Pogo Mine 2009
Annual Activity and Monitoring Report

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Appendix A. Table 1. Pogo Mine Effluent Toxicity Testing (WET) 2009

Lab	Species	NOEC (%)	LOEC (%)	IC_{25} (%)	TUc
CH2MHILL	*Ceridaphinia dubia*	100	>100	80	1.25
	Pimephales promelas	100	25	>100	<1.00
AECOM	*Ceridaphinia dubia*	100	90	>100	<1.00
	Pimephales promelas	82.5	95	>100	<1.00

NOEC=No Observed Effect Concentration

LOEC=Low Observed Effect Concentration

IC_{25} = Inhibition Concentration (25%)

Tuc = Toxic Units (Chronic)

Appendix A. Table 2. Whole Rock Geochemistry for Rock placed into Drystack 2009

PC002	units	1st Quarter 12-Mar-09	2nd Quarter 16-Jun-09	3rd Quarter 1-Oct-09	4th Quarter 15-Dec-09
Arsenic, Total	mg/kg	321.0	519	331	119
Copper, Total	mg/kg	29.1	25	30.6	18.9
Iron, Total	mg/kg	3020	4620	5340	3730
Lead, Total	mg/kg	33.2	20.1	14.9	16.6
Zinc, Total	mg/kg	55	63	61	55
pH, Paste	pH units	8.8	9.0	8.5	8.7
Total Sulfur, (Leco)	%	0.23	0.28	0.23	0.15
Sulfate Sulfur (Carbonate Leach)	%	0.02	<0.01	0.01	<0.01
Sulfate Sulfur (HCL Leachable)	%	0.03	<0.01	0.01	<0.01
Sulfide Sulfur (Calculated)	%	0.21	0.28	0.22	0.15
Neutralization Potential	tCaCO3/1000t	18	26	37	27
Maximum Potential Acidity	tCaCO3/1000t	7.2	8.8	7.2	4.7
Ratio (NP/MPA)	su	2.5	2.97	5.15	5.76
Inorganic Carbon	%	1.20	0.60	1.10	1.00
Carbon	%	0.32	0.17	0.31	0.27

Appendix A. Table 3. Geochemistry of Flotation Tailings Solids placed into Drystack 2009

PC003	units	1st Quarter 17-Mar-09	2nd Quarter 18-Jun-09	3rd Quarter 17-Sep-09	4th Quarter 15-Dec-09
Arsenic, Total	mg/kg	2500	764	530	671
Copper, Total	mg/kg	36.7	38.5	44.2	48.8
Iron, Total	mg/kg	2670	2020	2790	2280
Lead, Total	mg/kg	11.1	12.2	12.9	12.2
Zinc, Total	mg/kg	16	21	20	21
pH, Paste	pH units	8.3	8.2	8.3	8.3
Total Sulfur, (Leco)	%	0.19	0.11	0.1	0.1
Sulfate Sulfur (Carbonate Leach)	%	<0.01	0.02	0.02	0.04
Sulfate Sulfur (HCL Leachable)	%	0.01	<0.01	0.02	<0.01
Sulfide Sulfur (Calculated)	%	0.19	0.09	0.08	0.06
Neutralization Potential	tCaCO3/1000t	42	29	31	39
Maximum Potential Acidity	tCaCO3/1000t	5.9	3.4	3.1	3.1
Ratio (NP/MPA)	su	7.07	8.44	9.92	12.48
Inorganic Carbon	%	1.9	1.90	1.7	1.9
Carbon	%	0.53	0.52	0.47	0.53

Appendix B

Time Series Plots

Table B1. Time Series for Effluent Monitoring Program

Chart B1.1. Values over time for Lead, total (ug/L)

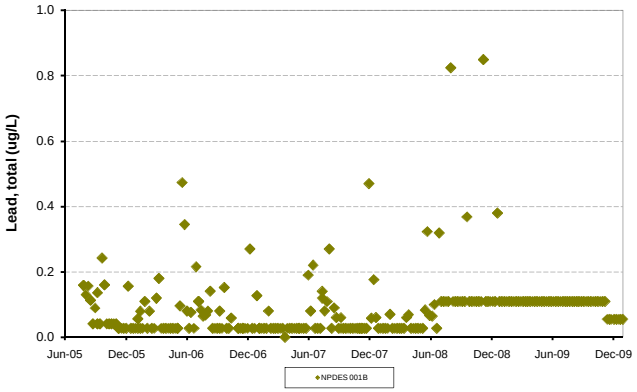


Chart B1.2. Values over time for Mercury, total (ug/L)

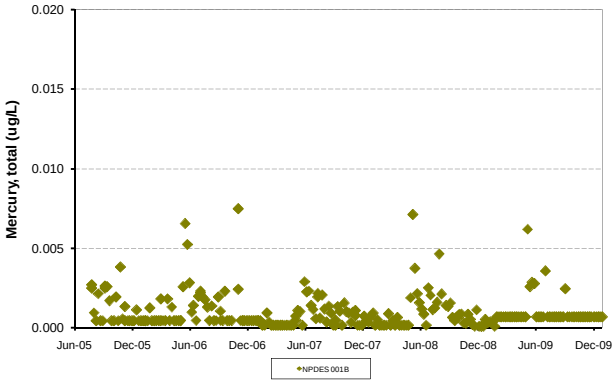


Chart B1.3. Values over time for Turbidity, field (NTU)

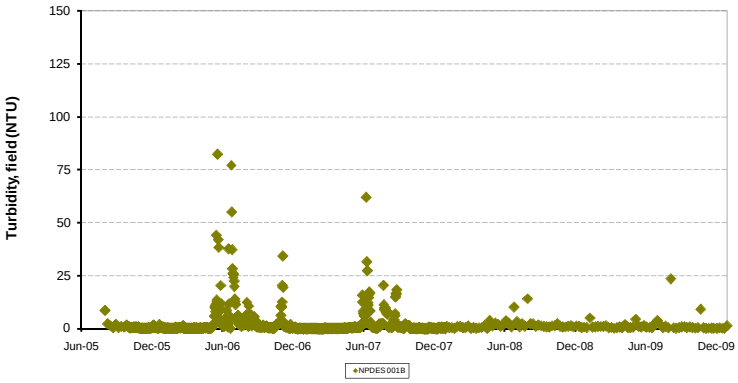
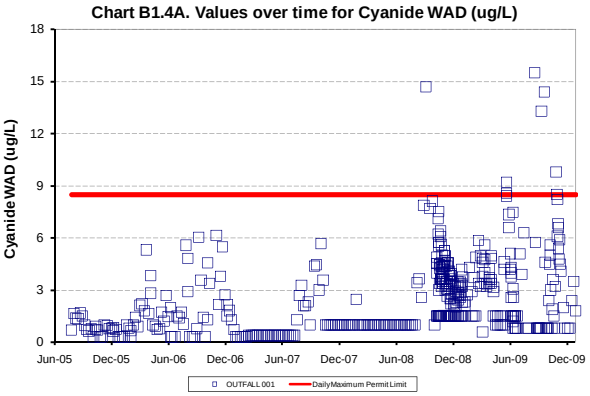
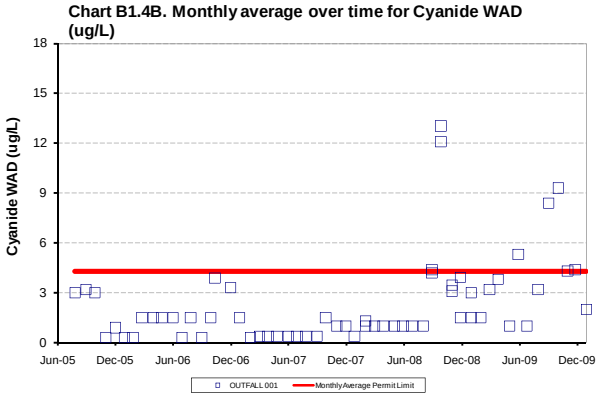
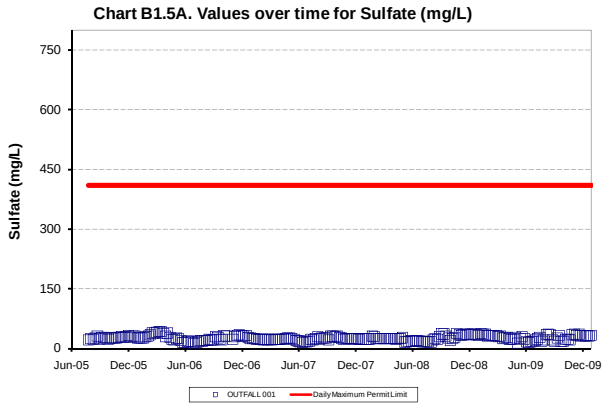
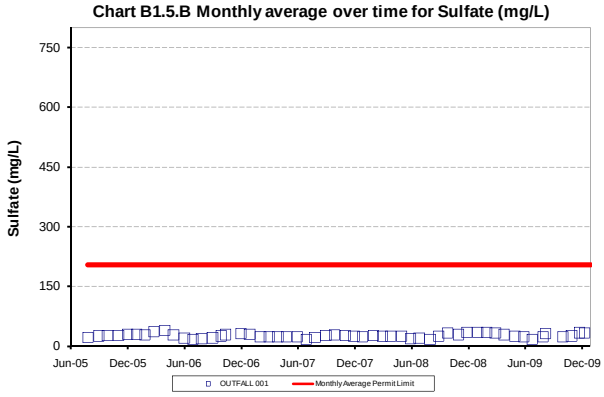


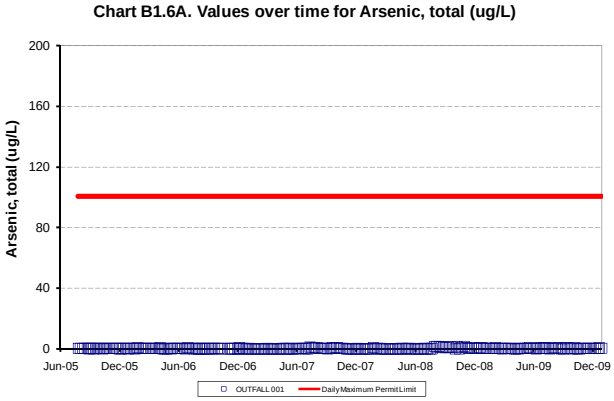
Table B1. Time Series for Effluent Monitoring Program (continued)











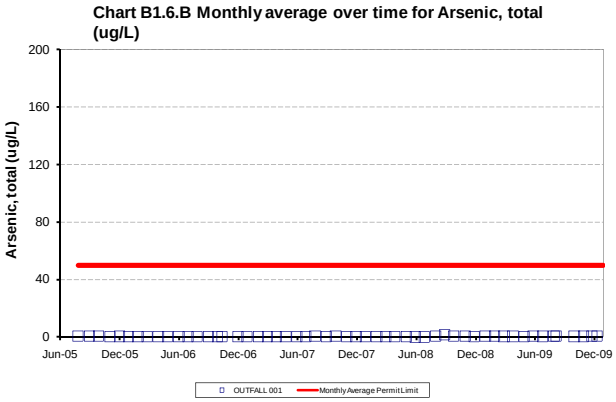


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.7A. Values over time for Cadmium, total (ug/L)

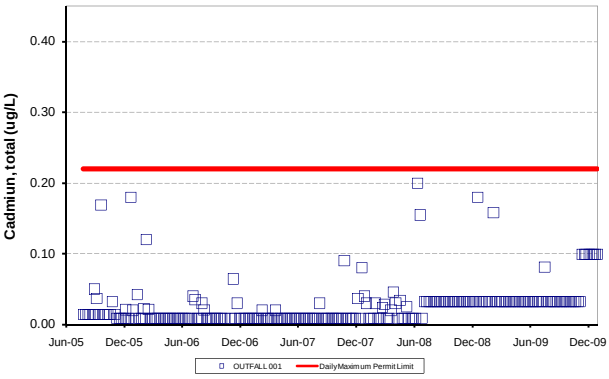


Chart B1.7.B Monthly average over time for Cadmium, total (ug/L)

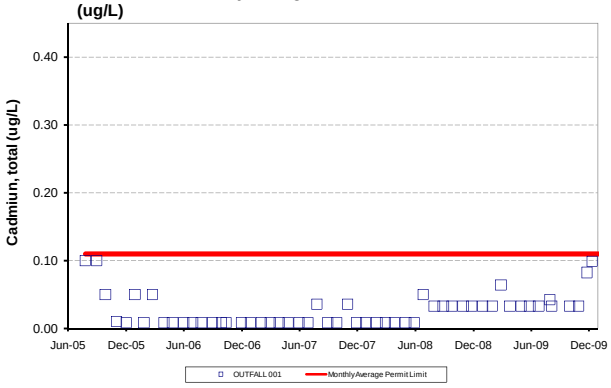


Chart B1.8. Values over time for Chromium, total (ug/L)

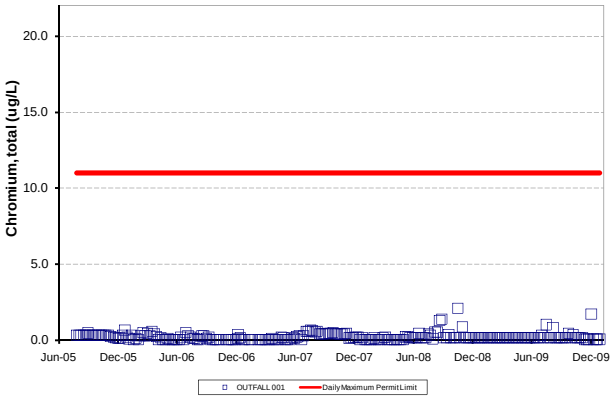


Chart B1.9A. Values over time for Copper, total (ug/L)

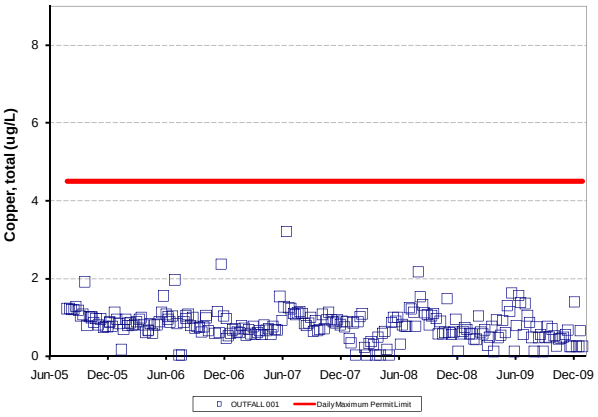


Chart B1.9.B Monthly average over time for Copper, total (ug/L)

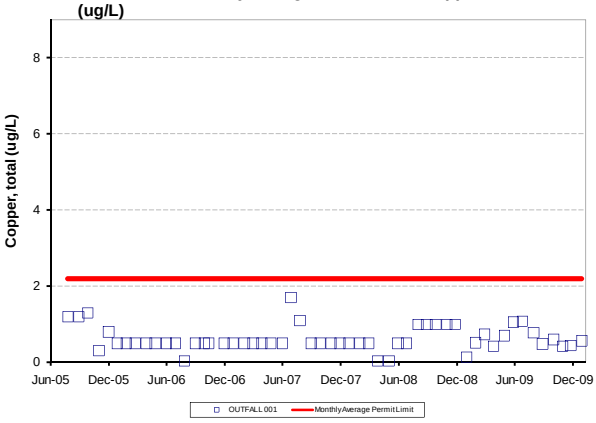


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.10A. Values over time for Lead, total (ug/L)

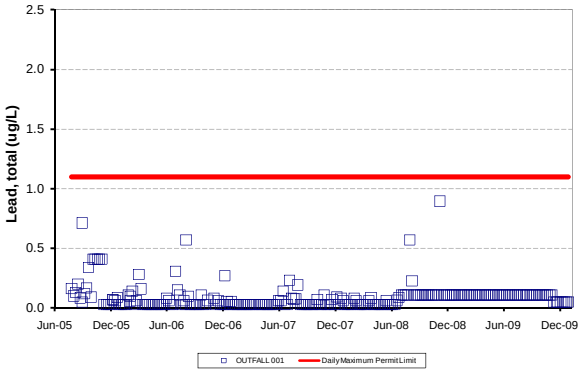


Chart B1.10B. Monthly average over time for Lead, total (ug/L)

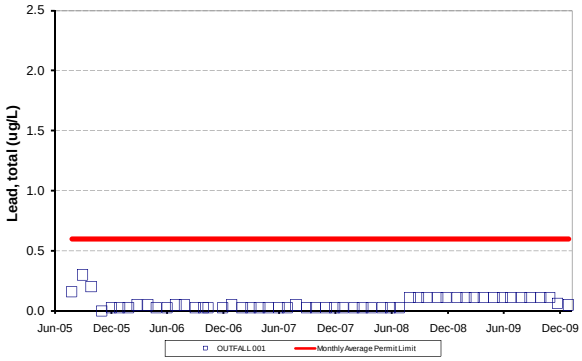


Chart B1.11A. Values over time for Manganese, total (ug/L)

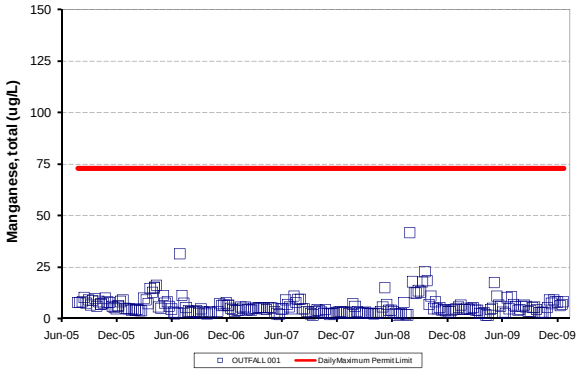


Chart B1.11B. Monthly average over time for Manganese, total (ug/L)

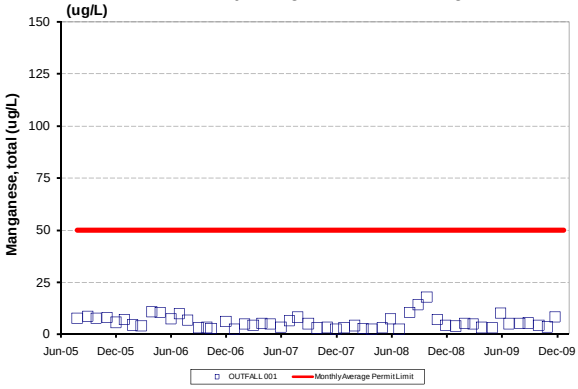


Chart B1.12A. Values over time for Mercury, total (ug/L)

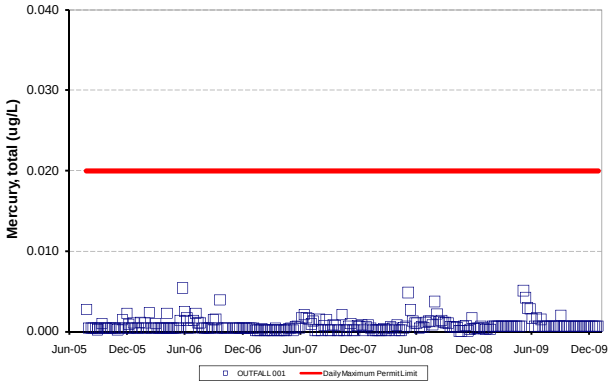


Chart B1.12B. Monthly average over time for Mercury, total (ug/L)

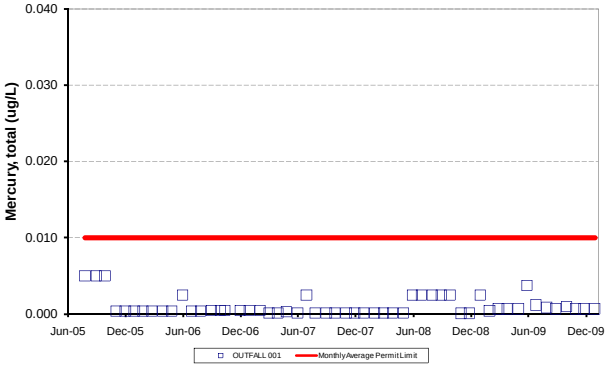


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.13A. Values over time for Nickel, total (ug/L)

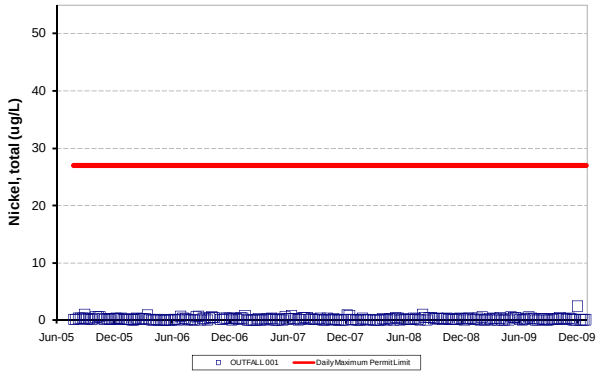


Chart B1.13B. Monthly average over time for Nickel, total (ug/L)

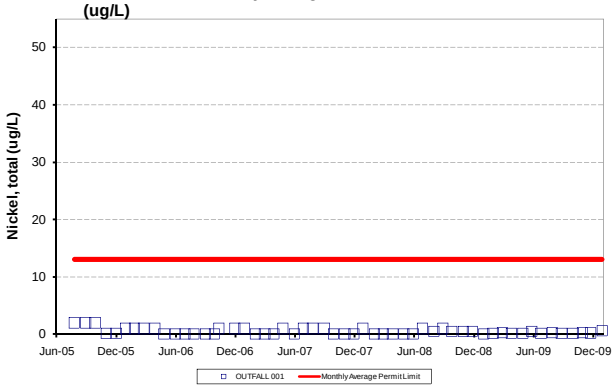


Chart B1.14A. Values over time for Zinc, total (ug/L)

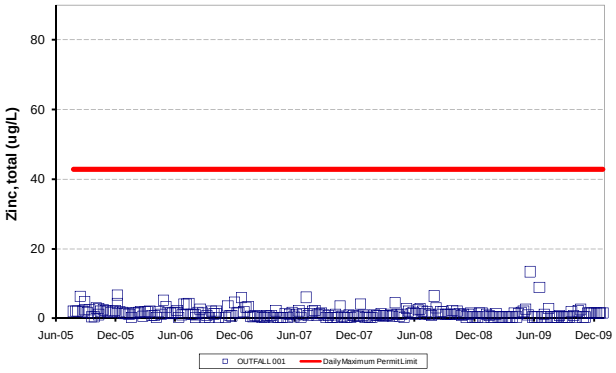


Chart B1.14B. Monthly average over time for Zinc, total (ug/L)

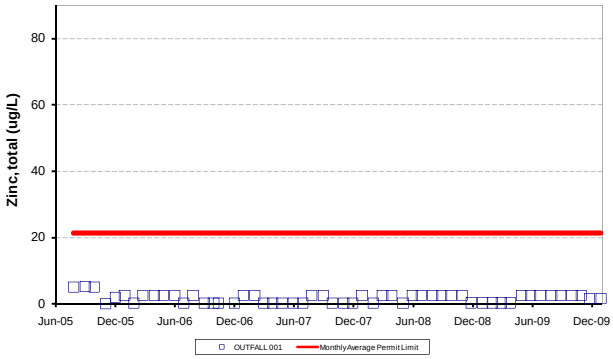


Chart B1.15. Values over time for Hardness (CaCO3) (mg/L)

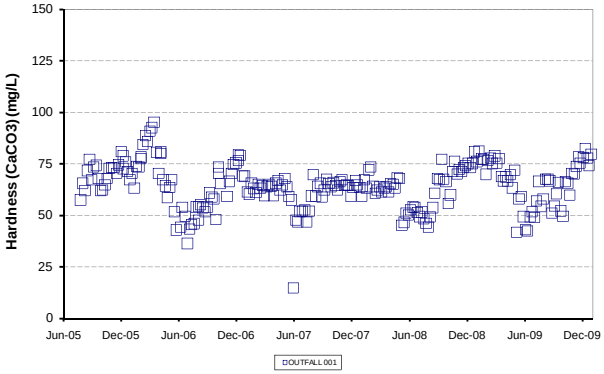


Chart B1.16. Values over time for pH, field (pH units)

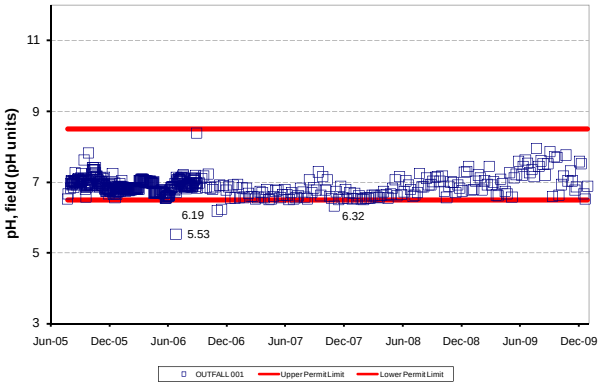


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.17A. Values over time for TDS (mg/L)

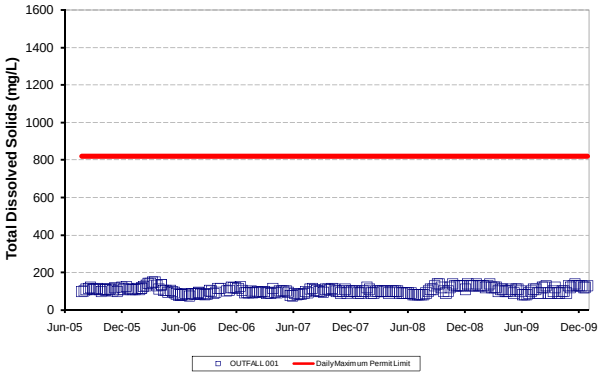


Chart B1.17B. Monthly average over time for TDS (mg/L)

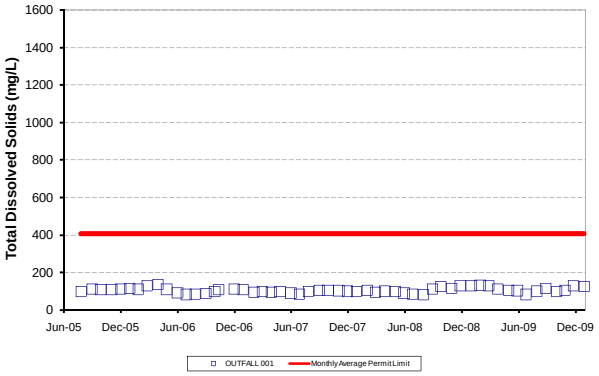


Chart B1.18. Values over time for Turbidity, lab (NTU)

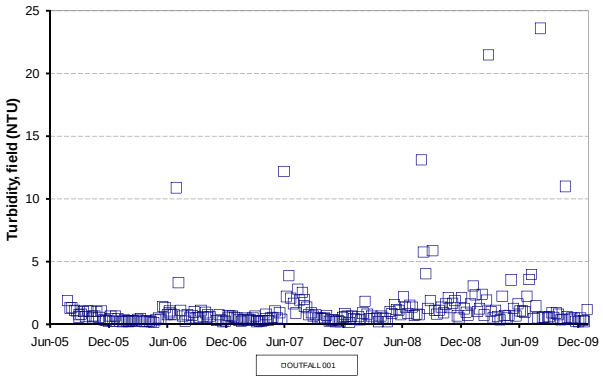


Chart B1.19. Values over time for Flow (gpm)

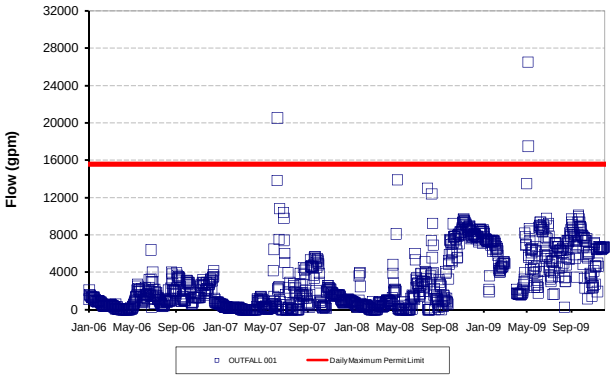


Chart B1.20. Values over time for Dilution Ratio

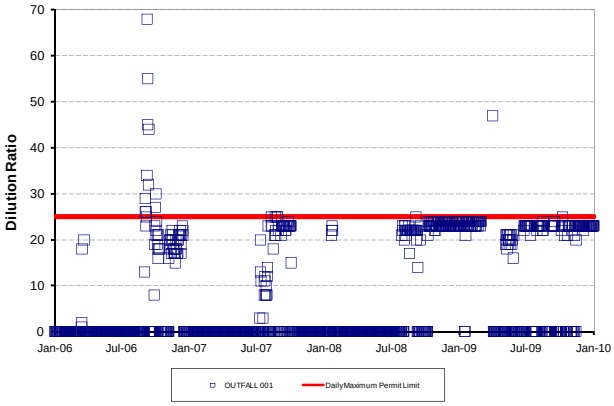


Chart B1.21. Values over time for Cyanide WAD (ug/L)

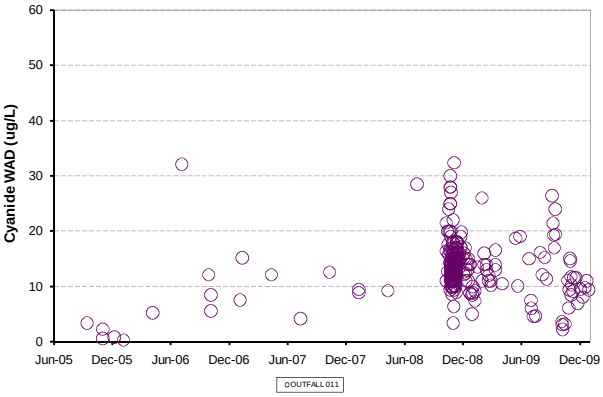


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.22. Values over time for Chloride (mg/L)

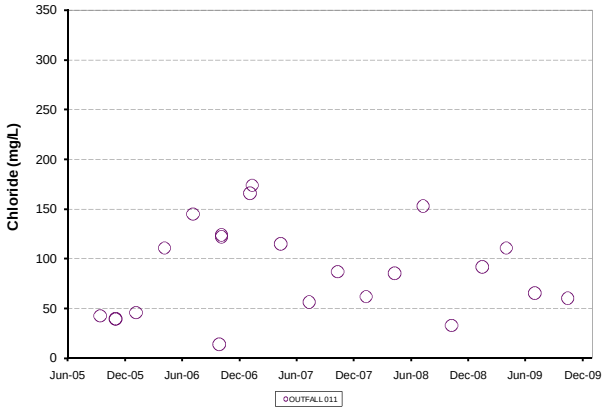


Chart B1.23. Values over time for Sulfate (mg/L)

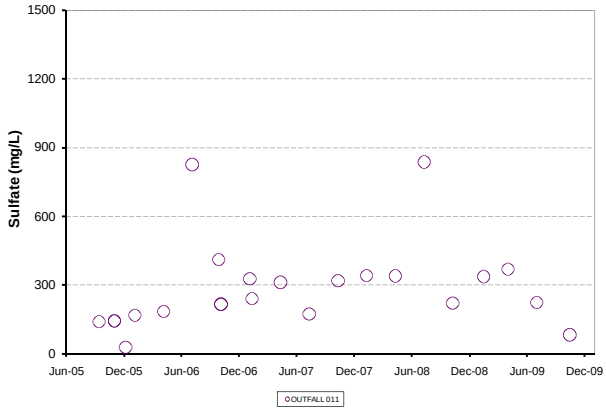


Chart B1.24. Values over time for Aluminum, total (ug/L)

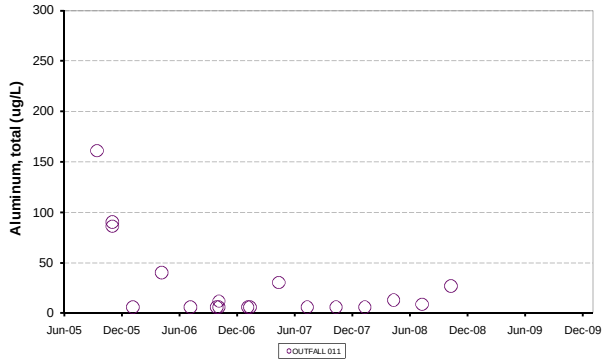


Chart B1.25. Values over time for Arsenic, total (ug/L)

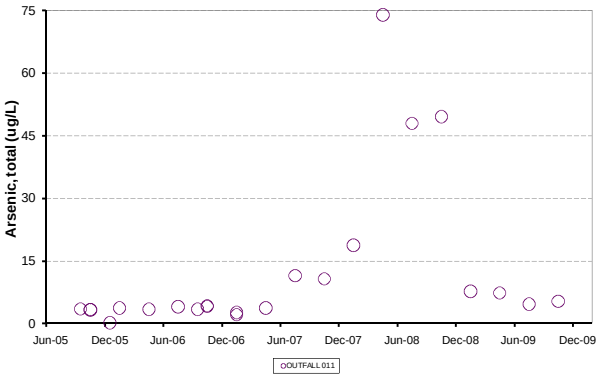


Chart B1.26A. Values over time for Cadmium, total (ug/L)

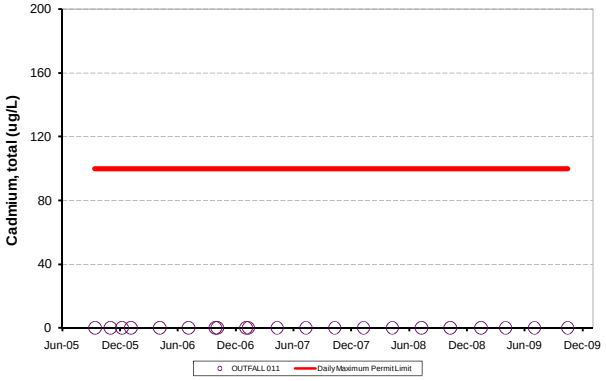


Chart B1.26B. Quarterly average over time for Cadmium, total (ug/L)

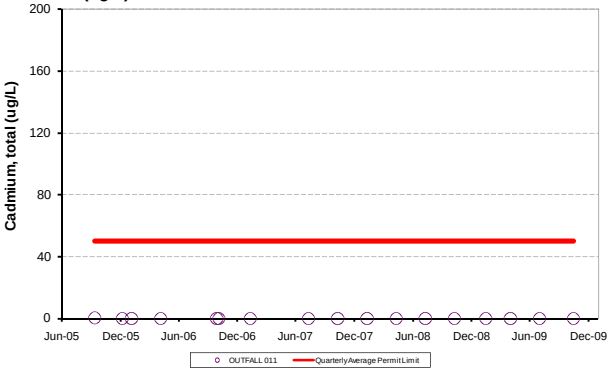


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.27. Values over time for Chromium, total (ug/L)

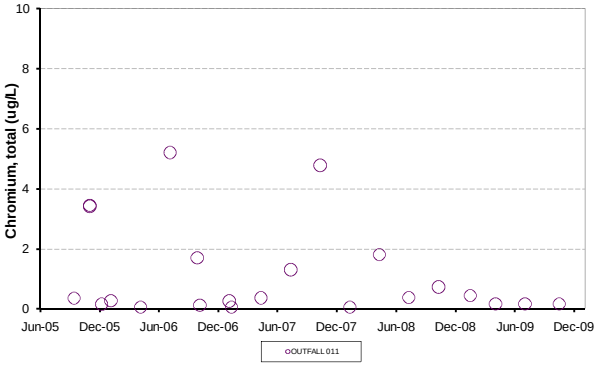


Chart B1.28A. Values over time for Copper, total (ug/L)

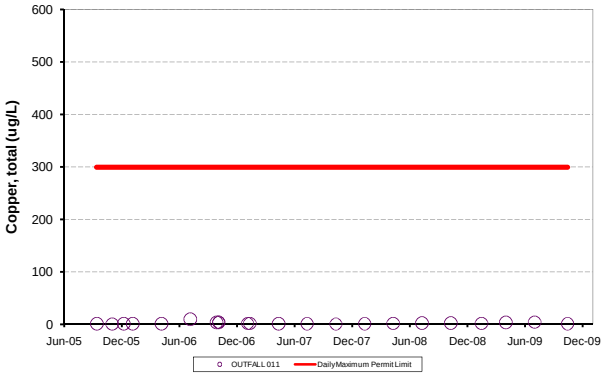


Chart B1.28B. Quarterly average over time for Copper, total (ug/L)

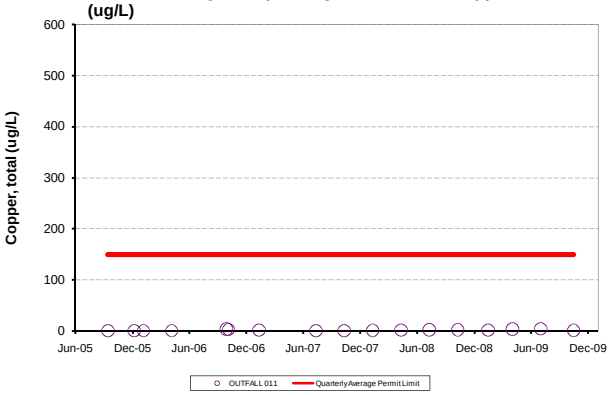


Chart B1.29A. Values over time for Iron, total (ug/L)

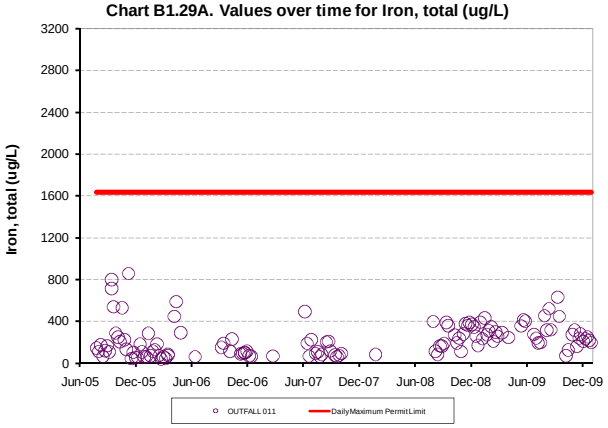


Chart B1.29B. Monthly average values over time for Iron, total (ug/L)

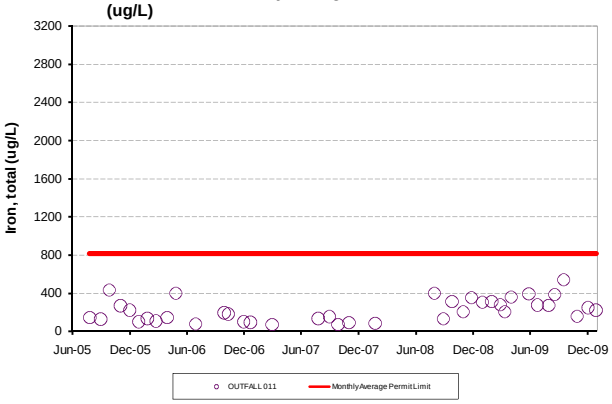


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.30A. Values over time for Lead, total (ug/L)

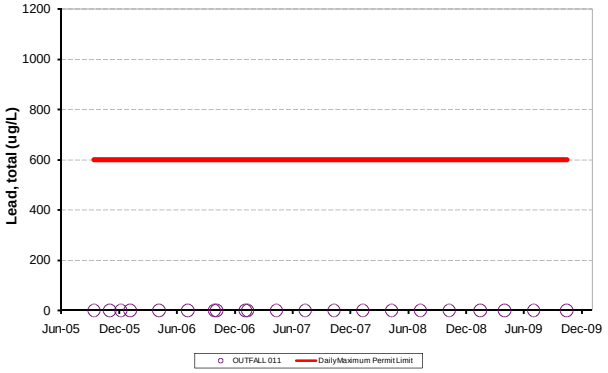


Chart B1.30B. Quarterly average over time for Lead, total (ug/L)

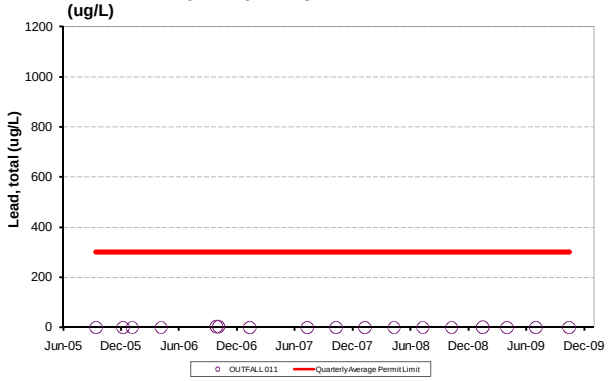


Chart B1.31A. Values over time for Mercury, total (ug/L)

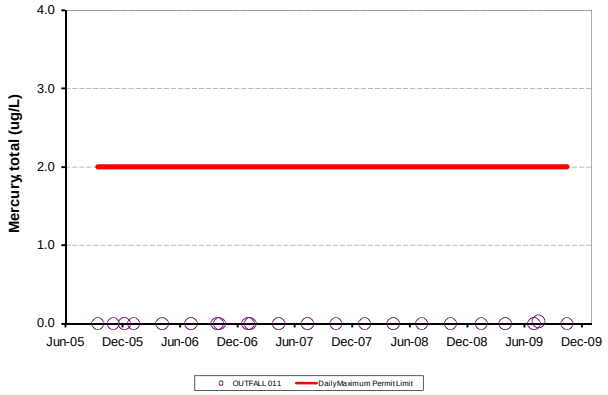


Chart B1.31B. Quarterly average over time for Mercury, total (ug/L)

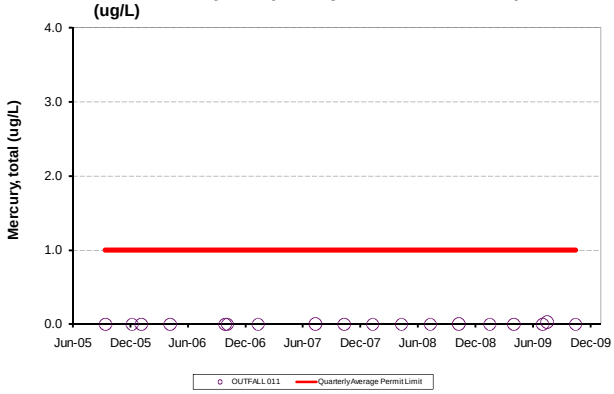


Chart B1.32. Values over time for Nickel, total (ug/L)

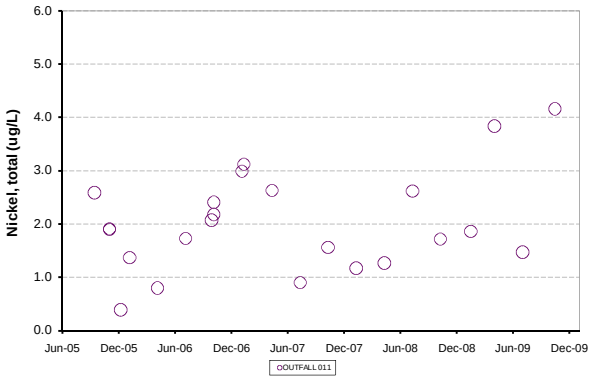


Chart B1.33. Values over time for Selenium, total (ug/L)

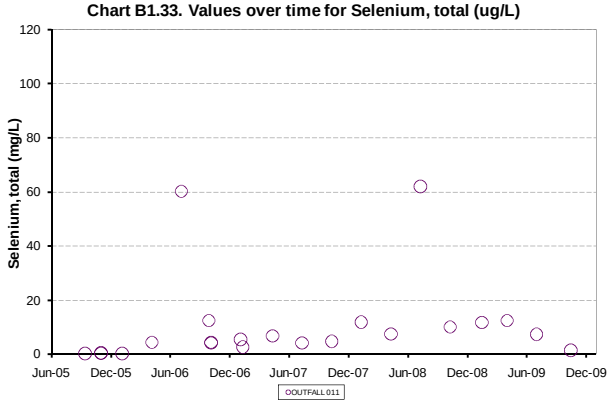


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.34. Values over time for Silver, total (ug/L)

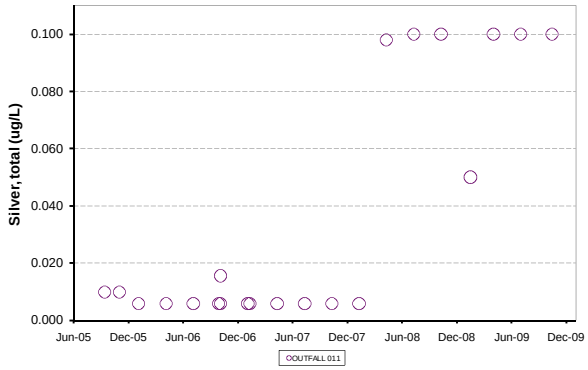


Chart B1.35A. Values over time for Zinc, total (ug/L)

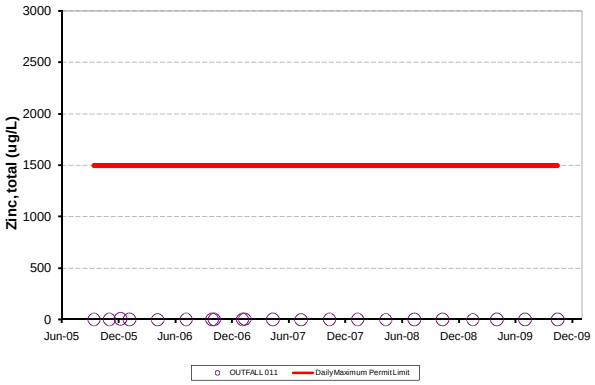


Chart B1.35B. Quarterly average over time for Zinc, total (ug/L)

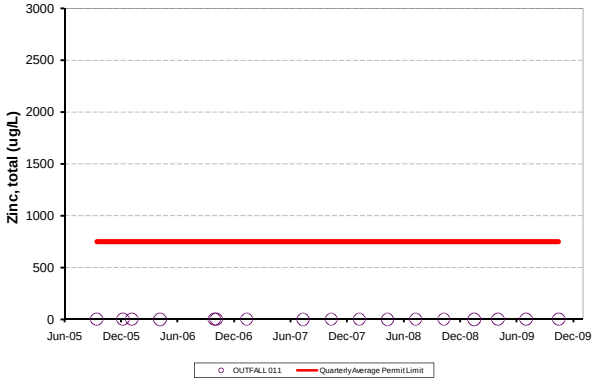


Chart B1.36. Values over time for Hardness (CaCO3) (mg/L)

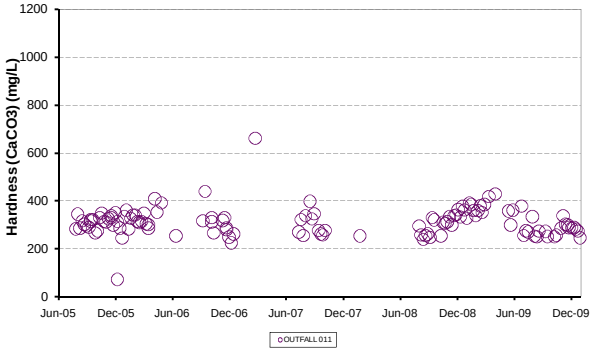


Chart B1.37. Values over time for pH, field (pH units)

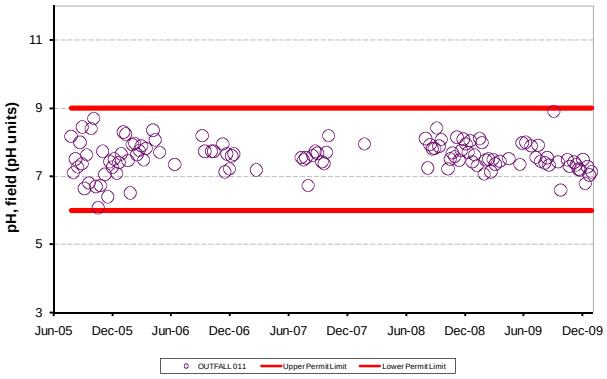


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.38. Values over time for TDS (mg/L)

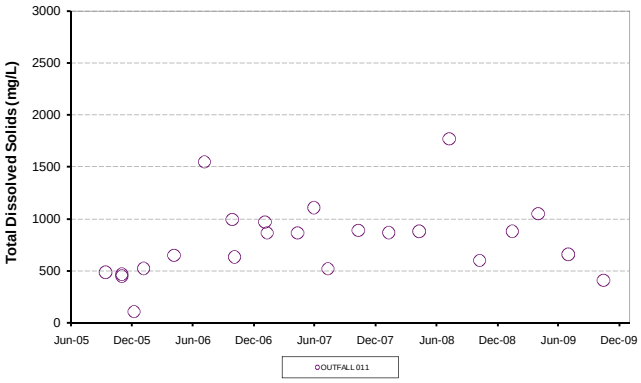


Chart B1.39A. Values over time for TSS (mg/L)

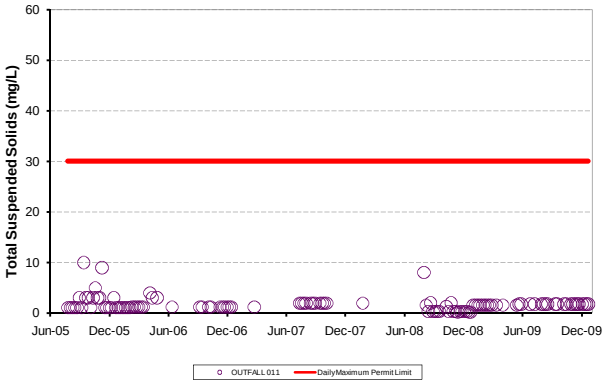


Chart B1.39B. Monthly average over time for TSS (mg/L)

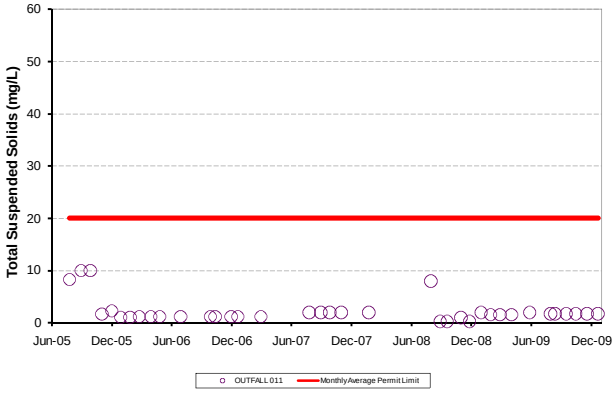


Chart B1.40. Values over time for Flow (gpm)

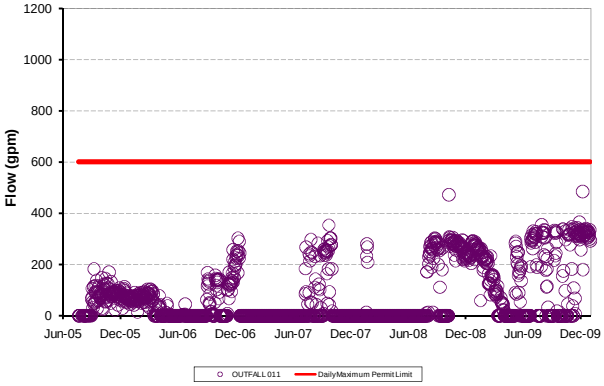


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.41A. Values over time for Nitrate-N (mg/L)

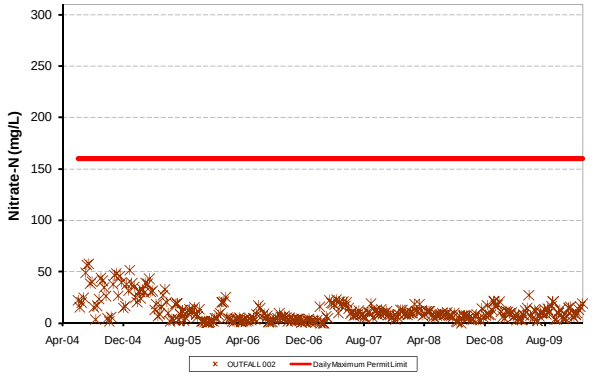


Chart B1.41B. Monthly average over time for Nitrate-N (mg/L)

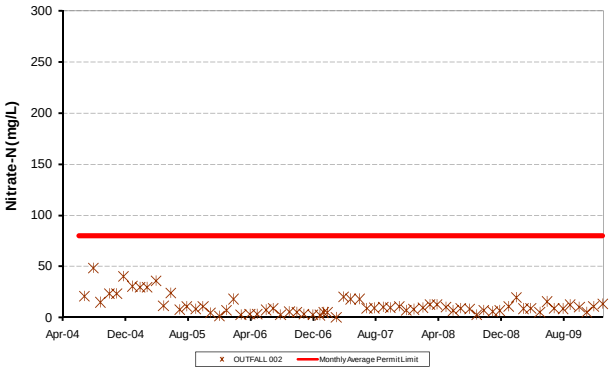


Chart B1.42A. Values over time for BOD, 5 day (mg/L)

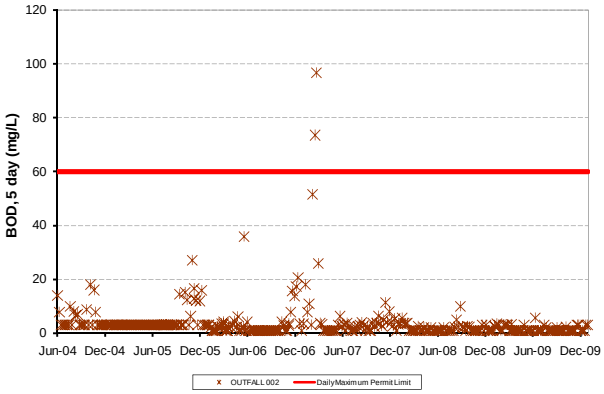


Chart B1.42B. Weekly average over time for BOD, 5 day (mg/L)

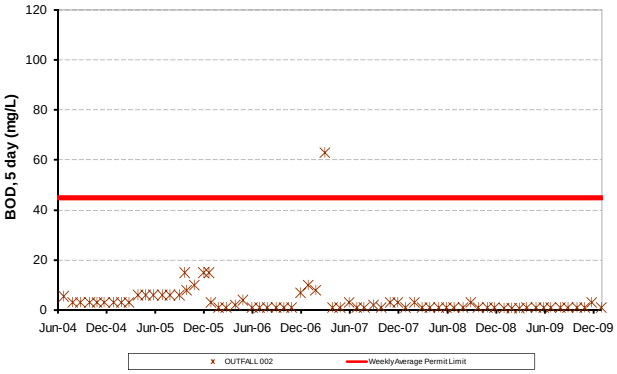


Chart B1.42C. Monthly average over time for BOD, 5 day (mg/L)

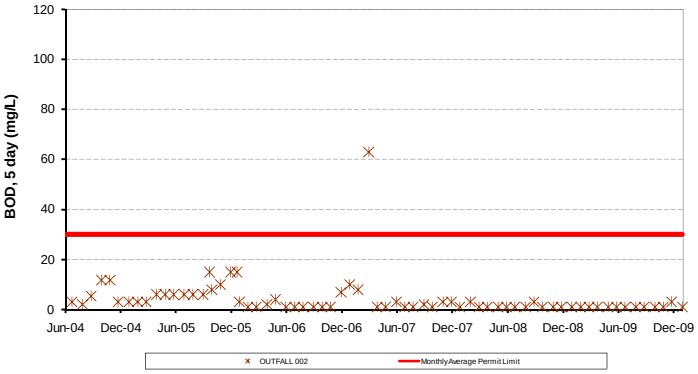


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.43. Values over time for Dissolved O2 (mg/L)

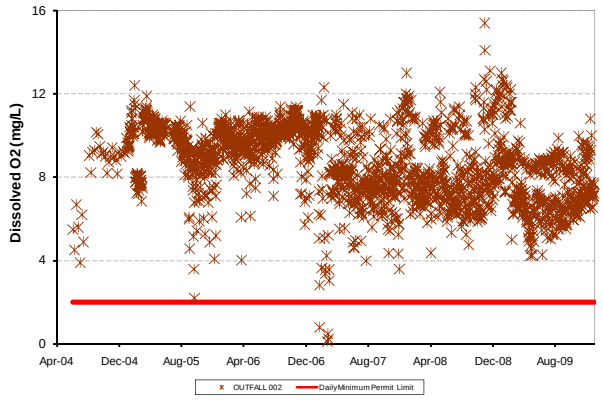


Chart B1.44. Values over time for pH, field (pH units)

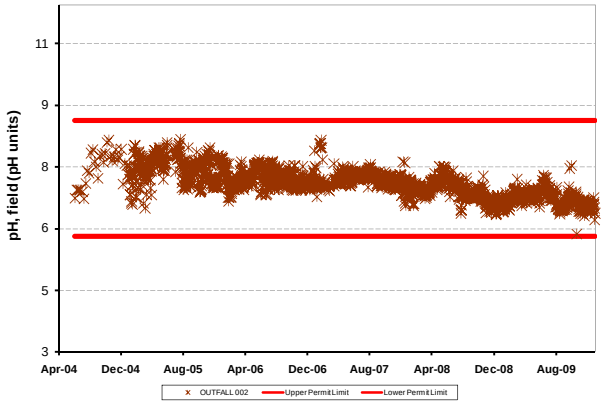


Chart B1.45A Values over time for TSS (mg/L)

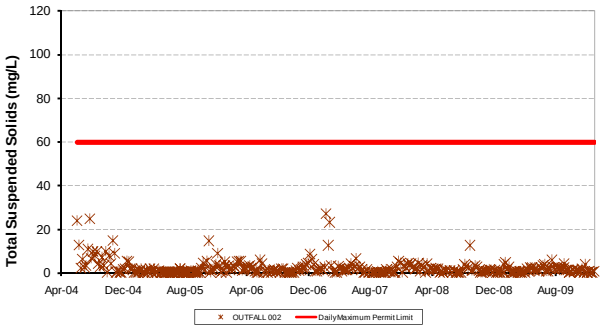


Chart B1.45B Weekly average over time for TSS (mg/L)

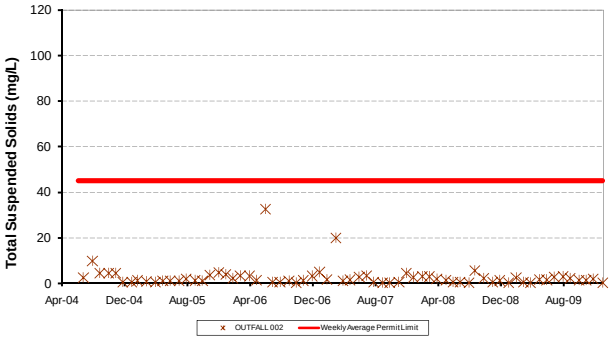


Chart B1.45C Monthly average over time for TSS (mg/L)

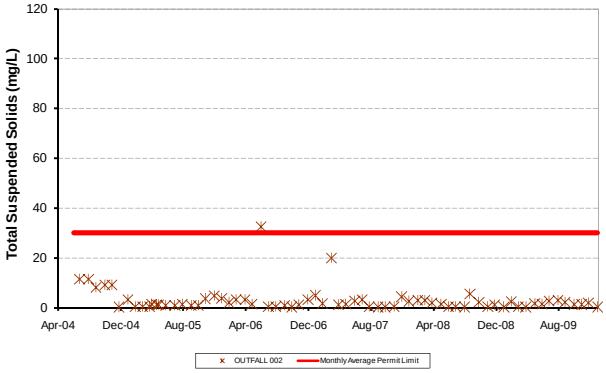


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.46A Values over time for Fecal Coliform (#/100mL)

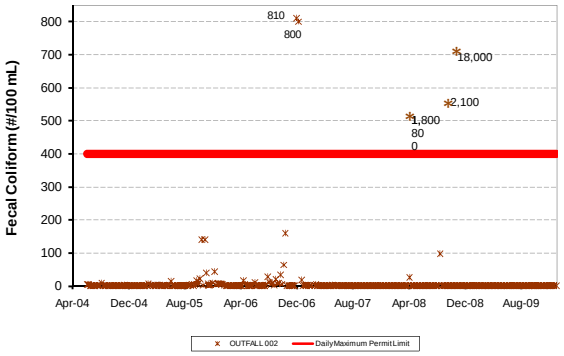


Chart B1.46B Monthly average over time for Fecal Coliform (#/100mL)

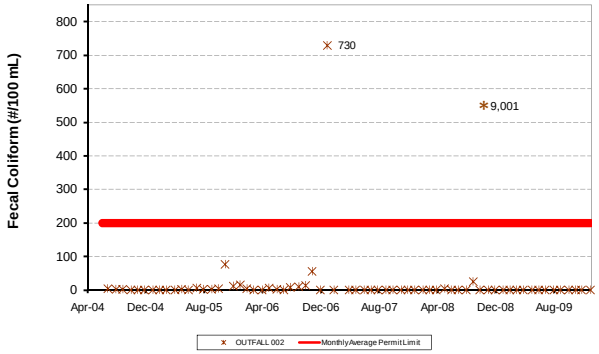


Chart B1.47. Values over time for Flow (gpd)

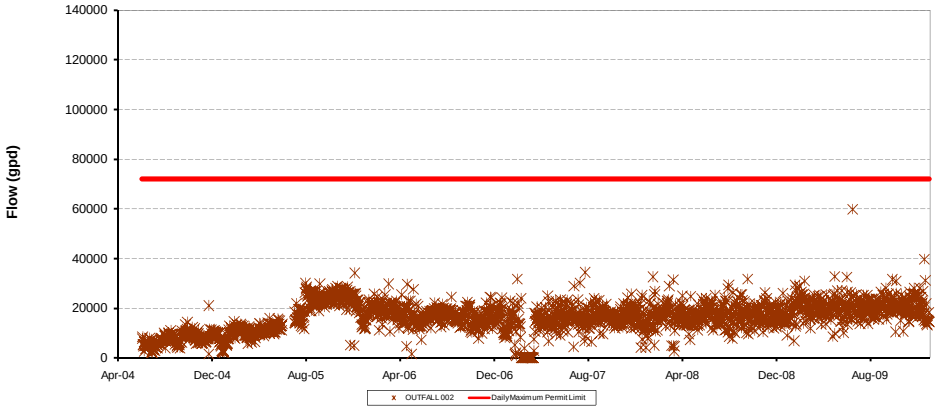


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.48. Values over time for BOD, 5 day (% removal)

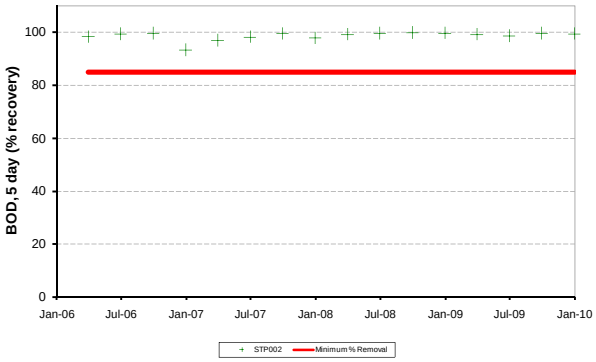


Chart B1.49. Values over time for TSS (% removal)

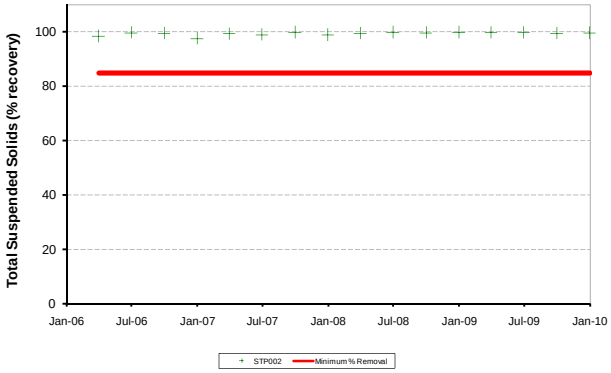
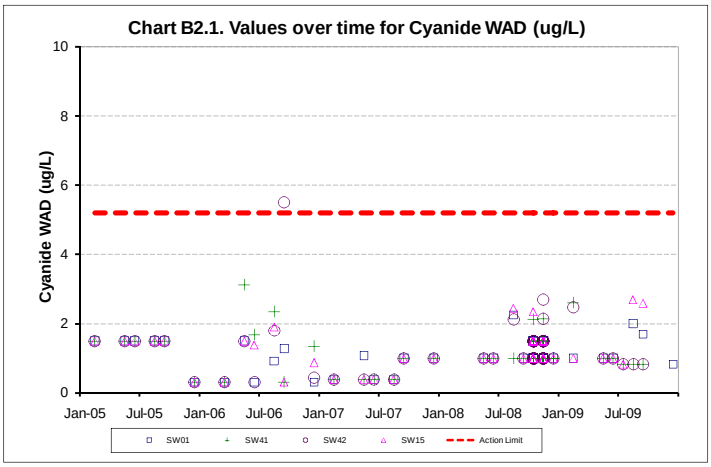
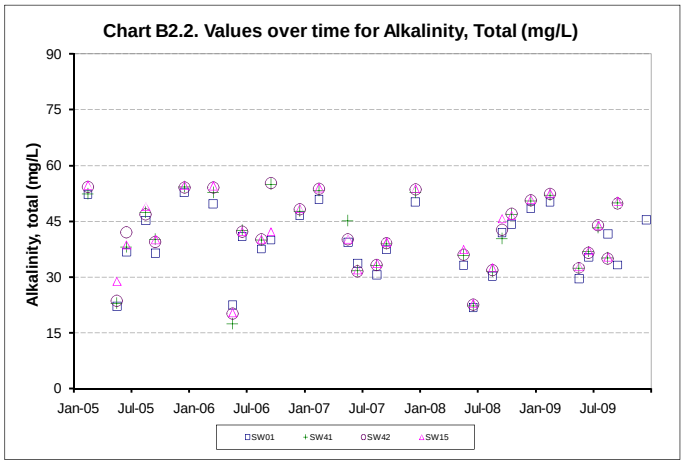
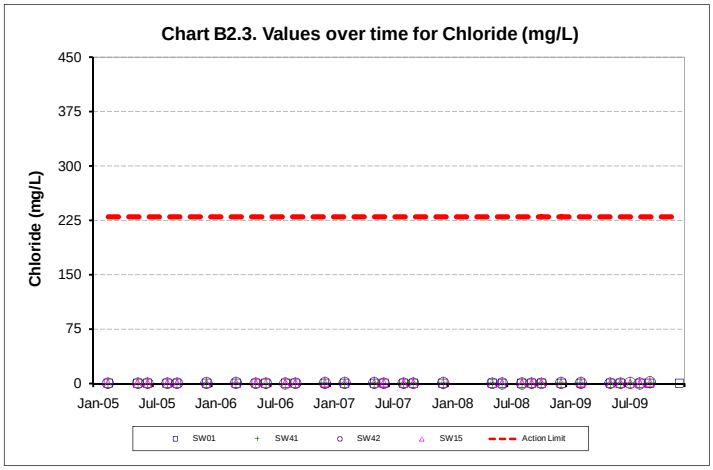
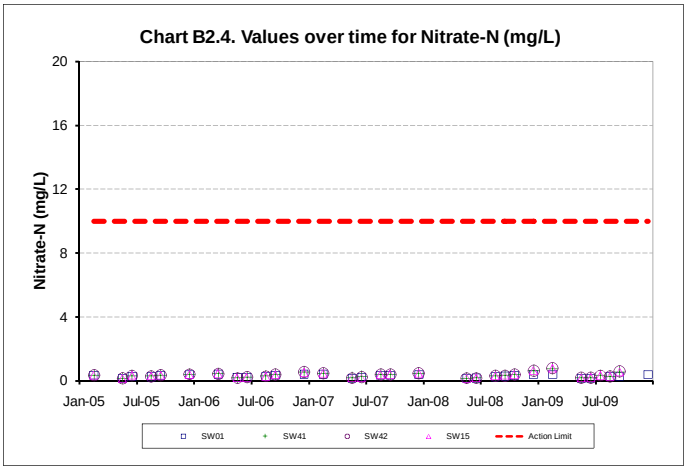


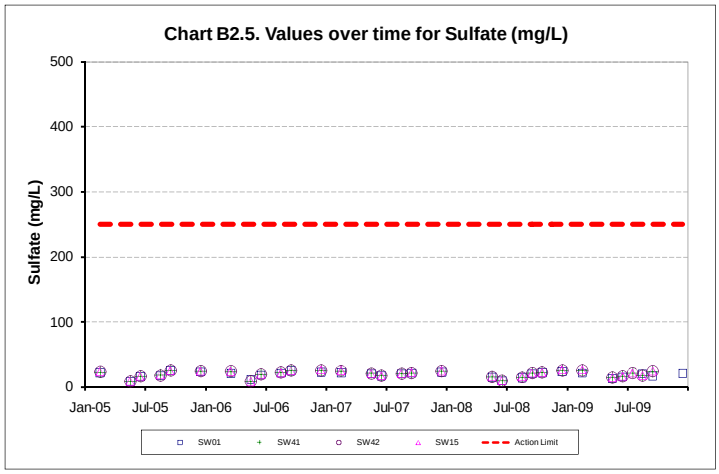
Table B2. Time Series for Receiving Environment











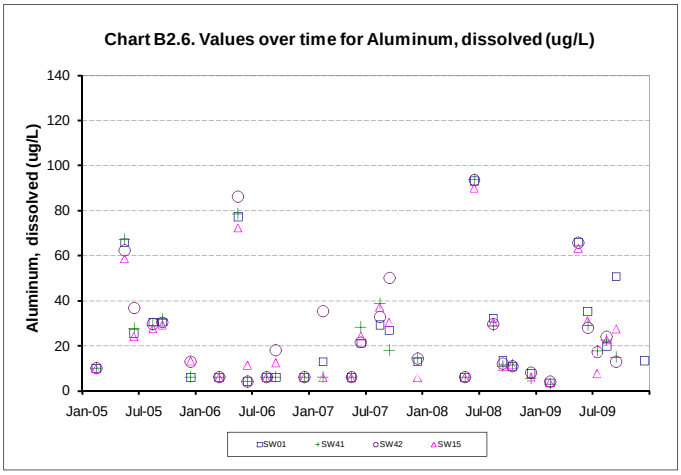
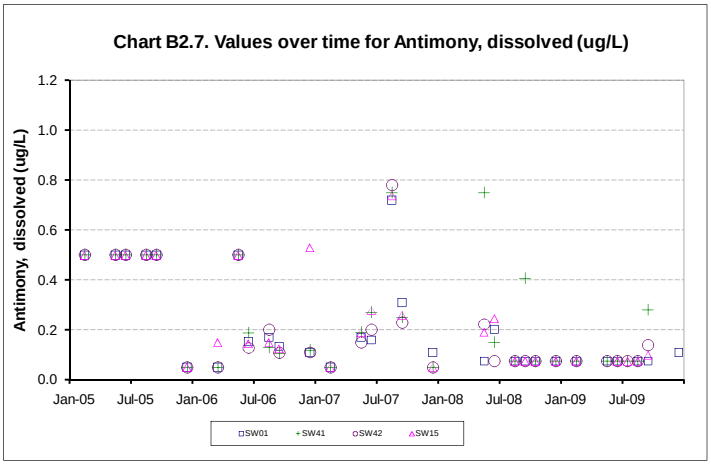
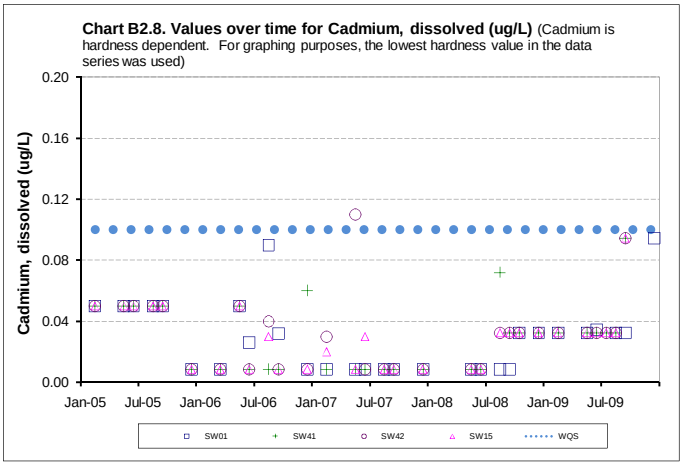
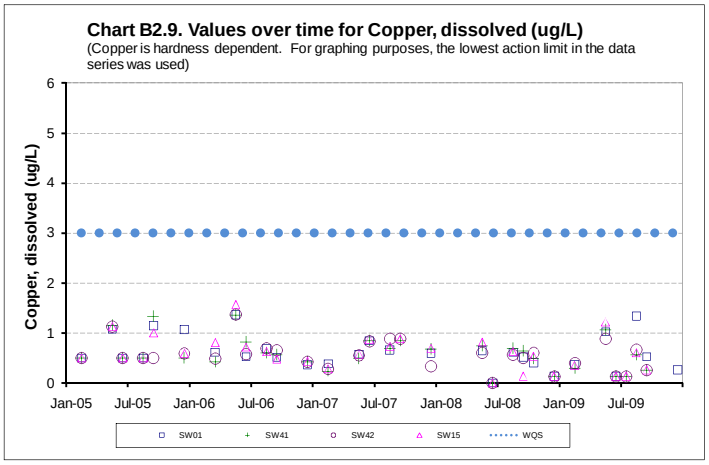
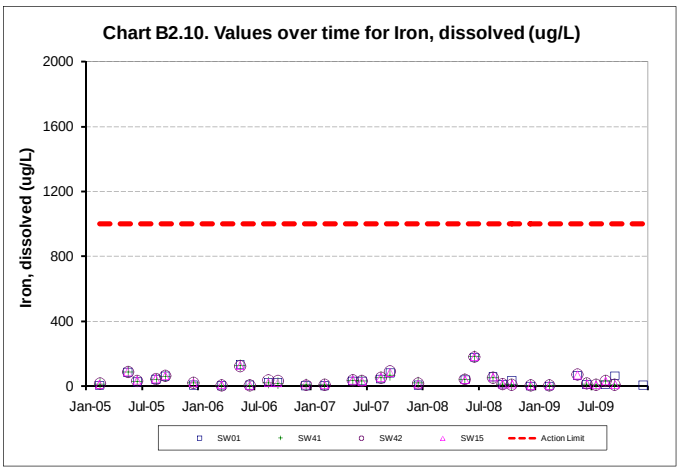


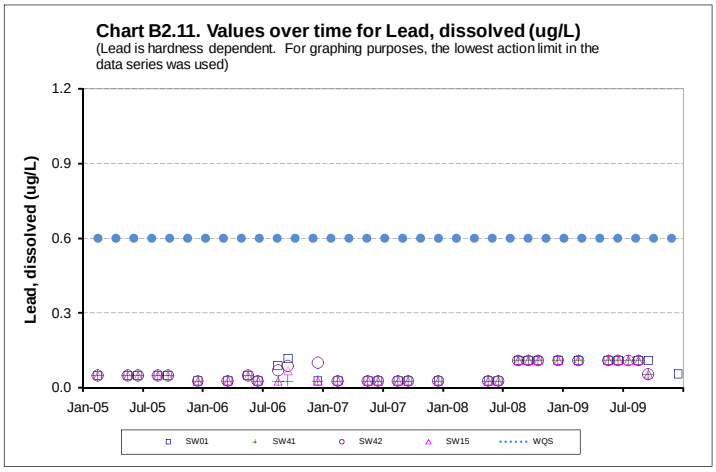
Table B2. Time Series for Receiving Environment (continued)











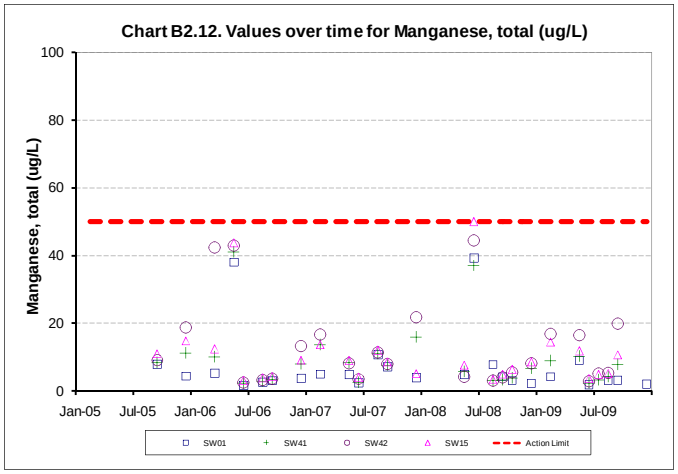
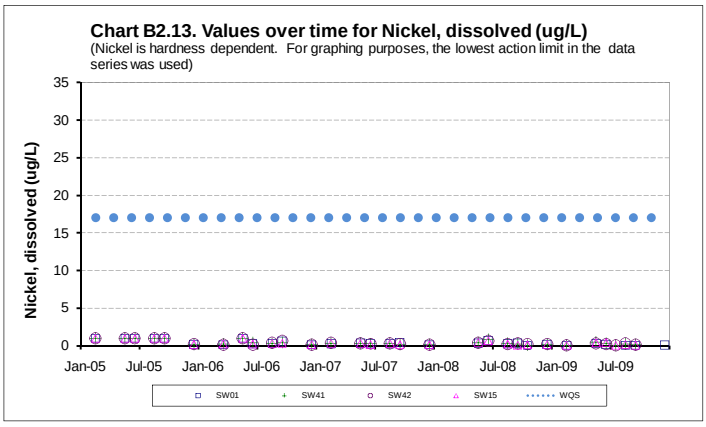
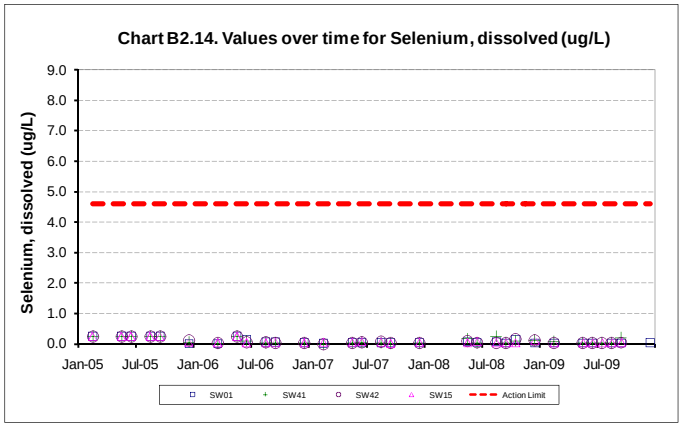
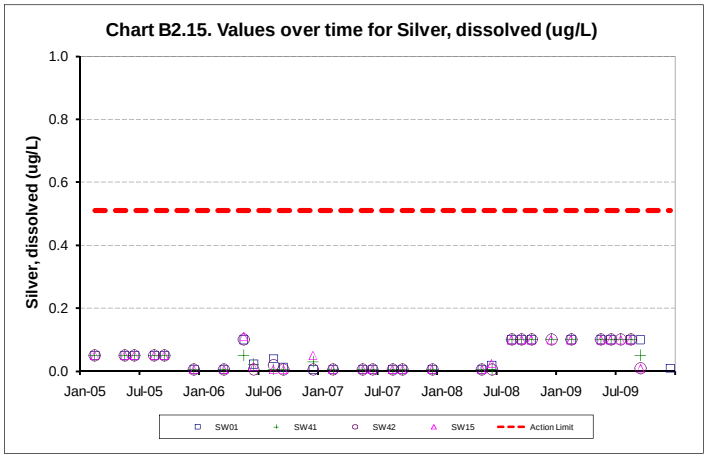
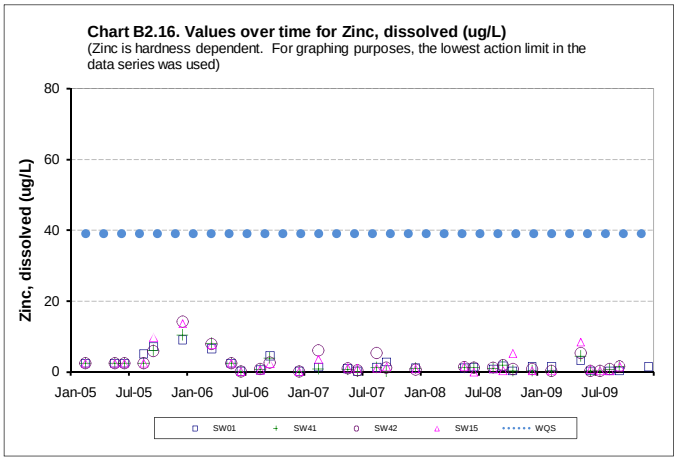


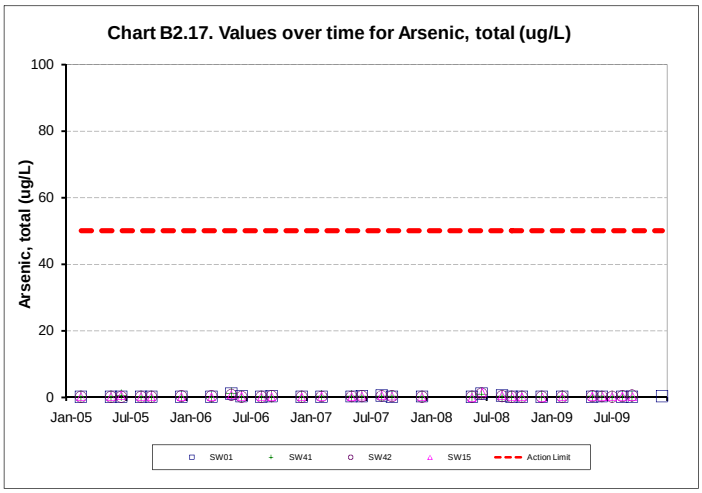
Table B2. Time Series for Receiving Environment (continued)











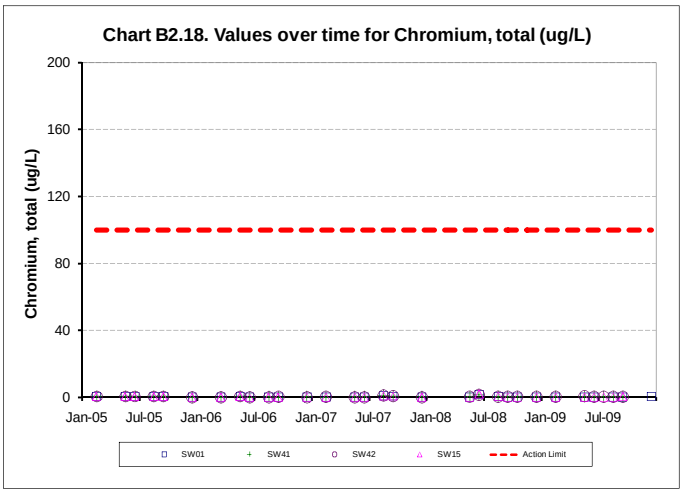
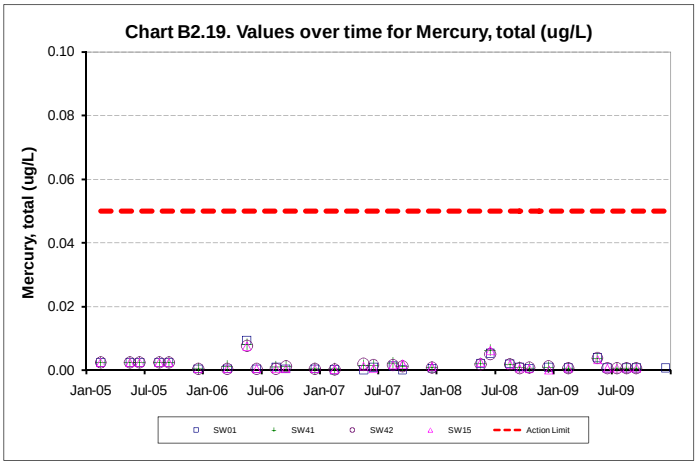
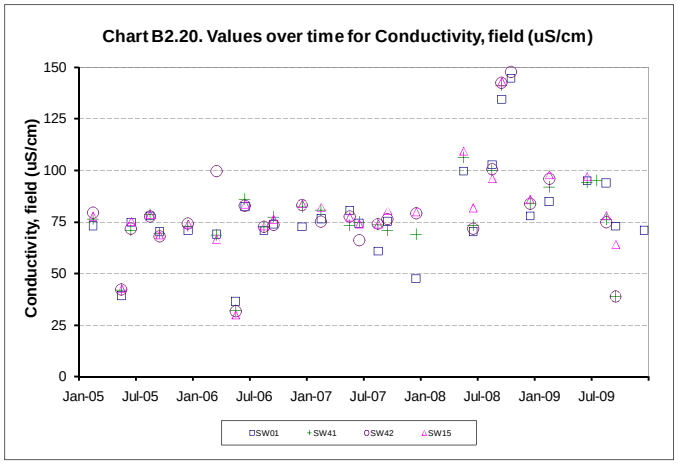
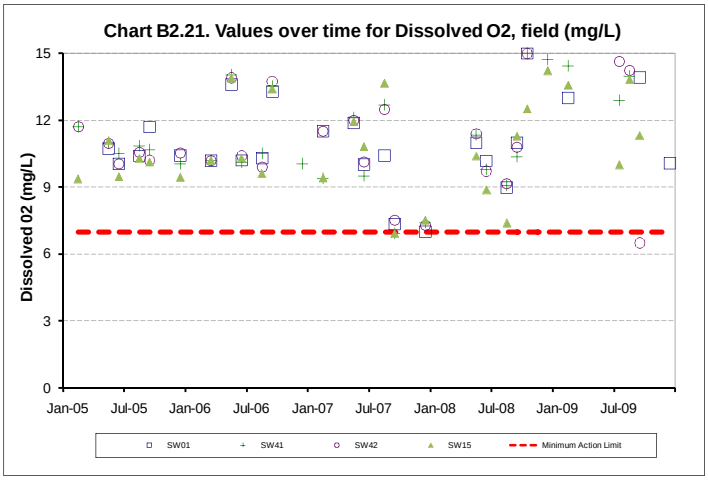
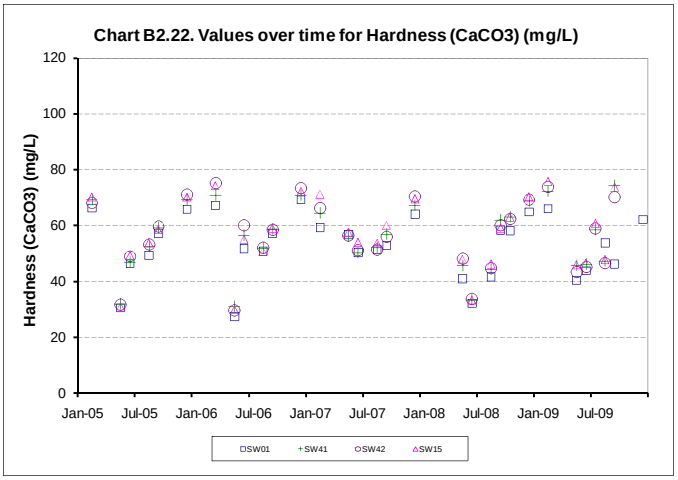


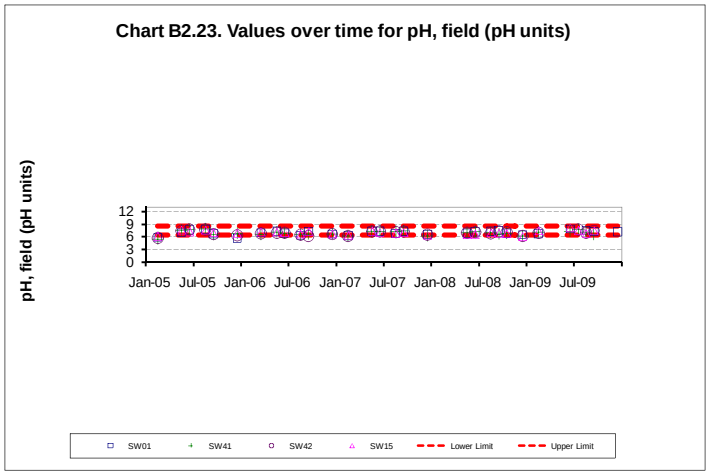
Table B2. Time Series for Receiving Environment (continued)











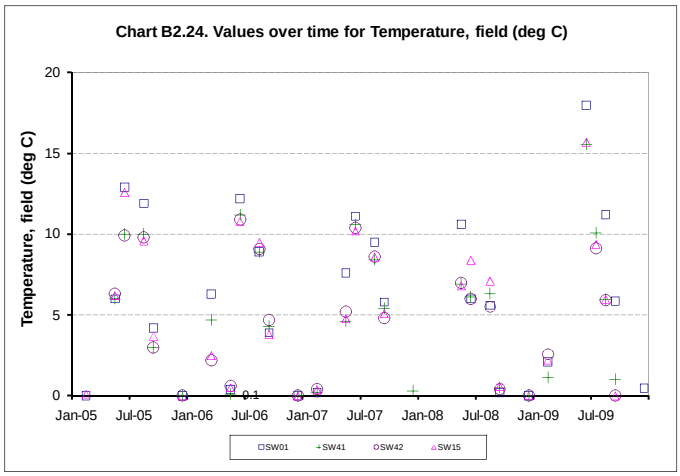
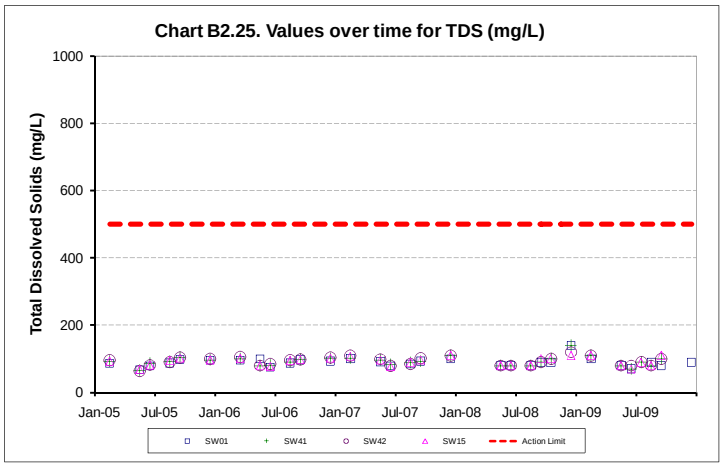
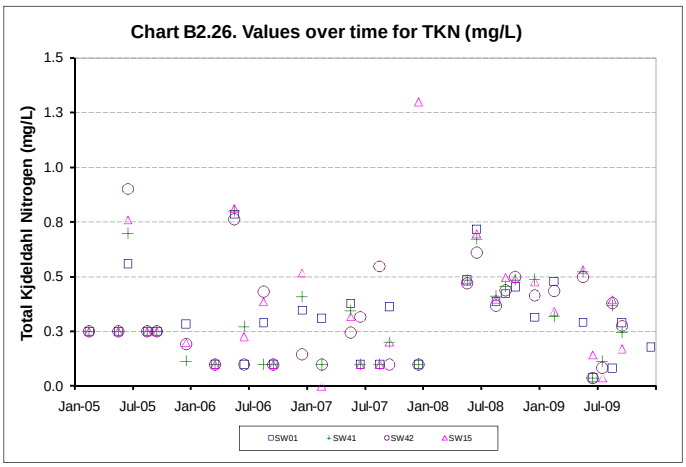
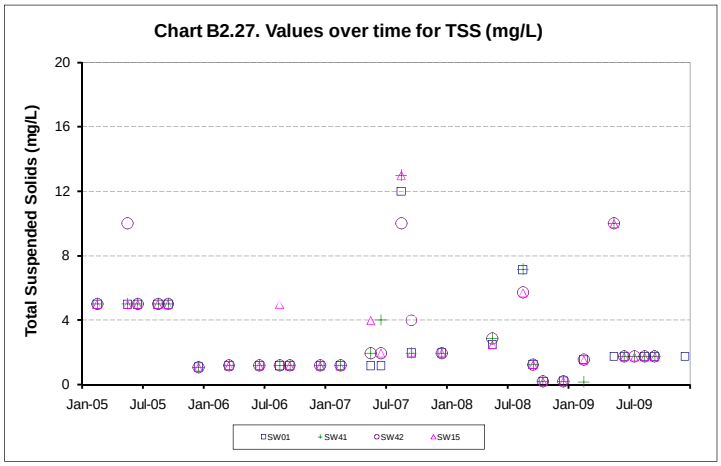


Table B2. Time Series for Receiving Environment (continued)







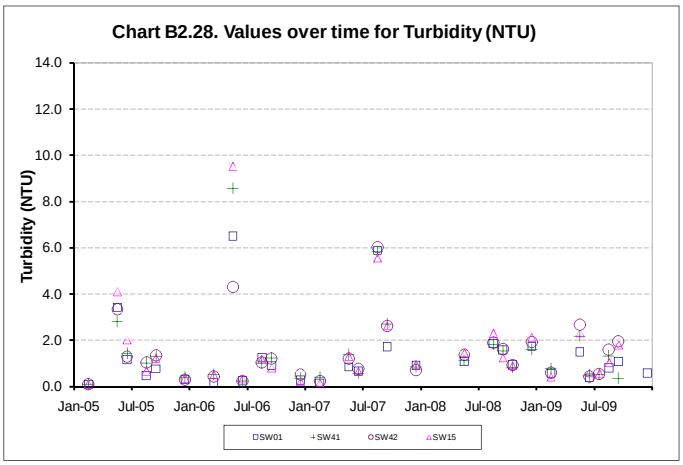


Table B3. Time Series for Groundwater Monitoring Program

Chart B3.1. Values over time for Chloride (mg/L)

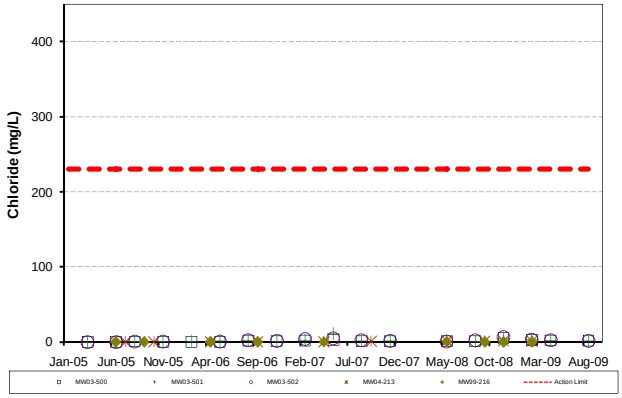


Chart B3.2. Values over time for Cyanide WAD (ug/L)

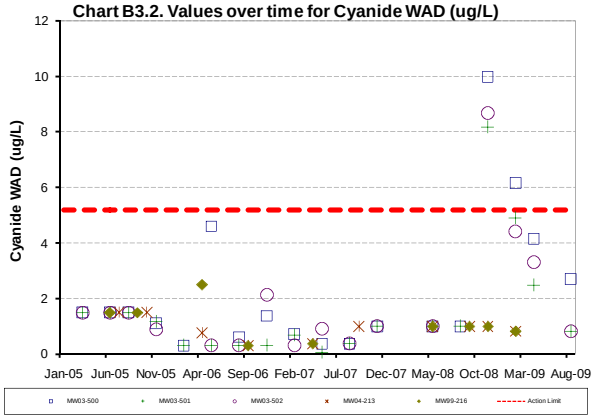


Chart B3.3. Values over time for Nitrate-N (mg/L)

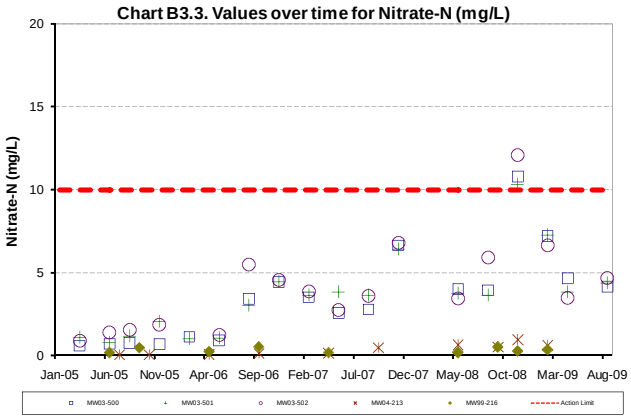


Chart B3.4. Values over time for Sulfate (mg/L)

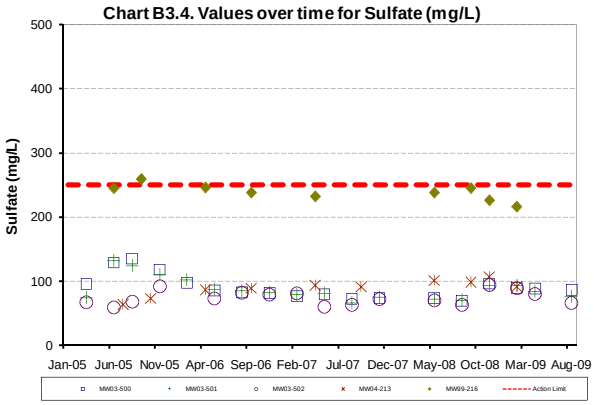


Chart B3.5. Values over time for Arsenic, dissolved (ug/L)

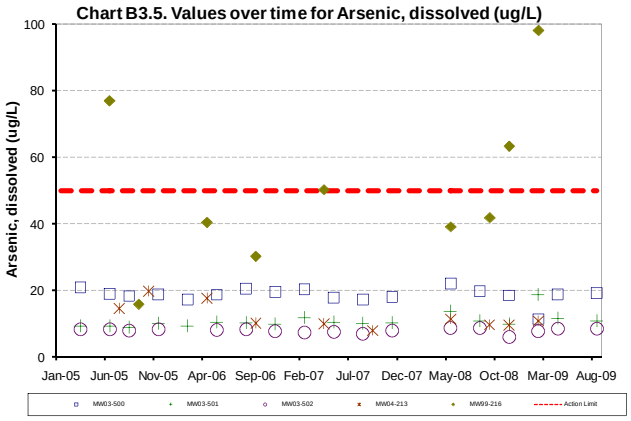


Chart B3.6. Values over time for Cadmium, dissolved (ug/L)
(Cadmium is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

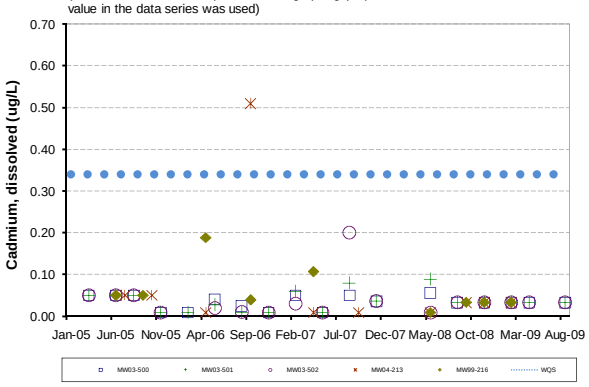


Table B1. Time Series for Groundwater Monitoring Program (continued)

Chart B3.7. Values over time for Chromium, dissolved (ug/L)

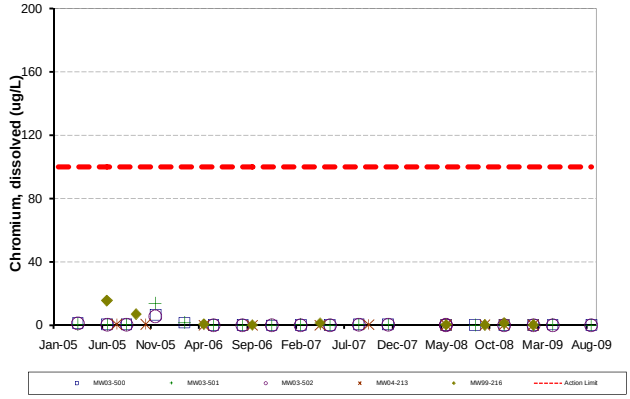


Chart B3.8. Values over time for Copper, dissolved (ug/L)
(Copper is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

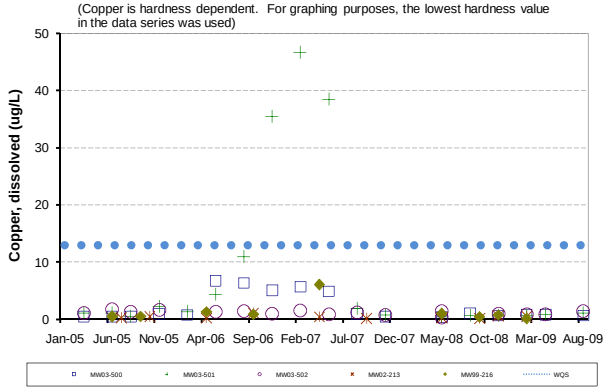


Chart B3.9. Values over time for Iron, dissolved (ug/L)

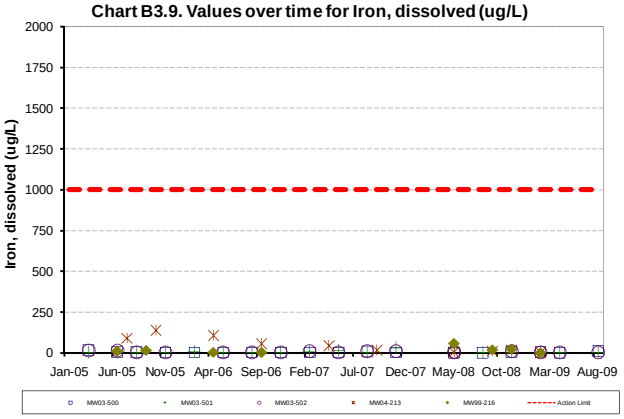


Chart B3.10. Values over time for Lead, dissolved (ug/L)
(Lead is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

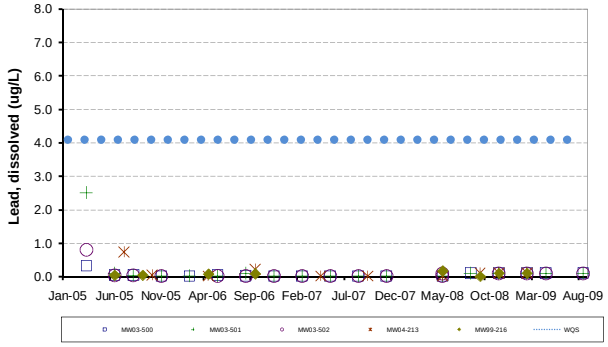


Chart B3.11. Values over time for Manganese, dissolved (ug/L)

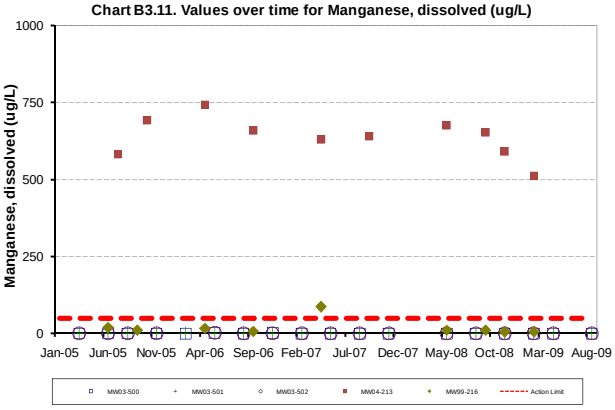


Chart B3.12. Values over time for Mercury, dissolved (ug/L)

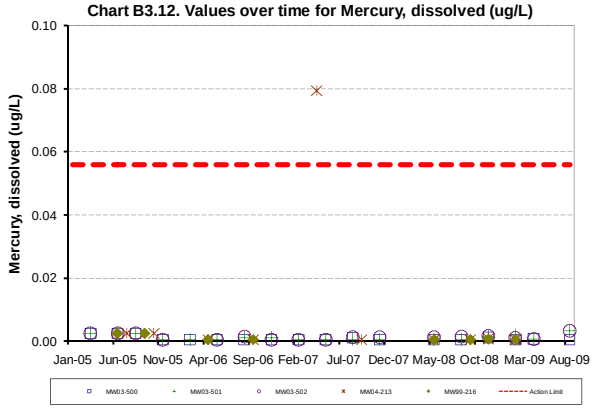


Table B1. Time Series for Groundwater Monitoring Program (continued)

Chart B3.13. Values over time for Nickel, dissolved (ug/L)
(Nickel is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

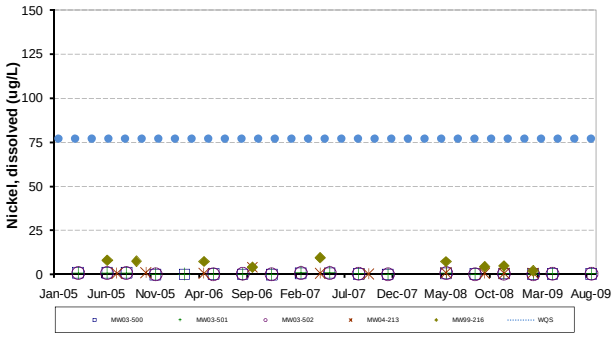


Chart B3.14. Values over time for Selenium, dissolved (ug/L)

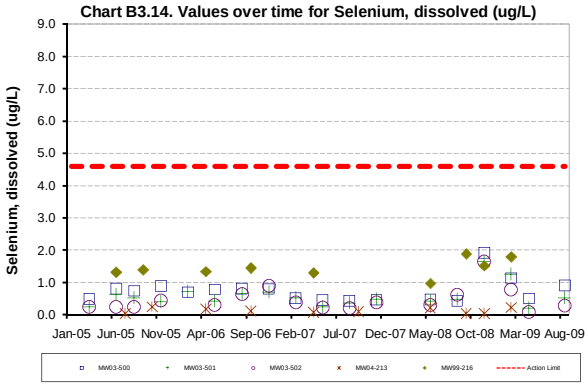


Chart B3.15. Values over time for Silver, dissolved (ug/L)

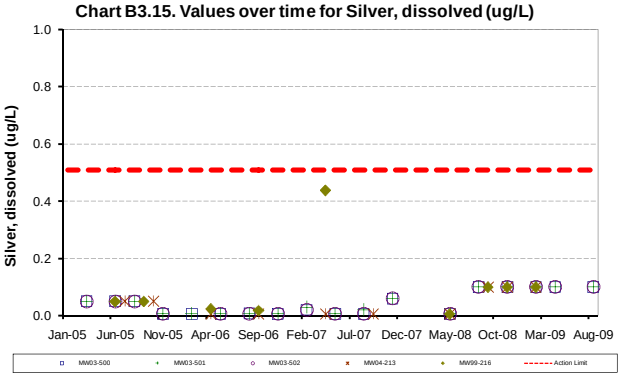


Chart B3.16. Values over time for Zinc, dissolved (ug/L)
(Zinc is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

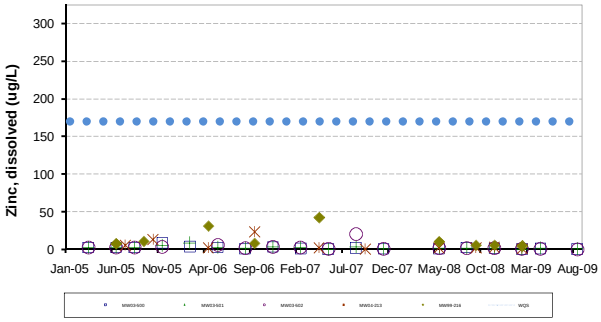


Chart B3.17. Values over time for Hardness (CaCO3) (mg/L)

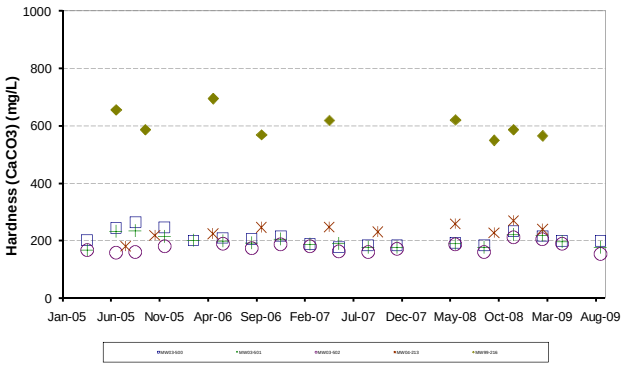


Chart B3.18. Values over time for pH, field (pH units)

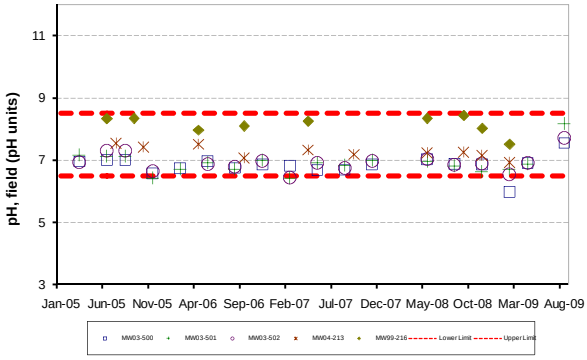


Table B1. Time Series for Groundwater Monitoring Program (continued)

Chart B3.19. Values over time for TDS (mg/L)

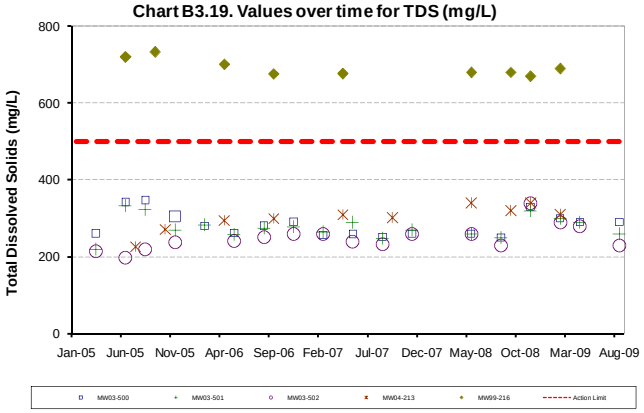


Chart B3.20. Values over time for TKN (mg/L)

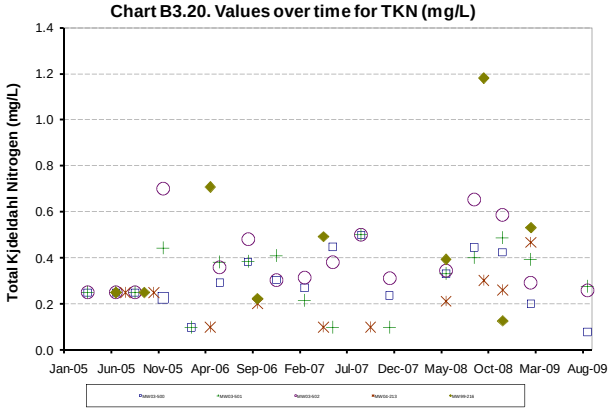


Chart B3.21. Values over time for Cyanide WAD (ug/L)

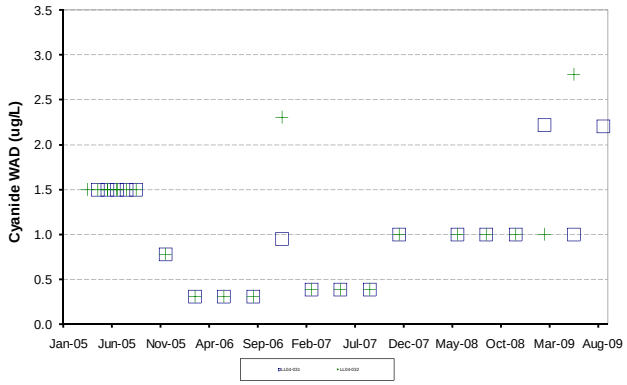


Chart B3.22. Values over time for Sulfate (mg/L)

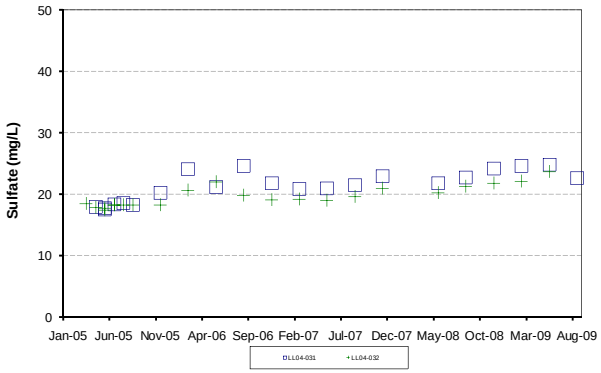


Chart B3.23. Values over time for Arsenic, total (ug/L)

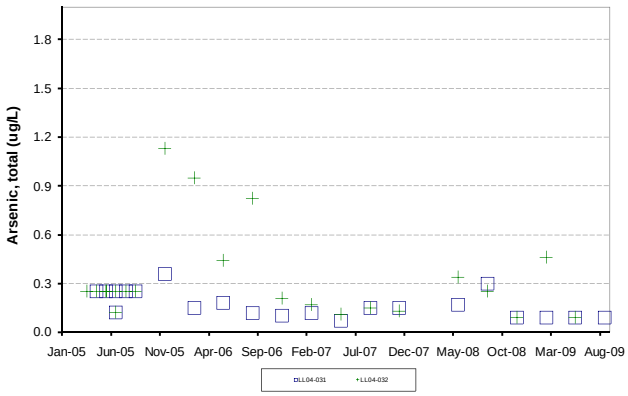


Chart B3.24. Values over time for Cadmium, total (ug/L)

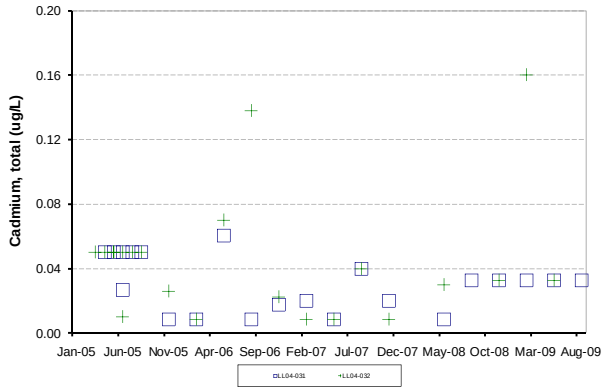


Table B1. Time Series for Groundwater Monitoring Program (continued)

Chart B3.25. Values over time for Chromium, total (ug/L)

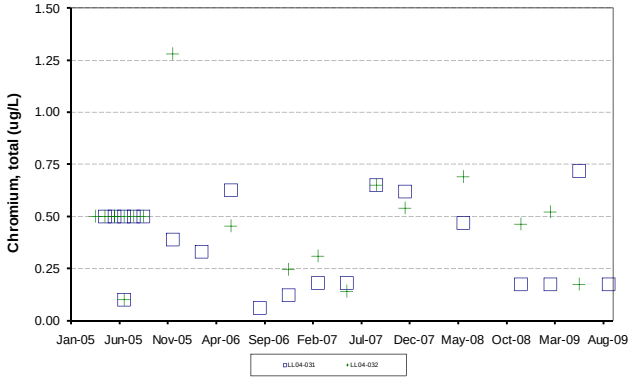


Chart B3.26. Values over time for Copper, total (ug/L)

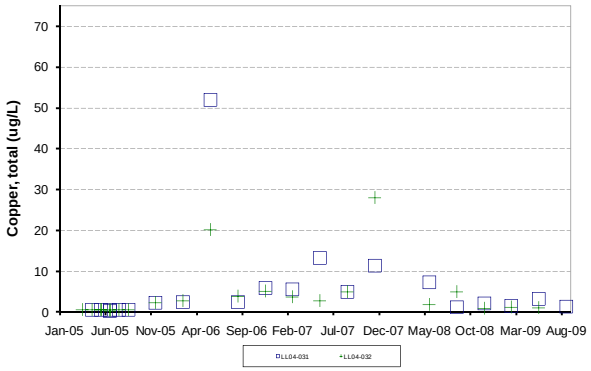


Chart B3.27. Values over time for Lead, total (ug/L)

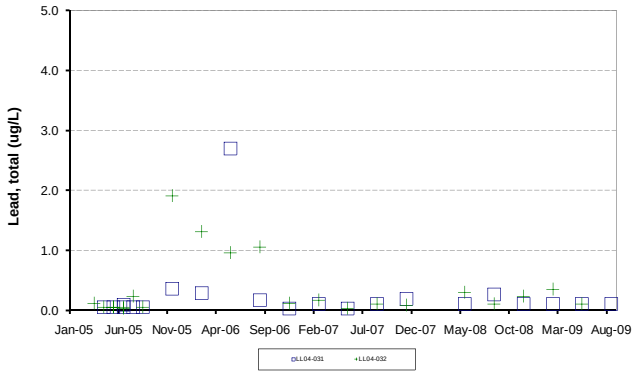


Chart B3.28. Values over time for Manganese, total (ug/L)

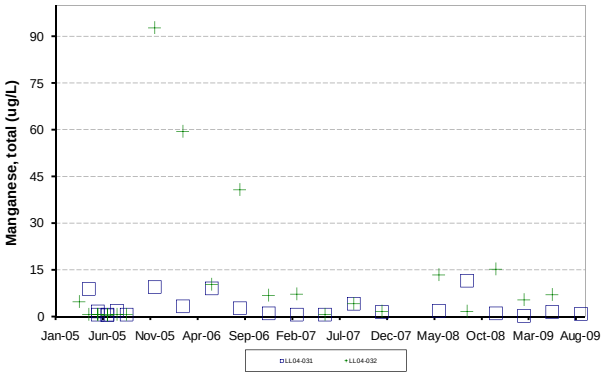


Chart B3.29. Values over time for Mercury, total (ug/L)

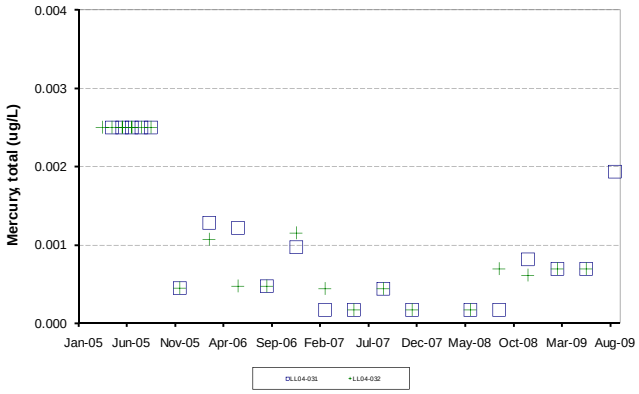


Chart B1330. Values over time for Nickel, total (ug/L)

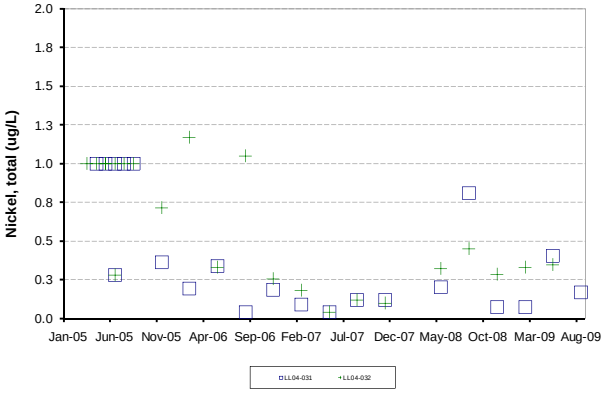


Table B1. Time Series for Groundwater Monitoring Program (continued)

Chart B3.31. Values over time for Zinc, total (ug/L)

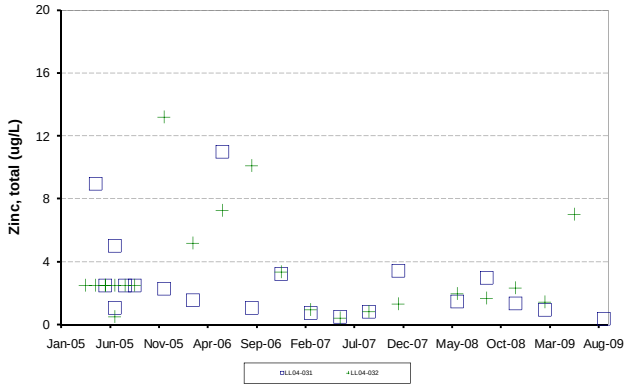


Chart B3.32. Values over time for Hardness (CaCO3) (mg/L)

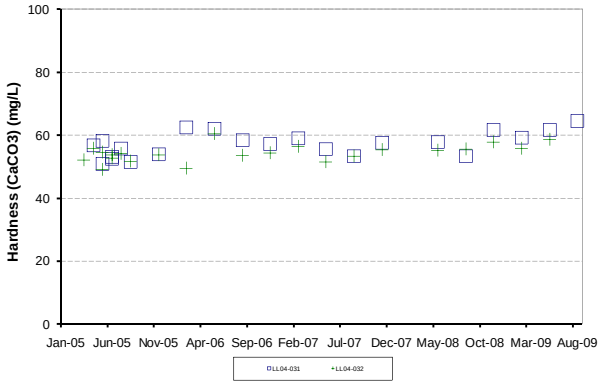


Chart B3.33. Values over time for pH, field (pH units)

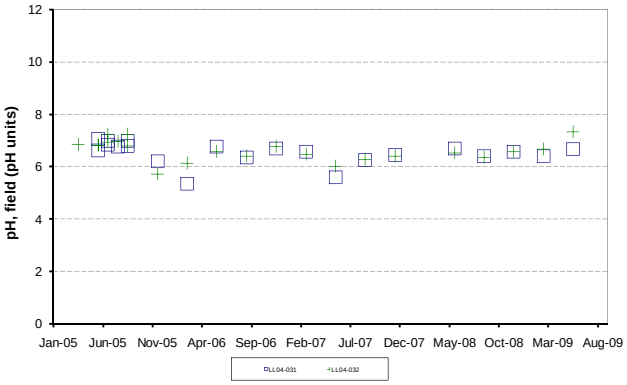


Chart B3.34. Values over time for TDS (mg/L)

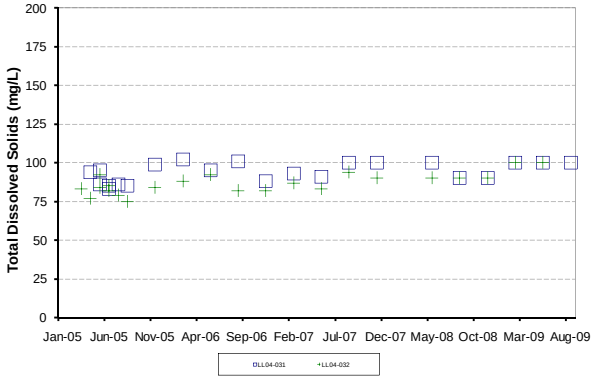


Chart B3.35. Values over time for Elevation (feet)

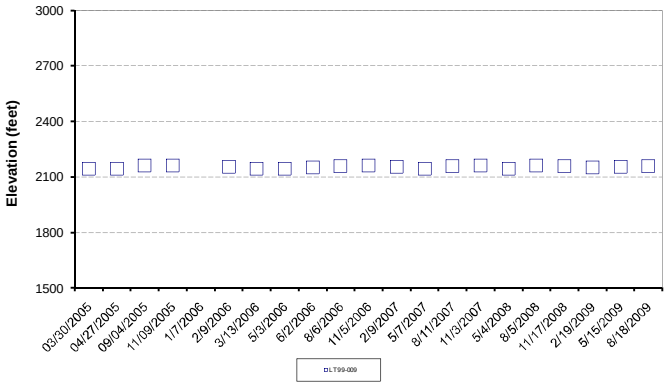
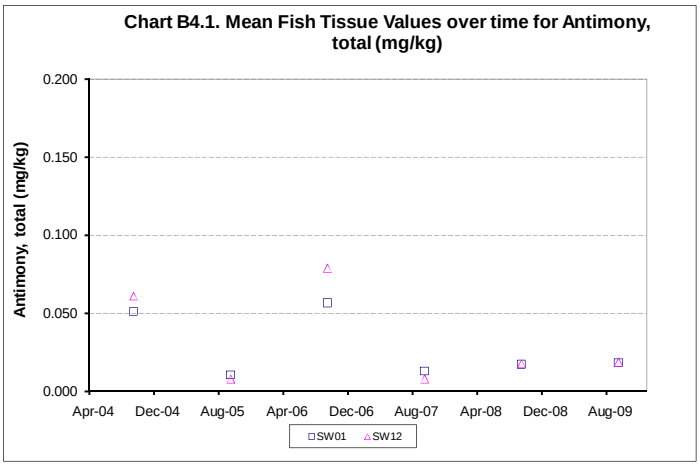
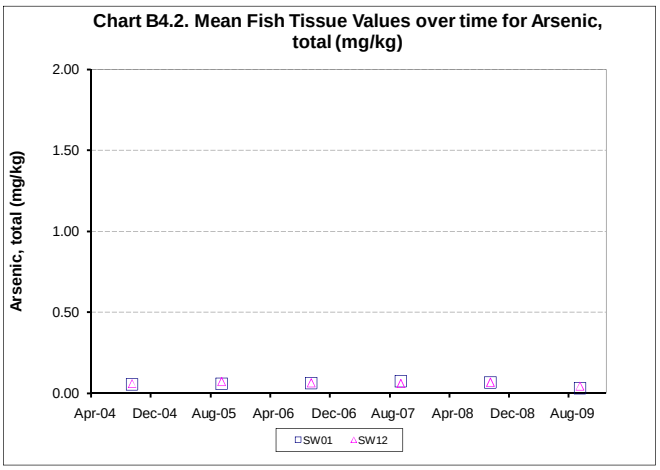
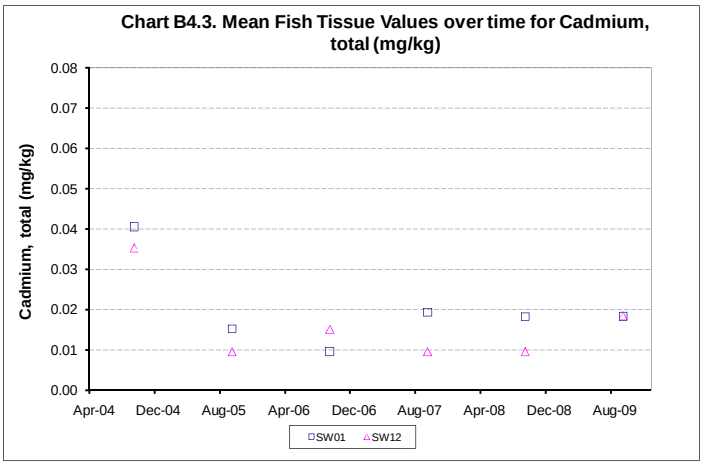
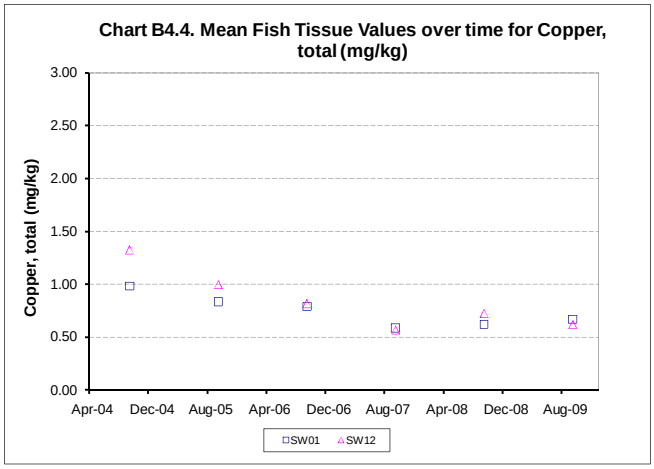


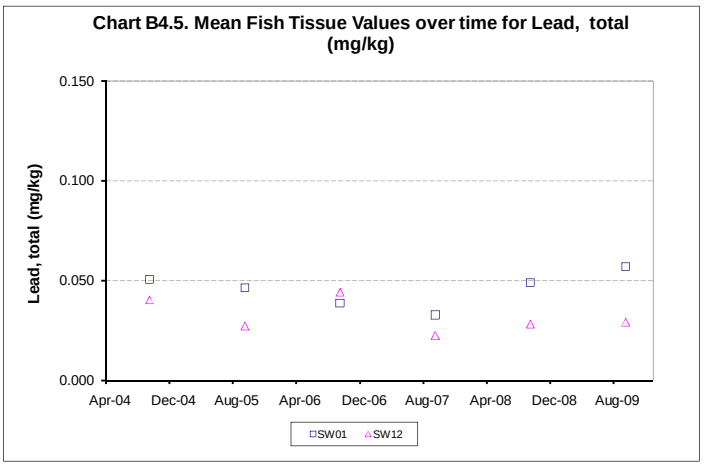
Table B4. Time Series for Fish Tissue Monitoring











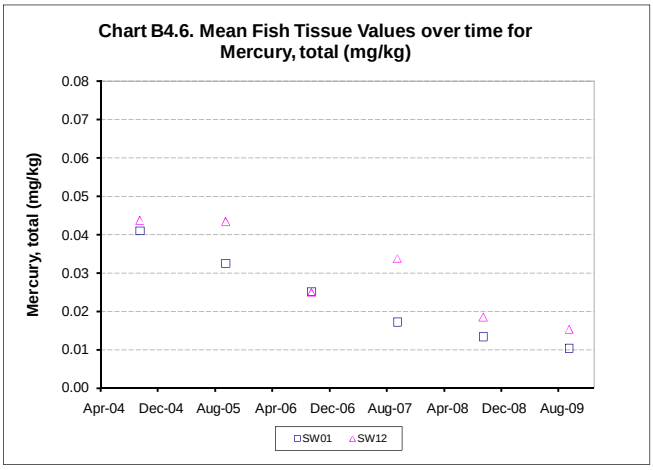
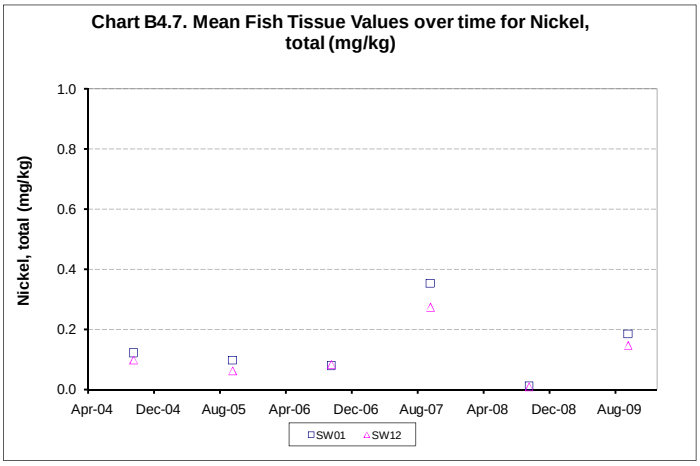
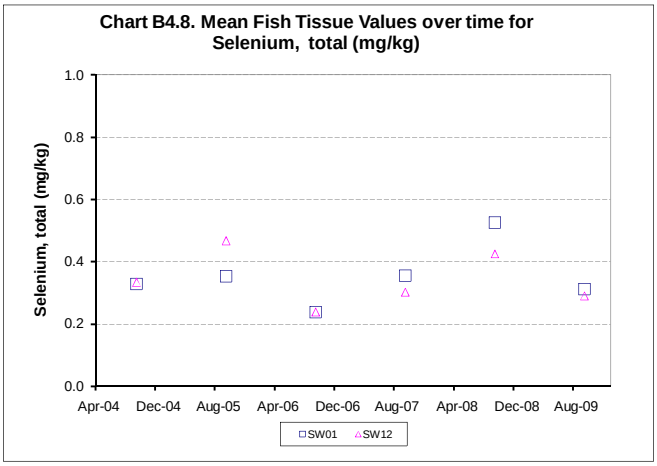
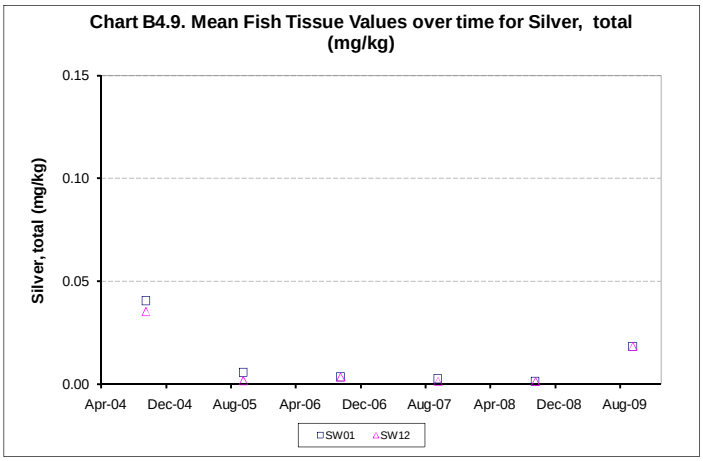


Table B4. Time Series for Fish Tissue Monitoring (continued)







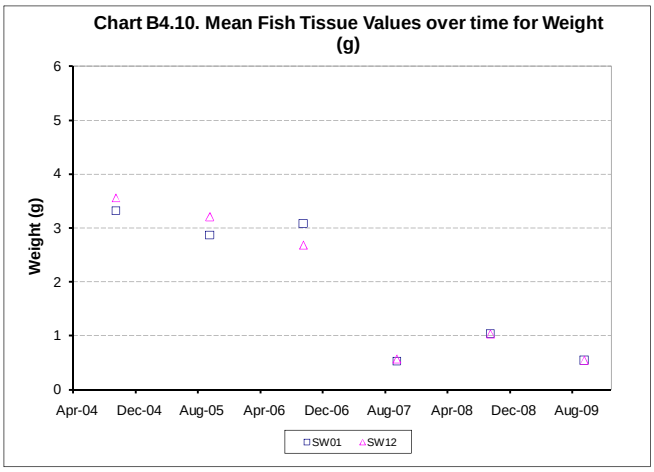
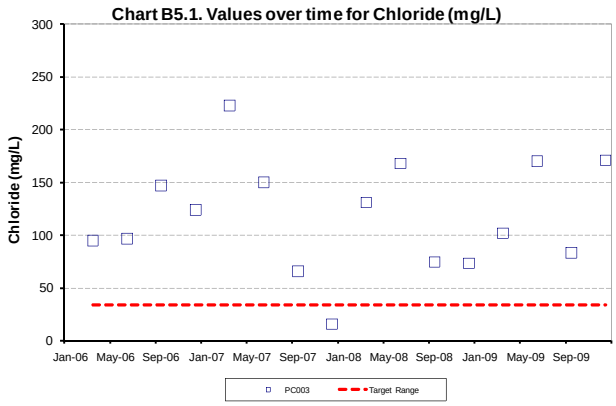
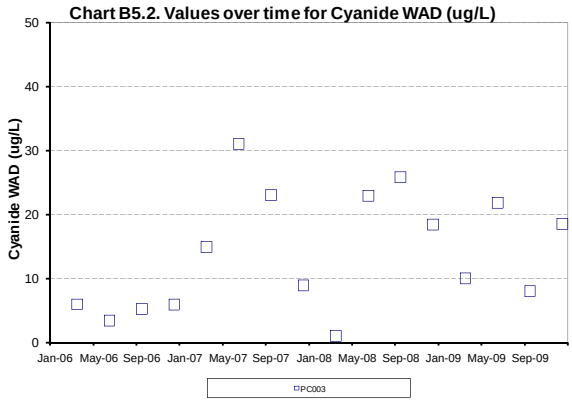
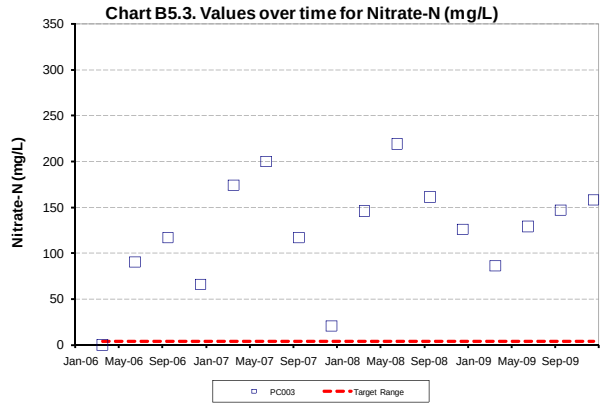
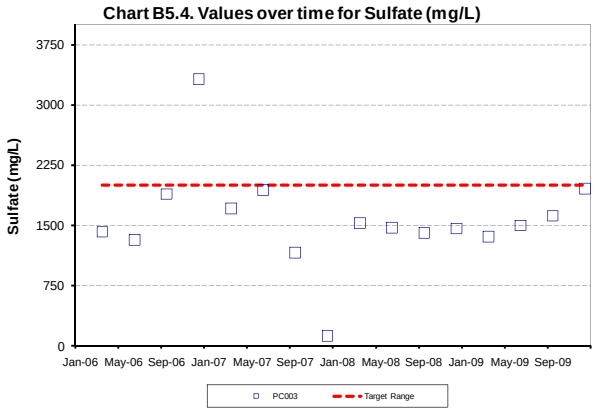


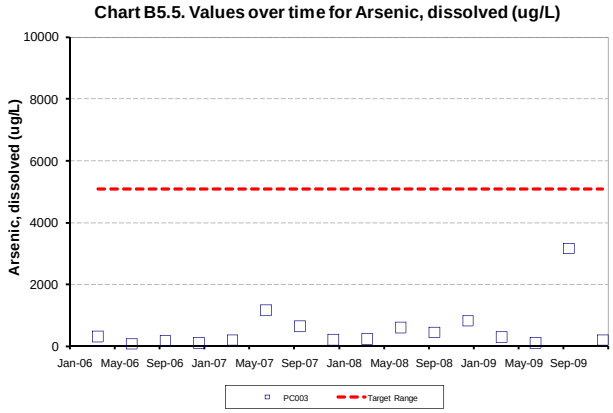
Table B5. Time Series for Flotation Interstitial Water











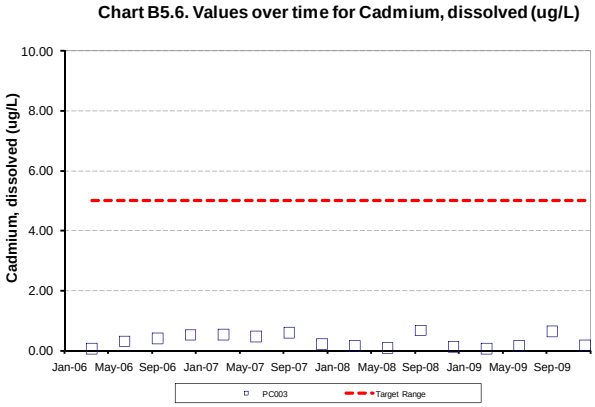


Table B3. Time Series for Flotation Interstitial Water (continued)

Chart B5.7. Values over time for Chromium, dissolved (ug/L)

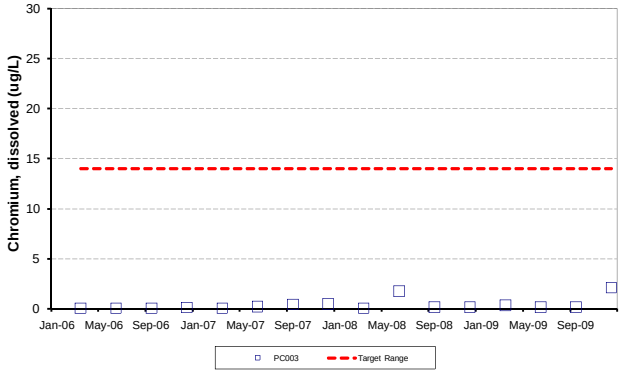


Chart B5.8. Values over time for Copper, dissolved (ug/L)

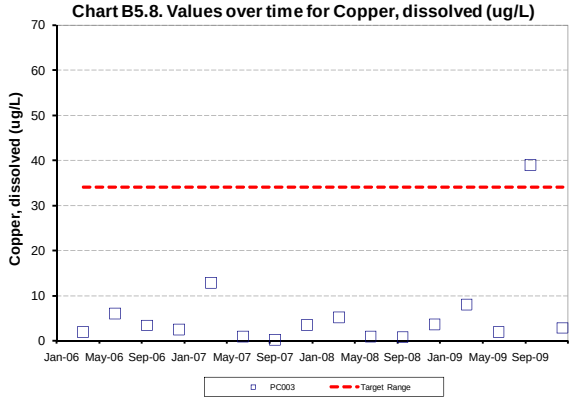


Chart B5.9. Values over time for Iron, dissolved (ug/L)

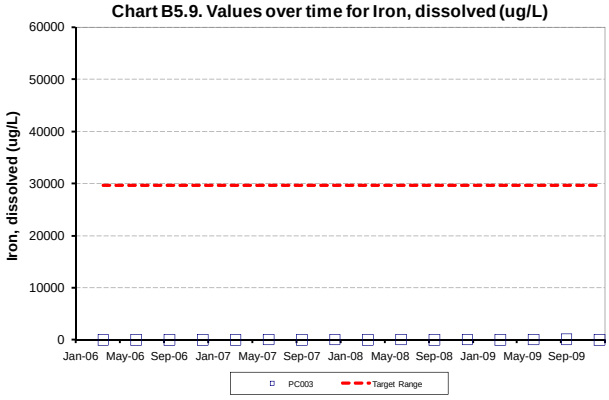


Chart B5.10. Values over time for Lead, dissolved (ug/L)

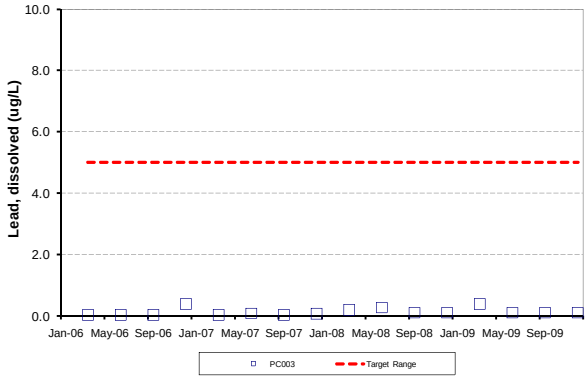


Chart B5.11. Values over time for Manganese, dissolved (ug/L)

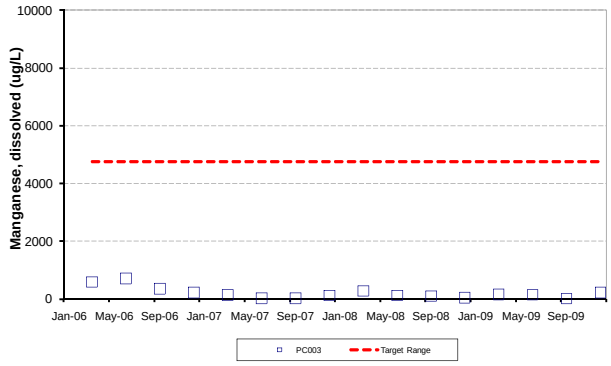


Chart B5.12. Values over time for Mercury, dissolved (ug/L)

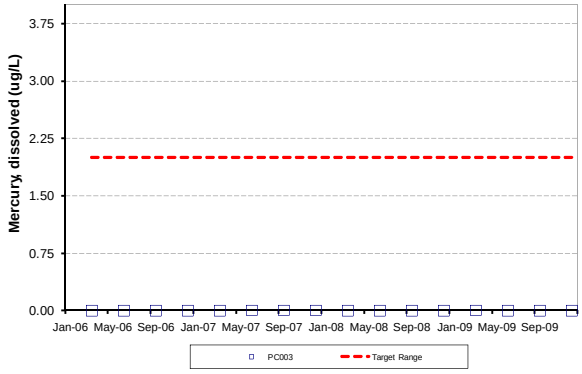


Table B3. Time Series for Flotation Interstitial Water (continued)

Chart B5.13. Values over time for Nickel, dissolved (ug/L)

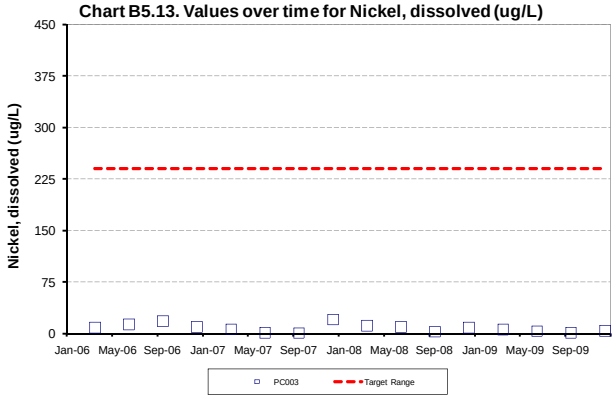


Chart B5.14. Values over time for Selenium, dissolved (ug/L)

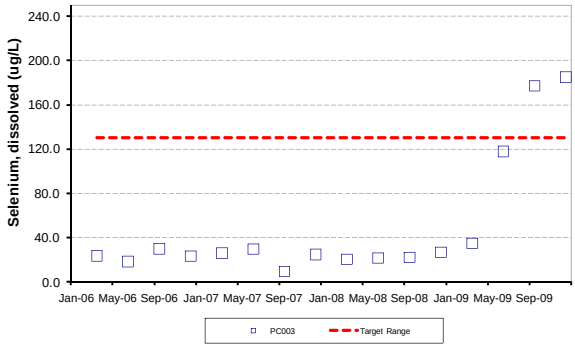


Chart B5.15. Values over time for Silver, dissolved (ug/L)

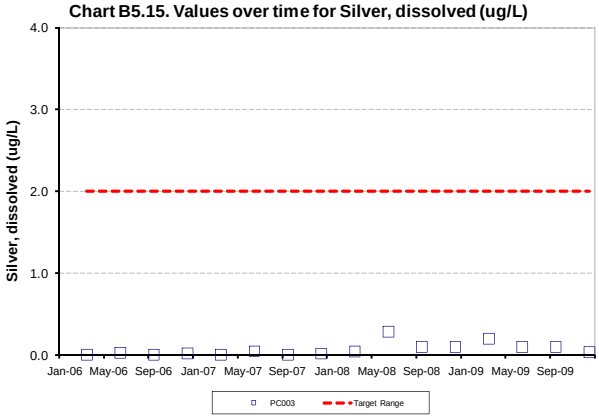


Chart B5.16. Values over time for Zinc, dissolved (ug/L)

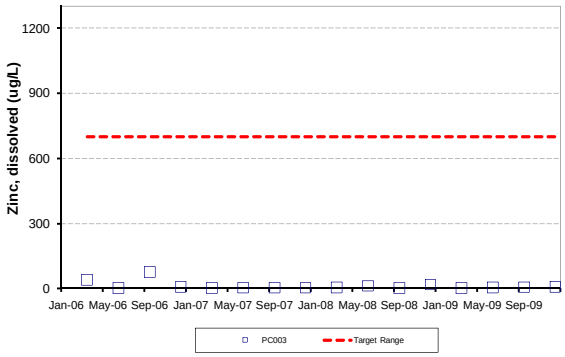


Chart B5.17. Values over time for Hardness (CaCO3) (mg/L)

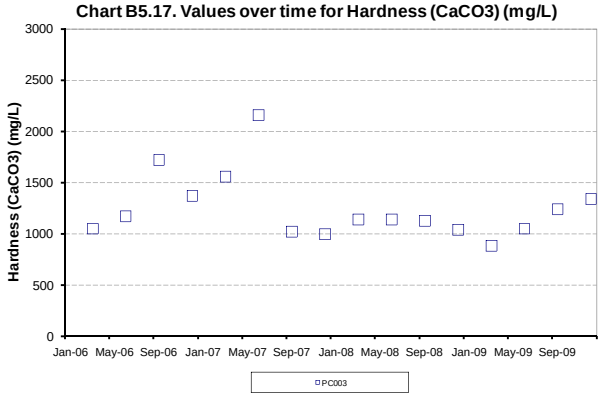


Chart B5.18. Values over time for pH, field (pH units)

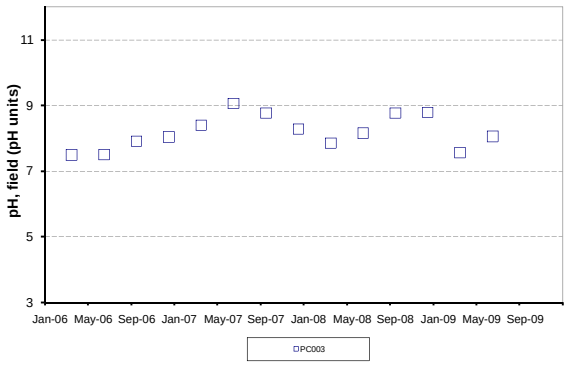
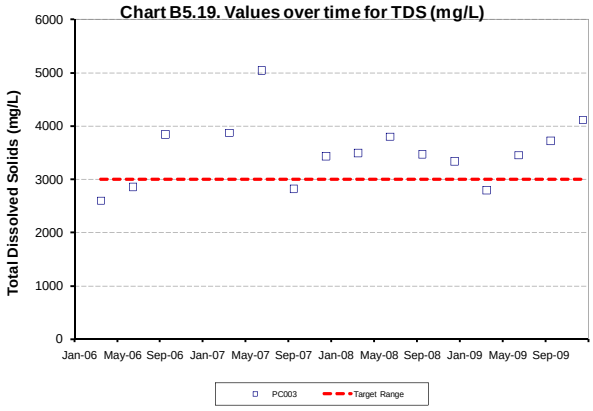
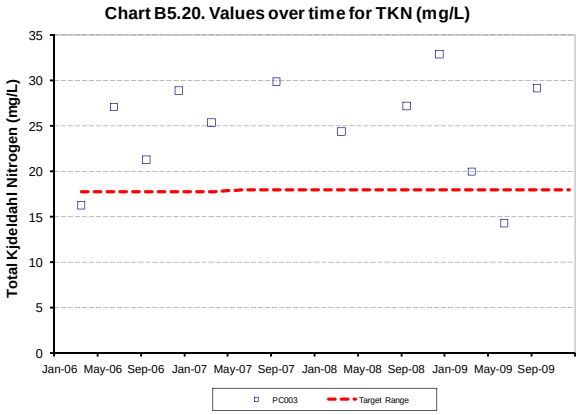


Table B3. Time Series for Flotation Interstitial Water (continued)





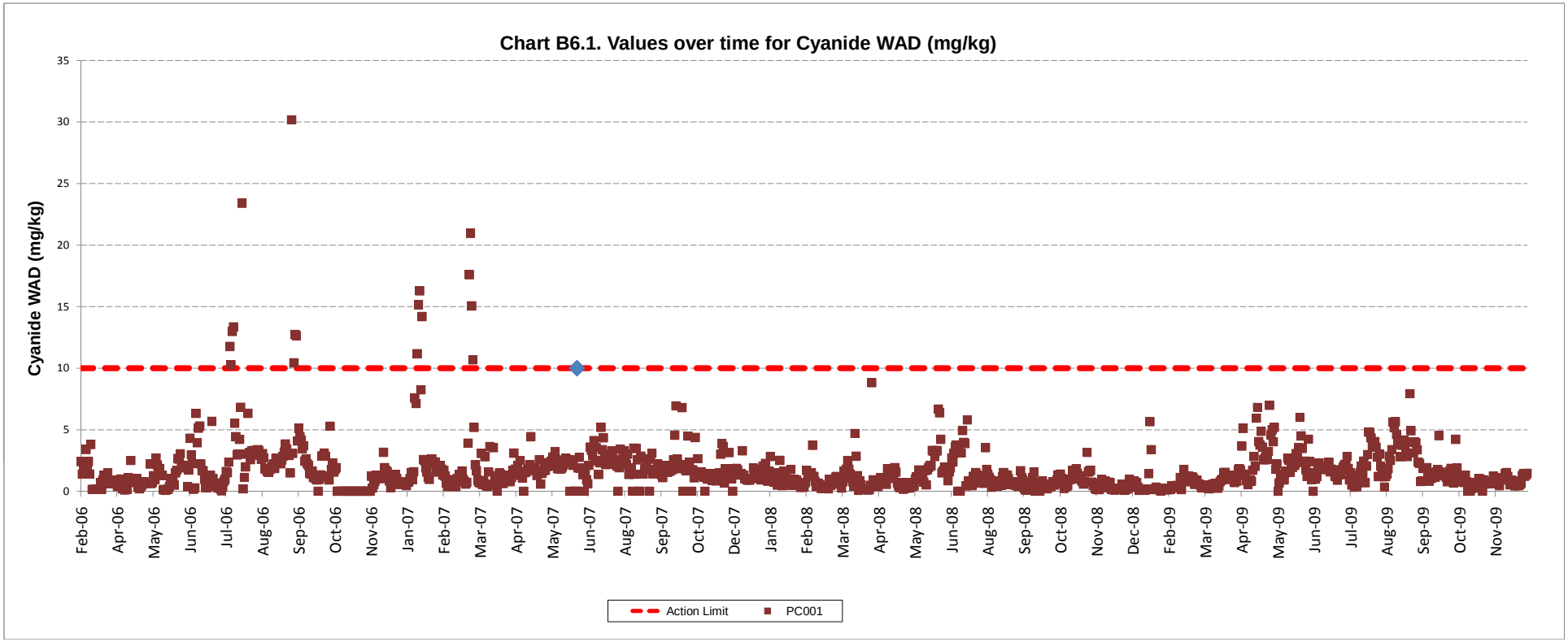


Chart B6.1. Values over time for Cyanide WAD (mg/kg)
Cyanide WAD (mg/kg)
35
30
25
20
15
10
5
0
Feb-06
Apr-06
May-06
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Aug-07
Sep-07
Oct-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Action Limit
PC001

Appendix C

Laboratory Results Data Tables

Table C1. Laboratory Results for Effluent Monitoring Program

Detailed data of treated effluent have been previously submitted to DEC via copies of the DMR's submitted to EPA under the NPDES permit.

Table C2. Laboratory Results for Groundwater Monitoring Program

Nov-2009		**LL04-031**	**LL04-032**
		17-Nov-2009	17-Nov-2009
Arsenic, Total	µg/L	<0.130	(J) 0.510
Cadmium, Total	µg/L	<0.189	<0.189
Calcium, Total	mg/L	17.1	16.3000
Chromium, Total	µg/L	<0.844	<0.844
Copper, Total	µg/L	(J) 1.20	(J) 1.04
Cyanide WAD	µg/L	(J) 3.00	(J) 2.20
Hardness (CaCO3)	mg/L	59.2	56.2
Lead, Total	µg/L	<0.111	(J) 0.600
Magnesium, Total	mg/L	3.78	3.75
Manganese, Total	µg/L	(J) 1.01	31.00
Mercury, Total	µg/L	(J) 0.00141	(J) 0.00308
Nickel, Total	µg/L	<0.232	(J) 0.250
Sulfate	mg/L	(J) 23.3	(J) 22.5
Total Dissolved Solids	mg/L	(J) 100	(J) 100
Turbidity	NTU		
Zinc, Total	µg/L	<3.08	<3.08

Nov-2009		**MW03-500**	**MW03-501**	**MW03-502**
		03-Nov-2009	03-Nov-2009	03-Nov-2009
Cyanide WAD	µg/L	<1.65	(J) <1.65	<1.65
Anion Sum	meq/L	4.53	4.37	4.1
Cation Sum	meq/L	4.05	(J) 3.84	3.59
Alkalinity, Bicarbonate	mg/L	110	104	93.8
Alkalinity, Carbonate	mg/L	<0.320	<0.320	(J) <0.320
Alkalinity, Hydroxide	mg/L	<0.320	<0.320	<0.320
Alkalinity, Total	mg/L	110	104	(J) 93.8
Chloride	mg/L	2.3	2.07	2.3
Flouride	mg/L	(J) <0.270	(J) 0.067	(J) 0.039
Nitrate-N	mg/L	6.42	5.53	(J) 7.00
Sulfate	mg/L	87.1	88.1	79.7
Calcium, Dissolved	mg/L	52.5	50.4	48.0
Magnesium, Dissolved	mg/L	14.0	(J) 12.6	10.6
Potassium, Dissolved	mg/L	2.50	2.28	2.20
Sodium, Dissolved	mg/L	4.88	5.3	6.14
Arsenic, Dissolved	µg/L	19.9	(J) 11.4	7.7
Cadmium, Dissolved	µg/L	<0.0650	<0.0650	(J) <0.0650
Chromium, Dissolved	µg/L	<0.350	<0.350	(J) <0.350
Copper, Dissolved	µg/L	<0.270	(J) <0.270	(J) 0.520
Iron, Dissolved	µg/L	<10.0	<10.0	<10.0
Lead, Dissolved	µg/L	<0.220	<0.220	(J) <0.220
Manganese, Dissolved	µg/L	<0.330	(J) 0.38	(J) 0.420
Nickel, Dissolved	µg/L	<0.150	(J) 0.16	(J) 0.280
Selenium, Dissolved	µg/L	(J) 0.93	(J) 0.840	0.56
Silver, Dissolved	µg/L	<0.200	<0.200	<0.200
Zinc, Dissolved	µg/L	<0.700	<0.700	(J) <0.700
Mercury, Dissolved	µg/L	(J) 0.001	(J) 0.001	(J) 0.002
Hardness (CaCO3)	mg/L	(J) 189	178	164
Total Dissolved Solids	mg/L	(J) 290	290	270
Total Kjeldahl Nitrogen	mg/L	(J) 0.324	(J) 0.423	(J) <0.700

Dec-2009		MW03-500	MW03-501	MW03-502
		01-Dec-2009	01-Dec-2009	01-Dec-2009
Cyanide WAD	µg/L	(J) 2.30	(J) 1.70	(J) 1.90
Anion Sum	meq/L	4.46	(J) 4.33	4.18
Cation Sum	meq/L	4.56	(J) 4.50	4.27
Alkalinity, Bicarbonate	mg/L	107	102	95.9
Alkalinity, Carbonate	mg/L	<0.320	<0.320	<0.320
Alkalinity, Hydroxide	mg/L	<0.320	<0.320	<0.320
Alkalinity, Total	mg/L	107	102	95.9
Chloride	mg/L	2.28	1.64	2.23
Flouride	mg/L	(J) 0.0950	(J) 0.0730	(J) 0.04930
Nitrate-N	mg/L	6.73	6.03	7.25
Sulfate	mg/L	84.8	86.4	80.4
Calcium, Dissolved	mg/L	6.7	59.8	57.3
Magnesium, Dissolved	mg/L	15.7	14.7	12.6
Potassium, Dissolved	mg/L	2.39	2.26	(J) 2.21
Sodium, Dissolved	mg/L	5.81	5.71	7.33
Arsenic, Dissolved	µg/L	18.3	10.4	7.23
Cadmium, Dissolved	µg/L	<0.189	<0.189	<0.189
Chromium, Dissolved	µg/L	<0.844	<0.844	<0.844
Copper, Dissolved	µg/L	1.42	1.42	1.78
Iron, Dissolved	µg/L	<17.0	<17.0	<17.0
Lead, Dissolved	µg/L	<0.111	<0.111	<0.111
Manganese, Dissolved	µg/L	0.39	<0.268	<0.268
Nickel, Dissolved	µg/L	0.29	<0.232	0.280
Selenium, Dissolved	µg/L	0.580	0.670	0.450
Silver, Dissolved	µg/L	<0.0180	<0.0180	<0.0180
Zinc, Dissolved	µg/L	<3.08	<3.08	<0.700
Mercury, Dissolved	µg/L	(J) 0.00132	(J) 0.00158	(J) 0.00259
Hardness (CaCO3)	mg/L	212	210	195
Total Dissolved Solids	mg/L	290	270	280
Total Kjeldahl Nitrogen	mg/L	<0.0750	3.19	(J) 0.337

Data Qualifier Codes:

R	Rejected
J	Estimated
Q	Questionable
F	Frozen

Table C3. Laboratory Results for Receiving Environment

Dec-2009		**SW01** 9-Dec-2009	**SW41** 9-Dec-2009	**SW42** 9-Dec-2009	**SW15** 9-Dec-2009
Alkalinity, Bicarbonate	mg/L	(J) 45.4	(J) 50.0	(J) 49.8	(J) 50.4
Alkalinity, Carbonate	mg/L	(J) <0.320	(J) <0.320	(J) <0.320	(J) <0.320
Alkalinity, Hydroxide	mg/L	(J) <0.320	(J) <0.320	(J) <0.320	(J) <0.320
Alkalinity, Total	mg/L	(J) 45.4	(J) 50.0	(J) 49.8	(J) 50.4
Aluminum, Dissolved	µg/L	(J) 13.4	(J) 14.8	(J) 12.9	27.6
Anion Sum	meq/L	1.4	1.56	1.600	1.59
Antimony, Dissolved	µg/L	(J) 0.11	(J) 0.280	(J) 0.140	(J) 0.100
Arsenic, Total	µg/L	(J) 0.300	(J) 0.180	(J)0.600	(J) 0.270
Cadmium, Dissolved	µg/L	<0.189	<0.189	<0.189	<0.189
Calcium, Dissolved	mg/L	18.7	20.3	20.2	20.4
Calcium, Total	mg/L	17.7	21.1	19.9	20.7
Cation Sum	meq/L	1.48	1.60	1.63	1.63
Chloride	mg/L	(J) 0.390	(J) 0.780	(J) 1.38	(J) 0.810
Chromium, Total	µg/L	<0.844	<0.844	<0.844	<0.844
Copper, Dissolved	µg/L	<0.526	<0.526	<0.526	<0.526
Cyanide WAD	µg/L	(J) <1.65	(J) <1.65	(J) <1.65	(J) 2.60
Flouride	mg/L	(J) 0.097	(J) 0.096	(J) 0.096	(J) 0.098
Hardness (CaCO3)	mg/L	62.2	74.3	70.2	73.8
Iron, Dissolved	µg/L	<17.0	<17.0	<17.0	<17.0
Lead, Dissolved	µg/L	<0.111	<0.111	<0.111	<0.111
Magnesium, Dissolved	mg/L	4.65	5.06	5.04	5.29
Magnesium, Total	mg/L	4.38	5.22	4.95	5.4
Manganese, Total	µg/L	2.01	7.78	19.9	10.6
Mercury, Total	µg/L	<0.00139	<0.00139	<0.00139	<0.00139
Nickel, Dissolved	µg/L	<0.232	<0.232	<0.232	<0.232
Nitrate-N	mg/L	(J) 0.390	(J) 0.550	(J) 0.600	(J) 0.560
Potassium, Dissolved	mg/L	0.905	0.95	1.04	0.98
Selenium, Dissolved	µg/L	<0.0920	(J) 0.200	<0.0920	<0.0920
Silver, Dissolved	µg/L	<0.0180	(J) 0.0500	<0.0180	<0.0180
Sodium, Dissolved	mg/L	3.14	3.45	4.21	3.58
Sulfate	mg/L	(J) 21.1	(J) 23.7	(J) 23.9	(J) 24.7
Total Dissolved Solids	mg/L	(J) 90	(J) 100	(J) 100	(J) 110
Total Kjeldahl Nitrogen	mg/L	(J) 0.178	(J) 0.244	(J) 0.275	(J) 0.171
Turbidity, Laboratory	NTU	(J) 0.577	(J) 0.356	(J) <3.50	(J) 1.79
Zinc, Dissolved	µg/L	<3.08	<3.08	<3.08	<3.08

		SW41 10/7/2009	**SW41** 10/15/2009	**SW41** 10/21/2009	**SW41** 10/28/2009
Cyanide WAD	µg/L	<3.0	<3.0	<3.0	<3.0

		SW41 11/23/2009	**SW41** 12/9/2009
Cyanide WAD	µg/L	<3.0	<3.0

Data Qualifier Codes:

R	Rejected
J	Estimated
Q	Questionable
F	Frozen

Table C4. Laboratory Results for Fish Tissue Monitoring

Sep-2009

SW01 upstream		**SW01F01**	**SW01F02**	**SW01F03**	**SW01F04**
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg		<0.038	<0.034	<0.033
Arsenic, Total	mg/kg	0.053	0.066	0.047	0.047
Cadmium, Total	mg/kg	<0.035	<0.038	<0.034	<0.033
Copper, Total	mg/kg	0.79	0.39	0.63	0.93
Mercury, Total	mg/kg	<0.018	0.029	<0.019	<0.018
Nickel, Total	mg/kg	0.44	<0.038	0.073	0.17
Lead, Total	mg/kg	0.10	<0.038	<0.034	0.044
Antimony, Total	mg/kg	<0.035	<0.038	<0.034	<0.033
Selenium, Total	mg/kg	0.32	0.30	0.39	0.31
Mass	g	0.5738	0.5314	0.5822	0.5980
		SW01F05	**SW01F06**	**SW01F07**	**SW01F08**
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.037	<0.034	<0.036	<0.036
Arsenic, Total	mg/kg	0.06	<0.034	0.048	<0.036
Cadmium, Total	mg/kg	<0.037	<0.034	<0.036	<0.036
Copper, Total	mg/kg	0.73	0.78	0.91	0.62
Mercury, Total	mg/kg	<0.019	<0.018	<0.018	<0.019
Nickel, Total	mg/kg	0.15	0.23	0.72	0.079
Lead, Total	mg/kg	0.093	0.035	0.13	0.15
Antimony, Total	mg/kg	<0.037	<0.034	<0.036	<0.036
Selenium, Total	mg/kg	0.46	0.27	0.25	0.3
Mass	g	0.5472	0.5805	0.5594	0.5586
		SW01F09	**SW01F10**	**SW01F11**	**SW01F12**
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.038	<0.037	<0.038	<0.039
Arsenic, Total	mg/kg	<0.038	<0.037	<0.038	<0.039
Cadmium, Total	mg/kg	<0.038	<0.037	<0.038	<0.039
Copper, Total	mg/kg	0.58	0.61	0.64	0.6
Mercury, Total	mg/kg	<0.017	<0.018	<0.018	<0.017
Nickel, Total	mg/kg	0.15	0.15	0.24	0.091
Lead, Total	mg/kg	<0.038	0.041	0.13	<0.039
Antimony, Total	mg/kg	<0.038	<0.037	<0.038	<0.039
Selenium, Total	mg/kg	0.32	0.28	0.32	0.28
Mass	g	0.5283	0.5399	0.5202	0.5135
		SW01F13	**SW01F14**	**SW01F15**	
		23-Sep-2009	23-Sep-2009	23-Sep-2009	
Silver, Total	mg/kg	<0.039	<0.039	<0.038	
Arsenic, Total	mg/kg	<0.039	<0.039	<0.038	
Cadmium, Total	mg/kg	<0.039	<0.039	<0.038	
Copper, Total	mg/kg	0.59	0.64	0.60	
Mercury, Total	mg/kg	<0.019	<0.018	<0.018	
Nickel, Total	mg/kg	0.13	0.061	0.07	
Lead, Total	mg/kg	<0.039	<0.039	<0.038	
Antimony, Total	mg/kg	<0.039	<0.039	<0.038	
Selenium, Total	mg/kg	0.25	0.31	0.32	
Mass	g	0.5090	0.5148	0.5260	

SW12 downstream		SW12F01	SW12F02	SW12F03	SW12F04
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.039	<0.035	<0.038	<0.038
Arsenic, Total	mg/kg	<0.039	<0.035	<0.038	0.0460
Cadmium, Total	mg/kg	<0.039	<0.035	<0.038	<0.038
Copper, Total	mg/kg	0.5	0.59	0.6	0.5600
Mercury, Total	mg/kg	0.021	<0.019	<0.019	<0.018
Nickel, Total	mg/kg	0.12	0.11	0.077	0.3300
Lead, Total	mg/kg	<0.039	<0.035	<0.038	<0.038
Antimony, Total	mg/kg	<0.039	<0.035	<0.038	<0.038
Selenium, Total	mg/kg	0.28	0.24	0.34	0.3400
Mass	g	0.5073	0.5642	0.5232	0.5228

		SW12F05	SW12F06	SW12F07	SW12F08
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.038	<0.036	<0.035	<0.038
Arsenic, Total	mg/kg	0.065	<0.036	<0.035	<0.038
Cadmium, Total	mg/kg	<0.038	<0.036	<0.035	<0.038
Copper, Total	mg/kg	0.65	0.65	0.55	0.77
Mercury, Total	mg/kg	<0.017	<0.019	0.042	<0.020
Nickel, Total	mg/kg	0.21	0.094	0.16	0.043
Lead, Total	mg/kg	0.039	<0.036	<0.035	0.043
Antimony, Total	mg/kg	<0.038	<0.036	<0.035	<0.038
Selenium, Total	mg/kg	0.29	0.3	0.24	0.37
Mass	g	0.5284	0.5537	0.5708	0.5241

		SW12F09	SW12F10	SW12F11	SW12F12
		23-Sep-2009	23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.035	<0.034	<0.039	<0.039
Arsenic, Total	mg/kg	0.0810	0.055	0.083	0.067
Cadmium, Total	mg/kg	<0.035	<0.034	<0.039	<0.039
Copper, Total	mg/kg	0.5900	0.6	0.77	0.71
Mercury, Total	mg/kg	<0.180	<0.019	<0.019	<0.018
Nickel, Total	mg/kg	0.0960	0.15	0.22	0.27
Lead, Total	mg/kg	0.0510	0.046	0.072	<0.039
Antimony, Total	mg/kg	<0.035	<0.034	<0.039	<0.039
Selenium, Total	mg/kg	0.3300	0.240	0.3	0.360
Mass	g	0.5780	0.589	0.5	0.516

		SW12F13	SW12F14	SW12F15
		23-Sep-2009	23-Sep-2009	23-Sep-2009
Silver, Total	mg/kg	<0.037	<0.038	<0.037
Arsenic, Total	mg/kg	<0.037	0.071	0.088
Cadmium, Total	mg/kg	<0.037	<0.038	<0.037
Copper, Total	mg/kg	0.62	0.57	0.55
Mercury, Total	mg/kg	<0.019	<0.18	0.055
Nickel, Total	mg/kg	0.17	0.058	0.10
Lead, Total	mg/kg	<0.037	<0.038	<0.037
Antimony, Total	mg/kg	<0.037	<0.038	<0.037
Selenium, Total	mg/kg	0.210	0.34	0.21
Mass	g	0.542	0.5199	0.5394

Table C5. Laboratory Results for Whole Effluent Toxicity Testing (WET)

Jun-2009					***CH2MHill***	***AECOM***
					OUTFALL001	**OUTFALL001**
					6/15/2009	6/15/2009
0%	Effective	Concentration	*Ceriodaphnia dubia*	%	80	100
0%	Effective	Concentration	*Pimephales promelas*	%	100	100.0
25%	Effective	Concentration	*Ceriodaphnia dubia*	%	70	90
25%	Effective	Concentration	*Pimephales promelas*	%	97.5	100.0
50%	Effective	Concentration	*Ceriodaphnia dubia*	%	60	100
50%	Effective	Concentration	*Pimephales promelas*	%	95	92.5
75%	Effective	Concentration	*Ceriodaphnia dubia*	%	70	90
75%	Effective	Concentration	*Pimephales promelas*	%	100	92.5
	Alkalinity, Total			mg/L	70	60
	Hardness (CaCO3)			mg/L	80	84
25%	Inhibition	Concentration	*Ceriodaphnia dubia*	%	80	>100
25%	Inhibition	Concentration	*Pimephales promelas*	%	>100	>100
	Low Observed Effect	Concentration	*Ceriodaphnia dubia*	%	>100	90
	Low Observed Effect	Concentration	*Pimephales promelas*	%	25	95
	No Observed Effect	Concentration	*Ceriodaphnia dubia*	%	100	100
	No Observed Effect	Concentration	*Pimephales promelas*	%	100	82.5
	Toxic Units (Chronic)		*Ceriodaphnia dubia*	TU	1.25	<1.00
	Toxic Units (Chronic)		*Pimephales promelas*	TU	<1	<1.00

Table C6. Laboratory Results for Flotation Interstitial Water

Dec-2009		**PC003** 15-Dec-09
Alkalinity, Bicarbonate	mg/L	74.2
Alkalinity, Carbonate	mg/L	<0.320
Alkalinity, Hydroxide	mg/L	<0.320
Alkalinity, Total	mg/L	74.2
Anion Sum	meq/L	58.5
Arsenic, Dissolved	µg/L	(J) 211
Cadmium, Dissolved	µg/L	(J) <0.378
Calcium, Dissolved	mg/L	456
Cation Sum	meq/L	53.6
Chloride	mg/L	171.0
Chromium, Dissolved	µg/L	(J) <4.22
Conductivity, Field	µS/cm	3768
Copper, Dissolved	µg/L	(J) 2.85
Cyanide WAD	µg/L	18.5
Flouride	mg/L	1.59
Hardness (CaCO3)	mg/L	(J) 1340
Iron, Dissolved	µg/L	<17.0
Lead, Dissolved	µg/L	(J) <0.222
Magnesium, Dissolved	mg/L	47.7
Manganese, Dissolved	µg/L	(J) 221
Mercury, Dissolved	µg/L	<0.000949
Nickel, Dissolved	µg/L	(J) 4.00
Nitrate-N	mg/L	(J) 158
Potassium, Dissolved	mg/L	(J) 354
Selenium, Dissolved	µg/L	(J) 185
Silver, Dissolved	µg/L	(J) 0.0400
Sodium, Dissolved	mg/L	(J) 410
Sulfate	mg/L	J) 1960
Total Dissolved Solids	mg/L	4110
Total Kjeldahl Nitrogen	mg/L	(J) 98.6
Zinc, Dissolved	µg/L	(J) <15.4

Data Qualifier Codes:

R	Rejected
J	Estimated
Q	Questionable
F	Frozen

Table C7. Field Results for Groundwater Monitoring Progran

Stn Name	Collect Date/Time	COND-F µS/cm	DO-F mg/L	Elevation (feet)	PH-F pH units	TEMP-F deg C	Water Depth (feet)
LL04-031	17-Nov-2009	79.0	8.5		6.95	3.52	6.60
LL04-032	17-Nov-2009	76.0	6.24		6.60	3.88	7.83
LT99-009	17-Nov-2009			2157			
MW03-500	3-Nov-2009	249	7.71		7.71	1.72	12.4
MW03-501	3-Nov-2009	244	7.78		7.77	2.17	12.0
MW03-502	3-Nov-2009	230	7.36		7.74	1.57	8.45
MW03-500	1-Dec-2009	236	8.41		7.07	1.99	13.1
MW03-501	1-Dec-2009	232	8.44		7.07	2.19	12.60
MW03-502	1-Dec-2009	222	6.51		7.08	1.85	9.1

Table C8. Field Results for Receiving Environmen

Stn Name	Collect Date/Time	COND-F µS/cm	DO-F mg/L	PH-F pH units	TEMP-F deg C
SW01	09-Dec-2009	71	(J) 10.07	7.21	0.47
SW41	09-Dec-2009	39	(J) 25	6.57	1.01
SW42	09-Dec-2009	39	6.5	7.50	0.01
SW15	09-Dec-2009	64	11.3	7.38	0.00

Table C9. Field Results for Flotation Tailings Interstitial Wate

Stn Name	Collect Date/Time	COND-F µS/cm	PH-F pH units	TEMP-F deg C
PC003	15-Dec-2009	3768	8.16	18

Table C10. Field Results for CIP Tailings

Stn Name	Collect Date/Time	CN-WAD-F mg/kg
PC001	10/1/2009	1.56
PC001	10/2/2009	1.76
PC001	10/3/2009	4.52
PC001	10/5/2009	1.57
PC001	10/6/2009	1.34
PC001	10/7/2009	1.46
PC001	10/8/2009	1.25
PC001	10/10/2009	1.40
PC001	10/11/2009	1.13
PC001	10/12/2009	0.77
PC001	10/16/2009	1.36
PC001	10/17/2009	1.61
PC001	10/18/2009	1.86
PC001	10/19/2009	1.28
PC001	10/20/2009	0.67
PC001	10/21/2009	0.76
PC001	10/23/2009	4.22
PC001	10/24/2009	1.87
PC001	10/25/2009	1.07
PC001	10/26/2009	1.19
PC001	10/27/2009	0.78
PC001	10/28/2009	0.90
PC001	10/29/2009	1.19
PC001	10/30/2009	0.71

Table C10. Field Results for CIP Tailings (continued

Stn Name	Collect Date/Time	CN-WAD-F mg/kg
PC001	11/1/2009	1.30
PC001	11/2/2009	0.75
PC001	11/7/2009	0.23
PC001	11/8/2009	0.42
PC001	11/9/2009	0.61
PC001	11/10/2009	0.72
PC001	11/11/2009	0.39
PC001	11/12/2009	0.27
PC001	11/13/2009	1.02
PC001	11/14/2009	0.96
PC001	11/15/2009	0.94
PC001	11/17/2009	0.89
PC001	11/18/2009	0.58
PC001	11/21/2009	0.66
PC001	11/22/2009	0.73
PC001	11/23/2009	0.81
PC001	11/24/2009	0.71
PC001	11/25/2009	0.65
PC001	11/26/2009	0.61
PC001	11/27/2009	1.23
PC001	11/28/2009	0.97
PC001	11/29/2009	0.76
PC001	11/30/2009	0.66

Table C10. Field Results for CIP Tailings (continued

Stn Name	Collect Date/Time	CN-WAD-F mg/kg
PC001	12/1/2009	0.75
PC001	12/2/2009	0.46
PC001	12/3/2009	1.10
PC001	12/4/2009	0.96
PC001	12/5/2009	1.03
PC001	12/6/2009	0.98
PC001	12/7/2009	1.42
PC001	12/9/2009	1.52
PC001	12/10/2009	1.20
PC001	12/11/2009	0.89
PC001	12/13/2009	0.51
PC001	12/14/2009	0.89
PC001	12/15/2009	0.84
PC001	12/16/2009	0.63
PC001	12/17/2009	0.44
PC001	12/20/2009	0.80
PC001	12/21/2009	0.65
PC001	12/22/2009	0.45
PC001	12/23/2009	0.53
PC001	12/24/2009	0.64
PC001	12/27/2009	1.26
PC001	12/28/2009	1.42
PC001	12/29/2009	1.22
PC001	12/30/2009	1.31
PC001	12/31/2009	1.45

Data Codes

NR	No Reading
FRZN	Frozen
INAC	Inaccessible

Data Qualifier Codes:

R	Rejected
J	Estimated
Q	Questionable
F	Frozen