TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
TAILINGS POND						
PH	7.22	6.32	8.28	8.60	----	7.39
SC	1300	1300	1300	260	----	1250
TURBIDITY	8.0000	10.0000	20.0000	0.8400	----	1.6000
TDS	1720	1800	1840	1845	1845	1520
SUSPENDED SOLIDS	11	22	29	2	2	3
TOTAL HARDNESS (CACO3)	----	----	----	----	----	----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA	NA	NA	NA
CA	311.0	322.0	334.0	338.0	349.0	265.0
MG	12.1	11.5	11.9	26.0	24.8	25.4
K	----	----	----	----	----	----
NA	168.0	190.0	201.0	173.0	166.0	128.0
TOTAL CATIONS (MEQ/L)	----	----	----	----	----	----
ANIONS						
TOTAL ALKALINITY	----	----	----	----	----	----
BICARBONATE ALKALINITY	----	----	----	----	----	----
CARBONATE ALKALINITY	----	----	----	----	----	----
CL	315.0	313.0	305.0	328.0	328.0	263.0
FL	----	----	----	----	----	----
N	----	----	----	----	----	----
SO4	754.0	795.0	807.0	808.0	772.0	572.0
TOTAL ANIONS (MEQ/L)	----	----	----	----	----	----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----	----	----	----
CATION/ANION RATIO	----	----	----	----	----	----
TRACE ELEMENTS						
AL	0.220	0.240	0.430	<0.10	<0.10	0.390
AS	0.066	0.028	0.060	0.013	0.039	<0.005
BA	0.100	0.100	<0.010	<0.1	<0.1	0.140
CD	0.007	0.007	0.005	0.004	0.006	<0.005
CR	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
CO	<0.02	<0.02	0.040	----	0.020	0.030
CU	0.020	0.010	0.010	0.010	0.010	0.020
FE	0.200	0.350	0.480	0.100	0.080	0.150
PB	0.120	<0.05	0.050	0.080	0.100	0.060
MN	0.260	0.380	0.540	0.490	0.450	0.320
HG	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
MO	4.000	4.140	4.020	2.210	2.380	0.940
NI	0.020	<0.05	<0.05	0.040	0.050	0.040
SE	0.056	0.060	0.048	0.033	0.043	0.013
AG	0.007	<0.005	0.007	0.008	0.005	<0.005
ZN	0.031	0.023	0.020	0.035	0.021	0.009
SI	----	----	----	----	----	----
ADDITIONAL CATIONS (MEQ/L)	----	----	----	----		

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
SEEPAGE RETURN DAM						
PH	6.28	6.24	8.02		----	7.29
SC	1400	1300	1400		----	1500
TURBIDITY	0.8000	1.6000	1.6000		----	2.4000
TDS	1805	1880	1875		1800	1810
SUSPENDED SOLIDS	1.0000	3.0000	3.0000		2.0000	4.0000
TOTAL HARDNESS (CACO3)	----	----	----		----	----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA		NA	NA
CA	364.0	370.0	372.0		343.0	307.0
MG	41.0	42.0	42.0		40.5	38.8
K	----	----	----		----	----
NA	116.0	134.0	134.0		----	----
TOTAL CATIONS (MEQ/L)	----	----	----		----	----
ANIONS						
TOTAL ALKALINITY	----	----	----		----	----
BICARBONATE ALKALINITY	----	----	----		----	----
CARBONATE ALKALINITY	----	----	----		----	----
CL	403.0	343.0	393.0		357.0	321.0
FL	----	----	----		----	----
N	----	----	----		----	----
SO4	670.0	665.0	658.0		627.0	564.0
TOTAL ANIONS (MEQ/L)	----	----	----		----	----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----		----	----
CATION/ANION RATIO	----	----	----		----	----
TRACE ELEMENTS						
AL	<0.10	<0.10	<0.10		<0.10	0.290
AS	0.214	0.070	0.060		0.022	<0.005
BA	<0.10	<0.10	<0.10		<0.1	0.150
CD	<0.005	0.008	0.007		0.008	<0.005
CR	<0.05	<0.05	<0.05		<0.05	<0.05
CO	0.020	0.050	0.050		0.020	0.030
CU	0.010	0.020	0.010		<0.02	0.040
FE	0.050	0.280	0.180		0.090	0.280
PB	0.100	<0.05	0.110		0.120	0.110
MN	0.890	0.890	0.910		0.770	0.590
HG	<0.0005	<0.0005	<0.0005		<0.0005	<0.005
MO	0.170	0.180	0.180		0.150	0.140
NI	0.040	0.060	0.050		0.050	0.060
SE	0.086	0.045	0.045		0.038	0.065
AG	0.009	0.005	0.007		0.006	0.006
ZN	0.018	0.029	0.026		0.038	0.066
SI	----	----	----		----	----
ADDITIONAL CATIONS (MEQ/L)	----	----	----			

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
PUMP BACK SYSTEM						
PH	6.19	6.08	7.95	7.35	----	6.92
SC	1300	1050	1100	1300	----	1300
TURBIDITY	0.1400	0.1000	0.2000	0.4400	----	0.3600
TDS	1610	1635	1620	----	1575	1625
SUSPENDED SOLIDS	2.0000	1.0000	1.0000	----	<1.0	<0.1
TOTAL HARDNESS (CACO3)	----	----	----	----	----	----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA	NA	NA	NA
CA	328.0	325.0	318.0	----	309.0	282.0
MG	52.0	53.0	58.0	----	52.0	42.0
K	----	----	----	----	----	----
NA	68.0	87.8	83.7	----	78.0	93.0
TOTAL CATIONS (MEQ/L)	----	----	----	----	----	----
ANIONS						
TOTAL ALKALINITY	----	----	----	----	----	----
BICARBONATE ALKALINITY	----	----	----	----	----	----
CARBONATE ALKALINITY	----	----	----	----	----	----
CL	328.0	317.0	320.0	----	311.0	263.0
FL	----	----	----	----	----	----
N	----	----	----	----	----	----
SO4	580.0	553.0	558.0	----	540.0	461.0
TOTAL ANIONS (MEQ/L)	----	----	----	----	----	----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----	----	----	----
CATION/ANION RATIO	----	----	----	----	----	----
TRACE ELEMENTS						
AL	<0.10	<0.10	<0.10	----	<0.10	<0.10
AS	0.051	0.049	0.047	----	0.030	<0.005
BA	<0.10	<0.10	<0.10	----	0.100	0.140
CD	0.007	0.011	0.004	----	0.006	<0.005
CR	<0.05	<0.05	<0.05	----	<0.05	<0.05
CO	0.030	<0.02	0.040	----	0.020	0.030
CU	0.010	0.010	0.020	----	<0.01	0.010
FE	0.060	<0.05	0.060	----	0.010	0.120
PB	0.070	<0.05	0.100	----	0.090	0.090
MN	0.010	<0.01	0.020	----	<0.01	<0.01
HG	<0.0005	<0.0005	<0.0005	----	<0.0005	<0.0005
MO	<0.05	0.050	<0.05	----	0.050	0.090
NI	0.040	<0.05	0.050	----	0.040	0.050
SE	0.044	0.039	0.052	----	0.038	0.033
AG	0.009	0.006	0.007	----	0.008	0.006
ZN	0.025	0.018	0.029	----	0.065	0.270
SI	----	----	----	----	----	----
ADDITIONAL CATIONS (MEQ/L)	----	----	----	----		

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
RIGHT ABUTMENT						
PH	7.44	5.54	8.22	FROZEN	FROZEN	6.21
SC	260	330	210			128
TURBIDITY	3.80	0.50	8.00			0.88
TDS	345	470	295			185
SUSPENDED SOLIDS	2.0000	2.0000	4.0000			2.0
TOTAL HARDNESS (CACO3)	----	----	----			----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA			NA
CA	67.1	105.0	61.6			30.6
MG	5.3	7.3	4.2			2.4
K	----	----	----			----
NA	22.5	33.6	22.0			21.0
TOTAL CATIONS (MEQ/L)	----	----	----			----
ANIONS						
TOTAL ALKALINITY	----	----	----			----
BICARBONATE ALKALINITY	----	----	----			----
CARBONATE ALKALINITY	----	----	----			----
CL	52.5	73.5	36.1			120.0
FL	----	----	----			----
N	----	----	----			----
SO4	112.0	150.0	74.0			51.0
TOTAL ANIONS (MEQ/L)	----	----	----			----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----			----
CATION/ANION RATIO	----	----	----			----
TRACE ELEMENTS						
AL	0.210	0.370	0.550			1.060
AS	0.028	0.020	<0.005			<0.005
BA	0.100	0.100	<0.1			<0.10
CD	<0.005	<0.005	<0.002			<0.005
CR	<0.05	<0.05	<0.05			<0.05
CO	<0.02	<0.02	<0.02			<0.02
CU	<0.01	0.010	0.020			<0.01
FE	0.080	0.190	0.490			0.260
PB	<0.05	<0.05	<0.05			<0.05
MN	0.430	0.870	0.400			0.280
HG	<0.0005	<0.0005	<0.0005			<0.0005
MO	<0.05	<0.05	<0.05			<0.05
NI	<0.01	<0.05	<0.05			0.020
SE	0.015	0.028	<0.005			<0.005
AG	<0.005	<0.005	<0.005			<0.005
ZN	0.039	0.062	0.092			0.074
SI	----	----	----			----
ADDITIONAL CATIONS (MEQ/L)	----	----	----			

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
RUNOFF INTERCEPTOR DITCH						
PH	6.68	6.54	8.14			6.56
SC	80	80	80			55
TURBIDITY	0.2600	0.1900	0.3000			21
TDS	130	105	100			85
SUSPENDED SOLIDS	1.0000	1.0000	2.0000			<1.0
TOTAL HARDNESS (CACO3)	----	----	----			----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA			NA
CA	21.5	29.7	31.2			12.9
MG	5.0	5.2	6.0			----
K	----	----	----			----
NA	4.6	3.6	3.8			6.5
TOTAL CATIONS (MEQ/L)	----	----	----			----
ANIONS						
TOTAL ALKALINITY	----	----	----			----
BICARBONATE ALKALINITY	----	----	----			----
CARBONATE ALKALINITY	----	----	----			----
CL	2.3	1.7	1.7			0.4
FL	----	----	----			----
N	----	----	----			----
SO4	9.0	7.0	13.0			2.0
TOTAL ANIONS (MEQ/L)	----	----	----			----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----			----
CATION/ANION RATIO	----	----	----			----
TRACE ELEMENTS						
AL	<0.10	<0.10	<0.10			0.720
AS	0.007	0.011	0.010			<0.005
BA	<0.1	<0.1	<0.1			<0.10
CD	<0.005	<0.005	<0.002			<0.005
CR	<0.05	<0.05	<0.05			<0.05
CO	<0.02	<0.02	<0.02			<0.02
CU	<0.01	<0.01	0.020			<0.01
FE	0.010	<0.05	0.060			0.160
PB	<0.05	<0.05	<0.05			<0.05
MN	<0.01	<0.01	0.010			2.000
HG	<0.0005	<0.0005	<0.0005			<0.0005
MO	<0.05	<0.05	<0.05			<0.05
NI	<0.05	<0.05	<0.05			<0.02
SE	0.010	0.060	<0.005			<0.005
AG	<0.005	<0.005	<0.005			<0.005
ZN	0.481	0.507	0.590			0.269
SI	----	----	----			----
ADDITIONAL CATIONS (MEQ/L)	----	----	----			

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
LEFT ABUTMENT						
PH	7.14	5.60	8.33	7.44	----	6.13
SC	1700	1700	1700	1600	----	1500
TURBIDITY	0.2200	0.1800	0.2000	0.2000	----	0.0600
TDS	1895	2020	1940	----	1870	1950
SUSPENDED SOLIDS	1.0000	2.0000	2.0000	----	2.0000	1.0000
TOTAL HARDNESS (CACO3)	----	----	----	----	----	----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA	----	NA	NA
CA	379.0	375.0	376.0	----	354.0	335.0
MG	41.5	40.5	42.5	----	41.0	41.0
K	----	----	----	----	----	----
NA	125.0	148.0	142.0	----	137.0	134.0
TOTAL CATIONS (MEQ/L)	----	----	----	----	----	----
ANIONS						
TOTAL ALKALINITY	----	----	----	----	----	----
BICARBONATE ALKALINITY	----	----	----	----	----	----
CARBONATE ALKALINITY	----	----	----	----	----	----
CL	410.0	411.0	408.0	----	388.0	343.0
FL	----	----	----	----	----	----
N	----	----	----	----	----	----
SO4	701.0	657.0	668.0	----	650.0	613.0
TOTAL ANIONS (MEQ/L)	----	----	----	----	----	----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----	----	----	----
CATION/ANION RATIO	----	----	----	----	----	----
TRACE ELEMENTS						
AL	<0.10	<0.10	<0.10	----	<0.10	<0.10
AS	0.067	0.072	0.044	----	0.035	<0.005
BA	<0.10	<0.10	<0.10	----	<0.1	0.170
CD	<0.005	0.008	0.005	----	0.006	<0.005
CR	<0.05	<0.05	<0.05	----	<0.05	<0.05
CO	0.040	0.030	0.030	----	0.020	0.050
CU	0.010	0.020	0.020	----	0.010	0.010
FE	0.070	0.180	0.090	----	0.070	0.060
PB	0.070	0.080	0.130	----	0.130	0.130
MN	0.680	0.770	0.750	----	0.570	0.400
HG	<0.0005	0.004	<0.0005	----	<0.0005	<0.0005
MO	0.190	0.200	0.190	----	0.160	0.180
NI	0.050	0.050	<0.050	----	0.060	0.060
SE	0.050	0.050	0.037	----	0.033	0.028
AG	0.009	0.006	0.005	----	0.006	0.007
ZN	0.057	1.650	0.030	----	0.016	0.012
SI	----	----	----	----	----	----
ADDITIONAL CATIONS (MEQ/L)	----	----	----	----	----	----

TAILINGS SURFACE WATER QUALITY

WATER QUALITY	12/04/86	12/10/86	12/18/86	01/22/87	01/29/87	04/20/87
MAIN DRAIN						
PH	7.14	5.55	8.33	7.44	----	7.12
SC	1500	1400	1500	1600	----	1500
TURBIDITY	0.6500	0.6000	0.6000	----	----	0.3200
TDS	1900	1975	1895	1850	1880	1890
SUSPENDED SOLIDS	1.0000	2.0000	1.0000	2.0000	<1.0	1.0000
TOTAL HARDNESS (CACO3)	----	----	----	----	----	----
CATIONS						
TOTAL ACIDITY (CACO3)	NA	NA	NA	NA	NA	NA
CA	381.0	378.0	368.0	349.0	354.9	329.0
MG	42.0	38.5	41.0	42.0	41.5	41.0
K	----	----	----	----	----	----
NA	127.0	142.0	133.0	132.0	131.0	131.0
TOTAL CATIONS (MEQ/L)	----	----	----	----	----	----
ANIONS						
TOTAL ALKALINITY	----	----	----	----	----	----
BICARBONATE ALKALINITY	----	----	----	----	----	----
CARBONATE ALKALINITY	----	----	----	----	----	----
CL	410.0	409.0	387.0	378.0	----	343.0
FL	----	----	----	----	----	----
N	----	----	----	----	----	----
SO4	672.0	657.0	663.0	673.0	649.0	568.0
TOTAL ANIONS (MEQ/L)	----	----	----	----	----	----
CATION-ANION DIFFERENCE (MEQ/L)	----	----	----	----	----	----
CATION/ANION RATIO	----	----	----	----	----	----
TRACE ELEMENTS						
AL	<0.10	<0.10	<0.10	<0.10	----	0.130
AS	0.066	0.075	0.054	0.023	0.020	<0.005
BA	<0.100	0.100	<0.100	<0.10	<0.10	0.120
CD	0.009	0.008	0.006	0.006	0.007	<0.005
CR	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
CO	0.020	0.040	0.030	----	0.030	0.040
CU	0.030	0.010	0.010	0.010	0.010	0.030
FE	0.120	0.480	0.150	0.160	0.130	0.140
PB	0.100	0.070	0.130	0.100	0.130	0.080
MN	0.780	1.030	0.920	0.650	0.770	0.620
HG	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
MO	0.210	0.180	0.180	0.160	0.170	0.180
NI	0.040	0.050	<0.050	0.050	0.060	0.060
SE	0.051	0.047	0.048	0.033	0.031	0.040
AG	0.008	0.007	0.005	0.007	0.008	0.009
ZN	0.037	0.037	0.030	0.034	0.023	0.014
SI	----	----	----	----	----	----
ADDITIONAL CATIONS (MEQ/L)	----	----	----	----		