2016
Mine Permit Groundwater Quality Monitoring Data
MW-702 QAL (Leachate)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[D]	Q2 2016 5/19/16[D]	Q3 2016 8/25/16[D]	Q4 2016 11/29/16[D]
Field						
D.O.[1]	ppm	--	**1.6**	**1.3**	**1.5**	**1.5**
ORP	mV	--	**61**	**105**	**-33**	**53**
pH	SU	9.8-10.8	**10.0**	**9.8**	**10.1**	**8.7**
Specific Conductance	µS/cm	--	**463**	**512**	**341**	**285**
Temperature	°C	--	**6.1**	**7.1**	**11**	**6.8**
Turbidity	NTU	--	**5.3**	**7.2**	**11**	**3.5**
Water Elevation	ft MSL	--	**1530.23**	**1529.44**	**1530.14**	**1529.92**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	7.5	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	155	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	386	< 200	< 200	< 200	< 200
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	717	**150**	**60**	< 50	**97**
Mercury	ng/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	**4.1**	--
Zinc	ug/L	40 (p)	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	194	**74**	**70**	**47**	**130**
Alkalinity, Carbonate	mg/L	54	**4.0**	**5.1**	**22**	< 2.0
Chloride	mg/L	12	**14**	**13**	**13**	< 10
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.03	**0.04**	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	1.8	**0.99**	**1.2**	**1.2**	**0.63**
Nitrogen, Nitrite	mg/L	0.12	**0.17**	**0.11**	**0.14**	< 0.1
Sulfate	mg/L	148	**89**	**100**	**87**	**86**
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	99	**45**	**46**	**37**	**36**
Magnesium	mg/L	17	**9.9**	**7.8**	**8.4**	**10**
Potassium	mg/L	36	**5.4**	**5.3**	**5.0**	**4.8**
Sodium	mg/L	42	**36**	**55**	**49**	**41**
General						
Hardness	mg/L	286	**152**	**152**	**150**	**134**

2016
Mine Permit Groundwater Quality Monitoring Data
HW-1L (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[D]	Q2 2016 5/17/16[D]	Q3 2016 8/24/16[D]	Q4 2016 11/22/16[D]
Field						
D.O.[1]	ppm	--	**0.14**	**0.24**	**1.1**	**0.45**
ORP	mV	--	**-251**	**-250**	**-84**	**-57**
pH	SU	9.0-10.0	**8.5**	**8.4**	**8.7**	**8.4**
Specific Conductance	µS/cm	--	**372**	**365**	**272**	**240**
Temperature	°C	--	**6.5**	**9.0**	**12**	**8.2**
Turbidity	NTU	--	**64**	**25**	**55**	**6.5**
Water Elevation	ft MSL	--	**1451.87**	**1478.81**	**1472.12**	**1461.31**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	**640**	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	1134	**1100**	**1000**	**540**	**700**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	**22**	--
Manganese	ug/L	23	< 50	< 50	< 50	< 50
Mercury	ng/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	11	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	117	**79**	**80**	**80**	**82**
Alkalinity, Carbonate	mg/L	14	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	52	**53**	**53**	**51**	**53**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.04	< 0.03	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	24	**22**	22	22	24
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	35	**26**	**27**	**23**	**25**
Magnesium	mg/L	17	**11**	**11**	**10**	**11**
Potassium	mg/L	11	**1.9**	**1.8**	**1.6**	**1.8**
Sodium	mg/L	27	**27**	**27**	**24**	**25**
General						
Hardness	mg/L	157	**108**	**122**	**112**	**110**

2016
Mine Permit Groundwater Quality Monitoring Data
HW-1U LLA (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[D]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/22/16[D]	
Field										
D.O.[1]	ppm	--	**0.12**		**0.09**		**0.59**		**0.68**	
ORP	mV	--	**-232**		**-210**		**-92**		**-68**	
pH	SU	8.6-9.6	**8.5**		**8.4**		**8.5**		**8.4**	
Specific Conductance	µS/cm	--	**394**		**389**		**293**		**280**	
Temperature	°C	--	**7.3**		**9.0**		**11**		**8.4**	
Turbidity	NTU	--	**18**		**16**		**23**		**534**	
Water Elevation	ft MSL	--	**1494.14**		**1487.61**		**1494.62**		**1490.03**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	800 (p)	< 200		< 200		< 200		**470**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**20**		--	
Manganese	ug/L	200 (p)	< 50		< 50		< 50		< 50	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	40 (p)	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	125	**100**		**110**		**110**		**120**	
Alkalinity, Carbonate	mg/L	66	**5.0**		< 2.0		< 2.0		**6.2**	
Chloride	mg/L	40 (p)	**23**		**22**		**21**		**27**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.1 (p)	**0.12**		**0.15**		**0.19**		**0.19**	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		**0.24**	
Sulfate	mg/L	58	**52**		**55**		**56**		**76**	
Sulfide	mg/L	0.36	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	29	**20**		**21**		**18**		**10**	
Magnesium	mg/L	15	**7.8**		**8.2**		**6.9**		**3.7**	
Potassium	mg/L	50	**2.6**		**2.4**		**1.4**		**0.57**	
Sodium	mg/L	33	**43**		**50**		**54**		**79**	
General										
Hardness	mg/L	132	**88**		**90**		**84**		**70**	

2016
Mine Permit Groundwater Quality Monitoring Data
HW-1U UFB (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[T]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/22/16[D]	
Field										
D.O.[1]	ppm	--	**0.33**		**0.90**		**0.08**		**0.90**	
ORP	mV	--	**-169**		**-160**		**-210**		**-119**	
pH	SU	8.4-9.4	**9.1**		**8.9**		**8.9**		**8.7**	
Specific Conductance	µS/cm	--	**296**		**208**		**197**		**147**	
Temperature	°C	--	**4.0**		**10**		**16**		**7.6**	
Turbidity	NTU	--	**1.3**		**7.1**		**9.4**		**3.6**	
Water Elevation	ft MSL	--	**1531.19**		**1531.51**		**1532.64**		**1530.83**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	11	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	800 (p)	< 200		< 200		< 200		< 200	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		< 10		--	
Manganese	ug/L	75	< 50		< 50		< 50		< 50	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	40 (p)	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	127	**77**		**81**		**95**		**94**	
Alkalinity, Carbonate	mg/L	14	**14**		**6.1**		**4.0**		**10**	
Chloride	mg/L	121	**23**		<10		<10		<10	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.12 (p)	**0.07**		**0.04**		< 0.03		< 0.03	
Nitrogen, Nitrate	mg/L	0.67	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	76	**20**		**14**		**10**		**7.4**	
Sulfide	mg/L	1.3	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	46	**11**		**14**		**19**		**19**	
Magnesium	mg/L	17	**5.3**		**4.6**		**5.8**		**6.1**	
Potassium	mg/L	22	**6.1**		**3.3**		**4.0**		**4.7**	
Sodium	mg/L	91	**35**		**22**		**18**		**19**	
General										
Hardness	mg/L	189	**54**		**56**		**76**		**70**	

2016
Mine Permit Groundwater Quality Monitoring Data
HW-2 (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[D]	Q2 2016 5/18/16[D]	Q3 2016 8/25/16[D]	Q4 2016 11/28/16[D]
Field						
D.O.[1]	ppm	--	**0.69**	**0.39**	**0.28**	**0.39**
ORP	mV	--	**-178**	**-205**	**-125**	**-147**
pH	SU	7.7-8.7	**8.0**	**8.1**	**7.5**	**8.3**
Specific Conductance	µS/cm	--	**579**	**616**	**490**	**431**
Temperature	°C	--	**5.5**	**8.9**	**13**	**9.3**
Turbidity	NTU	--	**53**	**75**	**21**	**38**
Water Elevation	ft MSL	--	**1530.26**	**1530.55**	**1531.03**	**1530.44**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 250	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	3401	**1700**	**1400**	**2200**	**590**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	324	**150**	**190**	**240**	**170**
Mercury	ng/L	1.3	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	40 (p)	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	145	**130**	**120**	**120**	**120**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	25	**21**	**26**	**27**	**27**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.05	< 0.03	**0.03**	< 0.03	**0.09**
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	135	**140**	**160**	**170**	**160**
Sulfide	mg/L	0.47	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	72	**61**	**61**	**59**	**60**
Magnesium	mg/L	28	**23**	**24**	**23**	**25**
Potassium	mg/L	7.1	**3.7**	**3.9**	**3.8**	**4.7**
Sodium	mg/L	15	**14**	**18**	**21**	**26**
General						
Hardness	mg/L	277	**256**	**278**	**284**	**256**

2016
Mine Permit Groundwater Quality Monitoring Data
HW-8U (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[T]		Q2 2016 5/17/16[T]		Q3 2016 8/26/16[T]		Q4 2016 11/28/16[T]	
Field										
D.O.[1]	ppm	--	**0.54**		**1.9**		**0.80**		**0.8**	
ORP	mV	--	**-109**		**-115**		**-91**		**-95**	
pH	SU	6.4-7.4	**7.1**		**7.0**		**7.0**		**6.9**	
Specific Conductance	µS/cm	--	**325**		**335**		**272**		**246**	
Temperature	°C	--	**5.2**		**9.8**		**13**		**8.1**	
Turbidity	NTU	--	**0.75**		**1.7**		**59**		**1.7**	
Water Elevation	ft MSL	--	**1532.50**		**1533.64**		**1533.2**		**1532.12**	
Metals										
Aluminum	ug/L	200 (p)	--		--		<100		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	**6.7**		**7.9**		**10**		**8.9**	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	27125	**9600**		**10000**		**9000**		**10000**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**11**		--	
Manganese	ug/L	5498	**4700**	e	**4800**		**5500**		**5400**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	26	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	237	**140**		**150**		**150**		**160**	
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	40 (p)	< 10		< 10		**10**		**13**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.04	< 0.03		< 0.03		< 0.03		< 0.03	
Nitrogen, Nitrate	mg/L	0.10	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	2.6	**6.4**		**6.8**		**8.0**		**9.0**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20		< 0.20	
Major Cations										
Calcium	mg/L	53	**32**		**36**		**36**		**39**	
Magnesium	mg/L	22	**12**		**13**		**12**		**13**	
Potassium	mg/L	4.1	**2.7**		**3.0**		**2.9**		**3.5**	
Sodium	mg/L	4.4	**3.4**		**3.9**		**3.6**		**4.1**	
General										
Hardness	mg/L	224	**144**		**154**		**170**		**162**	

2016
Mine Permit Groundwater Quality Monitoring Data
HYG-1 (Monitoring)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[T]	Q2 2016 5/18/16[T]	Q3 2016 8/25/16[D]	Q4 2016 11/29/16[T]
Field						
D.O.[1]	ppm	--	**0.31**	**0.43**	**0.26**	**0.82**
ORP	mV	--	**54**	**23**	**-18**	**65**
pH	SU	6.3-7.3	**7.0**	**6.9**	**6.5**	**7.0**
Specific Conductance	µS/cm	--	**559**	**576**	**471**	**372**
Temperature	°C	--	**6.7**	**9.0**	**10**	**9.0**
Turbidity	NTU	--	**0.37**	**2.2**	**6.6**	**1.0**
Water Elevation	ft MSL	--	**1533.26**	**1533.68**	**1533.93**	**1532.21**
Metals						
Aluminum	ug/L	200 (p)	--	--	<100	--
Antimony	ug/L	8.0 (p)	--	--	**7.4**	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	4.4	**7.6**	**4.2**	< 4.0	< 4.0
Iron	ug/L	800 (p)	< 200	< 200	**270**	< 200
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	286	**210**	**580**	**470**	**340**
Mercury	ng/L	6.2	**20**	**22**	**23**	**17**
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	19	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	157	**220**	**200**	**250**	**210**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	12	24	**20**	**18**	**18**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.38	**0.20**	**0.24**	**0.33**	**0.49**
Nitrogen, Nitrate	mg/L	0.26	**0.13**	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	98	**48**	**85**	**78**	**53**
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	52	**35**	**41**	**42**	**38**
Magnesium	mg/L	28	**19**	**22**	**23**	**20**
Potassium	mg/L	8.4	**7.5**	**8.9**	**9.7**	**8.3**
Sodium	mg/L	14	**51**	**46**	**54**	**39**
General						
Hardness	mg/L	230	**170**	**200**	**222**	**186**

2016
Mine Permit Groundwater Quality Monitoring Data
KMW-5R (COSA)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[D]		Q2 2016 5/19/16[D]		Q3 2016 8/26/16[D]		Q4 2016 11/30/16[D]	
Field										
D.O.[1]	ppm	--	**5.7**		**6.0**		**5.3**		**4.4**	
ORP	mV	--	**-29**		**40**		**5.1**		**28**	
pH	SU	6.7-7.7	**7.1**		**7.4**		**7.0**		**7.0**	
Specific Conductance	µS/cm	--	**1142**		**1075**		**690**		**590**	
Temperature	°C	--	**7.5**		**9.8**		**9.3**		**5.5**	
Turbidity	NTU	--	**>1000**	*	**98**		**177**		**89**	
Water Elevation	ft MSL	--	**1556.38**		**1559.08**		**1558.64**		**1558.63**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 250		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	6.0	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	15	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	33432	< 200		< 200		< 200		< 200	
Lead	ug/L	4.8	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**17**		--	
Manganese	ug/L	2815	**2200**		**2100**		**1800**		**1900**	
Mercury	ng/L	2.1	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20	e	< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	19	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	486	**360**		**380**		**360**		**380**	
Alkalinity, Carbonate	mg/L	3.3	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	139	**130**		**65**		**42**		**23**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.76	< 0.03		**0.04**		**0.03**		**0.04**	
Nitrogen, Nitrate	mg/L	0.11	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.06	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	123	**100**		**120**		**130**		**130**	
Sulfide	mg/L	3.9	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	169	**150**	e	**130**		**130**		**120**	
Magnesium	mg/L	67	**60**	e	**50**		**49**		**46**	
Potassium	mg/L	9.1	**7.7**		**7.7**		**7.2**		**7.1**	
Sodium	mg/L	50	**3.9**		**4.6**		**4.6**		**5.3**	
General										
Hardness	mg/L	800	**600**		**568**		**592**		**520**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-701 QAL (Leachate)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[T]	Q2 2016 5/18/16[T]	Q3 2016 8/25/16[T]	Q4 2016 11/29/16[T]
Field						
D.O.[1]	ppm	--	**7.2**	**8.4**	**7.6**	**8.9**
ORP	mV	--	**155**	**120**	**83**	**158**
pH	SU	5.8-6.8	**5.8**	**5.8**	**5.8**	**5.1**
Specific Conductance	µS/cm	--	**137**	**155**	**104**	**79**
Temperature	°C	--	**3.7**	**8.2**	**12**	**8.3**
Turbidity	NTU	--	**0.63**	**0.79**	**1.4**	**0.92**
Water Elevation	ft MSL	--	**1530.51**	**1531.34**	**1531.19**	**1530.32**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	459	< 200	< 200	< 200	< 200
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	4801	<50	< 50	< 50	< 50
Mercury	ng/L	11	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	40 (p)	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	189	**33**	**39**	**29**	**32**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	19	< 10	< 10	< 10	< 10
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.39	< 0.03	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	3.1	**0.71**	**1.3**	**0.53**	**0.56**
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	110	**22**	**25**	**25**	**17**
Sulfide	mg/L	0.22	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	57	**10**	**13**	**9.5**	**8.5**
Magnesium	mg/L	26	**4.4**	**5.7**	**4.3**	**3.9**
Potassium	mg/L	9.2	**3.3**	**3.4**	**3.0**	**2.8**
Sodium	mg/L	14	**6.9**	**7.6**	**5.8**	**6.3**
General						
Hardness	mg/L	272	**44**	**54**	**46**	**36**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-701 UFB (Leachate)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[D]	Q2 2016 5/18/16[D]	Q3 2016 8/25/16[D]	Q4 2016 11/29/16[D]
Field						
D.O.[1]	ppm	--	**0.28**	**0.20**	**0.20**	**0.61**
ORP	mV	--	**-161**	**-187**	**-136**	**-102**
pH	SU	7.2-8.2	**7.4**	**7.4**	**7.0**	**7.0**
Specific Conductance	µS/cm	--	**378**	**362**	**276**	**248**
Temperature	°C	--	**4.8**	**8.5**	**12**	**7.2**
Turbidity	NTU	--	**72**	**106**	**37**	**19**
Water Elevation	ft MSL	--	**1530.79**	**1531.63**	**1530.76**	**1530.93**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	**150**	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	30	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	27405	**20000**	**15000**	**15000**	**17000**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	**12**	--
Manganese	ug/L	6881	**2600**	**2400**	**2000**	**2200**
Mercury	ng/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	26	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	172	**140**	**140**	**140**	**150**
Alkalinity, Carbonate	mg/L	18	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	43	< 10	< 10	< 10	< 10
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	1.6	< 0.03	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	80	**28**	**22**	**23**	**21**
Sulfide	mg/L	1.7	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	40	**36**	**35**	**31**	**34**
Magnesium	mg/L	16	**15**	**15**	**14**	**15**
Potassium	mg/L	13	**2.8**	**3.2**	**2.7**	**3.0**
Sodium	mg/L	56	**4.7**	**5.0**	**4.3**	**4.8**
General						
Hardness	mg/L	163	**154**	**158**	**158**	**156**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-702 UFB (Leachate)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 3/3/16[D]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/22/16[D]	
Field										
D.O.[1]	ppm	--	**0.40**		**2.9**		**0.69**		**1.9**	
ORP	mV	--	**112**		**-140**		**265**		**137**	
pH	SU	8.5-9.5	**5.9**		**7.9**		**4.0**		**6.8**	
Specific Conductance	µS/cm	--	**305**		**247**		**175**		**157**	
Temperature	°C	--	**6.9**		**7.1**		**10**		**6.4**	
Turbidity	NTU	--	**18**		**19**		**7.6**		**3**	
Water Elevation	ft MSL	--	**1522.62**		**1525.75**		**1524.61**		**1526.19**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	2484	**850**		**630**		**540**		**630**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**12**		--	
Manganese	ug/L	126	**96**		**85**		**89**		**78**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	66	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	125	**92**		**89**		**91**		**94**	
Alkalinity, Carbonate	mg/L	15	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	40 (p)	< 10		< 10		< 10		< 10	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.12 (p)	**0.04**		< 0.03		**0.07**		< 0.03	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	36	**32**		**34**		**31**		**33**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	49	**28**		**30**		**26**		**29**	
Magnesium	mg/L	14	**9.0**		**9.6**		**8.8**		**9.5**	
Potassium	mg/L	22	**3.1**		**3.1**		**2.9**		**3.2**	
Sodium	mg/L	8.0	**2.9**		**2.9**		**2.8**		**3.2**	
General										
Hardness	mg/L	160	**110**		**118**		**114**		**116**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-703 DBA (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[T]		Q2 2016 5/17/16[T]		Q3 2016 8/24/16[T]		Q4 2016 11/22/16[T]	
Field										
D.O.[1]	ppm	--	**0.21**		**0.90**		**0.70**		**0.34**	
ORP	mV	--	**-236**		**-163**		**-100**		**-213**	
pH	SU	8.7-9.7	**9.6**		**9.4**		**9.1**		**8.9**	
Specific Conductance	µS/cm	--	**230**		**233**		**189**		**160**	
Temperature	°C	--	**4.4**		**8.6**		**11**		**6.0**	
Turbidity	NTU	--	**1.5**		**2.1**		**2.3**		**0.9**	
Water Elevation	ft MSL	--	**1531.32**		**1531.66**		**1532.25**		**1531.77**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	2738	**260**		< 200		< 200		< 200	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	17	--		--		**17**		--	
Manganese	ug/L	60	< 50		< 50		< 50		< 50	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	22	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	74	**41**		**71**		**91**		**79**	
Alkalinity, Carbonate	mg/L	27	**34**		**12**		**4.0**		**10**	
Chloride	mg/L	20	**18**		**18**		**18**		**18**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.12	< 0.03		< 0.03		**0.82**		**0.05**	
Nitrogen, Nitrate	mg/L	0.11	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	91	<1.0		**6.0**		**17**		**17**	
Sulfide	mg/L	0.80 (p)	**0.75**		**0.36**		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	29	**5.5**		**10**		**18**		**19**	
Magnesium	mg/L	17	**6.2**		**10**		**14**		**13**	
Potassium	mg/L	15	**23**		**17**		**12**		**11**	
Sodium	mg/L	14	**14**		**12**		**9.2**		**8.2**	
General										
Hardness	mg/L	137	**42**		**70**		**100**		**98**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-703 LLA (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[D]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/22/16[T]	
Field										
D.O.[1]	ppm	--	**0.13**		**0.97**		**0.10**		**0.36**	
ORP	mV	--	**-219**		**-219**		**-127**		**-136**	
pH	SU	8.2-9.2	**8.1**		**8.3**		**8.0**		**8.0**	
Specific Conductance	µS/cm	--	**267**		**265**		**190**		**162**	
Temperature	°C	--	**5.4**		**7.8**		**11**		**5.8**	
Turbidity	NTU	--	**4.3**		**4.3**		**4.6**		**1.9**	
Water Elevation	ft MSL	--	**1531.55**		**1532.15**		**1532.75**		**1532.11**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	2966	**590**		**600**		**560**		**750**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	30	--		--		**14**		--	
Manganese	ug/L	101	**74**		**74**		**78**		**79**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	40+	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	84	**87**		**86**		**86**		**86**	
Alkalinity, Carbonate	mg/L	4.0	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	124	**14**		**14**		**12**		**12**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.08	<0.03		**0.05**		**0.04**		**0.04**	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	44	**27**		**29**		**30**		**32**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	39	**25**		**26**		**25**		**26**	
Magnesium	mg/L	13	**11**		**11**		**10**		**11**	
Potassium	mg/L	9.7	**3.6**		**3.6**		**3.1**		**3.6**	
Sodium	mg/L	67	**7.7**		**7.6**		**6.4**		**6.5**	
General										
Hardness	mg/L	138	**106**		**110**		**118**		**112**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-703 QAL (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[D]	Q2 2016 5/18/16[D]	Q3 2016 8/25/16[D]	Q4 2016 11/29/16[T]
Field						
D.O.[1]	ppm	--	**5.1**	**4.6**	**6.5**	**7.6**
ORP	mV	--	**148**	**81**	**65**	**84**
pH	SU	7.2-8.2	**6.4**	**6.6**	**6.2**	**5.9**
Specific Conductance	µS/cm	--	**155**	**372**	**89**	**97**
Temperature	°C	--	**5.7**	**7.5**	**9.1**	**6.5**
Turbidity	NTU	--	**3.3**	**3.7**	**3.7**	**2.4**
Water Elevation	ft MSL	--	**1533.59**	**1534.82**	**1535.66**	**1534.58**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	255	< 200	< 200	< 200	< 200
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	105	< 50	< 50	< 50	< 50
Mercury	ng/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	40 (p)	<10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	100	**57**	**61**	**53**	**58**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	40 (p)	< 10	< 10	< 10	< 10
Fluoride	mg/L	131	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.12 (p)	< 0.03	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	0.22	**0.54**	**0.53**	**0.97**	**1.1**
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	50	**21**	**21**	**12**	**13**
Sulfide	mg/L	0.30	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	40	**17**	**17**	**13**	**16**
Magnesium	mg/L	11	**7.4**	**6.9**	**5.9**	**6.7**
Potassium	mg/L	3.1	**1.5**	**1.8**	**1.3**	**1.5**
Sodium	mg/L	10	**3.0**	**2.9**	**2.4**	**2.6**
General						
Hardness	mg/L	136	**80**	**72**	**64**	**66**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-703 UFB (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/24/16[D]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/22/16[D]	
Field										
D.O.[1]	ppm	--	**0.24**		**0.87**		**1.0**		**0.90**	
ORP	mV	--	**-14**		**-181**		**114**		**50**	
pH	SU	8.3-9.3	**5.3**		**8.0**		**6.3**		**7.4**	
Specific Conductance	µS/cm	--	**273**		**268**		**193**		**170**	
Temperature	°C	--	**6.5**		**7.0**		**11**		**6.7**	
Turbidity	NTU	--	**4.6**		**4.8**		**32**		**4.7**	
Water Elevation	ft MSL	--	**1529.40**		**1532.30**		**1532.69**		**1532.19**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	2441	**1100**		**910**		**490**		**1500**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**12**		--	
Manganese	ug/L	194	**170**		< 250		**160**		**170**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	14	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	127	**83**		**84**		**83**		**81**	
Alkalinity, Carbonate	mg/L	28	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	40 (p)	< 10		< 10		< 10		< 10	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.47	< 0.03		< 0.03		**0.03**		< 0.03	
Nitrogen, Nitrate	mg/L	0.4 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.4 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	53	**45**		**46**		**45**		**45**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	53	**31**		**32**		**28**		**31**	
Magnesium	mg/L	17	**11**		**11**		**9.8**		**11**	
Potassium	mg/L	5.9	**2.5**		**2.4**		**2.2**		**2.4**	
Sodium	mg/L	35	**3.0**		**2.9**		**2.7**		**3.1**	
General										
Hardness	mg/L	193	**124**		**126**		**128**		**124**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-704 DBA (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[T]		Q2 2016 5/17/16[T]		Q3 2016 8/24/16[T]		Q4 2016 11/28/16[T]	
Field										
D.O.[1]	ppm	--	**0.53**		**1.9**		**0.53**		**0.7**	
ORP	mV	--	**-205**		**-208**		**-114**		**-116**	
pH	SU	8.6-9.6	**8.7**		**8.6**		**8.7**		**8.0**	
Specific Conductance	µS/cm	--	**214**		**1.8**		**208**		**158.0**	
Temperature	°C	--	**2.4**		**12**		**17**		**6.2**	
Turbidity	NTU	--	**0.90**		**0.85**		**2.7**		**0.74**	
Water Elevation	ft MSL	--	**1533.25**		**1534.34**		**1533.90**		**1531.97**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1480	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	9645	**660**		**660**		**410**		**600**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**15**		--	
Manganese	ug/L	58	< 50		< 50		< 50		**51**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	11	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	129	**110**		**120**		**120**		**130**	
Alkalinity, Carbonate	mg/L	32	**16**		**2.0**		**2.0**		**4.1**	
Chloride	mg/L	40 (p)	< 10		< 10		< 10		< 10	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.04	< 0.03		< 0.03		< 0.03		< 0.03	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	6.0	< 1.0		< 1.0		< 1.0		< 1.0	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	27	**21**		**21**		**19**		**22**	
Magnesium	mg/L	14	**11**		**12**		**10**		**12**	
Potassium	mg/L	4.0	**2.9**		**2.8**		**2.6**		**2.8**	
Sodium	mg/L	14	**11**		**11**		**10**		**11**	
General										
Hardness	mg/L	111	**98**		**106**		**106**		**108**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-704 LLA (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[D]		Q2 2016 5/17/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/28/16[D]	
Field										
D.O.[1]	ppm	--	**0.50**		**0.43**		**0.56**		**0.32**	
ORP	mV	--	**-211**		**195**		**-75**		**-185**	
pH	SU	8.2-9.2	**9.2**		**8.7**		**8.9**		**8.3**	
Specific Conductance	µS/cm	--	**186**		**211**		**177**		**157**	
Temperature	°C	--	**2.5**		**12**		**17**		**7.7**	
Turbidity	NTU	--	**9.0**		**14**		**6.3**		**3.1**	
Water Elevation	ft MSL	--	**1533.95**		**1534.75**		**1534.55**		**1531.75**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	4974	< 200		**420**		< 200		**650**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**26**		--	
Manganese	ug/L	90	< 50	e	< 50		< 50		**50**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	11	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	132	**77**		**55**		**96**		**120**	
Alkalinity, Carbonate	mg/L	10	**7.0**		**2.0**		**4.0**		**4.1**	
Chloride	mg/L	40 (p)	< 10		< 10		< 10		< 10	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.12 (p)	< 0.03		< 0.03		< 0.03		< 0.03	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	23	**4.7**		**5.1**		**4.2**		**5.7**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	33	**11**		**15**		**13**		**19**	
Magnesium	mg/L	17	**10**		**12**		**10**		**12**	
Potassium	mg/L	5.0	**11**		**10**		**9.5**		**8.1**	
Sodium	mg/L	5.0	**5.8**		**5.7**		**5.3**		**5.1**	
General										
Hardness	mg/L	149	**66**		**84**		**80**		**98**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-704 QAL (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[D]	Q2 2016 5/18/16[D]	Q3 2016 8/25/16[D]	Q4 2016 11/28/16[T]
Field						
D.O.[1]	ppm	--	**0.47**	**0.16**	**0.39**	**0.87**
ORP	mV	--	**170**	**17**	**103**	**1.7**
pH	SU	5.5-6.5	**5.7**	**5.9**	**5.7**	**5.7**
Specific Conductance	µS/cm	--	**250**	**446**	**226**	**265**
Temperature	°C	--	**2.9**	**7.4**	**12**	**8.1**
Turbidity	NTU	--	**3.4**	**3.1**	**14**	**0.51**
Water Elevation	ft MSL	--	**1534.11**	**1534.65**	**1534.57**	**1531.48**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	24	< 5.0	**13**	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	37038	< 200	**15000**	< 200	**2200**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	7914	**900**	**5500**	**520**	**3900**
Mercury	ng/L	6.0	< 1.0	**6.1**	< 1.0	**9.7**
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	44 (p)	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	241	**83**	**170**	**66**	**140**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	18	**14**	**17**	**17**	**16**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.04	< 0.03	**0.06**	< 0.03	**0.09**
Nitrogen, Nitrate	mg/L	0.17	**0.76**	**0.79**	**1.5**	**0.74**
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	23	**22**	**24**	**49**	**38**
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	51	**27**	**38**	**29**	**40**
Magnesium	mg/L	9.0	**9.6**	**10**	**11**	**11**
Potassium	mg/L	3.1	**1.9**	**2.5**	**2.4**	**3.2**
Sodium	mg/L	27	**5.1**	**19**	**8**	**21**
General						
Hardness	mg/L	185	**110**	**154**	**124**	**156**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-704 UFB (Compliance)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[D]		Q2 2016 5/18/16[D]		Q3 2016 8/24/16[D]		Q4 2016 11/28/16[D]	
Field										
D.O.[1]	ppm	--	**0.29**		**0.22**		**0.29**		**0.44**	
ORP	mV	--	**-80**		**-116**		**-145**		**-108**	
pH	SU	6.4-7.4	**6.7**		**6.6**		**6.9**		**6.8**	
Specific Conductance	µS/cm	--	**407**		**452**		**368**		**345**	
Temperature	°C	--	**4.3**		**7.7**		**14**		**8.3**	
Turbidity	NTU	--	**33**		**12**		**15**		**4.7**	
Water Elevation	ft MSL	--	**1534.49**		**1535.03**		**1535.01**		**1531.63**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 250		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	5.0	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	23040	**26000**		**36000**		**37000**		**28000**	
Lead	ug/L	4.0	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		< 10		--	
Manganese	ug/L	618	**810**		**700**		**630**		**1000**	
Mercury	ng/L	2.0	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	15	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	181	**150**		**140**		**130**		**160**	
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	18	**14**		**17**		**18**		**19**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.27	**0.03**		< 0.03		**0.04**		**0.03**	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.14	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	38	**11**		**20**		**35**		**47**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20	e	< 0.20	
Major Cations										
Calcium	mg/L	38	**50**		**46**		**44**		**56**	
Magnesium	mg/L	7.0	**7.8**		**7.9**		**9.4**		**11**	
Potassium	mg/L	4.0	**2.8**		**2.6**		**2.6**		**4.1**	
Sodium	mg/L	65	**5.1**		**5.0**		**6.1**		**7.6**	
General										
Hardness	mg/L	106	**160**		**160**		**164**		**198**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-705 QAL (Cutoff Wall Key-In)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/25/16[T]	Q2 2016 5/18/16[T]	Q3 2016 8/25/16[D]	Q4 2016 11/28/16[T]
Field						
D.O.[1]	ppm	--	**0.35**	**0.15**	**0.21**	**0.59**
ORP	mV	--	**-16**	**-83**	**-18**	**-17**
pH	SU	5.6-6.6	**6.3**	**6.3**	**5.9**	**6.1**
Specific Conductance	µS/cm	--	**250**	**249**	**205**	**169**
Temperature	°C	--	**3.2**	**7.4**	**12**	**8.5**
Turbidity	NTU	--	**2.1**	**1.9**	**8.1**	**1.3**
Water Elevation	ft MSL	--	**1533.96**	**1536.06**	**1534.92**	**1534.12**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	14081	**10000**	**8300**	**8800**	**8700**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	1674	**870**	**790**	**810**	**750**
Mercury	ng/L	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	174	< 10	< 10	< 10	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	94	**62**	**41**	**47**	**61**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	66	**31**	**40**	**44**	**32**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.10	**0.11**	**0.11**	**0.13**	**0.11**
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	6.0	**3.6**	**8.1**	**4.4**	**5.0**
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	27	**17**	**15**	**16**	**15**
Magnesium	mg/L	13	**7.4**	**6.7**	**7.4**	**6.7**
Potassium	mg/L	3.0	**2.4**	**2.3**	**3.0**	**2.7**
Sodium	mg/L	17	**12**	**12**	**15**	**13**
General						
Hardness	mg/L	115	**72**	**66**	**76**	**70**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-705 UFB (Cutoff Wall Key-In)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[D]		Q2 2016 5/18/16[D]		Q3 2016 8/25/16[D]		Q4 2016 11/28/16[D]	
Field										
D.O.[1]	ppm	--	**0.60**		**0.42**		**1.7**		**0.77**	
ORP	mV	--	**-202**		**-38**		**-21**		**-68**	
pH	SU	6.7-7.7	**8.1**		**6.8**		**7.2**		**7.0**	
Specific Conductance	µS/cm	--	**279**		**256**		**197**		**188**	
Temperature	°C	--	**7.8**		**8.4**		**10**		**8.1**	
Turbidity	NTU	--	**49**		**29**		**14**		**3.8**	
Water Elevation	ft MSL	--	**1533.52**		**1535.77**		**1534.46**		**1534.16**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 50		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	20 (p)	< 5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		< 20		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	11214	**9400**		**9200**		**8600**		**9700**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**12**		--	
Manganese	ug/L	866	**820**		**750**		**600**		**710**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	< 20		< 20		< 20		< 20	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	17	< 10		**30**		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	103	**81**		**85**		**87**		**86**	
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	40 (p)	**16**		**20**		**23**		**24**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	0.12 (p)	< 0.03		< 0.03		< 0.03	e	< 0.03	
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	15	**4.2**		**4.7**		**4.0**		**4.7**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20		< 0.20	
Major Cations										
Calcium	mg/L	26	**20**		**21**		**20**		**23**	
Magnesium	mg/L	12	**9.9**		**11**		**10**		**12**	
Potassium	mg/L	4.0	**3.6**		**3.4**		**3.3**		**3.9**	
Sodium	mg/L	3.0	**2.8**		**3.4**		**2.5**		**3.0**	
General										
Hardness	mg/L	111	**98**		**102**		**108**		**110**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-706 QAL (MSB & Crusher)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[T]		Q2 2016 5/19/16[T]		Q3 2016 8/26/16[T]		Q4 2016 11/30/16[T]	
Field										
D.O.[1]	ppm	--	**0.33**		**0.34**		**0.34**		**0.56**	
ORP	mV	--	**46**		**45**		**46**		**37**	
pH	SU	6.2-7.2	**5.9**		**6.0**		**5.6**		**5.8**	
Specific Conductance	µS/cm	--	**898**		**928**		**701**		**670**	
Temperature	°C	--	**6.0**		**9.2**		**11**		**7.7**	
Turbidity	NTU	--	**0.78**		**2.0**		**2.1**		**7.7**	
Water Elevation	ft MSL	--	**1558.11**		**1560.78**		**1560.65**		**1560.54**	
Metals										
Aluminum	ug/L	200 (p)	--		--		< 200		--	
Antimony	ug/L	8.0 (p)	--		--		< 2.0		--	
Arsenic	ug/L	16	<5.0		< 5.0		< 5.0		< 5.0	
Barium	ug/L	400 (p)	--		--		< 100		--	
Beryllium	ug/L	4.0 (p)	--		--		< 1.0		--	
Boron	ug/L	1200 (p)	--		--		< 300		--	
Cadmium	ug/L	4.0 (p)	--		--		< 1.0		--	
Chromium	ug/L	40 (p)	--		--		< 10		--	
Cobalt	ug/L	80 (p)	--		--		**30**		--	
Copper	ug/L	16 (p)	< 4.0		< 4.0		< 4.0		< 4.0	
Iron	ug/L	10846	**5400**	e	**4900**		**4600**		**4300**	
Lead	ug/L	12 (p)	< 3.0		< 3.0		< 3.0		< 3.0	
Lithium	ug/L	40 (p)	--		--		**12**		--	
Manganese	ug/L	27225	**17000**		**17000**		< 25000		**18000**	
Mercury	ng/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Molybdenum	ug/L	200 (p)	--		--		< 50		--	
Nickel	ug/L	80 (p)	**24**		**25**		**26**		**26**	
Selenium	ug/L	20 (p)	--		--		< 5.0		--	
Silver	ug/L	0.8 (p)	--		--		< 0.20		--	
Thallium	ug/L	8.0 (p)	--		--		< 2.0		--	
Vanadium	ug/L	16 (p)	--		--		< 4.0		--	
Zinc	ug/L	55	< 10		< 10		< 10		< 10	
Major Anions										
Alkalinity, Bicarbonate	mg/L	153	**83**		**82**		**73**		**75**	
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0		< 2.0		< 2.0		< 2.0	
Chloride	mg/L	105	**120**		**130**		**140**		**150**	
Fluoride	mg/L	4.0 (p)	< 1.0		< 1.0		< 1.0		< 1.0	
Nitrogen, Ammonia	mg/L	1.4	**0.41**	e	**0.43**		**0.44**		**0.43**	
Nitrogen, Nitrate	mg/L	0.4 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Nitrogen, Nitrite	mg/L	0.4 (p)	< 0.1		< 0.1		< 0.1		< 0.1	
Sulfate	mg/L	479	**200**		**200**		**180**		**200**	
Sulfide	mg/L	0.80 (p)	< 0.20		< 0.20		< 0.20		< 0.20	
Major Cations										
Calcium	mg/L	183	**89**		**85**		**85**		**88**	
Magnesium	mg/L	56	**32**		**32**		**33**		**34**	
Potassium	mg/L	6.0	**4.3**		**4.7**		**4.5**		**4.5**	
Sodium	mg/L	234	**26**		**26**		**26**		**29**	
General										
Hardness	mg/L	609	**384**		**178**		**70**		**6**	

2016
Mine Permit Groundwater Quality Monitoring Data
MW-707 QAL (Concentrator & CLO)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[T]	Q2 2016 5/19/16[T]	Q3 2016 8/26/16[T]	Q4 2016 11/30/16[T]
Field						
D.O.[1]	ppm	--	**0.64**	**0.77**	**0.32**	**0.39**
ORP	mV	--	**-95**	**-101**	**-93**	**-59**
pH	SU	6.3-7.3	**7.0**	**7.1**	**6.8**	**6.7**
Specific Conductance	µS/cm	--	**318**	**320**	**236**	**219**
Temperature	°C	--	**5.5**	**9.8**	**11**	**8.4**
Turbidity	NTU	--	**1.3**	**1.4**	**2.5**	**0.96**
Water Elevation	ft MSL	--	**1581.84**	**1583.28**	**1582.64**	**1582.02**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 50	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	20 (p)	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	16 (p)	< 4.0	< 4.0	< 4.0	< 4.0
Iron	ug/L	7493	**5700**	**5100**	**4800**	**4900**
Lead	ug/L	12 (p)	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	1189	**1000**	**950**	< 1200	**810**
Mercury	ng/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	< 20	< 20	< 20	< 20
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	19	**11**	< 10	**25**	< 10
Major Anions						
Alkalinity, Bicarbonate	mg/L	150	**160**	**150**	**160**	**160**
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	40 (p)	< 10	< 10	< 10	< 10
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.34	**0.27**	**0.27**	**0.26**	**0.23**
Nitrogen, Nitrate	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	8.0	**6.8**	**4.4**	**6.3**	**5.2**
Sulfide	mg/L	0.80 (p)	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	51	**41**	**39**	**39**	**41**
Magnesium	mg/L	15	**12**	**11**	**11**	**12**
Potassium	mg/L	3.0	**2.3**	**2.3**	**2.3**	**2.5**
Sodium	mg/L	4.0	**2.7**	**3.0**	**2.8**	**2.9**
General						
Hardness	mg/L	149	**156**	**154**	**156**	**156**

2016
Mine Permit Groundwater Quality Monitoring Data
MW-9R (Concentrator)
Humboldt Mill

Parameter	Unit	Recom-mended Benchmark 2014	Q1 2016 2/26/16[T]	Q2 2016 5/19/16[T]	Q3 2016 8/26/16[T]	Q4 2016 11/30/16[T]
Field						
D.O.[1]	ppm	--	**1.8**	**0.21**	**0.56**	**3.60**
ORP	mV	--	**226**	**91**	**107**	**108**
pH	SU	5.4-6.4	**5.4**	**6.4**	**5.8**	**5.6**
Specific Conductance	µS/cm	--	**554**	**295**	**454**	**427**
Temperature	°C	--	**6.0**	**8.6**	**14**	**12**
Turbidity	NTU	--	**1.3**	**1.8**	**2.4**	**2.6**
Water Elevation	ft MSL	--	**1595.7**	**1595.74**	**1596.71**	**1595.52**
Metals						
Aluminum	ug/L	200 (p)	--	--	< 200	--
Antimony	ug/L	8.0 (p)	--	--	< 2.0	--
Arsenic	ug/L	25	< 5.0	< 5.0	< 5.0	< 5.0
Barium	ug/L	400 (p)	--	--	< 100	--
Beryllium	ug/L	4.0 (p)	--	--	< 1.0	--
Boron	ug/L	1200 (p)	--	--	< 300	--
Cadmium	ug/L	4.0 (p)	--	--	< 1.0	--
Chromium	ug/L	40 (p)	--	--	< 10	--
Cobalt	ug/L	80 (p)	--	--	< 20	--
Copper	ug/L	5.0	**4.8**	< 4.0	**4.1**	< 4.0
Iron	ug/L	25558	< 200	< 200	< 200	< 200
Lead	ug/L	0.04	< 3.0	< 3.0	< 3.0	< 3.0
Lithium	ug/L	40 (p)	--	--	< 10	--
Manganese	ug/L	1694	**430**	**79**	< 250	**66**
Mercury	ng/L	1.0	**1.0**	< 1.0	< 1.0	**1.9**
Molybdenum	ug/L	200 (p)	--	--	< 50	--
Nickel	ug/L	80 (p)	**51**	< 20	**29**	**25**
Selenium	ug/L	20 (p)	--	--	< 5.0	--
Silver	ug/L	0.8 (p)	--	--	< 0.20	--
Thallium	ug/L	8.0 (p)	--	--	< 2.0	--
Vanadium	ug/L	16 (p)	--	--	< 4.0	--
Zinc	ug/L	25	**18**	**21**	**19**	**15**
Major Anions						
Alkalinity, Bicarbonate	mg/L	137	**29**	**24**	**59**	**50**
Alkalinity, Carbonate	mg/L	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloride	mg/L	711	**16**	**23**	**32**	**14**
Fluoride	mg/L	4.0 (p)	< 1.0	< 1.0	< 1.0	< 1.0
Nitrogen, Ammonia	mg/L	0.36	< 0.03	< 0.03	< 0.03	< 0.03
Nitrogen, Nitrate	mg/L	1.0	**2.1**	**0.18**	**1.5**	**2.2**
Nitrogen, Nitrite	mg/L	0.07	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	mg/L	343	**210**	**77**	**170**	**200**
Sulfide	mg/L	1.0	< 0.20	< 0.20	< 0.20	< 0.20
Major Cations						
Calcium	mg/L	123	**55**	**26**	**59**	**62**
Magnesium	mg/L	48	**21**	**10**	**22**	**25**
Potassium	mg/L	8.0	**2.9**	**2.1**	**3.5**	**3.5**
Sodium	mg/L	289	**17**	**8.2**	**15**	**15**
General						
Hardness	mg/L	510	**232**	**114**	**242**	**256**

2016
Mine Permit Groundwater Quality Monitoring Data
Abbreviations & Data Qualifiers
Humboldt Mill

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.
T = Sample was not filtered and all values are total concentrations.
D = Samples for metals and major cation parameters were filtered and values are dissolved concentrations.
e = estimated value, results of laboratory control parameters were outside of established control limits.