

Appendix A

Twin Lakes Water Elevations

A-1 East Twin

A-2 West Twin

A-3 Graphical comparison

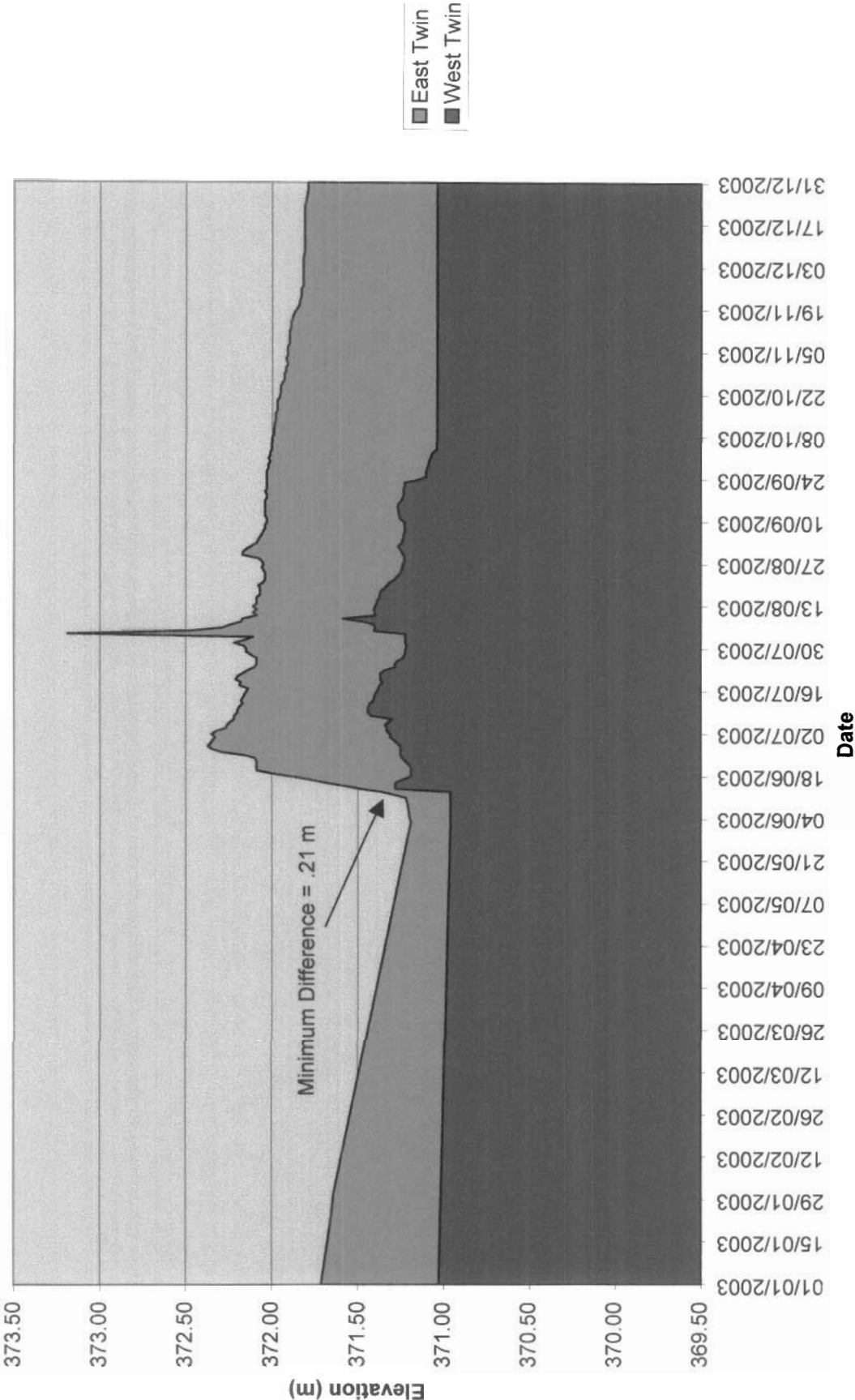
2003 WATER ELEVATIONS EAST TWIN LAKE (metres)												
Day	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	371.71	371.64	371.53	371.42	371.31	371.20	372.33	372.22	372.15	372.02	371.91	371.82
2	371.71	371.63	371.53	371.42	371.31	371.19	372.35	372.16	372.12	372.01	371.92	371.82
3	371.71	371.63	371.53	371.41	371.30	371.19	372.32	372.11	372.09	372.01	371.92	371.82
4	371.71	371.63	371.52	371.41	371.30	371.20	372.27	373.19	372.08	372.00	371.91	371.82
5	371.70	371.62	371.52	371.41	371.30	371.20	372.26	372.49	372.07	372.00	371.91	371.82
6	371.70	371.62	371.52	371.40	371.29	371.20	372.24	372.29	372.06	372.00	371.91	371.82
7	371.70	371.61	371.51	371.40	371.29	371.21	372.22	372.24	372.05	372.00	371.91	371.82
8	371.69	371.61	371.51	371.39	371.29	371.21	372.22	372.18	372.04	372.00	371.90	371.81
9	371.69	371.61	371.50	371.39	371.28	371.21	372.20	372.17	372.04	371.99	371.90	371.81
10	371.69	371.60	371.50	371.39	371.28	371.22	372.20	372.09	372.03	371.99	371.90	371.81
11	371.69	371.60	371.50	371.38	371.27	371.22	372.19	372.11	372.03	371.99	371.90	371.81
12	371.68	371.60	371.49	371.38	371.27	371.29	372.17	372.09	372.04	371.99	371.90	371.81
13	371.68	371.59	371.49	371.38	371.27	371.36	372.18	372.11	372.04	371.98	371.89	371.81
14	371.68	371.59	371.49	371.37	371.26	371.49	372.17	372.09	372.04	371.98	371.89	371.81
15	371.68	371.59	371.48	371.37	371.26	371.59	372.16	372.09	372.04	371.98	371.89	371.81
16	371.67	371.58	371.48	371.37	371.26	371.69	372.15	372.09	372.04	371.98	371.89	371.81
17	371.67	371.58	371.48	371.36	371.25	371.78	372.14	372.07	372.04	371.97	371.88	371.81
18	371.67	371.57	371.47	371.36	371.25	371.89	372.19	372.07	372.03	371.97	371.87	371.81
19	371.67	371.57	371.47	371.35	371.24	372.00	372.18	372.07	372.03	371.97	371.86	371.81
20	371.66	371.57	371.46	371.35	371.24	372.09	372.21	372.08	372.04	371.97	371.85	371.81
21	371.66	371.56	371.46	371.35	371.24	372.09	372.20	372.05	372.03	371.96	371.84	371.81
22	371.66	371.56	371.46	371.34	371.23	372.09	372.17	372.04	372.03	371.96	371.84	371.81
23	371.66	371.56	371.45	371.34	371.23	372.09	372.14	372.04	372.03	371.95	371.84	371.81
24	371.65	371.55	371.45	371.34	371.23	372.10	372.10	372.04	372.03	371.95	371.83	371.81
25	371.65	371.55	371.45	371.33	371.22	372.16	372.09	372.05	372.03	371.95	371.83	371.80
26	371.65	371.54	371.44	371.33	371.22	372.29	372.09	372.06	372.03	371.94	371.83	371.80
27	371.65	371.54	371.44	371.33	371.22	372.35	372.09	372.05	372.03	371.93	371.82	371.80
28	371.65	371.54	371.44	371.32	371.21	372.37	372.12	372.06	372.02	371.93	371.82	371.79
29	371.64		371.43	371.32	371.21	372.36	372.15	372.08	372.02	371.93	371.82	371.79
30	371.64		371.43	371.31	371.20	372.34	372.15	372.17	372.01	371.92	371.82	371.79
31	371.64		371.42		371.20		372.16	372.17		371.92		371.79

Avg 371.76
 Max 373.19
 Min 371.19

2003 WATER ELEVATIONS WEST TWIN RESERVOIR (metres)												
Day	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	371.03	371.01	371.00	370.99	370.97	370.96	371.31	371.22	371.25	371.08	371.04	371.04
2	371.03	371.01	371.00	370.99	370.97	370.96	371.31	371.22	371.26	371.07	371.04	371.04
3	371.03	371.01	371.00	370.99	370.97	370.96	371.33	371.22	371.24	371.06	371.04	371.04
4	371.03	371.01	371.00	370.99	370.97	370.96	371.33	371.22	371.24	371.04	371.04	371.04
5	371.03	371.01	371.00	370.99	370.97	370.96	371.34	371.40	371.23	371.04	371.04	371.04
6	371.03	371.01	371.00	370.99	370.97	370.96	371.32	371.40	371.23	371.04	371.04	371.04
7	371.03	371.01	371.00	370.99	370.97	370.96	371.30	371.40	371.23	371.04	371.04	371.04
8	371.03	371.01	371.00	370.99	370.97	370.96	371.42	371.47	371.23	371.04	371.04	371.04
9	371.03	371.01	371.00	370.98	370.97	370.96	371.44	371.59	371.23	371.04	371.04	371.04
10	371.02	371.01	371.00	370.98	370.97	370.96	371.44	371.40	371.23	371.04	371.04	371.04
11	371.02	371.01	371.00	370.98	370.97	370.96	371.44	371.40	371.25	371.04	371.04	371.04
12	371.02	371.01	371.00	370.98	370.97	370.96	371.43	371.40	371.26	371.04	371.04	371.04
13	371.02	371.01	371.00	370.98	370.97	370.96	371.41	371.40	371.26	371.04	371.04	371.04
14	371.02	371.01	371.00	370.98	370.97	371.28	371.40	371.39	371.26	371.04	371.04	371.04
15	371.02	371.01	371.00	370.98	370.97	371.28	371.40	371.39	371.27	371.04	371.04	371.04
16	371.02	371.01	371.00	370.98	370.97	371.28	371.39	371.37	371.26	371.04	371.04	371.04
17	371.02	371.01	371.00	370.98	370.97	371.24	371.38	371.37	371.25	371.04	371.04	371.04
18	371.02	371.01	370.99	370.98	370.97	371.19	371.37	371.37	371.24	371.04	371.04	371.04
19	371.02	371.01	370.99	370.98	370.97	371.19	371.36	371.34	371.23	371.04	371.04	371.04
20	371.02	371.01	370.99	370.98	370.97	371.19	371.37	371.33	371.23	371.04	371.04	371.04
21	371.02	371.01	370.99	370.98	370.97	371.19	371.37	371.31	371.23	371.04	371.04	371.04
22	371.02	371.01	370.99	370.98	370.97	371.21	371.37	371.28	371.23	371.04	371.04	371.04
23	371.02	371.00	370.99	370.98	370.96	371.22	371.34	371.27	371.23	371.04	371.04	371.04
24	371.02	371.00	370.99	370.98	370.96	371.24	371.28	371.25	371.15	371.04	371.04	371.04
25	371.02	371.00	370.99	370.98	370.96	371.25	371.28	371.25	371.10	371.04	371.04	371.04
26	371.02	371.00	370.99	370.98	370.96	371.25	371.27	371.24	371.10	371.04	371.04	371.04
27	371.02	371.00	370.99	370.98	370.96	371.25	371.24	371.24	371.10	371.04	371.04	371.04
28	371.02	371.00	370.99	370.98	370.96	371.25	371.23	371.23	371.09	371.04	371.04	371.04
29	371.02	371.00	370.99	370.98	370.96	371.27	371.22	371.23	371.08	371.04	371.04	371.04
30	371.02	371.00	370.99	370.98	370.96	371.29	371.22	371.23	371.08	371.04	371.04	371.04
31	371.02		370.99	370.98	370.96		371.22	371.24		371.04		371.04

Avg 371.09
 Max 371.59
 Min 370.96

East Twin Lake and West Twin Reservoir Water Elevations



Appendix B

2003 Water Data

B-1	159-4
B-2	159-6
B-3	159-9
B-4	159-10
B-5	159-12A
B-6	159-15
B-7	159-16
B-8	159-18
B-9	159-19

Appendix B-1

Final Discharge Point 159-4 (Effluent from W T D A at Decant Structure)													
Date	Temp (°C)	pH	Cond (mS)	T.S.S. (mg/L)	Cd (mg/L)	Pb (mg/L)	As (mg/L)	Cu (mg/L)	Ni (mg/L)	Rad 226 (Bq/L)	Zn (mg/L)	NH3 (mg/L)	24 Hour Flow (m³)
8-Jul	16.2	7.28	0.60	2.2	0.0001	0.003	0.000	0.005	<.005		<.005	0.48	833.8
9-Jul	15.4	7.28	0.67	1.6	<.0001	0.003	0.000	0.005	<.005		0.005	0.48	4777.9
10-Jul	15.0	7.23	0.7	0.8	0.0003	0.004					<.005	0.53	5270.4
11-Jul	15.8	7.52	0.78	1.4	0.0001	0.004					<.005	0.57	8907.8
12-Jul	14.1	6.60	0.84	2.0	0.0002	0.004					0.007	0.69	10372.3
13-Jul	14.9	6.29	0.85	2.8	0.0002	0.004	0.000	0.013	<.005	0.040	0.020	0.72	8532.0
14-Jul	14.4	6.33	0.91	1.2	0.0006	0.006	0.000	0.017	<.005	0.020	0.028	0.8	7490.9
15-Jul	12.80	7.05	0.92	1.2	0.0006	0.005	0.000	0.019	<.005	0.030	0.025	0.78	9923.0
16-Jul	12.8	7.66	0.95	0.8	0.0002	0.005	0.001	0.019	<.005	0.040	0.029	0.89	8134.6
17-Jul	12.2	7.55	1	0.4	0.0002	0.006	0.001	0.020	<.005	0.030	0.032	0.89	6553.4
18-Jul	11.5	7.06	1.11	2.4	0.0002	0.006	0.001	0.021	<.005	<0.01	0.031	1.05	7992.0
19-Jul	11.1	7.56	1.14	1.6	0.0002	0.007	0.001	0.022	<.005	0.050	0.037	1.08	7344.0
20-Jul	9.3	7.71	1.24	3.2	0.0002	0.008	0.001	0.019	<0.005	0.050	0.037	1.18	7318.1
21-Jul	8.8	7.84	1.37	1.6	0.0004	0.009	0.001	0.023	<0.005	0.090	0.045	1.35	6631.2
22-Jul	7.3	7.76	1.36	0.4	0.0004	0.008	0.001	0.022	<0.005	0.040	0.046	1.28	6099.8
23-Jul	8.1	7.86	1.52	0.8	0.0004	0.011	0.002	0.026	<0.005	0.060	0.064	1.35	5732.6
24-Jul	7.4	7.76	1.58	0.8	0.0003	0.009	0.002	0.028	<0.005	0.060	0.063	1.52	5313.6
25-Jul	7.2	7.76	1.69	2.0	0.0004	0.010	0.001	0.038	0.006	0.070	0.083	1.57	6177.6
26-Jul	8.3	7.69	1.59	2.8	0.0003	0.011	0.002	0.032	<0.005	0.080	0.079	1.69	4924.8
27-Jul	10.4	7.88	1.92	2.0	0.0003	0.012	0.002	0.042			0.094	1.78	5512.3
28-Jul	10.4	8.04	1.94	2.0	0.0002	0.012	0.002	0.042			0.092	1.64	5771.5
29-Jul	9.4	7.70	2.02	28.8	0.0004	0.027	0.003	0.042			0.118	1.69	5551.2
30-Jul	5.1	7.58	2.06	13.2	0.0004	0.015	0.002	0.036			0.097	1.81	5032.8
31-Jul	6.2	7.76	2.13	3.2	0.0003	0.012	0.002	0.031			0.094	1.83	4613.8
Average				3.3	0.0003	0.008	0.001	0.025	<0.005	0.047	0.054	1.15	

Total Effluent Deposited in July 154,812 m³

Mass Loading (July)

TSS	466.85	Kg
Cadmium	0.05	Kg
Lead	1.23	Kg
Arsenic	0.17	Kg
Copper	3.68	Kg
Nickel	0.59	Kg
Radium 226	6.62	MBq
Zinc	9.82	Kg
NH ₃	172.44	Kg

Note: One Half of the Lab Detection Limits were used for the calculations when the lab limit was above 1 tenth of the Method Detection Limits as set out in Column 4 of Schedule 3 (MMER)

Appendix B-1

Final Discharge Point 159-4 (Effluent from W T D A at Decant Structure)													
Date	Temp (°C)	pH	Cond (mS)	T.S.S. (mg/L)	Cd (mg/L)	Pb (mg/L)	As (mg/L)	Cu (mg/L)	Ni (mg/L)	Rad 226 (Bq/L)	Zn (mg/L)	NH3 (mg/L)	24 Hour Flow (m³)
1-Aug	4.6	7.77	2.10	0.8	0.0005	0.010	0.002	0.026			0.087	1.74	3693.6
2-Aug	5.5	7.80	2.27	3.2	0.0003	0.010	0.002	0.027	<0.005	0.060	0.091	1.88	3365.3
3-Aug	6.2	7.79	2.23	2.0	0.0006	0.009	0.001	0.026	0.006		0.111	1.8	1805.8
4-Aug	6.2	7.48	2.06	65.2	0.0006	0.014	0.002	0.025	0.007		0.113	1.7	5456.2
5-Aug	7.7	7.75	2.30	3.6	0.0009	0.010	0.001	0.037	0.007		0.136	1.92	6842.9
6-Aug	8.2	7.72	2.31	0.0	0.0022	0.012	0.001	0.045	0.007		0.230	2.14	7041.6
7-Aug	8.2	7.84	2.48	5.2	0.0008	0.015	0.001	0.051	0.008		0.163	2.11	7050.2
8-Aug	7.30	7.40	2.48	4.0	0.0007	0.015	0.001	0.052	0.008		0.197	2.18	6609.6
9-Aug	6.3	7.58	2.5	2.4	0.0006	0.014	0.001	0.053	0.008		0.219	2.13	8298.7
10-Aug	7.8	7.47	2.6	1.2	0.0008	0.016	0.001	0.058	0.007	0.080	0.155	2.46	6644.2
11-Aug	7.0	7.45	2.72	0.0	0.0005	0.016	0.001	0.059	0.007	0.100	0.167	2.32	6812.6
12-Aug	5.6	7.36	2.7	1.6	0.0005	0.018	0.001	0.061	0.007	0.120	0.165	2.7	7884.0
13-Aug	2.5	7.40	2.79	29.2	0.0006	0.022	0.002	0.063	0.008	0.130	0.189	2.7	7236.0
14-Aug	3.0	7.30	2.92	9.2	0.0006	0.015	0.002	0.065	0.007	0.100	0.171	2.89	7564.3
15-Aug	2.9	7.21	2.98	5.2	0.0006	0.016	0.002	0.067	0.008	0.140	0.188	2.83	7443.4
16-Aug	2.3	7.58	2.9	4.8	0.0005	0.016	0.002	0.067	0.008	0.070	0.184	2.86	6769.4
17-Aug	3.1	7.78	2.96	0.4	0.0005	0.015	0.002	0.073			0.195	2.83	6566.4
18-Aug	3.6	7.32	3.09	8.0	0.0006	0.017	0.002	0.072			0.182	2.89	4600.8
19-Aug	3.0	7.58	2.56	0.4	0.0005	0.017	0.002	0.073			0.184	2.83	3801.6
20-Aug	2.1	7.78	2.9	1.2	0.0005	0.018	0.002	0.077			0.189	2.94	4384.8
21-Aug	3.6	7.30	3.14	2.8	0.0006	0.021	0.002	0.077			0.179	3.1	3931.2
22-Aug	2.5	7.16	2.98	0.8	0.0006	0.019	0.002	0.079			0.180	3.05	4272.5
23-Aug	3.5	7.20	3.09	1.6	0.0006	0.019	0.002	0.079	0.010	0.090	0.181	3.13	4462.6
24-Aug	4.9	7.38	3.24	0.8	0.0007	0.020	0.002	0.083			0.230	2.89	4929.1
25-Aug	4.9	7.30	3	0.0	0.0007	0.020	0.002	0.080			0.220	2.82	4181.8
26-Aug	4.9	7.28	3.14	0.4	0.0007	0.019	0.002	0.082			0.220	3.01	2885.8
27-Aug	10.4	7.59	2.48	0.4	0.0007	0.018	0.002	0.079			0.220	2.92	2903.0
28-Aug	7.2	7.80	2.5	1.6	0.0007	0.019	0.002	0.082			0.230	2.94	2579.0
29-Aug	6.3	7.77	2.97	0.4	0.0006	0.019	0.002	0.084			0.210	2.94	2021.8
30-Aug	6.6	7.33	2.82	0.4	0.0007	0.021	0.002	0.077	0.011	0.110	0.220	2.92	1417.0
31-Aug	9.7	7.90	3.09	0.0	0.0007	0.019	0.002	0.077			0.230	2.94	1201.0

Average 5.1 0.0007 0.016 0.002 0.063 0.008 0.100 0.182 2.59
Total Effluent Deposited in August **154,656 m³**

Mass Loading (August)

TSS	932.94	Kg	Arsenic	0.24	Kg	Radium 226	15.46	MBq
Cadmium	0.10	Kg	Copper	9.37	Kg	Zinc	26.78	Kg
Lead	2.46	Kg	Nickel	1.39	Kg	NH ₃	394.82	Kg

Appendix B-1

Final Discharge Point 159-4 (Effluent from W T D A at Decant Structure)

Date	Temp (°C)	pH	Cond (mS)	T.S.S. (mg/L)	Cd (mg/L)	Pb (mg/L)	As (mg/L)	Cu (mg/L)	Ni (mg/L)	Rad 226 (Bq/L)	Zn (mg/L)	NH3 (mg/L)	24 Hour Flow (m³)
1-Sep	6.7	7.70	2.80	1.2	0.0006	0.018	0.002	0.077			0.210	2.97	1183.7
2-Sep	4.3	7.46	2.7	6.0	0.0006	0.022	0.002	0.073			0.230	2.97	2060.6
3-Sep	3.7	7.60	2.71	1.6	0.0007	0.018	0.002	0.073			0.210	2.94	2553.1
4-Sep	3.5	7.35	2.74	0.8	0.0006	0.019	0.002	0.077			0.200	2.92	2065
5-Sep	6.6	7.72	2.78	1.2	0.0006	0.020	0.002	0.075			0.220	3.06	1512
6-Sep	3.7	7.19	2.8	2.0	0.0006	0.017	0.002	0.079			0.210	2.85	1568.2
7-Sep	4.0	7.22	2.78	0.0	0.0006	0.017	0.002	0.077			0.200	2.9	1702.1
8-Sep	3.10	6.93	2.81	0.2	0.0006	0.016	0.002	0.073			0.200	2.92	1339.2
9-Sep	3.0	6.85	2.82	0.8	0.0006	0.017	0.002	0.078			0.220	2.99	1019.5
10-Sep	3.6	7.24	2.65	6.4	0.0007	0.021	0.002	0.069	0.009	0.090	0.210	2.83	1088.6
11-Sep	3.1	7.22	2.73	1.8	0.0004	0.022	0.002	0.061			0.220	2.78	1520.6
12-Sep	3.9	6.85	2.8	1.8	0.0004	0.012	0.002	0.060			0.210	2.78	2039
13-Sep	3.2	7.25	2.82	1.4	0.0004	0.012	0.002	0.061			0.210	2.81	2531.5
14-Sep	2.0	7.02	2.8	10.4	0.0004	0.019	0.002	0.065			0.220	2.84	3417.1
15-Sep	3.0	6.87	3	4.8	0.0005	0.015	0.002	0.087			0.230	2.87	3283.2
16-Sep	1.6	7.19	2.79	3.4	0.0006	0.014	0.002	0.079			0.240	2.96	2384.6
17-Sep	1.7	7.17	2.86	1.2	0.0005	0.014	0.002	0.074	0.013	0.100	0.230	3.04	2514.2
18-Sep	1.7	6.75	2.95	1.8	0.0007	0.017	0.002	0.080			0.260	3.05	2056.3
19-Sep	1.9	7.07	3	3.2	0.0007	0.017	0.003	0.083			0.260	3.07	972
20-Sep	2.5	6.86	3.3	2.4	0.0006	0.017	0.003	0.081			0.340	3.12	1741
21-Sep	2.9	6.68	3.11	0.4	0.0006	0.017	0.003	0.084			0.260	3.21	1339.2
22-Sep	1.5	7.00	3.14	3.4	0.0008	0.017	0.003	0.087			0.280	3.3	1365.1
23-Sep	1.1	7.02	3.31	3.2	0.0007	0.017	0.003	0.087			0.280	3.37	1010.9
24-Sep	0.8	7.00	3.17	3.0	0.0008	0.024	0.003	0.105	0.016	0.080	0.320	3.46	6428.2
25-Sep	1.7	6.69	3.19	3.0	0.0006	0.027	0.002	0.109			0.330	3.53	7128
26-Sep	1.1	7.12	3.14	1.6	0.0007	0.026	0.003	0.114			0.340	3.58	2432.2
27-Sep	0.3	6.73	3.1	2.2	0.0016	0.026	0.002	0.122			0.370	3.58	1965.6
28-Sep	0.7	6.72	3.31	1.8	0.0036	0.026	0.003	0.122			0.350	3.6	1408.3
29-Sep	0.7	6.72	3.31	1.8	0.0009	0.024	0.003	0.117			0.350	3.64	1183.7
30-Sep	2.3	6.41	3.43	1.8	0.001	0.023	0.003	0.111			0.340	3.73	846.72

Average 2.5 0.0008 0.019 0.002 0.085 0.013 0.090 0.258 3.12

Total Effluent Deposited in September **63,660 m³**

Mass Loading (September)

TSS	179.37	Kg	Arsenic	0.15	Kg	Radium 226	6.48	MBq
Cadmium	0.05	Kg	Copper	5.54	Kg	Zinc	16.90	Kg
Lead	1.26	Kg	Nickel	1.09	Kg	NH ₃	200.66	Kg

Appendix B-1

Final Discharge Point 159-4 (Effluent from West Twn Disposal Area at Decant Structure)													
Date	Temp	pH	Cond	T.S.S.	Cd total	Pb total	As total	Cu Total	Ni Total	Rad 226	Zn total	NH3	24 Hour Flow
1-Oct	1.3	6.45	3.5	2.4	0.0007	0.023	0.003	0.106	0.016	0.120	0.330	3.75	613.4
2-Oct	1.3	6.35	3.52	0.6	0.0012	0.023	0.003	0.112			0.340	3.75	898.6
3-Oct	0.3	6.63	3.34	1.6	0.0007	0.023	0.003	0.104			0.320	3.78	648.0
4-Oct	0.3	6.42	3.33	2.4	0.0006	0.022	0.002	0.098			0.300	3.78	518.4
Average				1.75	0.0008	0.023	0.003	0.105	0.016	0.120	0.323	3.77	669.6

Total Effluent Deposited in October **2,678.4m3**

Mass Loading (Oct)

TSS	4.29	Kg
Cadmium	0.02	Kg
Lead	0.06	Kg
Arsenic	0.01	Kg
Copper	0.28	Kg
Nickel	0.04	Kg
Radium 226	0.10	MBq
Zinc	0.87	Kg
NH ₃	10.08	Kg

Note:

All Samples collected at the decant structure were grab samples.

Appendix B-2

159-6							
Date	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)
06/18/03	3.8	6.71	0.38	6.0	<.001	<.01	0.456
06/25/03	3.7	5.67	0.21	53.7	0.002	0.090	2.390
07/02/03	9.1	6.76	0.07	11.0	<.001	<.01	0.183
07/09/03	9.6	7.44	0.14	4.4	0.0007	0.001	0.231
07/16/03	8.4	7.63	0.28	3.2	0.0007	<.001	0.607
07/23/03	6.6	7.76	0.45	0.8	0.0013	0.001	0.581
07/30/03	4.1	7.73	0.34	1.2	0.0007	<.001	0.523
08/07/03	7.3	7.81	3.19	0.4	0.0013	0.003	0.257
08/13/03	3.1	7.22	0.98	0.4	0.0049	0.002	1.930
08/20/03	6.0	7.10	1.58	0.4	*	*	*
08/27/03	6.0	7.24	1.84	0.4	0.0079	<0.001	2.000
09/03/03	2.5	7.37	0.58	1.6	0.0028	<0.001	0.810
09/03/03	2.5	7.37	0.58	1.6	<.001	0.010	1.230
09/10/03	2.1	7.18	1.12	2.8	0.0048	0.001	1.480
09/17/03	0.8	7.10	2	0.0	0.004	<.001	1.280
09/24/03	No Flow						

* Results not available - sample destroyed

	As total (mg/L)	Cu Total (mg/L)	Ni Total (mg/L)	Cd dissolved (mg/L)	Pb dissolved (mg/L)	Zn dissolved (mg/L)	NH3 (mg/L)
06/18/03				<.001	<.01	0.407	0.05
06/25/03				<.001	0.09	2.38	0.04
07/02/03				<.001	<.05	0.178	<.02
07/09/03	<.001	<.001	<.005	0.0006	<.001	0.223	<.02
07/16/03				0.0007	<.001	0.394	0.09
07/23/03							0.18
07/30/03				0.0007	0.001	0.515	0.12
08/07/03				0.0011	0.032	0.253	2.86
08/13/03				0.0051	0.002	1.91	0.4
08/20/03							*
08/27/03				0.0076	0.001	1.89	0.86
09/03/03							0.29
09/10/03							0.36
09/17/03							0.63
09/24/03	No Flow						

159-9

Date	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	As total (mg/L)	Cu Total (mg/L)	Ni Total (mg/L)	Rad 226 (Bq/L)	Zn total (mg/L)	NH3 (mg/L)
06/18/03	4.9	6.29	0.33	10.0		0.160					3.900	
07/04/03	7.2	6.74	0.01	5.0		<.001	<.001	<.001	<.001		0.140	
07/17/03	10.7	7.56	0.19	2.8	<.0001	0.001					0.095	
07/31/03	8.7	8.04	0.24	2.0	<.001	0.002					0.094	
08/09/03	5.8	7.77	0.55	23.2	0.0002	0.004					0.041	0.32
08/14/03	3.0	7.56	0.86	16.4		0.005					0.049	
08/27/03	6.4	7.53	1.55	0.4		0.004					0.090	
09/10/03	0.9	7.25	0.48	18.8	0.0002	0.009	<.001	0.009	<.005	<.02	0.040	0.36
09/12/03	1.2	7.25	1.59	1.6		0.003						

Date	Cd dissolved (mg/L)	Pb dissolved (mg/L)	Zn dissolved (mg/L)	Hardness (mg/L)	Ca (mg/L)	Mg (mg/L)	Fe (mg/L)	Mercury (mg/L)	Alu (mg/L)	Mo (mg/L)	Nitrate (mg/L)	Alkalinity (mg/L)
06/18/03		0.150	3.800									
07/04/03		<.001	0.119									
07/17/03		0.001	<.005									
07/31/03		0.002	0.093									
08/09/03	0.0002		0.010	213	72	8	0.33	<0.0001	0.32	<0.005		
08/14/03	0.0003	0.005	0.045									
08/27/03												
09/10/03							0.39	<.0001	0.31	0.005	6.49	12

Appendix B-4

159-10										
Date	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	As total (mg/L)	Cu Total (mg/L)	Ni Total (mg/L)	Zn total (mg/L)
06/18/03	3.0	6.25	0.42	11.00	0.009	0.210				4.60
06/27/03	5.9	5.97	0.08	10.8	<.001	0.040				1.030
07/05/03	7.3	6.81	0.01	5.4	<.001	0.001	<.001	<.001	<.005	0.223
07/11/03	12.7	7.35	0.18	0.4	0.0015	0.002				0.585
07/17/03	10.9	7.40	0.25	3.6	0.0009	0.001				0.499
07/25/03	7.9	7.97	0.43	1.2	0.0017	0.002				1.040
07/31/03	6.4	7.61	0.24	2.8	0.012	0.002				0.652
08/08/03	7.0	7.54	0.51	25.2	0.0059	0.003				1.890
08/14/03	1.7	7.64	0.93	6.4	0.0091	0.003				3.190
08/22/03	1.4	7.45	2.02	0.4	*	*				*
08/27/03	7.3	7.54	1.83	6.0	0.0133	0.002				3.810
09/05/03	3.3	7.16	0.88	2.0	0.0071	0.002				2.160
09/12/03	0.6	7.07	1.46	1.8	0.0115	0.002				3.540
09/19/03	1.2	6.74	2.63	2.0	0.0292	0.001				7.800

* Results not available - sample destroyed

Appendix B-5

159-12A										
Date	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)			
08/04/03	6.0	7.48	1.44	87.2	0.0195	0.837	6.770			
Date	As Total (mg/L)	Cu Total (mg/L)	Ni Total (mg/L)	NH3 (mg/L)	Hardness (mg/L)	Ca (mg/L)	Mg (mg/L)	Fe (mg/L)	Mercury (mg/L)	Alu (mg/L)
08/04/03	<0.001	0.014	0.017	0.35	874	180	103	5.94	<0.0001	2.37

Sample taken from overcresting of East Adit Treatment Facility dyke during major rain storm

Appendix B-6

159-15

Date	Station	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)
07/10/03	159-15	12.3	7.42	0.59	2.6	<0.0001	0.001	<0.005
07/23/03	159-15	7.6	8.17	0.52	0.4	<0.0001	<0.001	<0.005
08/07/03	159-15	2.60	8.36	0.48	0.0	<0.0001	<0.001	0.003
09/05/03	159-15	2.1	7.92	0.4	0.0	0.0001	<0.001	<0.01

Appendix B-7

159-16

Date	Station	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)
06/26/03	159-16	4.4	7.87	0.06	2.2	<.001	<.01	0.015
07/10/03	159-16	13.7	7.64	0.16	0.0	<.0001	0.001	<.005
07/23/03	159-16	5.0	8.36	0.39	0.4	<0.0001	<0.001	<0.005
08/07/03	159-16	6.70	8.31	0.38	0.0	<0.0001	<0.001	0.024
08/21/03	159-16	0.6	7.94	0.59	18.8	*	*	*
08/21/03	159-16dup	0.5	7.75	0.56	19.6	<.001	<.001	0.058
09/05/03	159-16	3.4	7.68	0.49	0.0	0.0002	<.001	<.01

* Results not available - sample destroyed

Appendix B-8

159-18

Date	Station	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)
25-Jun-03	159-18	5.9	5.96	0.61	2.0	<.001	<.01	0.13
15-Jul-03	159-18	10.7	8.00	0.47	0.4	<.001	<.001	0.085
30-Jul-03	159-18	2.7	8.46	0.48	0.8	<.001	<.001	0.066
12-Aug-03	159-18	6.6	8.15	0.58	0.0	<.001	<.001	0.025
26-Aug-03	159-18	3.8	8.13	0.61	0.0	<.001	<.001	0.034
9-Sep-03	159-18	No Flow						
16-Sep-03	159-18	No Flow						

Appendix B-9

159-19

Date	Station	Temp. (°C)	pH	Cond. (mS)	T.S.S. (mg/L)	Cd total (mg/L)	Pb total (mg/L)	Zn total (mg/L)
25-Jun-03	159-19	4.8	5.21	1.59	12.0	0.01	0.050	4.970
2-Jul-03	159-19	12.2	5.35	3.01	28.0	<.001	<.01	38.300
15-Jul-03	159-19	7.8	6.00	6.00	3.2	0.129	0.899	70.360
30-Jul-03	159-19	2.4	8.04	1.29	0.8	<.001	<.001	0.523
12-Aug-03	159-19	6.7	7.93	1.0	20.0	0.003	0.046	0.977
26-Aug-03	159-19	5.6	7.31	1.04	0.0	<.001	0.032	0.655
9-Sep-03	159-19	No Flow						
16-Sep-03	159-19	No Flow						

Appendix C

Effluent Characterization and Water Quality Monitoring

Appendix C-1

Effluent Characterization and Water Quality Monitoring

Date	Location	Aluminum	Cadmium	Iron	Mercury	Molybdenum	Ammonia	Nitrate	Alkalinity	Total Hardness	Dissolved Oxygen
12-Jul	159-4	0.02	0.0002	0.22	<.0001	0.011	0.69	1.16	22	363	
9-Aug	159-4	0.03	0.0006	0.10	<.0001	0.045	2.13	0.03		1210	
9-Aug	159-4A	0.30	0.0003	0.32	<.0001	0.009	0.51	0.30		317	9.05
9-Aug	159-4B	0.16	0.0002	0.11	<.0001	<.005	<.02	0.16		55	9.32
10-Sep	159-4	0.12	0.0007	0.40	<.0001	0.045	2.83	6.55	46	1580	
10-Sep	159-4A	0.38	0.0003	0.52	<.0001	0.016	1.16	2.45	32	727	9.81
10-Sep	159-4B	0.11	0.0001	0.12	<.0001	<.005	<.02	0.11	30	38	9.06
Date	Location	Temperature	pH	Conductivity							
12-Jul	159-4	14.1	6.6	0.84							
9-Aug	159-4	6.3	7.58	2.50							
9-Aug	159-4A	5.9	7.6	0.77							
9-Aug	159-4B	4.8	7.95	0.10							
10-Sep	159-4	3.6	7.24	2.65							
10-Sep	159-4A	4.1	7.3	1.26							
10-Sep	159-4B	4.1	6.9	0.09							

The coordinates and elevations for these stations are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4	73° 01' 29.4" N	84° 28' 32.8" W	368.196
159-4A	73° 01' 32.3" N	84° 28' 33.5" W	366.914
159-4B	73° 01' 33.2" N	84° 28' 20.9" W	366.742

159-4A is located approximately 50 metres downstream from the decant structure at station 159-4

159-4B is located approximately 50 metres upstream from the decant structure at station 159-4

All Samples collected were Grab samples except for 159-4A (Aug 9 and Sept 10), which were composite samples.