	14.76	**12.2**	**11.9**	**12.4**	**13.7**
Potassium	mg/L	6.10	**2.3**	**3.2**	**2.5**	**7.4**
Sodium	mg/L	32.26	**10.7**	**14.2**	**13.0**	**22.3**
General						
Hardness	mg/L	191.15	**167**	**130**	**139**	**158**
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2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-704 UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm		0.97	0.81	1.39	0.29
ORP	mV		-108.1	-142.6	-138.1	-164.7
pH	SU	6.4-7.4	6.81	7	6.82	7.23
Specific Conductance	uS/cm		599.1	646.7	575.6	610.2
Temperature	C		7.4	7.61	9.34	8.4
Turbidity	NTU		39.98	6.45	3.33	16.85
Water Elevation	ft MSL		1533.89	1535.11	1535.21	1535.07
Metals						
Aluminum	ug/L	5824.36	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.18**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**27.7**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	**0.59**	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	44051.82	**42900**	**47800**	**42300**	**36600**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	30.14	-	-	<4.6	-
Manganese	ug/L	1384.15	**906**	**990**	**815**	**789**
Mercury	ng/L	1.4	< 1.0	< 1.0	**1.03**	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.70**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	198.18	**158**	**154**	**131**	**144**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	24.46	**21.6**	**24**	**26.0**	**26.2**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.040**	<1.0
Nitrogen, Ammonia	mg/L	0.78	< 0.025	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.18	< 0.1	< 0.1	**0.009**	< 0.1
Sulfate	mg/L	45.37	**44.1**	**47.4**	**71.2**	**72.9**
Sulfide	mg/L	0.49	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	66.63	**52.7**	**56.2**	**50.9**	**56.6**
Magnesium	mg/L	14.04	**13.1**	**14**	**14.9**	**15.5**
Potassium	mg/L	5.28	**2.7**	**2.8**	**2.8**	**3.3**
Sodium	mg/L	43.16	**10.7**	**12.5**	**14.1**	**17.4**
General						
Hardness	mg/L	226.12	**216**	**184**	**188**	**205**
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2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-704 LLA (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.54	0.44	1.24	1.29
ORP	mV	-	-260.4	-318.4	-257.1	-320.6
pH	SU	-	8.34	8.58	8.24	8.56
Specific Conductance	uS/cm	-	328.2	267.6	354.4	317.2
Temperature	C	-	4.1	10.13	9.72	8.6
Turbidity	NTU	-	3.58	22.86	37.12	11.98
Water Elevation	ft MSL	-	1533.36	1534.97	1531.72	1531.95
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.76**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**47.8**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	<0.10	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	3308.59	**1130**	**2070**	**925**	**771**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	28.25	-	-	**13.7**	-
Manganese	ug/L	95.14	**83.4**	< 50.0	**101**	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.11**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	40	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	152.81	**135**	**111**	**157**	**119**
Alkalinity, Carbonate	mg/L	13.4	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10.0	**11.0**	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.083**	<1.0
Nitrogen, Ammonia	mg/L	0.1	< 0.025	< 0.025	**0.0295**	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.007**	< 0.1
Sulfate	mg/L	20.79	**10.3**	**8.3**	**9.9**	**7.3**
Sulfide	mg/L	0.80	< 0.20	< 0.20	**0.021**	<0.20
Major Cations						
Calcium	mg/L	33.39	**30.3**	**20.6**	**37.2**	**24.0**
Magnesium	mg/L	15.62	**13.7**	**13.9**	**15.6**	**14.6**
Potassium	mg/L	12.01	**5.9**	**6.8**	**5.4**	**6.1**
Sodium	mg/L	15.49	**4.5**	**4.8**	**4.7**	**4.6**
General						
Hardness	mg/L	156.51	**161**	**252**	**157**	**120**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-704 DBA (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.99	0.67	1.19	1.99
ORP	mV	-	-258.6	-251.1	-303.8	-224.5
pH	SU	8.13-9.13	8.46	8.4	8.46	8.46
Specific Conductance	uS/cm	-	263.2	262.4	266.1	271.9
Temperature	C	-	6.5	9.06	9.71	8.0
Turbidity	NTU	-	1.95	122.6	49.88	5.88
Water Elevation	ft MSL	-	*	1529.82	1529.52	1529.94
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	8.0	-	-	<0.80	-
Arsenic	ug/L	20.0	< 5.0	< 5.0	**0.34**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	4.0	-	-	<0.10	-
Boron	ug/L	1480	-	-	<8.4	-
Cadmium	ug/L	4.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.15**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	9645	**830**	**684**	**865**	**779**
Lead	ug/L	12.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	**11.7**	-
Manganese	ug/L	58	< 50	< 50.0	<1.1	<50.0
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	<0.20	-
Nickel	ug/L	80	< 20	< 20.0	**0.14**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	8.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	11	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	129	**132**	**132**	**127**	**142**
Alkalinity, Carbonate	mg/L	32.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10.0	<0.72	<10.0
Fluoride	mg/L	4.0	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.04	< 0.025	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.005**	< 0.1
Sulfate	mg/L	6	< 1.0	< 1.0	<0.86	<1.0
Sulfide	mg/L	0.80	<0.20	< 0.20	**0.017**	<0.20
Major Cations						
Calcium	mg/L	27.00	**21.8**	**21.3**	**22.4**	**22.7**
Magnesium	mg/L	14.00	**10.6**	**10.7**	**11.1**	**11.4**
Potassium	mg/L	4.00	**2.4**	**2.6**	**2.5**	**2.6**
Sodium	mg/L	14.00	**9.9**	**10**	**10**	**10.6**
General						
Hardness	mg/L	111.00	**125**	**110**	**102**	**103**

* - Diver failed 9/6/17, replaced 3/15/18

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-705 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.63	0.63	1.77	1.48
ORP	mV	-	-92.4	-10.3	-12.1	-30.2
pH	SU	5.67-6.67	6.66	6.14	5.87	6.17
Specific Conductance	uS/cm	-	231.1	198.6	378.6	370.8
Temperature	C	-	5.1	5.61	11.88	7.8
Turbidity	NTU	-	7.48	2.46	2.18	1.11
Water Elevation	ft MSL	-	1533.76	1536.47	1535.61	1535.96
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**32.0**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.35**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	**0.44**	<4.0
Iron	ug/L	12956.53	**7440**	**4870**	**10300**	**9710**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	1535.09	**651**	**523**	<55.0	<2500
Mercury	ng/L	1.8	< 1.0	**1.04**	<1.0	**1.09**
Molybdenum	ug/L	200	-	-	**0.24**	-
Nickel	ug/L	80	< 20	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	283.42	<10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	85.4	**110**	**46**	**40.0**	**48.7**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	51.62	**24.6**	**20.6**	**65.0**	**63.8**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.063**	<1.0
Nitrogen, Ammonia	mg/L	0.132	**0.095**	**0.0735**	**0.148**	**0.118**
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	**0.006**	< 0.1
Sulfate	mg/L	21.2	**2.4**	**7.6**	**2.9**	**2.7**
Sulfide	mg/L	0.80	< 0.20	< 0.20	**0.023**	<0.20
Major Cations						
Calcium	mg/L	23.88	**12.1**	**11.9**	**19.5**	**18.2**
Magnesium	mg/L	10.91	**5.6**	**5.4**	**8.5**	**8.3**
Potassium	mg/L	3.03	**2.1**	**1.9**	**2.8**	**2.6**
Sodium	mg/L	16.56	**12.3**	**12.2**	**17.6**	**18.7**
General						
Hardness	mg/L	109.66	**74**	**54**	**83.5**	**79.8**

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-705 UFB (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.91	0.62	1.32	1.40
ORP	mV	-	-117.1	-145.5	-127.6	-95.1
pH	SU	6.59-7.59	6.96	7.01	6.88	7.04
Specific Conductance	uS/cm	-	387.6	337.8	344.8	366.0
Temperature	C	-	6.2	10.21	10.92	6.44
Turbidity	NTU	-	172.1	6.42	2.85	9.77
Water Elevation	ft MSL	-	1533.53	1536.76	1535.34	1537.91
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	**0.39**	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**30.5**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.62**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	**0.74**	<4.0
Iron	ug/L	13309.31	**3960**	**9340**	**12100**	**7310**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	13.19	-	-	<4.6	-
Manganese	ug/L	972.64	**1440**	**955**	**936**	**875**
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	**0.45**	-
Nickel	ug/L	80	< 20	< 20.0	**0.76**	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	34.43	< 10	< 10.0	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	117.78	**101**	**84.2**	**79.6**	**88.3**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	35.98	**30.9**	**32.3**	**36.1**	**35.4**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.079**	<1.0
Nitrogen, Ammonia	mg/L	0.1	**0.03**	< 0.025	<0.004	< 0.025
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	14.23	**4.7**	**3.9**	**2.5**	**3.8**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	26.00	**28.6**	**24.7**	**27.4**	**26.5**
Magnesium	mg/L	13.29	**15.5**	**12.6**	**13.7**	**13.3**
Potassium	mg/L	4.01	**3.4**	**3.1**	**3.5**	**3.8**
Sodium	mg/L	3.37	**3.0**	**2.7**	**2.9**	**3.2**
General						
Hardness	mg/L	127.17	**172**	**120**	**125**	**121**
		-				
		-				

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-706 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.94	1.81	2.61	1.72
ORP	mV	-	63.6	75.5	66.3	75.3
pH	SU	5.74-6.74	6.02	5.93	5.75	5.88
Specific Conductance	uS/cm	-	991.4	1002.1	863.4	838.5
Temperature	C	-	7.8	9.21	9.47	7.9
Turbidity	NTU	-	2.91	2.52	3.5	3.01
Water Elevation	ft MSL	-	1559.45	1558.81	1559.33	1561.11
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	<8.4	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.26**	-
Cobalt	ug/L	31.38	-	-	**22.6**	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	8029.11	**3490**	**3410**	**2970**	**2990**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	17.21	-	-	<4.6	-
Manganese	ug/L	23484.14	**15000**	**13600**	**14100**	<25000
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	**0.57**	-
Nickel	ug/L	27.04	**23.2**	< 20.0	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	4.77	-	-	<1.4	-
Zinc	ug/L	77.08	< 10	< 10.0	**5.6**	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	131.77	**145**	**75.8**	**70.6**	**73.6**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	165.11	**126**	**117**	**105**	**100**
Fluoride	mg/L	2.5	< 1.0	< 1.0	**0.041**	<1.0
Nitrogen, Ammonia	mg/L	0.88	**0.416**	**0.412**	**0.426**	**0.37**
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	<0.0089	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	433.53	**186**	**192**	**179**	**175**
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.40
Major Cations						
Calcium	mg/L	132.61	**79.9**	**75.8**	**69.3**	**67.9**
Magnesium	mg/L	43.54	**29.4**	**28.9**	**27.3**	**26.4**
Potassium	mg/L	5.64	**4.3**	**4.5**	**4.3**	**4.6**
Sodium	mg/L	139.93	**45.0**	**44.4**	**42.0**	**42.3**
General						
Hardness	mg/L	619.10	**29**	**168**	**285**	**278**

2018 Q4 - Mine Permit Groundwater Quality Monitoring Data
MW-707 QAL (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	0.61	4.21	1.68	2.03
ORP	mV	-	-131.5	-123.1	-122.6	-116.3
pH	SU	6.43-7.43	7.26	7.16	6.93	7.1
Specific Conductance	uS/cm	-	342.9	349.6	332.4	333.9
Temperature	C	-	4.18	10.11	9.62	7.1
Turbidity	NTU	-	1.23	1.76	1.84	5.88
Water Elevation	ft MSL	-	1582.09	1582.94	1581.96	1582.69
Metals						
Aluminum	ug/L	200	-	-	<31.0	-
Antimony	ug/L	4.0	-	-	<0.80	-
Arsenic	ug/L	7.5	< 5.0	< 5.0	<0.10	<5.0
Barium	ug/L	400	-	-	<0.10	-
Beryllium	ug/L	2.5	-	-	<0.10	-
Boron	ug/L	1200	-	-	**20.2**	-
Cadmium	ug/L	3.0	-	-	<0.10	-
Chromium	ug/L	40	-	-	**0.19**	-
Cobalt	ug/L	80	-	-	<0.40	-
Copper	ug/L	16	< 4.0	< 4.0	<0.20	<4.0
Iron	ug/L	7115.36	**4800**	**3410**	**4440**	**3700**
Lead	ug/L	9.0	< 3.0	< 3.0	<0.10	<3.0
Lithium	ug/L	40	-	-	<4.6	-
Manganese	ug/L	1127.81	**976**	**716**	**841**	**747**
Mercury	ng/L	4.0	< 1.0	< 1.0	<1.0	<1.0
Molybdenum	ug/L	200	-	-	**0.89**	-
Nickel	ug/L	80	< 20	< 20	<0.10	<20.0
Selenium	ug/L	20	-	-	<1.0	-
Silver	ug/L	0.80	-	-	<0.10	-
Thallium	ug/L	2.0	-	-	<0.040	-
Vanadium	ug/L	16	-	-	<1.4	-
Zinc	ug/L	29.27	< 10	< 10	<1.7	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	168.29	**166**	**163**	**165**	**162**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	40	< 10	< 10	<0.72	<10.0
Fluoride	mg/L	2.5	< 1.0	< 1.0	<0.032	<1.0
Nitrogen, Ammonia	mg/L	0.32	**0.259**	**0.174**	**0.028**	-
Nitrogen, Nitrate	mg/L	0.4	< 0.1	< 0.1	**0.017**	< 0.1
Nitrogen, Nitrite	mg/L	0.4	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	9.35	**3.2**	**2.7**	<0.86	<1.0
Sulfide	mg/L	0.80	< 0.20	< 0.20	<0.011	<0.20
Major Cations						
Calcium	mg/L	45.91	**43.4**	**41.6**	**44.9**	**41.5**
Magnesium	mg/L	13.49	**11.3**	**11.5**	**11.7**	**11.3**
Potassium	mg/L	2.93	**2.1**	**2.2**	**2.3**	**2.4**
Sodium	mg/L	3.62	**3.0**	**2.8**	**2.9**	**3.0**
General						
Hardness	mg/L	162.23	**176**	**156**	**160**	**150**
		-				
		-				

Explanations of abbreviations are included on the final page of this table.

2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
MER-001 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	11.75	8.52	7.62	12.01
ORP	mV	-	67.8	230.6	143.7	93.6
pH	SU	5.4-6.4	6.91	6.66	6.78	7.60
Specific Conductance	uS/cm	-	99.6	71.9	114.3	100.0
Temperature	C	-	0.29	14.39	17.3	0.05
Turbidity	NTU	-	2.9	1.2	5.26	1.54
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	60.5	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	1.78	**1.1**	< 1.0	**1.5**	<1.0
Barium	ug/L	-	-	-	**9.1**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	**7.0**	-
Cadmium	ug/L	-	-	-	<0.012	-
Chromium	ug/L	-	-	-	**0.30**	-
Cobalt	ug/L	-	-	-	**0.193**	-
Copper	ug/L	1.56	**0.39**	**0.73**	**0.646**	**0.55**
Iron	ug/L	2135.64	**1610**	**1070**	**1640**	**911**
Lead	ug/L	0.66	**0.145**	**0.136**	**0.239**	**0.14**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	124.38	**123**	**1900**	**90.2**	**40.4**
Mercury	ng/L	4.63	**2.29**	**3.62**	**3.30**	**3.04**
Molybdenum	ug/L	-	-	-	**0.23**	-
Nickel	ug/L	0.74	**0.52**	**0.7**	**0.694**	**0.62**
Selenium	ug/L	-	-	-	**0.089**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	6.28	**1.88**	**2.4**	**0.93**	**2.62**
Major Anions						
Alkalinity, Bicarbonate	mg/L	23.92	**28.1**	**20.2**	**23.5**	**14.7**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	14.3	**6.7**	**4.9**	**7.2**	**4.0**
Fluoride	mg/L	0.4	< 0.10	< 0.10	**0.085**	<0.10
Nitrogen, Ammonia	mg/L	2.0	**0.066**	<0.025	<0.025	<0.025
Nitrogen, Nitrate	mg/L	2	**0.112**	< 0.1	0.044	< 0.1
Nitrogen, Nitrite	mg/L	2.0	< 0.1	< 0.1	<0.0037	< 0.1
Sulfate	mg/L	6.4	**1.6**	< 1.0	<1.7	<2.0
Sulfide	mg/L	20	< 0.20	< 0.20	**0.017**	<0.20
Major Cations						
Calcium	mg/L	9.97	**8.9**	**6.1**	**8.3**	**5.5**
Magnesium	mg/L	2.97	**2.5**	**1.9**	**2.2**	**1.6**
Potassium	mg/L	1.43	**0.68**	**0.68**	**0.74**	**0.50**
Sodium	mg/L	6.66	**3.6**	**3**	**4.1**	**2.4**
General						
Hardness	mg/L	43.78	**48**	**26**	**29.9**	**20.5**
Total Dissolved Solids	mg/L	200	<50	**116**	**110**	<50
Total Suspended Solids	mg/L	20.3	< 3.3	< 3.3	**3.6**	<3.3

2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
MER-002 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	11.62	8.4	7.65	12.06
ORP	mV	-	42.5	147.1	172.1	259.7
pH	SU	5.3-6.3	7.06	6.67	7.11	6.00
Specific Conductance	uS/cm	-	115.6	90.7	132.7	64.9
Temperature	C	-	0.3	14.29	16.3	0.07
Turbidity	NTU	-	3.47	1.83	5.39	1.34
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	**62.8**	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	2.05	**1.4**	**1.3**	**1.8**	<1.0
Barium	ug/L	-	-	-	**9.9**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	**23.4**	-
Cadmium	ug/L	-	-	-	<0.012	-
Chromium	ug/L	-	-	-	**0.45**	-
Cobalt	ug/L	-	-	-	**0.278**	-
Copper	ug/L	0.72	**0.40**	**0.66**	**0.576**	**0.55**
Iron	ug/L	2830.7	**2010**	**1300**	**2030**	**998**
Lead	ug/L	0.15	**0.131**	**0.133**	**0.211**	**0.139**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	346.55	**169**	**125**	**138**	**59.6**
Mercury	ng/L	4.26	**1.95**	**3.33**	**2.39**	**2.96**
Molybdenum	ug/L	-	-	-	**0.29**	-
Nickel	ug/L	0.82	**0.58**	**0.7**	**0.773**	**0.68**
Selenium	ug/L	-	-	-	**0.117**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	5.29	**8.25**	**1.96**	**0.91**	**2.71**
Major Anions						
Alkalinity, Bicarbonate	mg/L	31.21	**31.8**	**22.9**	**25.0**	**16.2**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	<2.0	<2.0	<2.0
Chloride	mg/L	18	**7.8**	**6.5**	**6.6**	**4.9**
Fluoride	mg/L	0.4	< 0.10	< 0.10	**0.11**	<0.10
Nitrogen, Ammonia	mg/L	2.0	**0.077**	< 0.025	< 0.025	< 0.025
Nitrogen, Nitrate	mg/L	2	**0.107**	< 0.10	**0.034**	< 0.10
Nitrogen, Nitrite	mg/L	2.0	< 0.10	< 0.10	**0.004**	< 0.10
Sulfate	mg/L	4	**5.1**	**3.3**	**6.0**	<1.0
Sulfide	mg/L	20	< 0.20	< 0.20	**0.016**	<0.20
Major Cations						
Calcium	mg/L	14.79	**10.3**	**7.3**	**8.5**	**6.0**
Magnesium	mg/L	4.14	**2.9**	**2.3**	**2.4**	**1.7**
Potassium	mg/L	1.59	**0.75**	**0.77**	**0.83**	**0.56**
Sodium	mg/L	9.09	**4.7**	**4.2**	**5.8**	**3.2**
General						
Hardness	mg/L	52.66	**42**	**26**	**31**	**22**
Total Dissolved Solids	mg/L	200	**120**	**120**	**113**	<50.0
Total Suspended Solids	mg/L	123.2	< 3.3	< 3.3	**3.7**	<3.3

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2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
MER-003 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	11.36	8.36	7.6	12.34
ORP	mV	-	11.6	114.8	134.6	89.7
pH	SU	5.4-6.4	7.42	6.78	7.22	7.35
Specific Conductance	uS/cm	-	124.7	121.3	152.1	130.3
Temperature	C	-	0.09	13.15	16.4	0.26
Turbidity	NTU	-	3.43	2.55	5.24	1.87
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	**68.5**	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	2.73	**1.5**	**1.3**	**1.7**	<1.0
Barium	ug/L	-	-	-	**9.8**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	**26.1**	-
Cadmium	ug/L	-	-	-	<0.012	-
Chromium	ug/L	-	-	-	**0.31**	-
Cobalt	ug/L	-	-	-	**0.262**	-
Copper	ug/L	0.67	**0.37**	**0.66**	**0.649**	**0.55**
Iron	ug/L	3492.75	**2040**	**1450**	**2020**	**1070**
Lead	ug/L	1.91	**0.127**	**0.151**	**0.208**	**0.134**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	325.69	**178**	**137**	**138**	**70.4**
Mercury	ng/L	6.99	**2.14**	**3.79**	**3.23**	**2.54**
Molybdenum	ug/L	-	-	-	**0.29**	-
Nickel	ug/L	1.54	**0.78**	**1.18**	**1.92**	**0.82**
Selenium	ug/L	-	-	-	**0.109**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	13.31	**1.99**	**2.2**	**0.69**	**2.35**
Major Anions						
Alkalinity, Bicarbonate	mg/L	33.46	**32.2**	**24.9**	**105**	**17.8**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	20.53	**8.7**	**8.7**	**8.6**	**6.9**
Fluoride	mg/L	0.4	< 0.10	< 0.10	**0.11**	<0.10
Nitrogen, Ammonia	mg/L	2.0	**0.087**	< 0.025	<0.004	**0.0286**
Nitrogen, Nitrate	mg/L	2	**0.107**	< 0.10	**0.032**	< 0.10
Nitrogen, Nitrite	mg/L	2.0	< 0.10	< 0.10	**0.004**	< 0.10
Sulfate	mg/L	25.51	**9.9**	**7.9**	**8.0**	**8.4**
Sulfide	mg/L	20	< 0.20	< 0.20	**0.019**	<0.20
Major Cations						
Calcium	mg/L	13.48	**10.8**	**7.5**	**8.5**	**6.3**
Magnesium	mg/L	4.16	**3.1**	**2.5**	**2.5**	**1.9**
Potassium	mg/L	1.73	**0.85**	**0.88**	**0.90**	**0.63**
Sodium	mg/L	9.33	**5.7**	**7**	**7.3**	**6.7**
General						
Hardness	mg/L	56.89	**42**	**22**	**31**	**23**
Total Dissolved Solids	mg/L	200	**62**	**86**	<83.3	**70.0**
Total Suspended Solids	mg/L	20.35	< 3.3	< 3.3	**3.7**	<3.3

2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
WBR-001 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q1	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	10.62	6.96	6.4	10.39
ORP	mV	-	138.6	230.9	205.1	315.9
pH	SU	4.6-5.6	6.55	5.49	6.42	5.29
Specific Conductance	uS/cm	-	96.9	103.2	91.7	72.6
Temperature	C	-	0.11	18.91	17.1	0.206
Turbidity	NTU	-	43.96	0.38	1.67	1.55
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	**239**	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	1.48	**1.8**	**1.4**	**1.6**	<1.0
Barium	ug/L	-	-	-	**10.0**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	**6.0**	-
Cadmium	ug/L	-	-	-	**0.026**	-
Chromium	ug/L	-	-	-	**0.67**	-
Cobalt	ug/L	-	-	-	**0.282**	-
Copper	ug/L	0.66	**0.97**	**0.77**	**0.589**	**1.13**
Iron	ug/L	1900.2	**3460**	**1320**	**2010**	**1610**
Lead	ug/L	1.32	**2.16**	**0.8**	**0.822**	**0.702**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	121.66	**277**	**135**	**94.7**	**111**
Mercury	ng/L	11.48	**8.75**	**7.11**	**4.76**	**5.23**
Molybdenum	ug/L	-	-	-	<0.20	-
Nickel	ug/L	0.98	**0.94**	**0.93**	**0.935**	**0.65**
Selenium	ug/L	-	-	-	**0.156**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	8.22	**7.78**	**5.93**	**3.98**	**5.38**
Major Anions						
Alkalinity, Bicarbonate	mg/L	5.75	**10**	**5.5**	**7.0**	**4.0**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	22.94	**19.4**	**21.5**	**9.2**	**14.5**
Fluoride	mg/L	0.4	< 0.10	< 0.10	**0.082**	<0.10
Nitrogen, Ammonia	mg/L	2.0	**0.259**	< 0.025	<0.004	**0.031**
Nitrogen, Nitrate	mg/L	2.0	<0.1	< 0.10	**0.016**	< 0.10
Nitrogen, Nitrite	mg/L	2.0	< 0.1	< 0.10	**0.006**	< 0.10
Sulfate	mg/L	4.0	< 10	< 2.0	<4.3	<5.0
Sulfide	mg/L	20	< 0.20	< 0.2	<0.011	<0.20
Major Cations						
Calcium	mg/L	5.64	**4.9**	**3.7**	**4.4**	**3.7**
Magnesium	mg/L	2.49	**2.0**	**1.6**	**1.7**	**1.4**
Potassium	mg/L	1.61	**0.87**	**0.86**	**0.62**	**0.65**
Sodium	mg/L	10.56	**8.4**	**9.7**	**4.5**	**6.8**
General						
Hardness	mg/L	30.37	**60**	**12**	**18**	**15**
Total Dissolved Solids	mg/L	200	**52**	**86**	**103**	**60.0**
Total Suspended Solids	mg/L	13.2	**6.9**	**20.4**	**3.2**	<3.3

* - Lowest achievable Reporting Limit by laboratory due to matrix interference

2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
WBR-002 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	1.45	8.53	7.14	10.2
ORP	mV	-	5.34	236.4	225.5	264.1
pH	SU	4.9-5.9	6.23	6.44	6.35	5.80
Specific Conductance	uS/cm	-	252.9	146.1	202.9	152.9
Temperature	C	-	0.74	20.34	19.2	1.98
Turbidity	NTU	-	42.11	56.1	29.1	62.2
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	<31.0	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	2.1	**5.1**	**3.2**	**2.7**	**1.7**
Barium	ug/L	-	-	-	**8.5**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	**13.4**	-
Cadmium	ug/L	-	-	-	<0.012	-
Chromium	ug/L	-	-	-	**0.26**	-
Cobalt	ug/L	-	-	-	**0.245**	-
Copper	ug/L	1.05	**0.84**	**3.07**	**0.482**	**1.13**
Iron	ug/L	4247.98	**12600**	**6380**	**6930**	**3980**
Lead	ug/L	0.28	**0.468**	**1.1**	**0.241**	**0.201**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	235.15	**875**	**271**	**188**	**106**
Mercury	ng/L	6.9	**3.97**	**5.72**	**0.99**	**2.35**
Molybdenum	ug/L	-	-	-	**0.35**	-
Nickel	ug/L	1.67	**1.7**	**3.21**	**1.43**	**2.95**
Selenium	ug/L	-	-	-	**0.119**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	18.09	**4.03**	**9.7**	**0.45**	**2.9**
Major Anions						
Alkalinity, Bicarbonate	mg/L	21.5	**35.2**	**16.4**	**28**	**16.2**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	<2.0	<2.0
Chloride	mg/L	36.73	**46.5**	**28.1**	**35.5**	**31.5**
Fluoride	mg/L	0.4	< 0.10	< 0.10	**0.096**	< 0.10
Nitrogen, Ammonia	mg/L	2.0	**0.437**	**0.0353**	**0.0046**	**0.0287**
Nitrogen, Nitrate	mg/L	2.0	< 0.1	< 0.10	<0.0089	< 0.10
Nitrogen, Nitrite	mg/L	2.0	< 0.1	< 0.10	**0.007**	< 0.10
Sulfate	mg/L	4.0	< 10	< 1.0	<0.86	<5.0
Sulfide	mg/L	20	< 0.20	< 0.20	**0.018**	< 0.20
Major Cations						
Calcium	mg/L	8.38	**10.8**	**5.4**	**8.3**	6.4
Magnesium	mg/L	3.92	**5.2**	**2.9**	**4**	2.9
Potassium	mg/L	2.7	**1.8**	**2.1**	**1.2**	1.4
Sodium	mg/L	19.72	**22.5**	**14.6**	**17.9**	16.3
General						
Hardness	mg/L	36.25	**44**	**26**	**37.3**	**28.1**
Total Dissolved Solids	mg/L	200	**142**	**106**	**127**	**90**
Total Suspended Solids	mg/L	13.2	**14.4**	**12.2**	**4.4**	**3.7**

* - Lowest achievable Reporting Limit by laboratory due to matrix interference

2018 - Mine Permit Surface Water Quality Monitoring Data
WBR-003 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	3.52	4.39	3.46	6.9
ORP	mV	-	32.9	188.2	56.1	284.2
pH	SU	4.9-5.9	6.35	6.26	6.6	5.87
Specific Conductance	uS/m	-	249.6	126.0	199.0	137.4
Temperature	C	-	0.03	16.75	17.1	0.06
Turbidity	NTU	-	27.83	10.44	53.7	6.79
Flow	cfs	-	-	-	-	-
Metals						
Aluminum	ug/L	-	-	-	**34.0**	-
Antimony	ug/L	-	-	-	<0.80	-
Arsenic	ug/L	2.1	**3.5**	**2.0**	**4.8**	<1.0
Barium	ug/L	-	-	-	**19.2**	-
Beryllium	ug/L	-	-	-	<0.10	-
Boron	ug/L	-	-	-	13.9	-
Cadmium	ug/L	-	-	-	<0.012	-
Chromium	ug/L	-	-	-	**0.27**	-
Cobalt	ug/L	-	-	-	**1.05**	-
Copper	ug/L	1.05	**0.53**	**0.63**	**0.231**	**0.73**
Iron	ug/L	4247.98	**10700**	**4430**	**13400**	**2780**
Lead	ug/L	0.28	**0.258**	**0.173**	**0.105**	**0.151**
Lithium	ug/L	-	-	-	<4.6	-
Manganese	ug/L	235.15	**1000**	**324**	**1030**	**44.8**
Mercury	ng/L	6.9	**2.63**	**3.38**	**1.80**	**1.25**
Molybdenum	ug/L	-	-	-	**0.22**	-
Nickel	ug/L	1.67	**1.47**	**1.49**	**1.12**	**1.09**
Selenium	ug/L	-	-	-	**0.106**	-
Silver	ug/L	-	-	-	<0.10	-
Thallium	ug/L	-	-	-	<0.040	-
Vanadium	ug/L	-	-	-	<1.4	-
Zinc	ug/L	18.09	**3.48**	**2.65**	**2.39**	**2.16**
Major Anions						
Alkalinity, Bicarbonate	mg/L	21.5	**46**	**27.9**	**44.7**	**17.2**
Alkalinity, Carbonate	mg/L	8.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	36.73	**37.5**	**16.2**	**21.8**	**25.5**
Fluoride	mg/L	0.4	< 0.10	**0.13**	**0.095**	<0.10
Nitrogen, Ammonia	mg/L	2.0	**0.442**	**0.0585**	**0.0332**	**0.0258**
Nitrogen, Nitrate	mg/L	2.0	< 0.1	< 0.10	<0.0089	< 0.10
Nitrogen, Nitrite	mg/L	2.0	< 0.1	< 0.10	**0.006**	< 0.10
Sulfate	mg/L	4.0	< 10 *	< 1.0	<4.3	< 1.0
Sulfide	mg/L	20	< 0.20	< 0.20	**0.021**	< 0.20
Major Cations						
Calcium	mg/L	8.38	**12.5**	**7.2**	**11.4**	**6.2**
Magnesium	mg/L	3.92	**5.6**	**3.3**	**4.5**	**2.9**
Potassium	mg/L	2.7	**1.6**	**1.3**	**1.4**	**1.1**
Sodium	mg/L	19.72	**17.1**	**8**	**11.3**	**13.4**
General						
Hardness	mg/L	36.25	**48**	**24**	**47.1**	**27.6**
Total Dissolved Solids	mg/L	200	**175**	**130**	**153**	**72**
Total Suspended Solids	mg/L	13.2	**11.8**	**8.3**	**26.8**	<3.3

* - Lowest achievable Reporting Limit by laboratory due to matrix interference

2018 Q4 - Mine Permit Surface Water Quality Monitoring Data
MWQQ-004 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark 2018 Q4	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	NM	NM	NM	NM
ORP	mV	-	NM	NM	NM	NM
pH	SU	-	NM	NM	NM	NM
Specific Conductance	uS/m	-	NM	NM	NM	NM
Temperature	C	-	NM	NM	NM	NM
Turbidity	NTU	-	NM	NM	NM	NM
Flow	cfs	-	NM	NM	NM	NM
Metals						
Aluminum	ug/L	-	NM	NM	NM	NM
Antimony	ug/L	-	NM	NM	NM	NM
Arsenic	ug/L	-	NM	NM	NM	NM
Barium	ug/L	-	NM	NM	NM	NM
Beryllium	ug/L	-	NM	NM	NM	NM
Boron	ug/L	-	NM	NM	NM	NM
Cadmium	ug/L	-	NM	NM	NM	NM
Chromium	ug/L	-	NM	NM	NM	NM
Cobalt	ug/L	-	NM	NM	NM	NM
Copper	ug/L	-	NM	NM	NM	NM
Iron	ug/L	-	NM	NM	NM	NM
Lead	ug/L	-	NM	NM	NM	NM
Lithium	ug/L	-	NM	NM	NM	NM
Manganese	ug/L	-	NM	NM	NM	NM
Mercury	ng/L	-	NM	NM	NM	NM
Molybdenum	ug/L	-	NM	NM	NM	NM
Nickel	ug/L	-	NM	NM	NM	NM
Selenium	ug/L	-	NM	NM	NM	NM
Silver	ug/L	-	NM	NM	NM	NM
Thallium	ug/L	-	NM	NM	NM	NM
Vanadium	ug/L	-	NM	NM	NM	NM
Zinc	ug/L	-	NM	NM	NM	NM
Major Anions						
Alkalinity, Bicarbonate	mg/L	-	NM	NM	NM	NM
Alkalinity, Carbonate	mg/L	-	NM	NM	NM	NM
Chloride	mg/L	-	NM	NM	NM	NM
Fluoride	mg/L	-	NM	NM	NM	NM
Nitrogen, Ammonia	mg/L	-	NM	NM	NM	NM
Nitrogen, Nitrate	mg/L	-	NM	NM	NM	NM
Nitrogen, Nitrite	mg/L	-	NM	NM	NM	NM
Sulfate	mg/L	-	NM	NM	NM	NM
Sulfide	mg/L	-	NM	NM	NM	NM
Major Cations						
Calcium	mg/L	-	NM	NM	NM	NM
Magnesium	mg/L	-	NM	NM	NM	NM
Potassium	mg/L	-	NM	NM	NM	NM
Sodium	mg/L	-	NM	NM	NM	NM
General						
Hardness	mg/L	-	NM	NM	NM	NM
Total Dissolved Solids	mg/L	-	NM	NM	NM	NM
Total Suspended Solids	mg/L	-	NM	NM	NM	NM

2018 - Mine Permit Surface Water Quality Monitoring Data
HMP-009 (Monitoring) - Humboldt Mill

Parameter	Unit	Recommended Benchmark Q4 2018	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Field						
D.O.	ppm	-	NM	NM	NM	NM
ORP	mV	-	NM	NM	NM	NM
pH	SU	-	NM	NM	NM	NM
Specific Conductance	uS/m	-	NM	NM	NM	NM
Temperature	C	-	NM	NM	NM	NM
Turbidity	NTU	-	NM	NM	NM	NM
Flow	cfs	-	NM	NM	NM	NM
Metals						
Aluminum	ug/L	-	NM	NM	NM	NM
Antimony	ug/L	-	NM	NM	NM	NM
Arsenic	ug/L	-	NM	NM	NM	NM
Barium	ug/L	-	NM	NM	NM	NM
Beryllium	ug/L	-	NM	NM	NM	NM
Boron	ug/L	-	NM	NM	NM	NM
Cadmium	ug/L	-	NM	NM	NM	NM
Chromium	ug/L	-	NM	NM	NM	NM
Cobalt	ug/L	-	NM	NM	NM	NM
Copper	ug/L	-	NM	NM	NM	NM
Iron	ug/L	-	NM	NM	NM	NM
Lead	ug/L	-	NM	NM	NM	NM
Lithium	ug/L	-	NM	NM	NM	NM
Manganese	ug/L	-	NM	NM	NM	NM
Mercury	ng/L	-	NM	NM	NM	NM
Molybdenum	ug/L	-	NM	NM	NM	NM
Nickel	ug/L	-	NM	NM	NM	NM
Selenium	ug/L	-	NM	NM	NM	NM
Silver	ug/L	-	NM	NM	NM	NM
Thallium	ug/L	-	NM	NM	NM	NM
Vanadium	ug/L	-	NM	NM	NM	NM
Zinc	ug/L	-	NM	NM	NM	NM
Major Anions						
Alkalinity, Bicarbonate	mg/L	-	NM	NM	NM	NM
Alkalinity, Carbonate	mg/L	-	NM	NM	NM	NM
Chloride	mg/L	-	NM	NM	NM	NM
Fluoride	mg/L	-	NM	NM	NM	NM
Nitrogen, Ammonia	mg/L	-	NM	NM	NM	NM
Nitrogen, Nitrate	mg/L	-	NM	NM	NM	NM
Nitrogen, Nitrite	mg/L	-	NM	NM	NM	NM
Sulfate	mg/L	-	NM	NM	NM	NM
Sulfide	mg/L	-	NM	NM	NM	NM
Major Cations						
Calcium	mg/L	-	NM	NM	NM	NM
Magnesium	mg/L	-	NM	NM	NM	NM
Potassium	mg/L	-	NM	NM	NM	NM
Sodium	mg/L	-	NM	NM	NM	NM
General						
Hardness	mg/L	-	NM	NM	NM	NM
Total Dissolved Solids	mg/L	-	NM	NM	NM	NM
Total Suspended Solids	mg/L	-	NM	NM	NM	NM

2018

Mine Permit Groundwater Quality Monitoring Data Abbreviations & Data Qualifiers

Humboldt Mill

Explanations of abbreviations are included on the final page of this table. *Abbreviations & Data Qualifiers*

Notes:
Benchmarks are calculated based on guidance from Eagles Mine's Development of Site Specific Benchmarks for Mine Permit Water Quality Monitoring.
Results in **bold** text indicate that the parameter was detected at a level greater than the laboratory reporting limit.
Highlighted Cell = Value is equal to or above site-specific benchmark. An exceedance occurs if there are 2 consecutive sampling events with a value equal to or greater than the benchmark at a compliance monitoring location.
(p) = Due to less than two detections in baseline dataset, benchmark defaulted to four times the reporting limit.
--Denotes no benchmark required or parameter was not required to be collected during the sampling quarter.
NM = Not mesured during the sampling event.