Sumitomo Metal Mining Pogo LLC

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March 3, 2010

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United States Environmental Protection Agency, Region 10
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610 University Avenue
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Alaska Department of Natural Resources
3700 Airport Way
Fairbanks, Alaska 99709-4699

Re: **Sumitomo Metal Mining Pogo LLC 2010 Annual Activity and Monitoring Report**

Dear Sirs:

Enclosed is Sumitomo Metal Mining Pogo LLC (Pogo) 2010 Annual Activity and Monitoring Report for the for Pogo Mine Site, located 38 miles northeast of Delta Junction, Alaska. This report is prepared to fulfill the requirements of the *Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949*, *U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1*, and *Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit 0131-BA002*. This report covers the period from January 1, 2010 through December 31, 2010. The Annual Meeting is scheduled for March 24, 2011 at 3:30 pm at the West Mark Hotel in Fairbanks. Pogo appreciates the extension of time granted by ADEC to submit this report.

Please give me a call at 907-895-2897 or email me at sally.mcleod@smmpogo.com if you have any questions.

Sincerely,

Sally S. McLeod, CEM, REM
Environmental Superintendent

Enclosure: 2010 Annual Activity and Monitoring Report

COR_11_016

2010 ANNUAL ACTIVITY AND MONITORING REPORT

SUMITOMO METAL MINING POGO LLC

Submitted To:

United States Environmental Protection Agency
Region 10, Office of Water
1200 Sixth Avenue, OW-133
Seattle, Washington 98101

Alaska Department of Environmental Conservation
Division of Water
610 University Avenue,
Fairbanks, Alaska 99709

Alaska Department of Natural Resources
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Prepared by:

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March 3, 2011

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1. Introduction

Sumitomo Metal Mining Pogo LLC (Pogo) prepared this report to fulfill the requirements of the *U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1, Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit 0131-BA002, and ADNR Plan of Operations Approval F20039500 (12/18/03)*. This report covers the period from January 1, 2010 through December 31, 2010. This report also provides an update on the status of the 2008 Environmental Audit.

2. 2010 Monitoring

A prescriptive program of environmental monitoring is conducted as required by Pogo's permits and in accordance with Pogo's approved *Pogo Mine Monitoring Plan* and *Quality Assurance Protection Plan (QAPP)*.

The objectives of the monitoring programs are:

- To monitor the water quality of the effluent discharged from the facility,
- To monitor water quality changes in the Goodpaster River and in the groundwater below the facility that may occur as a result of mining activities or discharges from the facility,
- To monitor fish tissue metals content in juvenile Chinook salmon from the Goodpaster River upstream and downstream from the project facilities,
- To monitor the CIP Tailings Processes associated with the underground paste backfill, and
- To monitor the Flotation Tailings and the materials placed in the Dry Stack Tailings Facility.

Samples collected from the Water Treatment Plant #2 (WTP#2), groundwater stations, surface water stations, and the Off River Treatment Works (ORTW) effluent were submitted to Test America Inc. Environmental Laboratory, Analytica Laboratories, and

ACZ Laboratories. Samples collected for the Sewage Treatment Plant (STP) influent and effluents were submitted to Analytica Laboratories.

2.1 SUMMARY

A summary of the 2010 monitoring results show:

- In January 2010 a WAD cyanide exceedance of the Daily Maximum and the Monthly Average was reported. Exceedance of the Monthly Average for WAD cyanide was also reported for August and September 2010. Refer to Section 2.2.2 for more detail.

- On April 20, 2010 a pH value of 6.35 was measured at the Outfall 001. No mine effluent discharge had taken place since January and Goodpaster River was showing a pH of 6.44, an indication of background conditions. Refer to Section 2.2.2 for more detail.

- On December 5, 2010 at Outfall 001, 125 minutes of pH readings below 6.5 was report at the continuous meter. The other continuous meters showed that incoming river water and water being discharged from the Mine Water Treatment Plant were all above pH 6.5 indicating a faulty meter, not an exceedance of the pH limit. Refer to Section 2.2.2 for more detail.

- There are no adverse trends in Surface water samples collected during the year. Refer to Section 2.3.1 for more detail.

- Three wells are located below the Recycled Tailings Pond (RTP) Dam, MW03-500, MW03-501, and MW03-502. They monitor groundwater downstream of the RTP seepage collection system. Samples were collected monthly during 2010. Refer to Section 2.4.1 for more detail.

- A Tracer Test began on September 14, 2010 when Rhodamine dye was placed in the RTP as part of a hydrogeologic study. Refer to Section 2.4.5 for more detail.

- Interstitial Water monitoring for the drystack indicates an increase in selenium levels during the year. Pogo is investigating the use of a mill reagent (Copper Sulfate) that contains trace amounts of selenium. Refer to Section 2.5.5 for more detail.

A discussion of the results for each sampling program is provided below. Time series graphs are provided in **Appendix C**.

2.2 TREATED EFFLUENT MONITORING

EPA NPDES AK-005334-1 (3/15/04), III.B

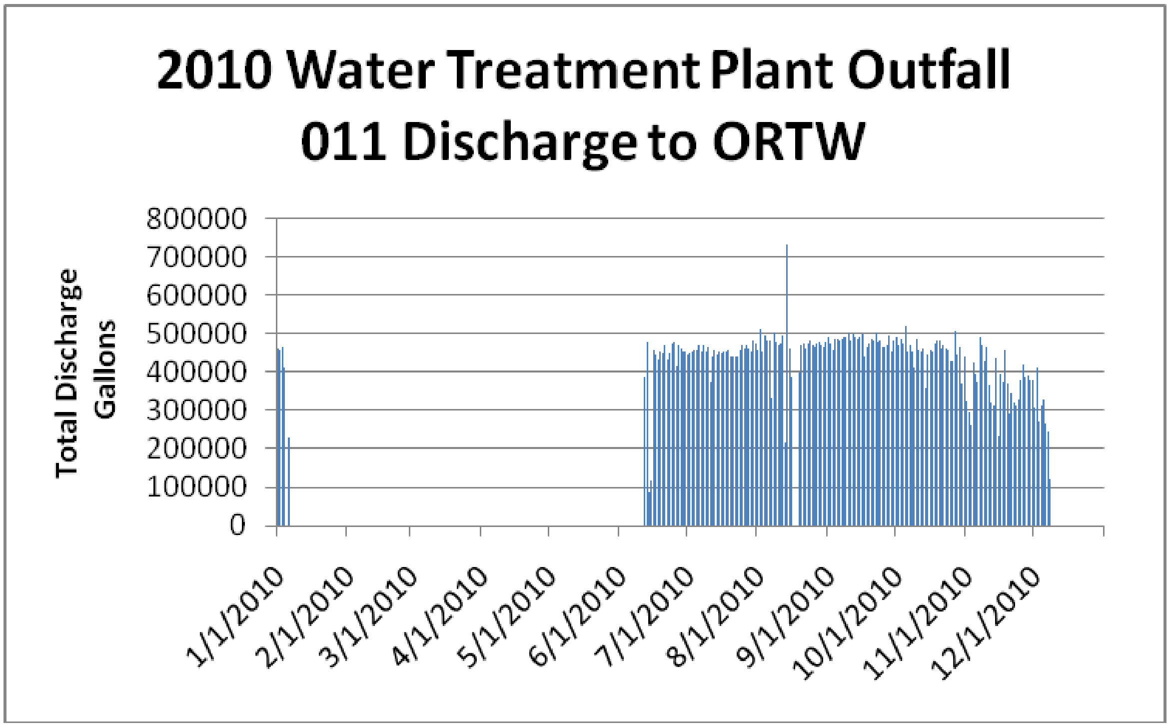
Detailed data of treated effluent were previously submitted to EPA and ADEC via copies of the Discharge Monitoring Reports (DMRs) under the NPDES Permit. The monitoring locations for treated effluent are shown on **Figure 2 in Appendix A**.

2.2.1 Outfall 011- Treated Effluent from Mine Water Treatment Plant

EPA NPDES Permit AK-005334-1 (3/15/04) I.B

Groundwater and drill water collected from the underground workings are sent to Water Treatment Plant #1 (WTP#1), treated and returned for use underground or sent to the mill to be used as process water. Surface runoff and groundwater collected in the RTP, as well as some mine seepage water, are sent to the WTP#2 (located near the 1525 portal), treated and then discharged to the ORTW or directed to the mill for use as process water. Discharge to the ORTW occurred for a short time in January and resumed in June and continued intermittently into December 2010. The volume of water discharged from the Water Treatment Plants is shown below in **Chart 1**.

Chart 1



Continuous pH data is collected at Outfall 011 along with weekly and quarterly laboratory samples for metals, TSS, Hardness, Weak-Acid Dissociable (WAD) Cyanide, Anions, Cations, and Total Dissolved Solids (TDS).

All results are within the limits and conditions set forth within the permit.

2.2.2 Outfall 001 – Discharge from Off River Treatment Works

EPA NPDES Permit AK-005334-1 (3/15/04), I.A

Treated effluent from WTP#2 is sent to the ORTW. After mixing in the ORTW, water flows over the weir of Pond 2 (Outfall 001) at the ORTW and into the Goodpaster River. The sampling location is at the weir.

Continuous pH and turbidity data is collected along with weekly laboratory samples for metals, WAD Cyanide, TDS, Turbidity, Sulfate, and Hardness at Outfall 001. In addition, daily field parameters and weekly samples (Lead, Mercury, and Turbidity) were collected upstream from the discharge point (NPDES001B) to determine background water quality of the Goodpaster River.

At the ORTW discharge point, Outfall 001, one exceedance of the daily maximum for WAD cyanide and 3 exceedances of the monthly average for WAD cyanide were reported in 2010. Pogo believes the reported exeedances are inconclusive due to limitations in the WAD Cyanide method at these concentrations and are below the proposed site specific Method Detection Limit (MDL) of 10 ppb.

On April 20, a pH value of 6.35 was measured with a handheld meter at the Outfall 001. The water entering the Off River Treatment Works, an indication of background conditions, was reported as a pH of 6.44 during the same time period. No treated mine water had been discharged since January.

On December 5, the continuous monitor for Outfall 001 recorded a pH level below the 6.5 permit level for a 125 minute interval. The minimum pH was reported at 5.96. While Pogo reported this value on the DMR, Pogo does not believe the pH result is reliable. Readings taken during the same 125 minute interval from the two continuous pH meters at Outfall 011 and the continuous pH meter at the Goodpaster River all show compliance within the permit limits. As such, Pogo does not believe there was any exceedance of the permit effluent limits.

Except as noted above, all results are within the limits and conditions set forth within the permit.

2.2.3 Outfall 002 – Treated Effluent from Sewage Treatment Plant

EPA NPDES Permit AK-005334-1 (3/15/04), I.C

The Sewage Treatment Plant (STP) operated throughout 2010 with discharge flows ranging between 20,000 and 35,000 gallons per day. Daily field parameters were collected to assess quality of treated effluent prior to discharge in the mixing zone in the Goodpaster River. Weekly samples were also collected for Biological Oxygen Demand (BOD5), Total Suspended Solids (TSS), Fecal Coliform, Nitrates, and Chlorine. Influent data from STP002 were collected for BOD5 and TSS on a monthly basis to determine quarterly percent removal. All results were within the limits and conditions set forth within the permit.

2.2.4 Whole Effluent Toxicity

EPA NPDES Permit AK-005334-1 (3/15/04), I.D.7.a
The annual WET test was conducted June 15 through June 21, 2010 by CH2M Hill's Aquatic Toxicology Laboratory in Corvallis, Oregon. A split of the same sample was also sent to ENSR Laboratory in Fort Collins, CO.

Results from both laboratories are presented in **Appendix B** and indicate that the toxicity for both *Ceriodaphnia dubia* (water flea) and Pimephales promelas (fathead minnow) was 1.0 TU_c or less, well under the toxicity trigger of 2.0 TU_c. All results are within the limits and conditions set forth within the permit.

2.3 SURFACE WATER MONITORING

2.3.1 Goodpaster River

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), Section I.E.1.6; EPA NPDES Permit AK-005334-1 (3/15/04), I.E.6; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.5

Four surface water stations are monitored to evaluate water quality along the Goodpaster River. They are SW01 located upstream of the Pogo Mine, SW41 located downstream of Outfall 001, SW42 downstream of Outfall 002, and SW15 located downstream from all Pogo facilities.

Surface water station SW12 located on the Goodpaster River at the confluence of Central Creek was also sampled concurrently with the fish tissue monitoring program in mid September.

Surface water samples are analyzed for cyanide, ionic balance, major cations and anions, and total and dissolved metals. Physical and aggregate properties of ammonia, conductivity, hardness, nitrates, pH, TDS, Total Settleable Solids (TSS), Turbidity, TKN, and Temperature were also measured.

All results are within the limits and conditions set forth within the permit. The locations of the surface water monitoring stations are shown in **Appendix A, Figure 2.**

2.3.2 Fish Tissue

EPA NPEDES Permit AK-005334-1 (3/15/04), I.E.5

In order to help assess long term trends in Goodpaster River quality, annual whole body analysis of juvenile Chinook salmon is required at monitoring sites both upstream (SW01) and downstream (SW12) from the project facilities. Juvenile Chinook salmon were collected at these stations on September 29, 2010. All results are within the limits and conditions set forth within the permit. As required by **Fish Resource Permit SF2010-239** a report of collecting activities and data submission form was submitted to ADFG on November 10, 2010.

2.4 GROUNDWATER QUALITY MONITORING

The locations of the groundwater monitoring stations are shown in **Appendix A, Figure 2**.

2.4.1 Downgradient of Drystack and RTP Dam

Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.6.1.1; ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.1.4, 1.5.3, 1.5.7, 1.6

Action limits for groundwater monitoring are set forth in the Pogo Mine Quality Assurance Project Plan as part of the requirements of the permit.

Three wells located below the RTP Dam, MW03-500, MW03-501, and MW03-502, monitor groundwater downstream of the RTP seepage collection system. Samples for the fourth quarter were collected October 27, November 10, and December 14, 2010. The permit only requires a quarterly sample, however monthly samples were taken throughout 2010. All results are within the limits and conditions set forth within the permit. 2010 Monitoring and historic data are provided in **Appendix E**. Time series graphs are provided in **Appendix C**.

2.4.2 Downgradient of the Solid Waste Facility

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.5.3, 1.5.7, 1.6; Pogo Mine

Monitoring Plan, Revision 4.0 (12/18/03) 4.6.2.1.1

Monitoring wells MW04-503 and MW04-504 were permitted to detect potential impacts to groundwater down gradient of a proposed solid waste facility. The solid waste disposal facility was not constructed. Solid waste is either incinerated onsite in accordance with Permit AQ0406MSS05, disposed in the drystack in accordance with Permit 0131-BA002 or it is shipped offsite for disposal in an approved landfill.

2.4.3 Downgradient of Ore Zone

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.5.3, 1.5.7, 1.6; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03), 4.6

Monitoring wells MW04-213 and MW99-216 provide information on water quality trends down-gradient from the ore zones. Samples were collected on May 26, and September 28. All results are within the limits and conditions set forth within the permit. 2010 Monitoring and historic data are provided in **Appendix E**. Time series graphs are provided in **Appendix C**.

2.4.4 Downgradient of ORTW

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), Sections 1.5.3, 1.5.7, 1.6

Monitoring stations LL04-031 and LL04-032 provide information on ground water quality trends between the ORTW and the Goodpaster River. Samples were collected during the fourth quarter on November 11, 2010. All results are within the limits and conditions set forth within the permit. 2010 Monitoring and historic data are provided in **Appendix E**. Time series graphs are provided in **Appendix C**.

2.4.5 Hydrogeologic Study

ADNR's October 14, 2008 inspection report requests a hydrogeology study of the RTP Dam area.

The following activities were conducted in 2010: 1) A pump-up test at the Seepage Collection Wells and 2) A Tracer Test using Rhodamine, a non-toxic purple dye.

Pump-up Test

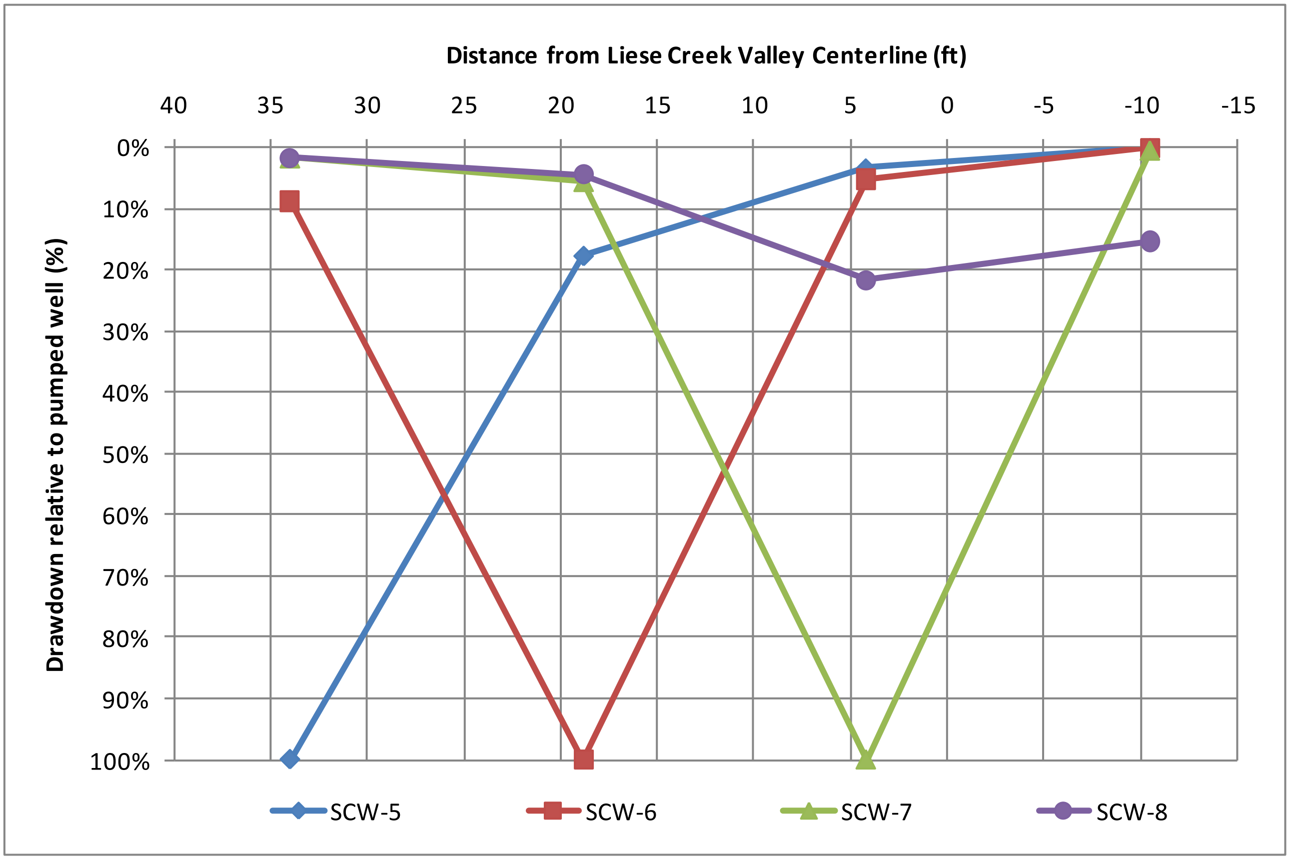
The objectives of the SCW pump test were to determine the hydraulics of the RTP area, and to determine the effectiveness of the seepage collection system. It was conducted on June 9 through June 10, 2010. The test comprised the following actions:

1. Monitor the flow and water levels in wells SCW-5, SCW-6, SCW-7, and SCW-8, which had been operating continuously at the start of the test.
2. Turn off all wells at 15:50 on 9 Jun 2010 and allow the water levels to recover until 19:30 (i.e. 3:40 of recovery time).
3. Turn on each well in turn for 60 minutes and off for 30 minutes (test order: SCW-7, SCW-5, SCW-8, SCW-6)
4. Turn all wells back on at 01:30 on 10 Jun 2010 and monitor for an additional hour.

During the entire test the flow from the combined manifold was monitored, and the water head above the transducer in each well was also monitored. In addition, a total of 11 electronic water pressure transducers were deployed across the site, measuring the water level changes in streams and wells during the test.

The results of the pumping test show that the drawdown cones are approximately the same (refer to **Chart 2**).

Chart 2 - Relative Drawdown in Seepage Collection Well Tests



SCW-9 was not pumped in this test because the water level was not high enough. When pumped, this well shows a very significant permeability, and is capable of large scale extraction. Its pumping capacity is limited by the fact that it is relatively shallow, and does not penetrate the full depth of the permeable zone.

<u>Tracer Test</u>

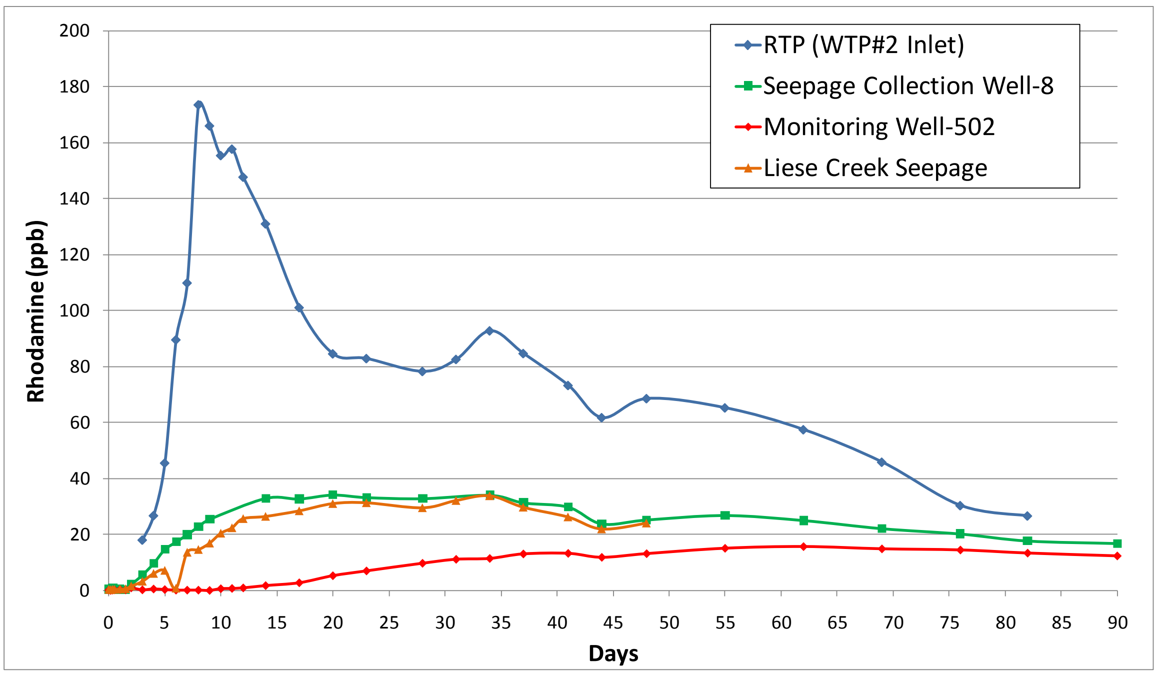
Rhodamine was poured into the RTP on September 14, 2010. Water samples were collected at various locations upstream and downstream of RTP to analyze the Rhodamine levels for 90 days. **Chart 3** shows the Rhodamine concentration at RTP, Seepage Collection Well #8, Seepage into Liese Creek, and Monitoring Well MW-502. It shows that:

- Rhodamine at RTP reached 173 ppb then dropped down because of inflow of runoff water into RTP and discharging of RTP water to ORTW;
- Rhodamine was detected at Seepage Collection Well No. 8 at Day 3 for the first

time. The concentration reached 34 ppb and dropped gradually. The Rhodamine concentration of Seepage Collection Wells were about 40-50% of that of RTP;

- Rhodamine concentration at the seepage into Liese Creek downstream of Seepage Collection Wells was quite similar to that of Seepage Collection Wells;
- Rhodamine was detected at Monitoring Well MW-502 at Day 17 for the first time. The concentration reached 15 ppb in maximum and remained steadily.

Chart 3 Tracer Test - Rhodamine Concentrations



Pogo intends to conduct a hydro-geophysical survey in the spring of 2011 in order to identify the major flow path of seepage from RTP. Appropriate mitigation measures will then be proposed by Pogo.

2.5 PROCESS CONTROL MONITORING

Process facilities are monitored as follows.

2.5.1 Water Balance

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.5.1.4; Pogo Project Water Management Plan (2/2002), Sec. 4.0

The beginning RTP reservoir volume was 8.1 million gallons and the ending RTP volume was 9.2 million gallons.

Added to RTP

- 92.2 million gallons of runoff and seepage water was collected in the RTP; and
- 9.4 million gallons of treated water were recycled to the RTP.

Removed from RTP

- 11.9 million gallons were pumped from the RTP for underground drill water;
- 31.1 million gallons were pumped from the RTP to the mill process; and
- 57.5 million gallons were pumped from the RTP to the water treatment plant.

Recycled at Mill

- 54.7 million gallons were recycled at the Mill from Water Treatment Plant; and
- 31.1 million gallons were recycled at the Mill from the RTP.

Discharge from ORTW

- 79.4 million gallons were treated and discharged via the ORTW.

2.5.2 CIP Tailings Cyanide Destruction

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.2.3, 1.5.1.3; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03), 4.4.3

After cyanide destruction, the CIP tailings are stored in the CIP tank prior to being mixed with cement and used as backfill in the mine. Pogo's QAPP requires monthly grab samples at station PC001 (CIP Stock Tank), which is located directly after the cyanide destruction circuit. Pogo collects a daily sample during a paste pour. The QAPP requires that at least 90% of the samples must contain less than 10 mg/kg of WAD Cyanide and none of the samples can contain more than 20 mg/kg of WAD cyanide.

During the first, second, and fourth quarter of 2010, 100% of the CIP stock tank samples contained less than 10 mg/kg. During the third quarter 96% of the CIP stock tank samples contained less than 10 mg/kg and one sample contained more than 20 mg/kg (please refer to the Pogo 2010 Third Quarter Activity and Monitoring Report for details). Results are reported in **Appendix C.**

2.5.3 Mineralized Development Rock Geochemistry

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.2.1, 1.5.1.6; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.4-4, 4.4.2.1, Appendix A

Composite samples of development rock materials placed in the drystack facility were collected on March 11, June 15, September 26, and December 9. These samples were analyzed for whole-rock chemistry and ABA and results are reported in **Appendix B** as PC002. No adverse trends are observed.

2.5.4 Flotation Tailings Geochemistry

Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.4.1.1

Flotation tailings geochemistry samples were collected on March 11, June 23, September 26 and December 15, at PC003, the underflow of the filter-feed tank at the end of the mill circuit, prior to disposal on the drystack. The results are presented in **Appendix B**. No adverse trends are observed.

2.5.5 Flotation Tailings Interstitial Water Chemistry

Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.4-3

The interstitial water from the tailings samples collected at PC003 on March 9, June 22, September 26, and December 15 were also analyzed. The results are presented in **Appendix C**. Results indicate an increase in selenium levels during the year. Pogo is investigating the use of a mill reagent (Copper Sulfate) that contains trace amounts of selenium. A study is underway to determine whether this may be the source of selenium.

2.6 VISUAL MONITORING

2.6.1 Facility Inspection

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.5.9.4, 1.6.1; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.1, 4.2, 4.2.1, 4.2.2, 4.2.3

Weekly visual inspections of the RTP dam were completed throughout 2010. No settlement or geotechnical concerns were observed.

2.6.2 Biological Survey

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.5.1.5; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03) 4.2.5;

The objective of the visual biological survey program is to monitor wildlife interaction with the surface waste disposal facilities.

No wildlife issues with the RTP or drystack occurred during the year.

2.7 DEVELOPMENT ROCK SEGREGATION AND STORAGE

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.2.7, 1.4.9, 1.5.1.6; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03), 4.3.1.2.3, 4.4.2.1, Appendix A

During 2010, 1,222 rounds were blasted underground and sampled in accordance with the Rock Segregation Procedure. 507 rounds (41%) exceeded either the Arsenic threshold of 600 mg/l or the Sulfide threshold of 0.5% and these were entombed in the drystack. Thirty-seven rounds were not sampled due to operational challenges and these rounds were also placed internally in the drystack.

2.8 WASTE DISPOSAL

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.2.7, 1.5.5

During 2010, 627,850 dry tons of flotation tailings and 298,200 tons of mineralized rock were placed in the drystack. During the year, 115,462 dry tons of CIP Tailing and 237,058 tons of filtered flotation tailings were placed underground as paste backfill.

The quantities of miscellaneous waste materials placed either into the drystack or underground during the year are shown in **Table 1** below:

Table 1: Miscellaneous Waste Disposal in Drystack and Underground

Material	Disposal Location	Quantity	unit
Grinding Media Flotation Debris Screen Residue	Drystack	200	tons
Lab Ore Sample Disposal	Drystack	0.36	tons
Water Treatment Plant Sludge	Drystack	178	yds
Water Treatment Plant Sludge	Underground	0	yds
Paste Pump Cleanup	Underground	148	yds

2.9 GEOTECHNICAL MONITORING

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.4.8; Pogo Mine Monitoring Plan, Revision 4.0 (12/18/03), 4.3

The shell of the Drystack Tailings Facility (DSTF) was constructed between April 26 and October 4, 2010. About 98,500 tons of drystack tailings and 28,300 tons of non-mineralized rock were placed at the shell. This resulted in 65 ft of rise to 2,280 ft above mean see level (amsl).

The geotechnical monitoring program for shell construction was carried out in accordance with the QAPP. The geotechnical monitoring for shell construction consists of geotechnical tests that include grain size distribution, Atterberg limits, Standard Proctor Tests and field density measurements using the Troxler density gauge. The details of geotechnical tests and field density measurements were described in the 2010 Third Quarter Monitoring Report submitted to ADEC on November 30, 2010. A summary of 2010 geotechnical monitoring is as follows:

- Seven drystack tailing samples were sent to Mappa TestLab in North Pole, Alaska, for geotechnical testing. The results are summarized in **Table 2**. The optimum water content ranged from 12.2% to 18.7%, and the average was 16.0%. The maximum dry density ranged from 104.1 pcf to 109.9 pcf, and the average was 107.8 pcf. These results are consistent with historical data.
- The field moisture and density measurements were conducted five times in 2010. The results are summarized in **Table 3**. The measurements conducted on May 18 and July 29 achieved the target of compaction (95% of maximum dry

density). The measurement conducted on August 31 showed slightly lower compaction than target because of the higher moisture content due to rainy weather. The measurement conducted on September 28 showed much lower dry density. It was obvious that the surface of the compacted dry stack was frozen. This frozen layer was ripped up and re-compacted and the field density was measured again on October 1. The dry density of the dry stack was improved; however, the compaction was still slightly lower than the target.

Table 2: 2010 Geotechnical Monitoring for DSTF Shell Construction
Results of Standard Proctor Tests

Date Sampled	Optimum Moisture Content (%)	Maximum Dry Density (pcf)
April 27	15.6	108.8
May 12	16.9	107.7
June 23	18.7	104.1
July 21	16.2	105.8
August 18	16.5	109.9
September 8	16.1	109.0
September 22	12.2	109.5

Table 3: 2010 Results of Field Density Measurements at the DSTF Shell

Date Measured	Shell Elevation (ft E.L.)	Moisture Content (%) (Average)	Dry Density (pcf) (Average)	% of Maximum Dry Density (Average)
May 18	2,230	17.5	104.8	96.4
July 29	2,251	20.8	104.0	98.3
August 31	2,270	20.9	102.1	92.9
September 28	2,278	17.8	94.3	86.1
October 1*	2,278	19.2	102.8	93.9

* The measurement on October 1 was conducted to confirm the re-compaction of the layer measured on September 28.

3. 2008 AUDIT ACTIVITIES

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.11; ADNR Plan of Operations Approval F20039500 (12/18/03), pg. 6; ADNR Pogo Mine Millsite Lease ADL416949 (3/9/04), Sec. 13

The 2008 Environmental Audit was conducted by Golder Associates. The July 2009 Audit Report, Section 4.9 identified a need for the following improvements: 1) The construction of secondary containments for Carbon-in-Pulp (CIP) Tailings Storage Tank and Backfill Dilution Water Tank (refer to **Photo A**); 2) Secondary containment for the Paste Line between CV-02 splice shack and the 1690 Portal (refer to **Photo B**); and 3) Secondary containment for the CIP Tailings Slurry and Backfill Dilution Water pipelines between Mill Plant and Paste Plant (refer to **Photo C**). The work was completed in 2010 which is why an update is provided in the Annual Report.

Photo A – CIP Tails Storage Tank Secondary Containment

Photo B – 1690 Portal Secondary Containment (arrow points to Paste Line)

Photo C - CIP Tailings Slurry and Backfill Dilution Water pipelines

4. 2010 AS-BUILT MAPS

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.4.13.1; ADNR Plan of Operations Approval F20039500 (12/18/03), pg. 4

Figure 3 Appendix A, provides an overview of all facilities within the Pogo millsite lease boundary at end of 2010. **Figures 3a** through **3d Appendix A** provide additional detail for the major areas of the mine.

5. RECLAMATION AND FINANCIAL RESPONSIBILITY

ADEC Waste Disposal Permit 0131-BA002 (12/18/03), 1.4.1, 1.6.3, 1.10, 3; ADNR Plan of Operations Approval F20039500 (12/18/03), pg. 2 and 4; ADNR Pogo Mine Millsite Lease ADL416949 (3/9/04), Sec. 18

Pogo is updating the Reclamation and Closure Plan in early 2011 to reflect revisions made to the Reclamation and Closure Cost Models in 2010. An updated mine reclamation and closure cost estimate was agreed to by ADEC and ADNR on September 13, 2010, at $44.43 million (refer to **Table 4**). The updated access road/transmission line reclamation and closure cost estimate was agreed to by ADEC and ADNR on X, at $4.8 million (refer to **Table 5**).

Table 4: Summary of Mine Reclamation and Closure Cost Estimates as of September 2010

SUMMARY OF ESTIMATED RECLAMATION AND CLOSURE COSTS-POGO MINE SITE									
		1 year holding cost	Phase I	Phase II	Phase III	Phase IV Water Treatment	Phase IV Reclamation	Phase V	Total
Direct Cost		$ 1,952,300	$ -	$ 770,900	$ 7,953,500	$ 5,205,600	$ 2,990,200	$ 104,800	$ 18,977,300
Site Management Cost			$ -	$ 26,500	$ 2,668,800	$ 5,433,728	$ 1,902,100	$ -	$ 10,031,128
Subtotal Direct Cost		**$ 1,952,300**	**$ -**	**$ 797,400**	**$ 10,622,300**	**$ 10,639,328**	**$ 4,892,300**	**$ 104,800**	**$ 29,008,428**
Indirect Costs	**% of Subtotal**								
Mobilization/Demobilization	**5.0%**	$ -	$ -	$ 39,870	$ 531,115	$ -	$ 244,615	$ 5,240	$ 820,840
Subtotal		$ 1,952,300	$ -	$ 837,270	$ 11,153,415	$ 10,639,328	$ 5,136,915	$ 110,040	$ 29,829,268
Contractor Overhead and Profit	**15.0%**	$ 292,845	$ -	$ 125,591	$ 1,673,012	$ 1,595,899	$ 770,537	$ 16,506	$ 4,474,390
Subtotal		$ 2,245,145	$ -	$ 962,861	$ 12,826,427	$ 12,235,227	$ 5,907,452	$ 126,546	$ 34,303,658
Performance Bond	**3.0%**	$ 67,354	$ -	$ 28,886	$ 384,793	$ 367,057	$ 177,224	$ 3,796	$ 1,029,110
Insurance	**1.5%**	$ 33,677	$ -	$ 14,443	$ 192,396	$ 183,528	$ 88,612	$ 1,898	$ 514,555
Subtotal		$ 2,346,177	$ -	$ 1,006,189	$ 13,403,616	$ 12,785,812	$ 6,173,288	$ 132,241	$ 35,847,322
Contract Administration	**4.0%**	$ 93,847	$ -	$ 40,248	$ 536,145	$ 511,432	$ 246,932	$ 5,290	$ 1,433,893
Engineering Re-Design	**3.0%**	$ -	$ -	$ 30,186	$ 402,108	$ -	$ 185,199	$ 3,967	$ 621,460
Contingency	**15.0%**	$ 351,926	$ -	$ 150,928	$ 2,010,542	$ 1,917,872	$ 925,993	$ 19,836	$ 5,377,098
Total Indirects		$ 839,650	$ -	$ 430,151	$ 5,730,112	$ 4,575,789	$ 2,639,111	$ 56,533	$ 14,271,346
Total Direct + Indirect		$ 2,791,950	$ -	$ 1,227,551	$ 16,352,412	$ 15,215,116	$ 7,531,411	$ 161,333	$ 43,279,773
Infration Proofing	**2.66%**	74,192	-	32,620	434,542	404,320	200,137	4,287	$ 1,150,099
Total Closure Cost		**$ 2,866,142**	**$ -**	**$ 1,260,171**	**$ 16,786,955**	**$ 15,619,437**	**$ 7,731,548**	**$ 165,621**	**$ 44,429,873**
								Rounded	$ 44,430,000

Table 5: Summary of Pogo Access Road/Transmission Line Reclamation and Closure Cost Estimates as of December 2010

Pogo Access Road and Transmission Line - Estimated Closure Cost							
		Phase I	Phase II	Phase III	Phase IV	Phase V	Total
Direct Cost		$ -	$ 13,666	$ -	$ 2,478,500	$ -	$ 2,492,167
Site Management Cost		$ -	$ 128	$ -	$ 582,645		$ 582,773
Subtotal Direct Cost		**$ -**	**$ 13,794**	**$ -**	**$ 3,061,145**	**$ -**	**$ 3,074,940**
Indirect Costs	**% of Subtotal**						
Mobilization/Demobilization	**6.5%**	$ -	$ 897	$ -	$ 198,974	$ -	$ 199,871
Subtotal		$ -	$ 14,691	$ -	$ 3,260,119	$ -	$ 3,274,811
Contractor Overhead and Profit	**15.0%**	$ -	$ 2,204	$ -	$ 489,018	$ -	$ 491,222
Subtotal		$ -	$ 16,895	$ -	$ 3,749,137	$ -	$ 3,766,032
Performance Bond	**3.0%**	$ -	$ 507	$ -	$ 112,474	$ -	$ 112,981
Insurance	**1.5%**	$ -	$ 253	$ -	$ 56,237	$ -	$ 56,490
Subtotal		$ -	$ 17,655	$ -	$ 3,917,849	$ -	$ 3,935,504
Contract Administration	**4.0%**	$ -	$ 706	$ -	$ 156,714	$ -	$ 157,420
Engineering Re-Design	**4.0%**	$ -	$ 706	$ -	$ 156,714	$ -	$ 157,420
Contingency	**10.0%**	$ -	$ 1,766	$ -	$ 391,785	$ -	$ 393,550
1 year holding cost			$ 41,000				$ 41,000
Total Indirects		**$ -**	**$ 48,038**	**$ -**	**$ 1,561,916**	**$ -**	**$ 1,609,955**
Total directs and indirects		$ -	$ 61,833	$ -	$ 4,623,061	$ -	$ 4,684,894
Inflation Proofing	2.66%	$ -	$ 1,645	$ -	$ 122,973	$ -	$ 124,618
Total Closure Cost		**$ -**	**$ 63,478**	**$ -**	**$ 4,746,035**	**$ -**	**$ 4,809,513**
						Rounded	**$ 4,810,000**

5.1 ALL-SEASON ROAD AND TRANSMISSION LINE

ADNR Right of Way Permit ADL416809, ADL417066, ADL416817 (12/18/03), Sec. 6

About 49,580 cubic yards of gravel was extracted from Material Site 18 to re-surface twenty-eight miles between mile marker 28 and mile marker 0. No reclamation activity was conducted.

5.2 POGO MILLSITE LEASE

ADNR Pogo Mine Millsite Lease ADL416949 (3/9/04), Sec. 8

During 2010, Pogo demolished the old lower camp. A new core shack was built on the same site.

The 1525 portal access road was expanded by 20 feet at the interval of 700 feet in order to allow two-way traffic, and it resulted in the disturbance of an additional area of about 1.3 acres.

6. PERMIT ACTIVITIES

6.1 CURRENT PERMIT ACTIVITIES

For the renewal of the *ADEC Waste Disposal Permit, 0131-BA002 (12/18/03)*, the following documents were submitted for agency's review:

- ❑ Mine Reclamation and Closure Cost (Agreed on September 13, 2010)
- ❑ Plan of Operations (Submitted on December 29, 2010)
- ❑ Pogo Mine Monitoring Plan (Submitted on February 2, 2011)

The following documents are still being updated:

- ❑ Mine Closure and Reclamation Plan
- ❑ Quality Assurance Project Plan
- ❑ Drystack Tailings Facility Operations and Maintenance Manual

For the renewal of *Right-of-Way permits for Pogo Access Road ADL 417066 and ADL 416809 (12/18/03), Transmission Line ADL 416817 (12/18/03), and Communication Site Access Road ADL 417247 (10/1/04)*, the following documents were submitted for agency's review:

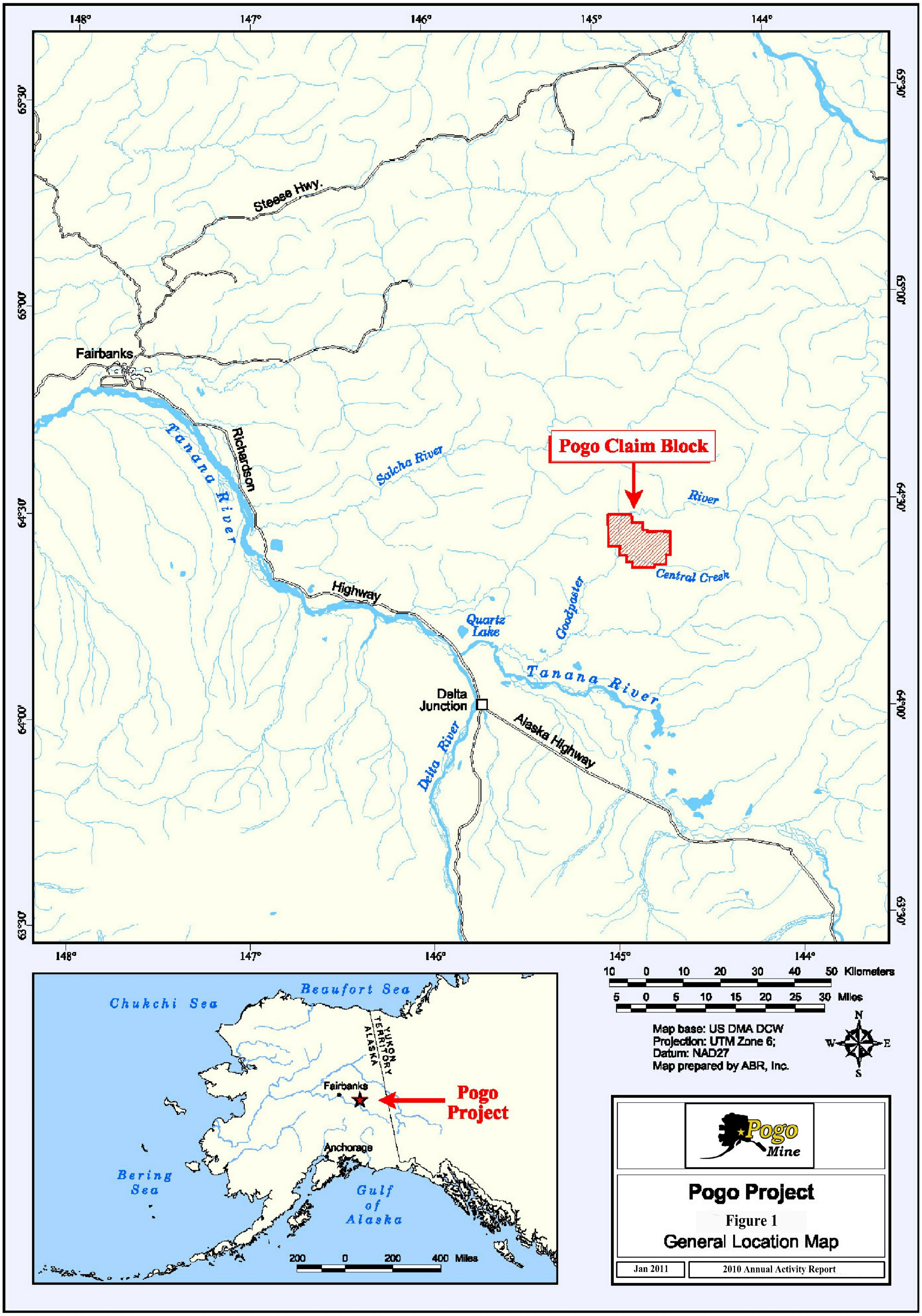
- ❑ Access Road/Transmission Line Reclamation and Closure Cost (Revised draft was agreed to on January 12, 2011).
- ❑ As-built survey drawings were submitted to ADNR on December 17, 2010. Agency comments were received on February 8, 2011. Final Drawings will be submitted in early 2011.

6.2 FUTURE PERMIT ACTIVITIES

Future permitting activities planned for 2011 include:

- ❑ Receive *ADEC APDES Permit AK-005334-1 (Issue date 3/15/04)*.
- ❑ Renewal of *ADEC Waste Disposal Permit, 0131-BA002 (Issue date 12/18/03)*.
- ❑ Renewal of *ADNR Pogo Mine Millsite Lease ADL416949 (issue date 3/9/04), ADNR Plan of Operations Approval F20039500 (issue date 12/18/03)*.
- ❑ Renewal of the *Right-of-Ways for the all-season road ADL416809 and 417066 (issue date 12/18/03), Transmission Line ADL 416817 (issue date 12/18/03), and Communication Site Access ADL 417247 (issue date 10/1/04)*.
- ❑ Renewal of *ADNR Temporary Certificate Approval to Operate A Dam for Pogo RTP Dam NID ID#AK00304 (issue date 11/18/10)*. The Final Emergency Action Plan (EAP) will be developed and the dam break analysis updated.
- ❑ Amendment of *US Army COE Section 404 Permit Q-1996-0211* to expand the Drystack Tailings Facility (DSTF) to 20Mtons.
- ❑ Amendment of *ADNR Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500* to expand the DSTF to 20Mtons.

Appendix A: Figures



148°
147°
146°
145°
144°
65°30'
65°00'
64°30'
64°00'
63°30'
Steese Hwy.
Fairbanks
Richardson
Highway
Tanana River
Salcha River
Pogo Claim Block
River
Central Creek
Goodpaster
Quartz Lake
Delta Junction
Delta River
Alaska Highway
10 0 10 20 30 40 50 Kilometers
5 0 5 10 15 20 25 30 Miles
Map base: US DMA DCW
Projection: UTM Zone 6;
Datum: NAD27
Map prepared by ABR, Inc.
N
S
E
W
Chukchi Sea
Beaufort Sea
YUKON TERRITORY
ALASKA
Fairbanks
Pogo Project
Anchorage
Bering Sea
Gulf of Alaska
200 0 200 400 Miles
Pogo Mine
Pogo Project
Figure 1
General Location Map
Jan 2011
2010 Annual Activity Report

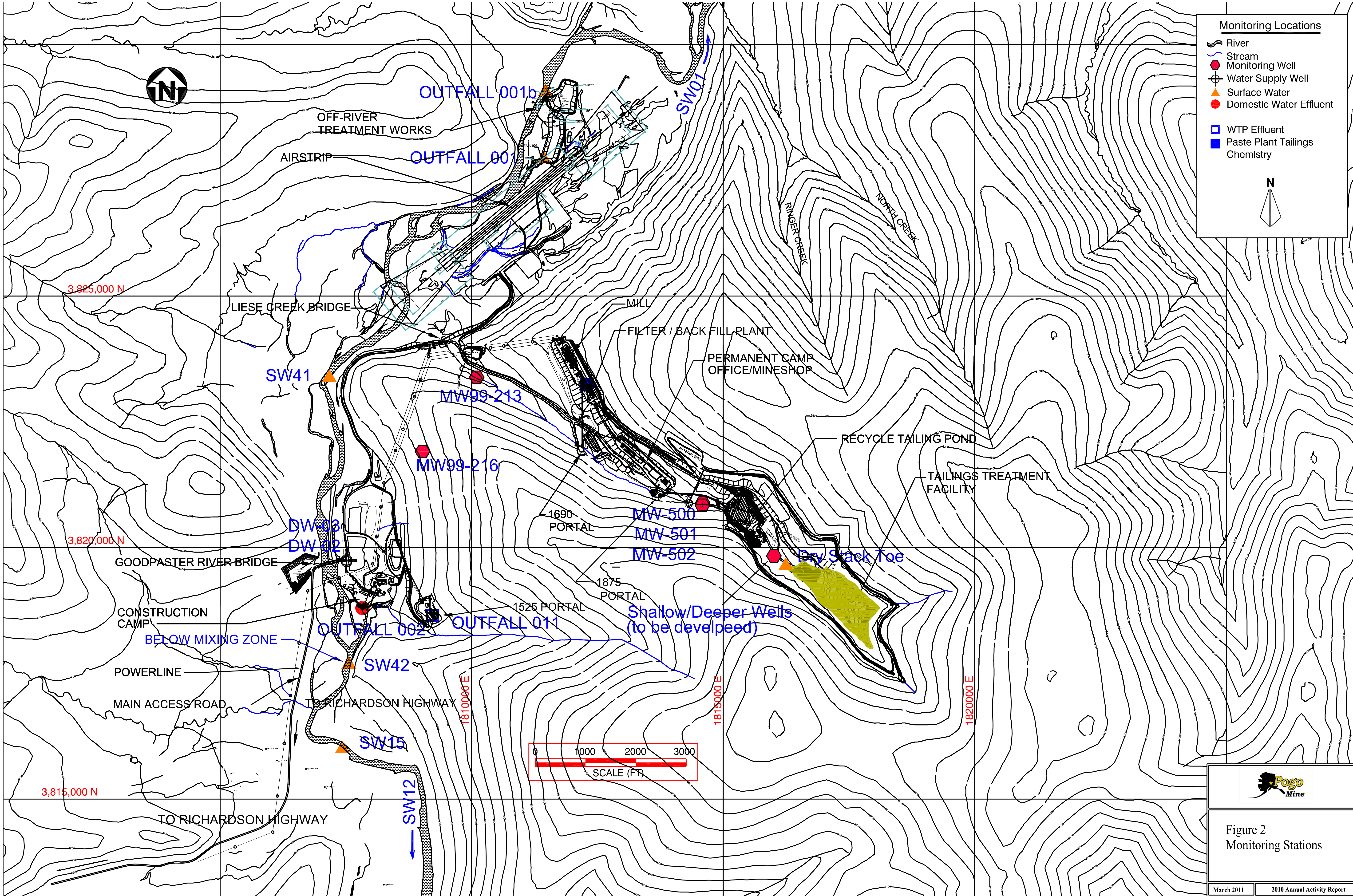
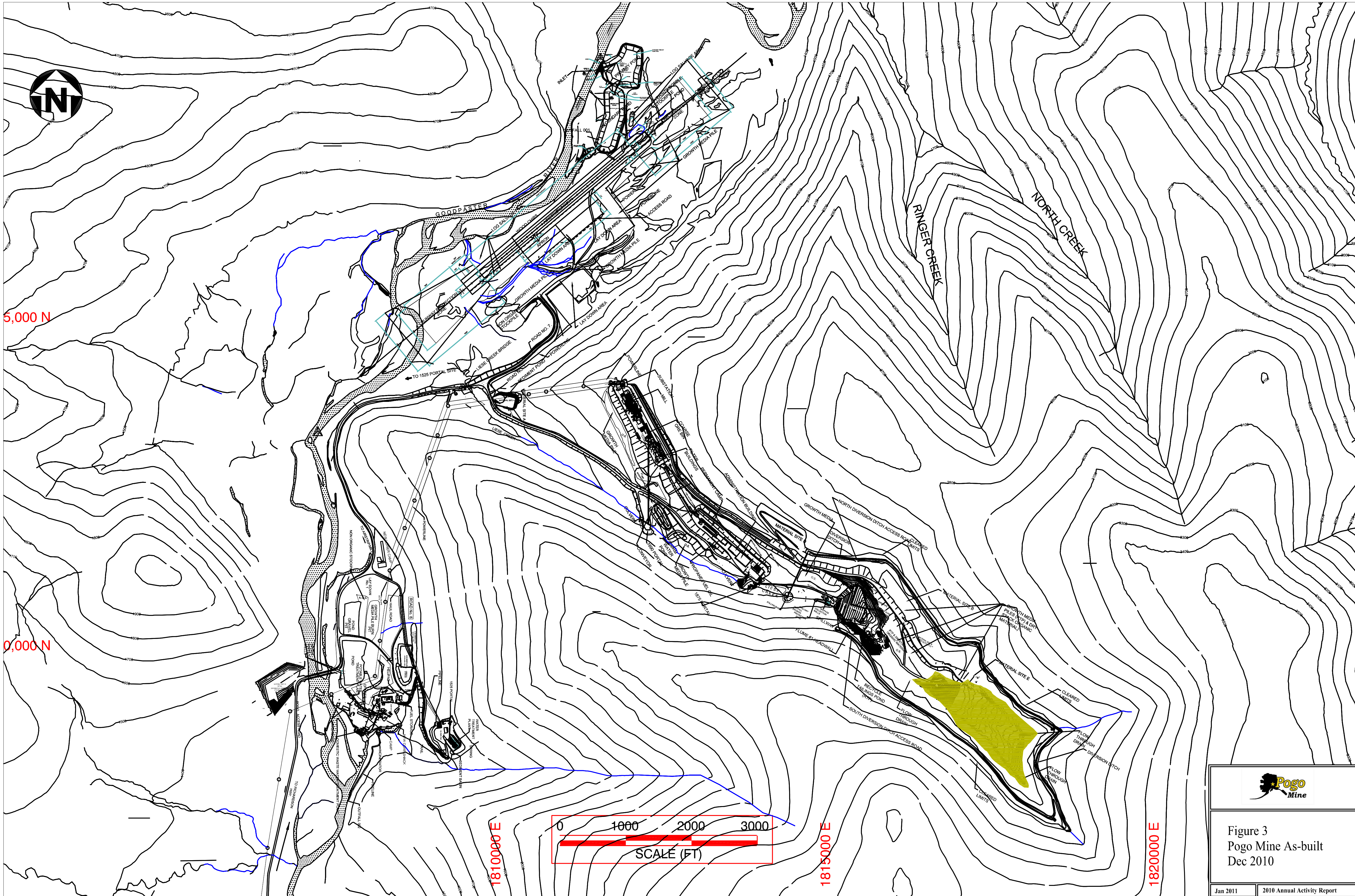


Figure 2
Monitoring Stations

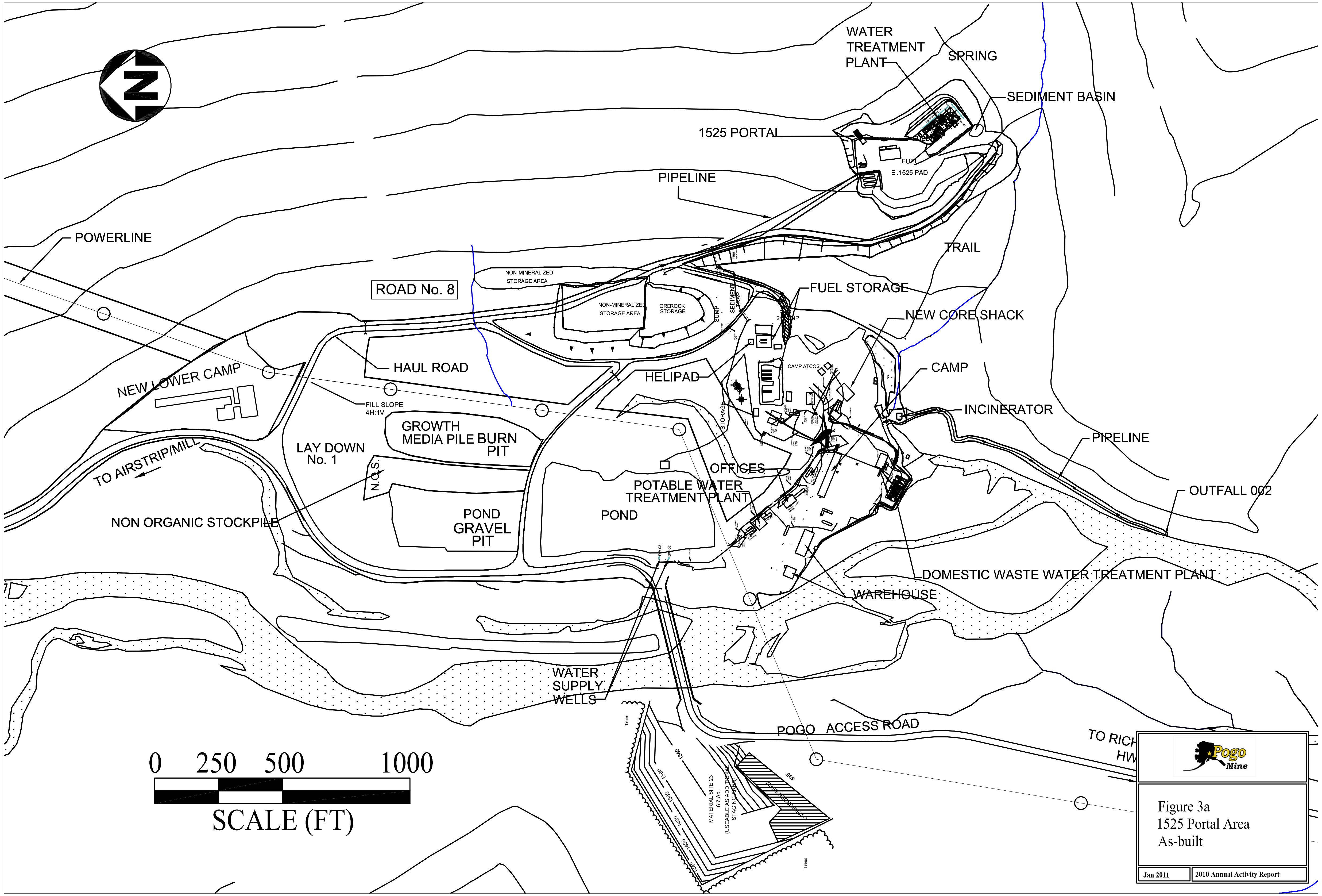
March 2011 | 2010 Annual Activity Report



Pogo Mine

Figure 3
Pogo Mine As-built
Dec 2010

Jan 2011 | 2010 Annual Activity Report



Pogo Mine

Figure 3a
1525 Portal Area
As-built

Jan 2011 | 2010 Annual Activity Report

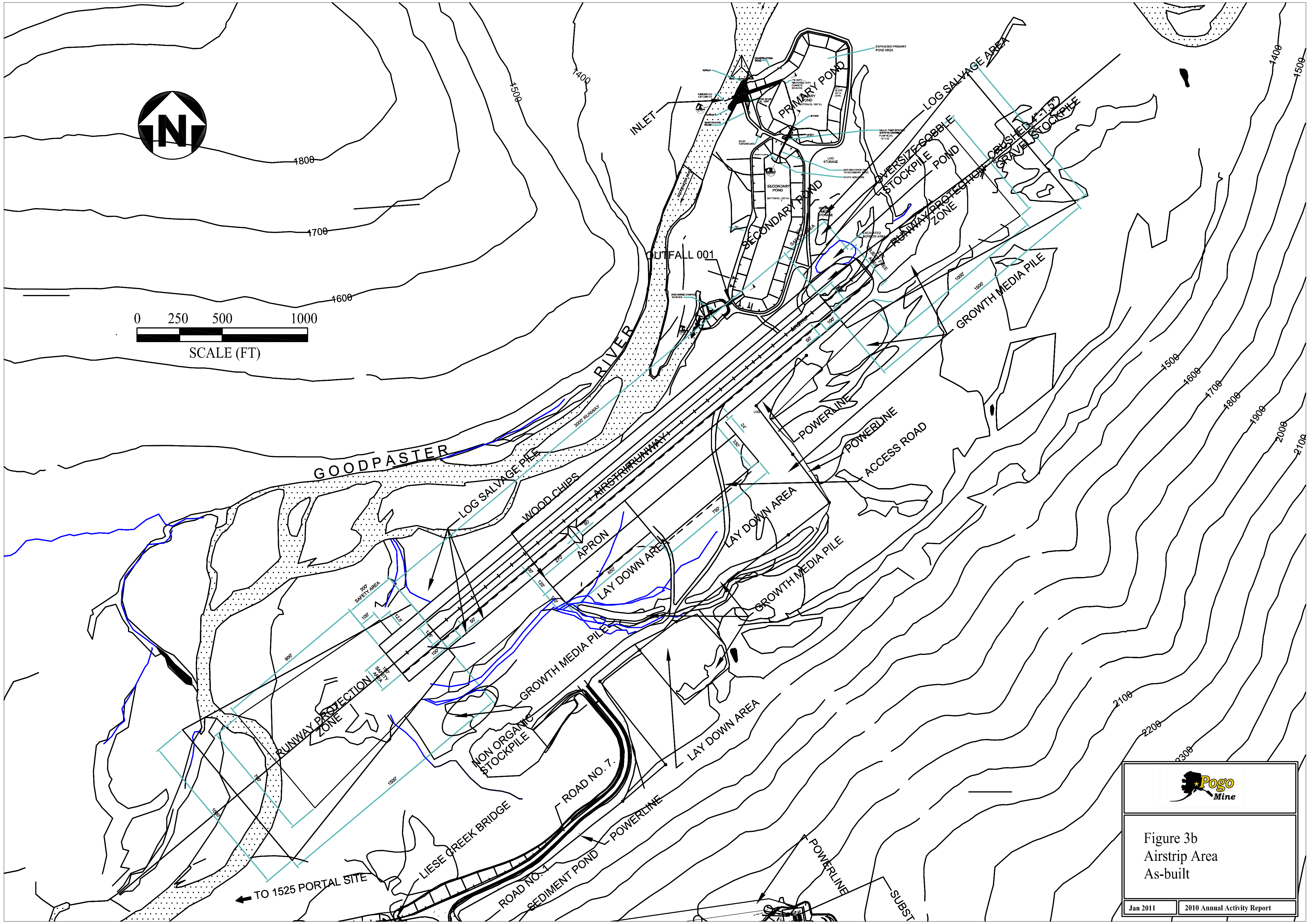
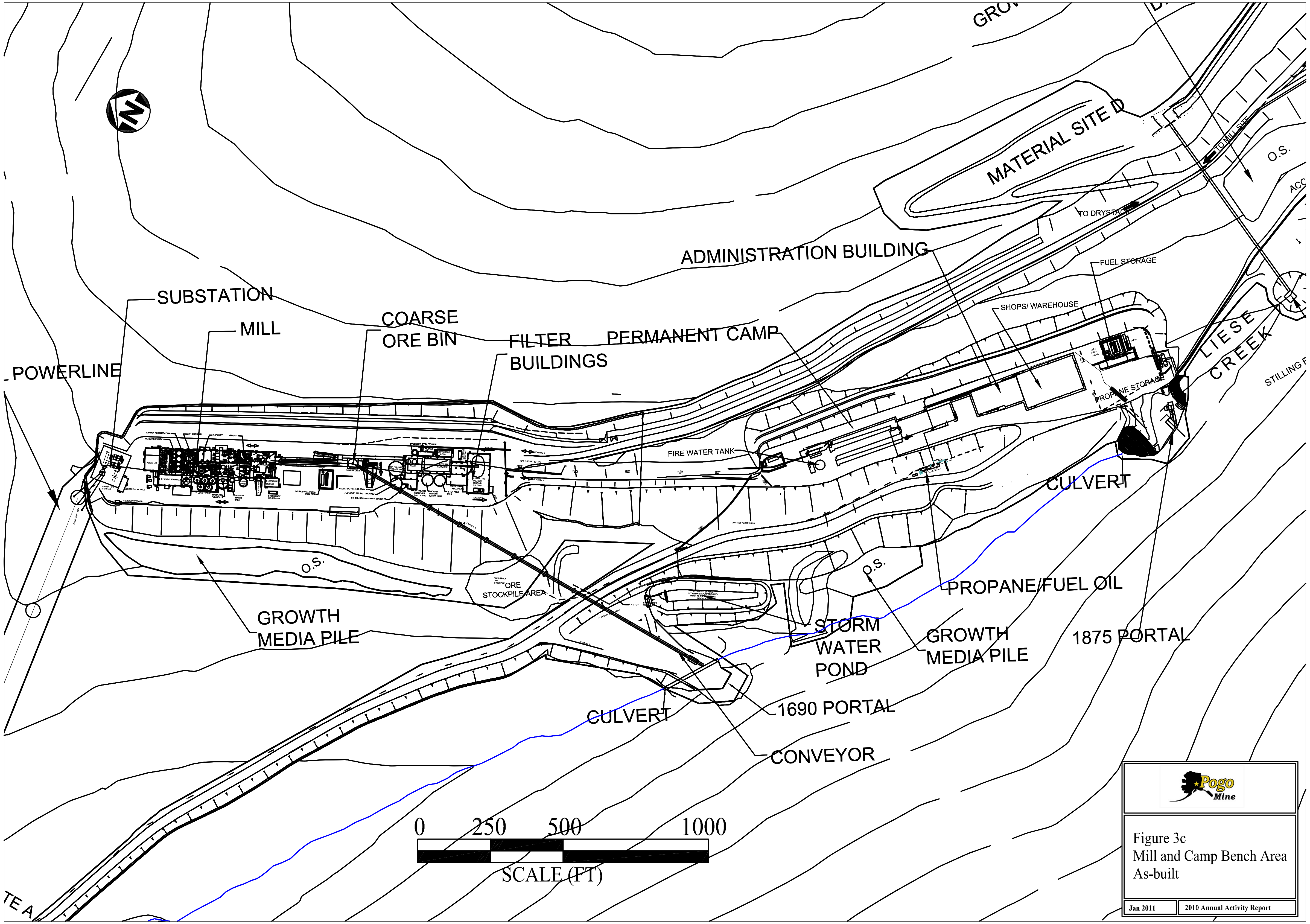


Figure 3b
Airstrip Area
As-built

Jan 2011 | 2010 Annual Activity Report



Pogo Mine

Figure 3c
Mill and Camp Bench Area
As-built

Jan 2011 | 2010 Annual Activity Report

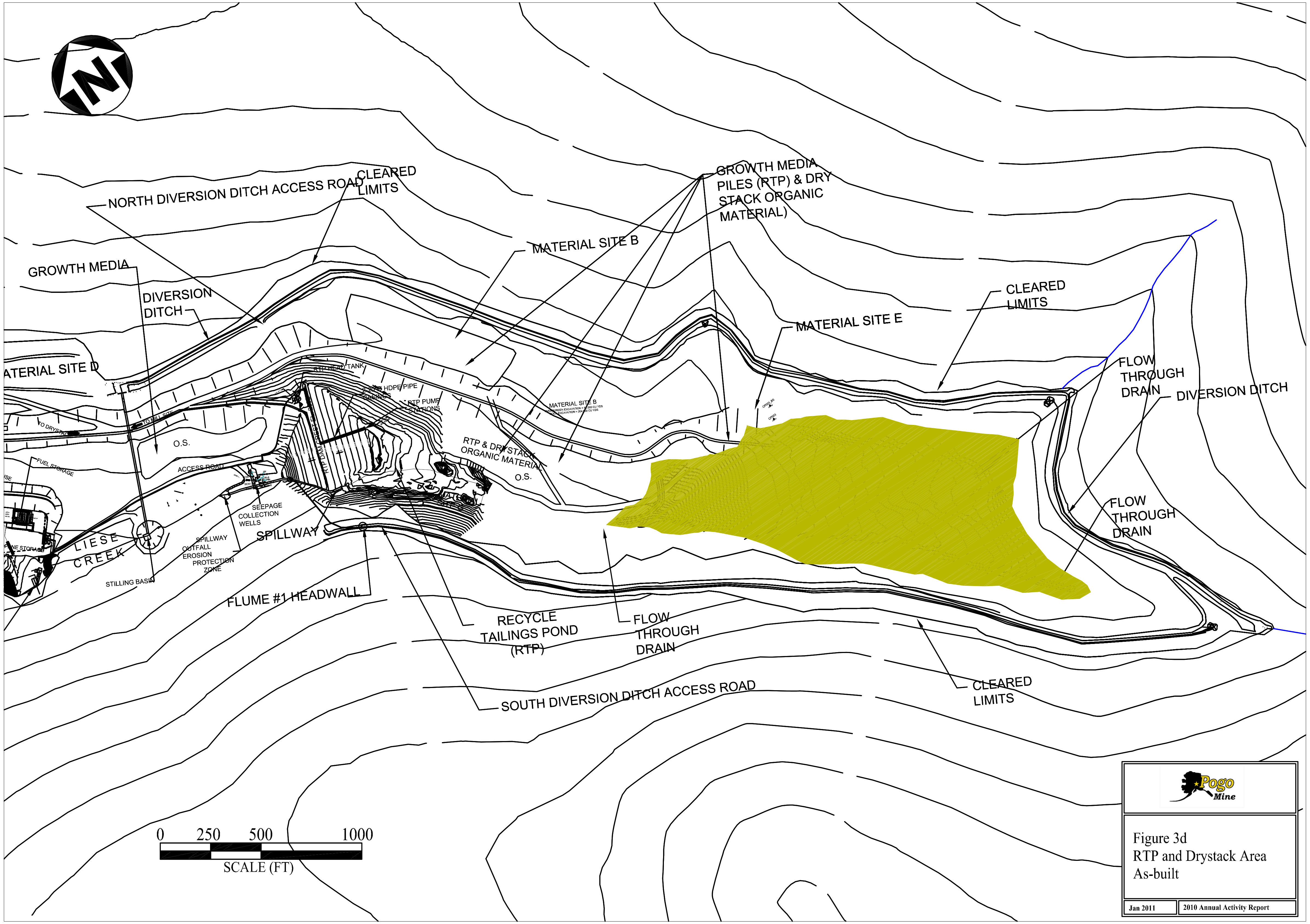


Figure 3d
RTP and Drystack Area
As-built

Jan 2011 | 2010 Annual Activity Report

Appendix B: Effluent Toxicity Testing (WET), Whole Rock Geochemistry, and Flotation Tailings Solids Chemistry Data

Appendix B. Table 1. **Pogo Mine Effluent Toxicity Testing (WET) 2010**

Lab	Species	NOEC	LOEC	IC_{25}	Tu_c
CH2MHILL	Ceridaphinia dubia	100	>100	79.9	1.25
	Pimephales promelas	100	25	>100	<1.00
AECOM	Ceridaphinia dubia	100	>100	>100	<1.00
	Pimephales promelas	100	>100	>100	<1.00

NOEC = No Observed Effect Concentration

LOEC = Low Observed Effect Concentration

IC_{25} = Inhibition Concentration (25%)

Tu_c = Toxic Units (Chronic)

Appendix B. Table 2. **Whole Rock Geochemistry for Rock placed into Drystack 2010**

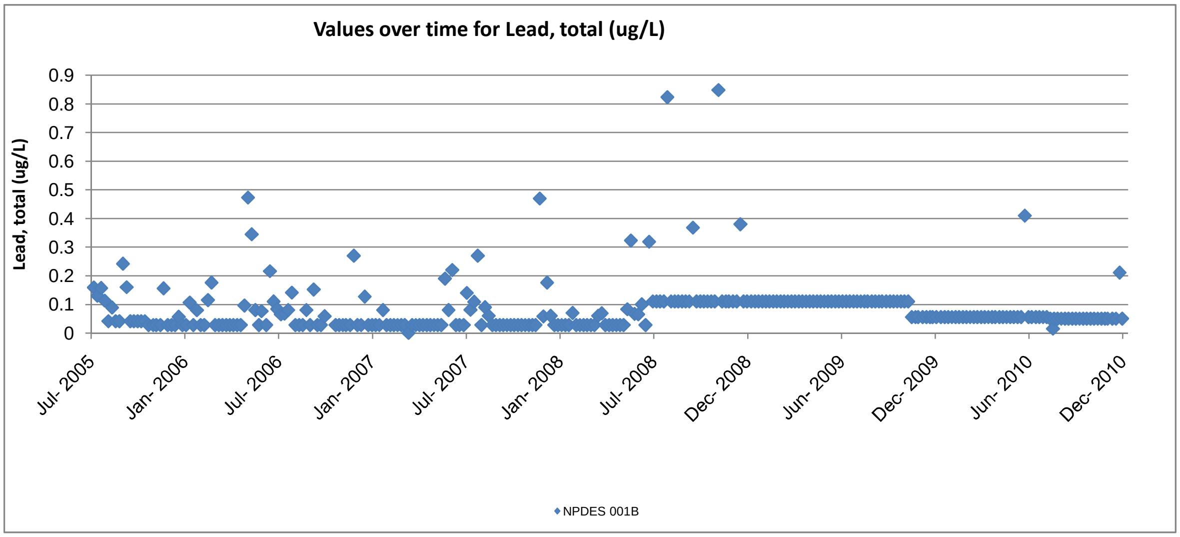
PC002	units	1st Quarter 11-Mar-10	2nd Quarter 15-Jun-10	3rd Quarter 22-Sep-10	4th Quarter 9-Dec-10
Antimony, Total	mg/kg	1.61	1.27	1.42	1.01
Arsenic, Total	mg/kg	407	565	776	280
Carbon, Total	%	0.37	0.57	0.75	0.42
Copper, Total	mg/kg	82	37.2	50.4	31.8
Inorganic Carbon	%	1.3	2.1	2.1	1.5
Iron, Total	mg/kg	36000	38600	48700	51000
Lead, Total	mg/kg	17.9	20.6	15.7	15.3
Maximum Potential Acidity	tCaCO3/1Kt	15	8.8	17.7	9.4
Net Neutralization Potential	tCaCO3/1Kt	26	38	27	35
PH, Paste	pH units	9.1	8.4	8.5	9
Potassium, Total	mg/kg	21200	23100	21300	19300
Ratio (NP:MPA)	su	2.73	5.37	3.47	4.69
Selenium, Total	mg/kg	2	2	3.3	1
Sodium, Total	mg/kg	13300	12300	13600	12700
Sulfate Sulfur (HCL Leachable)	%	0.01	0.01	0.01	0.01
Sulfide Sulfur (Calculated)	%	0.42	0.26	0.55	0.29
Sulfur, sulfate	%	0.06	0.02	0.02	0.01
Sulfur, Total	%	0.48	0.28	0.57	0.3
Zinc, Total	mg/kg	61	64	71	71

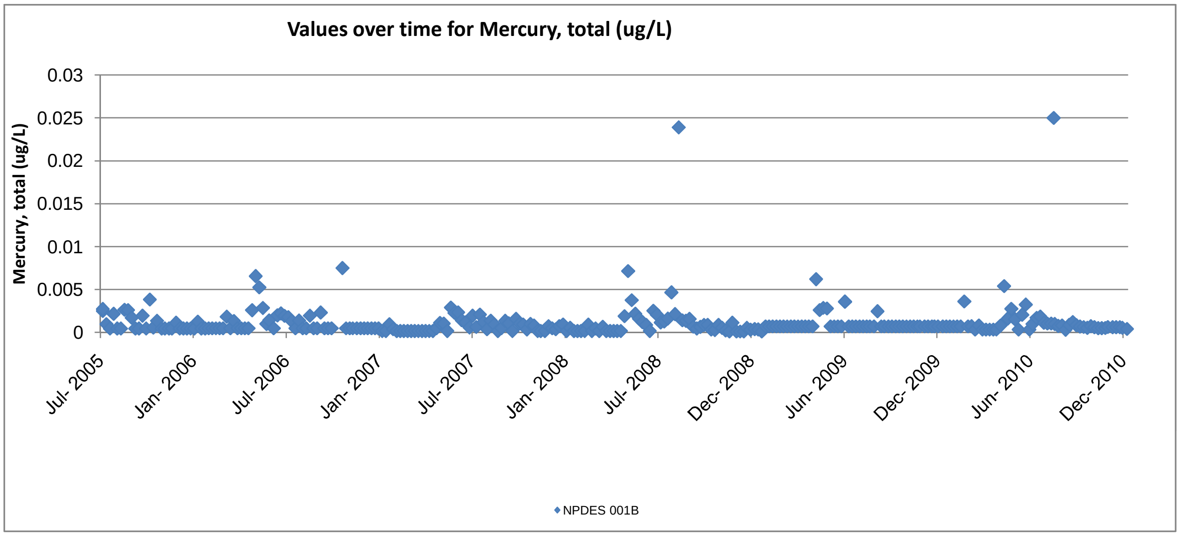
Appendix B. Table 3. Geochemistry of Flotation Tailings Solids placed into Drystack 2010

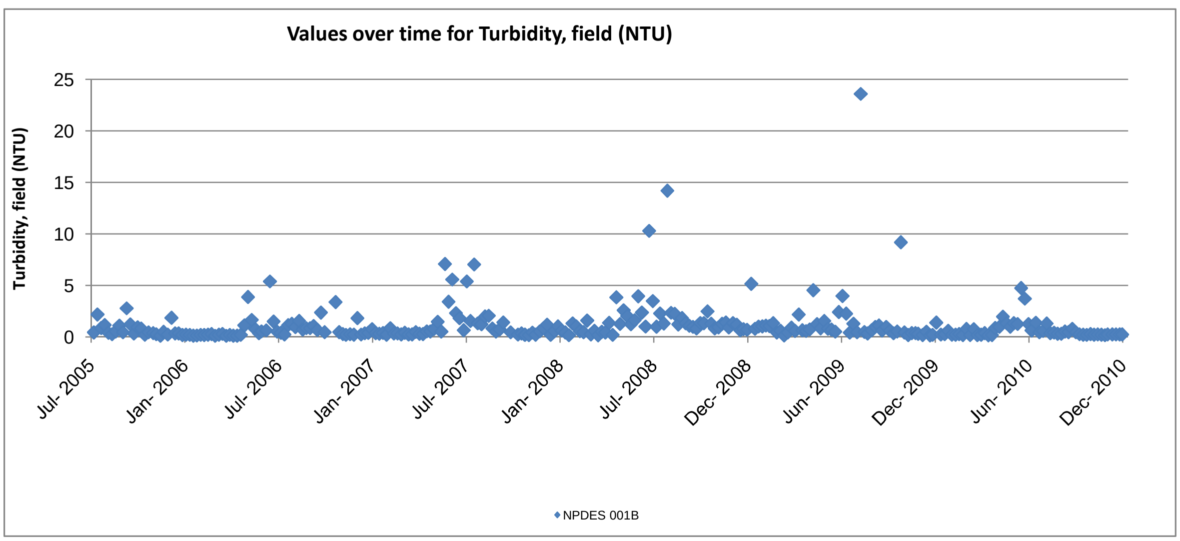
PC003	units	1st Quarter 11-Mar-10	2nd Quarter 23-Jun-10	3rd Quarter 26-Sep-10	4th Quarter 15-Dec-10
Antimony, Total	mg/kg	2.14	2.15	1.66	2.06
Arsenic, Total	mg/kg	591	1130	706	1030
Carbon, Total	%	0.45	0.47	0.51	0.48
Copper, Total	mg/kg	48.4	38.3	50.3	51.6
Inorganic Carbon	%	1.6	1.7	1.9	1.8
Iron, Total	mg/kg	22800	25900	23500	19200
Lead, Total	mg/kg	12	9.8	8.3	9.1
Maximum Potential Acidity	tCaCO3/1Kt	3.8	4.4	3.8	4.4
Net Neutralization Potential	tCaCO3/1Kt	29	34	27	28
PH, Paste	pH units	8	8.2	8	7.9
Potassium, Total	mg/kg	15800	16900	15600	14200
Ratio (NP:MPA)	su	8.8	8.69	8.27	7.31
Selenium, Total	mg/kg	2	2	2	2
Sodium, Total	mg/kg	4100	4200	3900	4200
Sulfate Sulfur (HCl Leachable)	%	0.03	-0.01	0.01	0.04
Sulfide Sulfur (Calculated)	%	0.07	0.1	0.06	0.14
Sulfur, sulfate	%	0.05	0.04	0.06	-0.01
Sulfur, Total	%	0.12	0.14	1300.12	0.03
Zinc, Total	mg/kg	18	17	13	12

Appendix C: Time Series Graphs of Monitoring Data

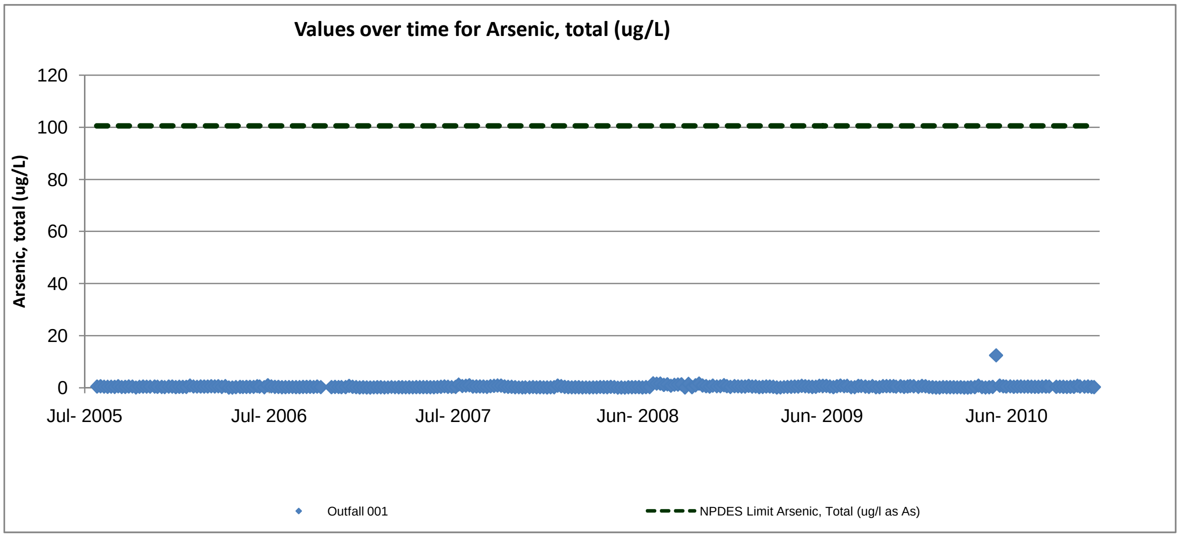
TIme Series for Effluent Monitoring Program

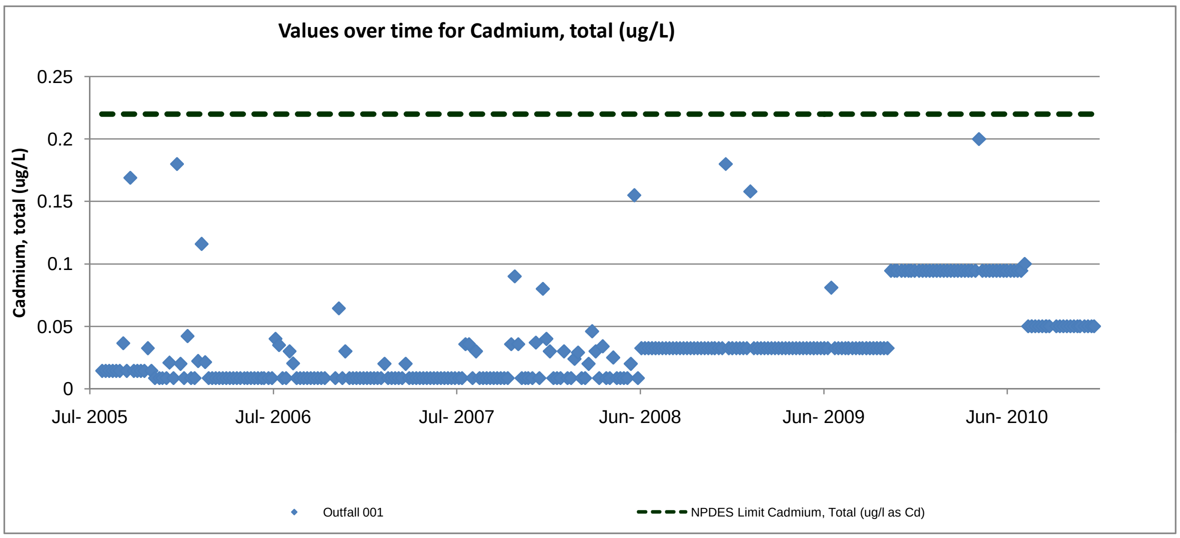


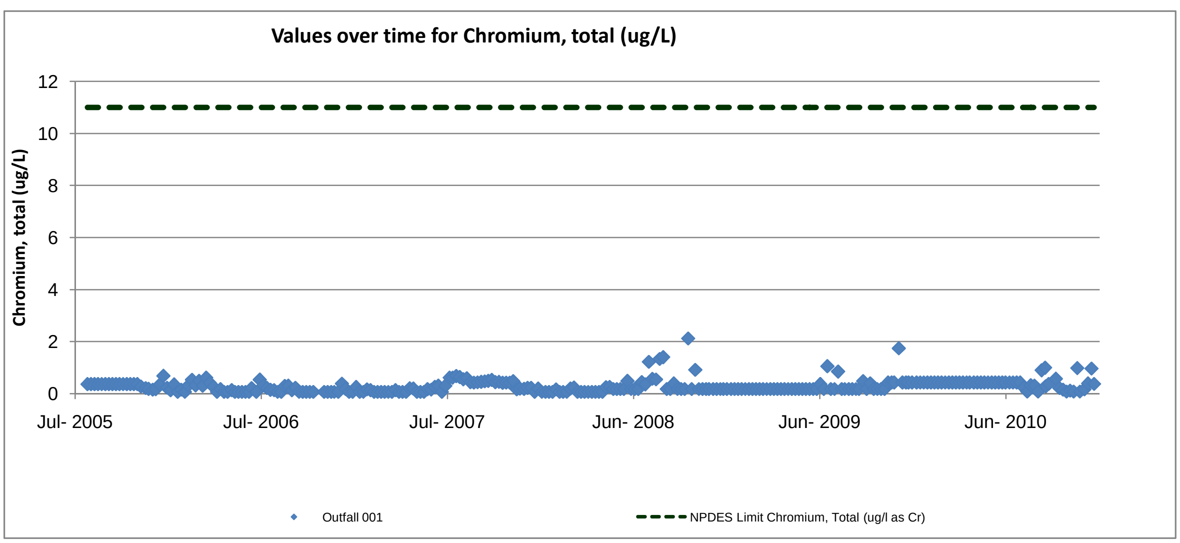


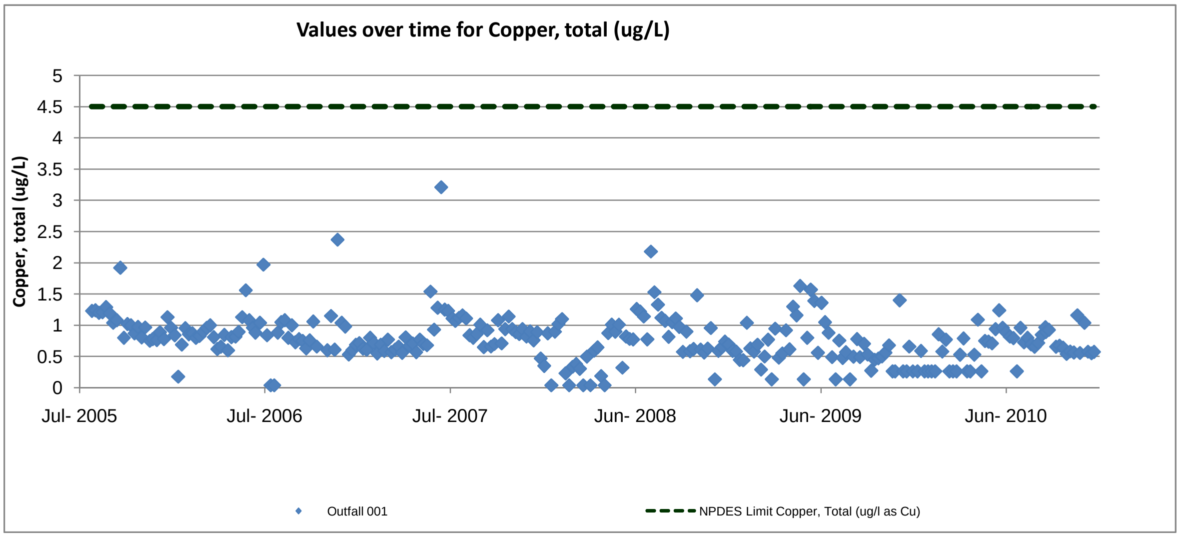


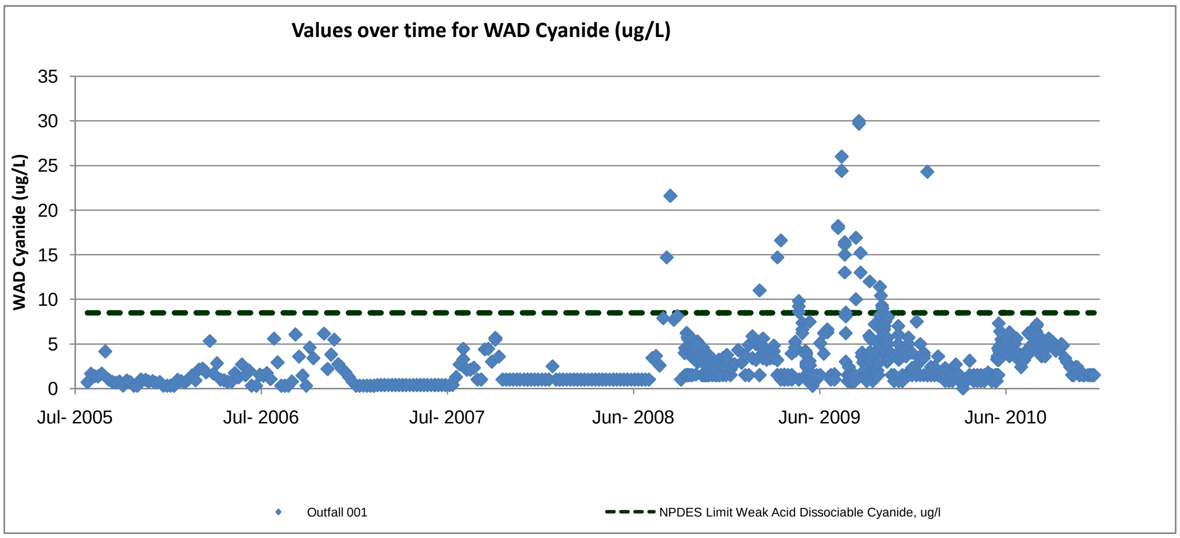
Time Series for Effluent Monitoring Program

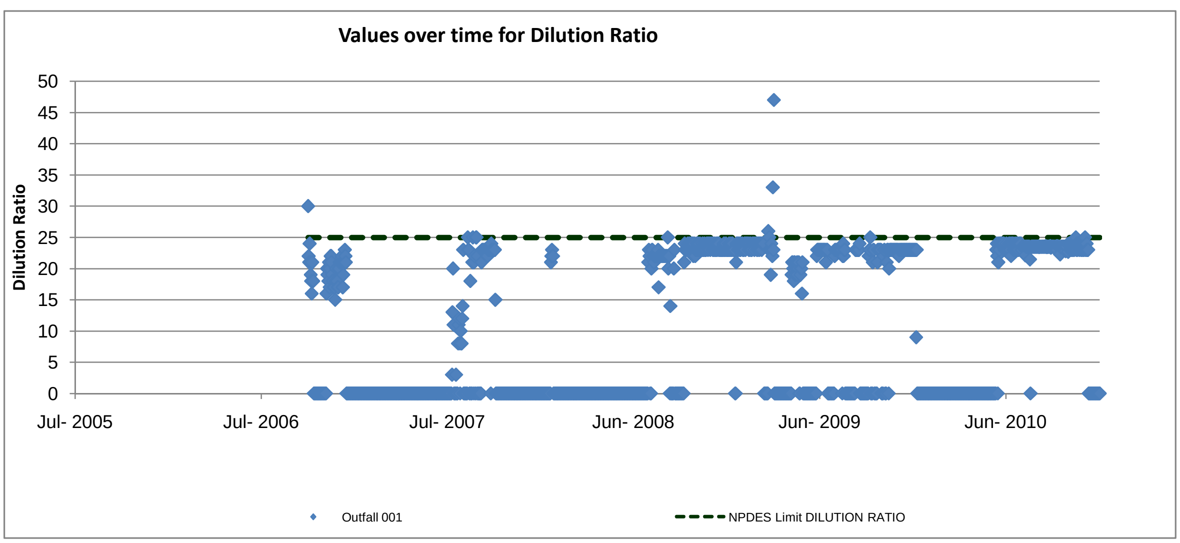




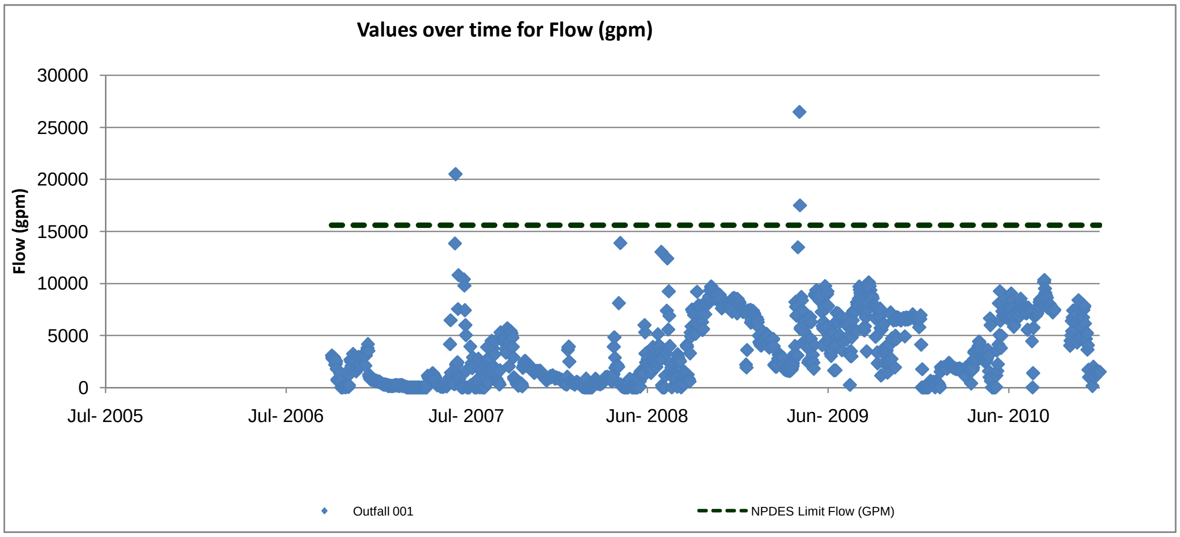


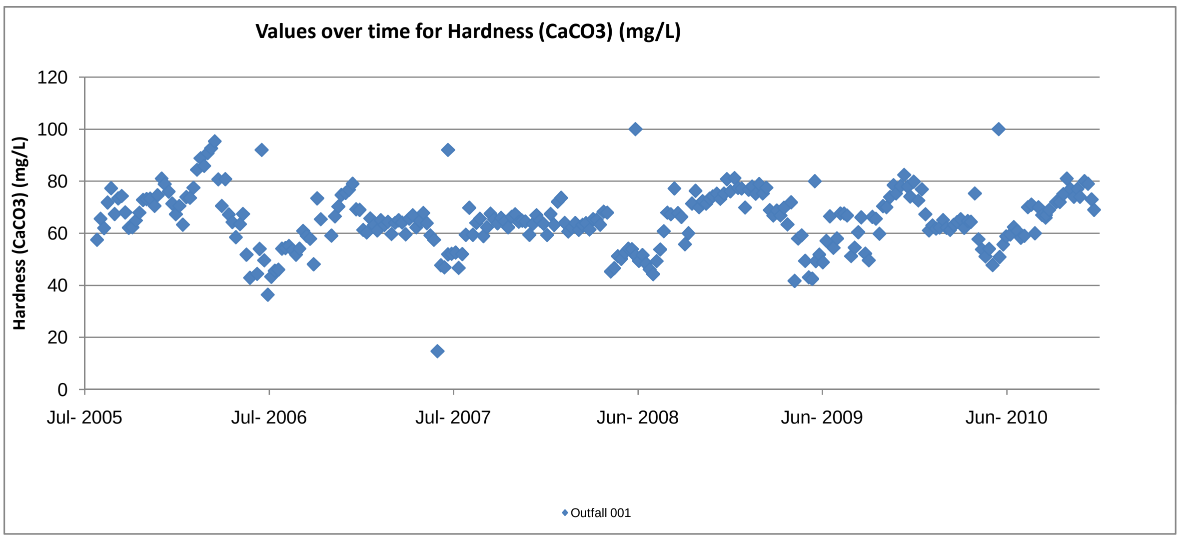

Values over time for Copper, total (ug/L)
Copper, total (ug/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 001
NPDES Limit Copper, Total (ug/l as Cu)

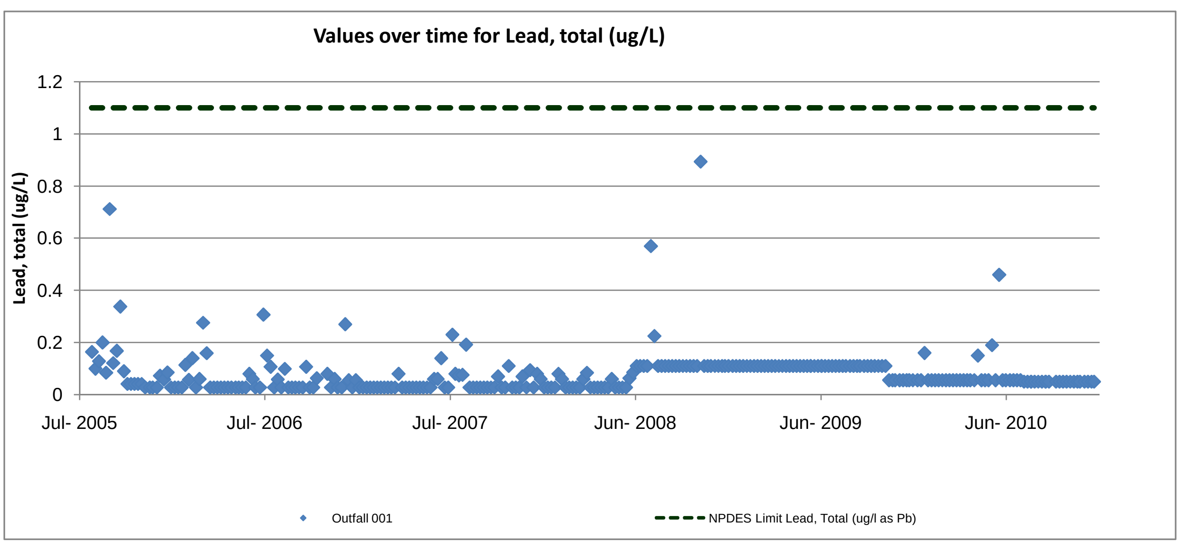

Values over time for WAD Cyanide (ug/L)
WAD Cyanide (ug/L)
35
30
25
20
15
10
5
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 001
NPDES Limit Weak Acid Dissociable Cyanide, ug/l


Values over time for Dilution Ratio
Dilution Ratio
50
45
40
35
30
25
20
15
10
5
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 001
NPDES Limit DILUTION RATIO

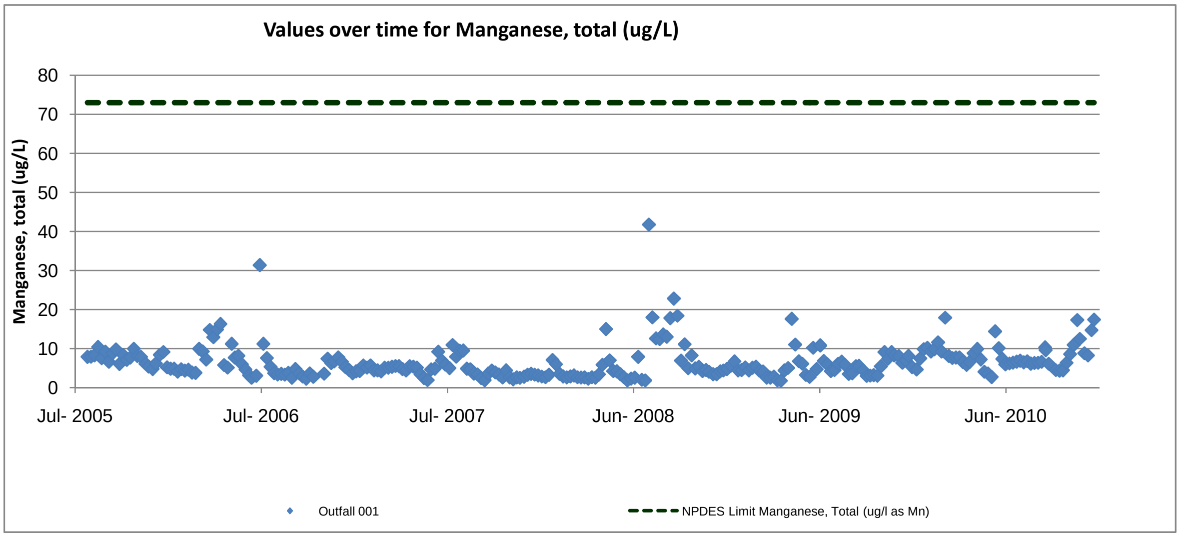
Time Series for Effluent Monitoring Program

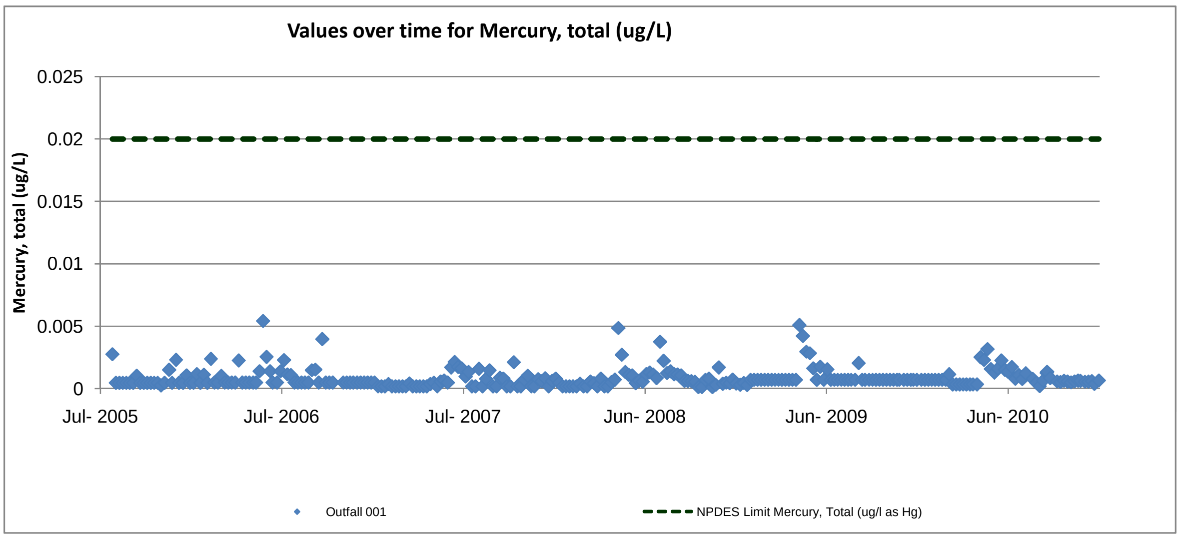


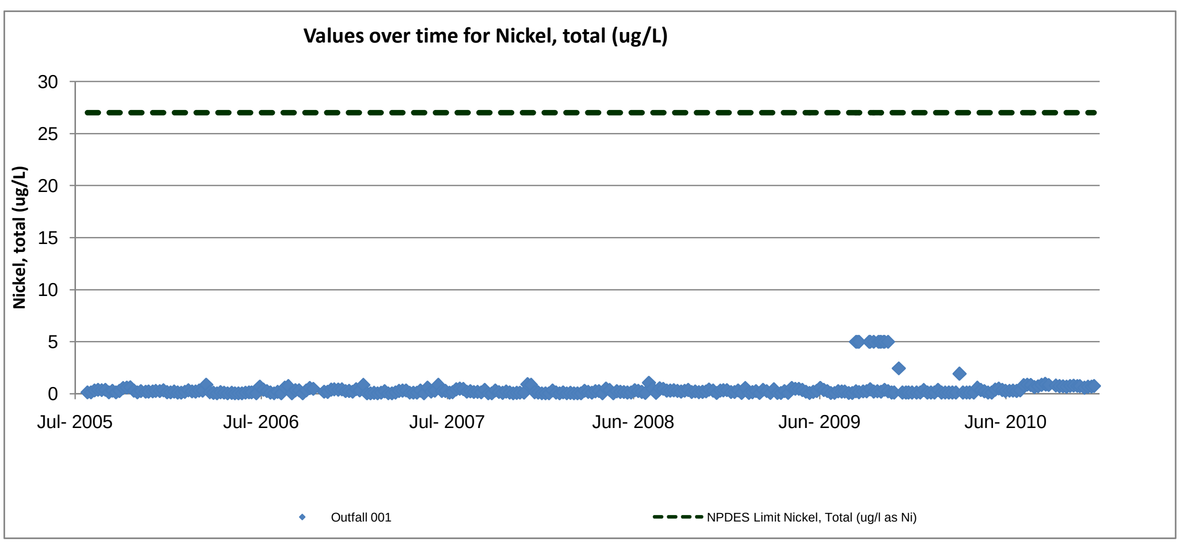




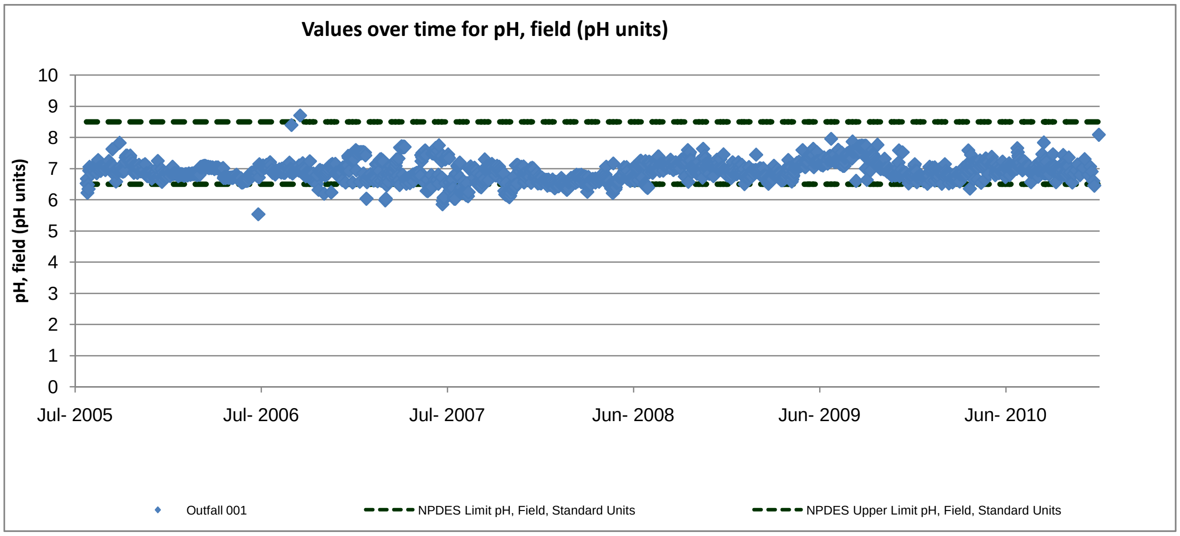
Time Series for Effluent Monitoring Program

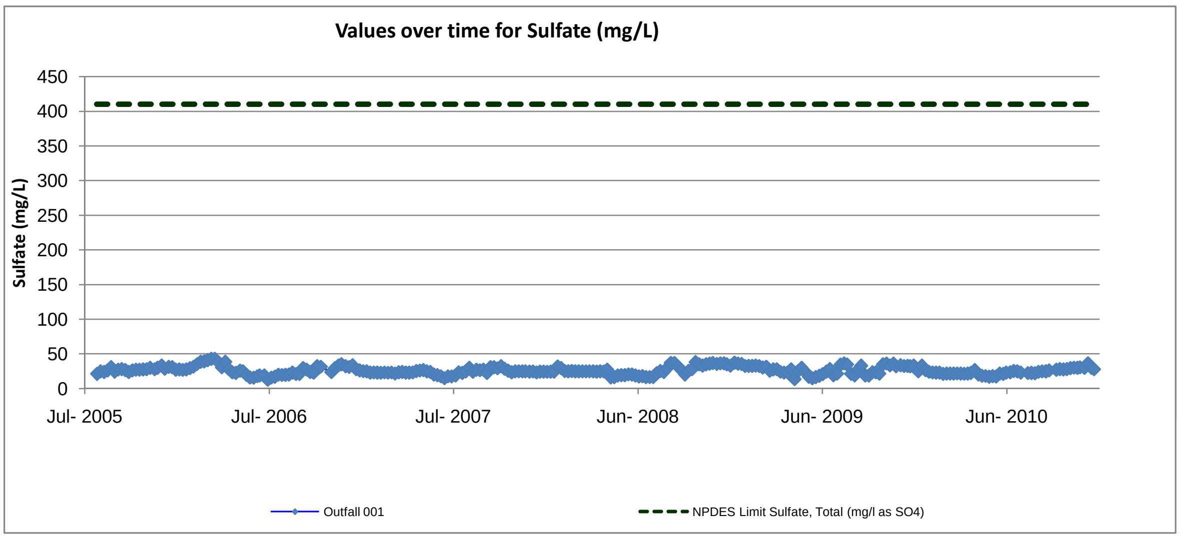


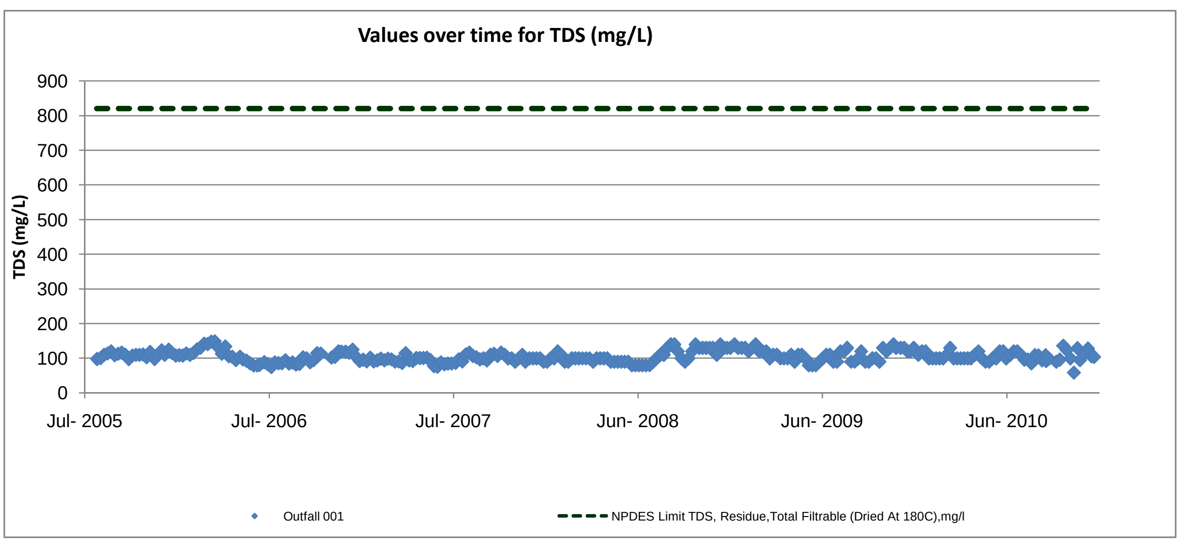


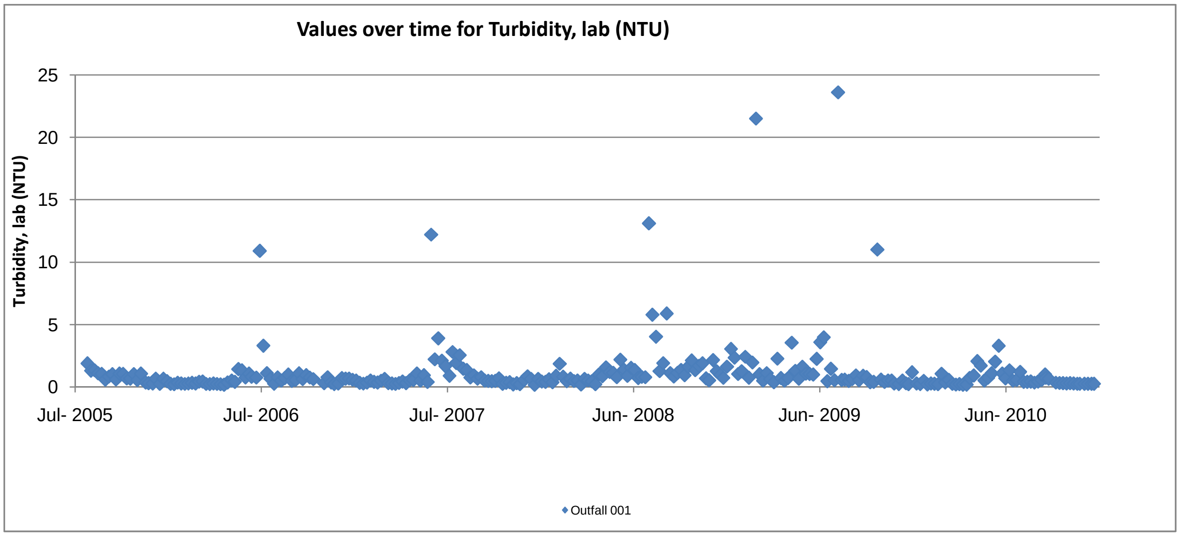


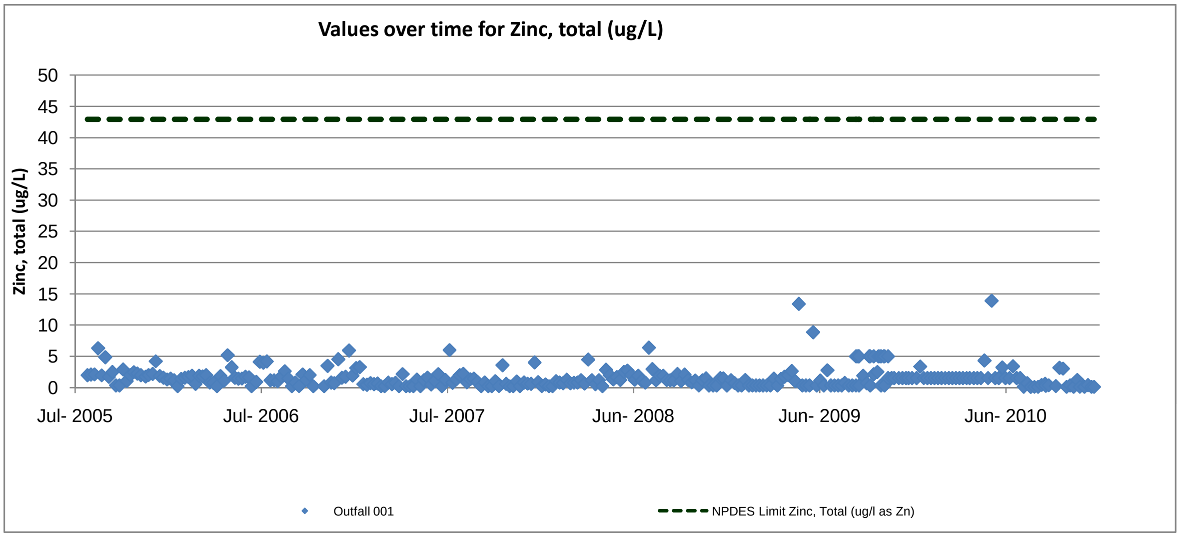
Time Series for Effluent Monitoring Program



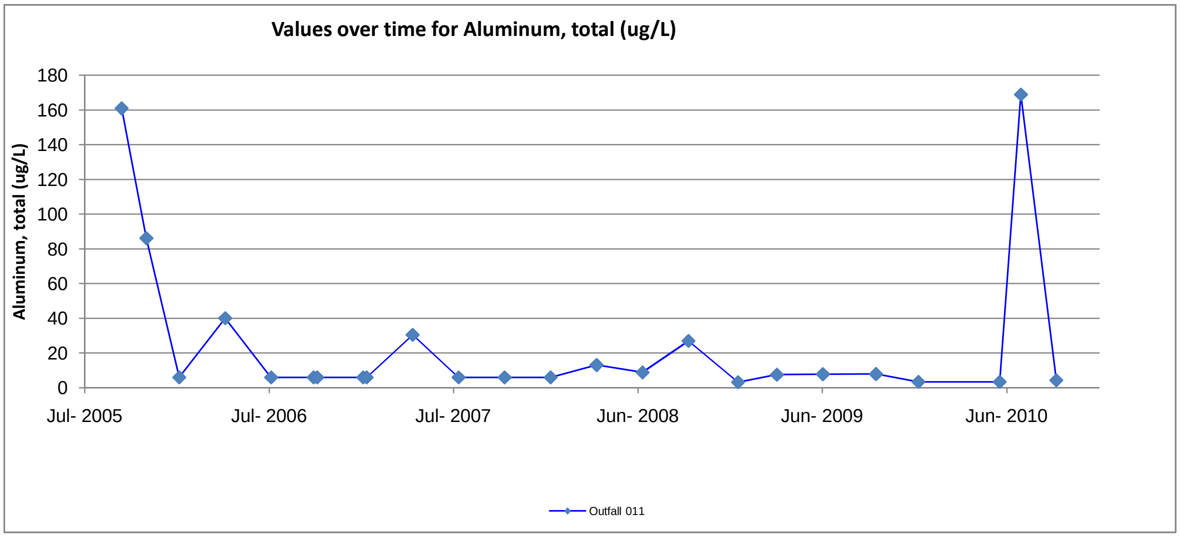


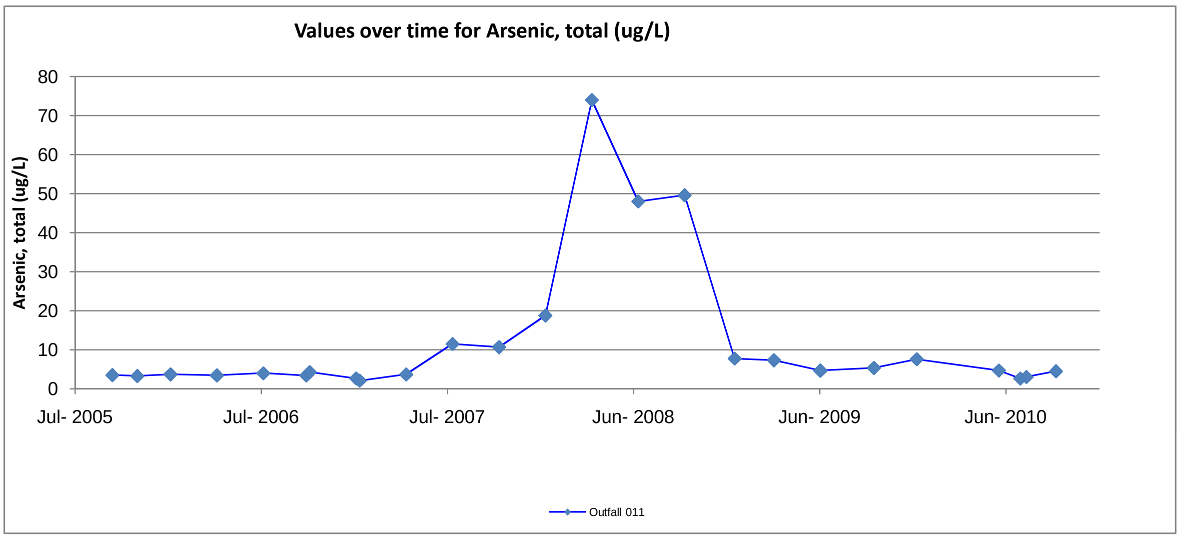


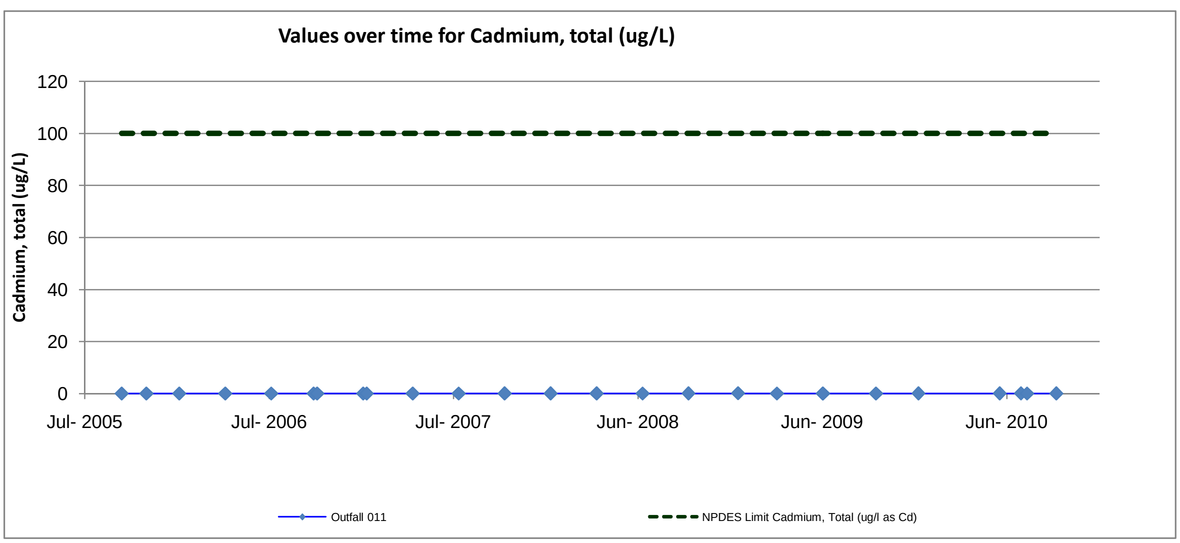

Values over time for Turbidity, lab (NTU)
Turbidity, lab (NTU)
25
20
15
10
5
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 001

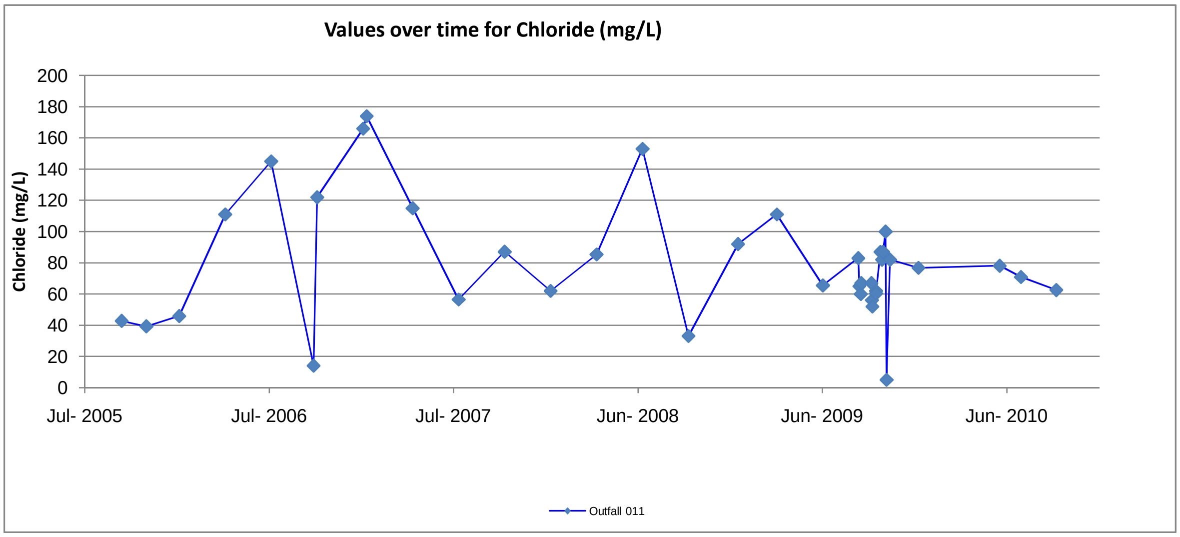

Values over time for Zinc, total (ug/L)
Zinc, total (ug/L)
50
45
40
35
30
25
20
15
10
5
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 001
NPDES Limit Zinc, Total (ug/l as Zn)

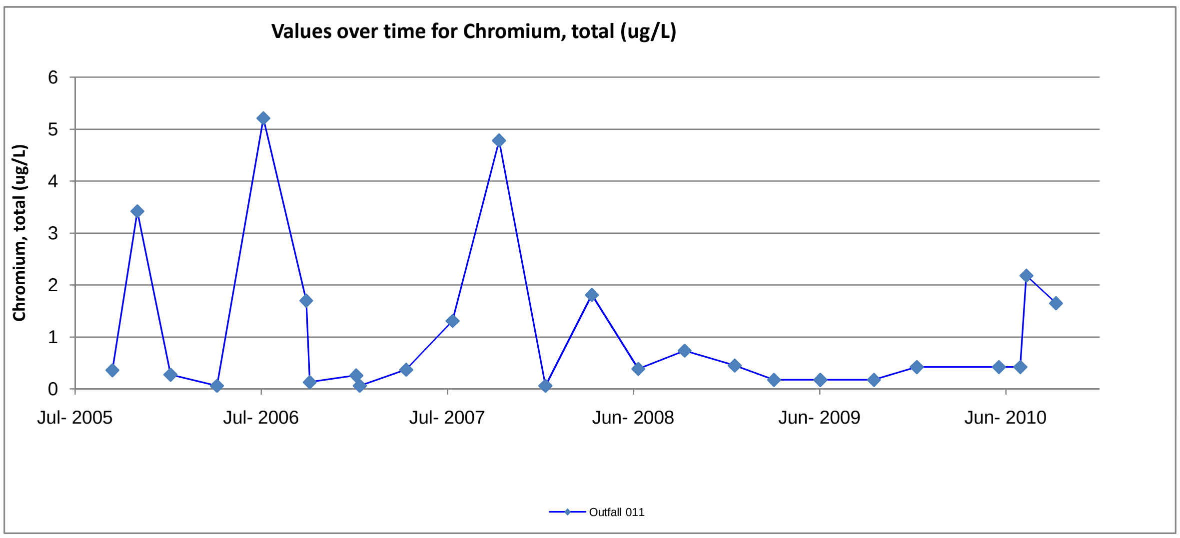
Time Series for Effluent Monitoring Program

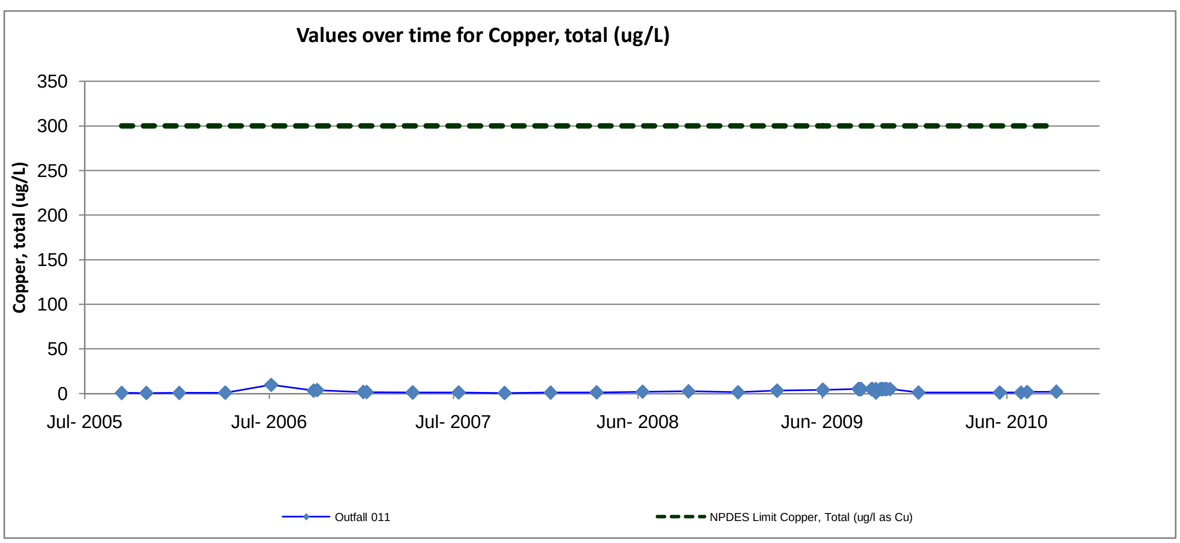


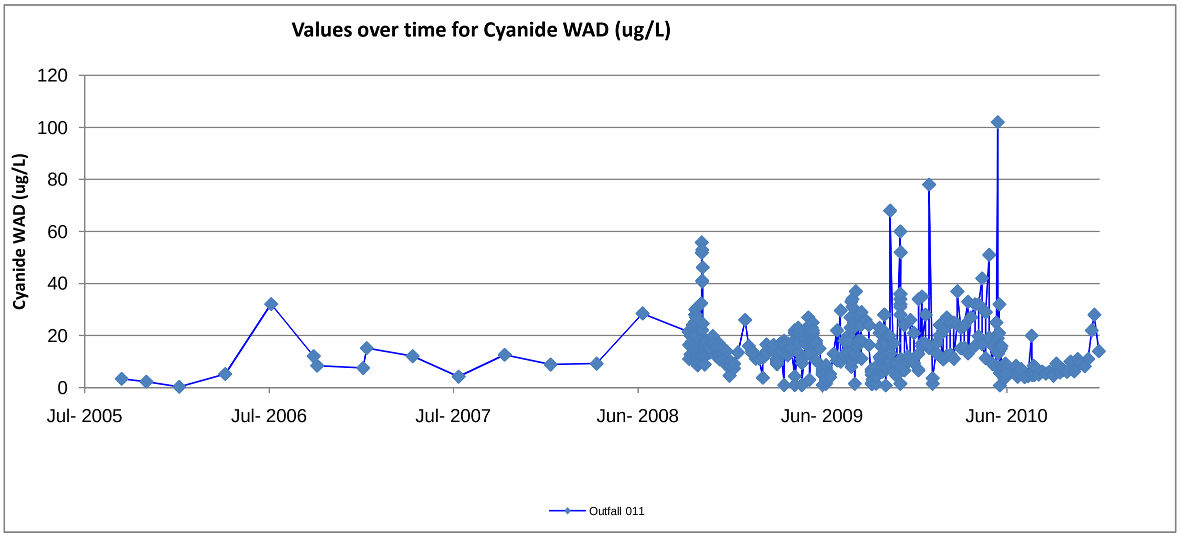


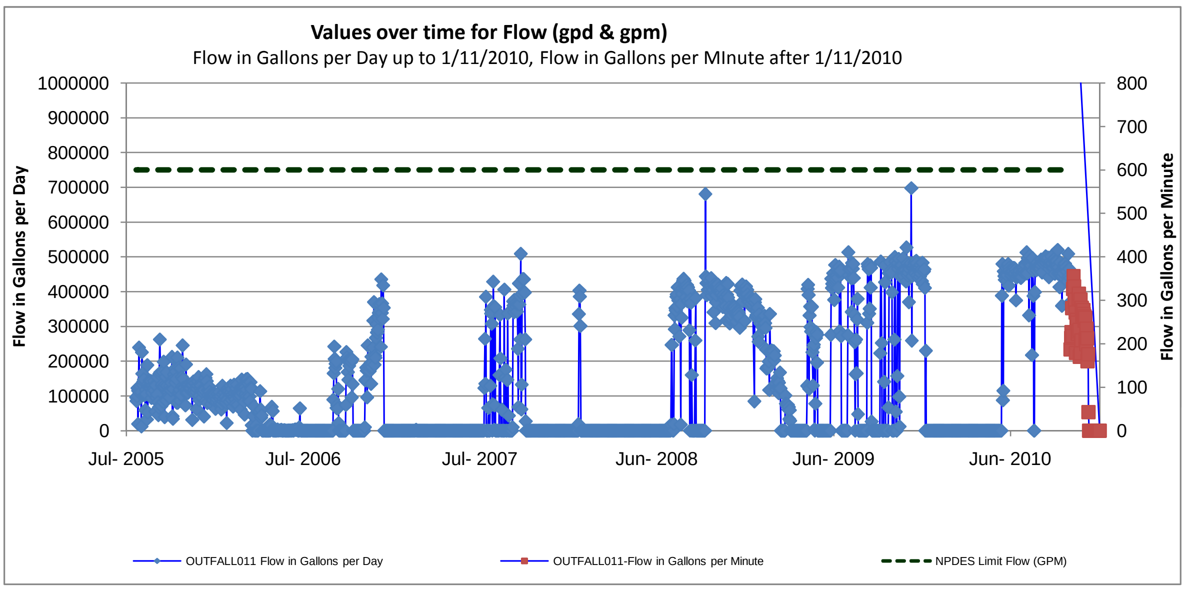


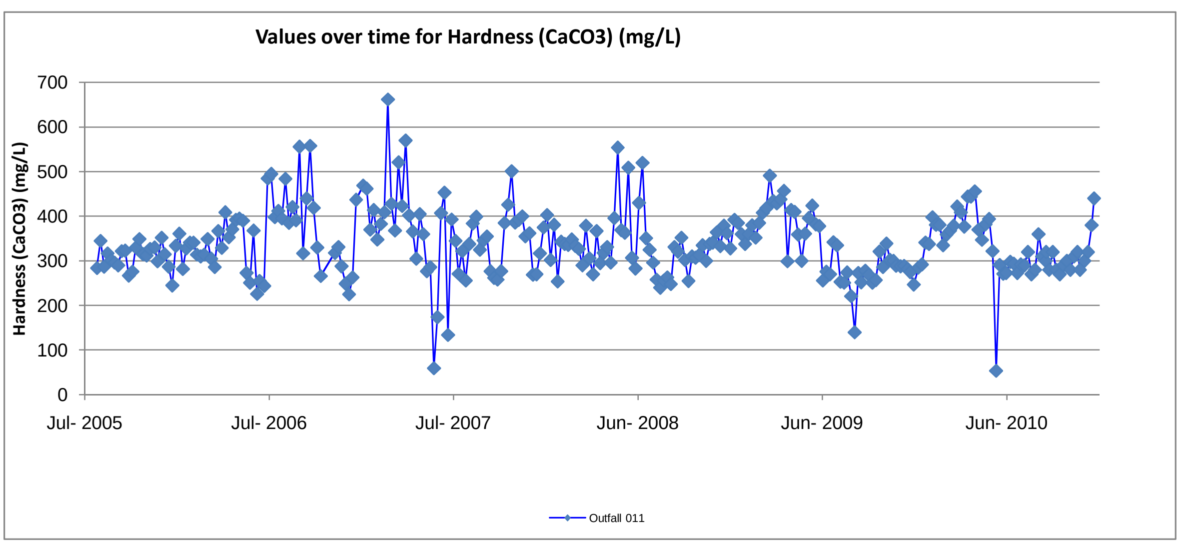

Values over time for Chloride (mg/L)
Chloride (mg/L)
200
180
160
140
120
100
80
60
40
20
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011


Values over time for Chromium, total (ug/L)
Chromium, total (ug/L)
6
5
4
3
2
1
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011

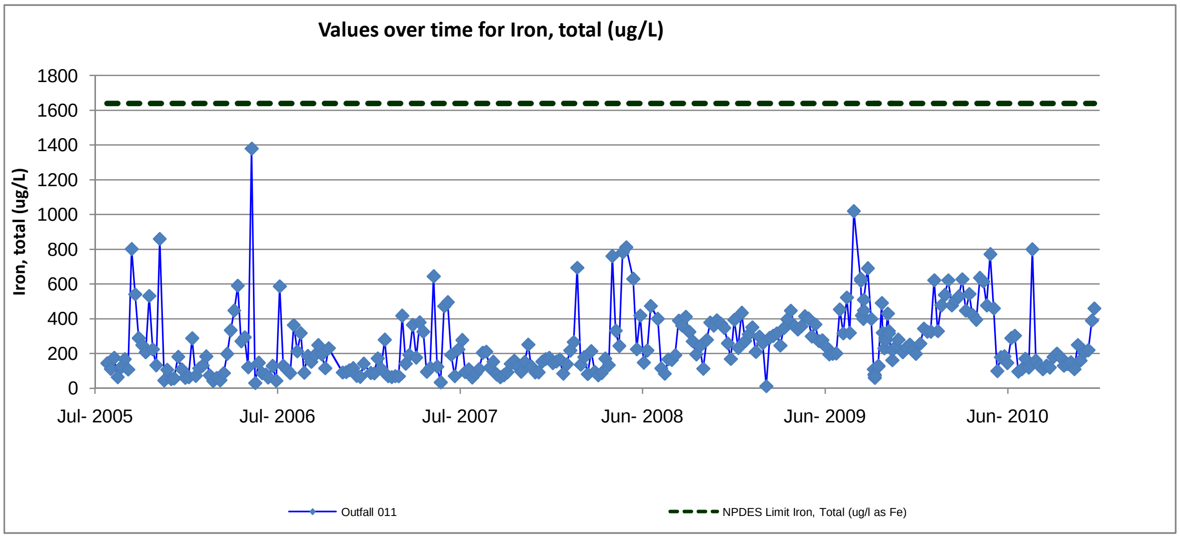

Values over time for Copper, total (ug/L)
Copper, total (ug/L)
350
300
250
200
150
100
50
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011
NPDES Limit Copper, Total (ug/l as Cu)

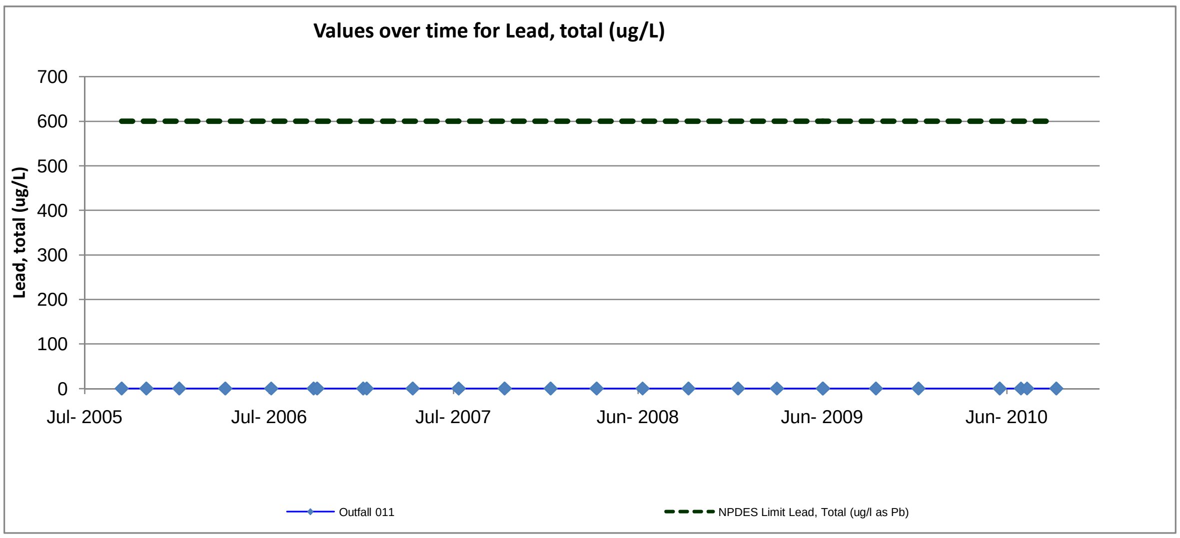

Values over time for Cyanide WAD (ug/L)
Cyanide WAD (ug/L)
120
100
80
60
40
20
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011

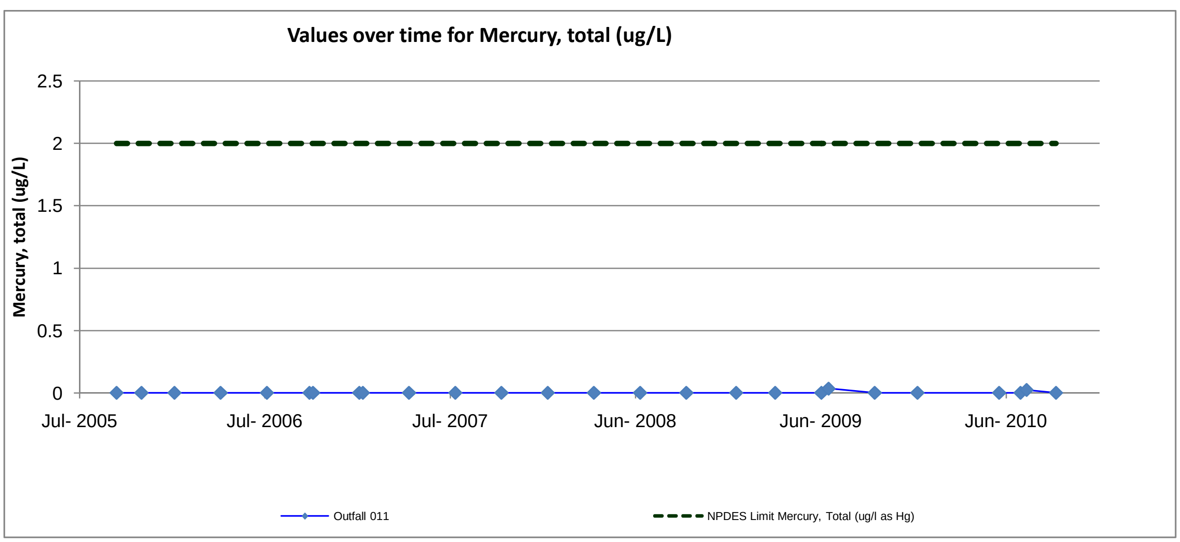

Values over time for Flow (gpd & gpm)
Flow in Gallons per Day up to 1/11/2010, Flow in Gallons per MInute after 1/11/2010
Flow in Gallons per Day
1000000
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
Flow in Gallons per Minute
800
700
600
500
400
300
200
100
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
OUTFALL011 Flow in Gallons per Day
OUTFALL011-Flow in Gallons per Minute
NPDES Limit Flow (GPM)

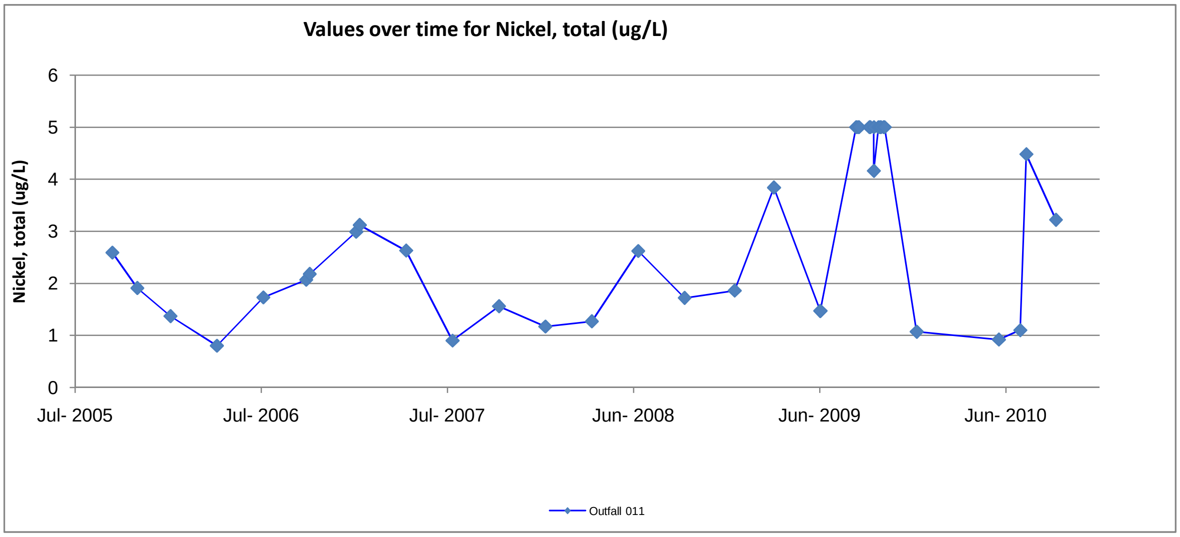

Values over time for Hardness (CaCO3) (mg/L)
Hardness (CaCO3) (mg/L)
700
600
500
400
300
200
100
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011

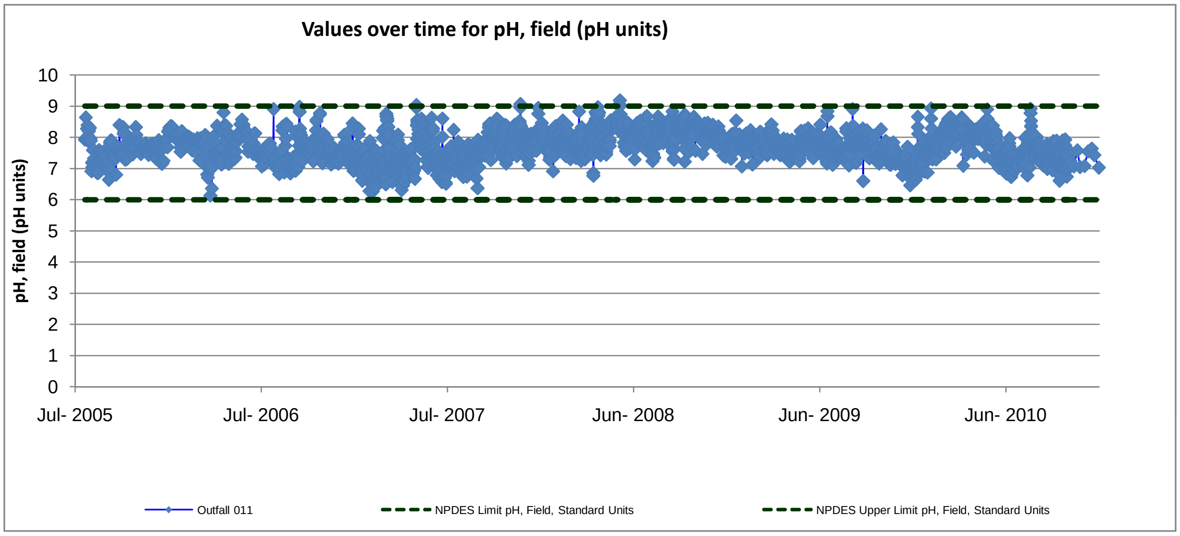
Time Series for Effluent Monitoring Program

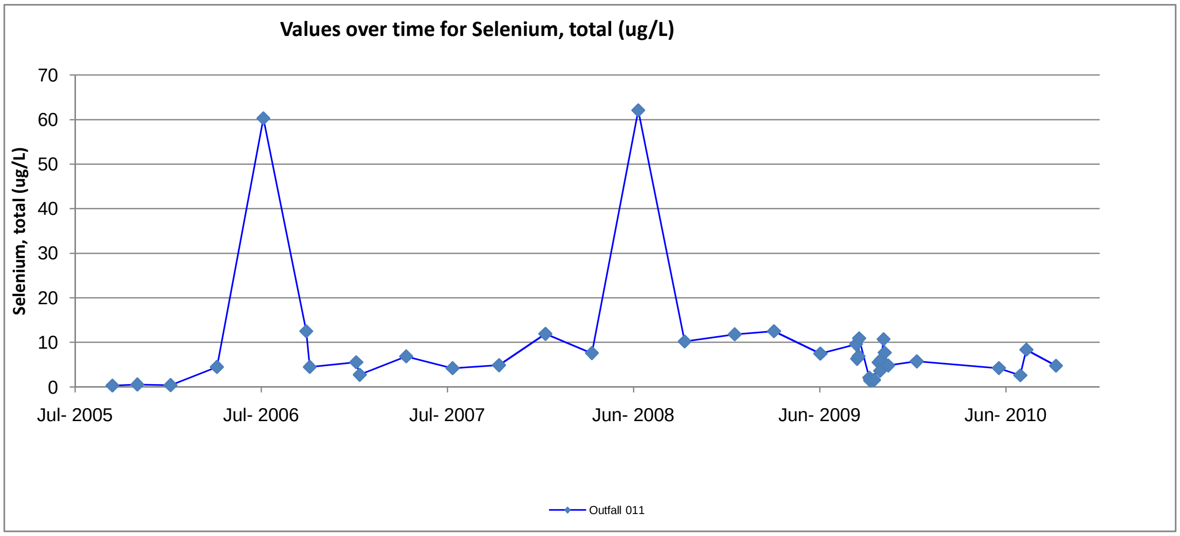




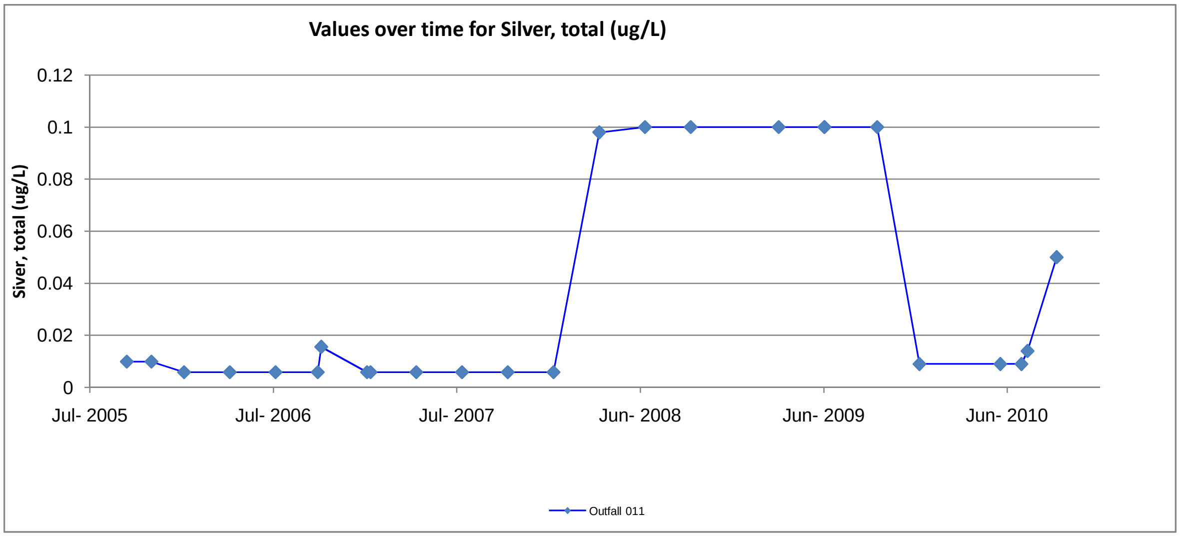


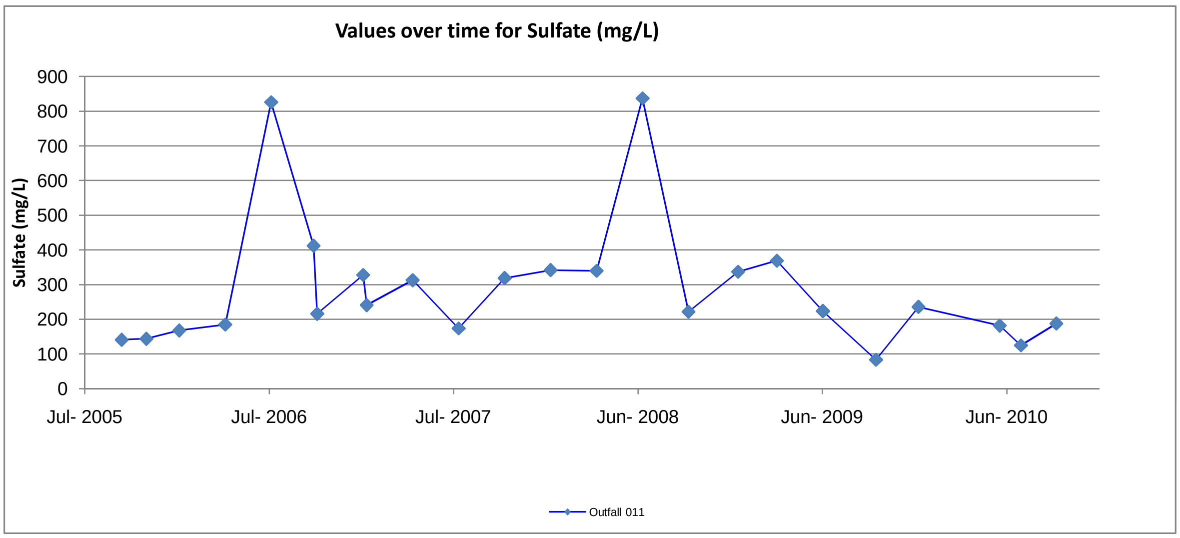

Values over time for Nickel, total (ug/L)
Nickel, total (ug/L)
6
5
4
3
2
1
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011

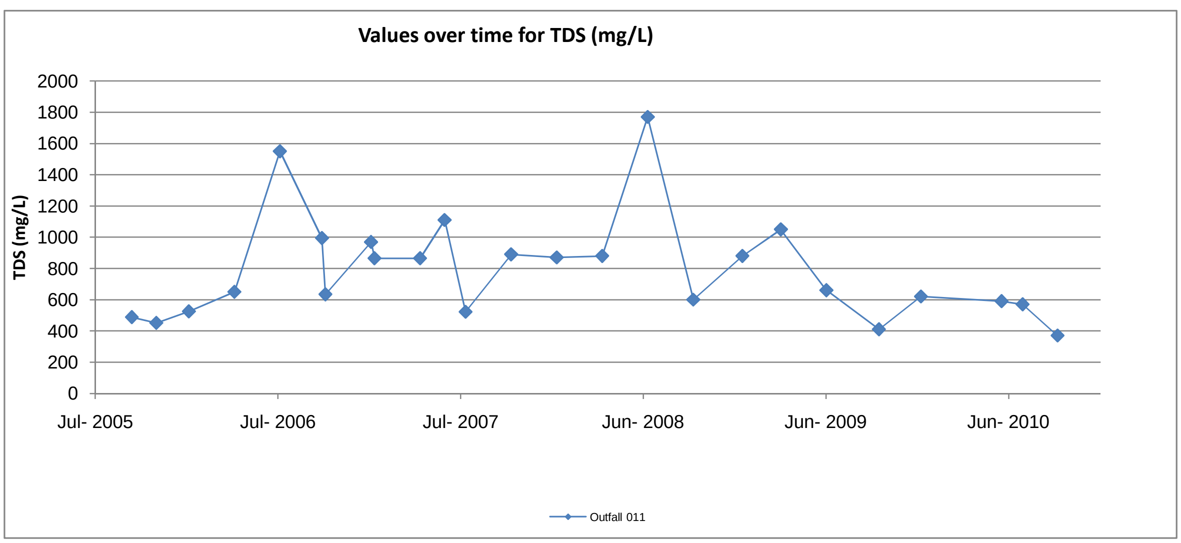

Values over time for pH, field (pH units)
pH, field (pH units)
10
9
8
7
6
5
4
3
2
1
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011
NPDES Limit pH, Field, Standard Units
NPDES Upper Limit pH, Field, Standard Units


Values over time for Selenium, total (ug/L)
Selenium, total (ug/L)
70
60
50
40
30
20
10
0
Jul- 2005
Jul- 2006
Jul- 2007
Jun- 2008
Jun- 2009
Jun- 2010
Outfall 011

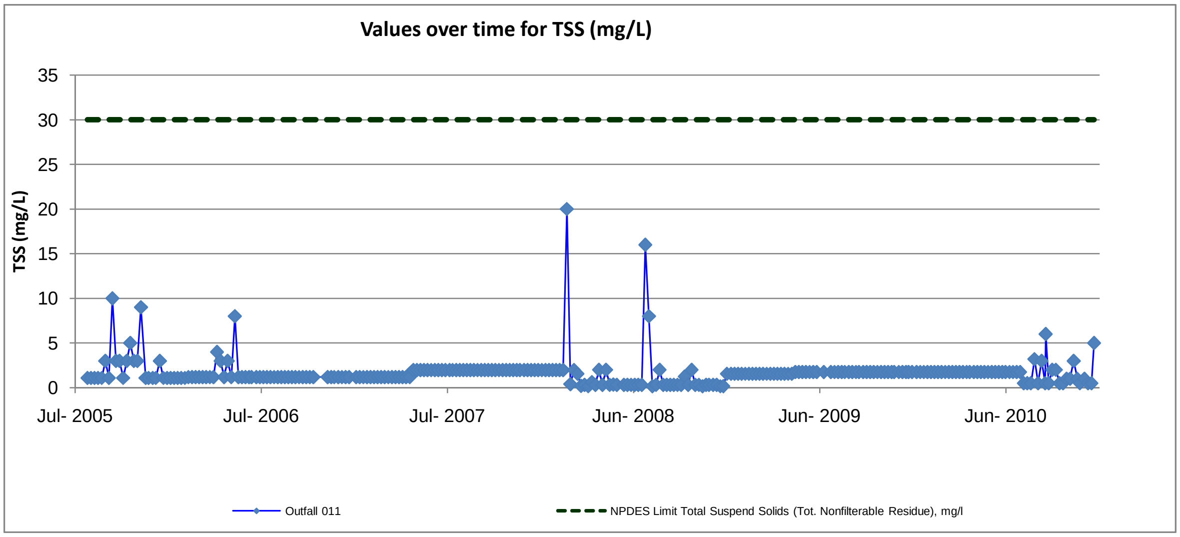
Time Series for Effluent Monitoring Program

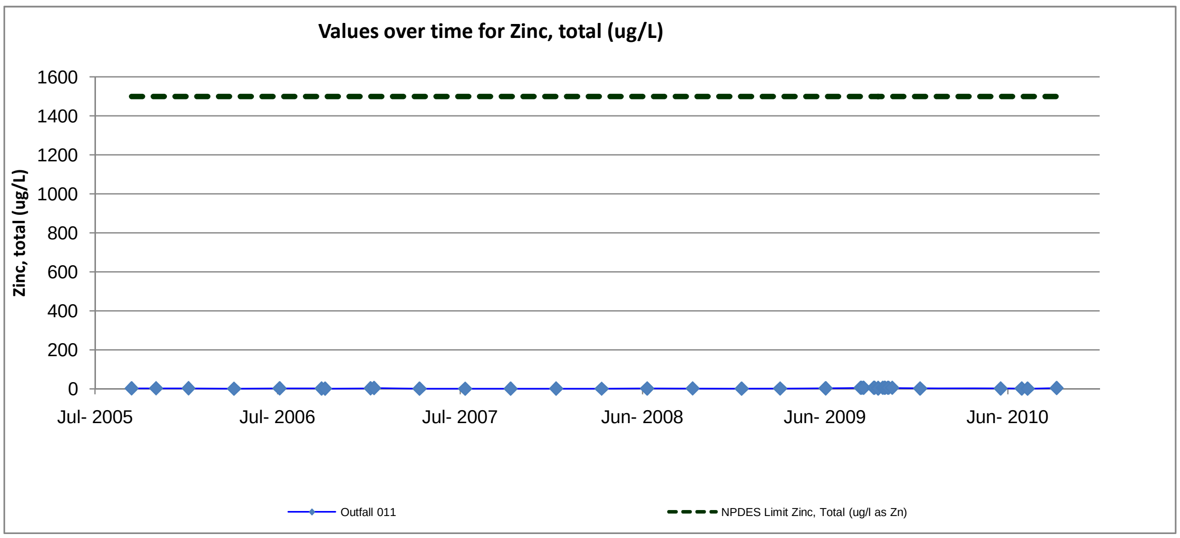




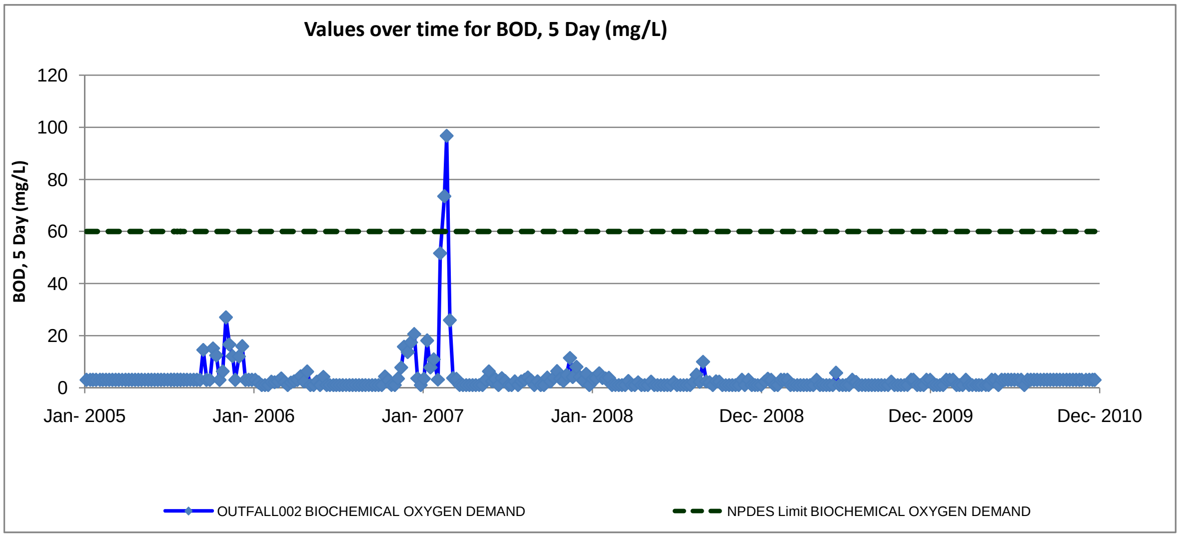


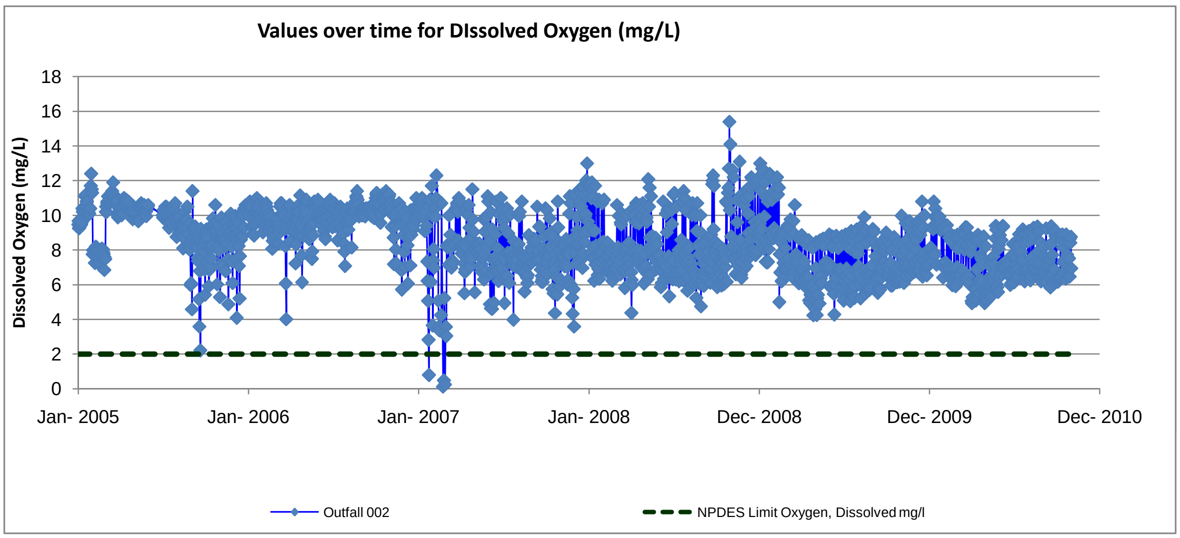
Time Series for Effluent Monitoring Program

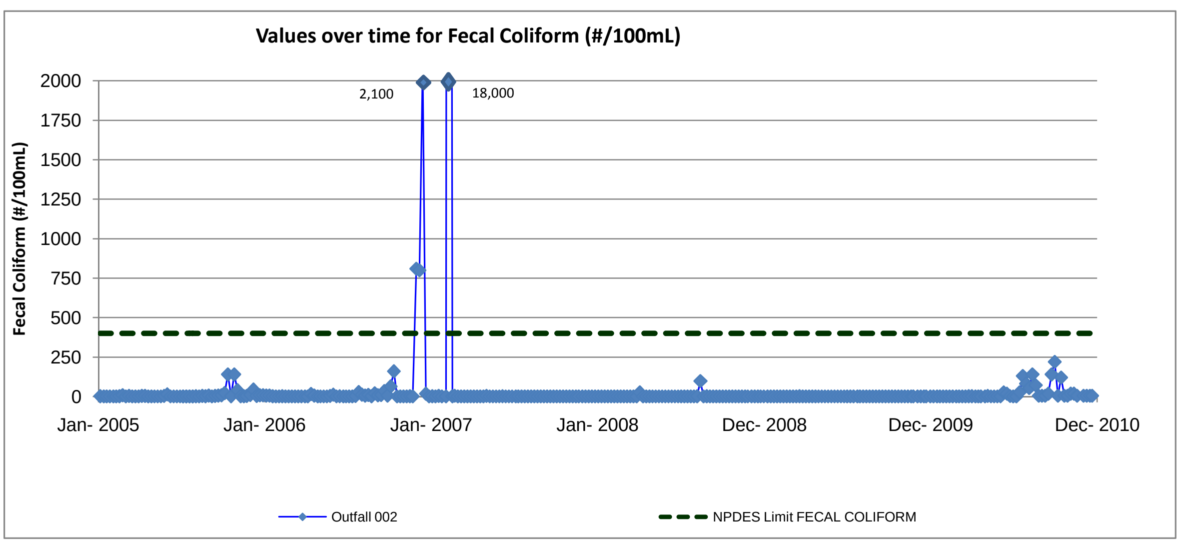




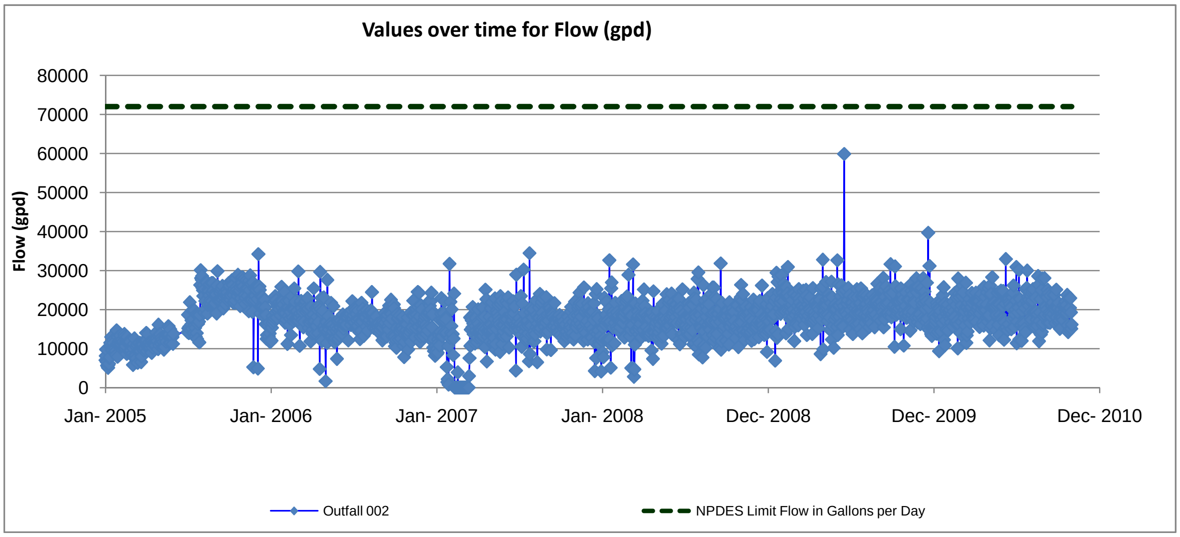
Times Series for Effluent Monitoring Program

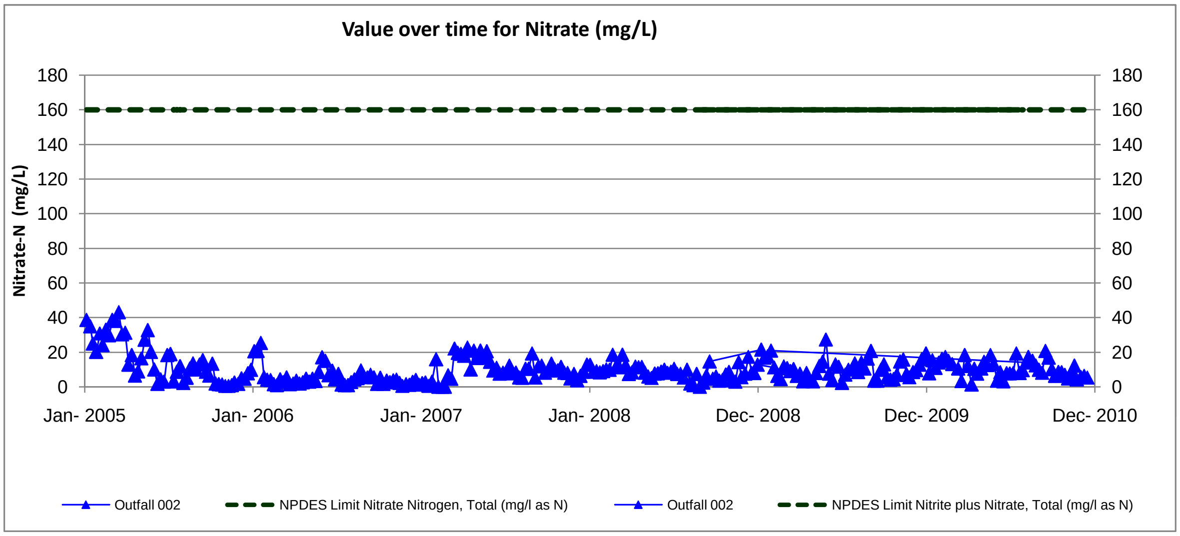


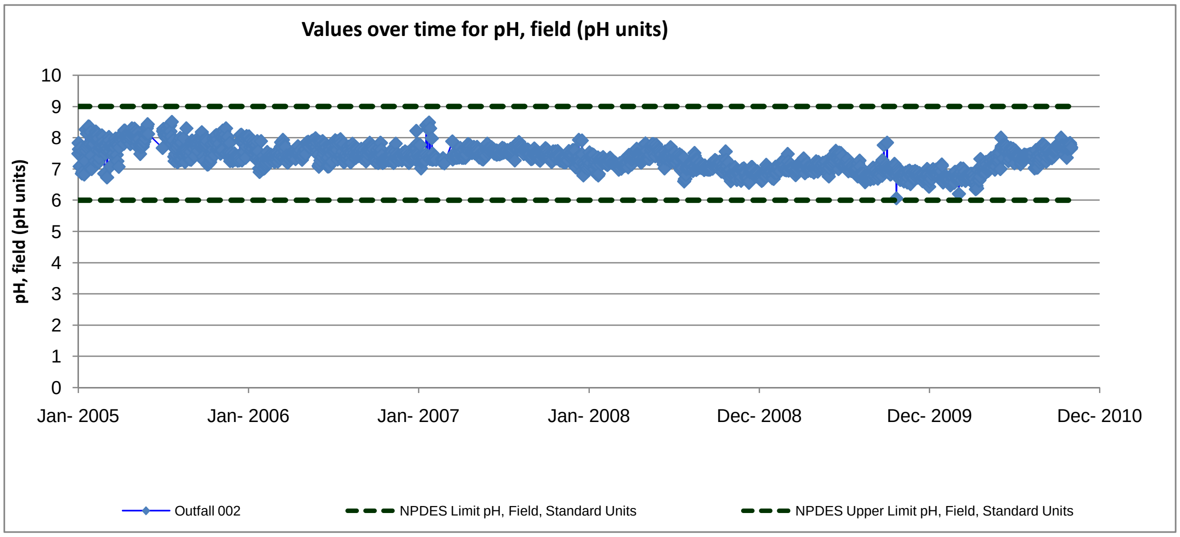




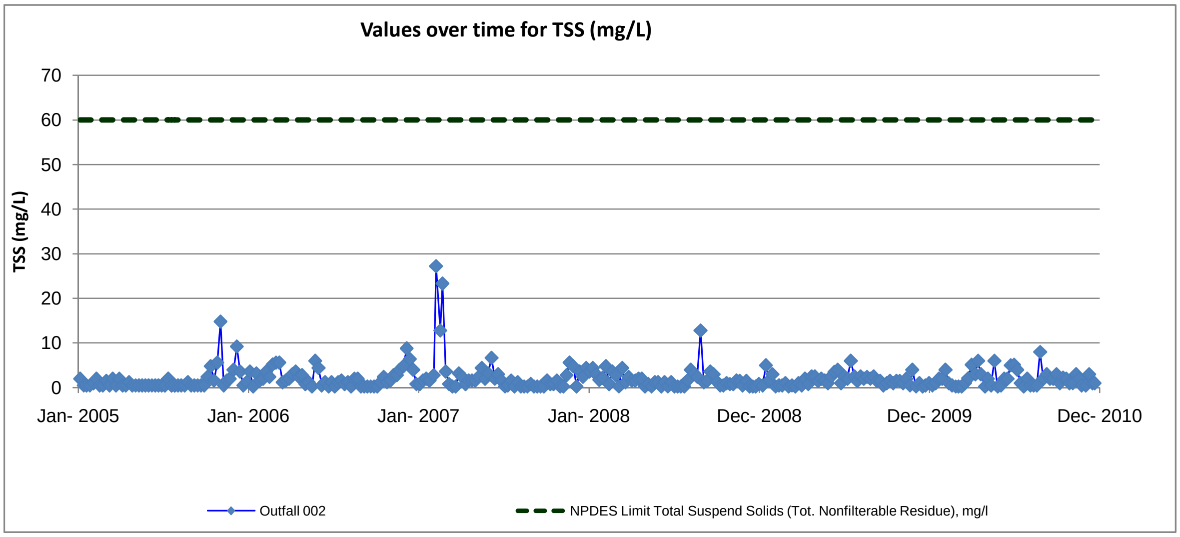
Times Series for Effluent Monitoring Program

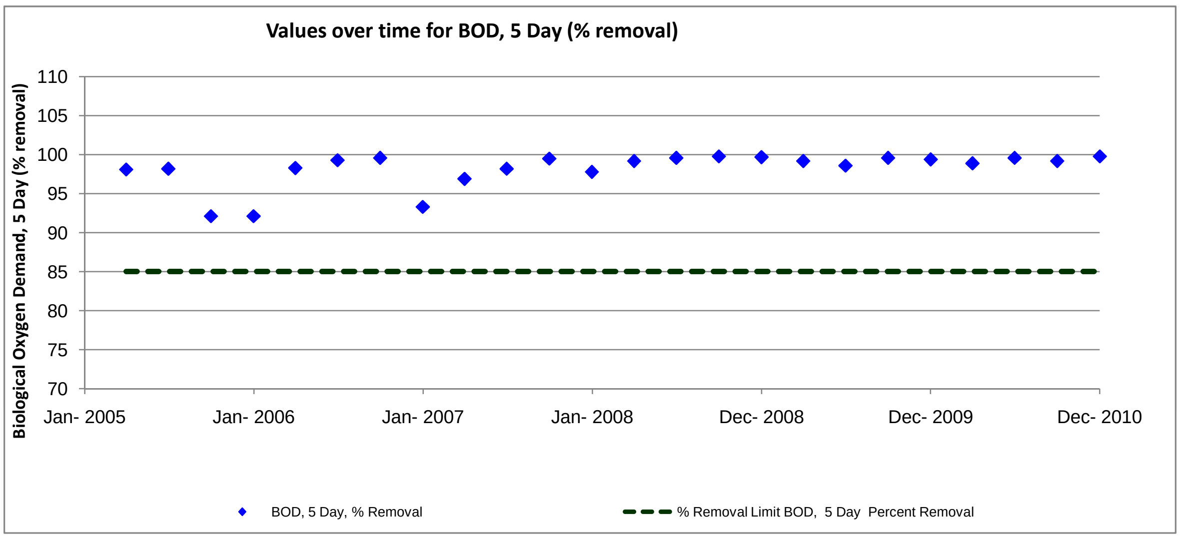


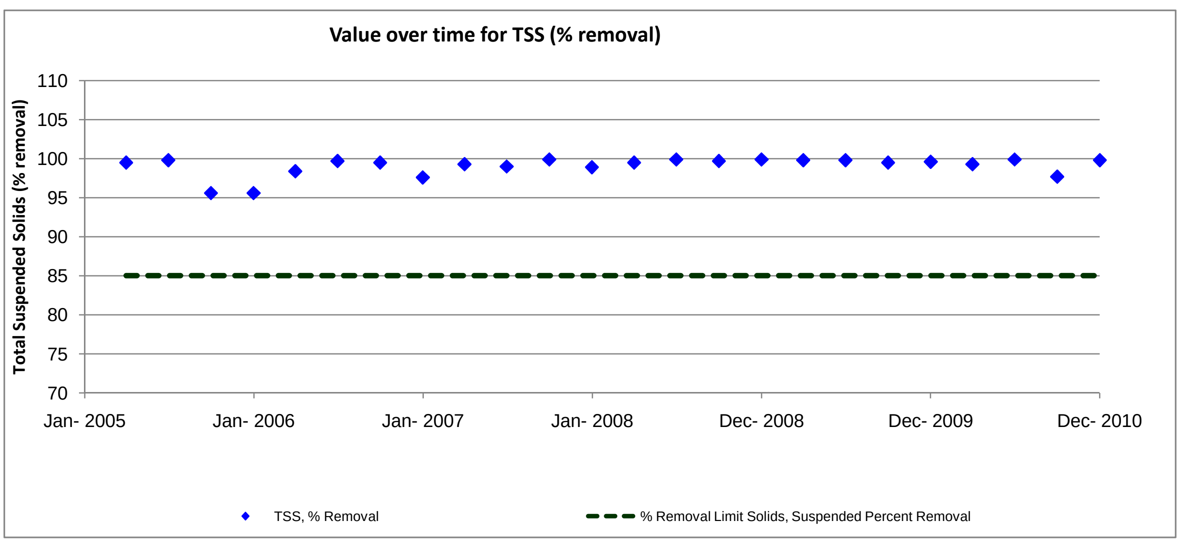


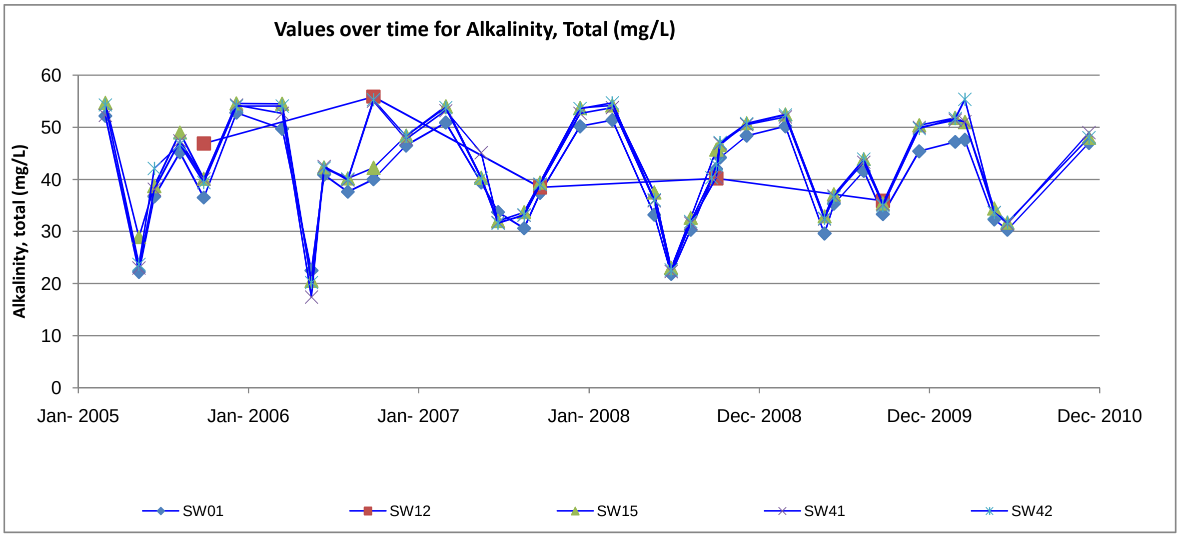


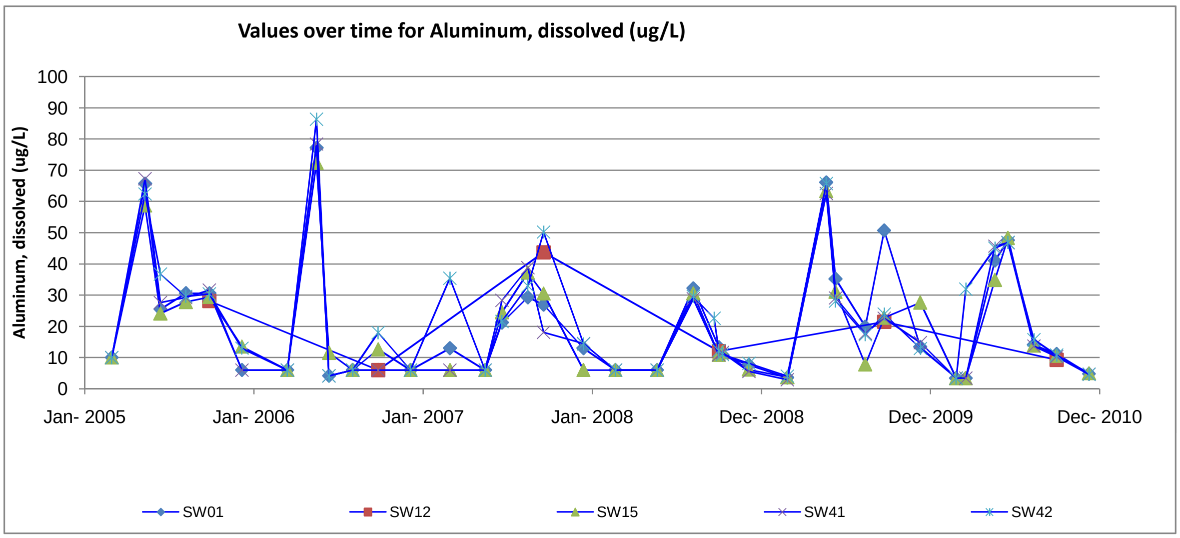
Times Series for Effluent Monitoring Program

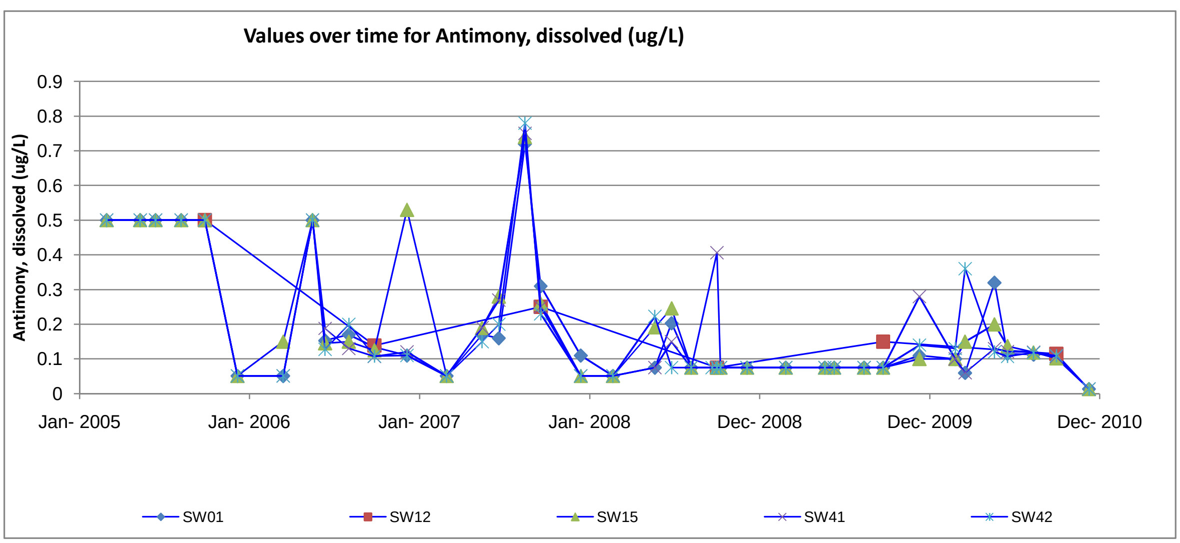


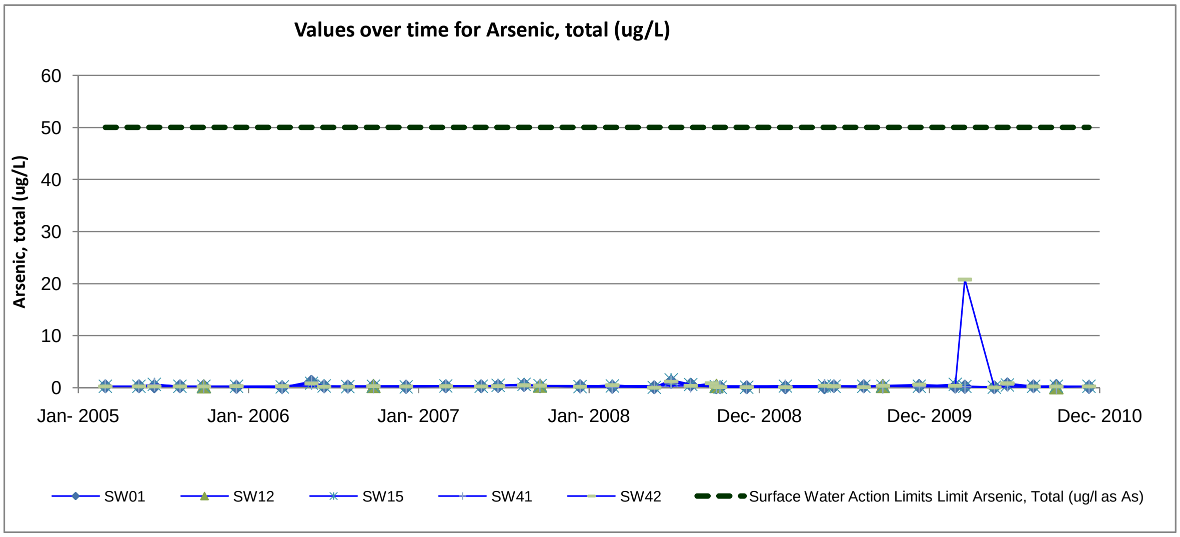


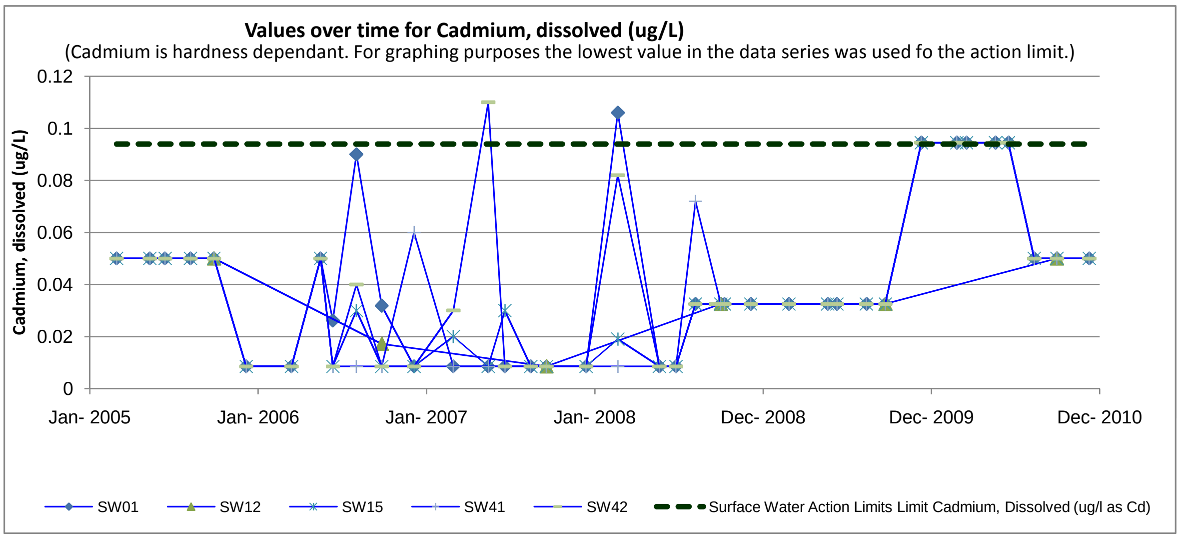


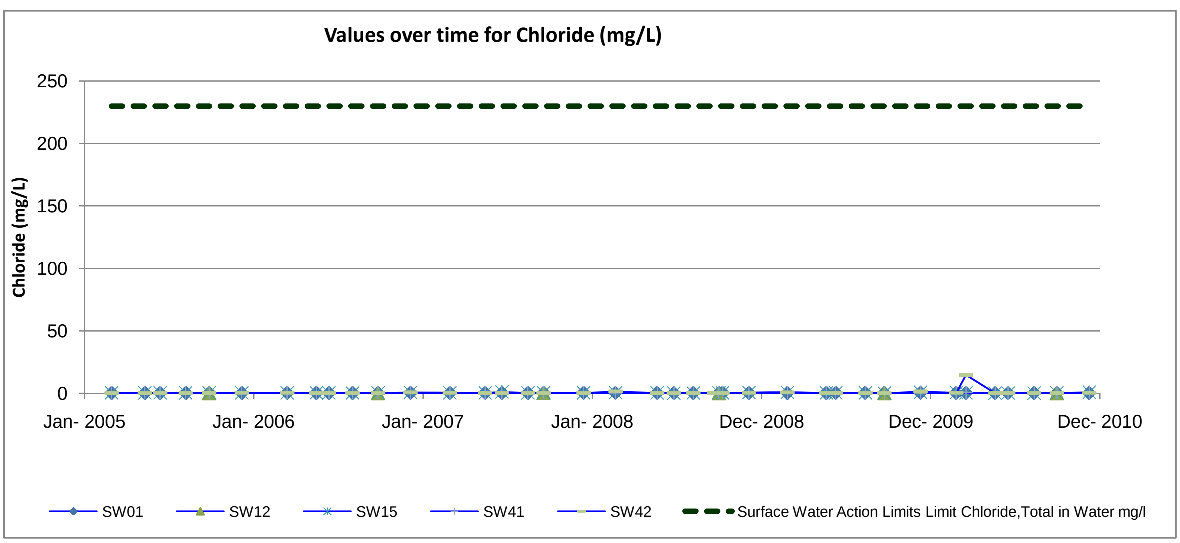

Values over time for Alkalinity, Total (mg/L)
Alkalinity, total (mg/L)
0
10
20
30
40
50
60
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42

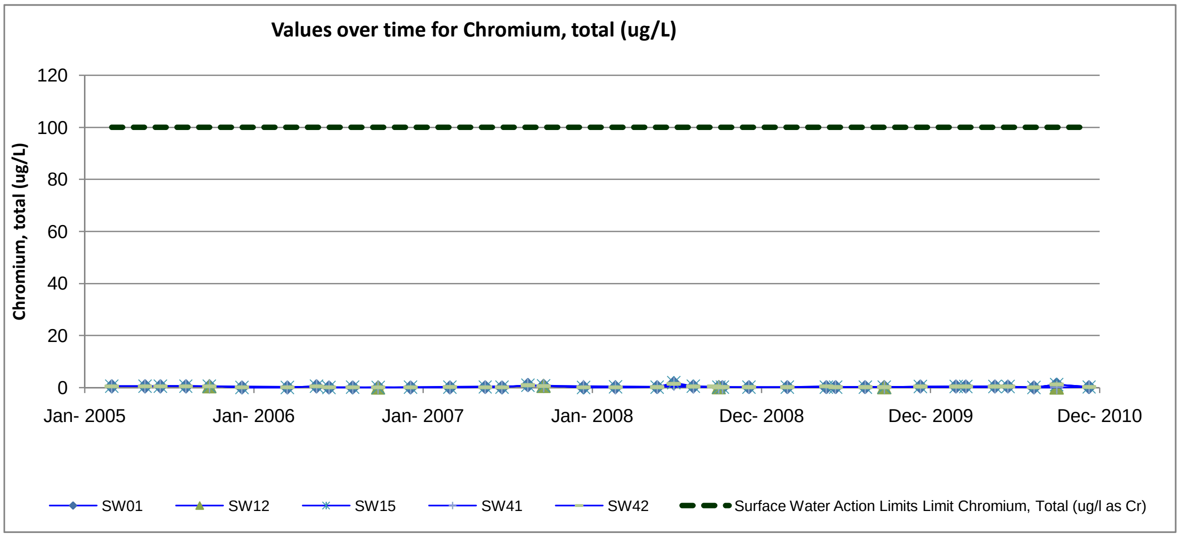

Values over time for Aluminum, dissolved (ug/L)
Aluminum, dissolved (ug/L)
0
10
20
30
40
50
60
70
80
90
100
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42

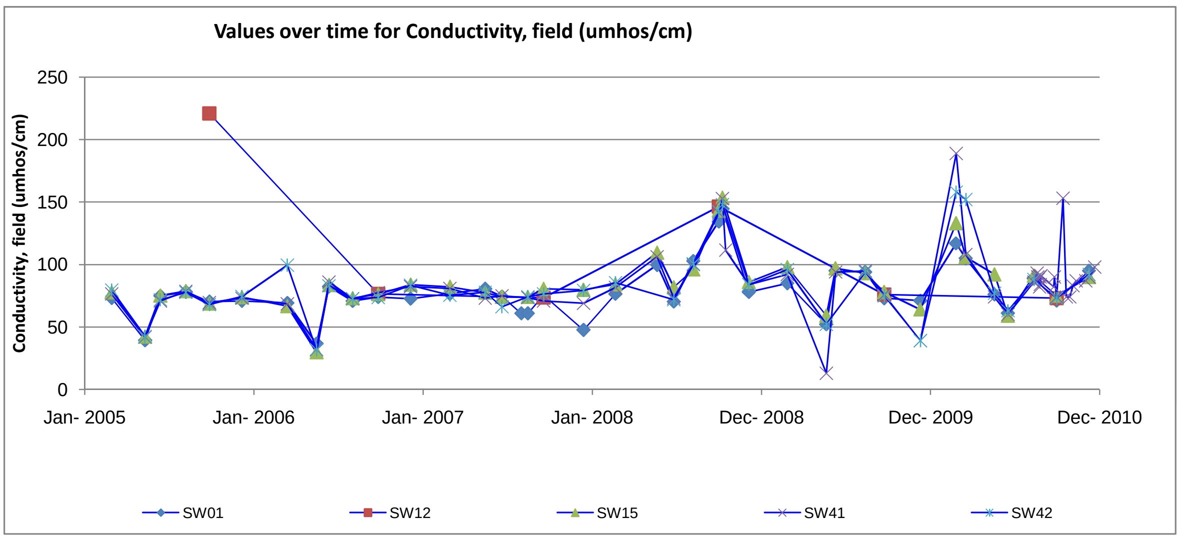

Values over time for Antimony, dissolved (ug/L)
Antimony, dissolved (ug/L)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42

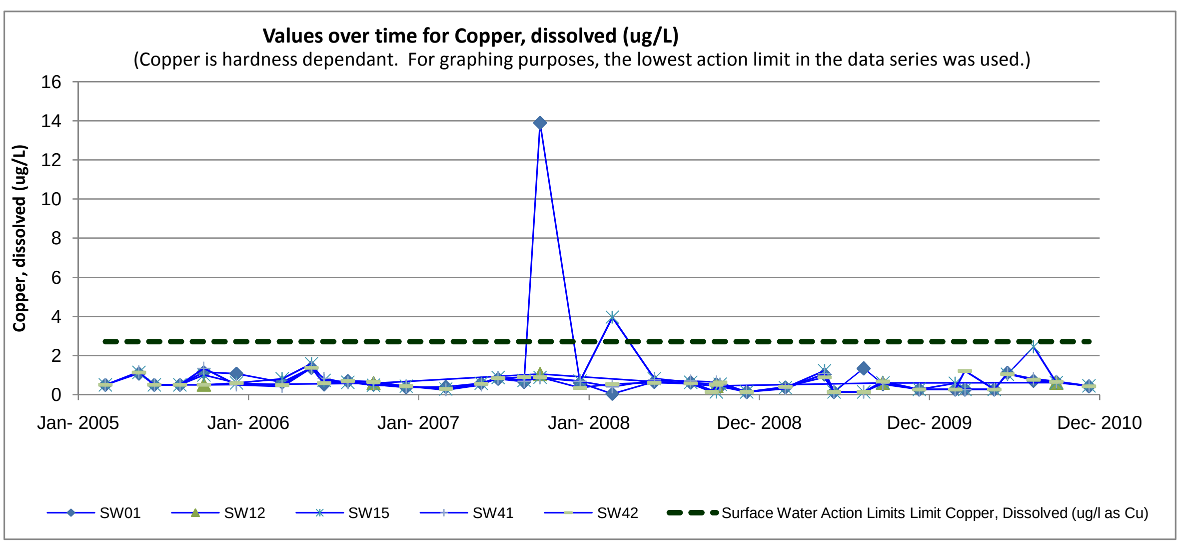

Values over time for Arsenic, total (ug/L)
Arsenic, total (ug/L)
60
50
40
30
20
10
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Arsenic, Total (ug/l as As)


Values over time for Cadmium, dissolved (ug/L)
(Cadmium is hardness dependant. For graphing purposes the lowest value in the data series was used fo the action limit.)
Cadmium, dissolved (ug/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Cadmium, Dissolved (ug/l as Cd)

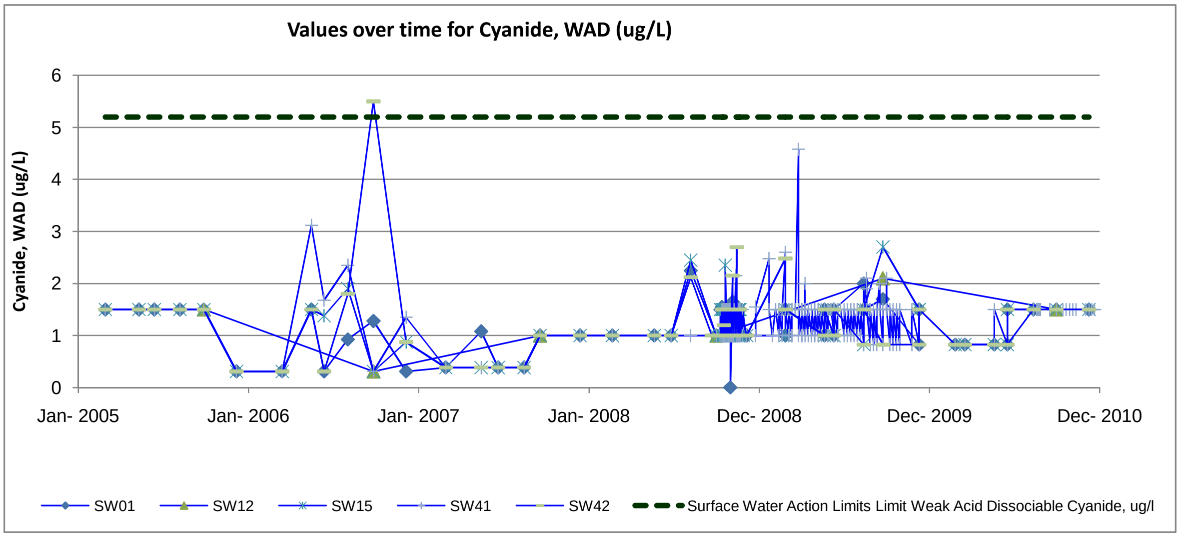

Values over time for Chloride (mg/L)
Chloride (mg/L)
250
200
150
100
50
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Chloride,Total in Water mg/l

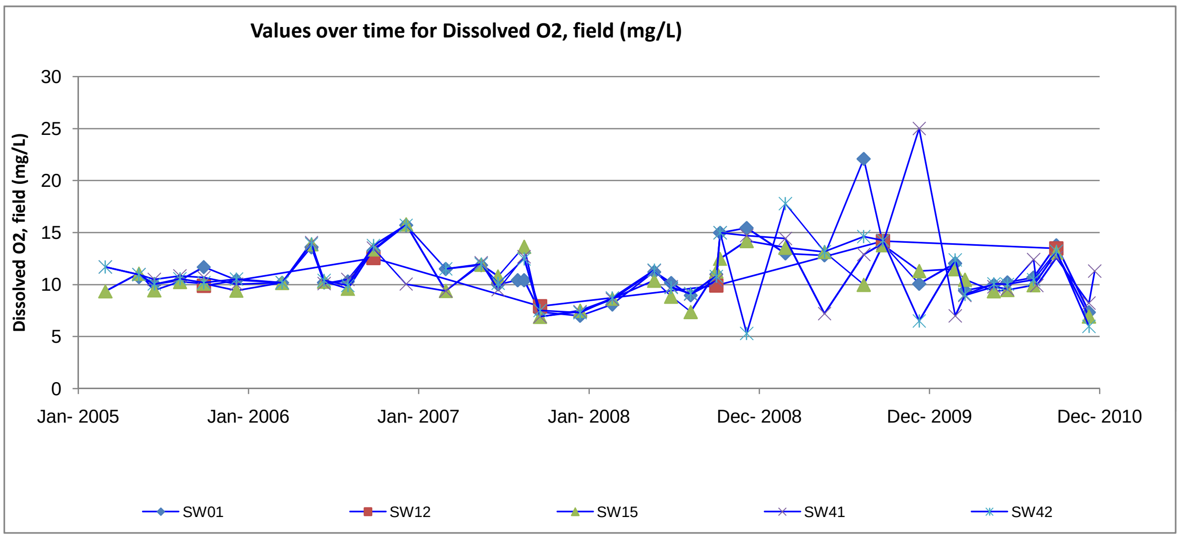

Values over time for Chromium, total (ug/L)
Chromium, total (ug/L)
120
100
80
60
40
20
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Chromium, Total (ug/l as Cr)

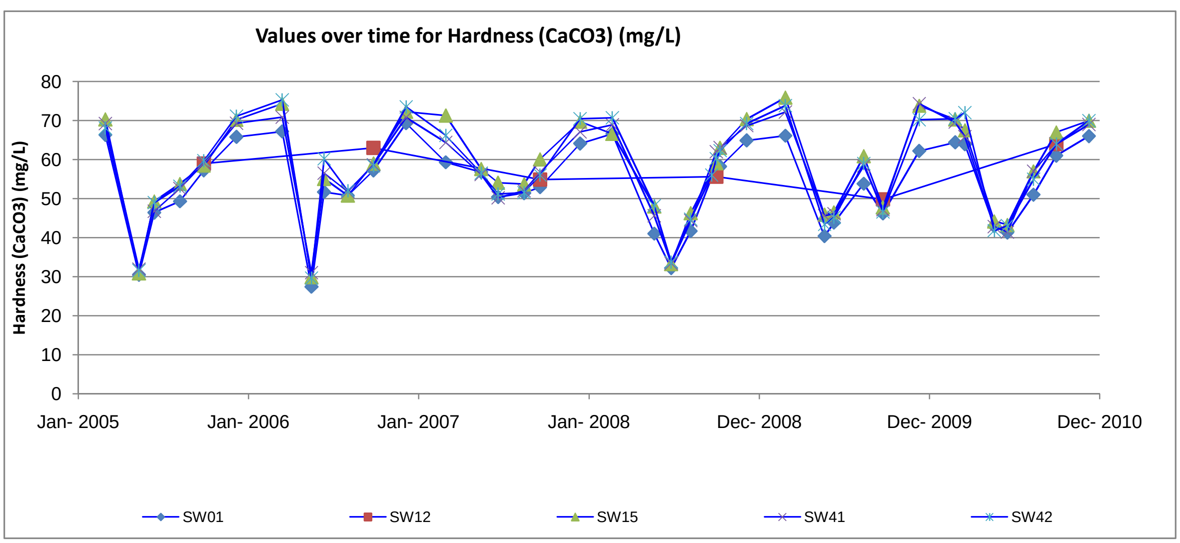

Values over time for Conductivity, field (umhos/cm)
Conductivity, field (umhos/cm)
250
200
150
100
50
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42


Values over time for Copper, dissolved (ug/L)
(Copper is hardness dependant. For graphing purposes, the lowest action limit in the data series was used.)
Copper, dissolved (ug/L)
16
14
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Copper, Dissolved (ug/l as Cu)

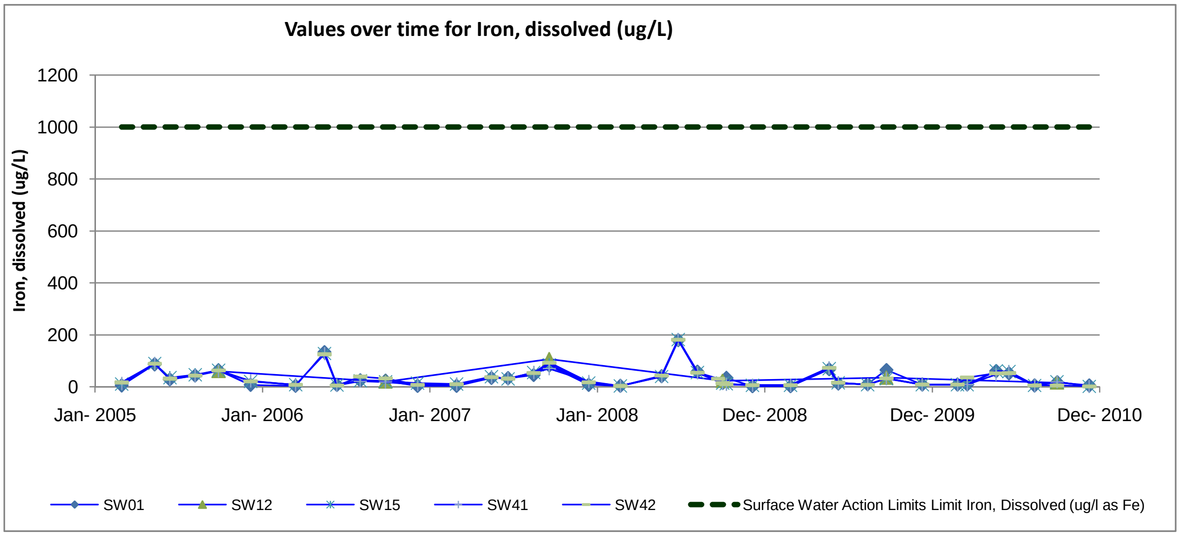
Time Series for Receiving Environment

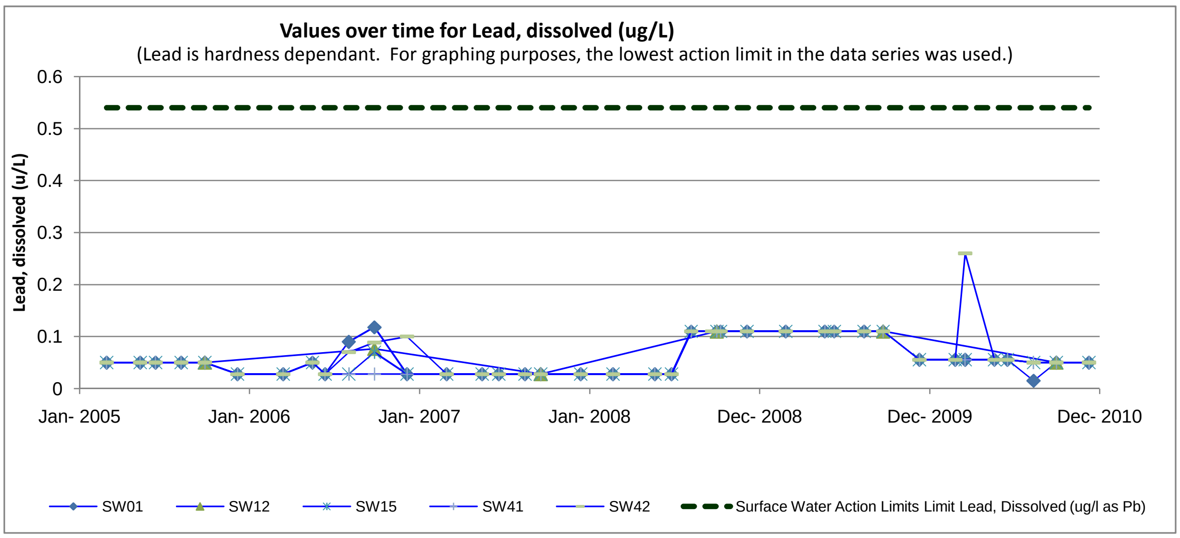


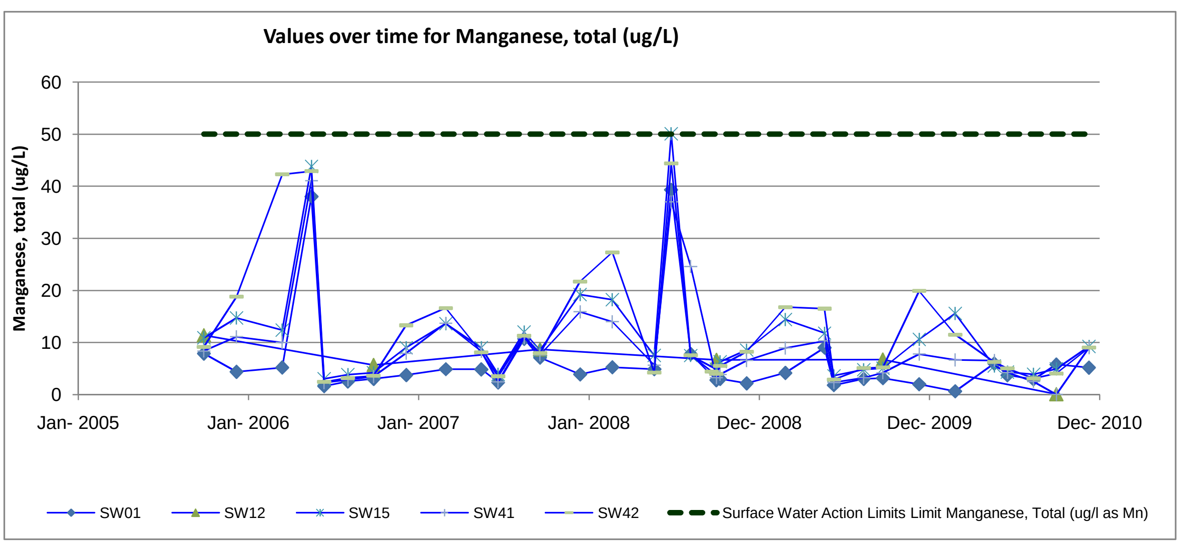


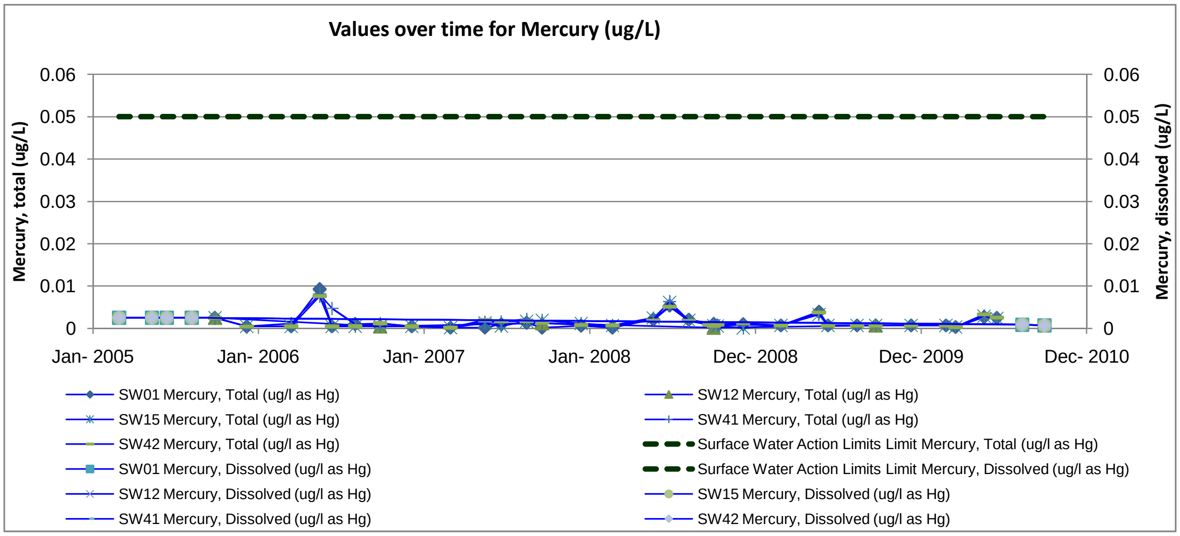


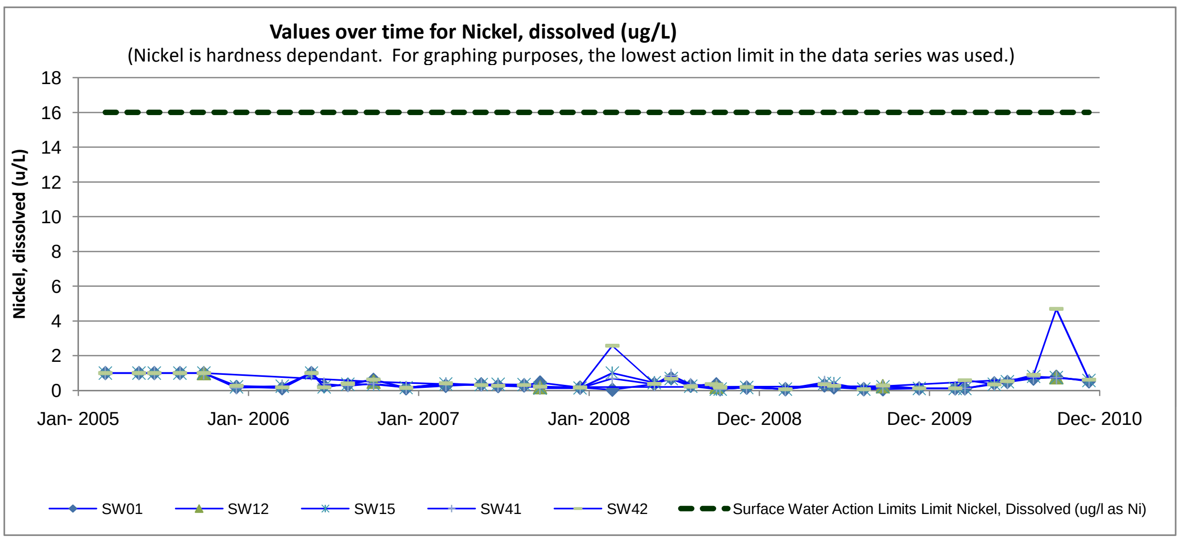
Time Series for Receiving Environment

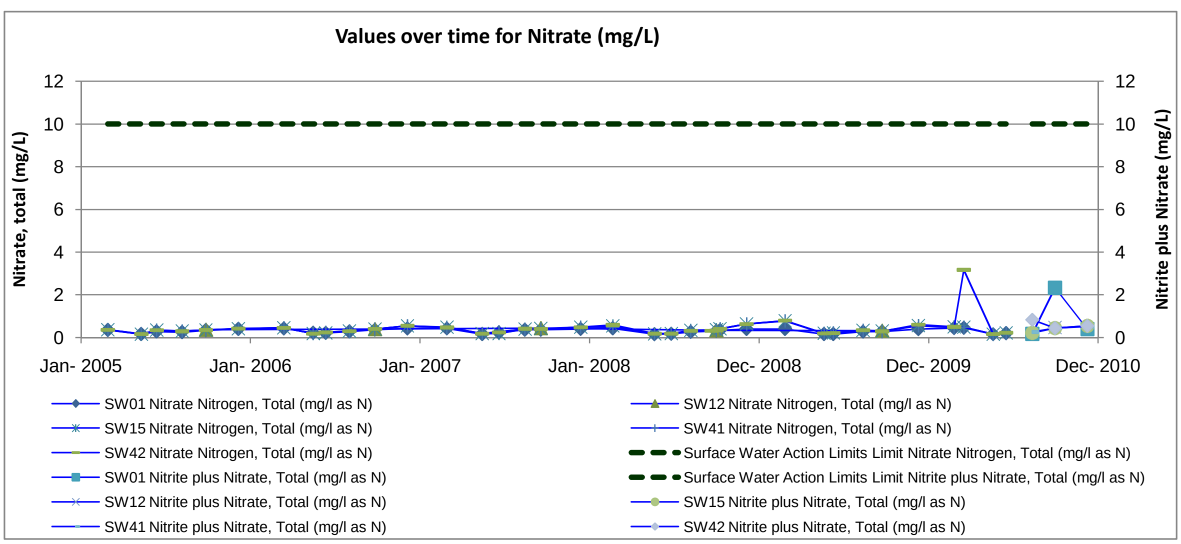


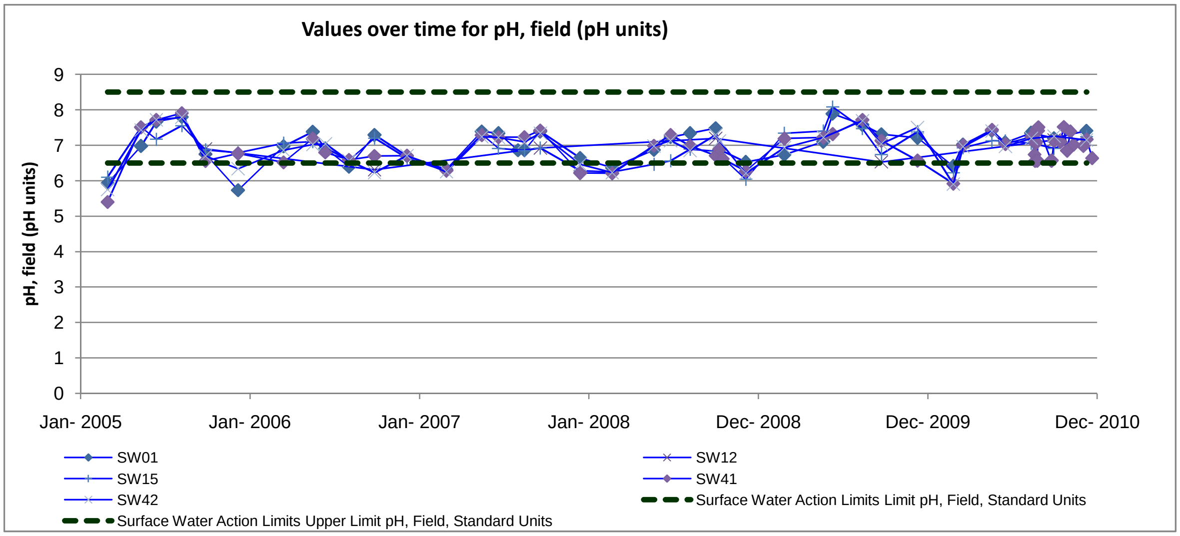


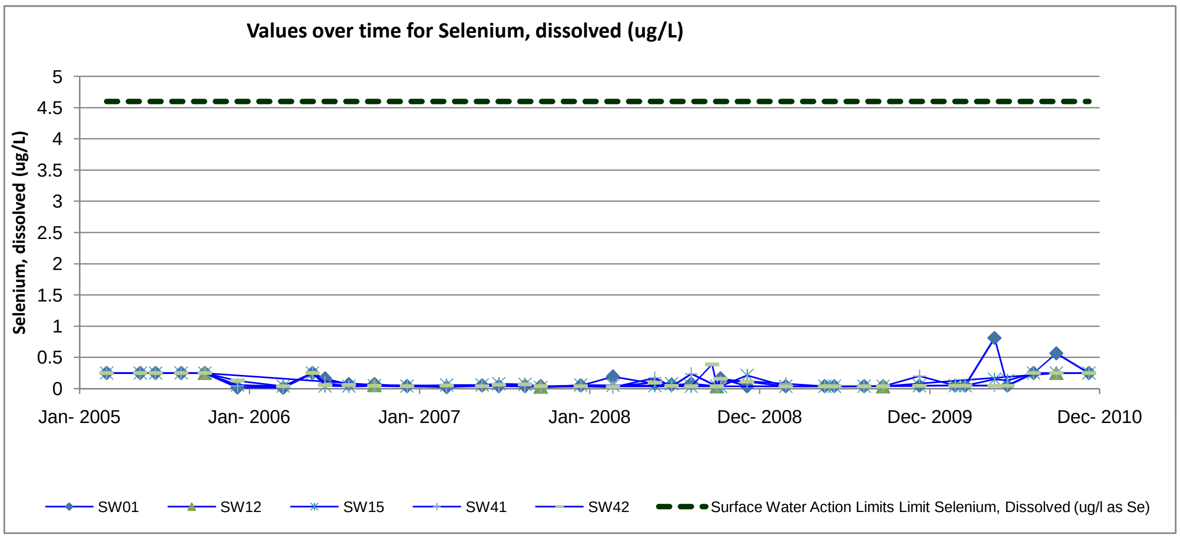


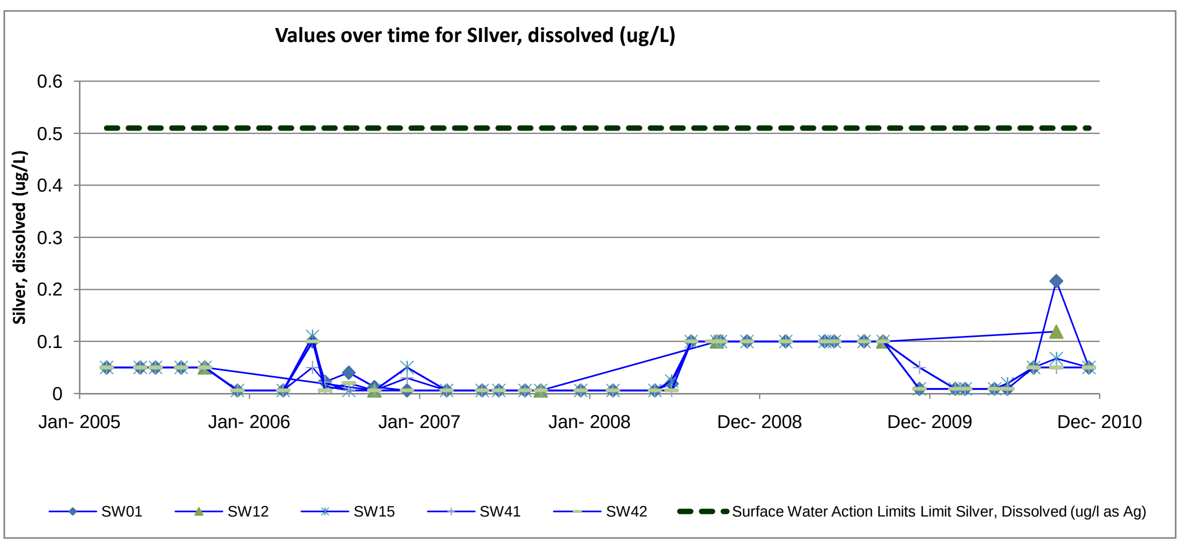

Values over time for Mercury (ug/L)
Mercury, total (ug/L)
Mercury, dissolved (ug/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01 Mercury, Total (ug/l as Hg)
SW12 Mercury, Total (ug/l as Hg)
SW15 Mercury, Total (ug/l as Hg)
SW41 Mercury, Total (ug/l as Hg)
SW42 Mercury, Total (ug/l as Hg)
Surface Water Action Limits Limit Mercury, Total (ug/l as Hg)
SW01 Mercury, Dissolved (ug/l as Hg)
Surface Water Action Limits Limit Mercury, Dissolved (ug/l as Hg)
SW12 Mercury, Dissolved (ug/l as Hg)
SW15 Mercury, Dissolved (ug/l as Hg)
SW41 Mercury, Dissolved (ug/l as Hg)
SW42 Mercury, Dissolved (ug/l as Hg)

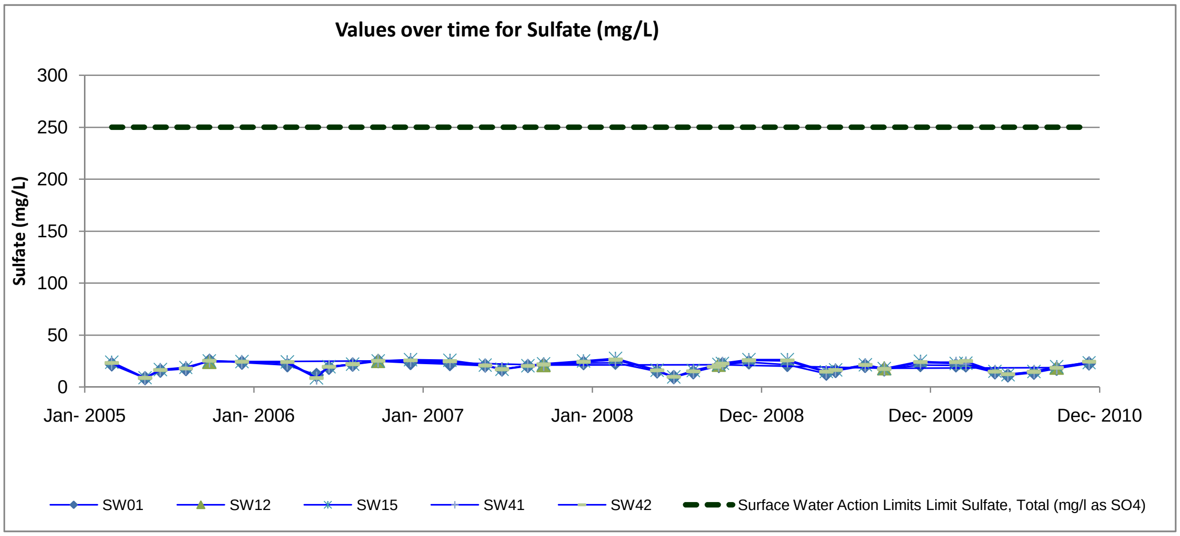

Values over time for Nickel, dissolved (ug/L)
(Nickel is hardness dependant. For graphing purposes, the lowest action limit in the data series was used.)
Nickel, dissolved (u/L)
18
16
14
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Nickel, Dissolved (ug/l as Ni)

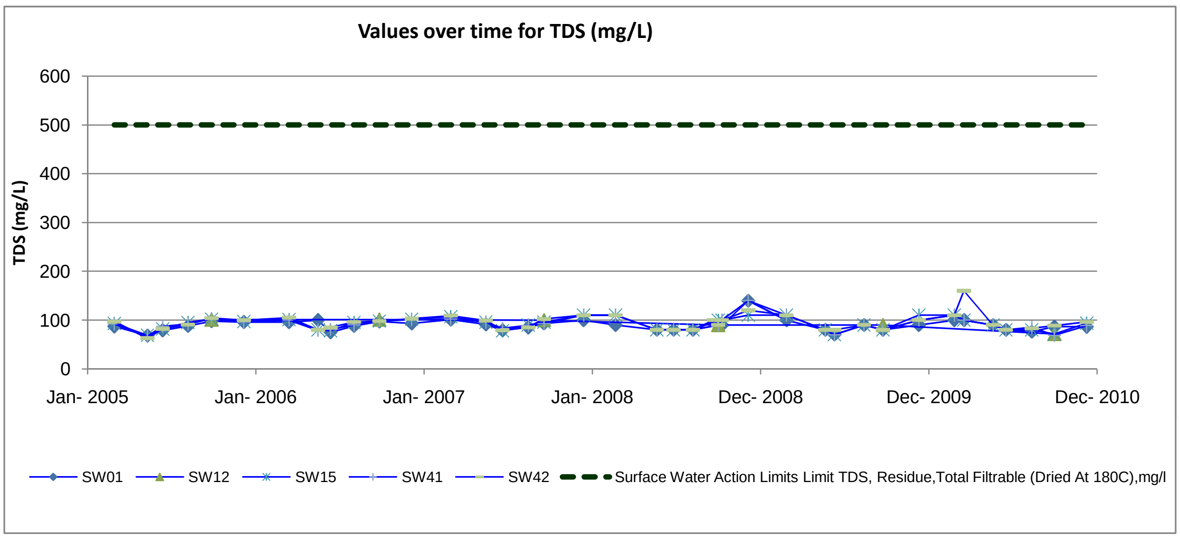

Values over time for Nitrate (mg/L)
Nitrate, total (mg/L)
Nitrite plus Nitrate (mg/L)
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01 Nitrate Nitrogen, Total (mg/l as N)
SW12 Nitrate Nitrogen, Total (mg/l as N)
SW15 Nitrate Nitrogen, Total (mg/l as N)
SW41 Nitrate Nitrogen, Total (mg/l as N)
SW42 Nitrate Nitrogen, Total (mg/l as N)
Surface Water Action Limits Limit Nitrate Nitrogen, Total (mg/l as N)
SW01 Nitrite plus Nitrate, Total (mg/l as N)
Surface Water Action Limits Limit Nitrite plus Nitrate, Total (mg/l as N)
SW12 Nitrite plus Nitrate, Total (mg/l as N)
SW15 Nitrite plus Nitrate, Total (mg/l as N)
SW41 Nitrite plus Nitrate, Total (mg/l as N)
SW42 Nitrite plus Nitrate, Total (mg/l as N)

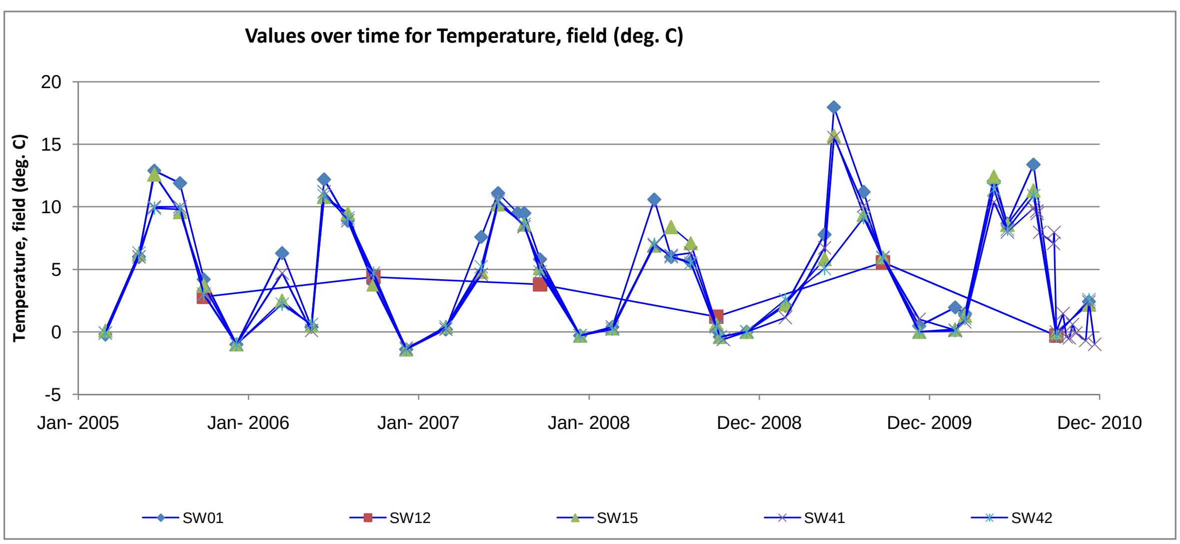

Values over time for pH, field (pH units)
pH, field (pH units)
9
8
7
6
5
4
3
2
1
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit pH, Field, Standard Units
Surface Water Action Limits Upper Limit pH, Field, Standard Units


Values over time for Selenium, dissolved (ug/L)
Selenium, dissolved (ug/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Selenium, Dissolved (ug/l as Se)

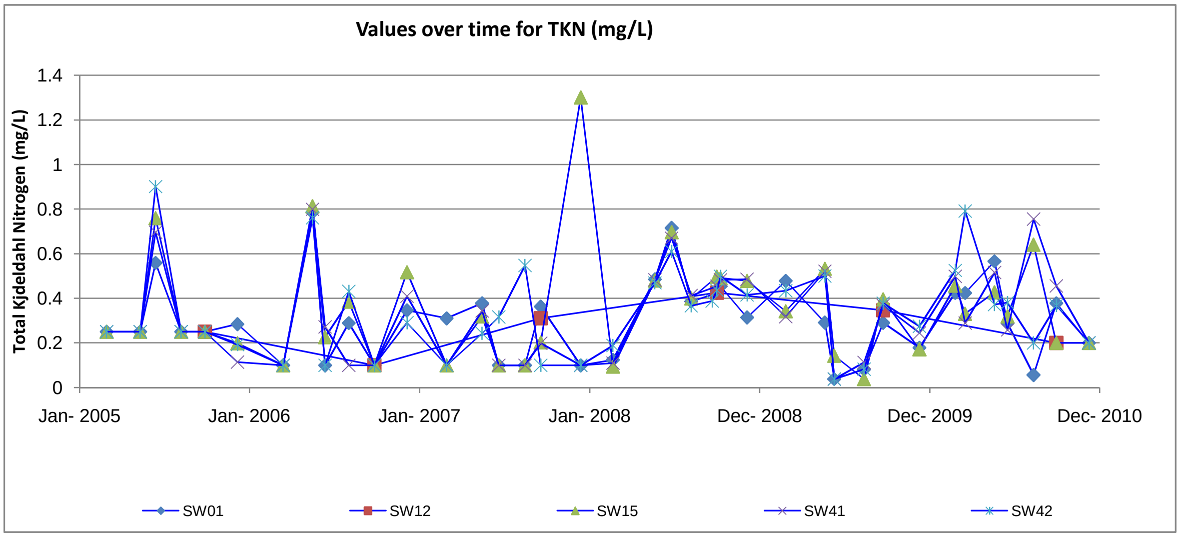

Values over time for SIlver, dissolved (ug/L)
Silver, dissolved (ug/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Silver, Dissolved (ug/l as Ag)

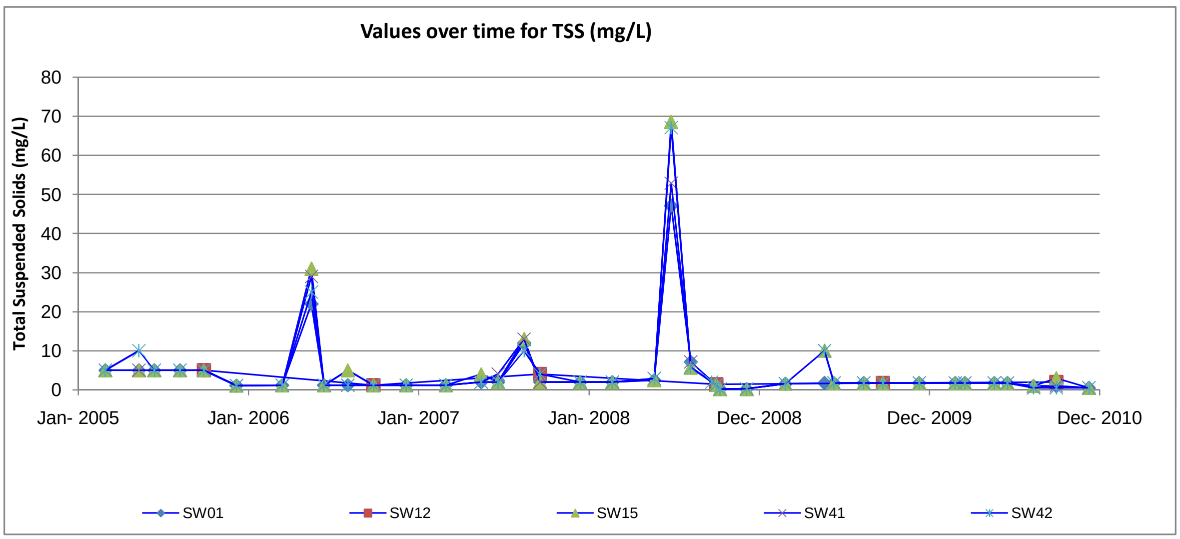

Values over time for Sulfate (mg/L)
Sulfate (mg/L)
300
250
200
150
100
50
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit Sulfate, Total (mg/l as SO4)

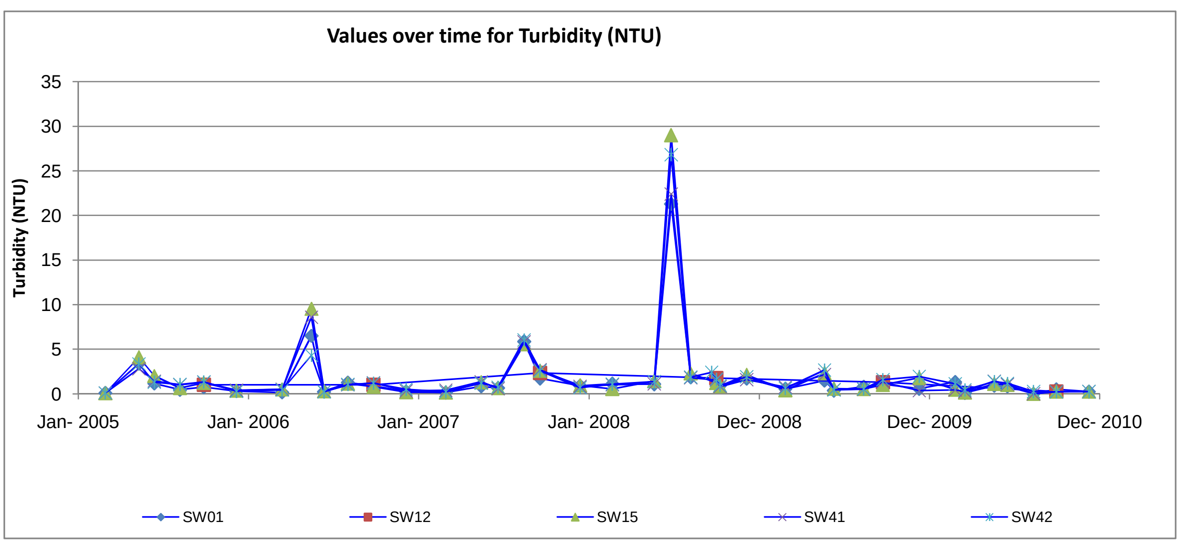

Values over time for TDS (mg/L)
TDS (mg/L)
600
500
400
300
200
100
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42
Surface Water Action Limits Limit TDS, Residue,Total Filtrable (Dried At 180C),mg/l


Values over time for Temperature, field (deg. C)
Temperature, field (deg. C)
20
15
10
5
0
-5
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
SW01
SW12
SW15
SW41
SW42

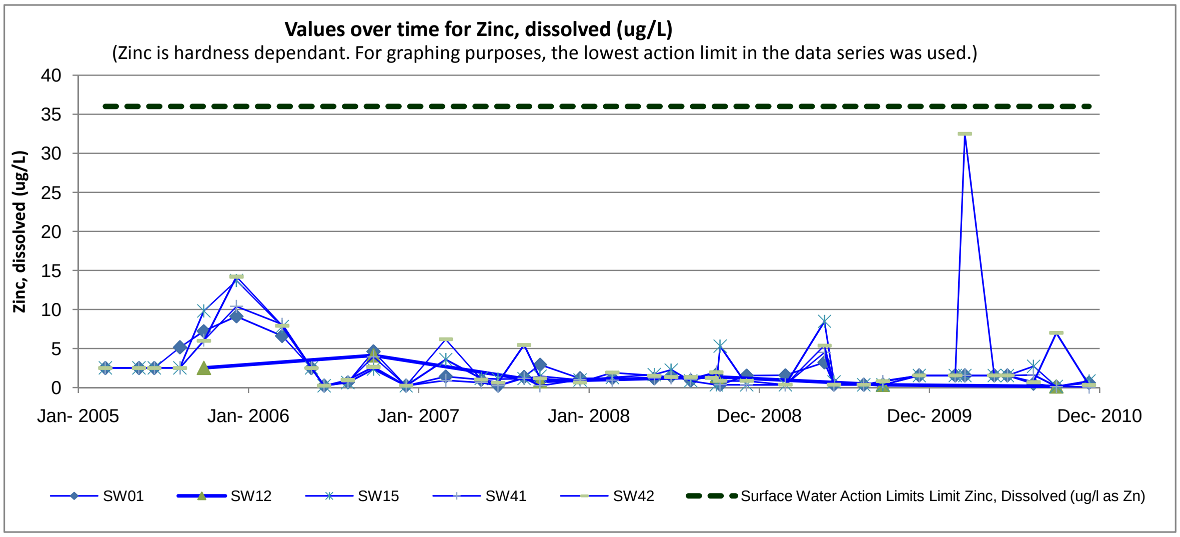
Time Series for Receiving Environment



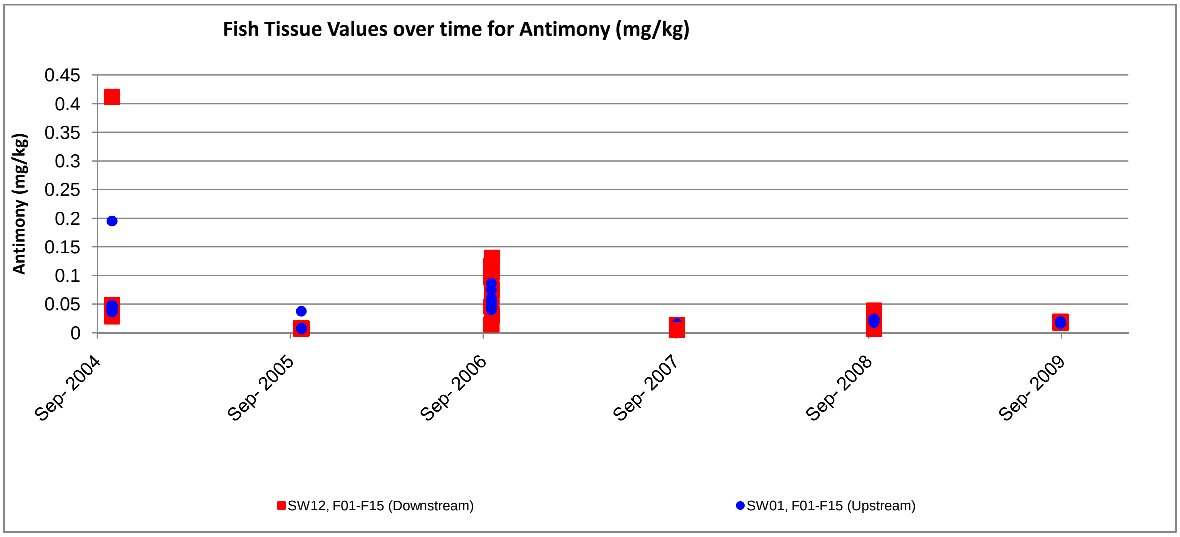


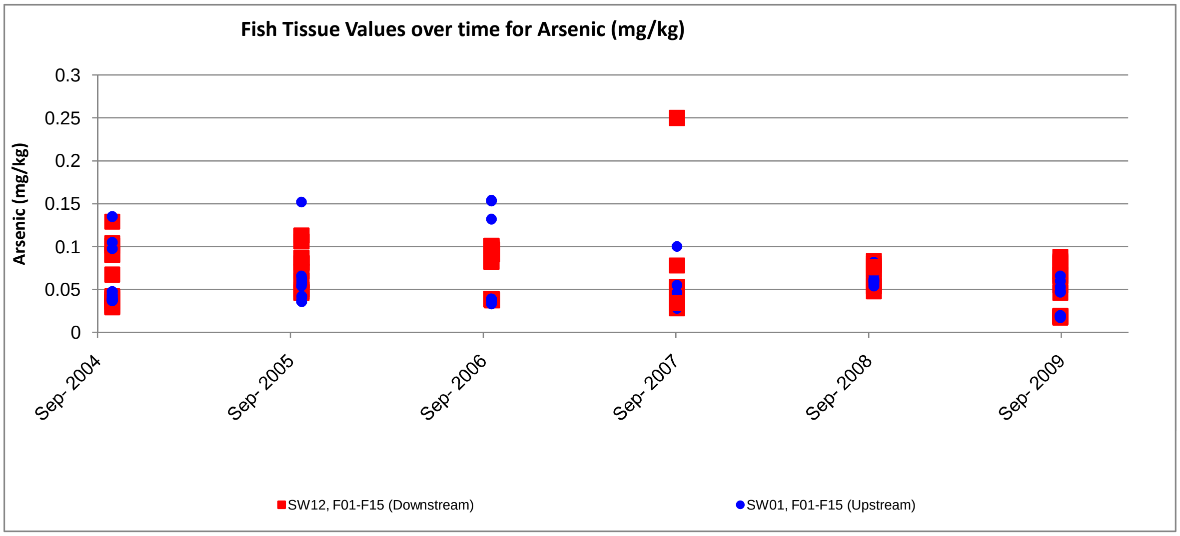


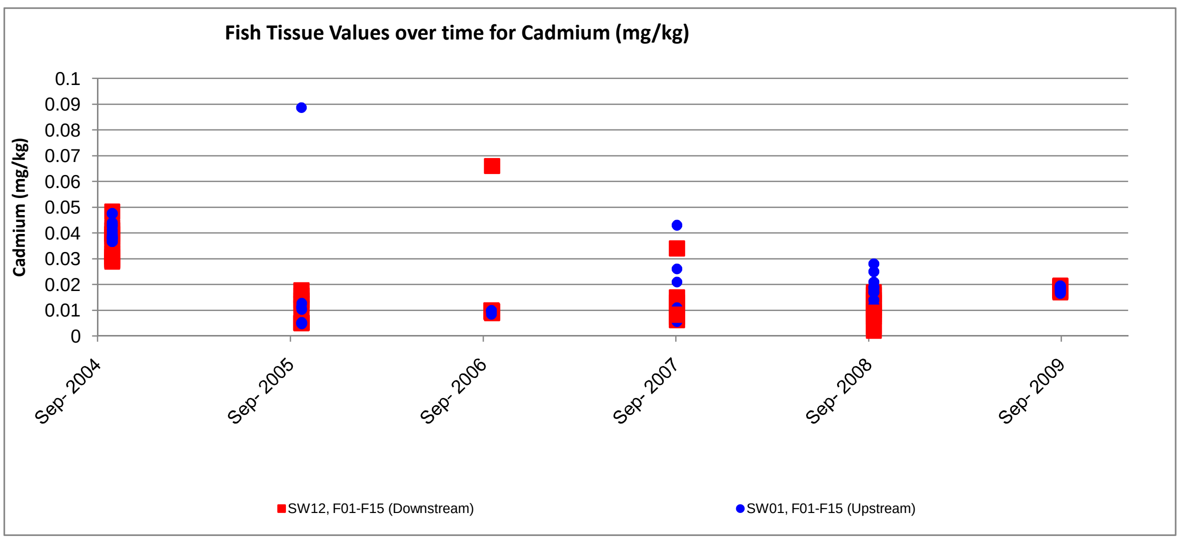
Time Series for Receiving Environment



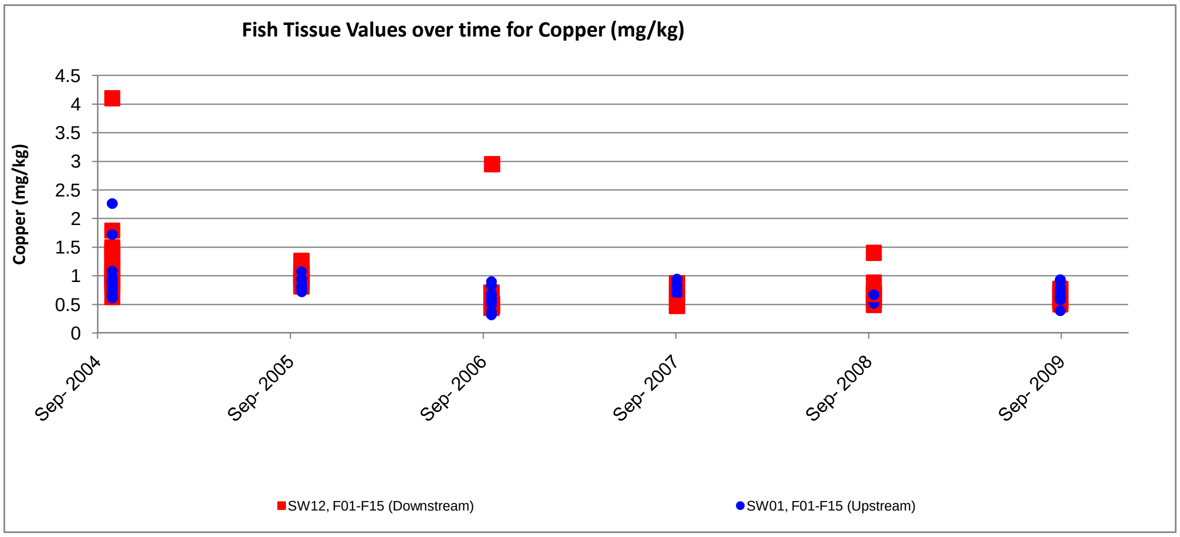
TIme Series for FIsh TIssue Monitoirng Program

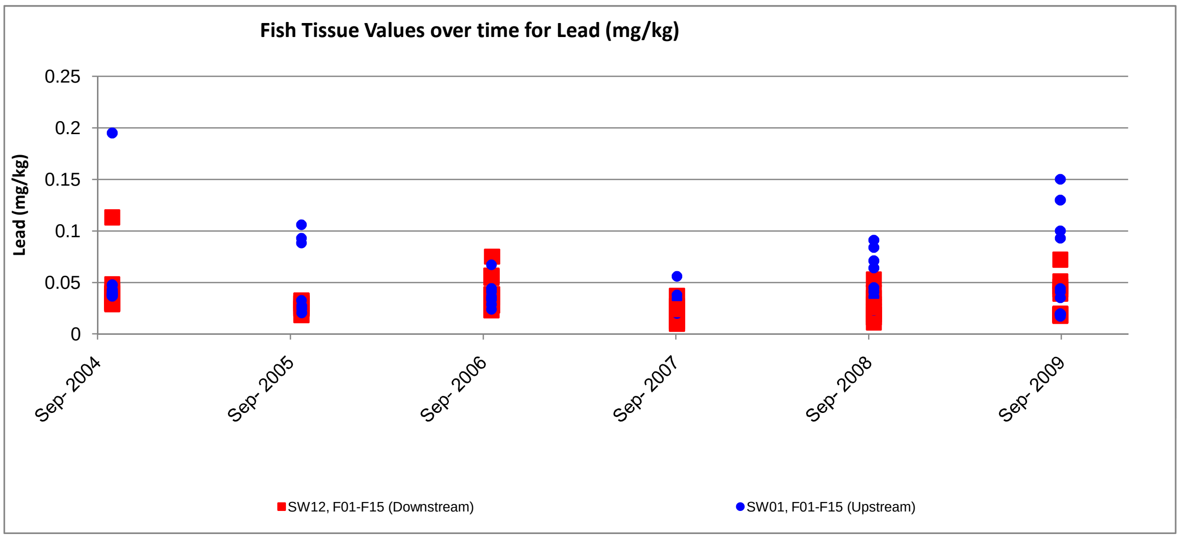


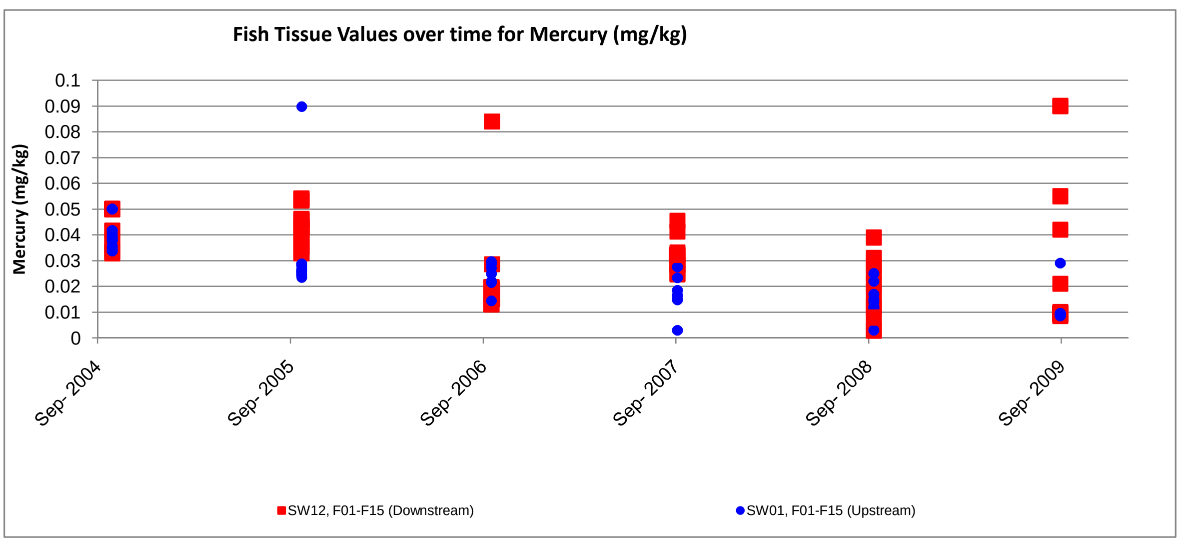




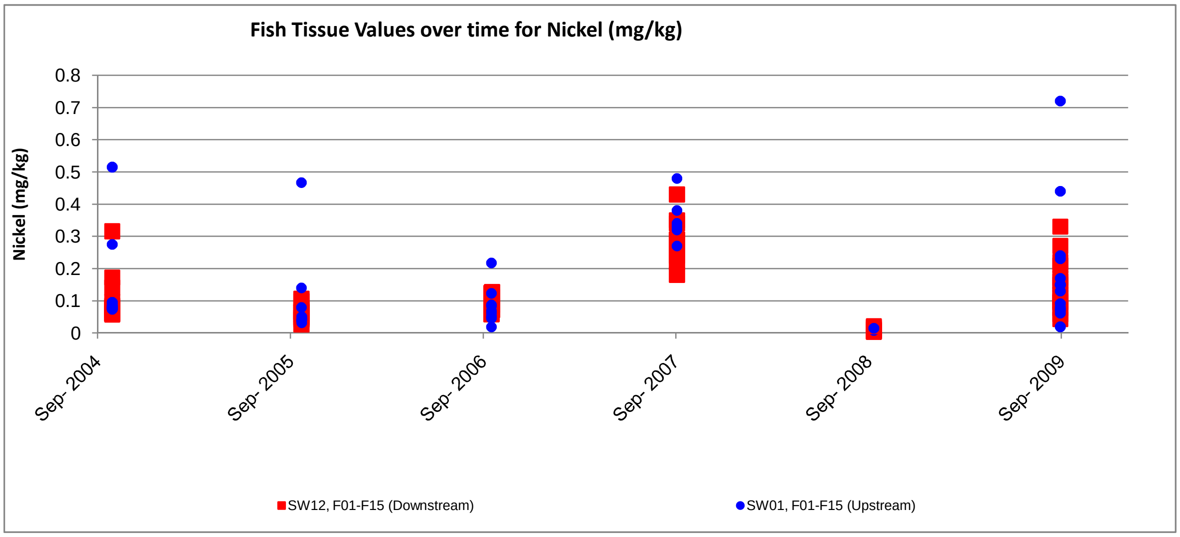
TIme Series for FIsh TIssue Monitoirng Program

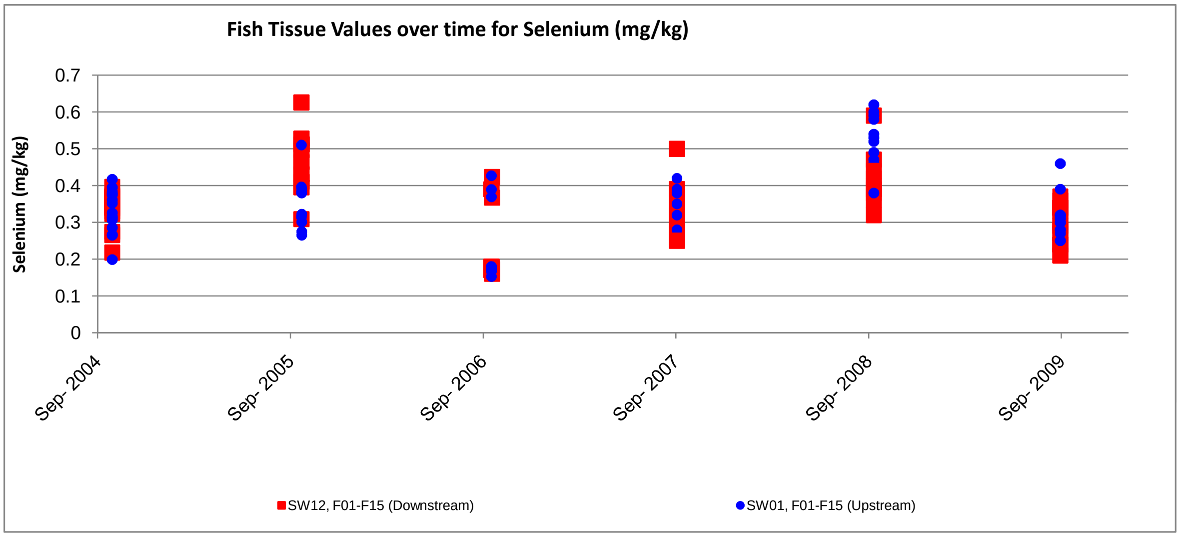


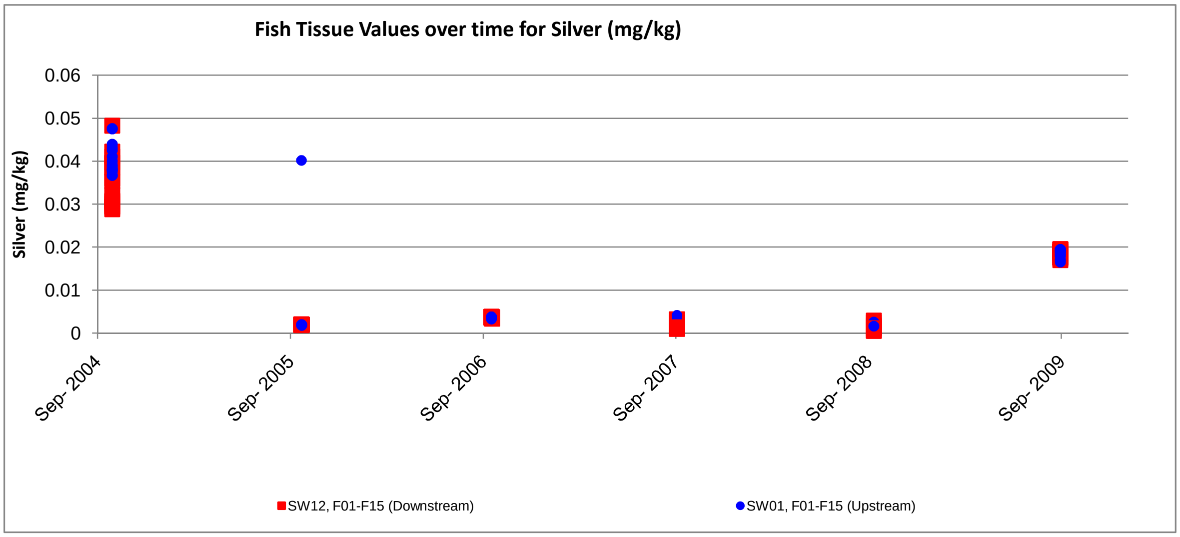




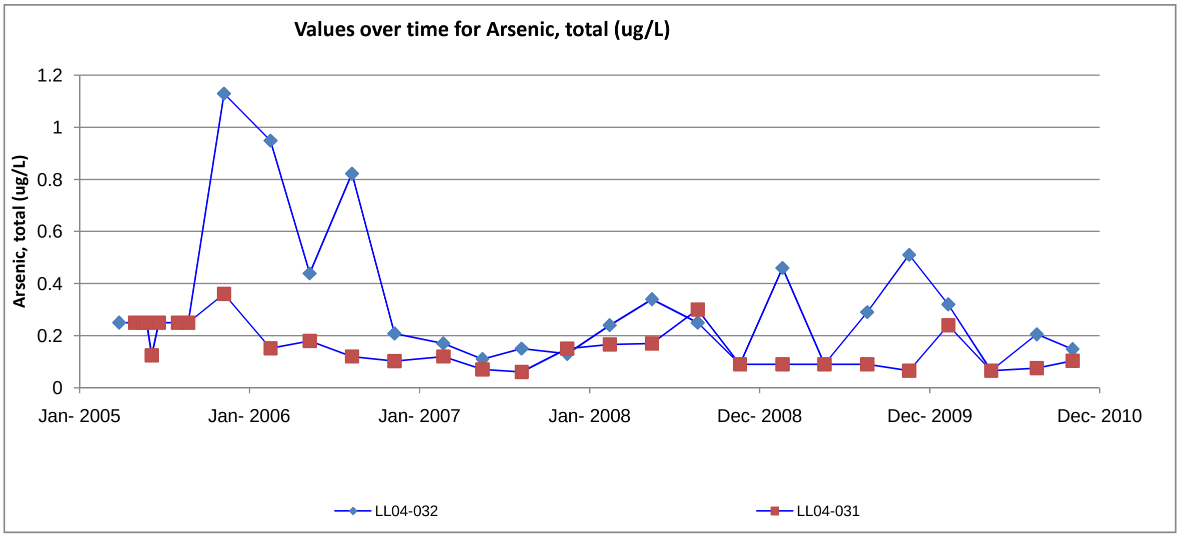
TIme Series for FIsh TIssue Monitoirng Program

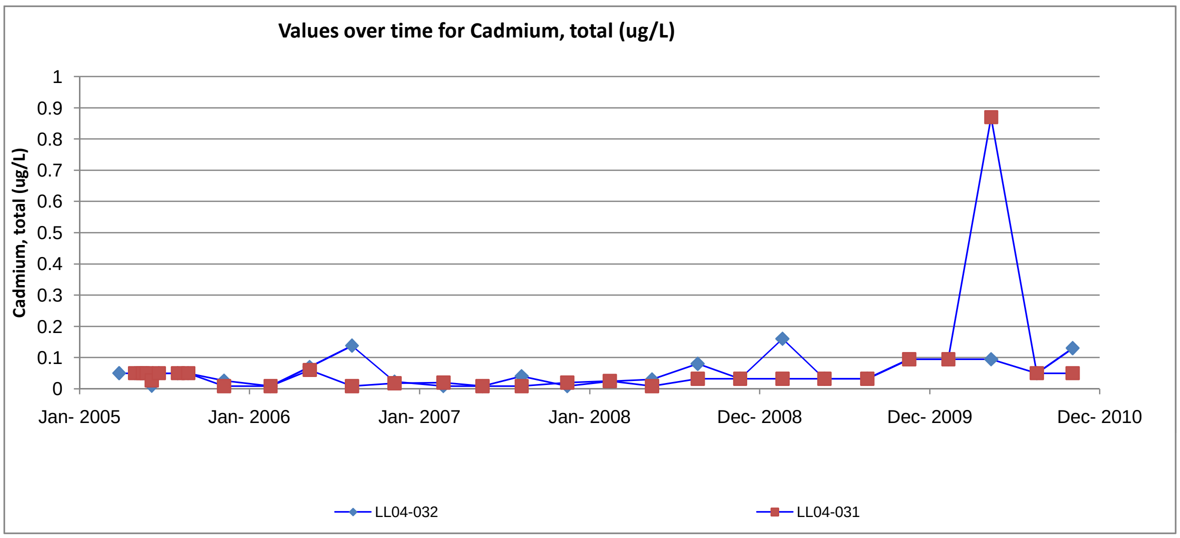


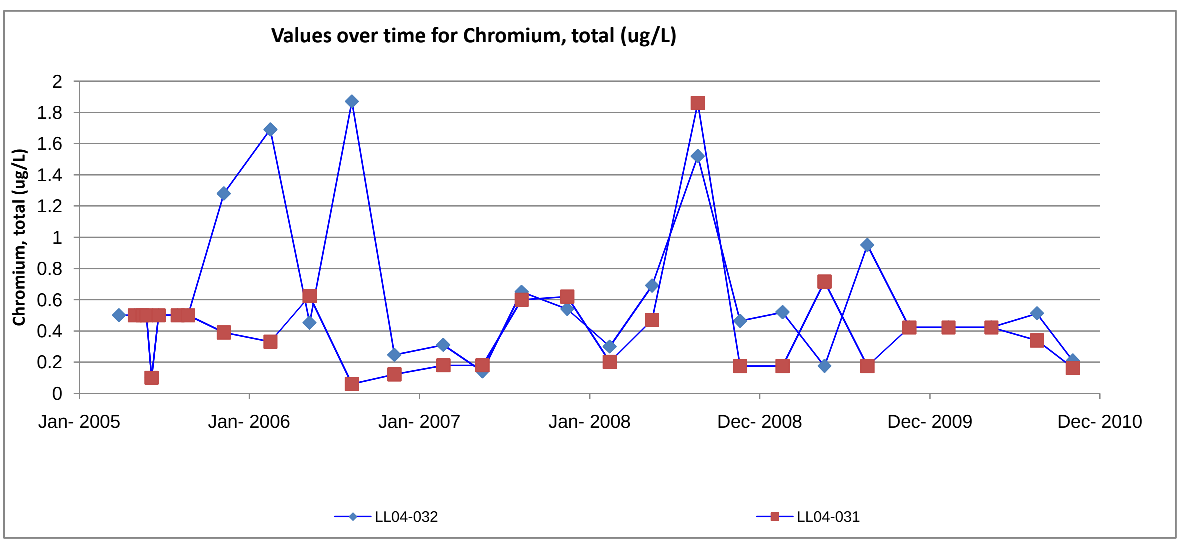




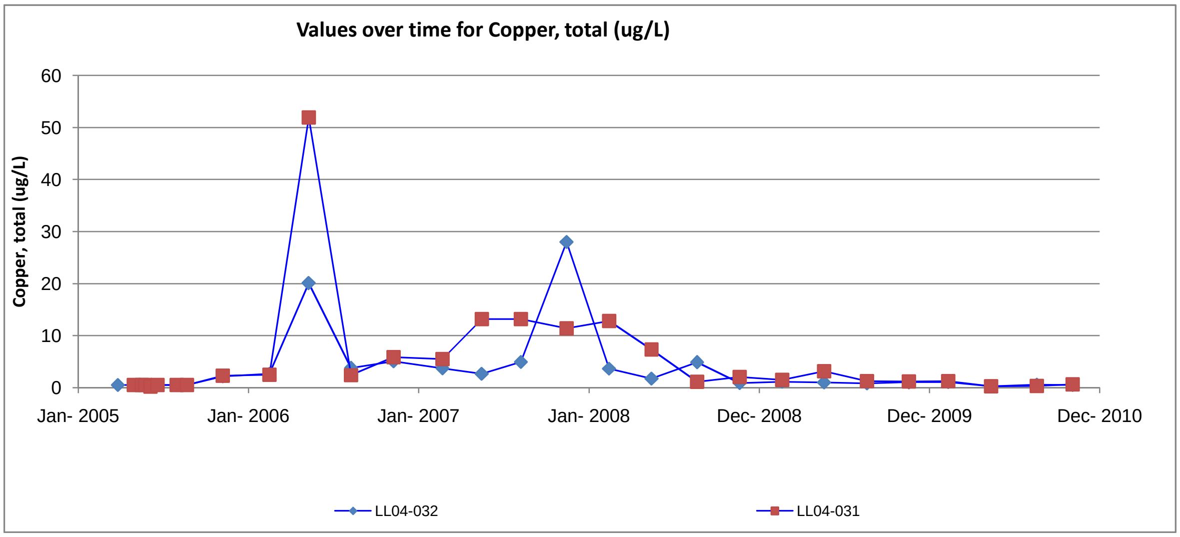
Time Series for Groundwater Monitoring Program

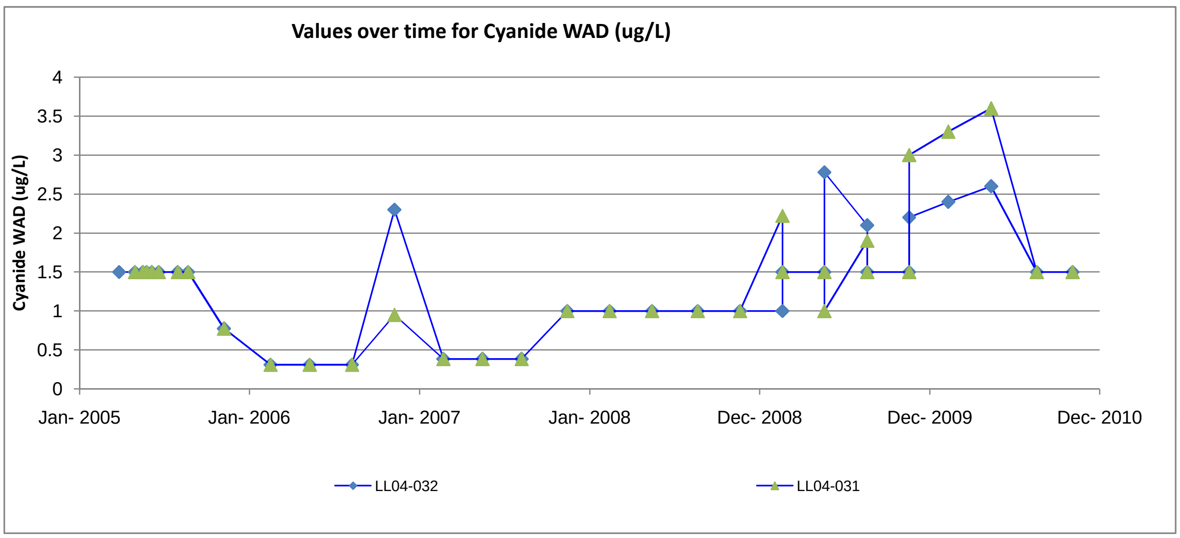


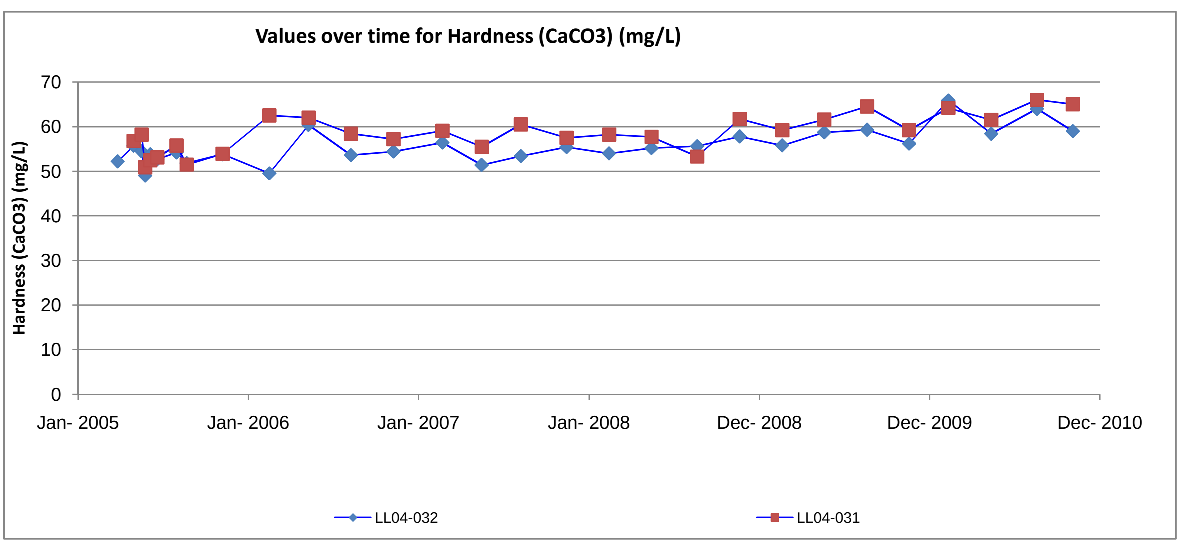




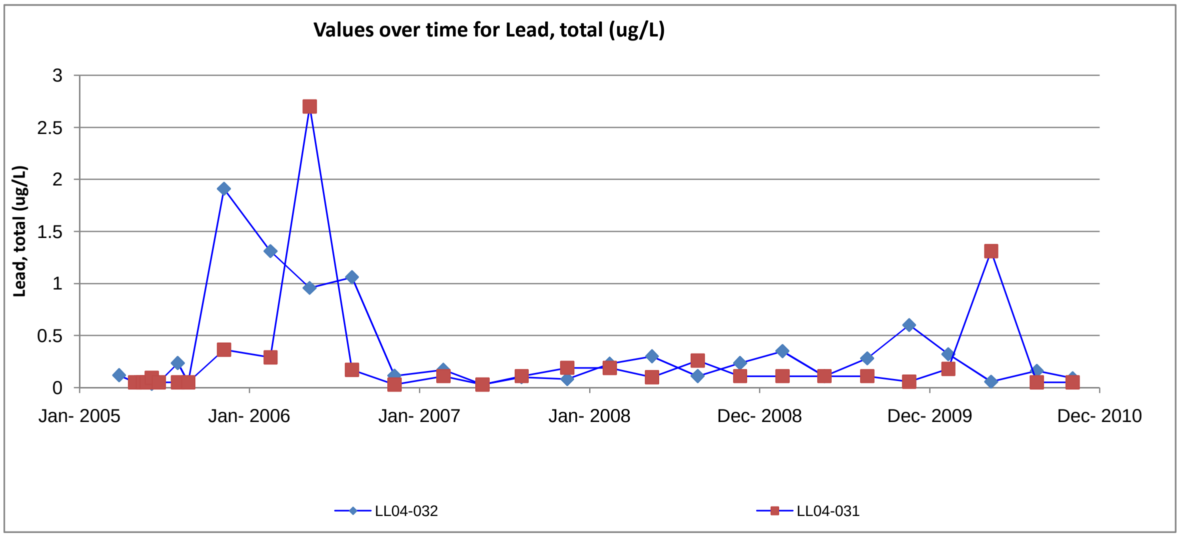
Time Series for Groundwater Monitoring Program

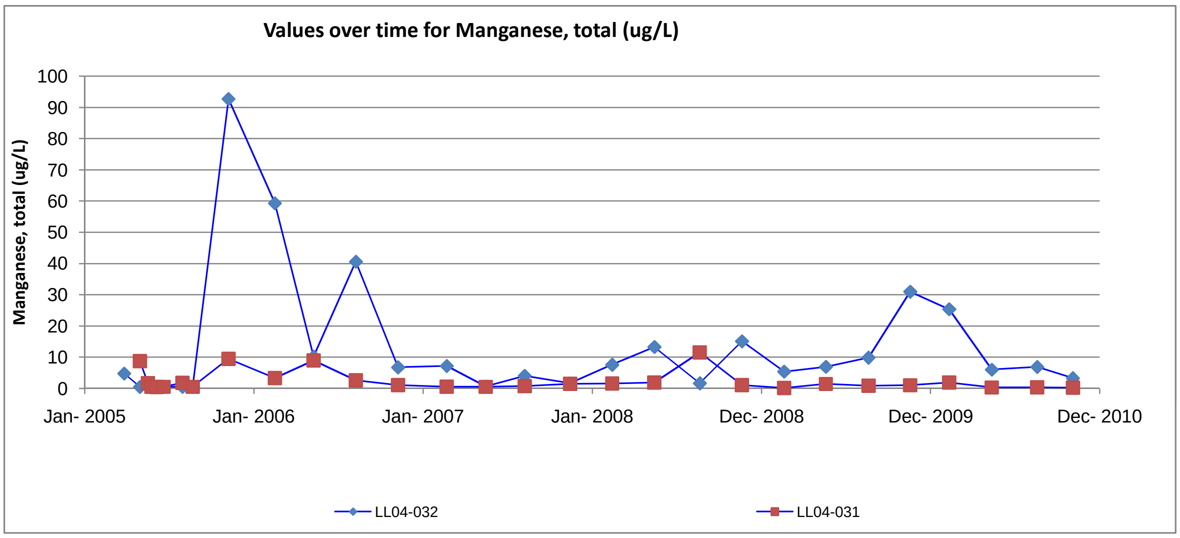


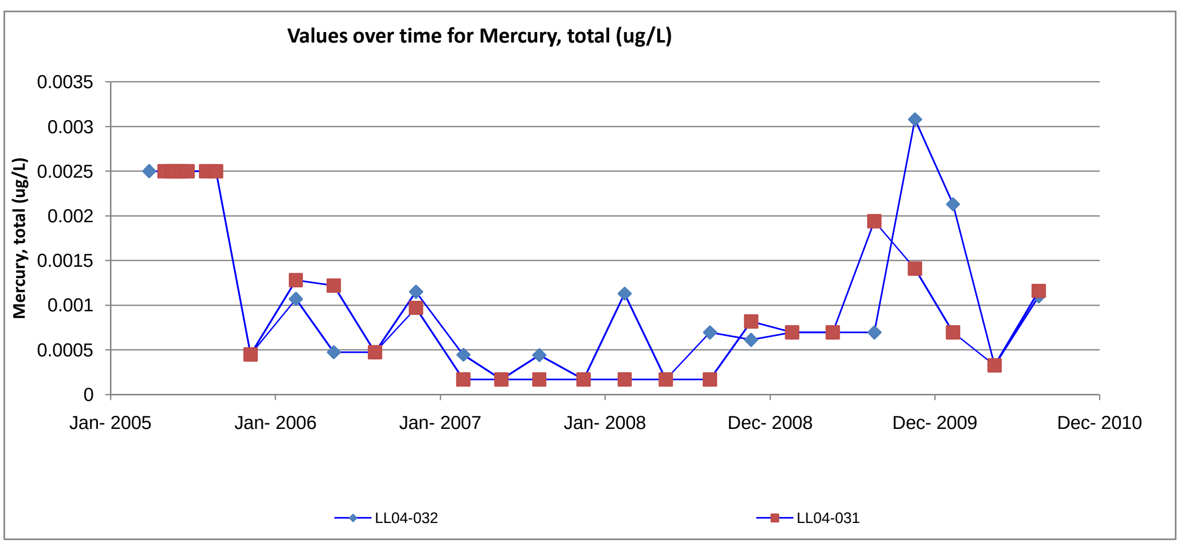




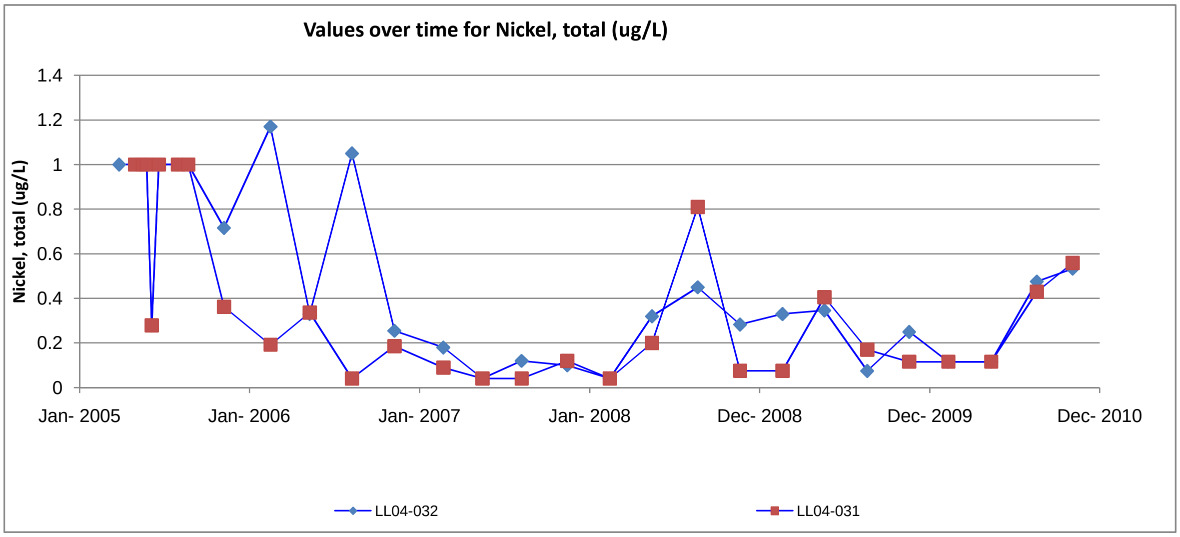
Time Series for Groundwater Monitoring Program

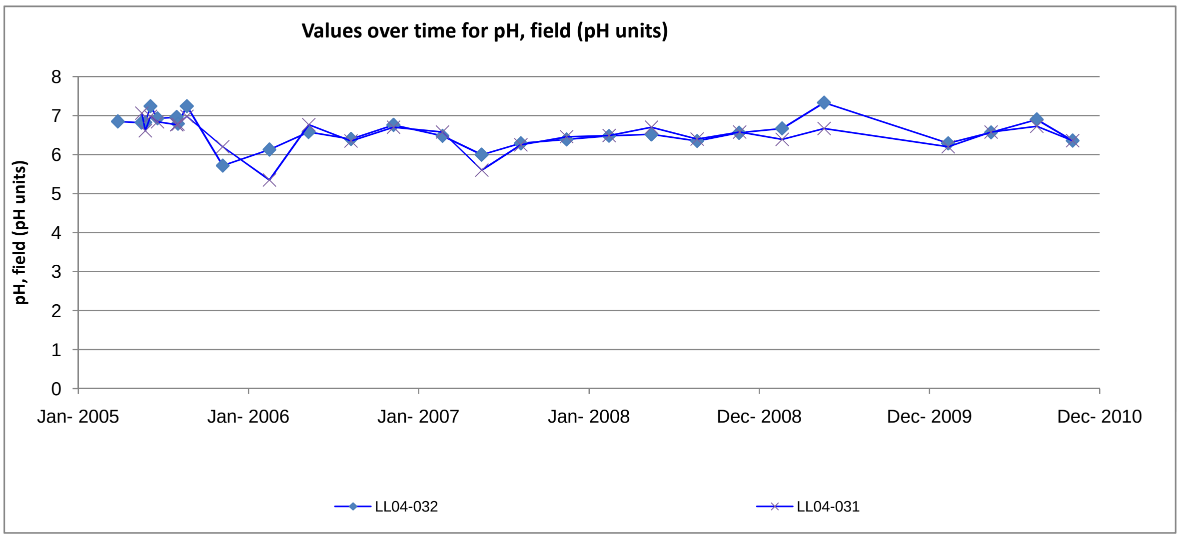


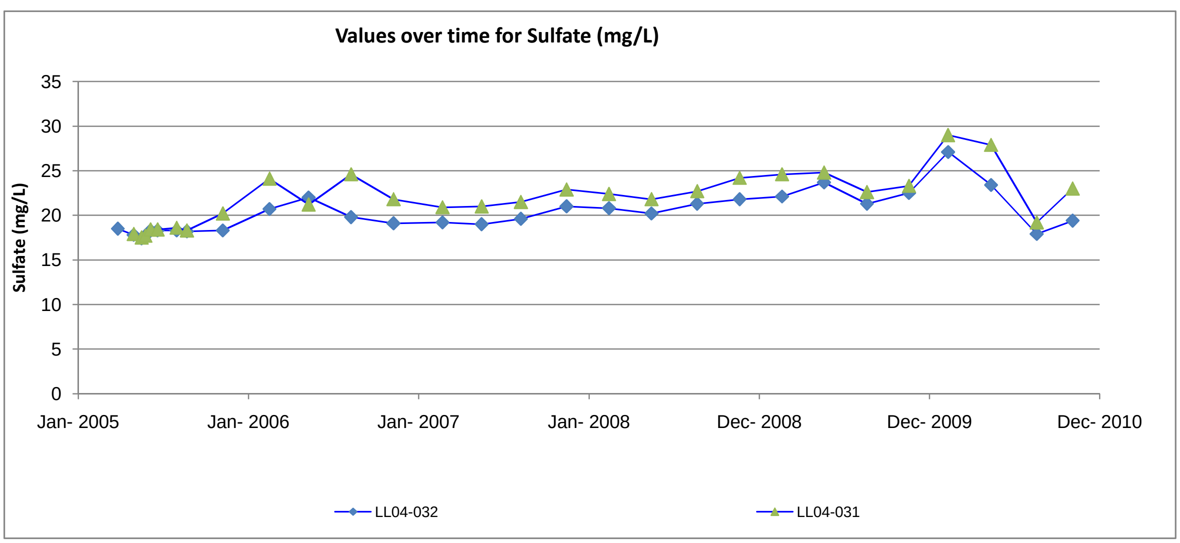




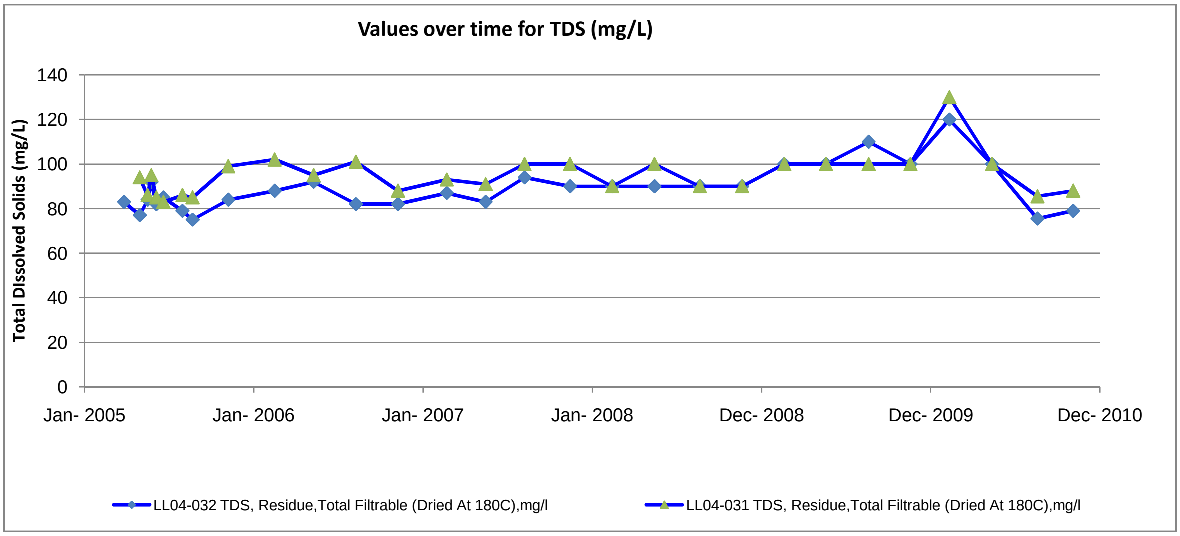
Time Series for Groundwater Monitoring Program

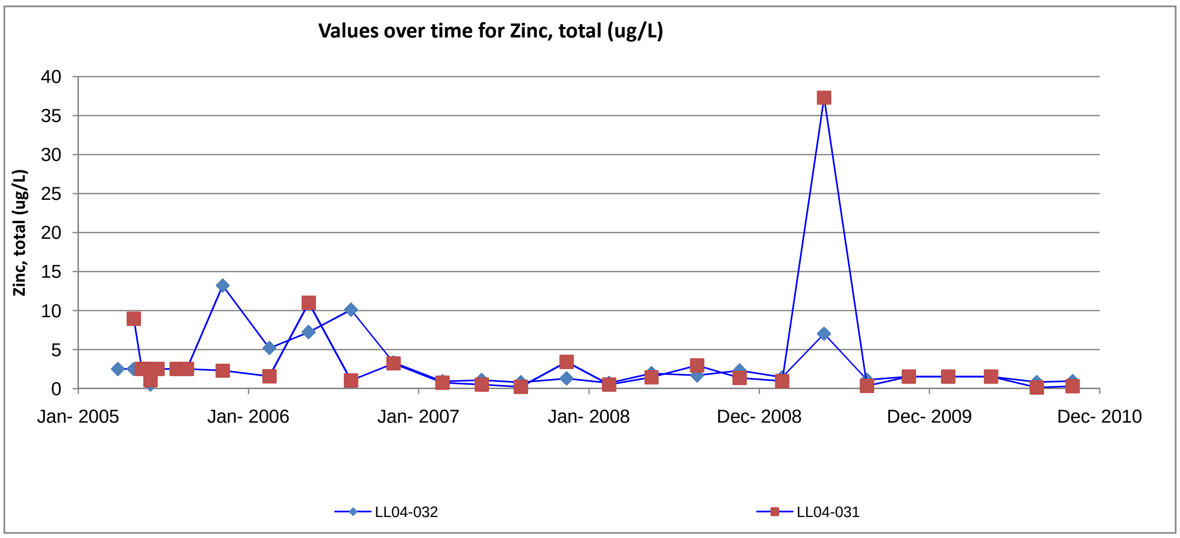


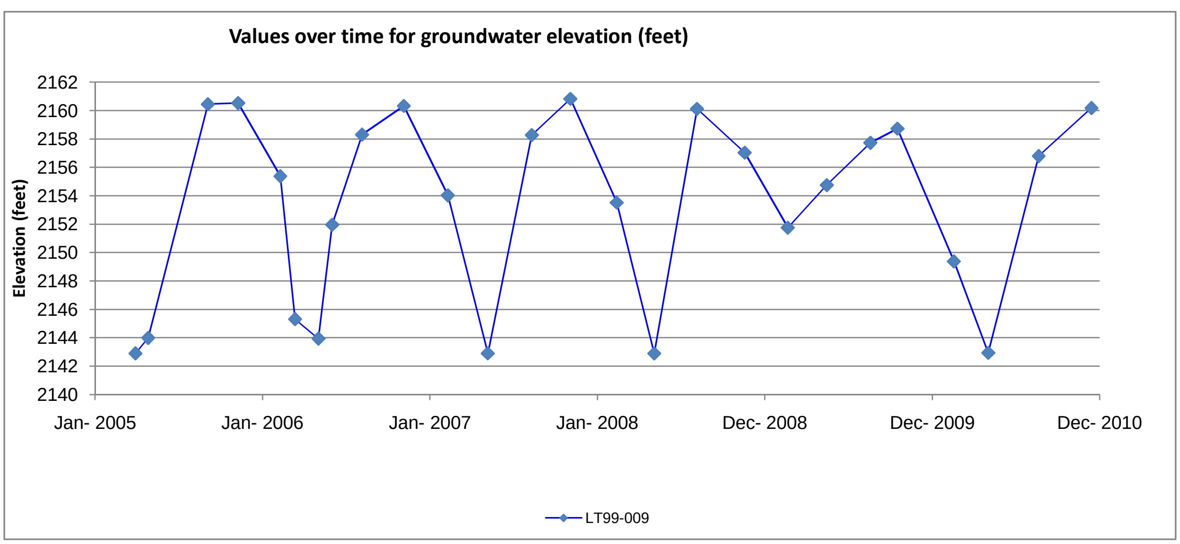




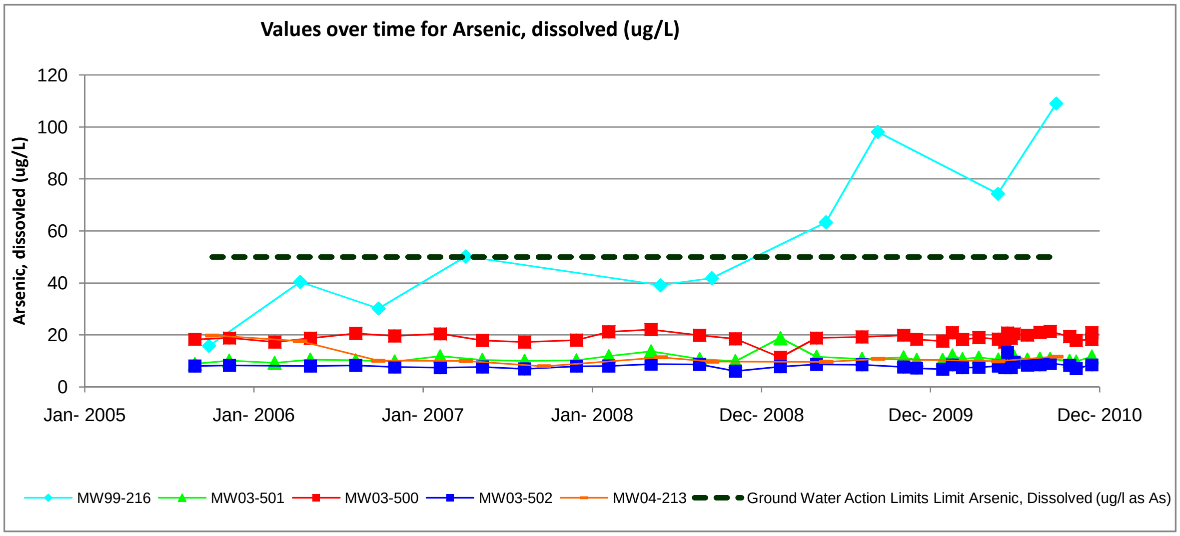
Time Series for Groundwater Monitoring Program

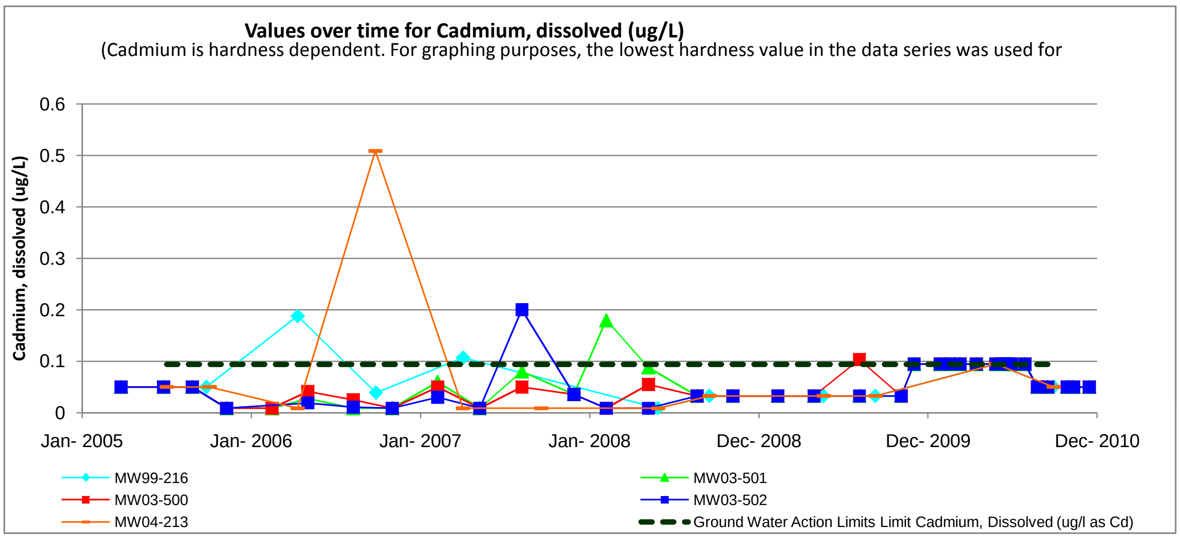


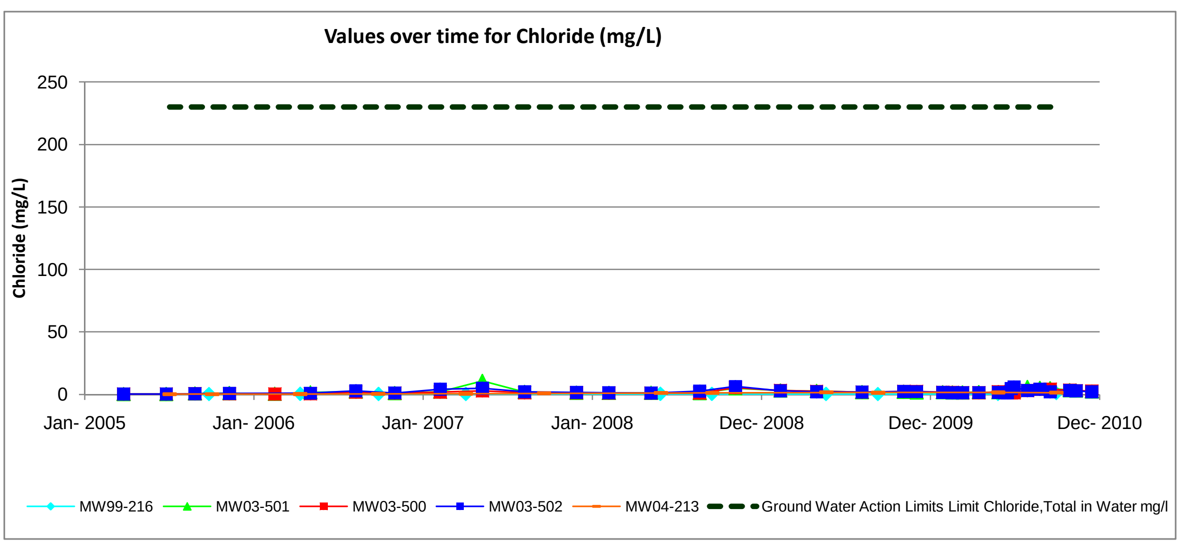


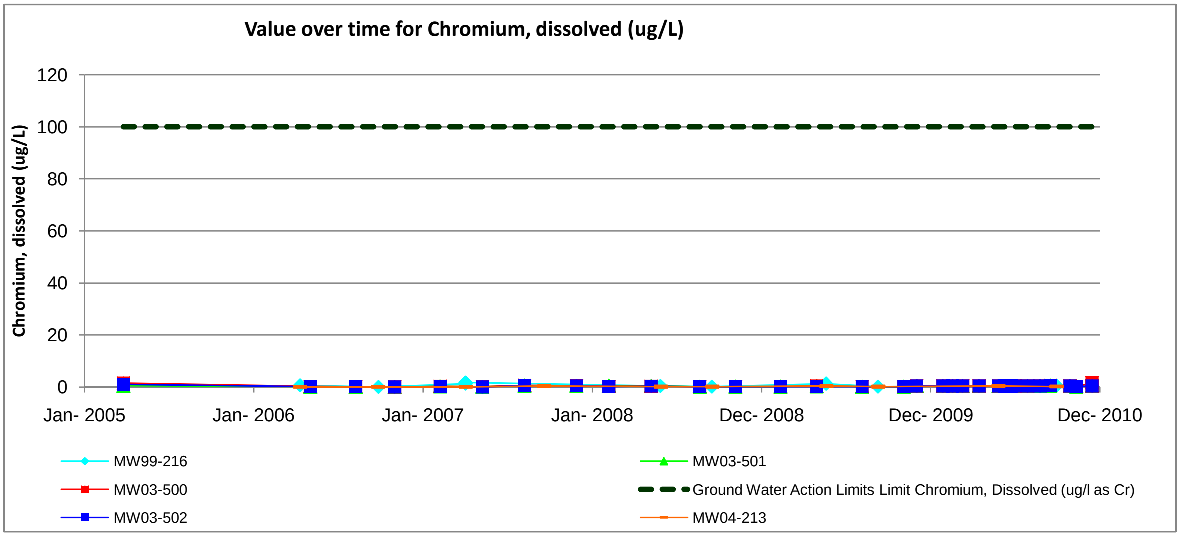


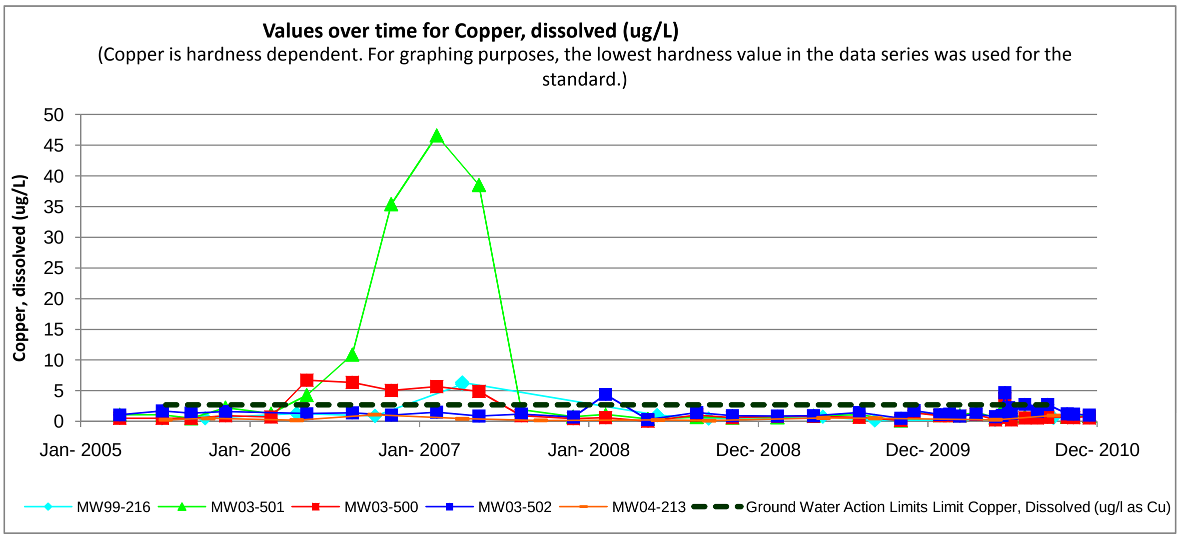
Time Series for Groundwater Monitoring Program

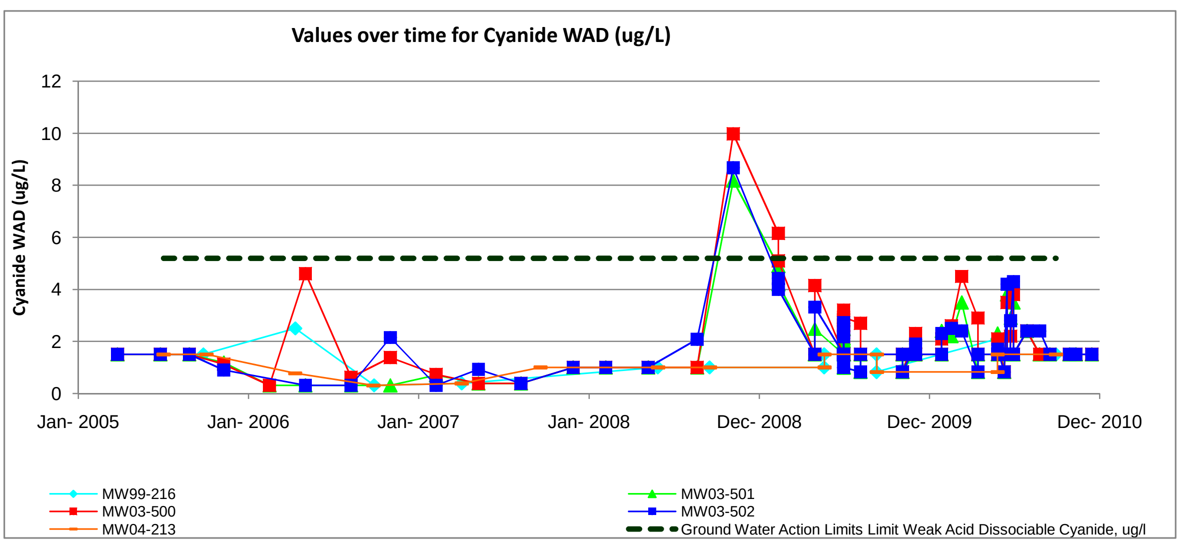


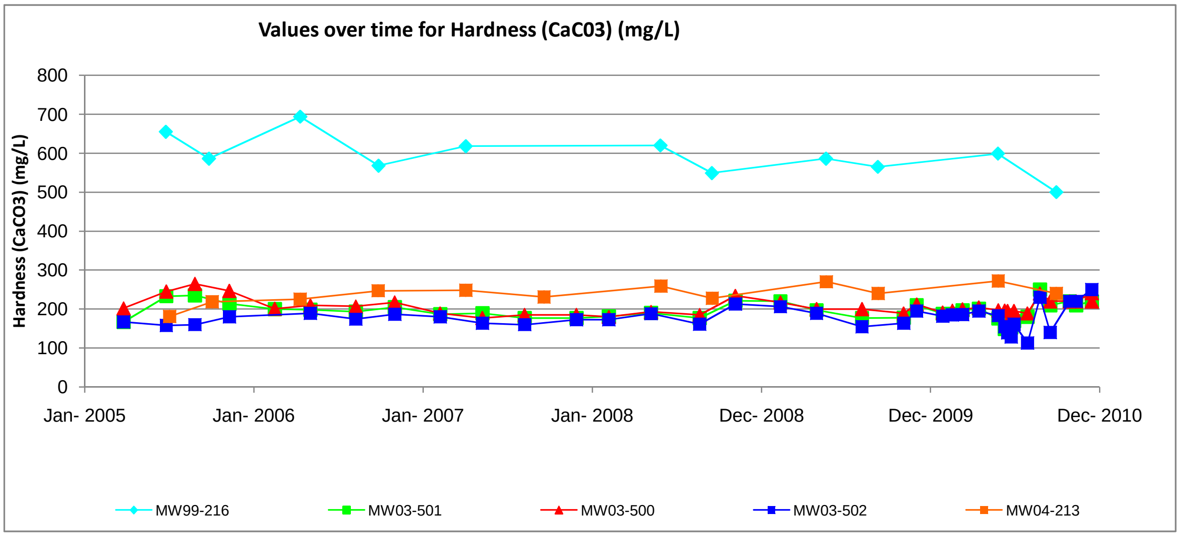


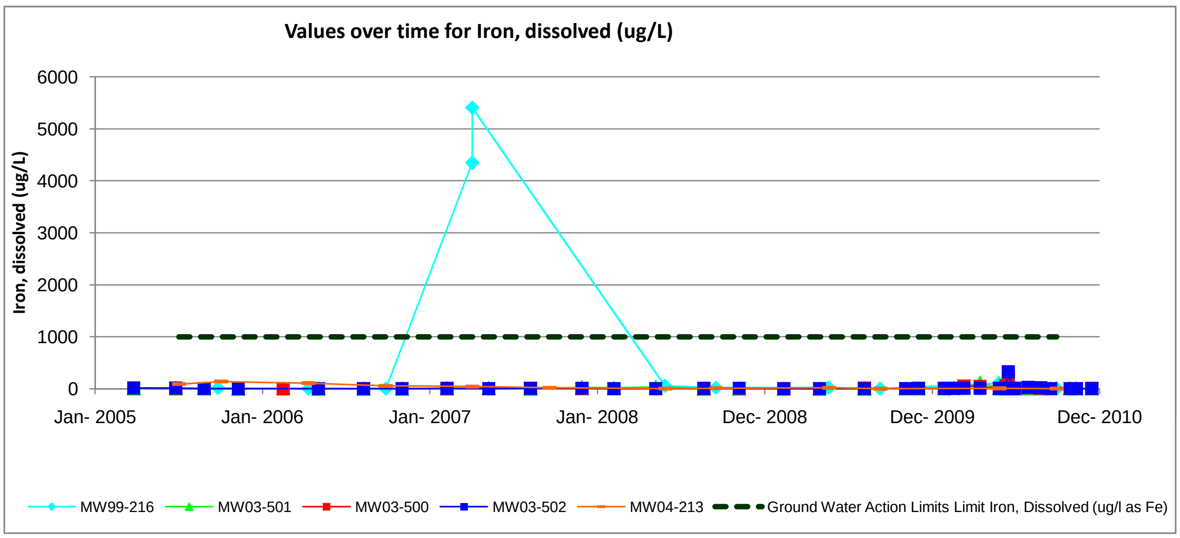


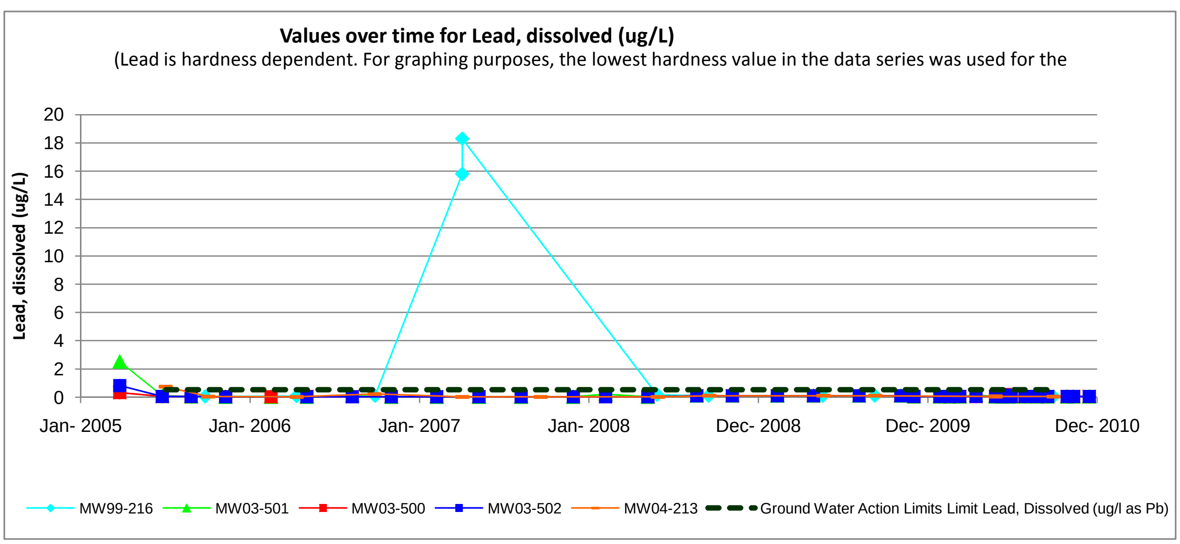

Value over time for Chromium, dissolved (ug/L)
Chromium, dissolved (ug/L)
120
100
80
60
40
20
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
Ground Water Action Limits Limit Chromium, Dissolved (ug/l as Cr)
MW03-502
MW04-213

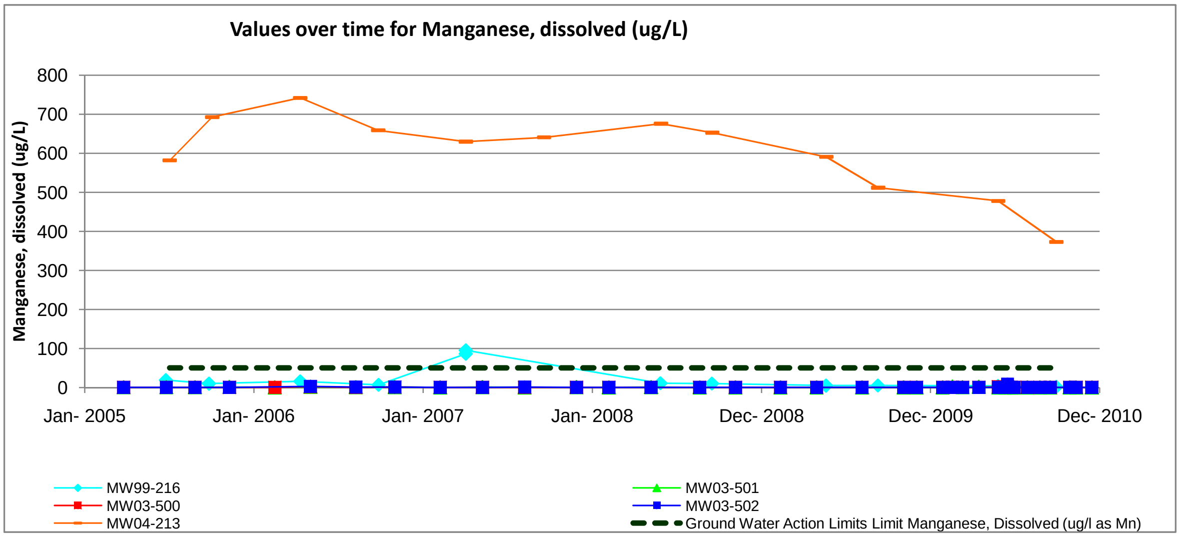

Values over time for Copper, dissolved (ug/L)
(Copper is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used for the standard.)
Copper, dissolved (ug/L)
50
45
40
35
30
25
20
15
10
5
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Copper, Dissolved (ug/l as Cu)

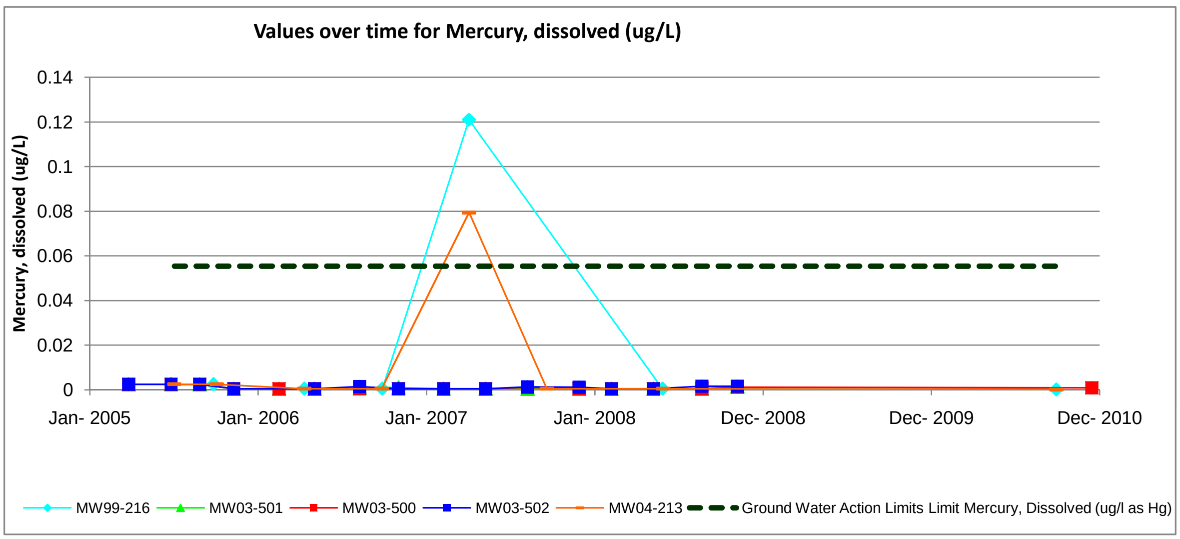

Values over time for Cyanide WAD (ug/L)
Cyanide WAD (ug/L)
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Weak Acid Dissociable Cyanide, ug/l

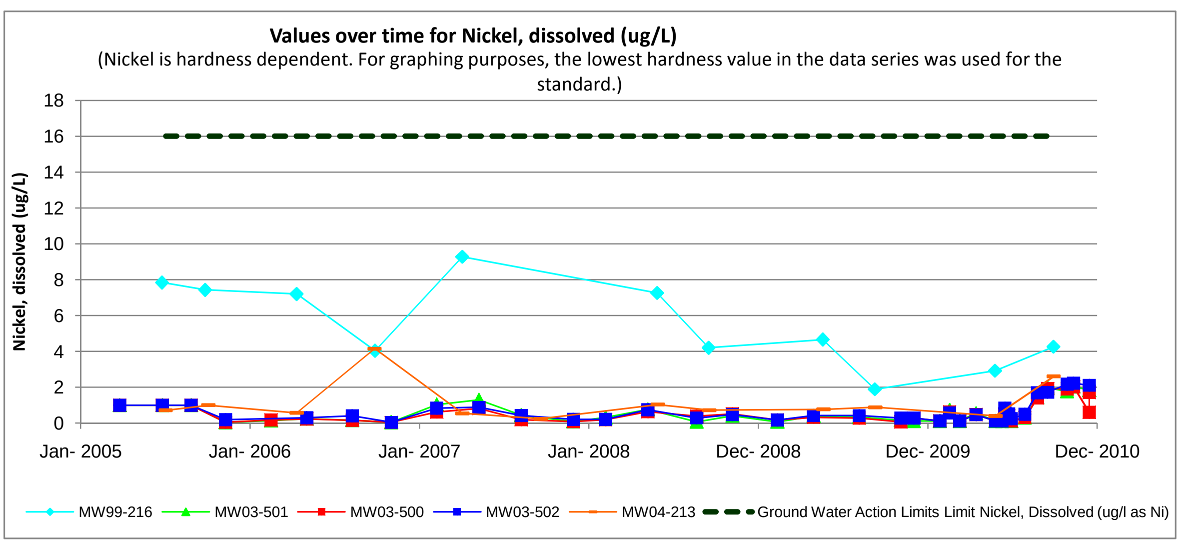

Values over time for Hardness (CaC03) (mg/L)
Hardness (CaCO3) (mg/L)
800
700
600
500
400
300
200
100
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213


Values over time for Iron, dissolved (ug/L)
Iron, dissolved (ug/L)
6000
5000
4000
3000
2000
1000
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Iron, Dissolved (ug/l as Fe)

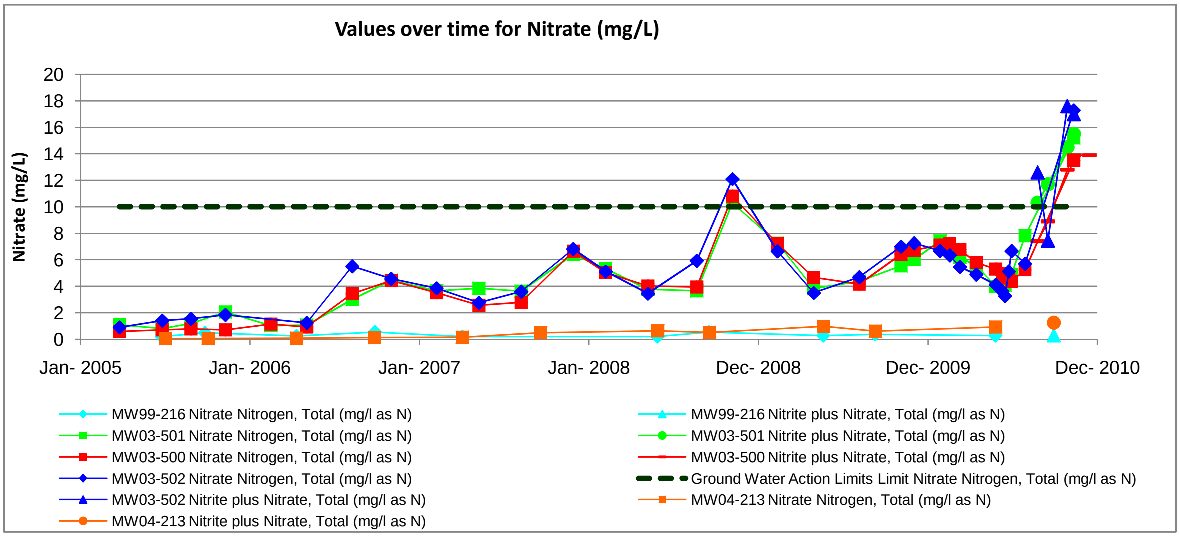

Values over time for Lead, dissolved (ug/L)
(Lead is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used for the
Lead, dissolved (ug/L)
20
18
16
14
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Lead, Dissolved (ug/l as Pb)

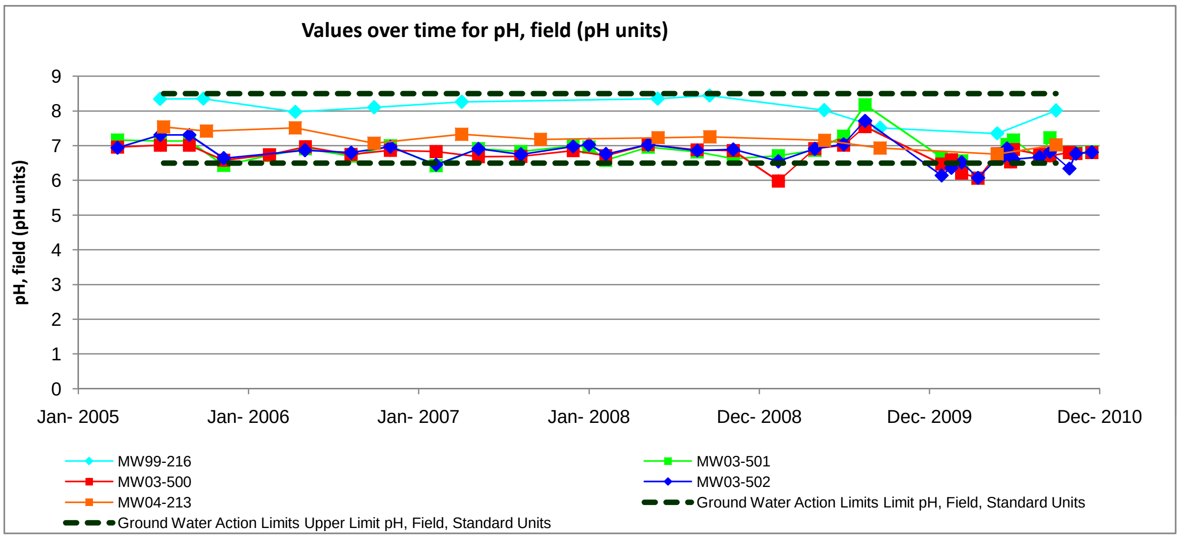

Values over time for Manganese, dissolved (ug/L)
Manganese, dissolved (ug/L)
800
700
600
500
400
300
200
100
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-500
MW04-213
MW03-501
MW03-502
Ground Water Action Limits Limit Manganese, Dissolved (ug/l as Mn)

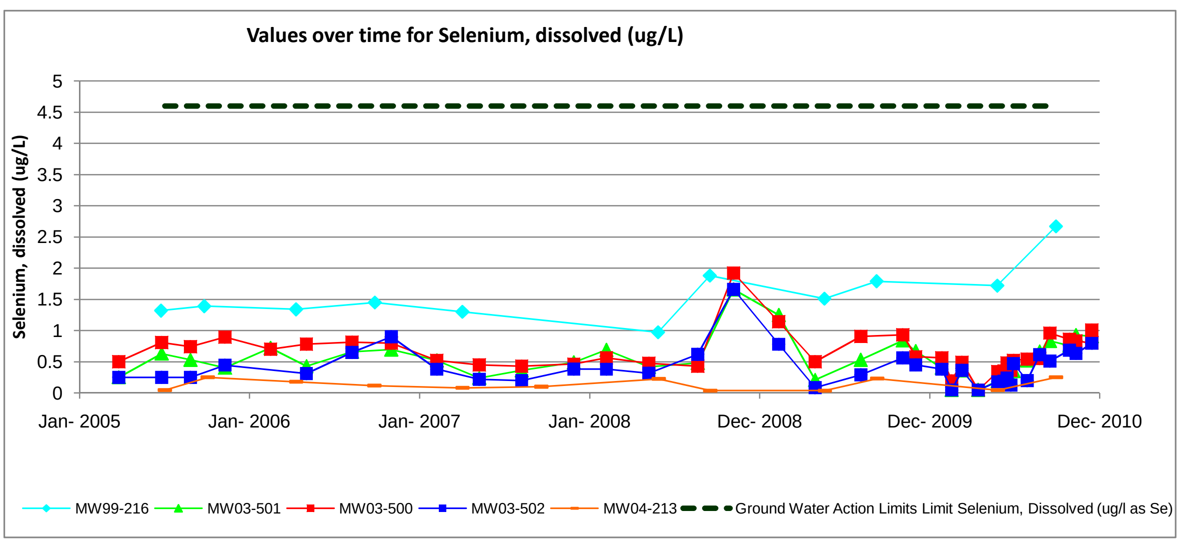

Values over time for Mercury, dissolved (ug/L)
Mercury, dissolved (ug/L)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Mercury, Dissolved (ug/l as Hg)

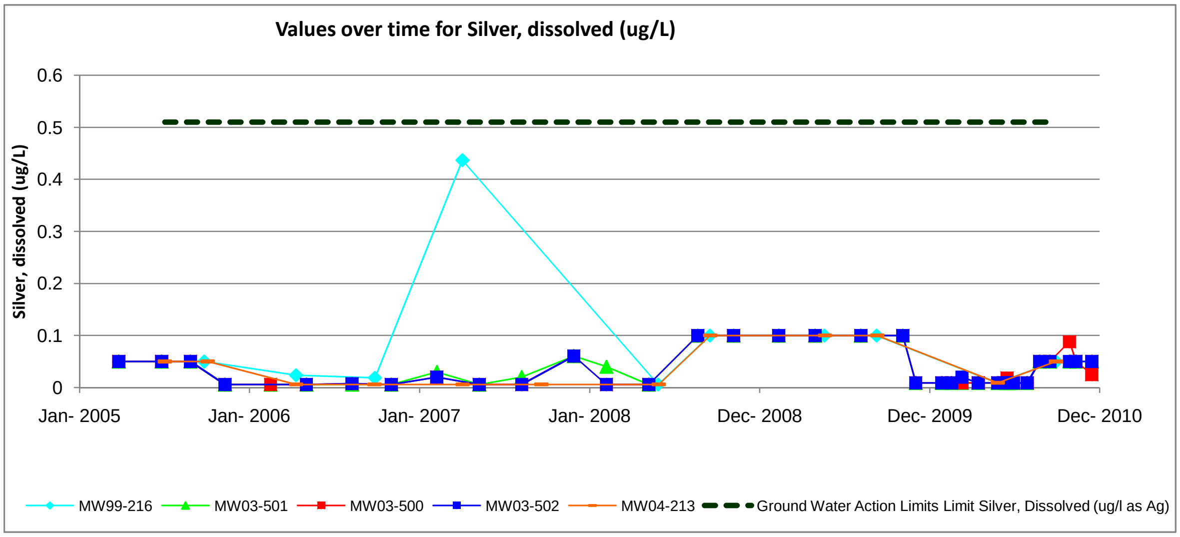

Values over time for Nickel, dissolved (ug/L)
(Nickel is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used for the standard.)
Nickel, dissolved (ug/L)
18
16
14
12
10
8
6
4
2
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Nickel, Dissolved (ug/l as Ni)

Time Series for Groundwater Monitoring Program

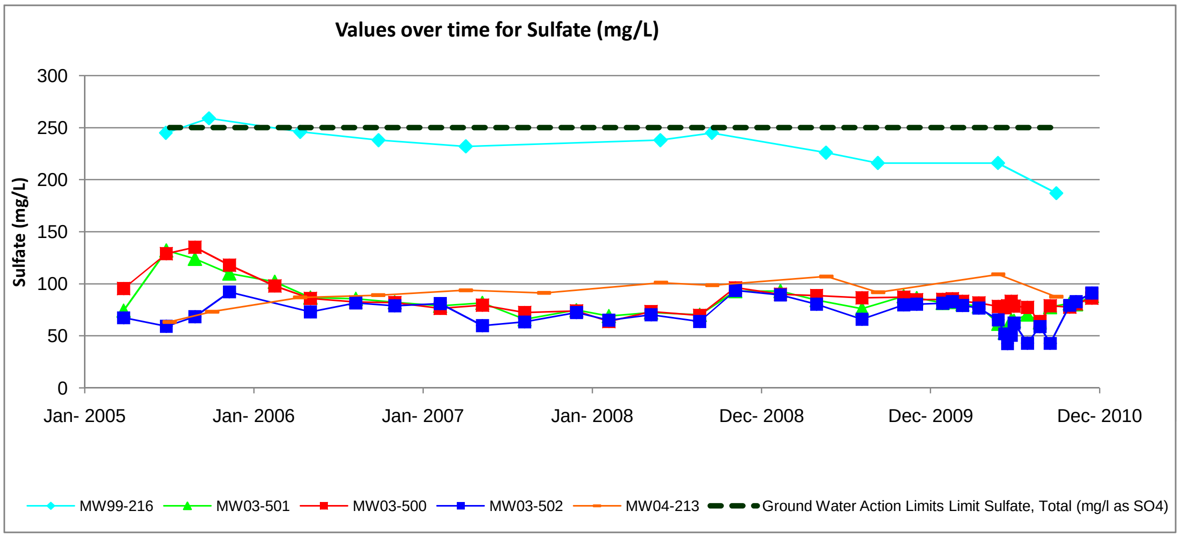




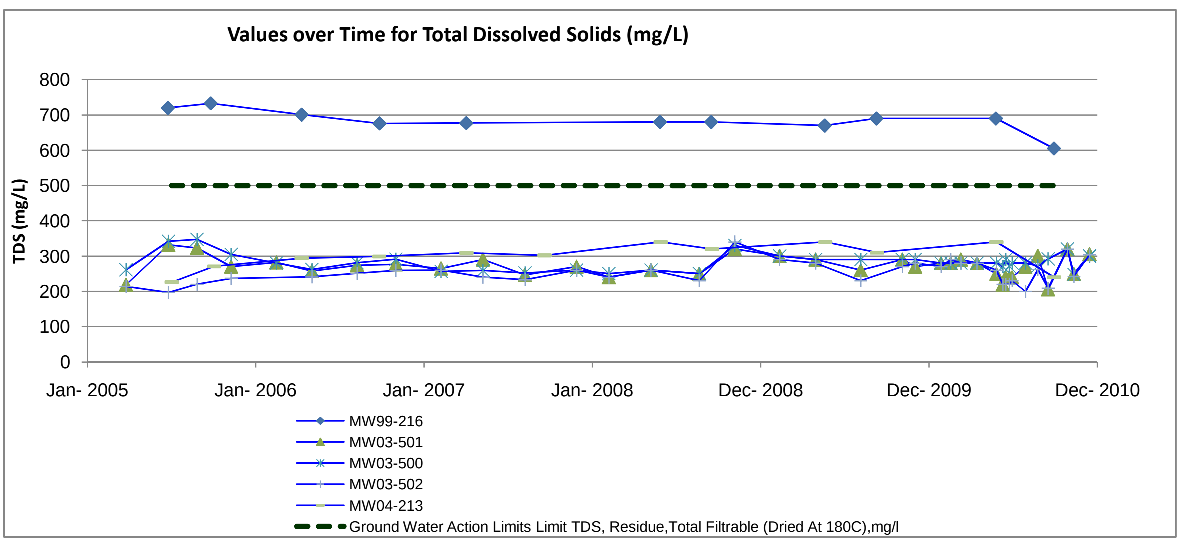




Values over time for Silver, dissolved (ug/L)
Silver, dissolved (ug/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Silver, Dissolved (ug/l as Ag)

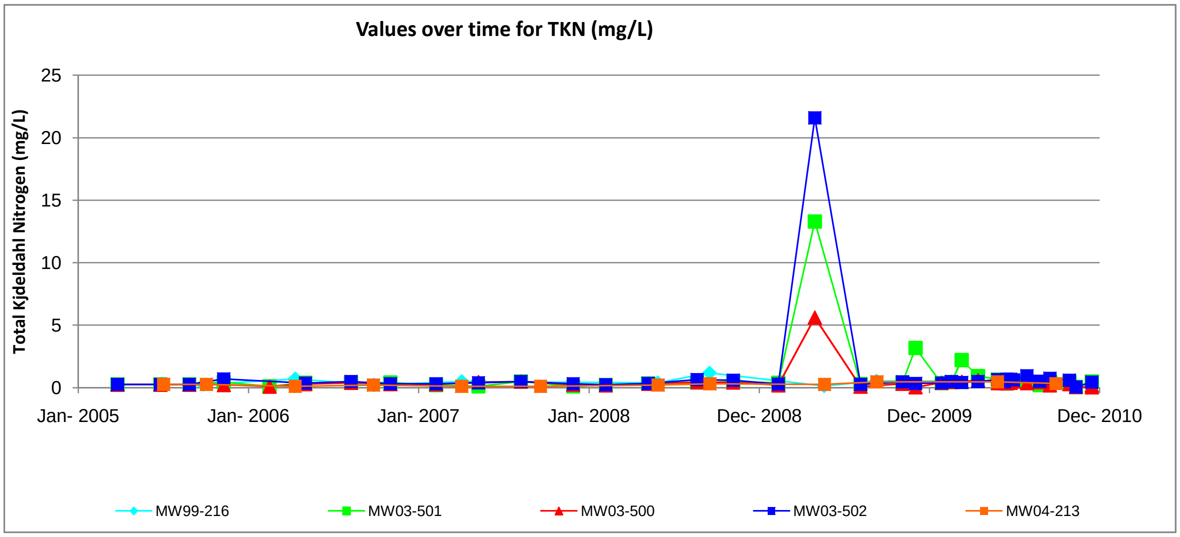


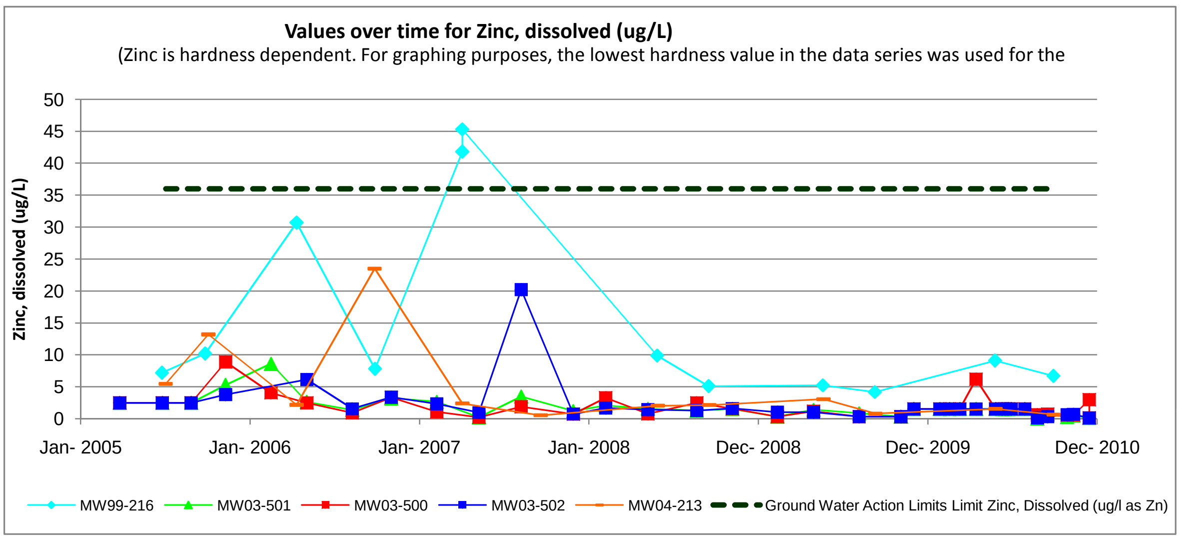
Values over time for Sulfate (mg/L)
Sulfate (mg/L)
300
250
200
150
100
50
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit Sulfate, Total (mg/l as SO4)



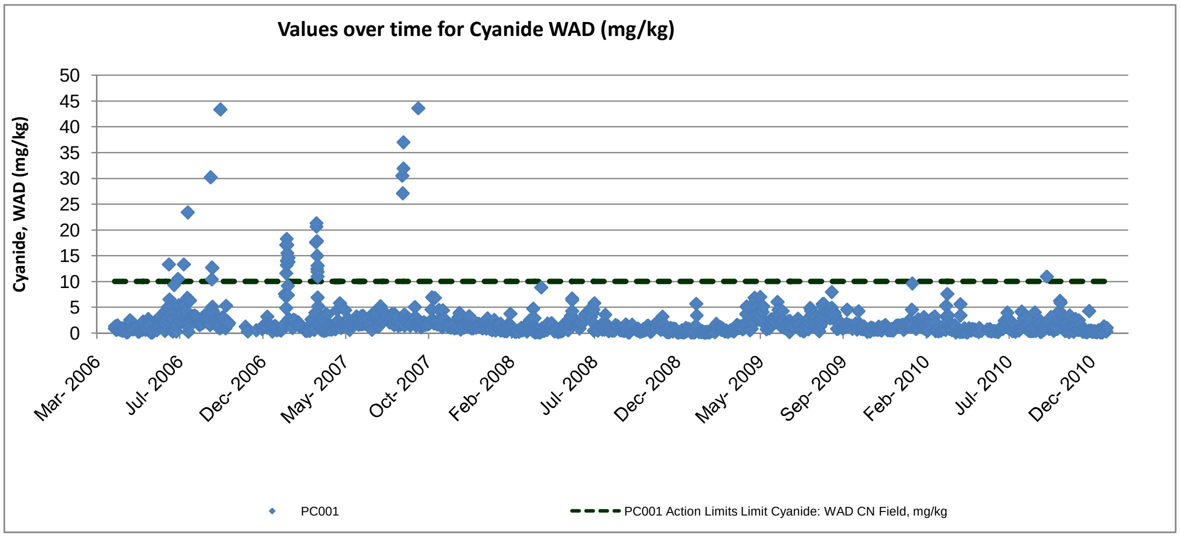
Values over Time for Total Dissolved Solids (mg/L)
TDS (mg/L)
800
700
600
500
400
300
200
100
0
Jan- 2005
Jan- 2006
Jan- 2007
Jan- 2008
Dec- 2008
Dec- 2009
Dec- 2010
MW99-216
MW03-501
MW03-500
MW03-502
MW04-213
Ground Water Action Limits Limit TDS, Residue,Total Filtrable (Dried At 180C),mg/l

Time Series for Groundwater Monitoring Program

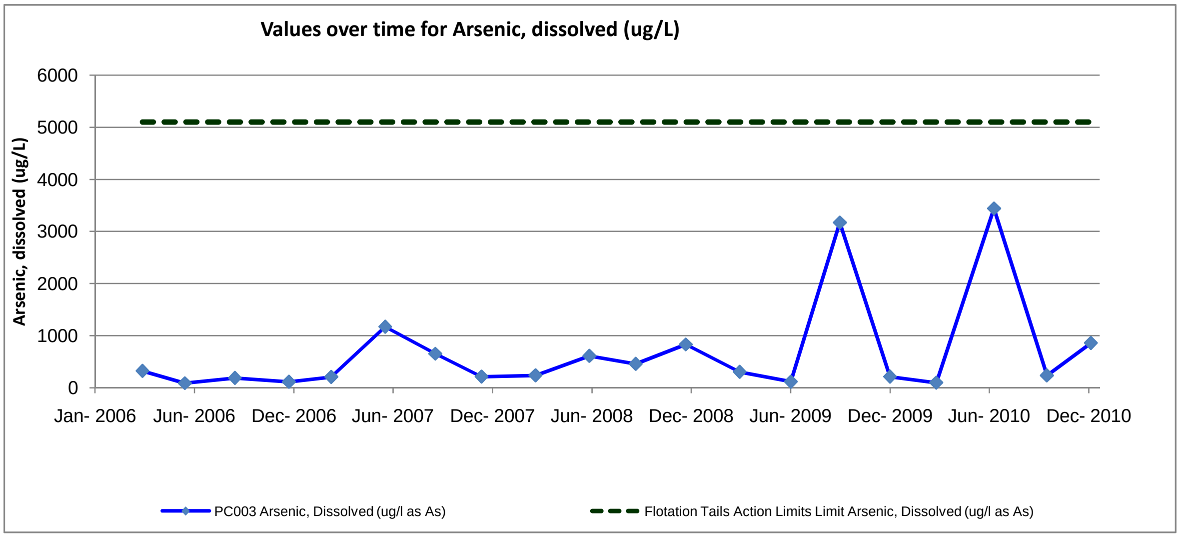


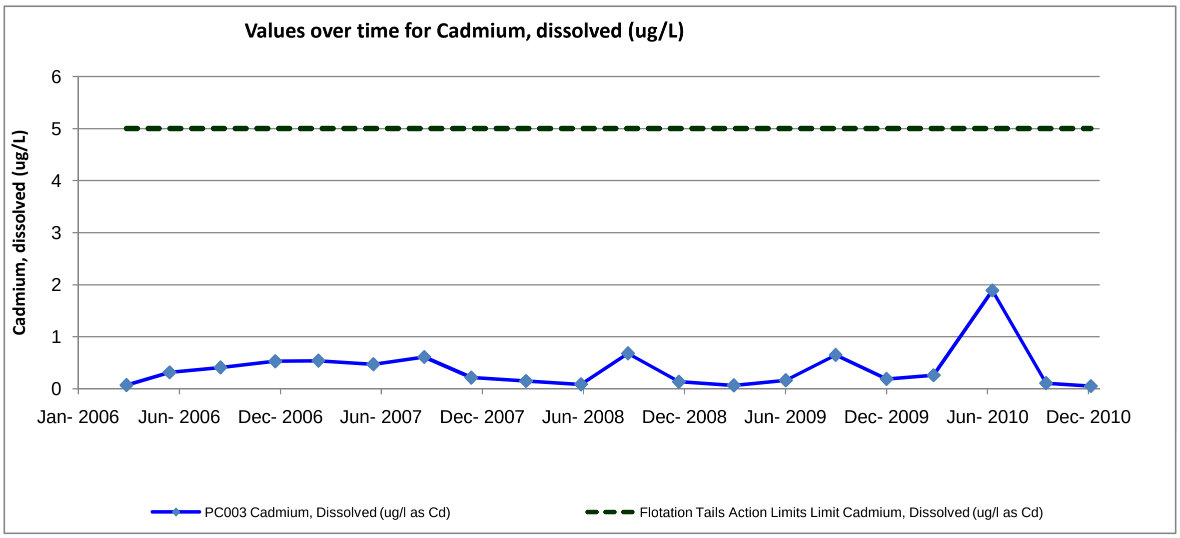


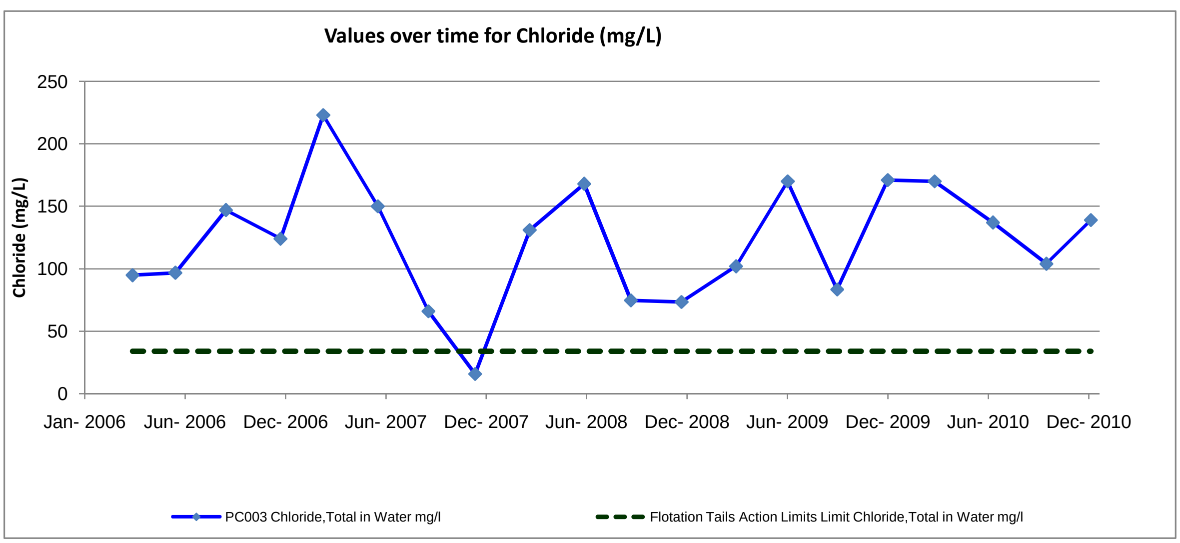
Time Series for Backfill Tailings



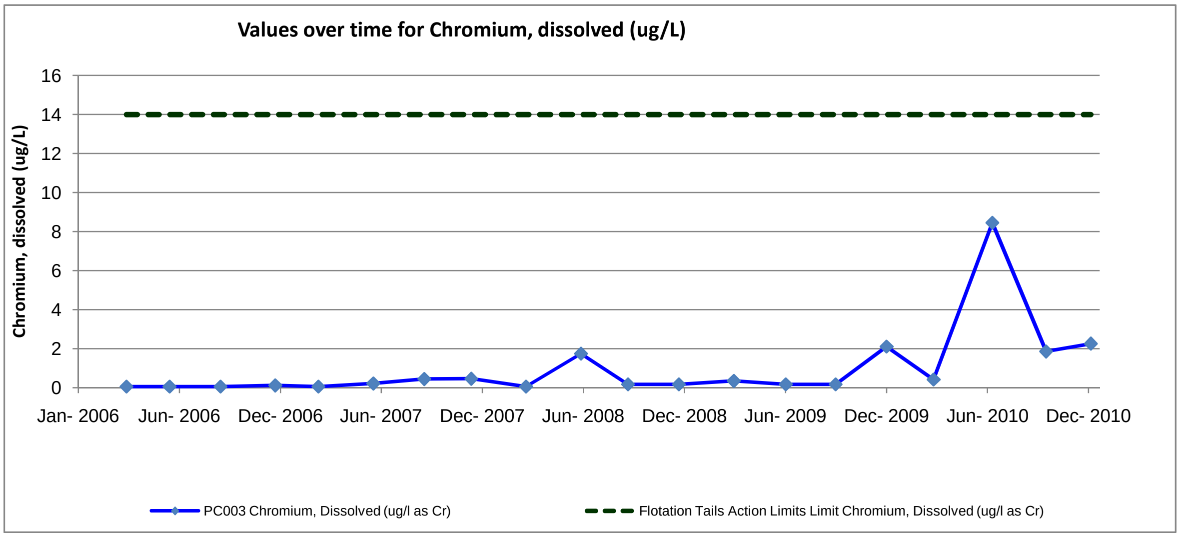
Time Series for Floatation Interstital Water

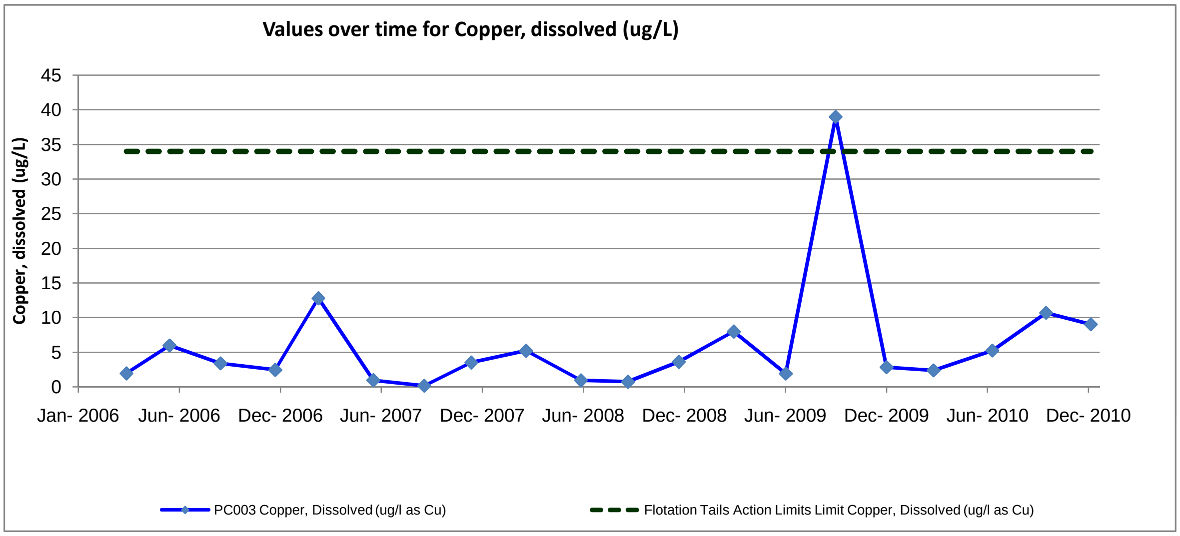


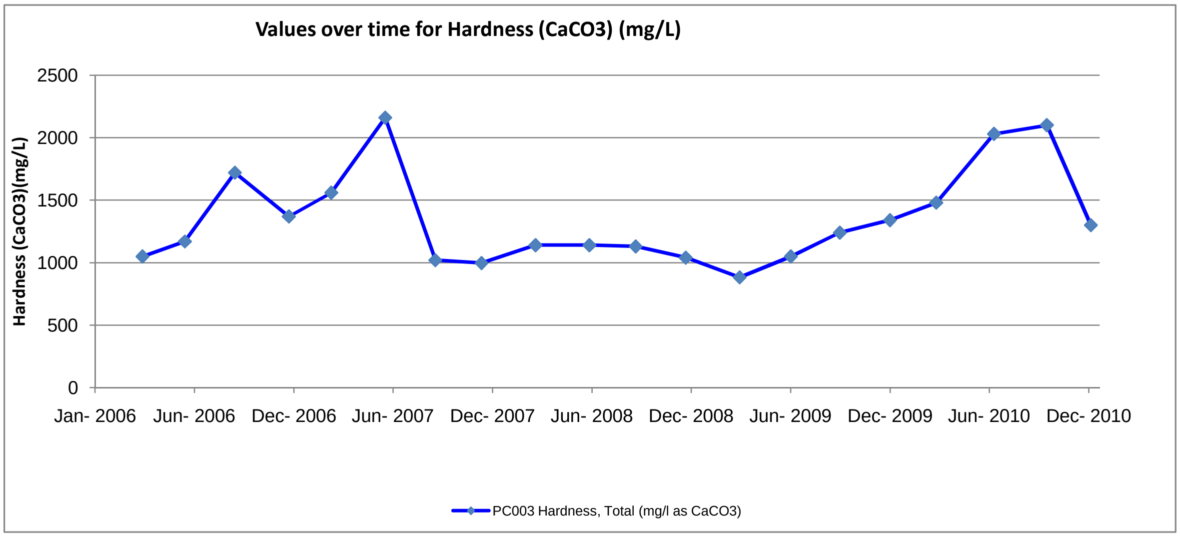




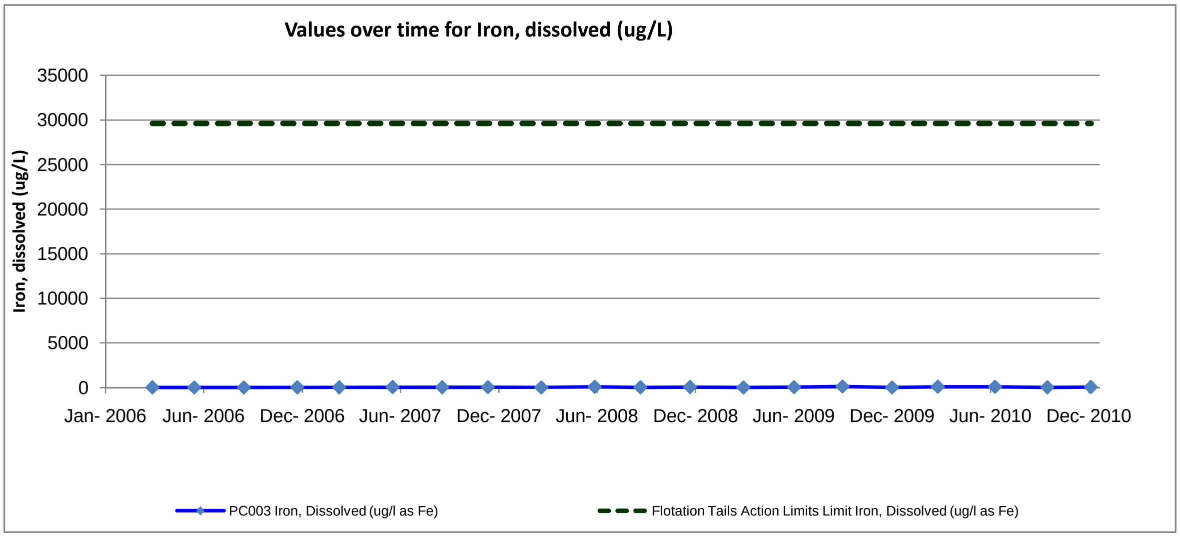
Time Series for Floatation Interstital Water

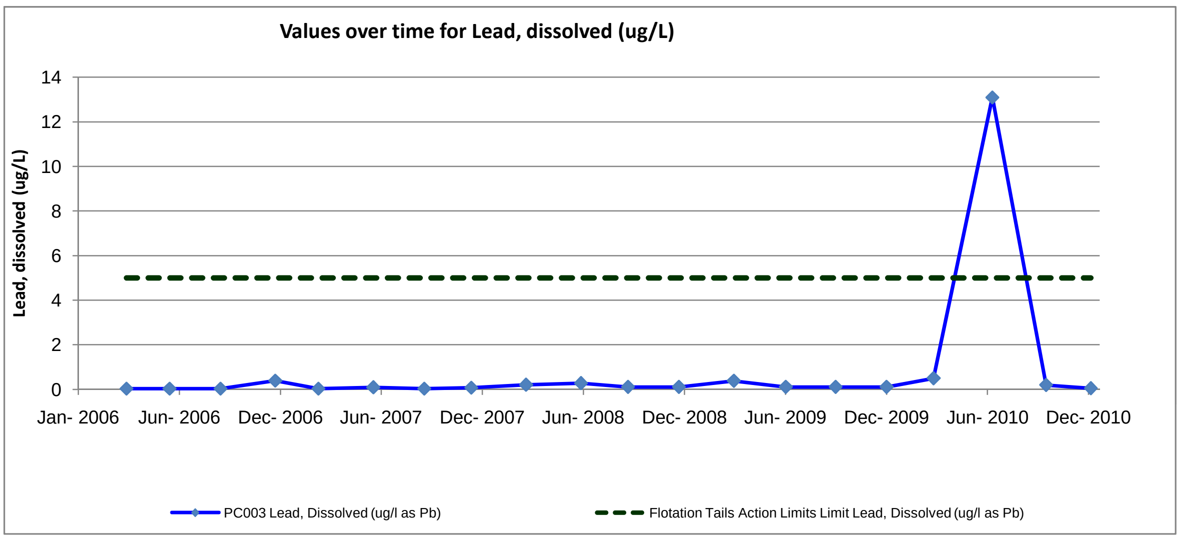


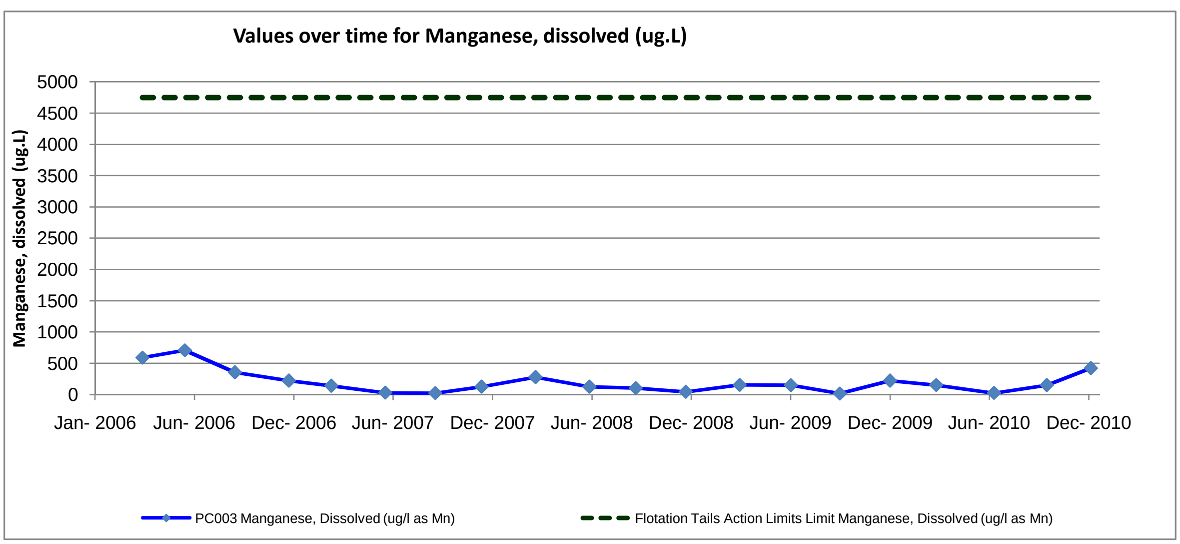




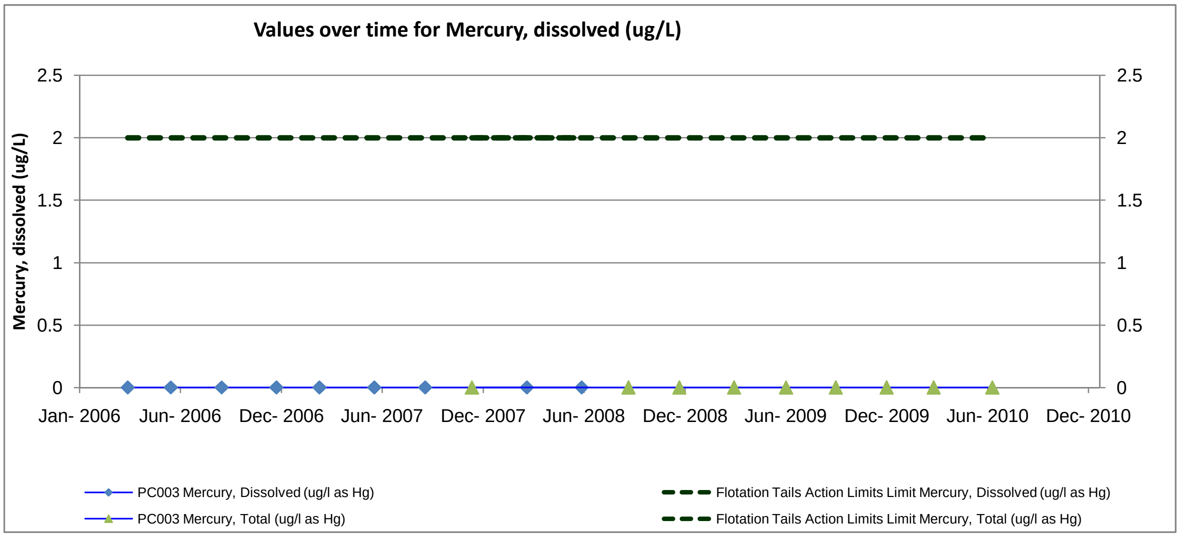
Time Series for Floatation Interstital Water

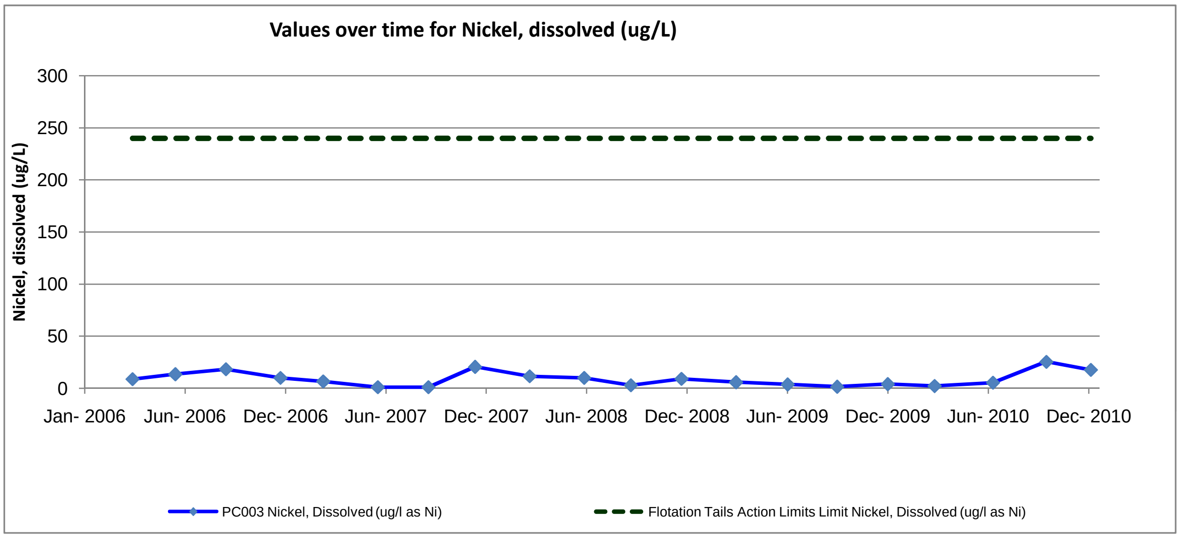


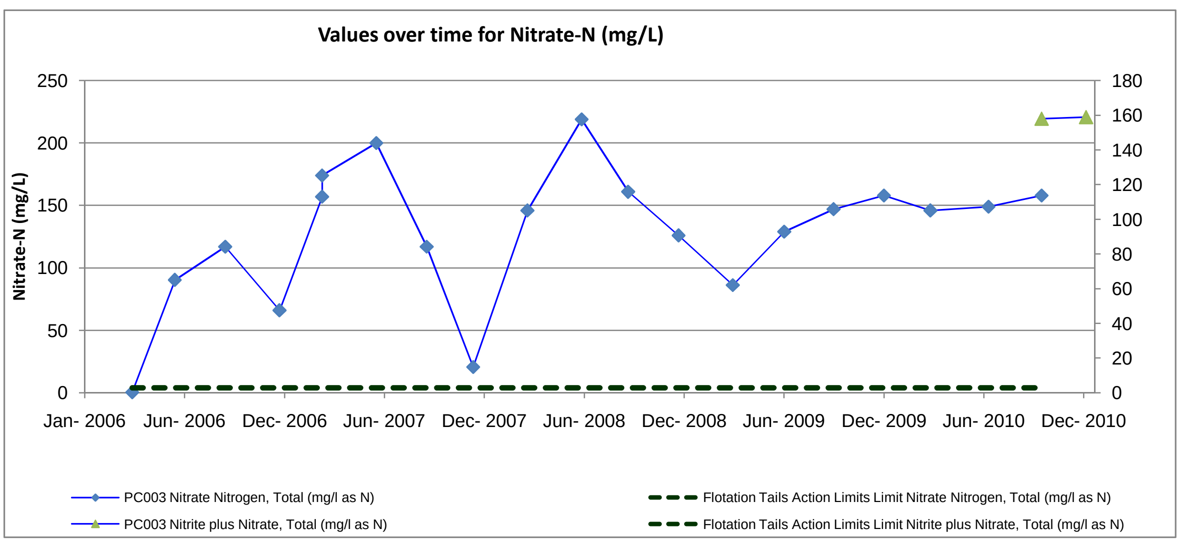


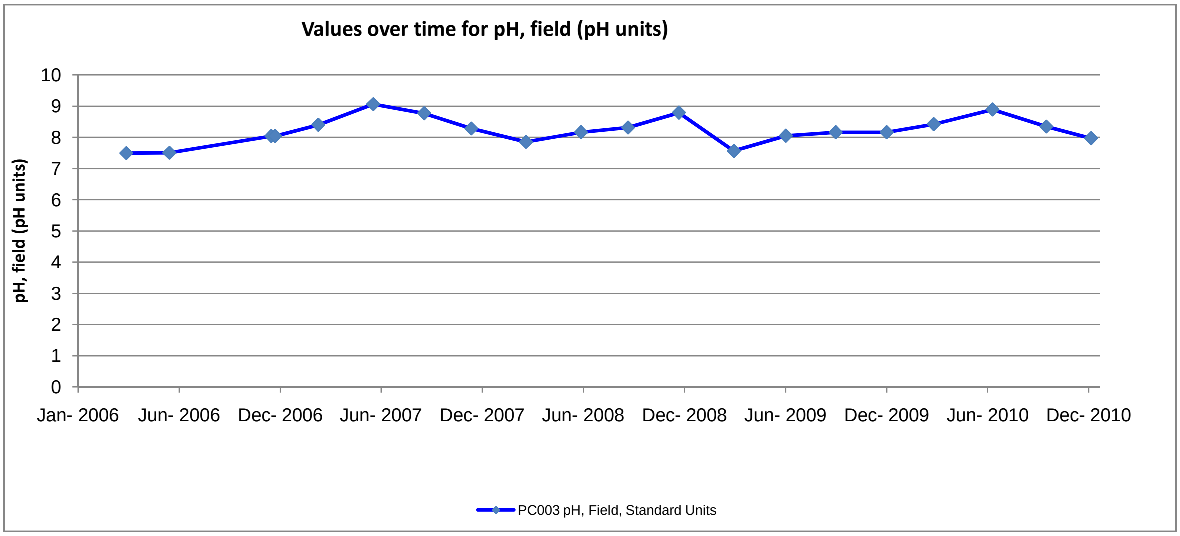


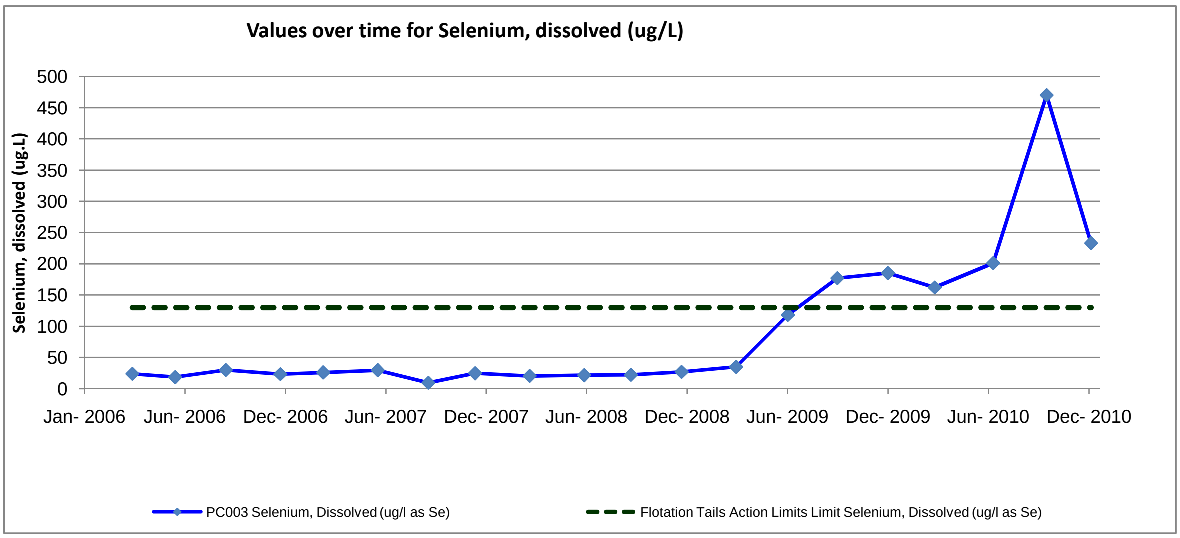
Time Series for Floatation Interstital Water

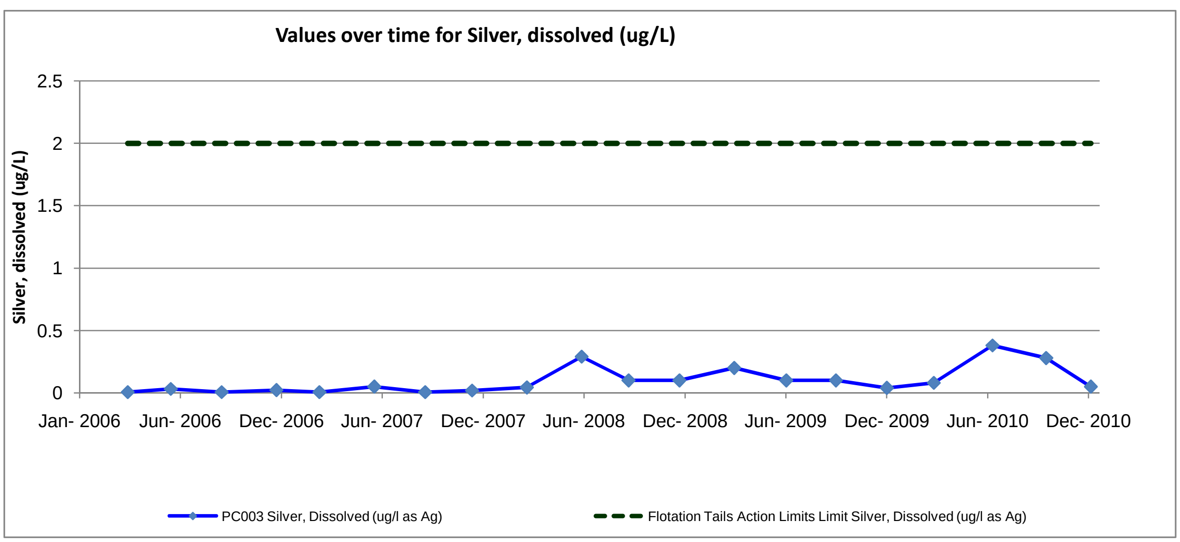




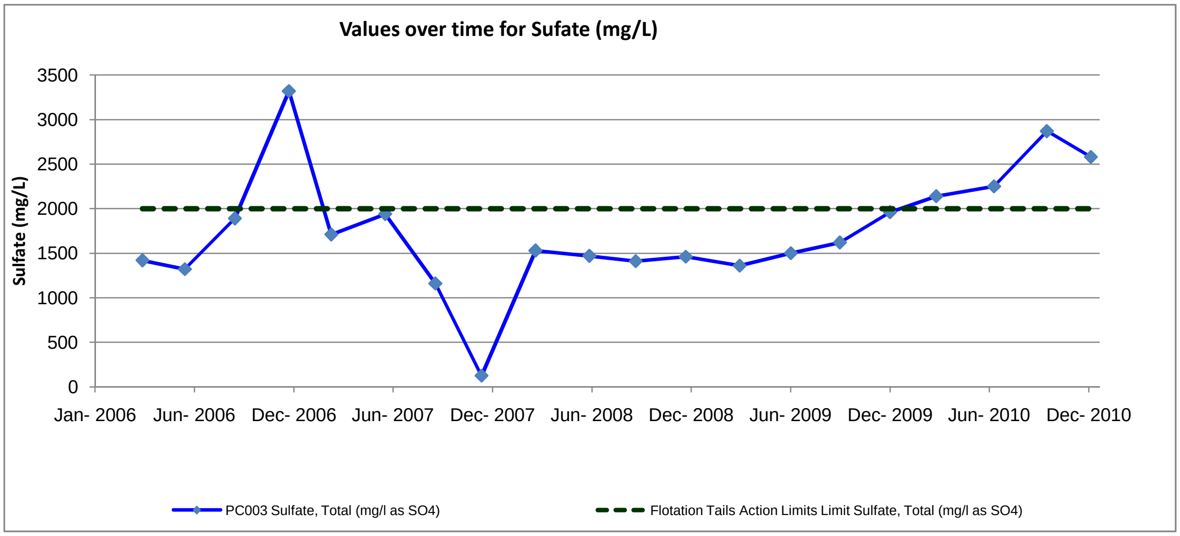


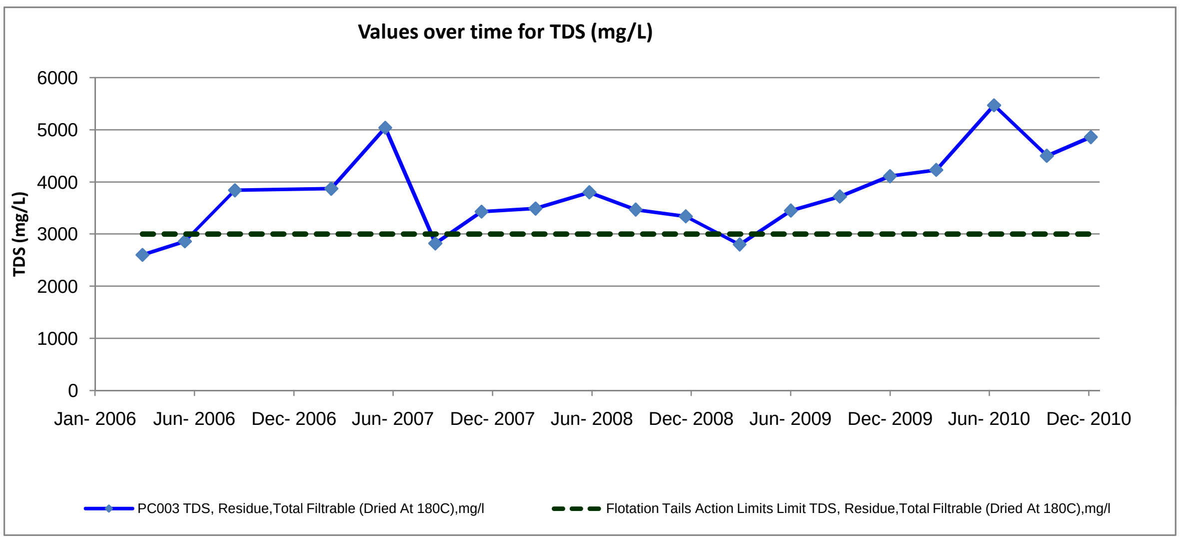

Values over time for pH, field (pH units)
pH, field (pH units)
10
9
8
7
6
5
4
3
2
1
0
Jan- 2006
Jun- 2006
Dec- 2006
Jun- 2007
Dec- 2007
Jun- 2008
Dec- 2008
Jun- 2009
Dec- 2009
Jun- 2010
Dec- 2010
PC003 pH, Field, Standard Units

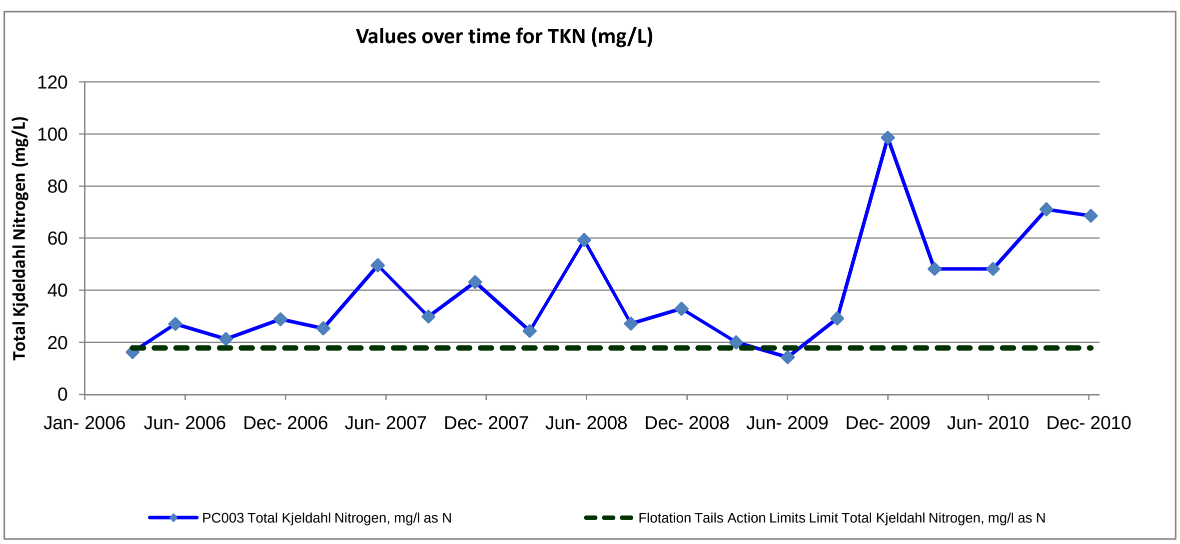

Values over time for Selenium, dissolved (ug/L)
Selenium, dissolved (ug.L)
500
450
400
350
300
250
200
150
100
50
0
Jan- 2006
Jun- 2006
Dec- 2006
Jun- 2007
Dec- 2007
Jun- 2008
Dec- 2008
Jun- 2009
Dec- 2009
Jun- 2010
Dec- 2010
PC003 Selenium, Dissolved (ug/l as Se)
Flotation Tails Action Limits Limit Selenium, Dissolved (ug/l as Se)

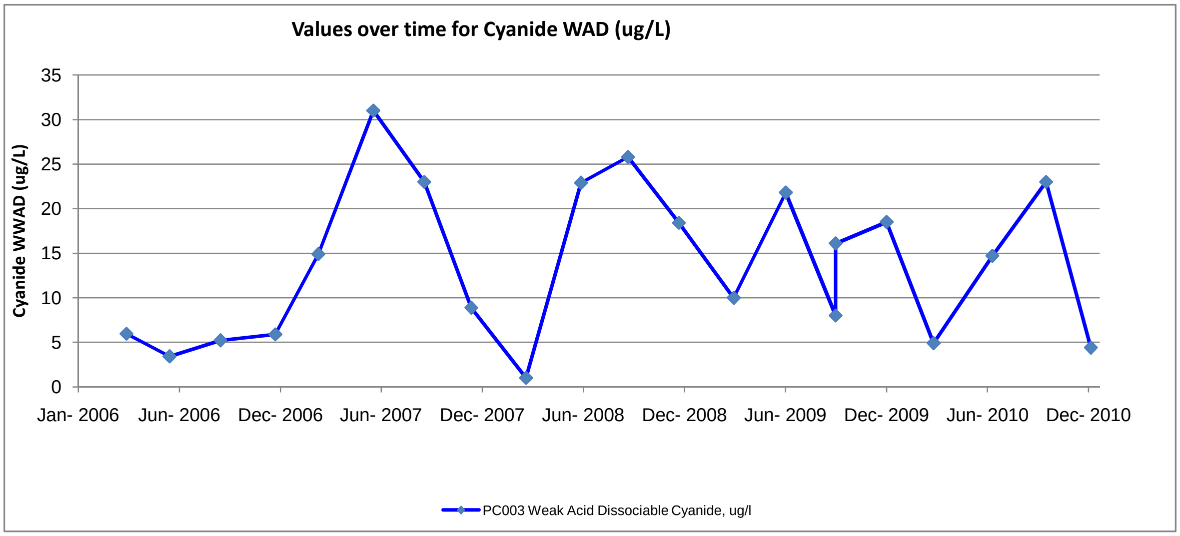

Values over time for Silver, dissolved (ug/L)
Silver, dissolved (ug/L)
2.5
2
1.5
1
0.5
0
Jan- 2006
Jun- 2006
Dec- 2006
Jun- 2007
Dec- 2007
Jun- 2008
Dec- 2008
Jun- 2009
Dec- 2009
Jun- 2010
Dec- 2010
PC003 Silver, Dissolved (ug/l as Ag)
Flotation Tails Action Limits Limit Silver, Dissolved (ug/l as Ag)

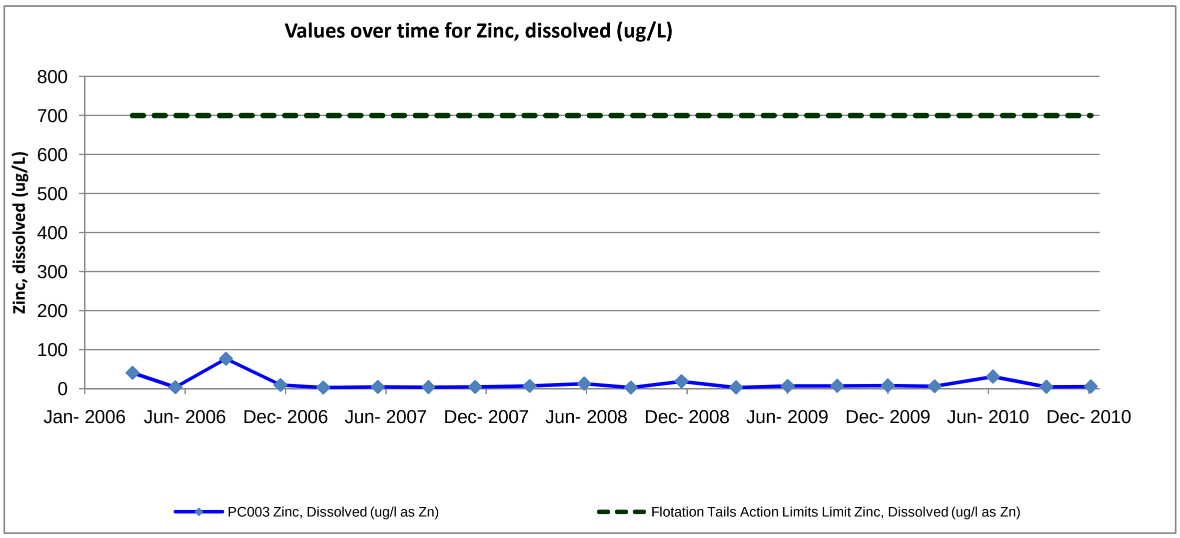
Time Series for Floatation Interstital Water








Values over time for Cyanide WAD (ug/L)
Cyanide WWAD (ug/L)
35
30
25
20
15
10
5
0
Jan- 2006
Jun- 2006
Dec- 2006
Jun- 2007
Dec- 2007
Jun- 2008
Dec- 2008
Jun- 2009
Dec- 2009
Jun- 2010
Dec- 2010
PC003 Weak Acid Dissociable Cyanide, ug/l


Values over time for Zinc, dissolved (ug/L)
Zinc, dissolved (ug/L)
800
700
600
500
400
300
200
100
0
Jan- 2006
Jun- 2006
Dec- 2006
Jun- 2007
Dec- 2007
Jun- 2008
Dec- 2008
Jun- 2009
Dec- 2009
Jun- 2010
Dec- 2010
PC003 Zinc, Dissolved (ug/l as Zn)
Flotation Tails Action Limits Limit Zinc, Dissolved (ug/l as Zn)