DE BEERS CANADA INC.
VICTOR MINE

MERCURY PERFORMANCE MONITORING 2012 ANNUAL REPORT

AS PER CONDITIONS 7(5) and 7(6) OF
CERTIFICATE OF APPROVAL #3960-7Q4K2G

Submitted to:
Ministry of the Environment
Timmins District Office
Ontario Government Complex, Hwy. 101E
P.O. Bag 3080
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and

Chief of Attawapiskat First Nation
First Nation Office
Attawapiskat, Ontario, P0L 1A0

Submitted by:
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June 2013
TC121511

June 27, 2013
TC121511

Mr. Denis Durocher, District Manager
Ministry of the Environment
Ontario Government Complex
Highway 101E
South Porcupine, Ontario, P0N 1H0

Chief Theresa Spence
Attawapiskat First Nation
First Nation Office
Box 248
Attawapiskat, Ontario, P0L 1A0

Dear Mr. Durocher / Chief Spence:

Re: Mercury Performance Monitoring 2012 Annual Report, Certificate of Approval #3960-7Q4K2G, Conditions 7(5) and 7(6)

Please find enclosed the Annual Mercury Performance Monitoring Report which is being submitted on behalf of the De Beers Canada Inc. Victor Mine, for the 2012 reporting period. The report addresses Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G, and summarizes monitoring data relating to peat pore water, surface water systems, groundwater (well field) discharge and fish. This annual report also addresses Ministry of the Environment (MOE) recommendations and action items as per the MOE memo, dated February 28, 2013.

All monitoring results to date are consistent with permit application expectations relating to mine dewatering activities, showing no adverse effects of mine dewatering on area mercury levels in peatlands, surface waters, or fish flesh for the 2012 monitoring period.

We would be pleased to discuss any aspect of the above with the MOE or the Attawapiskat First Nation. Should you have any questions please do not hesitate to contact the undersigned at (905) 568-2929.

Regards,

AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited
On behalf of De Beers Canada Inc.

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Abbreviation	Meaning
ATT	Attawapiskat River
CEQG	Canadian Environmental Quality Guidelines
COM	Community
CONF	Confluence
CPUE	Catch Per Unit Effort
DS	Downstream
DSNAY	Downstream Nayshkootayaow
F-Value	Analysis of Variance from Sample Statistics
FF	Far Field
HgCON	Mercury Control Station / Northwest Control
MC	Monument Channel
MDL	Method Detection Limit
NAY or NAYSH	Nayshkootayaow River
NAY-MOUTH	Mouth of Nayshkootayaow
NEF/F	Northeast Fen Final
NGC	North Granny Creek
ng/L	Nanograms per Litre
NF	Near Field
PPM	Parts Per Million
P-Value	Tabled Probability Threshold
SEF/F	Southeast Fen Final
SGC	South Granny Creek
ST	Station
SWF/F	Southwest Fen Final
T	Tributary
µg/G	Micrograms Per Gram
US	Upstream

1.0 INTRODUCTION

This report was prepared by AMEC Environment & Infrastructure Limited (AMEC) on behalf of De Beers Canada Inc. (De Beers), pursuant to the requirements of Conditions 7(5) and 7(6) of Certificate of Approval (C. of A.) #3960-7Q4K2G. The report is the fifth in a series of annual mercury monitoring reports that have been and will be prepared for the Victor Mine. This fifth annual report summarizes all Victor Mine site mercury monitoring data collected for the year 2012, and also provides summaries of earlier data and trends where appropriate. For consistency and readability from year to year, this report keeps the same format, and much of the same wording as the previous annual reports, with updates in data interpretation where warranted.

A broad-based, rigorous mercury monitoring program was established for the De Beers Victor Mine because of concerns raised during the provincial permitting process, regarding the possible influences of mine dewatering activities on muskeg system hydrodynamics and associated mercury chemodynamics. In particular, concerns have been expressed that should mine dewatering lead to extensive “drying out” of the local muskeg ecosystem, then there could be a potential for the release of increased quantities of mercury to area receiving waters above those that occur naturally. Mercury is present in area peatlands in the baseline condition as a result of the long-range aerial transport of emissions from natural and anthropogenic sources unrelated to activities of the Victor Mine. Volcanic activity is the primary natural source for the long-range transport of mercury. Coal-fired power plants are one of the primary anthropogenic sources for long-range mercury transport.

AMEC and De Beers have previously provided evidence to support the position that mine dewatering activities were not likely to result in a condition that would substantively increase mercury release rates to area receiving waters, and that if evidence of such substantive release rates was to occur, then mitigation measures would be implemented to prevent or arrest the aggravating condition. The Victor Mine mercury monitoring program is designed to test De Beers’ position that mine dewatering is not likely to substantively increase mercury release rates to area receiving waters.

Data collected up to the end of 2012 thus far continue to support the De Beers’ position that mine dewatering is unlikely to result in substantive increases in mercury release to area surface waters, as described in detail in the sections that follow.

Laboratory services for the water sample program were conducted in part by Flett Research Ltd. in Winnipeg (to approximately the end of April 2009), and by Dr. Brian Branfireun’s laboratory at the University of Western Ontario (approximately May 2009 until present). Fish flesh analyses were conducted at Dr. Branfireun’s laboratory as of 2008. Both laboratories are recognized for their specialty of ultra-trace analyses for mercury.

Data reported as “less than values” (i.e., less than the detection limit values) by either laboratory are shown as being at the reported detection limit in all tables in this document. Lower end values are therefore conservative. Detection limits provided by Flett Research for water samples varied with the samples being analyzed with some detection limits being shown as a low as 0.00 ng/L, measured to two decimal places. Detection limits provided by Dr. Branfireun’s laboratory were set at two levels: “limit of quantification” – 0.0169 ng/L, and “method detection limit” (MDL) – 0.0054 ng/L. Values less than the MDL were reported by Dr. Branfireun’s laboratory as “non-detect” and are presented in the tables of this report as <0.01 ng/L or as stated. Values reported as “detect” by Dr. Branfireun’s laboratory are presented in the tables as 0.01 ng/L if below the limit of quantification, or as stated if above that value.

For readers unfamiliar with these units of measurement:

ng/L represents nanograms per litre of water, which can also be expressed as parts per trillion (ppt) or 1 part of material in 1,000,000,000,000 parts of water.

ug/g represents micrograms per gram of solids (e.g. fish flesh), which can also be expressed as parts per million (ppm) or 1 part of material in 1,000,000 parts of solids.

A number of scientific papers have been published in the *Hydrological Processes* journal and the *Science of the Total Environment* journal in 2012 and 2013, in relation to the operation and dewatering effects at the Victor Mine site, for which some of the topics include: snow accumulation and melt of different peatland types, mine dewatering effects on peatlands, and the role of marine sediments on mitigating peatland drainage. The relevant papers are lised below. The data presented in these research papers, where applicable, support the data and conclusions presented in this report.

- Whittington, P. and J. Price. 2012. Effect of mine dewatering on peatlands of the James Bay Lowland: the role of bioherms. Hydrological Processes. 26: 1818-1826.
- Whittington, P. and J. Price. 2013. Effect of mine dewatering on the peatlands of the James Bay Lowland: the role of marine sediments on mitigating peatland drainage. Hydrological Processes. Published online in Wiley Online Library.
- Ulanowski, T.A. and B.A. Branfireun. 2013. Small-scale variability in peatland pore-water biogeochemistry, Hudson Bay Lowland, Canada. Science of the Total Environment. 454-455: 211-218.

2.0 REQUIREMENTS

Condition 7(5) of Certificate of Approval (C. of A.) #3960-7Q4K2G states the following:

> *The Owner shall report the results from the previous calendar year for the mercury monitoring program described [in] Condition 6(8), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.*

The referenced Condition 6(8) states:

> *The Owner shall carryout a mercury monitoring program that includes, but [is] not necessarily limited to the following:*
>
> *(a) A onetime assessment of peat solids to determine mercury content (completed in 2007);*
>
> *(b) An analysis of peat, mineral soil, and bedrock pore water on an ongoing annual basis at the locations identified in Table 2;*
>
> *(c) Monitoring of surface water systems on a monthly or quarterly basis depending on station at the locations identified in Table 3;*
>
> *(d) Monitoring of the well field discharge on a monthly basis and quarterly basis and quarterly sampling of individual wells;*
>
> *(e) Sampling of sportfish at 3 year intervals and small fish sampling on an annual basis at locations identified in Table 4.*

Condition 7(6) states the following:

> *The Owner shall report the results from the previous calendar year for the mercury assessments described [in] Condition 6(9), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.*

The referenced Condition 6(9) states:

> *In conjunction with the mercury management and monitoring program required in Section 6(8), the Owner shall also carryout data analyses, enhanced sampling programs, modeling, risk assessments, and implement effective mitigation measures, as and when required, all in accordance with the March 31, 2008 Report prepared by AMEC and submitted to the District Manager, entitled Trigger Values for Mercury Concentrations and/or Body Burdens in Fish, Condition 6(10) of Certificate of Approval #8700-783LPK, De Beers Canada Inc., Victor Mine. This program may be amended*

from time to time when approved in writing by the District Manager. As well, water quality data collected as part of the groundwater well field recovery system shall be analyzed statistically to determine the variability and trending over time. Should significant variation occur over time within individual wells or group of wells then a potential concern will be deemed to exist, requiring further investigation.

3.0 REPORTING – CONDITION 6(8) DATA

3.1 Condition 6(8) (a) – One Time Assessment of Peat Solids

Requirements of this condition were fulfilled in Section 3.1 of the first annual mercury report (2008 Annual Report), and are not repeated here.

3.2 Condition 6(8) (b) – Annual Analysis of Peat, Mineral Soil and Bedrock Pore Water

Condition 6(8) of Amended C. of A. #4111-7DXKQW, dated October 3, 2008, and Condition 6(8) of the Amended version referred to as C. of A. #3960-7Q4K2G, dated March 13, 2009, both provide for the annual collection of peat pore water samples from muskeg monitoring program stations identified in Table 2 of the C. of A. The two C. of A.'s also provide for the annual collection of water samples from muskeg monitoring program mineral soil and bedrock monitoring wells / piezometers identified in Table 2 of the C. of A. Samples are to be analyzed for total and methyl mercury.

C. of A. #4111-7DXKQW was preceded by C. of A. #8700-783LPK, dated December 11, 2007. Condition 6(9) of C. of A. 8700-783LPK provided for the development and approval of a mercury monitoring plan. The mercury monitoring plan had been developed previously through consultation with the MOE and was submitted to the MOE on November 13, 2007. The November 13, 2007 monitoring plan provided for the annual collection of peat pore water samples from the same muskeg monitoring program stations identified in Table 2 of C. of A. #3960-7Q4K2G; as well as from mineral soil samples to be collected from three depths below surface from each of the MSV(1)-D, MSV(2)-D and MSV(3)-D stations.

As a precautionary measure to better document baseline conditions, filtered samples for total and methyl mercury analysis were collected from all of the monitoring stations identified in Table 2 of C. of A. #3960-7Q4K2G during 2007. However, due to confusion over the small changes to the sampling program introduced in October 2008 in C. of A. #4111-7DXKQW, from those defined in the earlier November 2007 AMEC submission, the mineral soil pore water samples for the muskeg monitoring program stations were not collected in 2008 prior to freeze-up. Hence, there were no mineral soil or bedrock pore water mercury samples for the late summer / fall of 2008.

Sample collection as per C. of A. #3960-7Q4K2G Table 2 requirements was resumed in August / September of 2009; with the omission of a few samples due to monitoring wells with too little water to sample – particularly in deep clay overburden wells; sample breakage in transit; sampling errors, etc.

Muskeg monitoring program pore water sample results for total and methyl mercury filtered samples are provided in Table 1 from 2007 to 2012 and sampling station locations are shown in Figure 1.

More detailed data presentations for the various muskeg (peat) types and underlying marine sediment and bedrock zones are presented in Table 2. Table 2 is divided into a series of sub-tables from 2a to 2g, with associated graphical data presentations for ease of data interpretation. It should be noted that the vertical scales on these graphs vary depending on the range of results observed. Statistical analyses using all data sets are presented in Section 4. With minor, and possibly spurious results for a few samples, total and methyl mercury values observed in 2012 were within the range of values observed in previous years for the different stations. Occasional spikes in data were observed for some of the stations for both total and methyl mercury in 2012, but there is no temporal or spatial pattern to the data, and such spikes were equally likely to be observed in stations remote from the area under-drained by Victor Mine dewatering (e.g., Station Clusters S-9(1), S-9(2), S-13 and S-15), as at areas closer to the mine (Station Clusters S-1, S-2, S-7 and S-8, as well as the S-V1, S-V2 and S-V3 Clusters). Year to year variations therefore appear to be a regional phenomenon that is not linked to mine dewatering effects on muskeg mercury chemodynamics.

It is noteworthy in this regard that the summers (June through September) of 2011 and 2012 were exceptionally dry, as evidenced by flow measurements from the Tributary 5A control watershed. This control watershed is located south of the Nayshkootayaow River and is beyond the potential zone of mine dewatering effects. Average summer flows for Tributary 5A in 2011 and 2012 were only 46% and 32%, respectively, of average flows recorded for 2007 through 2010. Lower summer water levels can lead to higher mercury values in some circumstances due to evaporative concentration effects.

All of the observed values for total mercury and methyl mercury are well below their respective Canadian Environmental Quality Guideline (CEQG) values of 26 ng/L for total mercury and 4 ng/L for methyl mercury.

3.3 Condition 6(8) (c) – Analysis of Surface Water Systems

Surface water systems considered in this section include the following:

- Passive fen treatment systems;
- Ribbed fen systems;
- Granny Creek; and
- Nayshkootayaow and Attawapiskat Rivers.

Passive Fen Treatment Systems

The Southwest Fen (SWF) was used as a passive wetland treatment system for the removal of residual total suspended solids and nutrients from the Central Quarry waste water discharge during 2006. The Northeast Fen (NEF) provides, or provided, a similar function for effluents derived from the following sources:

- Plant site excavation area (completed 2006);
- Crusher excavation area (completed 2006 and 2007);
- Attawapiskat River intake excavation and construction (completed 2007).
- Open Pit mine Phase 1 Mine Water Settling Pond (started 2007 and ongoing);
- Dry waste landfill runoff and leachate (started autumn of 2008 and ongoing);
- Fully treated sewage treatment plant effluent (started 2006 and completed August 2011); and
- Mine rock stockpile runoff (started in 2010 and continuing).

The Southeast Fen (SEF) and the Northwest Control Fen (HgCON) were set up as control fens for the SWF and the NEF. The SEF previously received minor discharges from the shallow south quarry during parts of 2004 and 2005, but was not materially affected by these discharges, and is therefore regarded as being not impacted by mine site discharges or runoff. The HgCON has never received effluent discharge from any source.

Sampling from the SWF was discontinued in June 2009 as the C. of A. for this fen treatment system (C. of A. 3374-6G7J2Y – dated December 13, 2005) was revoked on March 3, 2009. Much of the SWF has since been overlaid by stockpiles of mine waste (overburden, low grade kimberlite and processed kimberlite). There are consequently no data for the SWF beyond May 2009.

Total mercury data (unfiltered and filtered) for the passive fen treatment and control system fens are presented in Tables 3 and 4. Methyl mercury data (unfiltered and filtered) for these same systems are presented in Tables 5 and 6. All results are within applicable federal (and provincial) guidelines for the protection of aquatic life with the exception of an NEF methyl mercury sample taken in January 2012 which is not consistent with the other 2012 methyl mercury results and appears anomalous in nature (unfiltered value of 8.09 ng/L and filtered value of 4.09 ng/L). The methyl mercury value of 8.09 ng/L (unfiltered) is greater than its counterpart total mercury value of 5.31 ng/L (unfiltered) and thus this sample is considered an outlier and most likely influenced by under ice sampling conditions which can cause an increase in mercury concentration, due to ice crystallization effects. In very shallow stagnant water, as the water freezes, ions tend to be extruded from the ice crystal matrix and concentrated in the remaining water below the ice. In extreme cases where the water freezes to near bottom, severe parameter concentration distortions can occur.

Total mercury concentrations in 2012, as in previous years, were generally comparable between the effluent treatment fen station (NEF), and the two control fen stations (SEF and HgCON) for unfiltered and filtered samples (Tables 3 and 4).

Results for methyl mercury in 2012 were similar to those of previous years (Tables 5 and 6), and while still meeting federal and provincial guidelines for the protection of aquatic life, with the exception of an anomalous methyl mercury result in January 2012 in the NEF, concentrations of methyl mercury were decidedly higher in the NEF compared with either of the two control fens.

Methyl mercury concentrations in the NEF are believed to be elevated as a result of increased sulphate levels, as described in the 2008 Mercury Performance Monitoring report. Sulphate reducing bacteria utilize sulphate as a nutrient, and hence higher sulphate levels tend to promote increased rates of conversion from total mercury to methyl mercury (Ullrich et al. 2001; Jeremiason et al. 2006). Sulphate concentrations in the NEF during 2012 averaged approximately 90.0 mg/L, which is above the optimal range of 20 to 50 mg/L for mercury methylation, but still within a range that would be expected to actively encourage mercury methylation. NEF sulphate levels during the summer months, when methylating bacteria are most active, were slightly lower averaging 62.7 mg/L for 2012. Samples from control fen sites typically contain <0.1 mg/L of sulphate. Sulphates discharged to the NEF are believed to derive from previous excavation discharges as well as from treated wastewater from the camp sewage plant, and other potential sources, including drainage from the developing mine rock stockpile. The increased mercury methylation rate observed for the NEF is therefore a localized phenomenon, and is not believed to be related to muskeg drying effects.

Ribbed Fen Systems

The water quality of general site area drainage is monitored on a quarterly basis at three ribbed fen stations located on or near the Victor Mine site (Stations MS-V1-R, MS-V2-R, and MS-V3-R), as well as at several more remote sites (Figures 1 and 2). Ribbed fen sites were selected for surface water quarterly monitoring because ribbed fens, more than other muskeg types, tend to collect water from surrounding drainages and therefore provide the most representative data on overall site drainage.

Quarterly water sample collection from the suite of ribbed fen sites was initiated in mid-2007, and has been carried out since, except where prevented by frozen ground conditions (Table 7). However, due to confusion at the Mine site over the need to collect both peat pore water and surface water samples from ribbed fens, only peat pore water samples were collected in 2007 and 2008. C. of A. #3960-7Q4K2G provides for collecting peat pore water samples from all muskeg monitoring stations, including ribbed fens, on an annual basis; and collecting surface water samples from ribbed fen stations, only, on a quarterly basis. Sample collection protocols were remedied in 2009 in accordance with C. of A. requirements.

In addition, to assist with data interpretation De Beers collects samples from these same ribbed fen stations for the analysis of chloride, conductivity, nitrate, dissolved organic carbon, pH, sulphate, total phosphorus, calcium, iron, magnesium and sodium (Table 8). Two aspects are of note from Table 8: elevated chloride and sodium levels for MR-S8 in 2007 and 2008; and low pH and calcium values in the later years for MS-13R. The high values of chloride and sodium at station MS-8-R during the early years rapidly dropped off in 2009 and have remained relatively low ever since. The elevated concentrations in 2007 and 2008 indicate active groundwater up-welling which likely ceased subsequently due to well field dewatering and reversing groundwater gradients. The sharp and sustained drop in pH and calcium for MS-13R from 2009 onwards suggests that the sampling location for this station may have changed, and is no longer reflective of fen drainage. This needs to be checked in the field for 2013 sampling. Bog and fen ponds occur in close proximity at this location, and it is possible that a slight shift in GPS sampling coordinates could result in sample position confusion.

Total and methyl mercury sample results for the ribbed fen stations are shown in Tables 7a and 7b for 2007 through 2012. The data show low concentrations of both total and methyl mercury, with no increasing or decreasing trends. MS-8-R showed a somewhat elevated methyl mercury concentration for the January 2012 sample, but MS-13-R (one of the two remote control stations) also showed somewhat elevated methyl mercury concentrations. MS-8-R is located near to the Victor site, northwest of the open pit. Both of the elevated methyl mercury values observed for these two stations in 2012 were for under ice samples, and should therefore be viewed with caution, as per discussions above regarding ice crystallization concentration effects.

Granny Creek System

Upstream and downstream total and methyl mercury concentration data for the Granny Creek system are provided in Tables 9 through 12. Sampling locations are shown in Figure 3. Average total mercury concentrations for the four stations for 2012 varied from 2.06 to 2.57 ng/L for unfiltered samples, and from 1.38 to 1.66 ng/L for filtered samples (Tables 9 and 10). These values are well within the 26 ng/L CEQG value for the protection of aquatic life. The South Granny Creek upstream sample taken in March 2012 has a total mercury concentration of 29.4 ng/L; this result appears anomalous compared to the rest of the data for 2012 and is possibly a laboratory typographical error (result should likely be 2.94 ng/L); the result is displayed in the table for completeness but excluded from the annual average calculation for 2012. Filtered sample results for total mercury, averaged over 2012, are similar for upstream and downstream samples from both creek branches (Table 10). The graphs attached to Tables 9 and 10 also show that while total mercury concentrations can vary substantively throughout the year, due to seasonal and hydrological effects, there are no evident long-term trends in the comparison of stations for either North or South Granny Creeks, for stations upstream or downstream of the developed areas of the mine site.

Methyl mercury concentrations for unfiltered and filtered samples, from upstream and downstream South and North Granny Creek stations, are shown in Tables 11 and 12. The values are again variable, depending on seasonal and hydrologic influences. However, unlike total mercury where there is no evident trend between upstream and downstream stations, a trend appears to be emerging for 2011 and 2012 where the downstream branches of both creeks are showing slightly elevated methyl mercury concentrations in some months (Tables 11 and 12), While elevated methyl mercury concentrations are noted in downstream Granny Creek waters in some months, these elevated values are still well below the CEQG value of 4 ng/L.

Downstream increases in Granny Creek methyl mercury appear to be related to sulphate drainages associated with the mine site area. These drainages occur in association with the

NEF, the mine rock stockpile, the coarse PK stockpile, and other stockpiles around the site; and are not believed to be linked to muskeg dewatering effects, as all available evidence shows that the peat horizons in the general mine site area continue to be saturated (AMEC 2012). Sulphate drainage effects are localized.

Nayshkootayaow and Attawapiskat Rivers

Total and methyl mercury results for the Nayshkootayaow and Attawapiskat Rivers are shown in Tables 13 and 14. Sample locations are shown in Figure 3. Graphical data are presented in Figure 4. All values are generally low, consistent across the stations, and well within CEQG values. Filtered results for all stations on the Nayshkootayaow and Attawapiskat Rivers were generally comparable and well within the range of historical data for the respective stations.

3.4 Condition 6(8) (d) – Annual Analysis of Well Field Discharge

Starting in November 2007, in accordance with Condition 6(3) of C. of A. #8700-783LPK, dated December 11, 2007, and Condition 6(3) of Amended C. of A. #4111-7DXKQW, dated October 3, 2008, as well as Condition 6(3) of Amended C. of A. 3960-7Q4K2G, dated March 13, 2009, De Beers initiated monthly monitoring of total and methyl mercury concentrations in the well field discharge. Sampling was initiated proactively in advance of the December 2007 C. of A. issue date. All values for the period of November 2007 to December 2012 have remained low (below CCME guidelines) for both total and methyl mercury, as shown in Table 15. Filtered total and methyl mercury concentrations in the well field discharge have thus far, on average, been below background concentrations measured in the Attawapiskat River as shown in Table 13 and 14, and there are no evident temporal trends in the data with the possible exception of a weakly expressed, slight decline in total mercury values (Table 15). However, if the data for total mercury are viewed from 2010 onwards, the curve is essentially flat.

Quarterly total and methyl mercury sampling results for operating individual wells are shown in Tables 16 and 17, respectively. Wells VDW-11, 12 and 22 continue to show the highest total mercury concentrations. The very high total mercury concentration of 109.24 ng/L observed for the January 2012 sample from VDW-22 is a result of a sediment pulse in the sample, or the value is anomalous, as the filtered sample for this date shows a total mercury concentration of 0.71 ng/L. Sediment pulses can occur when wells are turned on and off. Methyl mercury concentrations were uniformly low across all wells (Table 17). There appears a slight increase in total mercury concentrations for VDW-22 from 2011 to 2012 (3.92 ng/L to 8.20 ng/L), however these results are still below the CEQG value of 26 ng/L for protection of aquatic life, and may just represent random variation in sample results.

Methyl mercury concentrations were all low in the individual wells, ranging from <0.01 ng/L to 0.07 ng/L for the unfiltered samples and <0.01 ng/L to 0.05 ng/L for the filtered samples.

3.5 Condition 6(8)(e) – Small Fish Mercury Body Burdens

Small-bodied fish species are to be collected annually from North Granny Creek, South Granny Creek, Tributary 5A, the Nayshkootayaow River (upstream of Tributary 3 and downstream of the Granny Creek confluence) and the Attawapiskat River (upstream of the mine site, approximately 500 m downstream of the well-field discharge and approximately 2 km downstream of the well-field discharge point). Sampling areas in the Attawapiskat River upstream of the mine site, in the Nayshkootayaow River upstream of Tributary 3, as well as Tributary 5A serve as reference areas to near-field and far-field areas located downstream of the mine site and discharge locations.

The sample locations for small-bodied fish from 2007 to 2012 are shown in Figure 5. Small-bodied fish were collected from these locations using the techniques of electroshocking, minnow trapping and seine netting (where applicable). In 2012, small-bodied fish were captured at these locations in relatively moderate abundances, with reasonable effort, using all sampling techniques. A single common sentinel species was not available at each sampling area. The presence of Pearl Dace (*Margariscus margarita*) was adequate to allow for comparisons between North Granny Creek, South Granny Creek and Tributary 5A. A second species, Trout-Perch (*Percopsis omiscomaycus*), was used to compare upstream and downstream Attawapiskat and Nayshkootayaow River locations. Trout-Perch were captured at five of the eight locations sampled in 2011 and 2012 and therefore provide some level of comparability across the study area. Total species-specific catch data for each location are summarized in Tables 18, 19, 20 and 21 for electroshocking, minnow trapping, seine netting and dip netting respectively. A total of 1,739 fish of the two sentinel species were captured and 393 were submitted for analysis of mercury body burden in 2012. The catch of each species was greater than 30 per site in all cases and therefore sufficient to provide statistical comparison between sample areas for 2012.

Mercury body burden primary comparisons between sample areas were made using the species as summarized in Table 22. At time of capture fish were identified to species and measured for length (fork and total) and wet weight. Fish used for the mercury study were immediately frozen after processing.

In the laboratory, individual samples were thawed and sub-sampled for dorsal muscle on which total mercury analysis was completed. A small mass was retained for oven-drying, and a minimum of two wet samples (<0.5 g wet weight each) was used for analyses. Remaining sample, if any, was kept frozen for replicate analyses if required. Samples were analyzed and reported as wet weight as per standard methods. Analysis was by thermal decomposition and atomic absorption detection using a Milestone DMA-80 as per the requirements of USEPA Method 7473. Calibration and instrument performance were verified through the analysis of various fish tissue standard reference materials. Analyses were conducted at the Biotron multi-disciplinary experimental climate change research centre at the University of Western Ontario in London, Ontario.

Sentinel Species Comparisons

As previously described and summarized in Table 22, mercury body burden primary comparisons were made between sample areas using the two sentinel species (Pearl Dace and Trout-Perch). These species were used for comparative purposes for those locations where they have proven available in annual abundances that will facilitate comparison between similar waterbodies. It should also be noted that both species generally share a common trophic niche (i.e. insectivores).

It is acknowledged that a single sentinel species is preferred because it reduces the potential for variation in data and therefore difficulty of interpretation of results in fish tissue mercury concentrations. However, given the additional effort expended and the large differences in habitats studied (i.e. small tributary vs. large river) the need to use two sentinel species has been recognized by the MOE and has been generally accepted.

However, to further demonstrate the utility of using two sentinel species and present the possible between species variability in mercury body burden levels a one-way ANCOVA was performed to compare total mercury concentration between species with total length included as a covariate to account for size. This test was performed with data from all years pooled for each species both for all sites combined and then for those sites which have demonstrated an overlap of species availability on the Nayshkootayaow River (i.e. NAY-US3 and NAY-DS6).

Results of the between species comparison with all years and sample locations pooled indicated a significant difference in mean body burden with Pearl Dace having a arcsin transformed Least-Squared Mean (LS Mean) value of 0.371 compared to 0.292 for Trout-Perch (ANCOVA, $p < 0.001$) (Figure 6). However, these results do not necessarily indicate a large biological difference as the majority of Pearl Dace included in the analysis were captured in smaller tributaries (Granny Creek system) compared to the majority of Trout-Perch having been captured in the largest waterbody studied, the Attawapiskat River. Therefore, geographical and/or waterbody size variation would be sufficient to explain the difference in results.

When the analysis of total mercury body burdens is completed for both species, for those locations which have both species available (all years combined), the results show no significant difference (ANCOVA, $p = 0.25$) in mean total mercury body burden between Pearl Dace and Trout-Perch (Figure 7). These results indicate that when habitat and forage base are relatively similar that the two species show similar levels of mercury concentration within muscle tissues.

As such the use of two sentinel species specific to waterbody size is applicable for this study and should be continued in future studies with further opportunities for comparative analysis between species explored if and as needed.

Granny Creek System

Pearl Dace mercury body burden levels were compared between North Granny Creek (NGC), South Granny Creek (SGC) and Tributary 5A (ST-5A) for samples collected during June and August of 2012. (Tables 18 to 21). Tributary 5A is the selected control system for comparisons with the Granny Creek system.

Mean total length (mm), wet weight (g) and total mercury concentration (µg/g = ppm) values are summarized for Pearl Dace in Table 23. Mean length and weight were not statistically different between NGC, SGC and ST-5A in 2012 (ANOVA, $\alpha = 0.05$). Pearl Dace showed a greater mercury body burden concentration at NGC (0.359 µg/g) than at SGC (0.083 µg/g) or ST-5A (0.091 µg/g) in 2012.

Differences in Pearl Dace mean body burden total mercury values were statistically significant (ANOVA, $p < 0.001$) (Figure 8; Table 24). Post-hoc comparison indicated that mean body burden values were significantly different between NGC compared to SGC and ST-5A. The body burden value for NGC was almost 4 times greater than that of ST-5A (Figure 8). Total mercury concentrations in tissues were not significantly different between SGC and ST-5A in 2012.

A between year comparison using ANOVA was carried out for each of NGC, SGC and ST-5A and the results are shown in Table 25. Total mercury body burden in 2012, at SGC, was statistical different from all previous sampling years and showed a relative reduction to past levels (Figure 8). However, NGC Pearl Dace showed a change in mercury body burdens between years ($p < 0.001$) with 2011 showing no similarity to any other year with exception to 2012 which showed a similar mean body burden level. Mean total mercury was reduced from 0.176 µg/g in 2008 to 0.066 µg/g in 2009, yet increased to 0.259 µg/g in 2010, 0.350 µg/g in 2011 and 0.359 µg/g in 2012 (Table 23; Figure 8). NGC had the lowest mean body burden value of the three areas in 2009, yet the highest levels in 2011 and 2012.

The relationship between total mercury concentration and total length for Pearl Dace is shown in Figure 9 for each sample location from 2008 to 2012. The relationships were positive (i.e. larger fish contained more mercury) for all locations and years, yet slopes were variable between areas and years. Extrapolation of body burden levels for a standardized total length for Pearl Dace is summarized in Table 26. For Pearl Dace the standardized total length for comparison was 60 mm. The extrapolated values for Pearl Dace remained relatively consistent from 2008 to 2010 for SGC and ST-5A. The standardized value was markedly reduced in 2012 from 2011 at SGC with the value remaining constant at ST-5A. At NGC a marginal increase in the standardized value from 0.326 µg/g in 2011 to 0.333 µg/g in 2012 indicated a similar level of total mercury at size for this tributary through two successive years.

To further evaluate differences in the mercury levels in Pearl Dace between Granny Creek and Tributary 5A the mean body burden levels were compared between sampling area by mixed General Linear Model (GLM) using age class group as a categorical main effect to account for the age (growth) effect. This approach was used due to the absence of specific age assessment for each individual Pearl Dace analyzed for total mercury concentration and provides a reasonable approach to comparing between site effects while taking into account possible differences in accumulation rates. In the case of Pearl Dace, age class group was determined for each sampling area by plotting length frequency distributions (relative proportion of fish having a specific total length rounded to the nearest 5 mm) using data from all years pooled (Figure 10). For all sampling areas, accept NAY-US3, the total length of 60 mm was designated as the threshold for which individuals with a length less than this value were considered young of the year (YOY; having been hatched in the spring of year sampled). Individuals greater than 60 mm were considered to be aged 1+ (1 year of age or greater). For NAY-US3 the threshold was set at 50 mm as inferred from the length frequency distribution for this location. Further resolution in age groups is not currently available however, Pearl Dace from 2012 are currently being interpreted for age to provide further detail and support length frequency distributions.

Figure 11 summarizes the LS mean total mercury concentration (arcsin transformed and adjusted for age class group) for Pearl Dace from each sampling area for each year. Mean body burden levels showed an increasing trend from 2008 to 2012 for NGC while SGC showed an overall decreasing trend and ST5A showed little change from 2008 to 2012.

Summary and Discussion

Mean body burden mercury values for NGC were greater than for either ST-5A or SGC in 2012. This same trend of higher total mercury body burdens in NGC, compared with the values for SGC and ST-5A, was also observed in all other years dating back to 2008, with the exception of 2009 where the trend was reversed (Figure 8). The relationship between total mercury concentration and total length showed variability between area and between years for Pearl Dace, however, variable intercept and positive slope values for relationships indicate annual changes in young-of-the year mercury body burdens and subsequent trajectories of methyl mercury (the form most easily taken up by fish) accumulation. When correcting for age class there continues to be a significant difference between NGC, SGC and ST5A within each year sampled with NGC showing an increasing trend in mercury concentration. As age class had only two categories (YOY and age 1+) age class group was bimodal in this case. As such, investigation using linear regression as request by MOE is not feasible at this time. Further assessment of age distribution through interpretation of individual fish calcified age structures to provide mercury body burden at a given age and therefore a surrogate for accumulation with growth for each sampling area may prove useful. However, after adjusting for age class group the mean total body burden mercury levels in NGC show an increasing trend annually, while both SGC and ST5A show some reduction in levels, or have remained constant. The increasing trend at NGC likely signals and increase in accumulation rate in comparison to SGC and ST5A.

Mean weight and length for Pearl Dace were not significantly different in 2012. The relationship between weight and length (i.e. weight at length) provides a representation of fish condition and does not directly represent growth as there is no specific indication of time to reach such a condition. Differences in accumulation rates between waterbodies are best described as presented in the previous paragraph. It is assumed that based on similar weight and length mean values between waterbodies in 2012 that condition would also be similar.

To further assess the basis for observed differentials in small-bodied fish mercury body burden concentrations between the two systems, AMEC also compared background methyl mercury water quality concentrations in Granny Creek and Tributary 5A. Data for the Granny Creek system were taken from downstream stations dating back to mid-2006 (Stations G2 and G6, Figure 3). These stations are within the potential influence of mine site discharges or well field dewatering effects as well as in the vicinity of the sampling areas for small-bodied fish. Results are shown in Table 27. The data for Granny Creek are variable, responding to seasonal and hydrologic influences. In comparing Granny Creek to Tributary 5A, the average methyl mercury concentration for the North Granny Creek in 2008 was 8 times greater than for Tributary 5A and 2.6 times greater than for South Granny Creek for the same time period, suggesting that background methyl mercury concentrations are naturally elevated in North Granny Creek and South Granny Creek (in decreasing order) compared to Tributary 5A. Methyl mercury levels have remained relatively higher in NGC compared to SGC and Tributary 5A through 2008 to 2012 (Table 27). Increased methyl mercury levels are believed to be a result of increased sulphate levels associated with various mine activities, as described above in Section 3.3. Sulphate reducing bacteria utilize sulphate as a nutrient, and hence higher sulphate levels tend to promote increased rates of conversion from total mercury to methyl mercury (Ullrich et al. 2001; Jeremiason et al. 2006). Data provided by Orihel et al. (2007) suggest a direct linear relationship between mercury concentrations in water and mercury body burden concentrations in small fish.

Annual increases, in Pearl Dace body burden levels, from the preceding year (i.e. South Granny Creek from 2008 to 2009 and North Granny Creek from 2009 to 2010 to 2011) do not necessarily reflect the changes observed in mean methyl mercury water quality concentrations for each of these tributaries between years. However, the relative increase in methyl mercury water quality concentration in North Granny Creek from 2010 to 2011 is reflected in the increase in fish body burden levels for mercury in the same water body. Increases in body burden levels for Pearl Dace in NGC in 2012 likely reflect the continued bioavailability of sulphates to reducing bacteria, which may not be reflected in water quality results for 2012.

Nayshkootayaow and Attawapiskat River Systems

In 2012 Trout-Perch mercury body burden levels were compared between the Nayshkootayaow River upstream of Tributary 3 (NAY-US-ST3) and the Nayshkootayaow River downstream of Tributary 6 (Granny Creek) (NAY-DS6). Trout-Perch were compared from the Attawapiskat River approximately 9 km upstream of the mine site (ATT-US), the Attawapiskat River 250 m downstream of the well-field discharge (ATT-NF), and the Attawapiskat River 2.5 km downstream of the well-field discharge (ATT-FF) (Figure 5). The total number of Trout-Perch captured was 1,045 and catch per sampling area is summarized in Table 18. The total number of Trout-Perch analyzed for mercury tissue concentrations was 271 in 2012.

Mean total length (mm), wet weight (g) and total mercury concentration (µg/g) values are summarized for Trout-Perch in Table 28 for 2008 to 2012. Mean length and weight were not significantly different between sample locations in 2012 (ANOVA, $\alpha = 0.05$) with mean values ranging from 54 to 61 mm and 1.8 to 2.7 g between locations (Table 28).

In 2012, Trout-Perch mean mercury body burden levels were significantly different between the near-field sampling area (ATT-NF; 0.093 µg/g) and the upstream reference area (ATT-US; 0.058 µg/g). The mean mercury body burden level for the far-field sample area (ATT-FF; 0.093 µg/g) was similar to ATT-NF, but significantly different compared to ATT-US (ANOVA, $p < 0.001$). Mercury body burden levels for Trout-Perch from the Nayshkootayaow River were nearly equal between sampling areas in 2012 (NAY-US-ST3 = 0.057 µg/g and NAY-DS6 = 0.054 µg/g) in 2012 (Tables 24 and 28; Figure 12).

A between year comparison ANOVA was carried out for each of Attawapiskat and Nayshkootayaow River sample areas and the results are shown in Table 25. Each of the sample areas on the Attawapiskat River had a significant change in mercury body burden levels between years (ANOVA, $\alpha = 0.05$). Mean values for ATT-US were similar in 2008 and 2010 (0.096 and 0.106 µg/g respectively) while 2009 had a value of 0.058 µg/g, which was significantly lower than values for both 2008 and 2010 but similar to values in 2011 (0.062 µg/g) and 2012 (0.058 µg/g). Mercury concentrations in Trout-Perch from ATT-NF were significantly reduced between 2009 (0.196 µg/g) and 2010 (0.074 µg/g) and further reduced in 2011 (0.065 µg/g) however increased in 2012 (0.093 µg/g) yet remained below 2009 levels. Similarly, mercury values from Trout-Perch sampled at ATT-FF were significantly reduced from 2008 (0.164 µg/g) to 2009 (0.096µg/g) with the value staying consistent in 2010 (0.097 µg/g), reduced in 2011 (0.075 µg/g), then increasing in 2012 (0.093 µg/g) to a level similar to ATT-NF (Tables 25 and 28; Figure 12).

No significant change in mean mercury body burden values was evident for Trout-Perch at NAY-US-ST3 with the exception of 2011 (0.087 µg/g) being significantly different from 2012 (0.057 µg/g). NAY-DS6 had a significant reduction in the mean mercury body burden concentration for this species from 0.176 µg/g in 2008 to 0.098 µg/g in 2009 and remained consistent for 2010 at 0.108 µg/g, yet was reduced to 0.051 µg/g in 2011 which was nearly equal to the value for 2012 of 0.054 µg/g (Table 25 and 28; Figure 12).

The relationship between total mercury concentration and total length for Trout-Perch is shown in Figure 13 for each sample location from 2008 to 2012. Relationship slopes were variable between areas and years. Extrapolation of body burden levels for a standardized total length for Trout-Perch is summarized in Table 26. For Trout-Perch the standardized total length for comparison was 50 mm. The extrapolated values showed annual variability for each of the sampling areas with the mercury value for ATT-US more than doubling between 2009

(0.052 µg/g) and 2010 (0.111 µg/g) with a reduction to 0.044 µg/g in 2011. This value remained constant for at this location for 2012. Conversely, ATT-NF had an extrapolated mercury value reduced by a half between 2009 and 2010 (0.146 µg/g to 0.074 µg/g, respectively) with a reduction in 2011 to 0.060 µg/g and an increase in 2012 (0.089 µg/g). Results for the ATT-FF sampling area indicate a consistent body burden level for Trout-Perch through 2008 to 2010 (approximately 0.1 µg/g) with a marked reduction in 2011 to 0.039 µg/g. The extrapolated value for 2012 for this sampling area increased to 0.094 µg/g nearly equal to values from 2008 to 2010 (Table 26).

In 2011 individual Trout-Perch from each of the Attawapiskat River sampling areas were analyzed for both total mercury and age. Age was interpreted from calcified structures (otoliths) to determine age in years. Specific to this year the linear relationship between total mercury concentration in muscle tissue versus age in years was tested for each of ATT-US, ATT-NF and ATT-FF. For each of these relationships a statistically significant (Regression, $p < 0.001$ for each sampling area) and positive linear relationship was found with R^2 values of 0.60, 0.28 and 0.78, respectively. These relationships are presented in Figure 14 and show nearly similar slopes (0.04) indicating a very similar rate of accumulation for Trout-Perch between sites with age. A comparison of these relationships by ANCOVA provided LS mean values of arcsin transformed total mercury (adjusted for age) which were very similar between ATT-US and ATT-FF (0.28 and 0.29) with ATT-NF having only a slightly higher value (0.33) (Figure 15).

To further understand differences in the mercury levels in Trout-Perch between Attawapiskat River and the Nayshkootayaow River mean body burden levels were compared between sampling area by mixed General Linear Model (GLM) using age class group as a categorical main effect to account for the age (growth) effect. This approach was used due to the absence of specific age assessment for each individual Trout-Perch for all sampling years and to support the previous comparison of body burden at age described above. This approach provides a reasonable approach to comparing between site effects while taking into account possible differences in accumulation rates. In the case of Trout-Perch, age class group was determined for each sampling area by plotting length frequency distributions (relative proportion of fish having a specific total length rounded to the nearest 5 mm) using data from all years pooled (Figure 16). For all sampling areas the total length of 60 mm was designated as the threshold for which individuals with a length less than this value were considered YOY. Individuals greater than 60 mm were considered to be aged 1+.

Figure 17 summarizes the LS mean total mercury concentration (arcsin transformed and adjusted for age class group) for Trout-Perch from each sampling area for each year. Mean body burden levels in the Nayshkootayaow River showed a general decrease in 2012 in comparison to previous years with little difference between levels for Trout-Perch between NAY-US3 and NAY-DS6. When adjusted for age class group the body burden levels for Trout-Perch in the Attawapiskat River are somewhat variable from year to year. For the majority of years adjusted body burden levels was greater at ATT-NF in comparison to ATT-US with ATT-FF showing variable results with respect to its mean body burden level in comparison to more upstream sampling areas of the Attawapiskat River. From 2011 to 2012 the adjusted arcsin transformed mean total mercury concentration at ATT-NF saw only a slight increase from 0.29 to 0.33 (Figure 17).

Summary and Discussion

Trout-Perch total mercury body burden values were similar between Nayshkootayaow River sampling areas in 2012 which does not reflect previous results for this waterbody for past years where both the upstream area (NAY-US3) and the downstream area (NAY-DS6) have shown elevated mercury body burden levels for this species in comparison to each other. As such, a clear trend over time has not become apparent in the dataset indicating that natural variability may account for much of the variance.

In 2012 the mean mercury body burden concentration (both corrected and uncorrected for size and age) showed an elevated level at the Attawapiskat River near-field area compared to both the upstream reference area and downstream far-field area. This is consistent with previous years samples, except for 2011. Despite elevated levels of mercury in Trout-Perch tissues from the near-field area, methyl mercury concentrations in surface water samples were virtually unchanged along the length of the Attawapiskat River (Table 14) in 2012 and therefore variability in body burden levels of Trout-Perch are not likely related to water quality mercury concentrations and are not fully understood. When corrected for age class group, the body burden levels at the near-field and far-field areas showed similar results for mean mercury concentration, possibly indicating similar sources for bioaccumulation. However, the relationship of mercury concentration to age did not show a difference in slope, indicating a similar trajectory for accumulation rate. The difference between the near-field area and the other Attawapiskat River areas is demonstrated through a greater relationship y-intercept indicating a higher concentration of mercury at age zero (YOY). This may indicate a difference in forage behavior or food type availability for larval Trout-Perch within this area, as zooplankton often undergo dramatic shifts in community structure over short time frames and mercury concentrations vary among invertebrate taxa (Kainz et al. 2002, Eagles-Smith and Ackerman 2009)

Extrapolation of body burden levels for a standard total length of Trout-Perch (50 mm) showed a decrease for the upper Nayshkootayaow River area from 2011 to 2012 with the lower Nayshkootayaow River area staying similar or slightly increasing. The upstream reference area of the Attawapiskat River saw no change from 2011 to 2012 while the near-field and far-field areas both saw marked increases.

Variability in body burden levels specifically for YOY Trout-Perch as observed in some years and specifically in 2009 may be indicative of the differences in forage behavior or food type availability for larval Trout-Perch within areas on an annual basis (Kainz et al. 2002, Eagles-Smith and Ackerman 2009). Furthermore, it has been demonstrated that locations only a short distance apart (500 m) can show marked differences in mercury concentration in small-bodied fish as a result of YOY site fidelity and variations in the geographic sources of mercury (Choy et al. 2008). Streams and rivers can exhibit marked temporal variation in Hg concentrations, which is associated with variations in concentrations of dissolved organic carbon or suspended matter. Large increases in Hg concentrations can occur during high flow events (Shanley et al. 2005, Driscoll et al. 2007). Recent findings of ongoing research on the waterbodies within the vicinity of the Victor Mine have indicated that differences in mercury body burdens are correlated with hydrological events and specifically that increased variability in body burden levels are observed following periods of high precipitation and flows from the tributaries associated with muskeg drainage (Warnock et al., In Prep).

3.6 Condition 6(8)(e) – Sport Fish Mercury Body Burdens

As per C of A #3960-7Q4K2G, large-bodied sport fish are to be sampled every three years from the Attawapiskat River, Nayshkootayaow River and Monument Channel to investigate mercury body burden concentrations. There were no sport fish (large fish) sample collections required or planned for 2012. The next collection period for sport fish is scheduled for 2013.

4.0 REPORTING – CONDITION 6(9) DATA

4.1 Annual Analysis of Peat Pore Water

As described in Section 3.2, and as a general observation, concentrations of total mercury in the 2012 peat horizon water samples were not markedly higher or lower than the range of data for previous years, with the exception of two methyl mercury values for the horizontal and ribbed fens which are slightly higher than the range of data from 2007 to 2012. These two data points appear to be spurious. Statistical analyses of total and methyl mercury peat pore water concentrations are presented in Table 29 for the: S-1 stations (Table 29a), the S-2 stations (Table 29b), the S-7 stations (Table 29c), the S-8 stations (Table 29d), the S-9(1) stations (Table 29e), the S-9(2) stations (Table 29f), and the S-V stations (Table 29g). As was the case for previous years, none of the 2012 results for total or methyl mercury were significantly different for location effect compared with the S-13 / S-15 background control stations using Two-Way Analysis of Variance at $\alpha = 0.05$.

General site inspections and flyovers, showed no evidence of any meaningful peatland “drying out”, in the area of well field induced depressurization of the underlying upper bedrock aquifer for the 2012 season compared with background outlying areas. As noted above, flow data from the reference tributary (Tributary 5A) show that 2012 was an exceptionally dry summer. A few localized areas affected by shallow bedrock formations continue to show some dewatering effects, but these are very localized and in some cases intermittent from year to year. More detailed studies on this aspect have been carried out as part of the Natural Sciences and Engineering Research Council (NSERC) research program on Victor area peatland hydrology and mercury chemodynamics, by researchers from the University of Waterloo, the University of Western Ontario and Queen’s University.

4.2 Annual Analysis of Mineral Soil Pore Water

Total and methyl mercury results from shallow and deep clay pore water samples have continued to show low values, with no defining trends (Table 2f). Total mercury values have generally been <0.6 ng/L, and methyl mercury values have generally been <0.06 ng/L. The S-2 station yielded somewhat higher total mercury values in 2007 and 2011, but values in all other years, including 2012, have been comparable to those of other stations. Sampling consistency for a number of the clay stations has been poor, in large part because the very slow recovery times after well purging, often make it impractical to collect samples from site sites. Procedures are being reviewed for 2013to see if sampling improvements can be made for 2013. Also, the term “clay” is not quite appropriate, as further more detailed studies carried out as part of the NSERC program have determined that the fine grained materials at site are not really clay minerals, but instead rock flower, a portion of which consists of clay-sized grains, with the bulk of the material being silt. This overburden material is more appropriately termed fined-grained marine sediments.

Total and methyl mercury results from shallow bedrock water samples showed no real trends, but a number of samples were not collected in the different years. This condition is being rectified for 2013. Some stations, notably S-9(1) and S-15 show what appear to be anomalous results in some years, but there are no trends, other than that Station S-15 tends to show somewhat higher total mercury values. Stations S-9(1) and S-15 are beyond the zone of mine influence.

4.3 Annual Analysis of Surface Waters

Statistical analyses of total and methyl mercury concentrations in surface water samples are presented in Table 30. Monthly analyses of North Granny Creek total mercury concentrations for upstream and downstream samples showed no statistical differences (Table 30a). Differences in upstream and downstream total mercury results for South Granny Creek were, however, statistically different; but average differences were relatively small (1.66 ng/L compared with 1.38 ng/L), with the upstream station showing higher concentrations.

Methyl mercury concentrations in upstream, mid-stream and downstream reaches of North Granny Creek were statistically significant, suggesting a possible downstream increase in methyl mercury concentrations (Table 30b). Methyl mercury values for South Granny Creek showed a trend similar to that for North Granny Creek, but differences were not statistically significant. As per section 3.3, it is likely that methyl mercury dynamics in peatlands around the mine site are being influenced by elevated sulphate levels, which increase the activity of methylating bacteria. Any such increases in methyl mercury concentrations in downstream Granny Creek waters are not believed to be related to mine dewatering. Also, while methyl mercury values in North Granny Creek are elevated relative to those of South Granny Creek and Tributary 5A, all values are well below the CEQG value of 4 mg/L.

Data for the Nayshkootayaow and Attawapiskat Rivers show no upstream or downstream trends, and none of the results are statistically significant for either total or methyl mercury (Tables 30c and 30d).

4.4 Trend Analysis of Well Field Water Discharge

Monthly well field discharge data are presented in Table 15. Similar to previous years from 2009 to present both total and methyl mercury remain on average, lower than for comparable Attawapiskat River background water concentrations (Tables 13 and 14), and there are no evident trends in the data other than a possible slight decrease in total mercury concentrations with time (Table 15).

4.5 Annual Analysis of Fish Mercury Body Burdens

For discussions regarding comparisons of fish mercury body burdens between geographical locations in 2012 please refer to Section 3.5. Small-bodied fish species showed some variability between years. Extrapolation of body burden levels for a standardized total length for Pearl Dace remained relatively consistent from 2008 to 2011 in South Granny Creek and showed a marked decrease in 2012. Extrapolated body burden levels for Pearl Dace remained consistent for Tributary-5A from 2008 to 2012 with a slight decrease in mercury concentration from 2010 to 2011 at this area. However, North Granny Creek continued to show a greater body burden level for Pearl Dace compared to South Granny Creek and Tributary 5A with levels remaining similar in 2012 to those found for 2011. Body burden levels for a standardized total length for Trout-Perch showed an increase at both the near-field and far-field Attawapiskat River areas in 2012 compared to 2011.

Statistical analysis of mean mercury concentration corrected for size or age provided similar results as described above with no direct indication of a difference in rate of accumulation of mercury between the two sentinel species or for one species between sampling areas.

5.0 RESPONSE TO COMMENTS RECEIVED FROM THE MOE (FEBRUARY 28, 2013)

A memo was issued by the MOE, dated February 28, 2013, in response to the submission of the De Beers Canada Inc., Victor Diamond Mine Mercury Performance Monitoring Report (June 2012). The Ministry recommendations / actions items are listed below in the order they appear in the memo followed by AMEC's responses.

Comment #3.1.1 *Muskeg Pore Water – Domed Bogs Recommendation #1*

The consultant should include precipitation data from a nearby site to help justify the statement that variability of mercury within the peat pore water has been attributed to dry and wet conditions at the site and regionally.

Response:

The requested data are provided in Appendix B.

Comment #3.1.1 *Muskeg Pore Water – Domed Bogs Recommendation #2*

Make correction to Table 2A to ensure that the methyl mercury concentration for Station S-15 is correct.

Response:

The methyl mercury (filtered) concentration for Station S-15 in Table 2a for 2011 is 0.05 ng/L. This concentration is correctly identified in both the table and corresponding graph, for which the graph line colour is blue for 2011. The graph line colour is yellow for 2009 data, for which a methyl mercury concentration of 0.78 ng/L was reported for station S-15.

Comment #3.1.3 *Muskeg Pore Water – Horizontal Fens Recommendation #3*

No samples have been able to be collected at the near-field sampling station S-2. The company should provide an explanation for this occurrence or, if appropriate offer suggestions for this stations replacement.

Response:

The horizontal fen type is much less prevalent in the general area of the Victor Mine site, compared with the ribbed fen muskeg community type. Horizontal fens do not exist at the S-2 cluster location and therefore have not been collected. Ribbed fens do exist at the S-2 location and have been collected / sampled since 2007 and will continue to be sampled as part of the mercury monitoring program.1

***Comment #3.1.3** Muskeg Pore Water – Horizontal Fens Recommendation #4*

Although concentrations are very small, maximum values (filtered samples) are consistently observed at the mid-field stations S7 and S-9(1). The consultant should provide an explanation why values at these stations are significantly greater than those in the far-field and near-field.

Response:

The relatively higher values are principally in 2007 and 2008 for stations S-7 and S-9(1). In subsequent years, stations S-7 and S-9(1) were in agreement with the other stations related to total mercury concentration. Following a general review of water quality data, we have no obvious explanation as to why total mercury concentrations were relatively higher in stations S-7 and S-9(1) in 2007 and 2008.

***Comment #3.1.5** Pore Water – Mineral Horizon Pore Water – Shallow Bedrock Recommendation #5*

The consultant should explain why there is no data provided for stations S-9(1) and S-9(2) and/or examine their utility for continued use or replacement.

Response:

The bedrock wells for stations S-9(1) and S-9(2) were drilled to the top of bedrock and are actually referenced in Table 1 as deep clay wells in both cases, as the wells are screened at the transition deep clay to bedrock. An asterisk has been added to Table 1 to denote this condition.

***Comment #3.1.6** Water Quality: Ribbed Fens Recommendation #6*

Although the average sulphate concentration was reported to be 70 mg/L for the NEF, the raw monitoring data was not provided in tabular form in the appendices. The company should provide this data, determine if there are any trends and compare it with other data such as DOC, iron, pH and total phosphorus.

Response:

The average sulphate concentration was miscalculated and reported in the 2012 Annual Report as 70 mg/L; the average sulphate concentration was actually 60 mg/L in 2011 and 87 mg/L in 2012. Raw monitoring data for the NEF are provided in Appendix A from 2007 to 2012 for pH, sulphate, total phosphorus, DOC, and iron (both total and dissolved). From the data, it appears that the sulphate concentration is cyclic in nature; for the most part the sulphate concentration is higher during the winter months compared to the summer months and the annual average sulphate concentration has steadily increased since 2010. Total phosphorus and iron (both total and dissolved) have decreased over the past five years, since 2007. There appears no trend in data for either DOC or pH from 2007 to 2012 in the NEF.

Higher sulphate values in winter are likely an effect of two processes: markedly reduced rates sulphate reduction by bacteria at cold temperatures, and the ice crystallization / ion concentration effect described above, with reduced rates of sulphate reduction being the dominant factor. Average sulphate concentrations in the summer months (June through September) are the values of greatest importance to mercury methylation. Summer data are shown in Figure A-3 from Appendix A. In viewing the data for 2011 and 2012, it is important to bear in mind that both summers were very dry, such that sulphate levels may be somewhat increased by evaporative concentration effects.

Comment #3.1.6 *Water Quality: Ribbed Fens Recommendation #7*

The company suggests that elevated sulphates concentrations in the fen are due to a discharge of sulphate rich water in 2006. To better understand the implications of this historical input of sulphates and any ongoing releases, the flushing rate of the fen should be estimated / determined.

Response:

This question is more complicated that first appears, as runoff from the mine rock stockpile and from the pit perimeter and Attawapiskat River roads also drain to the NEF. Treated domestic sewage is no longer discharged to the NEF, but is instead directed to the fine processed kimberlite containment area. The question of fen residence time first emerged in connection with the Southwest Fen (SWF), which received water discharge from the Central Quarry during 2006. Data presented in the 2008 annual report for mercury monitoring showed that while sulphate levels in the SWF had declined from open water values of from 15 to 75 mg/L in 2006, to <1 mg/L in the open water period of 2008 (essentially background), chloride levels in the SWF were still markedly elevated (20-25 mg/L in 2008), compared with maximum early December 2006 peak chloride concentrations of approximately 220 mg/L. Typical background fen chloride concentrations are typically about 1 mg/L (Table 8). So after about 2 years, peak chloride values had been by approximately 90%, indicative of an approximate 90% flushing rate.

Existing sulphates would be removed in less than one year through a combination of bacterial reduction, as per the response to Comment 3.1.6 #6 above, and hydrologic flushing. The more important question is how to limit sulphate migration to the fen from existing sources. De Beers is proposing to study site area sulphate loadings to all area muskeg systems, as a means of better controlling mercury methylation potentials, and will further discuss plans for this action with both the MOE and the Attawapiskat First Nation.

Comment #3.1.6 *Water Quality: Ribbed Fens Recommendation #8*

In an attempt to better understand this potential linkage, the company should consider the merit of undertaking an in-situ exposure study within the NEF to evaluate the degree to which the NEF may potentially influence mercury tissue concentrations for forage fish in NGC.

Response:

The value of such a study is open to question since the linkage between mercury methylation and sulphate availability is well established in the literature, and is supported by site data. AMEC believes that it can be taken as a given at this point that forage fish would be expected to take up mercury at a faster rate from sulphate rich fen drainage waters, which exhibit markedly higher methyl mercury concentrations, compared to fen drainage where sulphate are not elevated.

We would respectfully suggest that a more meaningful study (as per the above) would be to better characterize sulphate sources and loadings to area muskeg environments from the various mine site facilities, and to assess alternatives for reducing any such loadings, so as to better restrict mercury methylation rates in the local fen systems.

Comment #3.1.7 *Water Quality: North and South Granny Creeks Recommendation #9*

I would recommend that the company collect samples at the downstream station on NGC at the same frequency that they collected at the upstream station during 2011 (i.e., monthly when ice conditions permit).

Response:

De Beers would agree that it would be more effective to collect monthly samples for both total and methyl mercury from both systems going forward, except as prevented by unsafe ice conditions.

Comment #3.1.8 *Water Quality: Nayshkootayaow and Attawapiskat Recommendation #10*

Based on Figure 3, the sampling station A-3 appears to be approximately 8+ km downstream. An additional sampling station should be included that is within 500m to the mine water discharge. It is recommended that one of the stations used during the transect sampling to assess chloride mixing be utilized.

Response:

A fifth Attawapiskat River station will be established for total and methyl mercury monthly sampling. This station will be positioned at the 500 m downstream chloride monitoring transect, recognizing that samples from the transect cannot be safely collected in winter.

Comment #3.1.8 *Water Quality: Nayshkootayaow and Attawapiskat Recommendation #11*

Although quarterly sampling was followed for total mercury (as reported in Table 13b), there was not a corresponding collection for methyl mercury (either filtered or unfiltered). Future sampling must include methyl mercury in the quarterly sampling program.

Response:

A corresponding collection for methyl mercury does exist for the Nayshkootayaow and Attawapiskat Rivers whereby concentrations for both unfiltered and filtered samples for methyl mercury were displayed in Tables 14a and 14b, respectively, in the 2011 Annual Report. Tables 14a and 14b have subsequently been updated to include new 2012 methyl mercury data for this 2012 Annual Report submission.

Comment #3.1.9 *Water Quality – Well Field Discharge Recommendation #12*

The scale (and r^2) of the graph that depicts the Well Field Methyl Hg (filtered) appears biased by the one-time elevated result observed December 2009 (0.12 ng/L). The consultant should re-draft the plot after discarding this one-time result.

Response:

The December 2009 result of 0.12 ng/L has been omitted from the plot associated with Table 15: Mercury Content in Well Field Discharge. The scale has also been adjusted and a new r^2 value has been recalculated which omits this biased 2009 result but also includes the new 2012 data.

Comment #3.2 *Small Fish Collections Action Required #13*

The consultant should examine the 2009 data for trout perch and explain the cause(s) of the variability.

Response:

Please refer to the last paragraph in Section 3.5 on pages 18 and 19 in this report for a response to this comment.

Comment #3.2 *Small Fish Collections Action Required #14*

It is recommended that a relationship be established between body burdens in Pearl Dace (Semotilus margarita) and body burdens in Trout Perch (Percopsis omiscomaycus) to better understand the relative rate of mercury uptake by both species (i.e. are the trout perch accumulating mercury at a different rate than the pearl dace?).

Response:

When the analysis of total mercury body burdens is completed for both species, for those locations which have both species available (all years combined), the results show no significant difference (ANCOVA, $p = 0.25$) in mean total mercury body burden between Pearl Dace and Trout-Perch (Figure 7). These results indicate that when habitat and forage base are relatively similar that the two species show similar levels of mercury concentration within muscle tissues.

Further details are provided under the heading 'Sentinel Species Comparisons' in Section 3.5 on page 12 in this report for a response to this comment.

Comment #3.2 *Small Fish Collections Action Required #15*

Given the change in laboratories during the course of the sampling program, an inter-lab comparison needs to be completed to better understand the potential variability in the data induced by analytical method/lab procedures.

Response:

Please refer to Recommendation #2 for a response to this comment.

Comment #3.2 *Small Fish Collections Action Required #16*

To better understand the variability observed in the forage fish data, the company should provide the data in graphical form (including line of best fit and an R^2 value) for the following relationships:

- *Body burden and age; and*
- *Weight and length (are we seeing different growth and accumulation rates between waterbodies?)*

Response:

Refer to the last two paragraphs under the heading 'Granny Creek System' in Section 3.5 on pages 13 and 14, the write up under the heading 'Summary and Discussion' on page 14, and the last three paragraphs under the heading 'Nayshkootayaow and Attawapiskat River Systems' on page 17.

Comment #4.0 *Additional Comments/Questions Laboratory Changes Action Required #17*

DeBeers should submit a QA/QC program that statistically defines the variance between the two labs for all media. Of particular focus of this assessment should be with the ultra-trace level water analysis. The TOR for this study should be submitted for review before the next field season is initiated.

Response:

De Beers agrees with this suggestion and will work cooperatively with the MOE to define a program of cross comparison sampling and analysis focusing on water quality.

6.0 CONCLUSIONS

Peat Pore Waters

- Total and methyl mercury concentrations in peat pore waters remained considerably lower than the respective CEQG values of 26 ng/L for total mercury and 4 ng/L for methyl mercury, and there are no evident trends in the data.

- Statistical analysis of peat pore waters showed no significant differences, for total or methyl mercury, between peat complexes located near to and at mid-distances from the mine site, compared with more remote control stations.

Surface Waters

- Total mercury concentrations measured in proximal area fen systems (NEF, SEF and HgCON) showed no evident overall trends. Data collection from the SWF was discontinued partway through 2009 so no conclusions could be drawn regarding this fen.
- Methyl mercury concentrations in the NEF, which receives (or received) various site effluents, showed elevated methyl mercury concentrations compared with the control fens (SEF and HgCON). Elevated methyl mercury concentrations in the NEF are likely attributed to sulphate-rich effluent waters which stimulate the mercury methylation process, and are not a function of well field dewatering effects.

- Total and methyl mercury concentrations measured in area surface waters (Granny Creek, the Nayshkootayaow River and the Attawapiskat River) show mercury concentrations well below the applicable CEQG values of 26 ng/L and 4 ng/L, respectively, and there are no evident long-term trends in the data, with the possible exception of the downstream North Granny Creek samples where methyl mercury concentrations appear to be increasing in some months. Any such increase in methyl mercury concentrations is likely attributable to sulphate-rich effluent waters which stimulate the mercury methylation process, as per the above, and not a function of well field dewatering effects.

- Well field discharge total and methyl mercury concentrations are well below CEQG values, and are also generally below Attawapiskat River background values upstream of the mine discharge, and there are no evident long-term trends in the data.

Fish Mercury Body Burdens

- Small-bodied species (Pearl Dace) samples collected from North Granny Creek showed significant, elevated concentrations of mercury compared to South Granny Creek and the Tributary 5A reference sample location in 2012. The difference in body burden mercury concentrations between the Granny Creek system and Tributary 5A is believed to primarily be a function of naturally higher methyl mercury increases in Granny Creek downstream waters as described above. Differences in body burden mercury concentrations between North Granny Creek and South Granny Creek are indicative of background methyl mercury concentrations of the creek water and environment as well as previous and ongoing sources of sulphates thereby providing an increased potential for methyl mercury formation through bacterial reduction.

- Trout-Perch samples collected from the Attawapiskat River near-field and far-field receiving water area had greater concentrations of mercury compared to the upstream reference area in 2012. In contrast, 2011 results showed near-field and upstream reference areas with approximately equal contractions of mercury, further demonstrating the annual variability which at this time is not fully understood for this system.

7.0 RECOMMENDATIONS

The mercury monitoring program is both extensive and robust, and it is recommended that the monitoring program continue to be carried out in its current form, with the following modifications:

1. De Beers commits to undertaking a study of sulphate loadings to mine site area muskeg systems, with the objective of assessing alternatives to better limit such loadings, as a means of reducing mercury methylation rates in affected muskeg systems.

2. De Beers will undertake an inter-laboratory sampling program to compare results between the Flett Research laboratory, Dr. Branfireun’s University of Western Ontario laboratory and the Ontario Ministry of the Environment Laboratory - Sport Fish Contaminant Program focusing on fish tissue mercury concentrations.

8.0 REFERENCES

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TABLE 1
MUSKEG MONITORING PROGRAM - ANNUAL MERCURY RESULTS - 2007-2012
(late summer / fall sampling - Data in ng/L or parts per trillion)

Cluster Location	Substrate/Condition	Well Name	GPS Code	Sample Code	Total Mercury (Filtered)							Methyl Mercury (Filtered)						
					2007	2008	2009	2010	2011 (Aug)	2011 (Sep/Nov)	2012	2007	2008	2009	2010	2011 (Aug)	2011 (Sep/Nov)	2012
S-1	Bedrock (Bioherm)	MS-1-BR	ES1-BR	ES1BDR	1.30	ns	0.27	Detect	Non-Detect	Detect	0.05	Detect	ns	0.06	Detect	Non-Detect	Non-Detect	Non-Detect
	Clay - Deep	MS-1-CL(1)	ES1-BR	ES1CLD	1.47	ns	0.18	Detect	Non-Detect	Detect	0.19	ns	ns	0.03	Detect	Non-Detect	Non-Detect	Non-Detect
	Clay - Shallow	MS-1-CL(2)	ES1-BR	ES1CLS	0.27	ns	0.16	Detect	Non-Detect	Detect	0.16	Detect	ns	0.03	0.04	Detect	Non-Detect	Non-Detect
	Peat - Domed Bog	MS-1-D	ES1D	ES1D	2.22	1.93	0.40	0.79	0.37	0.79	0.72	0.02	0.07	0.10	0.06	0.08	0.10	0.03
	Peat - Flat Bog	MS-1-F	ES1F	ES1F	2.73	3.04	0.83	1.47	1.18	1.17	1.31	Detect	0.18	0.19	0.14	Non-Detect	0.10	0.06
	Peat - Horizontal Fen	MS-1-H	ES1H	ES1H	na	1.77	0.36	0.53	0.30	0.51	0.48	na	na	0.10	0.04	Detect	Detect	0.10
	Peat - Ribbed Fen	MS-1-R	ES1R	ES1R	1.81	2.27	0.49	1.24	0.91	ns	1.06	0.02	0.07	0.06	0.06	0.05	ns	Non-Detect
S-2	Bedrock (Bioherm)	DAS-1	EDAS-1	EDAS-1	0.23	ns	0.24	0.45	Detect	ns	0.06	Non-Detect	ns	0.05	0.02	0.07	ns	Non-Detect
		MS-2BR	ES2-BR	ES2BR	0.68	ns	ns	0.38	Detect	ns	0.21	Non-Detect	ns	ns	0.14	0.04	ns	0.03
	Clay - Deep	MS-2-CL(1)	ES2-BR	ES2CLD	ns	ns	0.36	Detect	Detect	Detect	0.18	ns	ns	0.13	0.03	0.03	Detect	Non-Detect
	Clay - Shallow	MS-2-CL(2)	ES2-BR	ES2CLS	0.98	ns	0.17	Detect	3.01	Detect	0.07	Non-Detect	ns	0.04	0.02	Detect	Non-Detect	0.02
	Peat - Domed Bog	MS-2-D	ES2D	ES2D	1.98	2.15	0.51	1.25	4.69	0.74	1.02	Non-Detect	0.02	0.04	0.05	Detect	0.02	0.07
	Peat - Flat Bog	MS-2-F	ES2F	ES2F	3.12	3.05	2.35	2.74	5.79	1.18	1.53	Non-Detect	0.10	0.07	0.11	0.10	0.05	0.09
	Peat - Ribbed Fen	MS-2-R	ES2R	ES2R	1.56	2.02	0.38	1.43	4.6	0.64	0.67	Non-Detect	0.04	0.09	0.08	0.06	0.07	0.29
S-7	BR Shallow		NS7-BR	NS7BRS	1.02	ns	0.53	0.34	0.35	0.52	0.54	0.09	ns	0.05	0.05	0.05	0.12	0.03
	BR Intermediate		NS7-BR	NS7BRI	1.93	ns	0.23	Detect	Detect	ns	0.23	0.04	ns	0.02	0.05	Detect	ns	Non-Detect
	BR Deep		NS7-BR	NS7BRD	2.34	ns	0.12	0.39	Detect	Detect	1.62	0.03	ns	0.03	0.03	0.03	0.03	Non-Detect
	Clay - Deep	MS-7-CL(1)	NS7-CL	NS7-CLD	0.59	ns	0.25	Detect	Detect	Non-Detect	Non-Detect	Non-Detect	ns	0.02	0.05	Non-Detect	Non-Detect	Non-Detect
	Clay - Intermediate		NS7-CL	NS7-CLI	0.41	ns	0.13	Detect	Detect	Non-Detect	0.25	0.02	ns	0.02	0.02	Detect	Detect	Non-Detect
	Clay - Shallow	MS-7-CL(2)	NS7-CL	NS7-CLS	0.70	ns	0.10	Detect	0.96	Non-Detect	0.03	Detect	ns	0.02	Detect	0.03	Non-Detect	Non-Detect
	Peat - Domed Bog	MS-7-D	NS-7D	NS-7D	0.72	1.04	0.29	0.62	0.74	0.58	0.58	Detect	Detect	0.04	0.02	0.04	0.03	0.02
	Peat - Flat Bog	MS-7-F	NS-7F	NS-7F	1.23	1.61	0.27	0.85	1.09	0.95	0.86	Detect	Non-Detect	0.05	Detect	Detect	Non-Detect	Non-Detect
	Peat - Horizontal Fen	MS-7-H	NS-7H	NS-7H	1.24	2.18	0.68	1.35	0.61	0.95	0.74	0.02	0.06	0.10	0.04	0.03	0.06	0.46
	Peat - Ribbed Fen	MS-7-R	NS-7R	NS-7R	0.62	0.52	0.12	0.44	0.36	ns	0.25	Detect	Detect	0.03	0.02	Detect	ns	Non-Detect
S-8	Bedrock (Bioherm)	MS-8-BR(1)	NS8BR1	NS8B1S	7.46	ns	1.56	7.14	1.37	ns	0.79	0.03	ns	0.03	0.13	0.04	ns	0.03
	Bedrock (Bioherm)	MS-8-BR(2)	NS8BR1	NS8B1I	4.36	ns	ns	0.33	ns	ns	ns	Non-Detect	ns	ns	0.05	ns	ns	ns
			NS8BR1	NS8B1D	1.83	ns	ns	ns	ns	ns	ns	Non-Detect	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-8-CL(1)	NS8CL1	NS8C1D	0.31	ns	0.24	Detect	ns	ns	ns	Detect	ns	0.02	Detect	ns	ns	ns
	Clay - Middle	MS-8-CL(2)	NS8CL1	NS8C1I	ns	ns	0.26	ns	0.32	0.47	0.21	ns	ns	0.04	ns	0.10	0.06	0.02
	Clay - Shallow	MS-8-CL(3)	NS8CL1	NS8C1S	0.89	ns	0.28	0.50	Detect	Detect	ns	0.03	ns	0.02	0.06	0.08	0.03	ns
	Clay - Deep	MS-8-CL(4)	NS8CL2	NS8C2D	0.14	ns	0.16	Non-Detect	Detect	ns	<0.1	Detect	ns	0.02	Non-Detect	Non-Detect	ns	Non-Detect
	Clay - Middle	MS-8-CL(5)	NS8CL2	NS8C2I	0.49	ns	ns	ns	ns	ns	ns	Non-Detect	ns	ns	ns	ns	ns	ns
	Clay - Shallow	MS-8-CL(6)	NS8CL2	NS8C2S	0.33	ns	0.59	Detect	Detect	0.17	<0.1	0.08	ns	0.02	0.03	0.04	Detect	Non-Detect
	Peat - Domed Bog	MS-8-D	NS8-1D	NS8-1D	1.13	1.49	0.38	1.66	1.2	ns	1.33	Non-Detect	Detect	0.06	0.29	0.11	ns	0.07
	Peat - Flat Bog	MS-8-F	NS8-1F	NS8-1F	1.91	2.85	1.46	2.76	4.34	3.24	3.08	Non-Detect	0.08	0.31	0.14	0.16	0.25	0.12
	Peat - Horizontal Fen	MS-8-H	NS8-1H	NS8-1H	0.56	0.55	0.18	Detect	Detect	ns	0.14	Detect	Detect	0.07	0.02	Non-Detect	ns	Non-Detect
	Peat - Ribbed Fen	MS-8-R	NS8-1R	NS8-1R	1.00	0.98	0.27	1.60	1.18	ns	0.55	Non-Detect	Detect	0.09	Non-Detect	0.02	ns	Non-Detect
S-9(1)	Bedrock (Bioherm) *	MS-9(1)-BR			ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-9(1)-CL(1)	SS9CL1	SS9C1D	0.66	ns	Detect	0.52	Detect	Detect	0.09	Detect	ns	Detect	Non-Detect	0.029	Non-Detect	0.037
	Clay - Shallow	MS-9(1)-CL(2)	SS9CL1	SS9C1S	1.03	ns	0.10	0.43	Detect	Detect	0.24	Detect	ns	0.07	0.02	0.03	Detect	Non-Detect
	Peat - Domed Bog	MS-9(1)-D	SS9-1D	SS9-1D	0.77	0.77	0.27	0.58	Detect	ns	0.59	Detect	Non-Detect	0.17	Detect	Detect	ns	0.04
	Peat - Flat Bog	MS-9(1)-F	SS9-1F	SS9-1F	2.53	1.74	0.37	1.36	0.69	ns	1.08	Detect	0.04	0.05	0.05	Non-Detect	ns	0.05
	Peat - Horizontal Fen	MS-9(1)-H	SS9-1H	SS9-1H	2.65	2.06	0.45	1.01	0.71	0.9	0.68	0.02	0.05	0.11	0.03	0.04	0.03	0.02
	Peat - Ribbed Fen	MS-9(1)-R	SS9-1R	SS9-1R	0.72	1.26	0.22	0.47	0.42	ns	0.32	0.02	0.03	0.04	0.02	0.02	ns	Non-Detect
S-9(2)	Bedrock (Bioherm) *	MS-9(2)-BR			ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-9(2)-CL(1)	SS9CL2	SS9C2D	1.09	ns	0.30	0.38	Detect	Detect	0.03	0.01	ns	0.04	0.02	0.03	Non-Detect	Non-Detect
	Clay - Shallow	MS-9(2)-CL(2)	SS9CL2	SS9C2S	0.44	ns	0.13	Detect	Non-Detect	Non-Detect	0.51	Non-Detect	ns	0.02	Detect	Detect	Detect	Non-Detect
	Peat - Domed Bog	MS-9(2)-D	SS9-2D	SS9-2D	1.72	1.89	0.42	1.04	0.93	ns	0.63	Detect	0.02	0.02	Detect	Detect	ns	Non-Detect
	Peat - Flat Bog	MS-9(2)-F	SS9-2F	SS9-2F	1.10	1.27	0.57	1.21	0.98	ns	1.25	Non-Detect	0.06	0.12	0.03	0.05	ns	0.04
	Peat - Horizontal Fen	MS-9(2)-H	SS9-2H	SS9-2H	0.80	0.59	0.30	Detect	Detect	ns	0.11	Non-Detect	Detect	0.08	0.02	Non-Detect	ns	Non-Detect
	Peat - Ribbed Fen	MS-9(2)-R	SS9-2R	SS9-2R	1.29	0.90	0.33	0.72	5.16	Detect	0.34	Non-Detect	0.06	0.17	0.05	0.18	0.03	0.06
S-13	Bedrock (Bioherm)	MS-13-BR	WS13BR	WS13BS	2.57	ns	0.72	0.87	ns	ns	0.56	Non-Detect	ns	Detect	Non-Detect	ns	ns	Non-Detect
			WS13BR	WS13BD	1.19	ns	ns	ns	ns	ns	ns	Non-Detect	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-13-CL(1)	WS13CL	WS13CD	0.42	ns	0.09	Detect	Non-Detect	Det/Non	ns	0.03	ns	0.02	0.02	Detect	Det/Non	ns
			WS13CL	WS13CI	1.48	ns	0.18	ns	Detect	Detect	ns	0.04	ns	0.04	ns	Detect	Non-Detect	ns
	Clay - Shallow	MS-13-CL(2)	WS13CL	WS13CS	0.50	ns	Detect	0.36	Detect	ns	ns	0.02	ns	ns	Detect	Non-Detect	ns	ns
	Peat - Domed Bog	MS-13-D	WS13-D	WS13-D	2.81	2.68	1.26	1.45	7.02	1.65	1.23	0.03	0.12	0.24	0.11	0.08	0.16	0.06
	Peat - Flat Bog	MS-13-F	WS13-F	WS13-F	1.60	2.79	0.92	1.30	1.83	ns	1.22	0.07	0.24	0.45	0.15	0.19	ns	0.28
	Peat - Horizontal Fen	MS-13-H	WS13-H	WS13-H	ns	0.57	0.35	0.42	0.31	ns	<0.1	0.02	Detect	0.29	Detect	0.02	ns	Non-Detect
	Peat - Ribbed Fen	MS-13-R	WS13-R	WS13-R	0.40	0.95	0.25	Detect	Detect	ns	0.13	0.13	Non-Detect	0.05	Detect	0.03	ns	Non-Detect
S-15	Bedrock (Bioherm)	MS-15-BR	WS15BR	WS15BS	2.00	ns	2.34	2.74	2.46	ns	2.02	Detect	ns	0.37	0.03	Detect	ns	Non-Detect
			WS15BR	WS15BD	0.58	ns	ns	ns	ns	ns	ns	Detect	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-15-CL(1)	WS15CL	WS15CD	is	ns	ns	0.59	ns	ns	ns	Detect	ns	ns	0.04	ns	ns	ns
			WS15CL	WS15CI	1.70	ns	ns	ns	ns	ns	ns	Non-Detect	ns	ns	ns	ns	ns	ns
	Clay - Shallow	MS-15-CL(2)	WS15CL	WS15CS	0.69	ns	0.07	Detect	0.33	Detect	ns	Detect	ns	Detect	Detect	Non-Detect	0.037	ns
	Peat - Domed Bog	MS-15-D	WS15-D	WS15-D	1.35	1.89	0.93	Detect	0.34	ns	0.17	Detect	0.04	0.78	0.02	0.05	ns	Non-Detect
	Peat - Flat Bog	MS-15-F	WS15-F	WS15-F	2.66	2.55	0.30	0.35	1.92	ns	<0.1	Non-Detect	0.07	0.17	Non-Detect	0.16	ns	Non-Detect
	Peat - Horizontal Fen	MS-15-H	WS15-H	WS15-H	0.99	0.90	0.22	Detect	Detect	ns	0.10	ns	Detect	0.10	Detect	0.02	ns	Non-Detect
	Peat - Ribbed Fen	MS-15-R	WS15-R	WS15-R	0.43	0.92	0.15	Detect	Detect	ns	<0.1	0.02	0.02	Non-Detect	0.02	Detect	ns	Non-Detect
S-V1	Peat - Domed Bog	MS-V(1)-D	-	NS-V-1D	1.96	0.60	0.18	0.53	0.49	ns	0.14	ns	Detect	0.02	0.02	0.03	ns	Non-Detect
	Peat - Ribbed Fen	MS-V(1)-R	-	NS-V-1R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R
S-V2	Peat - Domed Bog	MS-V(2)-D	-	SS-V-2D	1.97	1.16	0.24	0.45	0.52	ns	1.19	ns	Detect	0.02	0.05	0.07	ns	0.03
	Peat - Ribbed Fen	MS-V(2)-R	-	SS-V(2)-R	0.59	0.60	0.13	0.85	Detect	ns	0.33	ns	Non-Detect	0.03	0.04	Detect	ns	Non-Detect
S-V3	Peat - Domed Bog	MS-V(3)-D	-	SS-V-3D	0.72	0.61	0.49	0.60	5.20	1.17	0.47	ns	0.10	0.03	Detect	0.07	0.03	Non-Detect
	Peat - Ribbed Fen	MS-V(3)-R	-	SS-V(3)-R	1.08	1.69	0.47	0.76	0.89	0.9	0.64	ns	0.02	0.04	0.02	Detect	0.03	Non-Detect

Notes
na: not accessible — Non-Detect: <0.0054 ng/L — Near-field sites: S-2; S-8; S-V1; S-V2; S-V3
is: insufficient sample — Detect: >0.0054 but ≤0.0169 ng/L — Mid-field sites: S-1; S-7; S-9(1); S-9(2)
ns: no sample — Far-field sites: S-13; S-15
*: bedrock samples for stations S-9(1) and S-9(2) are collected at the overburden/ bedrock inteface and are reported as deep clay samples

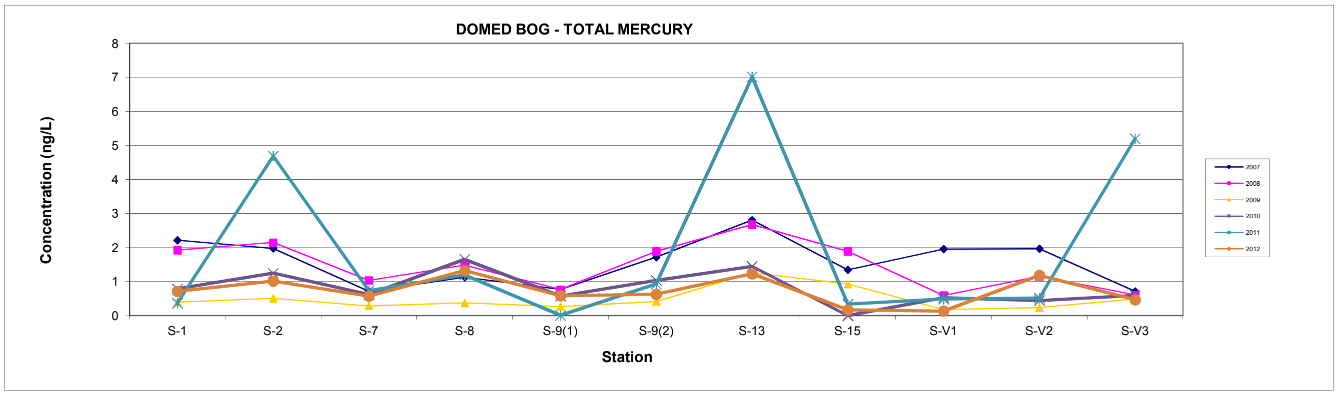
TABLE 2
MUSKEG MONITORING PROGRAM - ANNUAL MERCURY RESULTS - 2007-2012
(late summer / fall sampling - Data in ng/L or parts per trillion)

Cluster Location	Substrate/Condition	Total Mercury (Filtered)						Methyl Mercury (Filtered)					
		2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	Peat - Domed Bog	2.22	1.93	0.40	0.79	0.37	0.72	0.02	0.07	0.10	0.06	0.08	0.03
	Peat - Flat Bog	2.73	3.04	0.83	1.47	1.18	1.31	Detect	0.18	0.19	0.14	Non-Detect	0.06
	Peat - Horizontal Fen	na	1.77	0.36	0.53	0.30	0.48	na	na	0.10	0.04	Detect	0.10
	Peat - Ribbed Fen	1.81	2.27	0.49	1.24	0.91	1.06	0.02	0.07	0.06	0.06	0.05	Non-Detect
S-2	Peat - Domed Bog	1.98	2.15	0.51	1.25	4.69	1.02	Non-Detect	0.02	0.04	0.05	Detect	0.07
	Peat - Flat Bog	3.12	3.05	2.35	2.74	5.79	1.53	Non-Detect	0.10	0.07	0.11	0.10	0.09
	Peat - Ribbed Fen	1.56	2.02	0.38	1.43	4.6	0.67	Non-Detect	0.04	0.09	0.08	0.06	0.29
S-7	Peat - Domed Bog	0.72	1.04	0.29	0.62	0.74	0.58	Detect	Detect	0.04	0.02	0.04	0.02
	Peat - Flat Bog	1.23	1.61	0.27	0.85	1.09	0.86	Detect	Non-Detect	0.05	Detect	Detect	Non-Detect
	Peat - Horizontal Fen	1.24	2.18	0.68	1.35	0.61	0.74	0.02	0.06	0.10	0.04	0.03	0.46
	Peat - Ribbed Fen	0.62	0.52	0.12	0.44	0.36	0.25	Detect	Detect	0.03	0.02	Detect	Non-Detect
S-8	Peat - Domed Bog	1.13	1.49	0.38	1.66	1.2	1.33	Non-Detect	Detect	0.06	0.29	0.11	0.07
	Peat - Flat Bog	1.91	2.85	1.46	2.76	4.34	3.08	Non-Detect	0.08	0.31	0.14	0.16	0.12
	Peat - Horizontal Fen	0.56	0.55	0.18	Detect	Detect	0.14	Detect	Detect	0.07	0.02	Non-Detect	Non-Detect
	Peat - Ribbed Fen	1.00	0.98	0.27	1.60	1.18	0.55	Non-Detect	Detect	0.09	Non-Detect	0.02	Non-Detect
S-9(1)	Peat - Domed Bog	0.77	0.77	0.27	0.58	Detect	0.59	Detect	Non-Detect	0.17	Detect	Detect	0.04
	Peat - Flat Bog	2.53	1.74	0.37	1.36	0.69	1.08	Detect	0.04	0.05	0.05	Non-Detect	0.05
	Peat - Horizontal Fen	2.65	2.06	0.45	1.01	0.71	0.68	0.02	0.05	0.11	0.03	0.04	0.02
	Peat - Ribbed Fen	0.72	1.26	0.22	0.47	0.42	0.32	0.02	0.03	0.04	0.02	0.02	Non-Detect
S-9(2)	Peat - Domed Bog	1.72	1.89	0.42	1.04	0.93	0.63	Detect	0.02	0.02	Detect	Detect	Non-Detect
	Peat - Flat Bog	1.10	1.27	0.57	1.21	0.98	1.25	Non-Detect	0.06	0.12	0.03	0.05	0.04
	Peat - Horizontal Fen	0.80	0.59	0.30	Detect	Detect	0.11	Non-Detect	Detect	0.08	0.02	Non-Detect	Non-Detect
	Peat - Ribbed Fen	1.29	0.90	0.33	0.72	5.16	0.34	Non-Detect	0.06	0.17	0.05	0.18	0.06
S-13	Peat - Domed Bog	2.81	2.68	1.26	1.45	7.02	1.23	0.03	0.12	0.24	0.11	0.08	0.06
	Peat - Flat Bog	1.60	2.79	0.92	1.30	1.83	1.22	0.07	0.24	0.45	0.15	0.19	0.28
	Peat - Horizontal Fen	ns	0.57	0.35	0.42	0.31	<0.1	0.02	Detect	0.29	Detect	0.02	Non-Detect
	Peat - Ribbed Fen	0.40	0.95	0.25	Detect	Detect	0.13	0.13	Non-Detect	0.05	Detect	0.03	Non-Detect
S-15	Peat - Domed Bog	1.35	1.89	0.93	Detect	0.34	0.17	Detect	0.04	0.78	0.02	0.05	Non-Detect
	Peat - Flat Bog	2.66	2.55	0.30	0.35	1.92	<0.1	Non-Detect	0.07	0.17	Non-Detect	0.16	Non-Detect
	Peat - Horizontal Fen	0.99	0.90	0.22	Detect	Detect	0.10	ns	Detect	0.10	Detect	0.02	Non-Detect
	Peat - Ribbed Fen	0.43	0.92	0.15	Detect	Detect	<0.1	0.02	0.02	Non-Detect	0.02	Detect	Non-Detect
S-V1	Peat - Domed Bog	1.96	0.60	0.18	0.53	0.49	0.14	ns	Detect	0.02	0.02	0.03	Non-Detect
	Peat - Ribbed Fen	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R
S-V2	Peat - Domed Bog	1.97	1.16	0.24	0.45	0.52	1.19	ns	Detect	0.02	0.05	0.07	0.03
	Peat - Ribbed Fen	0.59	0.60	0.13	0.85	Detect	0.33	ns	Non-Detect	0.03	0.04	Detect	Non-Detect
S-V3	Peat - Domed Bog	0.72	0.61	0.49	0.60	5.20	0.47	ns	0.10	0.03	Detect	0.07	Non-Detect
	Peat - Ribbed Fen	1.08	1.69	0.47	0.76	0.89	0.64	ns	0.02	0.04	0.02	0.03	Non-Detect

Notes
na: not accessible — Non-Detect: <0.0054 ng/L
is: insufficient sample — Detect: >0.0054 but <0.0169 ng/L
ns: no sample

TABLE 2a
MUSKEG PORE WATER - DOMED BOG 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	2.22	1.93	0.40	0.79	0.37	0.72	0.02	0.07	0.10	0.06	0.08	0.03
S-2	1.98	2.15	0.51	1.25	4.69	1.02	<0.01	0.02	0.04	0.05	0.01	0.07
S-7	0.72	1.04	0.29	0.62	0.74	0.58	0.01	0.01	0.04	0.02	0.04	0.02
S-8	1.13	1.49	0.38	1.66	1.2	1.33	<0.01	0.01	0.06	0.29	0.11	0.07
S-9(1)	0.77	0.77	0.27	0.58	0.01	0.59	0.01	<0.01	0.17	0.01	0.01	0.04
S-9(2)	1.72	1.89	0.42	1.04	0.93	0.63	0.01	0.02	0.02	0.01	0.01	<0.01
S-13	2.81	2.68	1.26	1.45	7.02	1.23	0.03	0.12	0.24	0.11	0.08	0.06
S-15	1.35	1.89	0.93	0.01	0.34	0.17	0.01	0.04	0.78	0.02	0.05	<0.01
S-V1	1.96	0.6	0.18	0.53	0.49	0.14		0.01	0.02	0.02	0.03	<0.01
S-V2	1.97	1.16	0.24	0.45	0.52	1.19		0.01	0.02	0.05	0.07	0.03
S-V3	0.72	0.61	0.49	0.60	5.20	0.47		0.10	0.03	0.01	0.07	<0.01



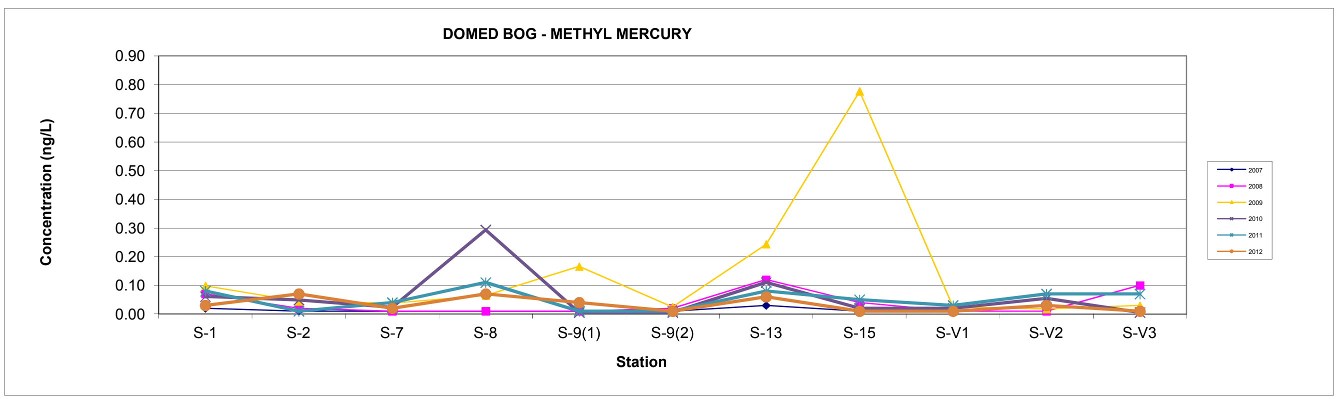
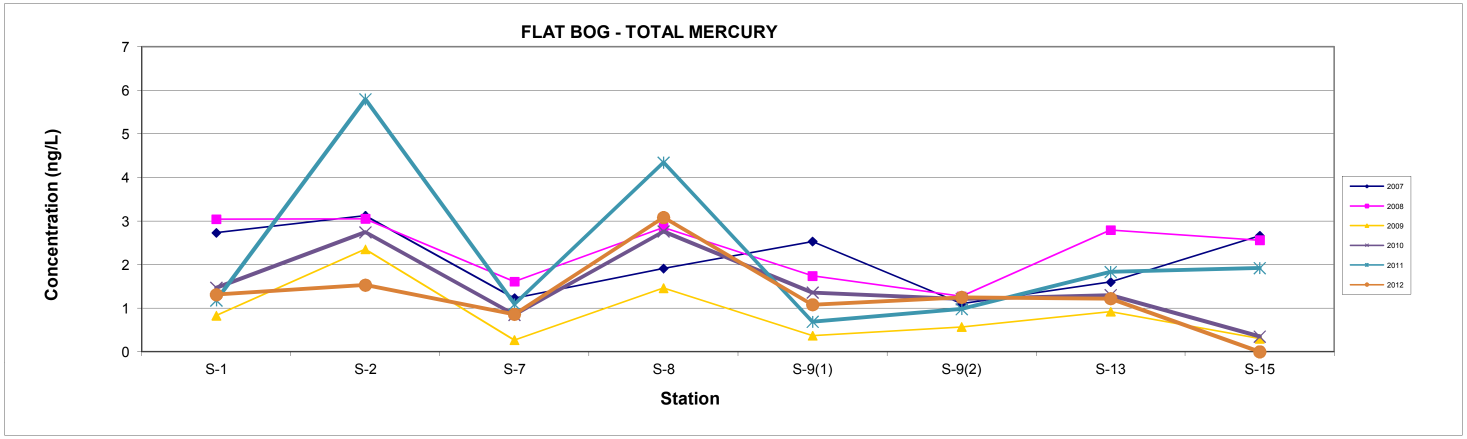


TABLE 2b
MUSKEG PORE WATER - FLAT BOG 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	2.73	3.04	0.83	1.47	1.18	1.31	0.01	0.18	0.19	0.14	<0.01	0.06
S-2	3.12	3.05	2.35	2.74	5.79	1.53	<0.01	0.10	0.07	0.11	0.10	0.09
S-7	1.23	1.61	0.27	0.85	1.09	0.86	0.01	<0.01	0.05	0.01	0.01	<0.01
S-8	1.91	2.85	1.46	2.76	4.34	3.08	<0.01	0.08	0.31	0.14	0.16	0.12
S-9(1)	2.53	1.74	0.37	1.36	0.69	1.08	0.01	0.04	0.05	0.05	<0.01	0.05
S-9(2)	1.10	1.27	0.57	1.21	0.98	1.25	<0.01	0.06	0.12	0.03	0.05	0.04
S-13	1.60	2.79	0.92	1.30	1.83	1.22	0.07	0.24	0.45	0.15	0.19	0.28
S-15	2.66	2.56	0.30	0.35	1.92	<0.1	<0.01	0.07	0.17	<0.01	0.16	<0.01



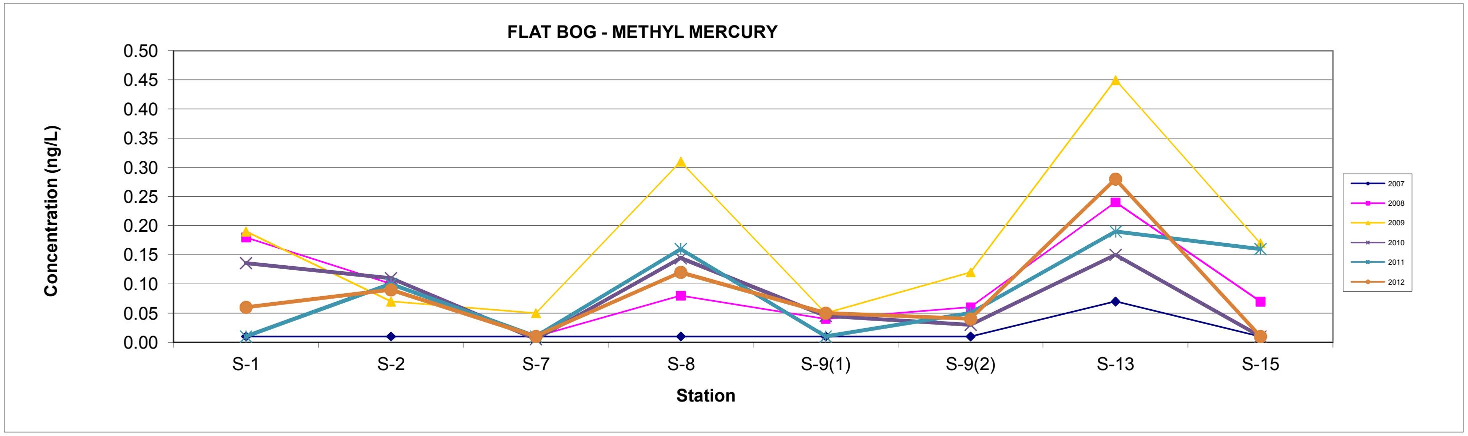
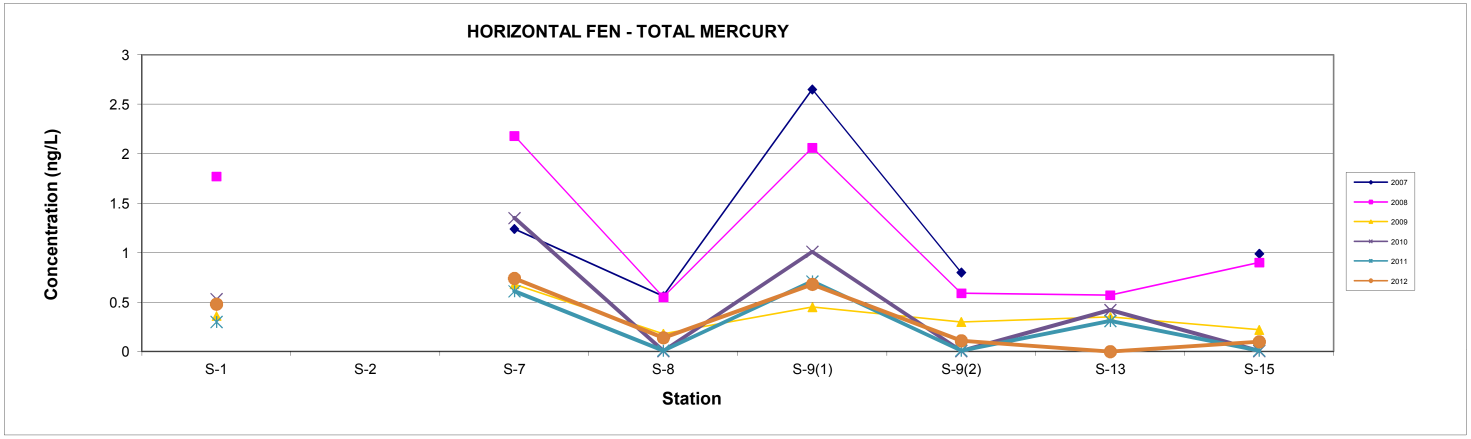


TABLE 2c
MUSKEG PORE WATER - HORIZONTAL FEN 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1		1.77	0.36	0.53	0.3	0.48			0.10	0.04	0.01	0.10
S-2												
S-7	1.24	2.18	0.68	1.35	0.61	0.74	0.02	0.06	0.10	0.04	0.03	0.46
S-8	0.56	0.55	0.18	0.01	0.01	0.14	0.01	0.01	0.07	0.02	<0.01	<0.01
S-9(1)	2.65	2.06	0.45	1.01	0.71	0.68	0.02	0.05	0.11	0.03	0.04	0.02
S-9(2)	0.80	0.59	0.30	0.01	0.01	0.11	<0.01	0.01	0.08	0.02	<0.01	<0.01
S-13		0.57	0.35	0.42	0.31	<0.1	0.02	0.01	0.29	0.01	0.02	<0.01
S-15	0.99	0.90	0.22	0.01	0.01	0.10		0.01	0.10	0.01	0.02	<0.01



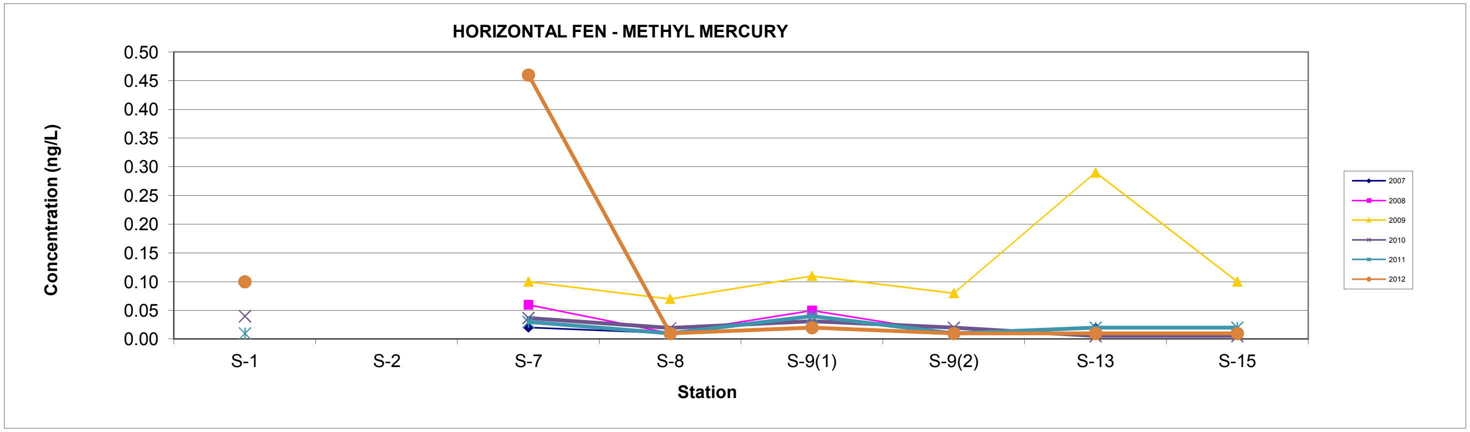
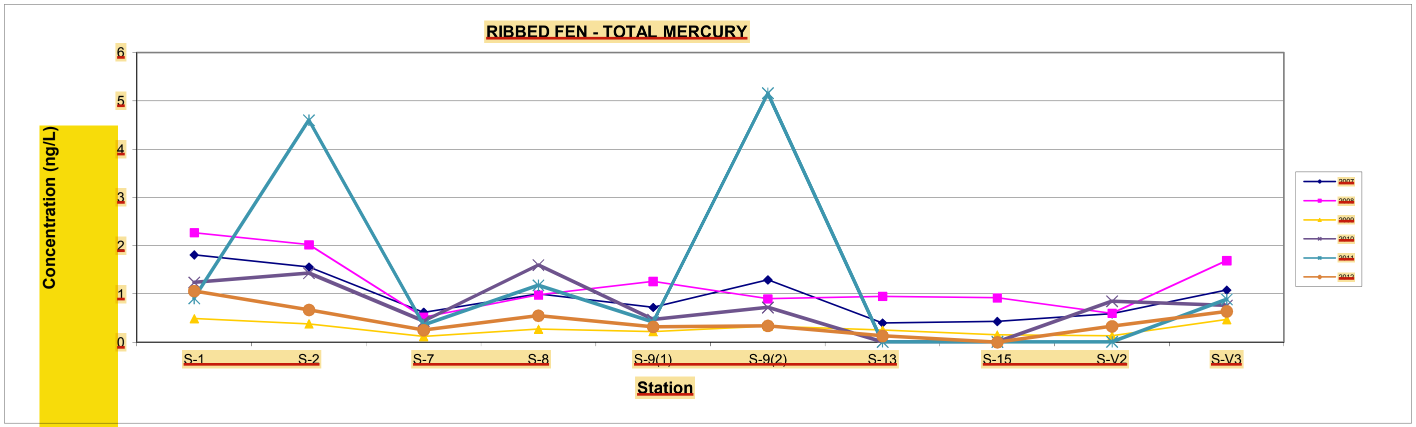


TABLE 2d
MUSKEG PORE WATER - RIBBED FEN 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	1.81	2.27	0.49	1.24	0.91	1.06	0.02	0.07	0.06	0.06	0.05	<0.01
S-2	1.56	2.02	0.38	1.43	4.6	0.67	<0.01	0.04	0.09	0.08	0.06	0.29
S-7	0.62	0.52	0.12	0.44	0.36	0.25	0.01	0.01	0.03	0.02	0.01	<0.01
S-8	1.00	0.98	0.27	1.60	1.18	0.55	<0.01	0.01	0.09	<0.01	0.02	<0.01
S-9(1)	0.72	1.26	0.22	0.47	0.42	0.32	0.02	0.03	0.04	0.02	0.02	<0.01
S-9(2)	1.29	0.90	0.33	0.72	5.16	0.34	<0.01	0.06	0.17	0.05	0.18	0.06
S-13	0.40	0.95	0.25	0.01	0.01	0.13	0.13	<0.01	0.05	0.01	0.03	<0.01
S-15	0.43	0.92	0.15	0.01	0.01	<0.1	0.02	0.02	<0.01	0.02	0.01	<0.01
S-V2	0.59	0.60	0.13	0.85	0.01	0.33		<0.01	0.03	0.04	0.01	<0.01
S-V3	1.08	1.69	0.47	0.76	0.89	0.64		0.02	0.04	0.02	0.01	<0.01



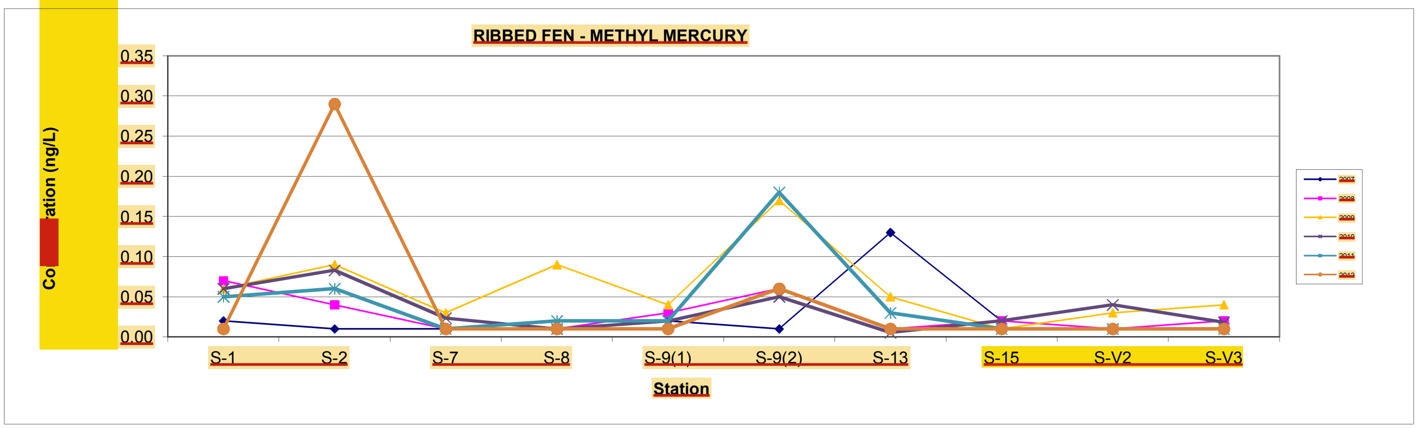
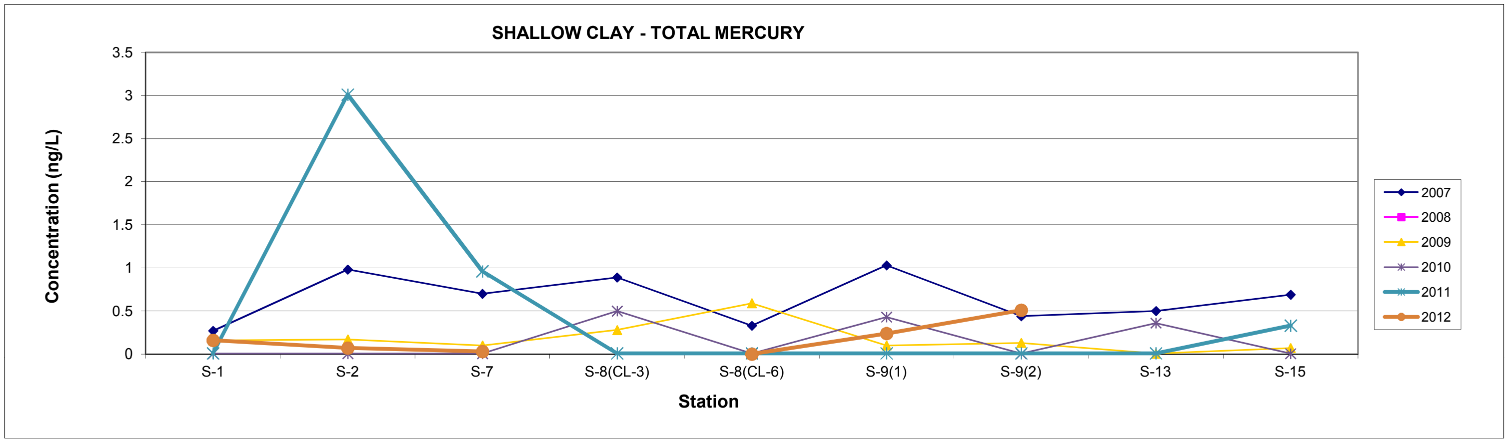


TABLE 2e
MINERAL HORIZON PORE WATER - SHALLOW CLAY 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	0.27		0.16	0.01	<0.01	0.16	0.01		0.03	0.04	0.01	<0.01
S-2	0.98		0.17	0.01	3.01	0.07	<0.01		0.04	0.02	0.01	0.021
S-7	0.70		0.10	0.01	0.96	0.03	0.01		0.02	0.01	0.03	<0.01
S-8(CL-3)	0.89		0.28	0.50	0.01		0.03		0.02	0.06	0.08	
S-8(CL-6)	0.33		0.59	0.01	0.01	<0.1	0.08		0.02	0.03	0.04	<0.01
S-9(1)	1.03		0.10	0.43	0.01	0.24	0.01		0.07	0.02	0.01	<0.01
S-9(2)	0.44		0.13	0.01	<0.01	0.51	<0.01		0.02	0.01	0.01	<0.01
S-13	0.50		0.01	0.36	0.01		0.02			0.01	<0.01	
S-15	0.69		0.07	0.01	0.33		0.01		0.01	0.01	<0.01	



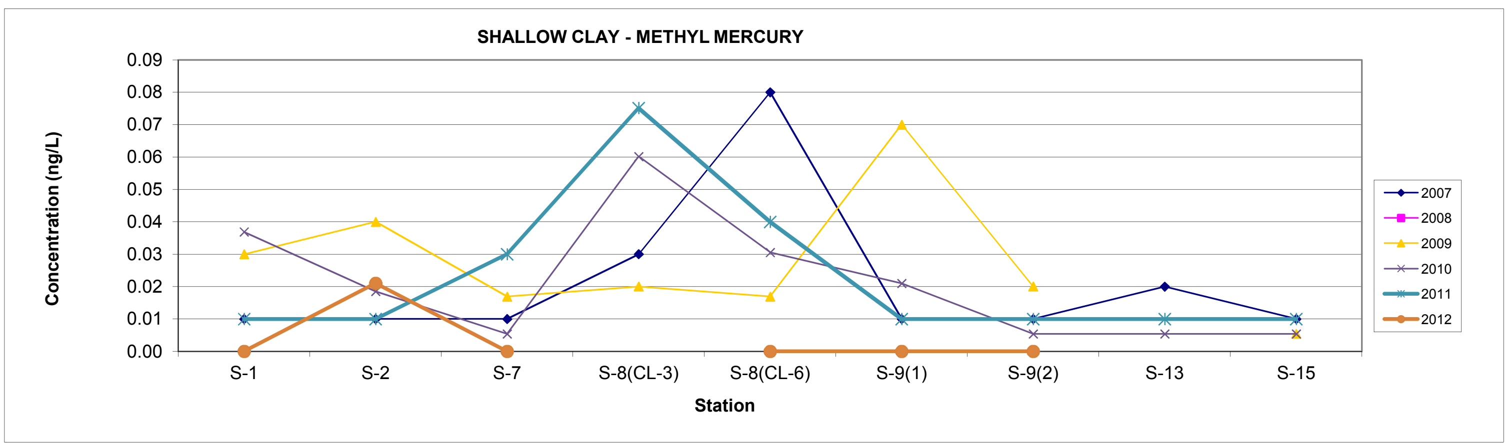
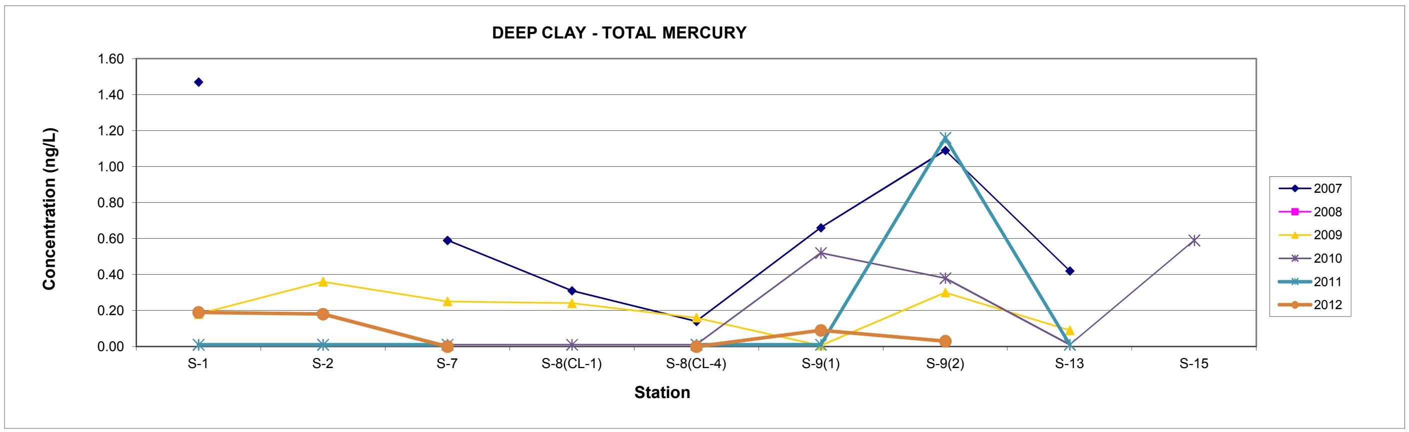
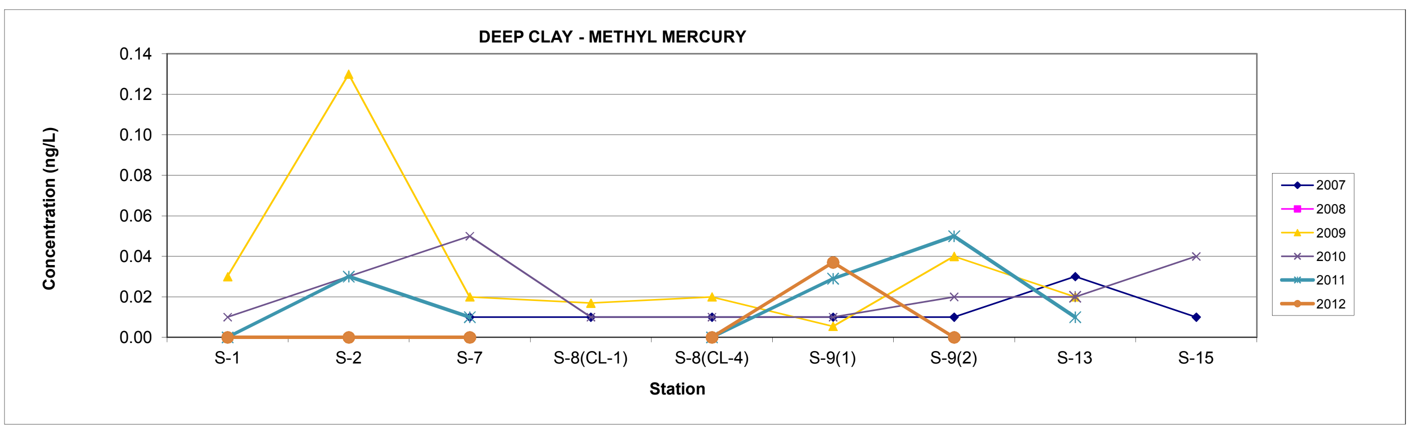


TABLE 2f
MINERAL HORIZON PORE WATER - DEEP CLAY 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	1.47		0.18	0.01	<0.01	0.19			0.03	0.01	<0.01	<0.01
S-2			0.36	0.01	0.01	0.18			0.13	0.03	0.03	<0.01
S-7	0.59		0.25	0.01	0.01	<0.01	<0.01		0.02	0.05	<0.01	<0.01
S-8(CL-1)	0.31		0.24	0.01			0.01		0.02	0.01		
S-8(CL-4)	0.14		0.16	0.01	0.01	<0.1	0.01		0.02	0.01	<0.01	<0.01
S-9(1)	0.66		0.01	0.52	0.01	0.09	0.01		0.01	0.01	0.03	0.037
S-9(2)	1.09		0.30	0.38	1.16	0.03	0.01		0.04	0.02	0.05	<0.01
S-13	0.42		0.09	0.01	<0.01		0.03		0.02	0.02	0.01	
S-15				0.59			0.01			0.04		

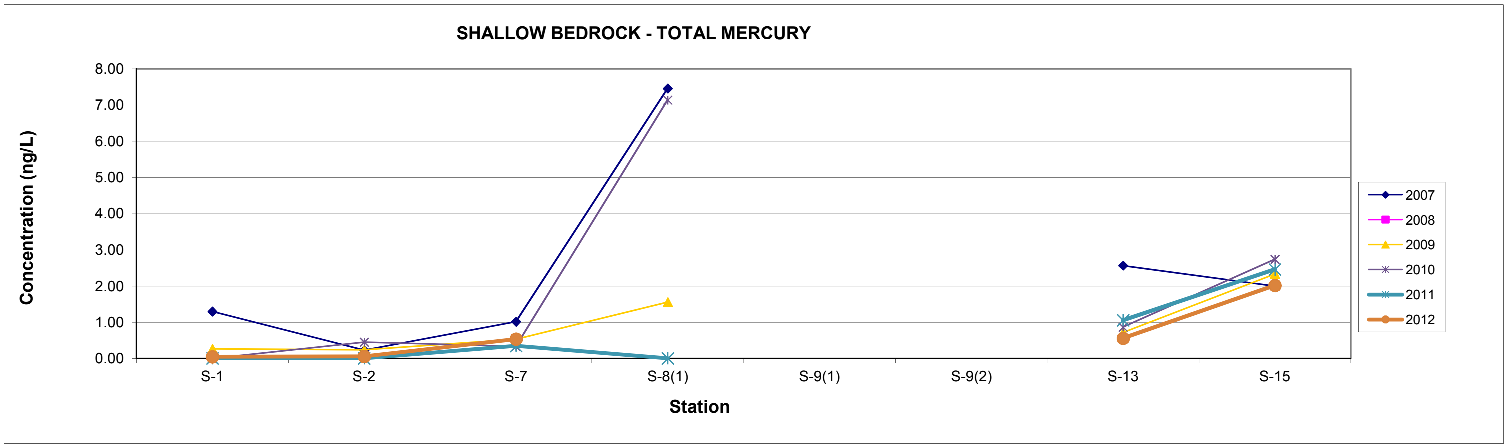




amec

TABLE 2g
MINERAL HORIZON PORE WATER - SHALLOW BEDROCK 2007-2012 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury						Methyl Mercury					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
S-1	1.30		0.27	0.01	<0.01	0.05	0.01		0.06	0.01	<0.01	<0.01
S-2	0.23		0.24	0.45	0.01	0.06	<0.01		0.05	0.02	0.04	<0.01
S-7	1.02		0.53	0.34	0.35	0.54	0.09		0.05	0.05	0.05	0.03
S-8(1)	7.46		1.56	7.14	0.01		0.03		0.03	0.13	0.01	
S-9(1)												
S-9(2)												
S-13	2.57		0.72	0.87	1.06	0.56	<0.01		0.02	0.01	0.01	<0.01
S-15	2.00		2.34	2.74	2.46	2.02	0.01		0.37	0.03	0.01	<0.01



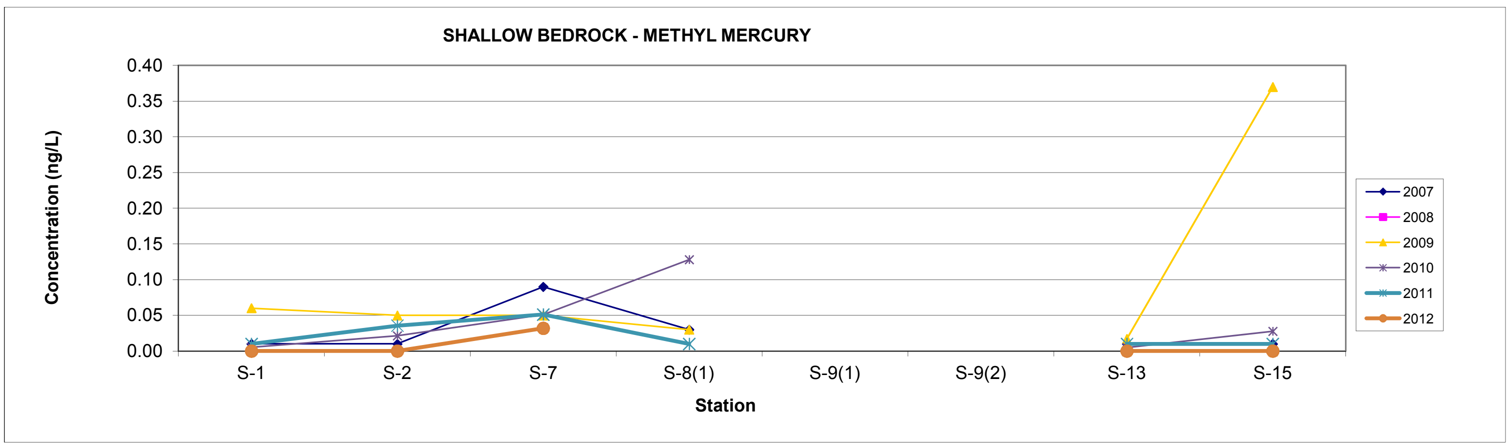


TABLE 3
TOTAL MERCURY - FENS (Unfiltered)
(concentrations in ng/L)

	Southwest Fen (SWF/F)	Northeast Fen (NEF/F)	Southeast Fen (SEF/F)	Northwest Control (HgCON)
May-06	0.77	0.62		
Jun-06	2.44	1.72		
Jul-06	2.49	1.26	2.51	2.64
Aug-06	1.86	0.83		
Sep-06	1.29	1.25		
Oct-06	1.59	0.53	1.09	1.70
Dec-06	4.65	1.08		
Jan-07	3.01	0.86	1.51	2.77
Feb-07	2.84	0.99		
Mar-07	F	3.14		
Apr-07	F	2.34		
May-07	2.07	1.31	1.43	1.25
Jun-07	1.96	1.21		
Jul-07	2.40	0.87	1.57	2.87
Aug-07	3.85	1.30		
Sep-07	2.28	1.32		
Oct-07	3.74	1.12	3.57	4.51
Nov-07	2.86	0.68		
Dec-07	3.42	1.41		
Jan-08	6.55	3.33	13.30	4.36
Feb-08	5.70	3.52		
Mar-08	9.79	4.64		
Apr-08	16.30	5.67	F	2.80
May-08	1.78	1.33		
Jun-08	2.37	1.11		
Jul-08	3.19	1.54	2.42	3.47
Aug-08	2.98	2.51		
Sep-08	2.76	2.22		
Oct-08	1.84	1.02	1.44	1.60
Nov-08	1.80	0.76		
Dec-08	2.19	0.92		
Jan-09	F	3.43	1.83	2.66
Feb-09	8.61	5.14		
Mar-09				
Apr-09	4.89	7.35		
May-09	1.44	2.92	2.60	2.91
Jun-09	Revoked	1.25		
Jul-09	Revoked	1.46	2.12	2.97
Aug-09	Revoked	1.11		
Sep-09	Revoked	1.42		
Oct-09	Revoked	1.41	0.94	1.15
Nov-09	Revoked	0.38		
Dec-09	Revoked	0.19		
Jan-10	Revoked	3.21	3.16	2.93
Feb-10	Revoked			
Mar-10	Revoked			
Apr-10	Revoked	1.03	0.55	
May-10	Revoked	0.70		1.20
Jun-10	Revoked	0.74		
Jul-10	Revoked	1.34	1.21	1.21
Aug-10	Revoked	1.76		
Sep-10	Revoked	1.15		
Oct-10	Revoked	0.78	1.29	1.86
Nov-10	Revoked	0.56		
Dec-10	Revoked	0.98		
Jan-11	Revoked	1.26	1.61	1.87
Feb-11	Revoked	F		
Mar-11	Revoked	F		
Apr-11	Revoked	2.81	3.74	2.05
May-11	Revoked	1.23		
Jun-11	Revoked	1.05		
Jul-11	Revoked	3.18	1.41	1.99
Aug-11	Revoked	3.29		
Sep-11**	Revoked			
Oct-11	Revoked	1.68	2.78	3.97
Nov-11	Revoked	1.23		
Dec-11	Revoked	1.17		
Jan-12	Revoked	5.31	7.75	5.49
Feb-12	Revoked			
Mar-12	Revoked	1.88		
Apr-12	Revoked	2.06	3.32	0.72
May-12	Revoked	0.68		
Jun-12	Revoked	1.16		
Jul-12	Revoked	3.59	1.36	1.90
Aug-12	Revoked	4.93		
Sep-12	Revoked	3.79		
Oct-12	Revoked	0.60	1.33	1.33
Nov-12	Revoked	2.70		
Dec-12	Revoked	2.37		
*Average 2009	5.03	2.31	1.87	2.42
*Average 2010	-	1.59	1.55	1.80
*Average 2011	-	1.88	2.39	2.47
*Average 2012	-	2.89	3.44	2.36
Average All Years	3.62	1.90	2.63	2.47

F = Frozen
Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southeast Fen - Control site
Northwest Control - Control site
*Annual average values are only for dates when control samples were collected
** Samples discarded due to lab miscommunicaton

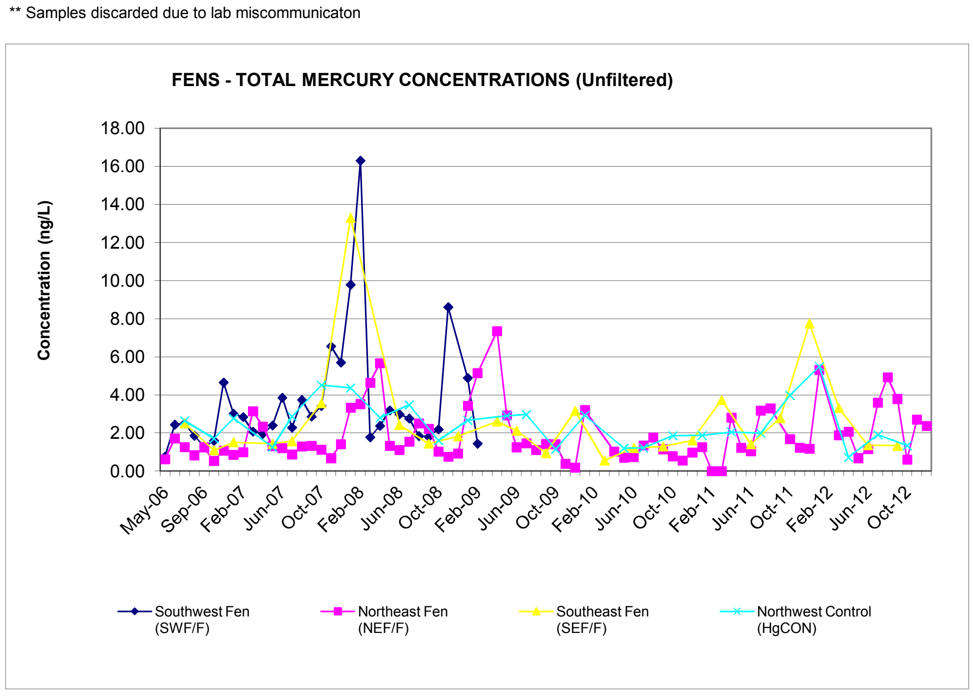


TABLE 4
TOTAL MERCURY - FENS (Filtered)
(concentrations in ng/L)

Date	Southwest Fen (SWF/F)	Northeast Fen (NEF/F)	Southeast Fen (SEF/F)	Northwest Control (HgCON)
May-06	0.64	0.48		
Jun-06	2.32			
Jul-06	1.96	0.86	1.38	1.82
Aug-06	1.34	0.72		
Sep-06	1.11	0.61		
Oct-06	0.85	0.44	0.94	1.19
Dec-06	3.05	0.59		
Jan-07	1.86	0.47	1.01	1.73
Feb-07	1.90	0.48		
Mar-07	F	3.03		
Apr-07	F	1.69		
May-07	1.31	1.41	0.89	1.03
Jun-07	1.24	1.05		
Jul-07	1.74	0.70	1.48	1.70
Aug-07	2.45	0.98		
Sep-07	1.87	0.69		
Oct-07	2.89	1.04	3.11	3.92
Nov-07	2.66	0.60		
Dec-07	3.22	1.00		
Jan-08	4.86	2.10	2.21	3.07
Feb-08	5.40	2.32		
Mar-08	3.79	3.41		
Apr-08	6.72	2.41	F	2.41
May-08	1.22	1.01		
Jun-08	1.63	1.11		
Jul-08	2.87	1.38	2.02	2.88
Aug-08	2.55	1.81		
Sep-08	2.07	1.90		
Oct-08	1.71	1.04	1.12	1.33
Nov-08	1.77	0.66		
Dec-08	2.02	0.86		
Jan-09	F	2.86	1.61	2.00
Feb-09	7.42	3.62		
Mar-09				
Apr-09	3.89	5.09		
May-09	1.44	1.55	2.25	1.85
Jun-09	Revoked	1.20		
Jul-09	Revoked	1.12	1.49	2.09
Aug-09	Revoked	0.79		
Sep-09	Revoked	1.15		
Oct-09	Revoked	1.46	0.92	1.02
Nov-09	Revoked	0.21		
Dec-09	Revoked	0.08		
Jan-10	Revoked	1.40	1.93	2.21
Feb-10	Revoked			
Mar-10	Revoked			
Apr-10	Revoked	0.65		0.01
May-10	Revoked	0.50	0.76	
Jun-10	Revoked	0.59		
Jul-10	Revoked	1.00	0.80	0.95
Aug-10	Revoked	1.25		
Sep-10	Revoked	0.89		
Oct-10	Revoked	0.37	1.35	0.64
Nov-10	Revoked	0.55		
Dec-10	Revoked	0.45		
Jan-11	Revoked	0.81	0.95	1.37
Feb-11	Revoked	F		
Mar-11	Revoked	F		
Apr-11	Revoked	1.65	0.79	0.53
May-11	Revoked	0.60		
Jun-11	Revoked	0.91		
Jul-11	Revoked	2.00	1.16	1.57
Aug-11	Revoked	2.20		
Sep-11**	Revoked			
Oct-11	Revoked	0.96	1.59	2.89
Nov-11	Revoked	0.48		
Dec-11	Revoked	0.66		
Jan-12	Revoked	3.32	2.00	4.73
Feb-12	Revoked			
Mar-12	Revoked	0.69		
Apr-12	Revoked	0.98	2.06	0.25
May-12	Revoked	0.41		
Jun-12	Revoked	0.68		
Jul-12	Revoked	2.09	1.11	1.56
Aug-12	Revoked	3.01		
Sep-12	Revoked	2.86		
Oct-12	Revoked	0.43	0.85	0.96
Nov-12	Revoked	1.07		
Dec-12	Revoked	0.89		
*Average 2009	4.43	1.75	1.57	1.74
*Average 2010	-	0.86	1.21	0.95
*Average 2011	-	1.14	1.12	1.59
*Average 2012	-	1.71	1.51	1.88
Average All Years	2.56	1.27	1.43	1.76

F = Frozen
Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southeast Fen - Control site
Northwest Control - Control site
*Annual average values are only for dates when control samples were collected
** Samples discarded due to lab miscommunication

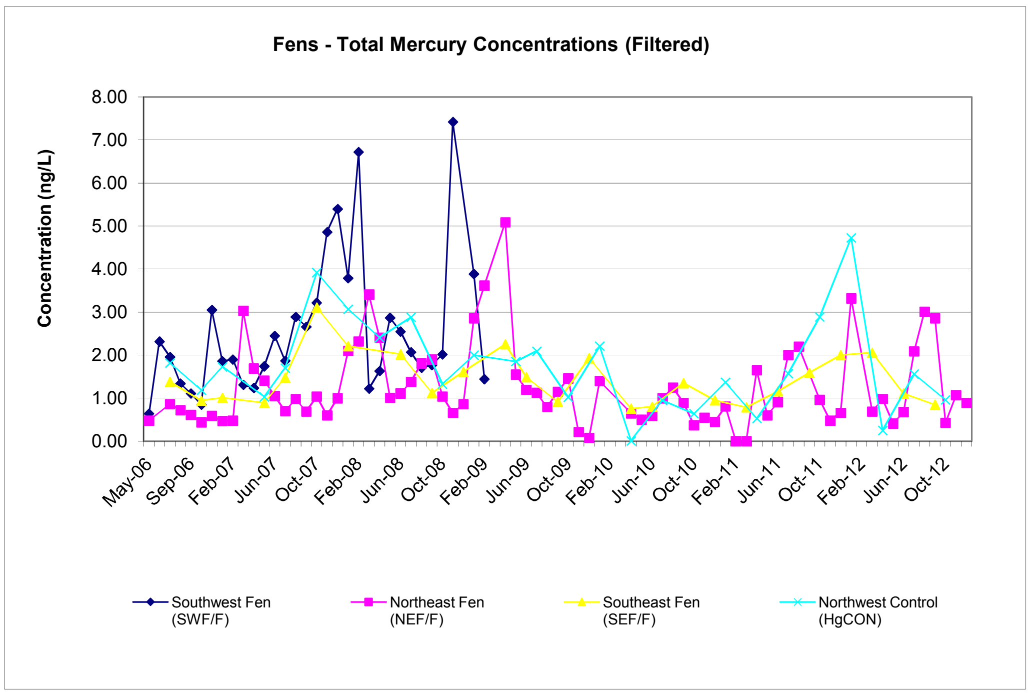


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TABLE 5
METHYL MERCURY - FENS
(concentrations in ng/L)

Unfiltered Samples				
Date	**Southwest Fen (SWF/F)**	**Northeast Fen (NEF/F)**	**Southeast Fen (SEF/F)**	**Northwest Control (HgCON)**
Jul-06	0.16	0.10	0.03	0.06
Oct-06	0.20	0.02	0.02	0.05
Jan-07	0.97	0.07	0.07	0.16
May-07	0.14	0.07	0.01	0.04
Jul-07	0.68	0.10	0.02	0.05
Oct-07	0.81	0.15	0.08	0.09
Jan-08	5.58	1.72	1.07	0.34
Mar-08	F	2.07	F	F
Apr-08	8.37	2.90	0.07	0.65
Jul-08	0.69	0.40	0.11	0.12
Oct-08	0.27	0.50	0.05	0.04
Jan-09	4.59	1.99	0.12	0.19
Apr/May-09	2.79	5.08	0.05	0.04
Jul-09	Revoked	0.34	<0.01	0.03
Oct-09	Revoked	0.12	0.03	0.04
Jan-10	Revoked	2.38	0.06	0.18
Apr-10	Revoked	0.21	0.04	0.06
Jul-10	Revoked	1.10	0.03	0.08
Oct-10	Revoked	0.24	0.03	0.07
Jan-11	Revoked	0.65	0.08	0.06
Apr-11	Revoked	0.13	0.18	0.18
Jul-11	Revoked	1.03	0.03	0.04
Oct-11	Revoked	0.23	0.07	0.07
Jan-12	Revoked	8.09	0.94	0.47
Apr-12	Revoked	0.49	0.10	0.05
Jul-12	Revoked	1.74	0.03	0.07
Oct-12	Revoked	0.15	0.02	0.03
Average 2009	3.69	1.88	0.05	0.07
Average 2010	-	0.98	0.04	0.10
Average 2011	-	0.51	0.09	0.09
Average 2012	-	2.62	0.27	0.16
Average all Data	2.10	1.19	0.13	0.13

F = Frozen

Southwest Fen - Received effluent from the Central Quarry

Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump

Southwest Fen - Control site

Northwest Control - Control site

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

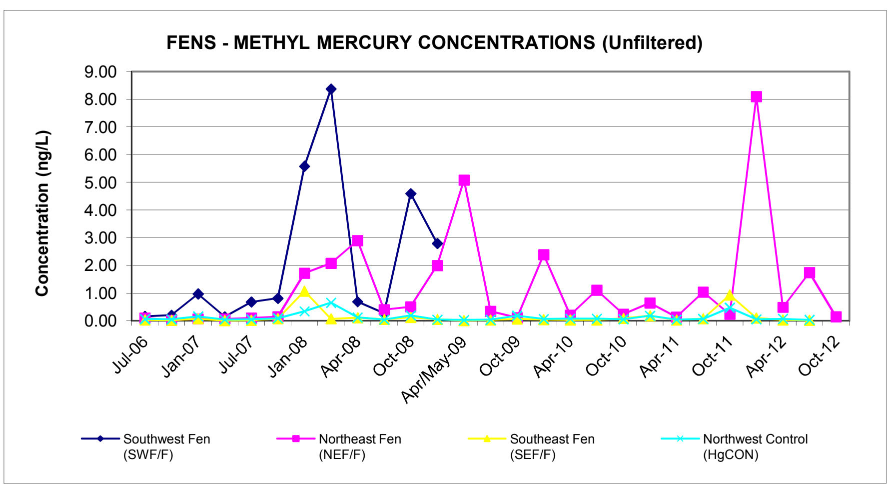

TABLE 6
METHYL MERCURY - FENS
(concentrations in ng/L)

Filtered Samples				
Date	**Southwest Fen (SWF/F)**	**Northeast Fen (NEF/F)**	**Southeast Fen (SEF/F)**	**Northwest Control (HgCON)**
Jul-06	0.13	0.08	0.02	0.01
Oct-06	0.15	0.02	0.01	0.02
Jan-07	0.68	0.04	0.06	0.10
May-07	0.08	0.06	0.02	0.04
Jul-07	0.30	0.10	0.02	0.04
Oct-07	0.63	0.12	0.04	0.09
Jan-08	3.48	1.29	0.39	0.17
Mar-08	F	1.34	F	F
Apr-08	3.42	1.73	0.03	0.37
Jul-08	0.58	0.41	0.08	0.07
Oct-08	0.29	0.39	0.02	0.04
Jan-09	3.03	0.89	0.09	0.14
Apr/May-09	1.85	3.32	0.05	0.05
Jul-09	Revoked	0.16	0.07	0.08
Oct-09	Revoked	0.13	0.05	0.06
Jan-10	Revoked	0.76	0.11	0.07
Apr-10	Revoked	0.12	0.03	0.05
Jul-10	Revoked	0.59	0.02	0.04
Oct-10	Revoked	0.23	0.03	0.06
Jan-11	Revoked	0.40	0.03	0.03
Apr-11	Revoked	0.01	0.04	0.06
Jul-11	Revoked	0.88	0.02	0.04
Oct-11	Revoked	0.04	0.03	0.01
Jan-12	Revoked	4.09	0.17	0.20
Apr-12	Revoked	0.27	0.07	<0.02
Jul-12	Revoked	1.18	0.02	0.04
Oct-12	Revoked	0.11	<0.01	0.03
Average 2009	2.44	1.12	0.07	0.08
Average 2010	-	0.43	0.05	0.06
Average 2011	-	0.33	0.03	0.03
Average 2012	-	1.41	0.07	0.07
Average All Data	1.22	0.69	0.06	0.07

F = Frozen

Southwest Fen - Received effluent from the Central Quarry

Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump

Southwest Fen - Control site

Northwest Control - Control site

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

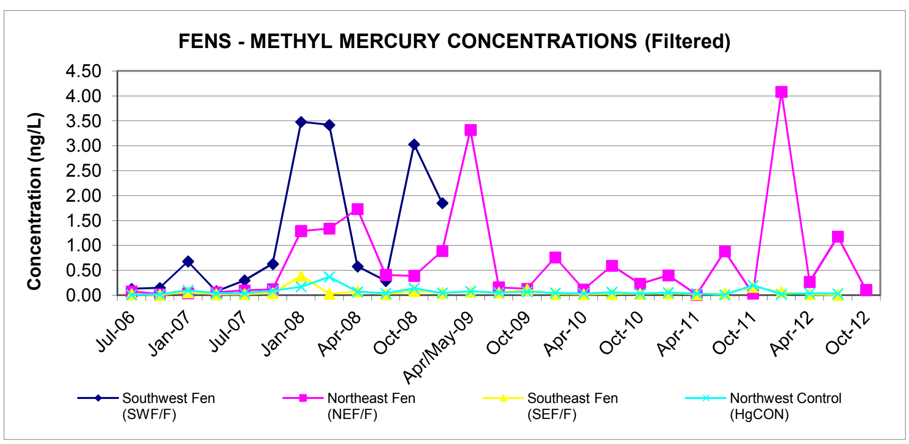

TABLE 7a
TOTAL MERCURY - RIBBED FEN SURFACE WATERS (Sampled as Peat Pore Water 2007-2012)
(filtered; concentrations in ng/L)

Date	MS-1-R (ES1-R)	MS-2-R (ES2-R)	MS-7-R (NS7-R)	MS-8-R (NS8-1R)	MS-9(1)-R (SS9-1R)	MS-9(2)-R (SS9-2R)	MS-13-R (WS13-R)	MS-15-R (WS15-R)	MS-V(1)-R (ES2-R)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
Aug / Sep-07	1.81	1.56	0.62	1.00	0.72	1.29	0.40	0.43	1.56	0.01	0.01
Nov-07	1.67	2.30	0.82	1.36	1.11	1.01	1.70	1.11	2.30	0.01	0.01
May-08	2.86	5.56	F	0.91	0.53	F	0.42	0.38	5.56	F	F
Aug-08	2.27	2.02	0.52	0.98	1.26	0.90	0.95	0.92	2.02	0.60	1.69
Oct-08	1.52	1.07	0.72	1.26	1.26	0.70	1.22	0.37	1.07	0.41	1.33
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May-09	2.90	1.98	1.92	3.25	2.10	2.40	4.08	2.19	1.98	2.38	3.19
Aug-09	1.00	0.95	0.95	1.38	1.01	1.44	2.54	0.86	0.95	0.94	1.78
Oct-09	1.19	1.01	1.15	1.19	1.18	1.24	2.54	0.75	1.01	0.86	2.01
Jan-10	0.65	0.01	<0.01	2.45	1.17	0.01	1.21	0.01	0.01	0.01	F
May-10	1.86	1.75	0.74	1.32	1.32	1.40	0.93	2.68	1.75	0.83	2.06
Aug-10	1.24	1.43	0.44	1.60	0.47	0.72	0.01	0.01	1.43	0.85	0.76
Oct-10	1.11	1.24	0.81	1.79	1.25	1.05	3.03	0.68	1.24	1.03	1.67
Jan / Feb-11	F	0.60	0.41	1.42	0.94	0.54	1.92	0.49	0.60	F	F
Apr-11	1.07	0.83	0.84	1.35	0.92	0.84	2.63	0.63	0.83	0.47	1.01
Jul-11	2.10	1.23	1.20	1.52	1.52	1.04	3.06	0.51	1.23	1.36	1.38
Oct-11	2.52	2.07	4.43	2.73	2.00	2.01	3.43	1.02	2.07	1.45	3.92
Jan-12	1.68	F	0.84	4.44	1.98	0.94	4.84	0.73	F	1.70	1.95
Apr-12	2.00	2.28	1.03	0.87	1.21	1.37	2.09	0.69	2.28	0.49	0.71
Jul-12	1.70	0.66	0.76	1.18	1.23	1.70	2.97	0.62	0.66	1.24	2.87
Oct-12	2.05	1.76	2.89	1.87	1.34	0.71	3.25	0.67	1.76	0.76	2.61
2009 Average	1.70	1.31	1.34	1.94	1.43	1.69	3.05	1.27	1.31	1.39	2.32
2010 Average	1.22	1.11	0.50	1.79	1.05	0.79	1.29	0.84	1.11	0.68	1.50
2011 Average	1.90	1.18	1.72	1.76	1.35	1.11	2.76	0.66	1.18	1.09	2.10
2012 Average	1.86	1.57	1.38	2.09	1.44	1.18	3.29	0.68	1.57	1.05	2.04
Average All Years	1.75	1.60	1.11	1.69	1.23	1.12	2.16	0.79	1.60	0.85	1.70

TABLE 7b
METHYL MERCURY - RIBBED FEN SURFACE WATERS (Sampled as Peat Pore Water 2007-2012)
(filtered; concentrations in ng/L)

Date	MS-1-R (ES1-R)	MS-2-R (ES2-R)	MS-7-R (NS7-R)	MS-8-R (NS8-1R)	MS-9(1)-R (SS9-1R)	MS-9(2)-R (SS9-2R)	MS-13-R (WS13-R)	MS-15-R (WS15-R)	MS-V(1)-R (ES2-R)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
Aug / Sep-07	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.13	0.02	<0.01	0.01	0.01
Nov-07	0.02	<0.01	0.01	0.01	<0.01	0.02	<0.01	0.01	<0.01	0.01	0.01
May-08	0.11	0.07	F	<0.01	0.01	F	0.01	0.02	0.07	F	F
Aug-08	0.07	0.04	0.01	0.01	0.03	0.06	<0.01	0.02	0.04	<0.01	0.02
Oct-08	0.02	0.01	0.01	0.01	0.02	0.04	0.01	0.02	0.01	<0.01	0.01
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May / June-09	0.07	0.05	0.02	0.08	0.02	0.01	0.08	0.01	0.05	0.04	0.04
Aug-09	0.03	0.05	0.03	0.09	0.02	0.04	0.04	0.11	0.05	0.04	0.01
Oct-09	0.05	0.03	0.05	0.06	0.04	0.04	0.09	0.02	0.03	0.05	0.14
Jan-10	0.07	0.01	<0.01	0.10	0.01	<0.01	0.05	0.02	0.01	<0.01	F
May-10	0.04	0.04	0.03	0.03	0.04	0.03	0.02	0.07	0.04	0.03	0.06
Aug-10	0.06	0.08	0.02	<0.01	0.02	0.05	0.01	0.02	0.08	0.04	0.02
Oct-10	0.03	0.04	0.01	0.08	0.03	0.02	0.12	0.01	0.04	0.01	0.07
Jan / Feb-11	F	0.03	<0.01	0.03	0.09	0.01	0.04	<0.01	0.03	F	F
Apr-11	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
Jul-11	0.05	0.07	0.03	0.05	0.03	0.01	0.16	0.01	0.07	0.03	0.03
Oct-11	0.07	0.06	0.08	0.14	0.03	0.04	0.15	0.01	0.06	0.05	0.23
Jan-12	0.29	F	0.03	0.95	0.02	0.13	0.63	0.07	F	0.18	0.10
Apr-12	0.06	0.06	0.03	0.05	0.04	0.06	0.10	0.02	0.06	<0.02	0.03
Jul-12	0.04	0.05	<0.01	0.11	<0.01	0.05	0.20	<0.01	0.05	0.03	<0.01
Oct-12	0.04	0.02	0.02	0.03	<0.02	0.02	0.06	<0.02	0.02	<0.01	0.10
2009 Average	0.05	0.04	0.03	0.08	0.03	0.03	0.07	0.05	0.04	0.04	0.06
2010 Average	0.05	0.04	0.02	0.05	0.02	0.03	0.05	0.03	0.04	0.02	0.05
2011 Average	0.04	0.04	0.03	0.06	0.04	0.02	0.09	0.01	0.04	0.03	0.09
2012 Average	0.11	0.04	0.02	0.28	0.02	0.06	0.25	0.03	0.04	0.06	0.06
Average All Years	0.06	0.04	0.02	0.09	0.03	0.03	0.10	0.03	0.04	0.03	0.05

Notes:

(yellow)	MS-2-R and MS-v(1)-R are the same stations
F	Frozen - no sample
(orange)	Stations located at or inside the Upper Bedrock 2 m drawdown contour
(green)	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G dated March 13, 2009 provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW dated October 3, 2008 provided for the same sampling frequency

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TABLE 8

MUSKEG SYSTEM RIBBED FEN GENERAL CHEMISTRY RESULTS - ALL YEARS

Station	Year	Number of Samples	Cl (mg/L)	Cond (us/cm)	Nitrate (mg/L)	DOC (mg/L)	pH (units)	SO4 (mg/L)	TP (mg/L)	Ca-D (mg/L)	Fe-D (mg/L)	Mg-D (mg/L)	Na-D (mg/L)
MS-1V-R (ES2-R)	2007	2	0.6	44	<0.1	16.7	6.06	<0.1	0.10	7.2	0.660	0.7	<0.8
	2008	3	0.6	37	<0.1	23.3	5.68	<0.1	0.21	4.6	1.132	0.3	<0.5
	2009	3	0.4	19	<0.1	10.0	6.43	<0.1	<0.01	3.4	0.320	0.4	<0.4
	2010	4	0.6	27	<0.1	22.2	5.84	<1.0	0.01	3.7	0.860	0.3	0.4
	2011	4	5.7	60	<0.1	23.7	6.41	7.5	0.03	5.0	1.292	0.8	3.2
	2012	3	0.5	26	<0.1	36.0	6.09	<1.0	0.01	3.2	1.064	0.4	0.4
MS-2V-R (SSV2-R)	2007	1	1.2	131	<0.1	29.0	6.18	0.2	1.81	24.4	1.910	1.6	0.8
	2008	2	0.9	91	<0.1	35.1	5.87	<0.1	0.06	11.6	0.557	0.5	0.7
	2009	3	0.4	19	<0.1	14.8	6.52	<0.1	<0.01	18.9	0.107	2.8	7.1
	2010	4	0.5	70	<0.1	18.7	6.93	<1.0	0.02	12.4	0.568	0.7	0.5
	2011	4	2.1	84	<0.1	18.9	7.53	<1.0	0.08	11.8	0.070	0.9	0.7
	2012	4	2.5	194	<0.1	38.3	7.28	<1.0	0.05	32.8	0.950	3.1	1.8
MS-3V-R (SSV3-R)	2007	1	1.8	141	<0.1	51.6	6.23	0.3	2.47	50.2	5.540	12.0	0.8
	2008	2	1.0	68	<0.1	59.2	5.75	<0.1	0.09	9.5	0.457	1.3	<0.5
	2009	3	0.3	18	<0.1	20.8	5.34	<0.1	<0.01	1.0	0.100	0.1	<0.5
	2010	3	0.3	20	<0.1	23.6	5.08	<1.0	0.01	1.8	0.161	0.2	0.2
	2011	4	0.5	37	<0.10	22.9	6.07	<1.00	0.01	3.6	0.108	0.5	0.4
	2012	4	2.3	75	<0.1	38.0	6.48	<1.0	0.04	11.1	0.318	1.4	0.7
MS-1R (ES1-R)	2007	2	0.6	98	<0.1	21.0	6.17	<0.1	0.20	11.3	0.340	0.8	1.5
	2008	3	0.8	47	<0.1	20.2	5.98	<0.1	0.13	5.5	0.340	0.4	1.2
	2009	3	0.5	26	<0.1	18.9	6.47	<0.1	<0.01	3.4	0.136	0.3	<0.6
	2010	4	0.4	34	<0.1	22.6	6.22	<1.0	0.01	5.6	0.499	0.4	0.8
	2011	4	0.7	43	<0.1	24.8	6.77	<1.0	0.01	5.7	0.317	0.5	1.1
	2012	4	2.3	82	<0.1	44.7	6.66	<1.0	0.01	13.1	2.578	1.3	2.1
MS-7R (NS-7-R)	2007	2	1.1	246	<0.1	28.7	6.33	<0.2	0.14	47.4	1.350	3.6	4.6
	2008	2	0.8	198	<0.1	14.9	6.40	<0.1	0.03	20.5	1.775	2.1	5.8
	2009	2	0.6	31	<0.1	13.6	7.14	<0.1	<0.01	2.6	0.165	0.3	0.9
	2010	4	0.6	76	<0.1	16.6	6.83	<1.0	0.01	11.2	1.966	1.1	1.5
	2011	4	0.6	67	<0.1	21.4	6.92	<1.0	0.01	9.9	2.187	0.7	1.5
	2012	4	2.5	78	<0.1	18.3	6.92	<1.0	0.07	10.1	0.892	1.2	1.9
MS-8R (NS-8-1R)	2007	2	85.8	591	<0.1	28.1	6.98	7.0	0.46	28.6	0.078	10.2	92.8
	2008	3	52.5	452	<0.1	33.2	7.13	<0.2	0.08	10.8	0.053	5.8	57.6
	2009	2	1.2	28	<0.1	16.4	6.81	<0.2	<0.01	1.9	0.119	0.5	2.3
	2010	4	4.2	82	<0.1	35.3	6.40	<1.0	0.02	8.4	0.993	1.4	7.2
	2011	4	4.6	80	0.16	30.5	6.95	<1.0	0.01	8.2	1.313	1.4	73.1
	2012	4	8.9	147	<0.1	72.1	7.00	1.25	0.03	15.3	7.257	3.0	11.4
MS-9(1)R (SS9-1R)	2007	2	0.5	199	<0.1	19.8	6.65	<0.3	0.22	38.5	0.245	1.0	1.4
	2008	3	0.4	77	<0.2	16.7	5.87	<0.1	0.02	9.8	0.241	0.7	<0.6
	2009	3	0.3	22	<0.1	14.6	6.56	<0.1	<0.02	2.5	0.670	0.2	<0.5
	2010	4	0.3	32	<0.1	19.4	6.14	<1.0	0.01	5.5	0.238	0.4	0.4
	2011	4	0.4	32	<0.1	18.0	6.73	<1.0	0.01	5.0	0.114	0.4	0.5
	2012	4	1.5	37	<0.1	20.9	6.57	<1.0	0.01	5.8	0.392	0.5	0.5
MS-9(2)R (SS9-2R)	2007	2	0.7	70	<0.1	17.8	6.28	<0.1	0.16	12.7	0.398	1.7	<1.1
	2008	2	0.4	79	<0.1	17.2	6.26	<0.1	0.05	10.4	0.847	1.1	1.4
	2009	3	0.5	30	<0.1	13.0	6.98	<0.1	<0.02	3.6	0.087	0.4	<0.5
	2010	4	0.7	58	<0.1	19.2	6.66	<1.0	0.03	10.1	0.881	1.1	0.7
	2011	4	0.7	70	<0.1	18.3	7.12	<1.0	0.01	10.5	1.618	1.0	1.1
	2012	4	0.8	60	<0.1	19.1	7.02	<1.0	0.01	8.9	1.278	1.2	1.3
MS-13R (WS-13R)	2007	2	1.2	248	<0.1	20.9	6.25	<0.1	0.07	47.9	1.360	3.7	4.9
	2008	3	0.8	203	<0.1	67.0	5.91	<0.1	0.06	33.1	1.357	2.5	0.7
	2009	3	0.4	21	<0.1	22.9	4.53	<0.1	<0.01	0.7	0.067	0.1	<0.5
	2010	3	0.9	31	<0.1	26.0	4.34	<1.0	0.00	0.9	0.090	0.1	0.3
	2011	4	2.6	51.6	0.2	50.9	4.30	1.4	0.02	2.5	0.351	0.4	0.4
	2012	4	1.4	42.0	<0.1	66.2	4.75	1.0	0.01	2.4	0.458	0.3	0.4
MS-15R (WS15-R)	2007	2	0.8	172	<0.1	11.6	6.43	<0.1	0.04	36.8	0.769	2.6	1.3
	2008	3	0.7	191	<0.1	11.5	6.44	<0.1	0.04	24.0	0.666	1.9	1.0
	2009	3	0.4	50	<0.1	9.8	7.27	<0.1	<0.01	6.8	0.019	0.5	<0.5
	2010	4	0.7	86	<0.1	12.7	7.12	<1.0	0.00	15.7	0.344	1.3	0.6
	2011	4	0.5	86	<0.1	10.2	7.49	<1.0	0.01	12.9	0.499	1.0	0.7
	2012	4	0.7	98	<0.1	13.4	7.30	<1.0	0.01	15.5	0.263	1.3	0.9

MS-8R This station stands out as being influenced by natural groundwater upwellings, as evidenced by elevated Cl and Na

(shaded) Beyond zone of dewatering influence

TABLE 9
TOTAL MERCURY - GRANNY CREEK
(unfiltered; concentrations in ng/L)

Date	N. Granny Cr. Upstream (NGC/UP/NWF)	N. Granny Cr. Downstream (NGC/DN/NEF)	S. Granny Cr. Upstream (SGC/UP/SWF)	S. Granny Cr. Downstream (SGC/DS/SWF)
May-06	1.18	1.66	0.86	1.26
Jun-06	3.55		3.37	3.16
Jul-06	2.92	2.80	2.72	3.08
Aug-06	4.21	3.77	2.57	2.6
Sep-06	2.37	2.26	2.28	2.74
Oct-06		1.61	1.34	1.30
Dec-06	2.53	4.58	2.23	2.08
Jan-07	2.02	2.35	16.20	4.52
Feb-07		2.02	3.57	3.16
Mar-07	7.17	F	F	7.43
Apr-07	8.82	5.87	3.72	3.76
May-07	3.01	3.02	2.46	2.08
Jun-07	3.34	2.99	2.49	3.04
Jul-07	3.16	2.23	2.73	2.03
Aug-07	3.10	1.94		2.17
Sep-07	1.96	2.04	4.41	1.61
Oct-07	5.91	5.67	5.16	3.79
Nov-07	3.19	3.00	2.74	2.49
Dec-07	2.42	2.60	2.67	2.61
Jan-08	2.95	2.42	2.97	2.94
Feb-08	2.19	2.29	3.76	2.91
Mar-08	0.46	2.66	3.06	3.35
Apr-08	11.90	F	2.19	2.91
May-08	3.54	3.73	3.37	3.42
Jun-08	3.06	3.08	2.55	2.81
Jul-08	3.28	1.61	3.60	2.68
Aug-08	2.71	2.69	2.63	2.38
Sep-08	1.76	2.32	1.94	2.78
Oct-08	1.37	1.57	2.14	1.83
Nov-08	3.20	2.39		1.81
Dec-08	1.82	1.83	1.84	1.88
Jan-09	1.41	1.54	4.42	1.64
Feb-09	1.18	1.34	2.22	1.52
Mar-09	1.48	2.26	2.56	1.45
Apr-09	3.19	1.41	2.19	2.98
May-09	5.18	3.81	3.31	3.82
Jun-09	2.95	2.72	2.65	2.76
Jul-09	3.62	3.48	2.70	2.69
Aug-09	2.07	2.08	2.06	2.05
Sep-09	1.45	1.82	1.47	1.39
Oct-09	1.47	1.38	1.40	1.05
Nov-09	1.70	1.79	3.65	0.98
Dec-09	1.11	1.02	1.08	0.96
Jan-10	1.46	1.03	0.94	1.89
Feb-10	1.49	1.36	1.89	2.03
Mar-10	1.64	1.78	2.14	1.84
Apr-10	1.56	2.05	1.68	1.90
May-10	1.99	1.80	1.90	2.13
Jun-10	0.93	0.97	0.83	0.78
Jul-10	0.92	1.04	0.70	1.28
Aug-10	3.90	3.15	3.06	3.37
Sep-10	2.44	2.71	2.21	2.00
Oct-10	1.46	1.81	1.59	1.55
Nov-10	1.94	2.10	1.82	1.86
Dec-10	1.50	1.62	1.59	1.67
Jan-11	1.31	1.24	1.50	1.46
Feb-11	1.77	1.64	1.70	1.42
Mar-11	1.56	1.36	2.55	1.11
Apr-11	0.92	1.04	2.40	1.38
May-11	3.58	3.75	2.98	3.53
Jun-11	2.99	2.65	2.34	2.36
Jul-11	1.51	2.03	2.08	2.00
Aug-11	1.81	1.92	2.42	2.28
**Sep-11				
Oct-11	4.36	4.11	3.67	3.57
Nov-11	3.12	3.45	3.00	2.72
Dec-11	1.82	2.05	2.32	1.97
Jan-12			2.33	1.56
Feb-12	0.78	0.81	2.06	0.95
Mar-12	0.78	1.15	29.4*	0.82
Apr-12			2.72	2.41
May-12	2.08	2.23	2.13	2.42
Jun-12	3.96	4.06	3.36	2.95
Jul-12	1.94	2.29	2.42	2.68
Aug-12	1.48	1.75	2.28	1.74
Sep-12	1.71	2.15	2.77	2.61
Oct-12			2.63	2.34
Nov-12		5.12	2.33	3.53
Dec-12	3.76	3.31	3.26	3.31
Average 2009	2.23	2.06	2.48	1.94
Average 2010	1.77	1.79	1.70	1.86
Average 2011	2.25	2.29	2.45	2.16
Average 2012	2.06	2.54	2.57	2.28
Average All Data	2.62	2.38	2.66	2.35

* Samples excluded from annual average calculation
** Samples discarded due to lab miscommunication
F = Frozen
CCME Protection of Aquatic Life Guideline - 26 ng/L

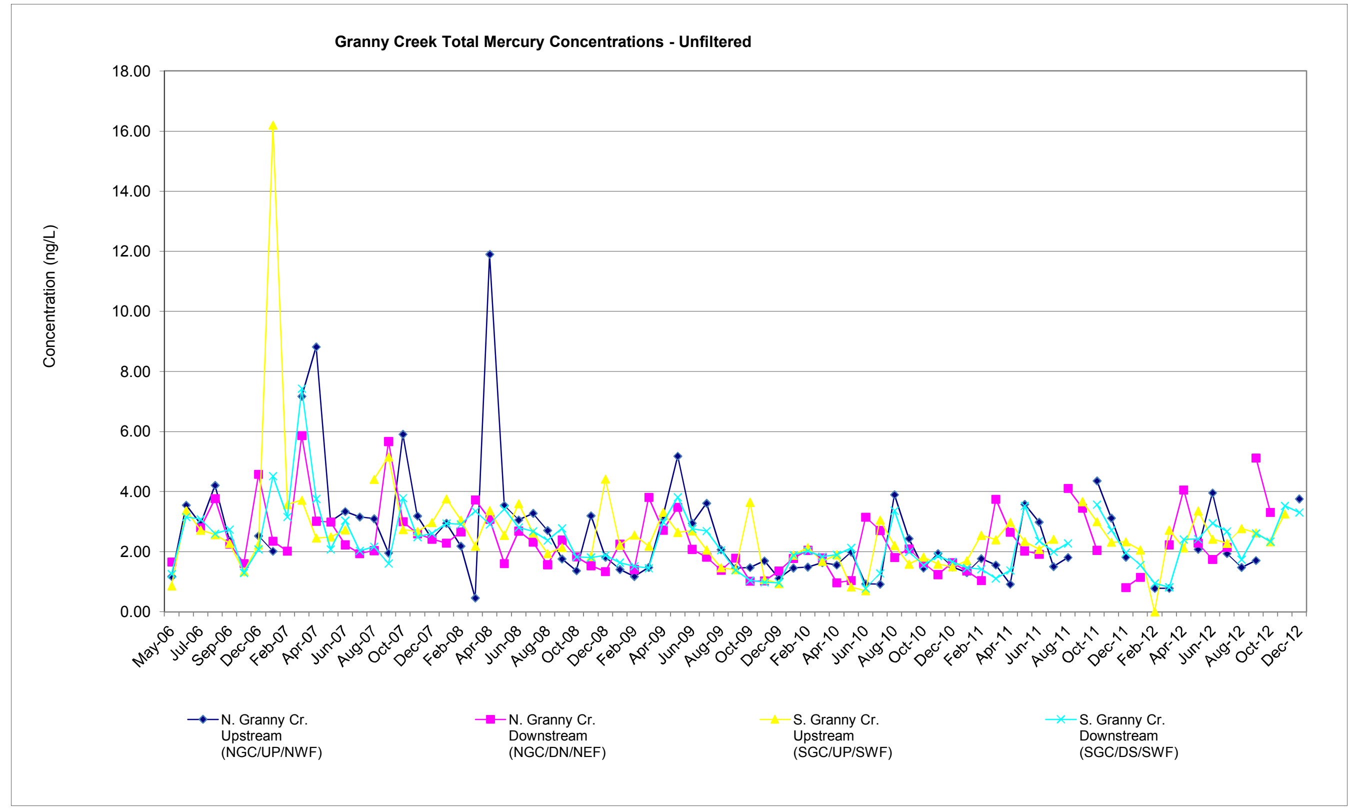


TABLE 10
TOTAL MERCURY - GRANNY CREEK
(filtered; concentrations in ng/L)

Date	N. Granny Cr. Upstream (NGC/UP/NWF)	N. Granny Cr. Downstream (NGC/DN/NEF)	S. Granny Cr. Upstream (SGC/UP/SWF)	S. Granny Cr. Downstream (SGC/DS/SWF)
May-06	0.87	0.90	0.55	0.90
Jun-06	2.91			2.83
Jul-06	2.33	2.22	2.07	1.94
Aug-06	3.43	3.03	2.07	1.94
Sep-06	1.64	1.70	1.34	2.11
Oct-06		1.30	1.11	0.97
Dec-06	1.98	3.98	1.92	1.58
Jan-07	1.06	1.40	2.01	3.37
Feb-07		0.75	0.79	1.90
Mar-07	7.05	F	F	2.92
Apr-07	4.19	2.50	1.96	1.84
May-07	2.40	2.56	2.40	1.83
Jun-07	2.51	2.64	2.26	1.79
Jul-07	2.96	2.10	2.32	2.01
Aug-07	1.52	1.81		1.70
Sep-07	1.96	1.75	3.87	1.49
Oct-07	5.19	5.60	4.76	3.42
Nov-07	2.91	2.74	2.45	2.16
Dec-07	2.05	2.18	2.35	2.61
Jan-08	1.42	1.63	2.21	2.33
Feb-08	1.91	1.60	2.24	2.08
Mar-08	1.76	1.63	1.76	1.98
Apr-08	1.84	F	1.63	2.06
May-08	3.16	3.21	2.90	2.97
Jun-08	2.74	2.72	2.29	2.36
Jul-08	2.95	1.49	2.84	2.32
Aug-08	2.39	2.34	2.23	2.06
Sep-08	1.35	1.88	1.62	1.60
Oct-08	1.19	1.40	1.88	1.27
Nov-08	2.28	2.15		1.73
Dec-08	1.30	1.65	1.77	1.71
Jan-09	1.33	1.27	2.05	1.34
Feb-09	1.15	1.05	1.68	1.19
Mar-09	1.15	1.40	1.75	1.22
Apr-09	1.56	1.09	1.34	1.78
May-09	2.43	2.34	1.98	2.19
Jun-09	3.24	3.19	2.75	2.71
Jul-09	2.57	2.93	2.20	1.96
Aug-09	1.66	1.69	1.80	1.59
Sep-09	1.54	1.63	1.39	1.39
Oct-09	1.45	1.38	1.01	1.08
Nov-09	1.51	1.45	2.01	0.80
Dec-09	0.97	0.68	0.95	0.75
Jan-10	1.07	1.11	1.29	1.31
Feb-10	0.88	1.05	1.37	1.32
Mar-10	0.96	1.02	1.11	1.23
Apr-10	0.97	1.10	1.14	1.07
May-10	1.43	1.11	1.54	1.45
Jun-10	1.47	0.87	0.68	0.60
Jul-10	0.89	0.65	0.50	0.70
Aug-10	3.33	2.10	2.72	2.25
Sep-10	1.66	1.57	1.69	1.48
Oct-10	1.38	0.54	1.71	1.61
Nov-10	1.59	1.63	1.61	1.54
Dec-10	0.98	0.92	1.08	0.95
Jan-11	0.82	0.81	1.07	1.02
Feb-11	1.30	1.44	1.65	1.02
Mar-11	0.94	0.70	0.75	0.69
Apr-11	0.69	0.73	0.77	0.76
May-11	2.24	1.95	1.85	1.83
Jun-11	2.94	2.45	2.13	2.16
Jul-11	1.19	1.85	1.72	1.16
Aug-11	0.73	0.84	1.09	1.10
* Sep-11				
Oct-11	2.96	2.36	2.71	2.30
Nov-11	2.53	2.40	2.45	1.95
Dec-11	1.05	1.20	1.67	1.21
Jan-12			1.68	0.99
Feb-12	0.46	0.38	1.03	0.49
Mar-12	0.42	0.34	0.41	0.38
Apr-12			1.84	1.44
May-12	1.66	1.56	1.58	1.52
Jun-12	3.47	3.16	2.63	2.28
Jul-12	1.54	1.60	1.57	1.61
Aug-12	0.86	0.98	1.30	1.02
Sep-12	1.13	1.46	2.09	2.09
Oct-12			2.13	1.48
Nov-12		3.10	1.94	1.81
Dec-12	1.59	1.88	1.67	1.49
Average 2009	1.71	1.68	1.74	1.50
Average 2010	1.38	1.14	1.37	1.29
Average 2011	1.58	1.52	1.62	1.38
Average 2012	1.39	1.61	1.66	1.38
Average All Data	1.90	1.75	1.79	1.65

* Samples discarded due to lab miscommunication
F = Frozen
CCME Protection of Aquatic Life Guideline - 26 ng/L

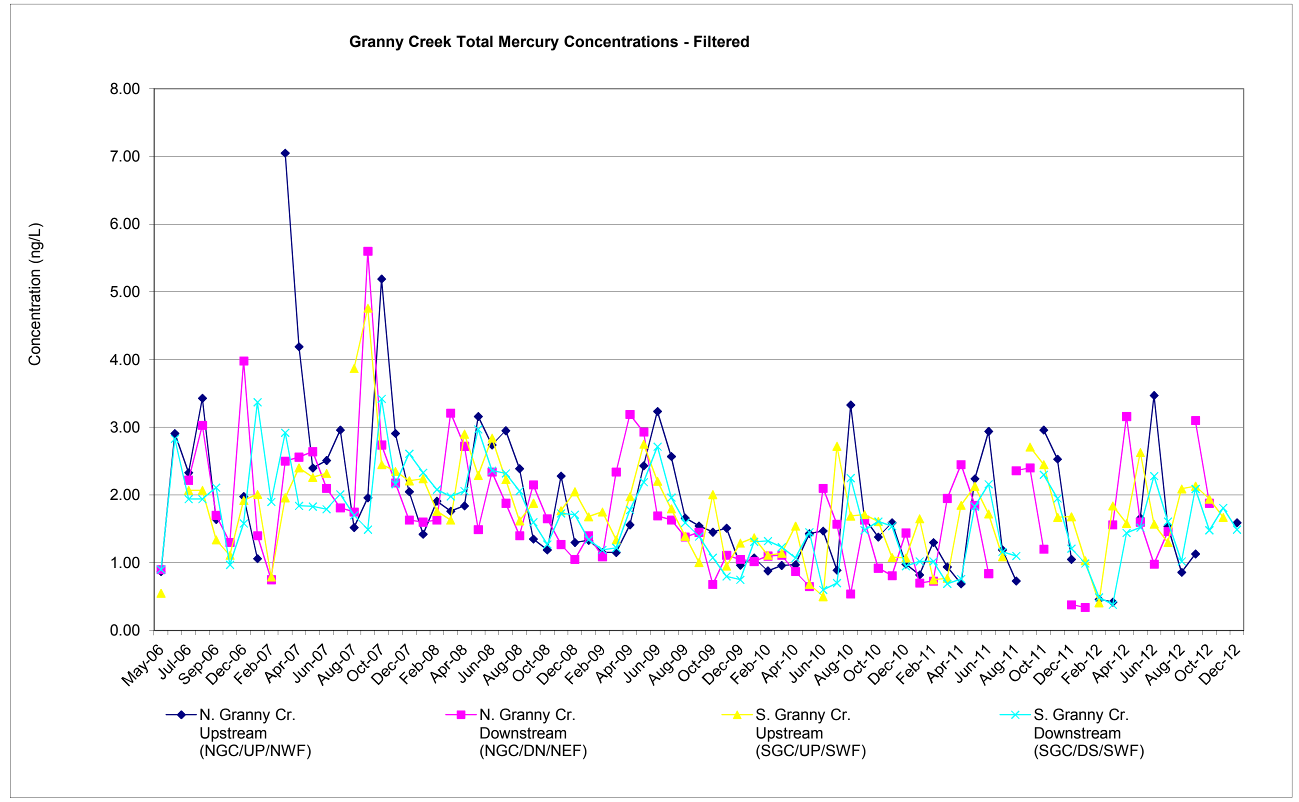


TABLE 11
METHYL MERCURY - SOUTH GRANNY CREEK
(concentrations in ng/L)

Date	Upstream SGC/UP/SWF		Downstream SGC/DS/SWF	
	US Unfiltered	US Filtered	DS Unfiltered	DS Filtered
Jul-06	0.06	0.05	0.04	0.02
Oct-06	0.03	0.03	0.11	0.08
Jan-07	0.10	0.08	0.13	0.10
May-07	0.04	0.04	0.06	0.06
Jul-07	0.05	0.05	0.05	0.04
Oct-07	0.05	0.04	0.07	0.05
Feb-08	0.17	0.10	0.11	0.07
Apr-08	0.06	0.04	0.15	0.09
Jul-08	0.06	0.04	0.07	0.06
Oct-08	0.02	0.02	0.04	0.03
Jan-09	0.01	0.06	0.06	0.04
Apr-09	0.08	0.02	0.06	0.02
Jul-09	0.01	0.04	0.05	0.05
Oct-09	0.02	0.05	0.01	0.02
Jan-10	0.06	0.04	0.07	0.02
Apr-10	0.05	0.04	0.08	0.05
Jul-10	0.06	0.02	0.08	0.06
Oct-10	0.04	0.04	0.07	0.07
Jan-11	0.03	0.03	0.17	0.11
Apr-11	0.09	0.04	<0.01	<0.01
Jul-11	0.05	0.05	0.14	0.11
Oct-11	0.04	0.01	0.23	0.08
Jan-12	0.25	0.10	0.07	0.04
Apr-12	0.08	0.03	0.07	0.07
Jul-12	0.07	0.05	0.17	0.12
Oct-12	0.03	0.03	0.09	0.08
2009 Average	0.03	0.04	0.04	0.03
2010 Average	0.05	0.04	0.08	0.05
2011 Average	0.05	0.03	0.14	0.08
2012 Average	0.11	0.05	0.10	0.08
Average All Years	0.06	0.04	0.09	0.06

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

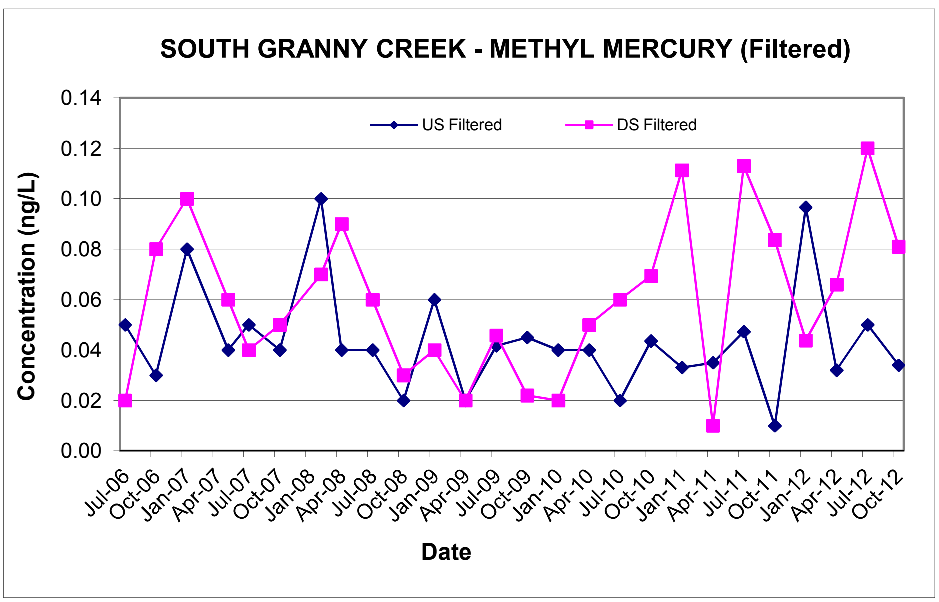


TABLE 12
METHYL MERCURY - NORTH GRANNY CREEK
(concentrations in ng/L)

Date	Upstream NGC/UP/NWF		Downstream NGC/DN/NEF	
	US Unfiltered	US Filtered	DS Unfiltered	DS Filtered
Jul-06	0.11	0.05	0.10	0.08
Oct-06	0.01	0.01	0.13	0.14
Jan-07	0.12	0.08	0.18	0.13
May-07	0.07	0.06	0.09	0.09
Jul-07	0.09	0.06	0.10	0.10
Oct-07	0.09	0.09	0.10	0.07
Jan-08	0.01	0.01	0.26	0.15
Feb-08	0.09	0.06	0.01	0.01
Mar-08	0.01	0.01	0.29	0.17
Apr-08	0.44	0.08	0.13	0.05
Jul-08	0.09	0.09	0.52	0.49
Oct-08	0.04	0.05	0.11	0.11
Jan-09	0.04	0.03	0.08	0.06
Apr-09	0.04	0.02	0.01	0.01
Jul-09	0.06	0.06	0.02	0.12
Oct-09	0.01	0.04	0.07	0.04
Jan-10	0.19	0.05	0.11	0.04
Apr-10	0.06	0.03	0.10	0.05
Jul-10	0.06	0.05	0.19	0.10
Oct-10	0.07	0.05	0.16	0.13
Jan-11	0.07	0.03	0.09	<0.01
Apr-11	<0.01	<0.01	0.06	0.03
May-11	0.05	0.04		
Jun-11	0.07	<0.01		
Jul-11	0.06	0.04	0.35	0.39
Aug-11	0.10	0.09	0.53	0.21
Oct-11	<0.01	0.01		0.18
Nov-11	0.11	0.07		
Dec-11	0.08	0.05		
Jan-12			0.18	0.06
Feb-12	0.03	0.01	0.07	0.02
Mar-12	0.03	<0.02	0.04	<0.02
Apr-12			0.22	0.15
May-12	0.05	0.04	0.11	0.09
Jun-12	0.05	0.04	0.12	0.10
Jul-12	0.06	0.05	0.24	0.18
Aug-12	0.02	<0.01		
Sep-12	0.07	0.04		
Oct-12			0.19	0.16
Dec-12	0.12	0.05		
2009 Average	0.04	0.04	0.04	0.06
2010 Average	0.09	0.04	0.14	0.08
2011 Average	0.07	0.04	0.26	0.20
2012 Average	0.05	0.03	0.14	0.10
Average All Years	0.07	0.04	0.15	0.12

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

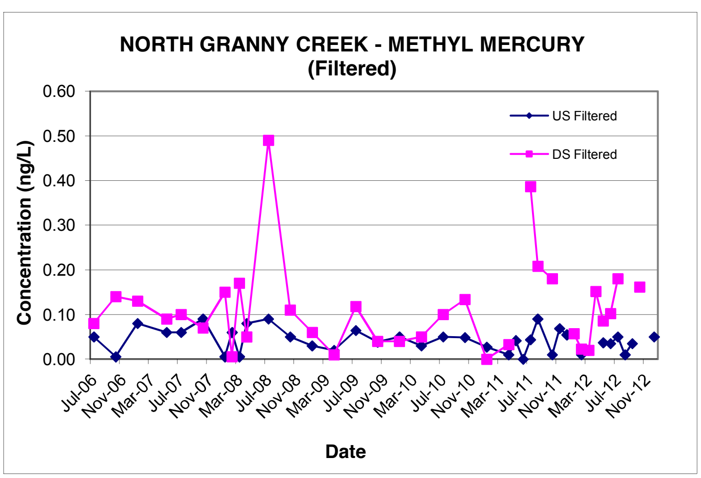


TABLE 13a
TOTAL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(unfiltered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv up)	Naysh. R. Middle (Naysh Riv dn)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	1.48	1.47	5.33	0.81	8.75	2.19	10.50	2.20
May-08	4.31	4.58	3.30	3.15	3.41	3.64	3.64	3.61
Aug-08	1.98	2.14	2.28	2.13	1.91	2.32	2.09	1.82
Oct-08	2.30	2.31	2.53	1.86	1.93	1.25	1.72	1.79
Jan-09	1.39	1.19	2.00	1.07	1.39	2.09	2.35	1.34
Feb-09	-	-	-	-	-	2.17	1.84	-
Mar-09	-	-	-	-	-	1.36	1.28	-
Apr-09	-	1.00	1.47	0.69	1.36	1.26	1.93	1.22
May-09	5.26	-	-	-	-	4.17	3.19	-
Jun-09	-	-	-	-	-	2.81	2.57	-
Jul-09	2.80	2.58	2.47	2.83	3.58	3.23	3.48	3.50
Aug-09	-	-	-	-	-	1.69	1.79	-
Oct-09	0.80	0.70	1.33	1.07	1.58	1.25	1.39	1.35
Nov-09	-	-	-	-	-	1.07	1.13	-
Dec-09	-	-	-	-	-	0.81	0.96	-
Jan-10	-	-	-	-	-	1.20	1.52	-
Feb-10	1.39	1.11	1.50	1.03	1.76	1.43	1.93	1.52
Mar-10	-	-	-	-	-	1.67	1.80	-
Apr-10	-	-	-	1.60	-	2.13	2.31	-
May-10	2.54	2.21	2.17	-	2.58	2.68	2.82	2.77
Jun-10	-	-	-	-	-	0.70	0.94	-
Jul-10	1.28	1.10	1.12	1.10	1.40	1.08	0.87	0.90
Aug-10	-	-	-	-	-	2.50	1.89	-
Sep-10	-	-	-	-	-	1.23	1.12	-
Oct-10	1.27	1.35	1.28	1.30	1.31	1.71	1.24	1.26
Nov-10	-	-	-	-	-	1.52	1.28	-
Dec-10	-	-	-	-	-	2.17	1.35	-
Jan-11	0.86	0.86	0.98	0.74	1.07	1.31	1.10	1.05
Feb-11	-	-	-	-	-	1.12	1.39	-
Mar-11	-	-	-	-	-	2.67	1.22	-
Apr-11	0.69	0.66	1.30	0.68	0.70	2.18	0.93	0.77
May-11	-	-	-	-	-	3.20	3.83	-
Jun-11	-	-	-	-	-	1.76	1.90	-
Jul-11	1.16	1.46	1.67	2.14	1.36	1.42	1.43	1.44
Aug-11	-	-	-	-	-	1.48	1.55	-
Sep-11*	-	-	-	-	-	-	-	-
Oct-11	1.90	2.53	2.09	2.99	-	2.85	1.99	1.95
Nov-11	-	-	-	-	-	1.79	2.09	-
Dec-11	-	-	-	-	-	3.51	1.23	-
Jan-12	1.53	1.28	1.47	0.94	1.27	1.16	1.28	1.15
Feb-12	-	-	-	-	-	0.85	0.88	-
Mar-12	-	-	-	-	-	0.73	0.75	-
Apr-12	-	-	-	-	-	-	-	-
May-12	2.22	1.86	2.06	2.54	1.80	1.62	1.51	1.61
Jun-12	-	-	-	-	-	3.59	4.00	-
Jul-12	2.00	1.79	1.77	2.39	2.27	2.93	2.20	2.37
Aug-12	-	-	-	-	-	1.76	1.51	-
Sep-12	-	-	-	-	-	1.43	1.88	-
Oct-12	1.82	1.80	1.91	2.56	1.30	1.08	1.03	1.09
Nov-12	-	-	-	-	-	-	-	-
Dec-12	-	-	-	-	-	2.11	2.24	-
Average 2009	**2.56**	**1.37**	**1.82**	**1.42**	**1.98**	**1.99**	**1.99**	**1.85**
Average 2010	**1.62**	**1.44**	**1.52**	**1.26**	**1.76**	**1.67**	**1.59**	**1.61**
Average 2011	**1.15**	**1.38**	**1.51**	**1.64**	**1.04**	**2.12**	**1.70**	**1.30**
Average 2012	**1.89**	**1.68**	**1.80**	**2.11**	**1.66**	**1.73**	**1.73**	**1.56**
Average All Years	**1.95**	**1.70**	**2.00**	**1.68**	**2.14**	**1.91**	**1.98**	**1.74**

CCME Protection of Aquatic Life Guideline - 26 ng/L
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications
* Samples discarded as a result of lab miscommunication

TABLE 13b
TOTAL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(filtered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv up)	Naysh. R. Middle (Naysh Riv dn)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	1.15	1.12	2.31	0.69	2.36	2.12	1.73	1.97
May-08	2.71	2.71	2.35	2.57	2.62	2.58	2.80	2.64
Aug-08	1.66	1.71	1.89	1.68	1.57	1.53	1.53	1.49
Oct-08	1.79	1.79	1.90	1.72	1.60	1.24	1.39	1.39
Jan-09	0.96	0.99	1.99	0.80	1.14	1.58	1.49	1.17
Feb-09	-	-	-	-	-	-	-	-
Mar-09	-	-	-	-	-	-	-	-
Apr-09	-	0.78	0.76	0.67	1.08	1.11	1.36	1.06
May-09	2.40	-	-	-	-	2.11	2.07	-
Jun-09	-	-	-	-	-	1.93	1.84	-
Jul-09	1.49	1.43	1.50	1.75	2.36	1.82	2.03	2.34
Aug-09	-	-	-	-	-	1.20	1.22	-
Sep-09	-	-	-	-	-	1.32	1.53	-
Oct-09	0.80	0.68	0.86	0.80	1.05	1.05	1.02	0.94
Nov-09	-	-	-	-	-	0.76	0.69	-
Dec-09	-	-	-	-	-	0.67	0.68	-
Jan-10	-	-	-	-	-	1.41	1.49	-
Feb-10	0.85	0.65	1.06	0.50	1.21	1.47	1.64	1.49
Mar-10	-	-	-	-	-	1.30	1.30	-
Apr-10	-	-	-	1.05	-	1.45	1.58	-
May-10	1.28	1.59	1.28	-	1.69	1.77	1.29	1.84
Jun-10	-	-	-	-	-	0.60	0.69	-
Jul-10	0.74	0.74	0.73	0.70	0.77	0.72	1.55	0.63
Aug-10	-	-	-	-	-	1.62	1.59	-
Sep-10	-	-	-	-	-	0.86	0.71	-
Oct-10	1.07	1.08	1.10	1.09	1.17	1.24	1.27	1.30
Nov-10	-	-	-	-	-	1.04	1.39	-
Dec-10	-	-	-	-	-	0.98	0.94	-
Jan-11	0.62	0.59	0.62	0.51	0.92	0.98	0.89	0.99
Feb-11	-	-	-	-	-	0.85	0.94	-
Mar-11	-	-	-	-	-	1.05	0.98	-
Apr-11	0.68	0.46	1.12	0.37	0.67	0.78	0.73	0.94
May-11	-	-	-	-	-	1.99	2.06	-
Jun-11	-	-	-	-	-	1.18	1.21	-
Jul-11	1.15	1.15	1.28	0.94	1.28	0.93	0.88	0.90
Aug-11	-	-	-	-	-	<0.01	0.98	-
Sep-11*	-	-	-	-	-	-	-	-
Oct-11	1.35	1.53	1.51	1.72	1.35	1.73	1.31	1.33
Nov-11	-	-	-	-	-	1.28	1.23	-
Dec-11	-	-	-	-	-	1.00	0.91	-
Jan-12	1.47	0.68	0.84	0.43	0.77	0.72	0.75	0.73
Feb-12	-	-	-	-	-	0.49	0.52	-
Mar-12	-	-	-	-	-	0.49	0.45	-
Apr-12	-	-	-	-	-	-	-	-
May-12	1.07	1.06	1.23	1.49	0.94	0.81	0.86	0.87
Jun-12	-	-	-	-	-	1.68	1.62	-
Jul-12	0.99	0.99	1.02	1.46	1.23	1.28	1.18	1.03
Aug-12	-	-	-	-	-	0.81	0.82	-
Sep-12	-	-	-	-	-	1.05	1.23	-
Oct-12	1.08	0.96	1.08	1.57	0.78	0.80	0.69	0.66
Nov-12	-	-	-	-	-	-	-	-
Dec-12	-	-	-	-	-	1.26	1.20	-
Average 2009	**1.41**	**0.97**	**1.28**	**1.01**	**1.41**	**1.36**	**1.39**	**1.38**
Average 2010	**0.99**	**1.01**	**1.04**	**0.83**	**1.21**	**1.21**	**1.29**	**1.32**
Average 2011	**0.95**	**0.93**	**1.13**	**0.89**	**1.06**	**1.18**	**1.10**	**1.04**
Average 2012	**1.15**	**0.92**	**1.04**	**1.24**	**0.93**	**0.94**	**0.93**	**0.82**
Average All Years	**1.27**	**1.13**	**1.32**	**1.13**	**1.33**	**1.23**	**1.24**	**1.29**

CCME Protection of Aquatic Life Guideline - 26 ng/L
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications
* Samples discarded as a result of lab miscommunication

TABLE 14a
METHYL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(unfiltered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv Up)	Naysh. R. Middle (Naysh Riv DN)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	0.03	0.03	0.09	0.04	0.14	0.03	0.20	0.04
May-08	0.04	0.04	0.01	0.08	0.06	0.07	0.05	0.04
Aug-08	0.06	0.07	0.11	0.14	0.06	0.05	0.03	0.04
Oct-08	0.06	0.05	0.07	0.06	0.04	0.02	0.03	0.02
Jan-09	0.03	0.02	0.04	0.05	0.02	0.04	0.03	0.02
Feb-09	-	-	-	-	-	-	-	-
Apr-09	-	0.03	0.02	0.02	0.03	0.02	<0.01	0.03
May-09	0.03	-	-	-	-	0.02	0.02	-
Jun-09	-	-	-	-	-	0.10	0.07	-
Jul-09	0.05	0.05	0.03	0.03	0.04	0.04	0.10	0.02
Oct-09	0.06	0.05	0.05	0.10	0.09	0.06	0.05	0.10
Nov-09	-	-	-	-	-	0.04	0.05	-
Dec-09	-	-	-	-	-	0.08	0.10	-
Jan-10	-	-	-	-	-	0.09	0.08	-
Feb-10	0.20	0.04	0.03	0.02	0.04	0.05	0.07	0.03
Mar-10	-	-	-	-	-	0.06	0.03	-
Apr-10	-	-	-	0.07	-	0.06	0.06	-
May-10	0.05	<0.01	0.05	-	<0.01	0.02	0.05	0.01
Jun-10	-	-	-	-	-	0.08	0.05	-
Jul-10	0.02	0.10	0.11	0.14	0.15	0.04	0.12	0.09
Aug-10	-	-	-	-	-	0.08	0.07	-
Sep-10	-	-	-	-	-	0.04	0.04	-
Oct-10	0.04	0.05	0.05	0.14	0.03	0.03	0.04	0.03
Nov-10	-	-	-	-	-	0.07	0.04	-
Dec-10	-	-	-	-	-	<0.01	0.04	-
Jan-11	0.03	0.03	0.01	0.05	0.04	0.04	0.03	0.04
Feb-11	-	-	-	-	-	<0.01	0.01	-
Mar-11	-	-	-	-	-	0.03	0.01	-
Apr-11	-	-	-	-	-	0.06	0.03	-
May-11	-	-	-	-	-	0.07	0.05	-
Jun-11	-	-	-	-	-	0.03	0.03	-
Jul-11	0.07	0.06	0.08	0.13	0.05	0.05	0.05	0.03
Aug-11	-	-	-	-	-	0.07	0.07	-
Sep-11*	-	-	-	-	-	-	-	-
Oct-11	0.27	0.08	0.08	0.12	-	0.10	0.07	0.04
Nov-11	-	-	-	-	-	0.07	0.06	-
Dec-11	-	-	-	-	-	0.07	0.04	-
Jan-12	0.08	0.09	0.06	0.12	0.06	0.06	0.08	0.06
Feb-12	-	-	-	-	-	0.06	0.01	-
Mar-12	-	-	-	-	-	0.03	0.03	-
Apr-12	-	-	-	-	-	-	-	-
May-12	0.05	0.05	0.05	0.10	0.07	0.06	0.06	0.04
Jun-12	-	-	-	-	-	<0.02	0.08	-
Jul-12	0.07	0.07	0.08	0.17	0.06	0.07	0.04	0.06
Aug-12	-	-	-	-	-	0.05	0.03	-
Sep-12	-	-	-	-	-	0.04	0.04	-
Oct-12	0.03	0.04	0.06	0.07	<0.01	0.02	<0.02	0.04
Nov-12	-	-	-	-	-	-	-	-
Dec-12	-	-	-	-	-	0.05	0.05	-
Average 2009	**0.04**	**0.04**	**0.03**	**0.05**	**0.04**	**0.05**	**0.05**	**0.04**
Average 2010	**0.08**	**0.05**	**0.06**	**0.09**	**0.06**	**0.05**	**0.06**	**0.04**
Average 2011	**0.12**	**0.05**	**0.05**	**0.10**	**0.05**	**0.06**	**0.04**	**0.04**
Average 2012	**0.06**	**0.06**	**0.06**	**0.11**	**0.05**	**0.05**	**0.04**	**0.05**
Average All Years	**0.07**	**0.05**	**0.06**	**0.09**	**0.06**	**0.05**	**0.05**	**0.04**

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Sampling locations and frequency governed by Ammended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications
* Samples discarded as a result of lab miscommunication

TABLE 14b
METHYL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(filtered; concentrations in ng/L)

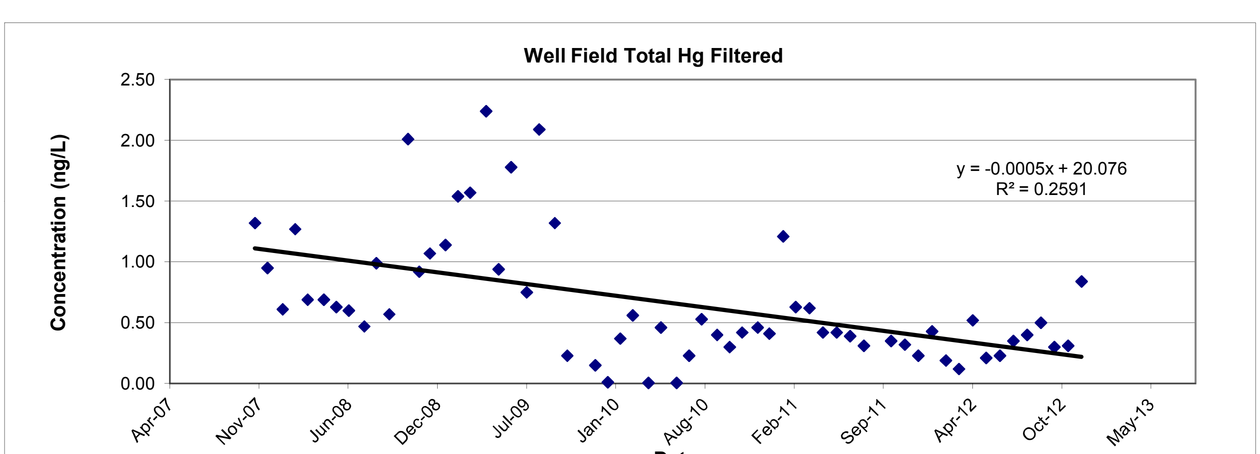
Date	Naysh. R. Upstream (Naysh Riv Up)	Naysh. R. Middle (Naysh Riv DN)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	0.03	0.02	0.03	0.03	0.04	0.05	0.03	0.04
May-08	0.01	0.03	0.02	0.06	0.01	0.03	0.02	0.03
Aug-08	0.05	0.05	0.06	0.10	0.04	0.02	0.03	0.03
Oct-08	0.03	0.02	0.03	0.04	0.03	0.02	0.02	0.02
Jan-09	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Feb-09	-	-	-	-	-	-	-	-
Apr-09	-	0.01	0.01	0.01	0.02	0.02	0.03	0.01
May-09	0.09	-	-	-	-	0.03	0.03	-
Jun-09	-	-	-	-	-	0.03	0.03	-
Jul-09	0.04	0.10	0.11	0.07	0.15	0.03	0.02	0.03
Aug-09	-	-	-	-	-	0.05	0.03	-
Oct-09	0.07	0.04	0.06	0.04	0.04	0.05	0.06	0.07
Nov-09	-	-	-	-	-	0.03	0.15	-
Dec-09	-	-	-	-	-	0.08	0.09	-
Jan-10	-	-	-	-	-	0.01	0.04	-
Feb-10	0.01	0.05	0.09	0.03	0.04	0.07	0.05	0.04
Mar-10	-	-	-	-	-	0.05	0.03	-
Apr-10	-	-	-	0.05	-	0.04	0.03	-
May-10	0.04	0.12	0.04	-	0.05	0.03	0.04	0.05
Jun-10	-	-	-	-	-	0.01	0.02	-
Jul-10	0.05	0.06	0.03	0.07	<0.01	0.03	0.04	0.04
Aug-10	-	-	-	-	-	0.04	0.05	-
Sep-10	-	-	-	-	-	0.03	0.02	-
Oct-10	0.05	0.04	0.05	0.10	0.04	0.03	0.04	0.03
Nov-10	-	-	-	-	-	0.02	<0.01	-
Dec-10	-	-	-	-	-	0.04	0.02	-
Jan-11	0.01	0.01	<0.01	0.03	0.02	<0.01	0.02	0.01
Feb-11	-	-	-	-	-	<0.01	0.01	-
Mar-11	-	-	-	-	-	0.01	0.01	-
Apr-11	-	-	-	-	-	0.01	0.01	-
May-11	-	-	-	-	-	0.02	0.01	-
Jun-11	-	-	-	-	-	0.01	0.02	-
Jul-11	0.04	0.05	0.05	0.03	0.02	0.02	0.02	0.03
Aug-11	-	-	-	-	-	0.07	0.07	-
Sep-11*	-	-	-	-	-	-	-	-
Oct-11	0.06	0.06	0.07	0.11	0.05	0.06	0.04	0.04
Nov-11	-	-	-	-	-	0.04	0.04	-
Dec-11	-	-	-	-	-	0.01	0.03	-
Jan-12	0.01	0.02	0.04	0.08	<0.01	0.04	0.05	0.02
Feb-12	-	-	-	-	-	0.05	0.01	-
Mar-12	-	-	-	-	-	<0.02	0.03	-
Apr-12	-	-	-	-	-	-	-	-
May-12	0.04	0.02	0.04	0.08	0.03	0.04	0.02	0.02
Jun-12	-	-	-	-		<0.02	0.04	-
Jul-12	0.04	0.05	0.05	0.09	0.03	0.05	0.02	0.02
Aug-12	-	-	-	-	-	0.04	0.03	-
Sep-12	-	-	-	-	-	0.03	0.03	-
Oct-12	0.02	0.02	0.04	0.04	<0.02	0.03	<0.01	<0.02
Nov-12	-	-	-	-	-	-	-	-
Dec-12	-	-	-	-	-	0.06	0.04	-
Average 2009	**0.06**	**0.05**	**0.05**	**0.03**	**0.06**	**0.04**	**0.05**	**0.03**
Average 2010	**0.04**	**0.07**	**0.05**	**0.06**	**0.03**	**0.03**	**0.03**	**0.04**
Average 2011	**0.04**	**0.04**	**0.06**	**0.06**	**0.03**	**0.03**	**0.03**	**0.03**
Average 2012	**0.03**	**0.03**	**0.04**	**0.07**	**0.02**	**0.04**	**0.03**	**0.02**
Average All Years	**0.04**	**0.04**	**0.05**	**0.06**	**0.03**	**0.03**	**0.03**	**0.03**

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Sampling locations and frequency governed by Ammended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications
* Samples discarded as a result of lab miscommunication

TABLE 15
MERCURY CONTENT IN WELL FIELD DISCHARGE
(concentrations in ng/L)

Date	Total Mercury		Methyl Mercury		Wells in Production
	Unfiltered	Filtered	Unfiltered	Filtered	
Nov-07	1.33	1.32	<0.01	<0.01	VDW-6, 11 and 22
Dec-07	1.33	0.95	0.01	0.01	VDW-6, 11 and 22
Jan-08	0.87	0.61	0.01	0.01	VDW-6, 11, 15, 17 and 22
Feb-08	1.55	1.27	<0.01	0.01	VDW-6, 11 and 22
Mar-08	0.70	0.69	<0.01	0.01	VDW-6, 11, 15, 17 and 22
Apr-08	0.84	0.69	0.02	0.02	VDW-7, 11, 15, 17 and 22
May-08	0.78	0.63	<0.01	<0.01	VDW-7, 11, 15, 17 and 22
Jun-08	0.72	0.60			VDW-7, 11, 15, 17 and 22
Jul-08	0.65	0.47	0.01	0.01	VDW-6, 11, 15, 17 and 22
Aug-08	2.63	0.99			VDW-6, 11, 15, 17 and 22
Sep-08	0.67	0.57			VDW-6, 11, 15, 17 and 22
Oct-08	2.20	2.01	<0.01	<0.01	VDW-3, 6, 7, 11, 15, 17 and 22
Nov-08	1.00	0.92	<0.01	<0.01	VDW-3, 6, 7, 11, 15, 17 and 22
Dec-08	1.34	1.07	0.01	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
Jan-09	1.43	1.14			VDW-3, 6, 7, 11, 15, 17 and 22
Feb-09	1.71	1.54			VDW-3, 6, 7, 11, 15, 17 and 22
Mar-09	1.73	1.57			VDW-3, 6, 7, 11, 15, 17 and 22
Apr-09	2.42	2.24	0.01	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
May-09	2.53	0.94		0.02	VDW-3, 6, 7, 11, 15, 17 and 22
Jun-09	0.72	1.78	0.04		VDW-3, 6, 7, 11, 15, 17 and 22
Jul-09	1.69	0.75	0.09	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
Aug-09	4.22	2.09	0.01		VDW-3, 6, 7, 11, 15, 17 and 22
Sep-09	0.77	1.32			VDW-3, 6, 7, 11, 15, 17 and 22
Oct-09	0.63	0.23	0.02	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
Nov-09				0.02	VDW-3, 6, 7, 11, 15, 17 and 22
Dec-09	0.34	0.15	0.08	0.12*	VDW-3, 6, 7, 11, 15, 17 and 22
Jan-10	1.09	<0.01	0.06	0.03	VDW-3, 6, 7, 11, 14, 15, 17 and 22
Feb-10	1.54	0.37			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Mar-10	1.20	0.56			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Apr-10	1.03	0.01	0.01	<0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
May-10	1.03	0.46			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Jun-10	0.62	0.01			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Jul-10	0.92	0.23	0.01	0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
Aug-10	1.10	0.53			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Sep-10	1.25	0.40			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Oct-10	1.61	0.30	<0.01	<0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
Nov-10	1.15	0.42			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Dec-10	0.94	0.46			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Jan-11	1.04	0.41	<0.01	0.05	VDW-6, 7, 11, 12, 14, 15, 17, 18 and 22
Feb-11	1.33	1.21			VDW-6, 7, 11, 12, 14, 15, 17, 18 and 22
Mar-11	1.73	0.63			VDW-6, 7, 11, 12, 14, 15, 17, 18 and 22
Apr-11	1.28	0.62			VDW-6, 7, 11, 12, 14, 15, 17, 18 and 22
May-11	1.48	0.42			VDW-6, 7, 11, 12, 14, 15, 17, 18 and 22
Jun-11	1.64	0.42			VDW-2, 6, 7, 11, 12, 14, 15, 17, 18 and 22
Jul-11	1.41	0.39	0.01	0.01	VDW-2, 6, 7, 11, 12, 14, 15, 17, 18 and 22
Aug-11	1.05	0.31	0.21	<0.01	VDW-2, 7, 11, 12, 14, 15, 17, 18 and 22
Sep-11					VDW-2, 6, 7, 11, 12, 14, 15, 17, 18 and 22
Oct-11	6.36	0.35	0.01	0.01	VDW-2, 6, 7, 11, 12, 14, 15, 17, 18 and 22
Nov-11	4.40	0.32			VDW-2, 6, 7, 11, 12, 14, 15, 17, 18 and 22
Dec-11	1.05	0.23			VDW-2, 6, 7, 12, 14, 15, 17, 18 and 22
Jan-12	0.97	0.43	0.02	0.01	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Feb-12	0.57	0.19	0.01	0.01	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Mar-12	0.31	0.12	<0.01	<0.01	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Apr-12	0.98	0.52	<0.01	<0.02	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
May-12	1.42	0.21	0.27	0.02	VDW-2, 6, 7, 11, 12, 14, 15, 17, 18, 21 and 22
Jun-12	0.66	0.23	<0.02	<0.02	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Jul-12	0.76	0.35	0.02	<0.01	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Aug-12	5.70	0.40			VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Sep-12	2.52	0.50			VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Oct-12	1.87	0.30	<0.01	<0.01	VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Nov-12	0.87	0.31			VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Dec-12	2.83	0.84			VDW-2, 6, 7, 12, 14, 15, 17, 18, 21 and 22
Average 2009	**1.65**	**1.25**	**0.04**	**0.01**	
Average 2010	**1.12**	**0.31**	**0.02**	**0.02**	
Average 2011	**2.07**	**0.48**	**0.06**	**0.02**	
Average 2012	**1.62**	**0.37**	**0.05**	**0.01**	
Average All Years	**1.51**	**0.67**	**0.03**	**0.01**	

CEQG-PAL: Total Mercury - 26 ng/L; Methyl Mercury - 4 ng/L
*Samples excluded from plots below



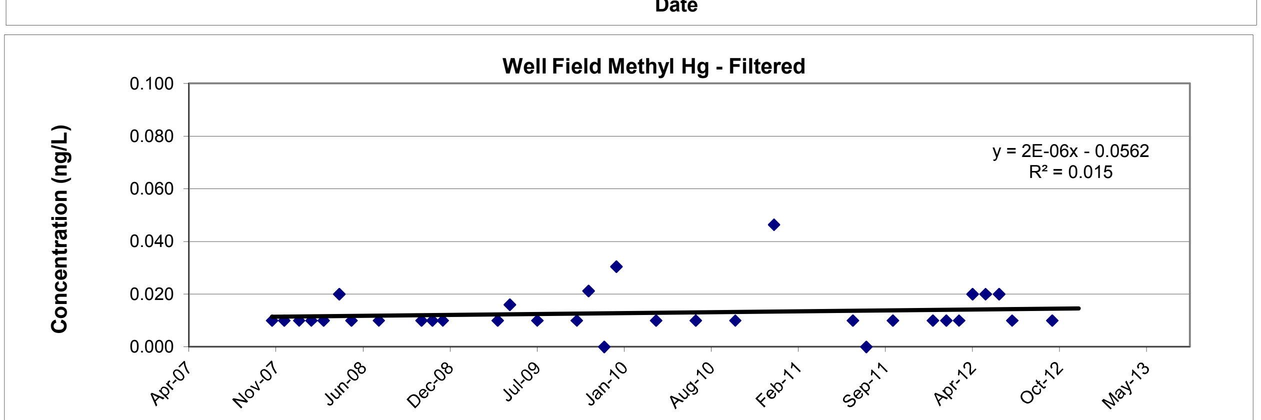


TABLE 16a
TOTAL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(unfiltered; concentrations in ng/L)

Date	VDW-2	VDW-3	VDW-6	VDW-7	VDW-11	VDW-12	VDW-14	VDW-15	VDW-17	VDW-18	VDW-21	VDW-22
Nov-07	-	-	-	-	-	-	-	-	-	-		-
Dec-07	-	-	0.07	-	1.31	-	-	-	-	-		3.08
Jan-08	-	-	0.06	-	1.64	-	-	0.29	0.09	-		3.66
Feb-08	-	-	0.12	-	1.41	-	-	-	-	-		3.13
Mar-08	-	-	0.33	-	2.93	-	-	0.22	0.28	-		3.26
Apr-08	-	-	-	-	1.89	-	-	0.64	0.31	-		4.27
Jul-08	-	-	0.14	-	2.18	-	-	0.20	0.19	-		2.28
Oct-08	-	0.03	0.05	0.42	*38.6	-	-	0.07	0.06	-		6.52
Jan-09	-	0.04	0.02	0.25	3.33	-	-	0.07	0.10	-		6.56
Apr-09	-	0.03	0.05	-	3.34	-	-	0.03	0.10	-		5.59
Jul-09	-	0.74	0.52	1.11	3.50	-	-	0.69	0.85	-		4.37
Oct-09	-	0.14	0.63	0.16	1.55	-	-	0.41	0.09	-		1.61
Jan-10	-	<0.01	<0.01	<0.01	3.40	-	0.01	<0.01	<0.01	-		3.80
Apr-10	-	<0.01	<0.01	<0.01	2.59	-	<0.01	<0.01	<0.01	-		3.32
Jul-10	-	0.12	0.09	0.28	3.00	-	0.08	0.03	0.24	-		3.36
Oct-10	-	<0.01	0.01	0.01	4.31	-	<0.01	<0.01	<0.01	0.35		5.18
Jan-11	-	-	-	0.23	3.34	1.39	0.20	<0.01	0.01	0.01		3.66
Apr-11	-	-	0.39	0.72	3.76	1.37	1.07	0.44	0.66	0.40		2.92
Jul-11	0.85	-	-	0.57	5.15	2.18	0.37	0.79	0.25	0.39		5.18
Oct-11	0.59	-	0.60	2.08	*125.15	2.75	0.67	0.55	0.95	1.21		15.86*
Jan-12	0.43	-	0.01	0.43	-	2.48	0.01	0.41	0.01	0.60	1.23	109.24*
Apr-12	0.54	-	0.47	0.68	-	3.65	0.51	0.56	0.32	1.00	0.89	6.63
Jul-12	0.12	-	0.13	0.28	-	2.66	<0.10	0.12	<0.10	0.47	0.42	8.29
Oct-12	<0.10	-	<0.10	0.69	-	3.63	<0.10	<0.10	<0.10	1.19	0.66	9.69
Average 2009	**-**	**0.24**	**0.31**	**0.51**	**2.93**	**-**	**-**	**0.30**	**0.29**	**-**	**-**	**4.53**
Average 2010	**-**	**0.04**	**0.03**	**0.08**	**3.32**	**-**	**-**	**0.01**	**0.07**	**-**	**-**	**3.91**
Average 2011	**0.72**	**-**	**0.50**	**0.90**	**4.08**	**1.92**	**0.58**	**0.45**	**0.47**	**0.50**	**-**	**3.92**
Average 2012	**0.30**	**-**	**0.18**	**0.52**	**-**	**3.11**	**0.18**	**0.30**	**0.13**	**0.82**	**0.80**	**8.20**
Average All Years	**0.44**	**0.13**	**0.19**	**0.50**	**2.86**	**2.51**	**0.26**	**0.27**	**0.23**	**0.62**	**0.80**	**4.59**

TABLE 16b
TOTAL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(filtered; concentrations in ng/L)

Date	VDW-2	VDW-3	VDW-6	VDW-7	VDW-11	VDW-12	VDW-14	VDW-15	VDW-17	VDW-18	VDW-21	VDW-22
Nov-07	-	-	0.08	-	1.07	-	-	-	-	-		2.36
Dec-07	-	-	0.08	-	0.96	-	-	-	-	-		2.27
Jan-08	-	-	0.05	-	1.01	-	-	0.08	0.12	-		1.87
Feb-08	-	-	0.10	-	1.17	-	-	-	-	-		2.74
Mar-08	-	-	0.25	-	0.14	-	-	0.09	0.17	-		2.92
Apr-08	-	-	-	-	1.21	-	-	0.18	0.35	-		3.71
Jul-08	-	-	0.18	-	1.56	-	-	0.15	0.18	-		1.82
Oct-08	-	0.05	0.06	0.41	*17.4	-	-	0.09	0.06	-		6.09
Jan-09	-	0.02	0.01	0.19	2.30	-	-	0.05	0.09	-		4.63
Apr-09	-	0.04	0.06	-	3.34	-	-	0.03	0.08	-		5.28
Jul-09	-	0.61	0.62	0.60	1.12	-	-	0.58	0.45	-		0.95
Oct-09	-	0.09	0.34	0.10	0.49	-	-	0.36	0.08	-		0.38
Jan-10	-	0.01	0.01	<0.01	0.53	-	0.01	<0.01	<0.01	-		0.62
Apr-10	-	<0.01	<0.01	<0.01	0.82	-	<0.01	<0.01	<0.01	-		0.57
Jul-10	-	0.10	0.06	0.11	0.42	-	0.20	0.03	0.12	-		0.45
Oct-10	-	0.39	0.36	0.42	0.75	-	-	0.01	0.01	0.01		0.01
Jan-11	-	-	0.01	0.23	0.88	0.48	0.40	0.01	-	0.01		0.73
Apr-11	-	-	0.01	0.36	0.80	0.46	0.54	0.01	0.38	0.37		1.10
Jul-11	0.01	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01		1.86
Oct-11	0.01	-	0.01	0.01	0.73	0.54	0.01	0.01	0.35	0.35		1.08
Jan-12	0.42	-	<0.01	0.40	-	0.82	0.01	0.01	0.01	0.42	0.01	0.71
Apr-12	0.18	-	0.16	0.30	-	0.28	0.18	0.06	0.18	0.38	0.33	1.07
Jul-12	0.10	-	<0.10	0.15	-	1.59	<0.10	0.12	<0.10	0.20	0.14	0.64
Oct-12	<0.10	-	<0.10	<0.10	-	1.03	<0.10	<0.10	<0.10	0.36	0.18	1.08
Average 2009	**-**	**0.19**	**0.26**	**0.30**	**1.81**	**-**	**-**	**0.22**	**0.18**	**-**	**-**	**2.81**
Average 2010	**-**	**0.13**	**0.11**	**0.14**	**0.63**	**-**	**-**	**0.02**	**0.04**	**-**	**-**	**0.41**
Average 2011	**0.01**	**-**	**0.01**	**0.15**	**0.61**	**0.37**	**0.24**	**0.01**	**0.25**	**0.19**	**-**	**1.19**
Average 2012	**0.20**	**-**	**0.09**	**0.24**	**-**	**0.93**	**0.10**	**0.07**	**0.10**	**0.34**	**0.17**	**0.88**
Average All Years	**0.14**	**0.15**	**0.12**	**0.21**	**1.02**	**0.65**	**0.14**	**0.10**	**0.14**	**0.23**	**0.17**	**1.87**

* Samples excluded from annual average calculations
CCME Protection of Aquatic Life Guideline - 26 ng/L
Average values for VDW-11 exclude the anomalous Oct 2008 values
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

amec

TABLE 17a
METHYL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(unfiltered; concentrations in ng/L)

Date	VDW-2	VDW-3	VDW-6	VDW-7	VDW-11	VDW-12	VDW-14	VDW-15	VDW-17	VDW-18	VDW-21	VDW-22
Nov-07	-	-	-	-	-	-	-	-	-	-		-
Dec-07	-	-	<0.01	-	0.01	-	-	-	-	-		0.01
Jan-08	-	-	0.01	-	0.01	-	-	0.01	0.01	-		0.01
Feb-08	-	-	<0.01	-	<0.01	-	-	-	-	-		<0.01
Mar-08	-	-	0.02	-	0.02	-	-	0.02	0.01	-		0.02
Apr-08	-	-	-	-	0.01	-	-	0.01	<0.01	-		<0.01
Jul-08	-	-	0.01	-	0.02	-	-	0.02	0.02	-		0.01
Oct-08	-	<0.01	0.01	0.01	0.01	-	-	<0.01	0.01	-		0.01
Jan-09	-	-	-	-	-	-	-	-	-	-		-
Apr-09	-	0.01	0.01	-	0.02	-	-	0.02	<0.01	-		<0.01
Jul-09	-	0.03	-	-	0.01	-	-	-	-	-		-
Oct-09	-	0.01	0.01	0.01	0.01	-	-	0.01	0.01	-		0.04
Jan-10	-	0.04	0.03	0.07	0.07	-	0.03	0.06	0.20	-		0.06
Apr-10	-	0.01	0.05	0.01	0.01	-	<0.01	<0.01	0.02	-		0.01
Jul-10	-	0.02	0.01	<0.01	<0.01	-	<0.01	0.03	<0.01	-		<0.01
Oct-10	-	0.01	<0.01	<0.01	0.01	-	<0.01	<0.01	<0.01	0.03		<0.01
Jan-11	-	-	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
Apr-11	-	-	<0.01	<0.01	<0.01	-	-	0.55	<0.01	-		0.03
Jul-11	0.01	-	-	<0.01	0.03	0.01	0.01	0.01	<0.01	0.01		0.01
Oct-11	0.01	-	0.04	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.06		0.01
Jan-12	0.02	-	0.07	<0.01	-	0.04	0.03	0.05	0.01	0.05	0.01	0.06
Apr-12	<0.01	-	<0.01	<0.01	-	<0.02	<0.01	<0.01	<0.01	<0.02	<0.02	0.04
Jul-12	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Oct-12	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01
Average 2009	**-**	**0.02**	**0.01**	**0.01**	**0.01**	**-**	**-**	**0.02**	**0.01**	**-**		**0.02**
Average 2010	**-**	**0.02**	**0.03**	**0.03**	**0.02**	**-**	**-**	**0.03**	**0.06**	**-**		**0.02**
Average 2011	**0.01**	**-**	**0.02**	**0.01**	**0.02**	**0.01**	**0.01**	**0.14**	**<0.01**	**0.03**		**0.01**
Average 2012	**0.01**	**-**	**0.03**	**0.01**	-	**0.02**	**0.01**	**0.02**	**0.01**	**0.02**	**0.01**	**0.03**
Average All Years	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.01**	**0.05**	**0.02**	**0.02**	**0.01**	**0.02**

TABLE 17b
METHYL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(filtered; concentrations in ng/L)

Date	VDW-2	VDW-3	VDW-6	VDW-7	VDW-11	VDW-12	VDW-14	VDW-15	VDW-17	VDW-18	VDW-21	VDW-22
Nov-07	-	-	0.01	-	0.01	-	-	-	-	-		<0.01
Dec-07	-	-	0.01	-	<0.01	-	-	-	-	-		0.01
Jan-08	-	-	0.01	-	0.01	-	-	0.01	0.01	-		0.01
Feb-09	-	-	0.01	-	0.01	-	-	-	-	-		0.01
Mar-09	-	-	<0.01	-	0.01	-	-	0.01	0.01	-		0.02
Apr-08	-	-	-	-	0.01	-	-	0.02	0.01	-		0.02
Jul-08	-	-	0.02	-	<0.01	-	-	0.01	0.01	-		0.02
Oct-08	-	0.01	<0.01	<0.01	<0.01	-	-	0.01	0.01	-		0.01
Jan-09	-	-	-	-	-	-	-	-	-	-		-
Apr-09	-	0.01	0.02	-	0.02	-	-	0.02	0.01	-		0.02
Jul-09	-	0.05	0.18	-	0.06	-	-	0.03	0.14	-		0.03
Oct-09	-	0.01	0.01	0.01	0.01	-	-	0.01	0.01	-		0.01
Jan-10	-	0.07	0.02	0.04	<0.01	-	0.04	0.01	0.02	-		0.01
Apr-10	-	0.01	0.01	<0.01	0.02	-	<0.01	<0.01	0.01	-		<0.01
Jul-10	-	0.01	0.02	0.01	0.01	-	0.04	<0.01	0.01	-		<0.01
Oct-10	-	0.01	0.01	0.01	0.01	-	<0.01	<0.01	<0.01	0.05		<0.01
Jan-11	-	-	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Apr-11	-	-	<0.01	<0.01	<0.01	-	-	<0.01	0.01	-		<0.01
Jul-11	0.01	-	-	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01		<0.01
Oct-11	0.01	-	0.04	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.05		<0.01
Jan-12	0.02	-	0.05	<0.01	-	0.03	0.01	0.01	0.01	0.03	0.01	<0.01
Apr-12	<0.02	-	<0.02	<0.01	-	<0.01	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02
Jul-12	<0.02	-	<0.01	<0.01	-	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02
Oct-12	<0.01	-	<0.01	<0.01	-	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02
Average 2009	**-**	**0.02**	**0.07**	**0.01**	**0.03**	**-**	**-**	**0.02**	**0.05**	**-**	**-**	**0.02**
Average 2010	**-**	**0.03**	**0.01**	**0.02**	**0.01**	**-**	**-**	**0.01**	**0.01**	**-**	**-**	**0.01**
Average 2011	**0.01**	**-**	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**-**	**0.01**
Average 2012	**0.02**	**-**	**0.02**	**0.01**	**-**	**0.02**	**0.01**	**0.02**	**0.01**	**0.02**	**0.02**	**0.02**
Average All Years	**0.02**	**0.02**	**0.03**	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**	**0.02**	**0.02**	**0.02**	**0.01**

Notes: CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 18
SPECIES-SPECIFIC CPUE FOR ELECTROSHOCKING
BY LOCATION DURING 2012

	Waterbody	Attawapiskat River			Nayshkootayaow River		North Granny Cr.	South Granny Cr.	Catch (n)
	Sample Area	ATT-US*	ATT-NF*	ATT-FF*	NAY-DSST6	NAY-USST3*	NGC*	SGC*	
	Date (mm/dd/yy)	04/09/12	9/2/2012**	03/09/12	31/08/12	01/09/12	30/8/2012**	09/05/12	
	Electroshocking Seconds	3859	8247	4671	1982	8114	3343	6353	
Species-specific CPUE (fish/electroshocking second*100)	Burbot	0.03	0.00	0.02	0.00	0.00	0.00	0.00	2
	Brook Stickleback	0.00	0.00	0.02	0.00	0.07	0.00	0.02	8
	Northern Redbelly Dace	0.00	0.01	0.02	0.00	0.00	0.00	0.00	2
	Blacknose Shiner	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1
	Blacknose Dace	0.08	0.00	0.06	0.00	0.00	0.00	0.00	6
	Emerald Shiner	0.18	0.01	0.09	0.00	0.00	0.00	0.00	12
	Mottled Sculpin	0.00	0.11	0.00	0.40	0.06	0.00	0.02	23
	Slimy Sculpin	0.00	0.07	0.00	0.10	0.00	0.00	0.00	8
	Pearl Dace	0.10	0.10	0.41	0.20	0.37	0.00	0.54	99
	Johnny Darter	0.00	0.38	0.06	0.30	0.46	0.30	0.13	95
	Iowa Darter	0.00	0.00	0.00	0.20	0.01	0.24	0.19	25
	Logperch	0.05	0.00	0.04	0.86	0.02	0.00	0.00	23
	Trout Perch	5.70	2.63	8.71	7.01	0.76	0.00	0.00	1045
	Longnose Dace	0.00	0.00	0.06	0.00	0.00	0.00	0.00	3
	Northern Pike	0.00	0.17	0.00	0.00	0.10	0.18	0.05	31
	Shorthead Redhorse Sucker	0.62	0.59	0.28	0.00	0.00	0.00	0.00	86
	Longnose Sucker	0.00	0.01	0.02	0.30	0.11	0.00	0.00	17
	Walleye	0.10	0.28	0.30	0.30	0.23	0.00	0.00	66
	Lake Sturgeon	0.34	0.44	0.28	0.81	0.25	0.78	0.24	139
	White Sucker	0.00	0.00	0.00	0.00	0.01	0.03	0.00	2
	CPUE Total	7.20	4.81	10.38	10.49	2.46	1.53	1.16	1693

Note
* - Comprised of multiple capture events

TABLE 19
SPECIES-SPECIFIC CPUE IN MINNOW TRAPS
BY LOCATION DURING 2012

Waterbody	North Granny Cr.	South Granny Cr.	Tributary 5A	Catch (n)
Sample Area	NGC*	SGC*	ST-5A	
Date (mm/dd/yy)	30/06/2012**	02/09/2012**	02/09/12	
Total Trap Hours (# traps*hours)	1080	731	287	
Pearl Dace	0.25	0.01	0.91	538
Finescale Dace	0.06	0.00	0.25	138
Northern Redbelly Dace	0.01	0.00	0.03	25
White Sucker	0.00	0.00	0.13	43
Longnose Sucker	0.00	0.00	0.00	1
Johnny Darter	0.01	0.00	0.00	7
BrookStickleback	0.00	0.00	0.01	4
CPUE Total	0.34	0.01	1.34	756

Note
* - Comprised of multiple capture events
** - Comprised of multiple capture dates

TABLE 20
SPECIES-SPECIFIC CPUE IN SEINE NETTING BY LOCATION DURING 2012

Waterbody	**North Granny Cr.**	**Catch (n)**
Sample Area	**NGC***	
Date (dd/mm/yy)	**29/06/12****	
Effort (# of Seine Hauls)	**11**	
Finescale Dace	1.73	19
Pearl Dace	4.18	46
Iowa Darter	0.18	2
White Sucker	0.09	1
Brook Stickleback	0.27	3
CPUE Total	6.45	71

Note
* - Comprised of multiple capture events
** - Comprised of multiple capture dates

TABLE 21
SPECIES-SPECIFIC CPUE IN DIP NETTING
BY LOCATION DURING 2012

Waterbody	North Granny Cr.	Catch (n)
Sample Area	NGC*	
Date (dd/mm/yy)	29/06/12**	
Effort (# of Dips)	11	
Finescale Dace	10.17	61
Pearl Dace	1.83	11
CPUE Total	12.00	72

Note
* - Comprised of multiple capture events
** - Comprised of multiple capture dates

TABLE 22
SUMMARY OF PRESENTED FISH BODY BURDEN COMPARISONS

Sampling Area / Waterbody	Species Investigated
NGC / SGC / ST-5A	Pearl Dace
NAY-US-ST3 / NAY-DS-T6	Pearl Dace, Trout-Perch
ATT-US / ATT-NF / ATT-FF / ATT-COM	Trout-Perch

TABLE 23
PEARL DACE DESCRIPTIVE STATISTICS

Year	Area	Sample Size (n)	Total Length (mm)					Round Weight (g)					Total Hg (µg/g)				
			Mean	SE	Min	Max	Median	Mean	SE	Min	Max	Median	Mean	SE	Min	Max	Median
2008	NAY-DS6	4	77.75	8.14	57	95	79.5	4.43	1.25	1.57	7.23	4.46	0.059	0.010	0.030	0.074	0.066
	NGC	7	80.57	1.66	49	119	88	5.35	1.66	1.13	13.58	5.18	0.176	0.014	0.108	0.226	0.183
	SGC	5	90.00	7.80	67	112	89	6.80	1.82	2.36	12.24	5.70	0.151	0.013	0.115	0.194	0.146
	ST-5A	30	48.07	2.89	31	85	45	1.13	0.20	0.20	4.53	0.75	0.059	0.004	0.022	0.108	0.058
2009	ATT-US	6	33.16	1.56	26	36	34.5	0.33	0.04	0.18	0.42	0.34	0.033	0.002	0.029	0.042	0.032
	ATT-FF	14	43.93	8.98	27	159	34.5	3.49	3.00	0.17	43.79	3.10	0.072	0.008	0.042	0.163	0.068
	NAY-US-ST3	23	47.26	2.92	26	71	52	1.04	0.15	0.15	2.65	1.11	0.042	0.002	0.028	0.064	0.042
	NAY-DS6	17	43.91	3.84	22	71	51	0.97	0.19	0.07	2.80	1.12	0.042	0.004	0.025	0.089	0.038
	NGC	18	48.44	3.77	38	104	44	1.45	0.57	0.51	10.79	0.77	0.066	0.005	0.038	0.116	0.062
	SGC	19	70.53	4.01	49	107	64	3.66	0.62	1.10	10.35	2.70	0.166	0.027	0.040	0.522	0.199
	ST-5A	32	71.72	6.16	24	151	78	5.97	1.17	0.11	27.83	4.64	0.076	0.010	0.011	0.227	0.072
2010	NAY-US-ST3	30	44.33	2.54	34	107	41	1.02	0.35	0.29	10.77	0.58	0.058	0.002	0.038	0.081	0.058
	NAY-DS6	29	40.00	0.93	30	51	41	0.54	0.04	0.24	0.97	0.57	0.087	0.007	0.058	0.235	0.074
	NGC	40	68.45	2.62	48	95	64	3.58	0.39	0.98	8.36	2.62	0.259	0.021	0.101	0.689	0.234
	SGC	40	65.05	1.92	49	93	62	2.67	0.23	1.13	6.16	2.29	0.168	0.013	0.071	0.431	0.141
	ST-5A	40	71.00	2.31	38	94	74	3.91	0.34	0.54	8.17	3.91	0.060	0.005	0.018	0.163	0.052
2011	NAY-US-ST3	40	54.00	2.35	30	77	60	1.58	0.16	0.32	3.80	1.75	0.064	0.003	0.031	0.103	0.064
	NAY-DS6	41	47.20	2.32	31	87	42	1.11	0.19	0.23	5.05	0.59	0.070	0.006	0.035	0.244	0.055
	NGC	106	71.32	0.93	32	96	72	3.33	0.11	0.28	7.41	3.28	0.350	0.014	0.083	0.724	0.324
	SGC	34	57.03	2.45	15	100	53.5	1.68	0.24	0.71	7.74	1.14	0.157	0.030	0.034	0.826	0.092
	ST-5A	40	87.63	3.39	56	138	84.5	6.64	0.80	1.56	21.69	4.80	0.109	0.008	0.026	0.260	0.100
2012	NGC	49	67.04	2.71	37	112	68	3.22	0.37	0.37	10.95	2.86	0.359	0.021	0.059	0.680	0.353
	SGC	33	61.64	3.23	46	113	51	2.57	0.49	0.82	11.94	1.12	0.083	0.014	0.037	0.354	0.056
	ST-5A	40	66.63	2.30	48	90	67	2.60	0.23	0.90	5.25	2.45	0.091	0.010	0.029	0.300	0.071

TABLE 24

COMPARISON BY ANOVA OF TOTAL MERCURY (ARCSIN TRANSFORMED) BETWEEN LOCATION (2012)

Species	Trophic Guild	ANOVA all Locations			Tukeys Post-hoc Comparisons (alpha = 0.05)		
		F-value	P-value	P < 0.05	ATT	NAYSH	GC / ST- 5A
Pearl Dace	Invertivore	102.86	< 0.001	Y	–	–	NGC ≠ SGC, NGC ≠ ST-5A, SGC = ST-5A
Trout-Perch	Invertivore	26.51	< 0.001	Y	ATT-FF = ATT-NF, ATT-FF ≠ ATT-US, ATT-NF ≠ ATT-US	NAY-DS6 = NAY-US-ST3	–

TABLE 25
COMPARISON BY ANOVA OF TOTAL MERCURY
BETWEEN YEARS (2008 to 2012)

Species	Location	ANOVA all Years			Tukeys Post-hoc Comparisons (alpha = 0.05)
		F-value	P-value	p< 0.05	
Pearl Dace	NGC	26.63	< 0.001	Y	2009 ≠ 2010 ≠ 2012, 2009 ≠ 2010 ≠ 2011, 2008 ≠ 2012, 2008 ≠ 2011, 2011 = 2012, 2008 = 2010, 2008 = 2009
	SGC	6.94	< 0.001	Y	2008 = 2009 = 2010 = 2011, 2008 = 2012, 2009 ≠ 2012, 2010 ≠ 2012, 2011 ≠ 2012
	ST-5A	7.78	< 0.001	Y	2008 = 2009 = 2010, 2008 = 2009 = 2012, 2008 ≠ 2011, 2009 ≠ 2011, 2010 ≠ 2011, 2010 ≠ 2012, 2011 = 2012
	NAY-US-ST3	19.29	< 0.001	Y	2011 ≠ 2009 ≠ 2010, 2010 = 2011
	NAY-DS6	8.27	< 0.001	Y	2008 = 2009, 2010 and 2011, 2011 ≠ 2009 ≠ 2010, 2010 = 2011
Trout-Perch	ATT-US	17.96	< 0.001	Y	2009 = 2011 = 2012, 2008 ≠ 2009, 2008 = 2010, 2008 ≠ 2011, 2008 ≠ 2011, 2008 ≠ 2012, 2009 ≠ 2010, 2010 ≠ 2011, 2010 ≠ 2012
	ATT-NF	13.88	< 0.001	Y	2010 = 2011 = 2012, 2009 ≠2011, 2009 ≠ 2011, 2009 ≠ 2012
	ATT-FF	22.74	< 0.001	Y	2009 = 2010 = 2012, 2009 = 2010 = 2011, 2008 ≠ 2011 ≠ 2012, 2008 ≠ 2010, 2008 ≠ 2009
	NAY-US-ST3	3.44	0.02	Y	2009 = 2010 = 2011, 2009 = 2012, 2010 = 2012, 2011 ≠ 2012
	NAY-DS6	70.63	< 0.001	Y	2008 ≠ 2009 ≠ 2011, 2008 ≠ 2010 ≠ 2011, 2008 ≠ 2009 ≠ 2012, 2009 ≠ 2010, 2010 ≠ 2012, 2011 = 2012

TABLE 26
SUMMARY OF STANDARDIZED LENGTHS AND EXTRAPOLATED MERCURY BODY BURDENS FROM REGRESSION RELATIONSHIPS

Size Group	Species	Sample Area	Standardized Total Length (mm)	Extrapolated Mercury Body Burden (µg/g = ppm)				
				2008	2009	2010	2011	2012
Small bodied	Pearl Dace	NGC	60	0.161*	0.079	0.229	0.326*	0.333
		SGC		0.103	0.170*	0.146	0.178	0.081
		ST-5A		0.063	0.065*	0.041	0.076	0.076
	Trout-Perch	ATT-US	50	0.091	0.052	0.111*	0.044	0.044
		ATT-NF		—	0.146*	0.074	0.060	0.089
		ATT-FF		0.112	0.098*	0.098	0.039	0.094
		NAY-US-ST3		—	—	0.047	0.081	0.043
		NAY-DS6		0.098	0.081	0.109*	.040*	0.045

Notes
"—" = insufficient data for relationship generation
* = Relationship not statistically significant

TABLE 27
Granny Creek and Tributary 5A Background Methyl Mercury Water Quality Concentrations
(filtered, ng/L)

Date	North Granny Creek DS	South Granny Creek DS	Tributary 5A
Jul-06	0.08	0.02	
Oct-06	0.14	0.08	
Jan-07	0.13	0.10	
May-07	0.09	0.06	
Jul-07	0.10	0.04	
Oct-07	0.07	0.05	
Jan-08	0.15		
Feb-08	0.01	0.07	0.02
Mar-08	0.17		
Apr-08	0.05	0.09	0.02
Jul-08	0.49	0.06	0.03
Oct-08	0.11	0.03	0.02
Jan-09	0.06	0.04	0.01
Apr-09	0.01	0.02	0.02
Jul-09	0.12	0.05	0.03
Oct-09	0.04	0.02	0.04
Jan-10	0.04	0.02	0.02
Apr-10	0.05	0.05	0.02
Jul-10	0.10	0.06	0.03
Oct-10	0.13	0.07	0.02
Jan-11	<0.01	0.11	0.05
Apr-11	0.03	<0.01	0.01
Jul-11	0.39	0.13	0.04
Oct-11	0.25	0.08	0.03
Jan-12		0.04	0.05
Feb-12	0.02	0.04	
Mar-12	<0.02	<0.02	
Apr-12		0.07	0.03
May-12	0.09	0.05	
Jun-12	0.10	0.08	
Jul-12	0.18	0.12	0.02
Oct-12		0.08	<0.02
Average 2008	**0.16**	**0.06**	**0.02**
Average 2009	**0.06**	**0.03**	**0.03**
Average 2010	**0.08**	**0.05**	**0.02**
Average 2011	**0.17**	**0.08**	**0.03**
Average 2012	**0.08**	**0.06**	**0.03**
Average All Years	**0.11**	**0.06**	**0.03**

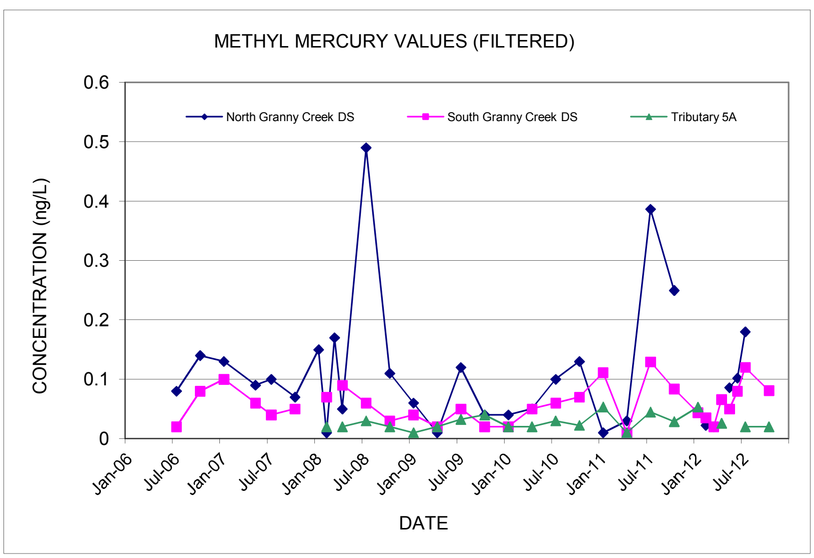


TABLE 28
TROUT-PERCH DESCRIPTIVE STATISTICS

Year	Area	Sample Size (n)	Total Length (mm)					Round Weight (g)					Total Hg (µg/g)				
			Mean	SE	Min	Max	Median	Mean	SE	Min	Max	Median	Mean	SE	Min	Max	Median
2008	ATT-US	63	54.64	3.33	27	115	36	2.73	0.45	0.19	14.03	0.49	0.096	0.005	0.041	0.218	0.081
	ATT-FF	24	78.71	2.51	64	101	72.5	5.03	0.52	2.37	10.53	3.54	0.164	0.008	0.106	0.248	0.164
	NAY-DS6	33	69.15	2.47	44	104	72	3.46	0.35	0.84	10.12	3.51	0.176	0.012	0.072	0.358	0.167
	SGC	1	77.00	—	77	77	77	4.72	—	4.72	4.72	4.72	0.182	—	0.182	0.182	0.182
2009	ATT-US	20	59.65	4.97	30	97	64	2.83	0.59	0.28	8.79	2.36	0.058	0.004	0.030	0.113	0.055
	ATT-NF	35	38.68	2.21	23	70	34	0.76	0.14	0.16	3.04	0.37	0.196	0.037	0.040	0.760	0.064
	ATT-FF	34	50.32	4.01	29	104	36	2.08	0.47	0.27	10.46	0.47	0.096	0.012	0.028	0.339	0.074
	NAY-US-ST3	1	67.00	—	67	67	67	2.86	—	2.86	2.86	2.86	0.065	—	0.065	0.065	0.065
	NAY-DS6	27	59.93	4.80	24	92	69	3.04	0.48	0.19	7.56	3.42	0.098	0.010	0.032	0.227	0.093
2010	ATT-US	58	47.97	1.20	30	81	46	1.14	0.11	0.31	5.14	0.93	0.106	0.010	0.038	0.484	0.091
	ATT-NF	38	49.32	0.95	40	61	48.5	1.17	0.06	0.65	2.12	1.07	0.074	0.002	0.054	0.106	0.070
	ATT-FF	50	57.20	2.23	35	87	55	2.18	0.26	0.41	5.92	1.51	0.097	0.002	0.064	0.132	0.096
	NAY-US-ST3	20	42.40	1.04	34	50	44	0.69	0.05	0.40	1.05	0.74	0.074	0.007	0.030	0.204	0.070
	NAY-DS6	31	52.68	2.79	38	87	45	1.70	0.29	0.50	5.74	0.81	0.108	0.004	0.081	0.165	0.104
2011	ATT-US	103	67.37	2.54	33	124	69	3.99	0.37	0.08	18.73	2.76	0.062	0.004	0.006	0.291	0.056
	ATT-NF	62	53.03	1.27	37	89	52	1.55	0.15	0.34	6.16	1.26	0.065	0.002	0.033	0.140	0.063
	ATT-FF	80	75.29	2.56	38	127	84	4.93	0.43	0.51	19.37	5.30	0.075	0.004	0.018	0.198	0.074
	NAY-US-ST3	14	54.93	5.70	34	100	52	2.36	0.65	0.40	9.17	1.44	0.087	0.013	0.048	0.236	0.070
	NAY-DS6	41	35.02	0.76	27	52	34	0.44	0.04	0.11	1.32	0.38	0.051	0.003	0.020	0.096	0.047
2012	ATT-US	50	61.24	2.07	47	84	50.5	2.50	0.24	0.86	5.39	1.31	0.058	0.004	0.023	0.127	0.048
	ATT-NF	40	58.78	2.41	45	100	51	2.27	0.34	0.87	10.38	1.24	0.093	0.004	0.048	0.180	0.091
	ATT-FF	70	53.66	1.96	31	85	50	1.83	0.19	0.26	5.97	1.20	0.093	0.003	0.041	0.166	0.100
	NAY-US-ST3	51	59.02	3.10	25	90	67	2.69	0.31	0.13	6.55	2.65	0.057	0.006	0.015	0.156	0.042
	NAY-DS6	60	56.35	2.45	33	83	57	2.23	0.23	0.32	5.70	1.67	0.054	0.003	0.020	0.110	0.050

TABLE 29a
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-1

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog	0.70	0.72	1.420
F. Bog	0.66	1.31	1.970
H. Fen	0.10	0.48	0.580
R. Fen	0.12	1.06	1.175
Sum c.	1.58	3.570	5.145

Total SS	1.228
Treat SS	0.498
Block SS	0.498
Error SS	0.233

ANVOA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.228	-		
Treatment	1	0.498	0.498	**6.41**	10.1
Block	3	0.498	0.166	2.14	9.28
Error	3	0.233	0.078		

Treatment Effect (i.e., difference between Control and S-1) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog	0.04	0.03	0.067
F. Bog	0.15	0.06	0.210
H. Fen	0.01	0.10	0.111
R. Fen	0.01	0.01	0.020
Sum c.	0.201	0.207	0.408

Total SS	0.017
Treat SS	0.000
Block SS	0.010
Error SS	0.008

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.017	-		
Treatment	1	0.000	0.000	**0.002**	10.1
Block	3	0.010	0.003	1.31	9.28
Error	3	0.008	0.003		

Treatment Effect (i.e., difference between Control and S-1) **Not Significant**

TABLE 29b
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-2

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis (green shading)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog	0.70	1.02	1.720
F. Bog	0.66	1.53	2.190
R. Fen	0.12	0.67	0.785
Sum c.	1.475	3.220	4.695

Total SS	1.095
Treat SS	0.508
Block SS	0.512
Error SS	0.076

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	5	1.095	-		
Treatment	1	0.508	0.508	**13.33**	18.5
Block	2	0.512	0.256	6.72	19.0
Error	2	0.076	0.038		

Treatment Effect (i.e., difference between Control and S-2) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog	0.04	0.07	0.107
F. Bog	0.15	0.09	0.236
R. Fen	0.01	0.29	0.297
Sum c.	0.191	0.449	0.640

Total SS	0.050
Treat SS	0.011
Block SS	0.009
Error SS	0.030

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	5	0.050	-		
Treatment	1	0.011	0.011	**0.75**	18.5
Block	2	0.009	0.005	0.32	19.0
Error	2	0.030	0.015		

Treatment Effect (i.e., difference between Control and S-2) **Not Significant**

TABLE 29c
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-7

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis (green)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	0.70	0.58	1.280
F. Bog	0.66	0.86	1.520
H. Fen	0.10	0.74	0.840
R. Fen	0.12	0.25	0.365
Sum c.	1.575	2.430	4.005

Total SS	0.630
Treat SS	0.091
Block SS	0.389
Error SS	0.150

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.630	-		
Treatment	1	0.091	0.091	**1.83**	10.1
Block	3	0.389	0.130	2.60	9.28
Error	3	0.150	0.050		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	0.04	0.02	0.056
F. Bog	0.15	0.01	0.156
H. Fen	0.01	0.46	0.471
R. Fen	0.01	0.01	0.020
Sum c.	0.201	0.502	0.703

Total SS	0.174
Treat SS	0.011
Block SS	0.063
Error SS	0.100

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.174	-		
Treatment	1	0.011	0.011	**0.34**	10.1
Block	3	0.063	0.021	0.63	9.28
Error	3	0.100	0.033		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

TABLE 29d

MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS

ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-8

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis (S-8, S-13, S-15)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	0.70	1.33	2.030
F. Bog	0.66	3.08	3.740
H. Fen	0.10	0.14	0.240
R. Fen	0.12	0.55	0.665
Sum c.	1.575	5.100	6.675

Total SS	6.957
Treat SS	1.553
Block SS	3.735
Error SS	1.669

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	6.957	-		
Treatment	1	1.553	1.553	**2.79**	10.1
Block	3	3.735	1.245	2.24	9.28
Error	3	1.669	0.556		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	0.04	0.07	0.101
F. Bog	0.15	0.12	0.263
H. Fen	0.01	0.01	0.020
R. Fen	0.01	0.01	0.020
Sum c.	0.201	0.203	0.404

Total SS	0.021
Treat SS	0.000
Block SS	0.020
Error SS	0.001

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.021	-		
Treatment	1	0.000	0.000	**0.00**	10.1
Block	3	0.020	0.007	21.86	9.28
Error	3	0.001	0.000		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

TABLE 29e

MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS

ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-9(1)

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis (green: S-9(1), S-13, S-15)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	0.70	0.59	1.290
F. Bog	0.66	1.08	1.740
H. Fen	0.10	0.68	0.780
R. Fen	0.12	0.32	0.435
Sum c.	1.575	2.670	4.245

Total SS	0.776
Treat SS	0.150
Block SS	0.492
Error SS	0.134

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.776	-		
Treatment	1	0.150	0.150	**3.37**	10.1
Block	3	0.492	0.164	3.68	9.28
Error	3	0.134	0.045		

Treatment Effect (i.e., difference between Control and S-9[1])**Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	0.04	0.04	0.077
F. Bog	0.15	0.05	0.198
H. Fen	0.01	0.02	0.034
R. Fen	0.01	0.01	0.020
Sum c.	0.201	0.128	0.329

Total SS	0.014
Treat SS	0.001
Block SS	0.010
Error SS	0.004

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.014	-		
Treatment	1	0.001	0.001	**0.52**	10.1
Block	3	0.010	0.003	2.53	9.28
Error	3	0.004	0.001		

Treatment Effect (i.e., difference between Control and S-9[1])**Not Significant**

TABLE 29f
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-9(2)

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	0.70	0.63	1.330
F. Bog	0.66	1.25	1.910
H. Fen	0.10	0.11	0.210
R. Fen	0.12	0.34	0.455
Sum c.	1.575	2.330	3.905

Total SS	1.130
Treat SS	0.071
Block SS	0.928
Error SS	0.131

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.130	-		
Treatment	1	0.071	0.071	**1.64**	10.1
Block	3	0.928	0.309	7.10	9.28
Error	3	0.131	0.044		

Treatment Effect (i.e., difference between Control and S-9[2]) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	0.04	0.01	0.045
F. Bog	0.15	0.04	0.186
H. Fen	0.01	0.01	0.020
R. Fen	0.01	0.06	0.069
Sum c.	0.201	0.119	0.320

Total SS	0.015
Treat SS	0.001
Block SS	0.008
Error SS	0.006

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.015	-		
Treatment	1	0.001	0.001	**0.40**	10.1
Block	3	0.008	0.003	1.29	9.28
Error	3	0.006	0.002		

Treatment Effect (i.e., difference between Control and S-9[2]) **Not Significant**

TABLE 29g

MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS

ANNUAL SAMPLING PROGRAM 2012 RESULTS - CLUSTER S-V SERIES

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.72	0.03
	Peat - Flat Bog	MS-1-F	1.31	0.06
	Peat - Horizontal Fen	MS-1-H	0.48	0.10
	Peat - Ribbed Fen	MS-1-R	1.06	<0.01
S-2	Peat - Domed Bog	MS-2-D	1.02	0.07
	Peat - Flat Bog	MS-2-F	1.53	0.09
	Peat - Ribbed Fen	MS-2-R	0.67	0.29
S-7	Peat - Domed Bog	MS-7-D	0.58	0.02
	Peat - Flat Bog	MS-7-F	0.86	<0.01
	Peat - Horizontal Fen	MS-7-H	0.74	0.46
	Peat - Ribbed Fen	MS-7-R	0.25	<0.01
S-8	Peat - Domed Bog	MS-8-D	1.33	0.07
	Peat - Flat Bog	MS-8-F	3.08	0.12
	Peat - Horizontal Fen	MS-8-H	0.14	<0.01
	Peat - Ribbed Fen	MS-8-R	0.55	<0.01
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.59	0.04
	Peat - Flat Bog	MS-9(1)-F	1.08	0.05
	Peat - Horizontal Fen	MS-9(1)-H	0.68	0.02
	Peat - Ribbed Fen	MS-9(1)-R	0.32	<0.01
S-9(2)	Peat - Domed Bog	MS-9(2)-D	0.63	<0.01
	Peat - Flat Bog	MS-9(2)-F	1.25	0.04
	Peat - Horizontal Fen	MS-9(2)-H	0.11	<0.01
	Peat - Ribbed Fen	MS-9(2)-R	0.34	0.06
S-13	Peat - Domed Bog	MS-13-D	1.23	0.06
	Peat - Flat Bog	MS-13-F	1.22	0.28
	Peat - Horizontal Fen	MS-13-H	<0.10	<0.01
	Peat - Ribbed Fen	MS-13-R	0.13	<0.01
S-15	Peat - Domed Bog	MS-15-D	0.17	<0.01
	Peat - Flat Bog	MS-15-F	<0.10	<0.01
	Peat - Horizontal Fen	MS-15-H	0.10	<0.01
	Peat - Ribbed Fen	MS-15-R	<0.10	<0.01
S-V1	Peat - Domed Bog	MS-V(1)-D	0.14	<0.01
	Peat - Ribbed Fen	MS-V(1)-R	0.67	0.29
S-V2	Peat - Domed Bog	MS-V(2)-D	1.19	0.03
	Peat - Ribbed Fen	MS-V(2)-R	0.33	<0.01
S-V3	Peat - Domed Bog	MS-V(3)-D	0.47	<0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.64	<0.01

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog	0.70	0.14	1.19	0.47	2.50
R. Fen	0.12	0.67	0.33	0.64	1.76
Sum c.	0.82	0.81	1.52	1.11	4.26

Total SS	0.864
Treat SS	0.168
Block SS	0.069
Error SS	0.626

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.864	-		
Treatment	3	0.168	0.056	**0.27**	**9.28**
Block	1	0.069	0.069	0.33	10.1
Error	3	0.626	0.209		

Treatment Effect (i.e., difference between Control and S-V Series) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog	0.04	0.01	0.03	0.01	0.09
R. Fen	0.01	0.29	0.01	0.01	0.32
Sum c.	0.05	0.30	0.04	0.02	0.41

Total SS	0.066
Treat SS	0.026
Block SS	0.007
Error SS	0.033

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.066	-		
Treatment	3	0.026	0.009	**0.80**	**9.28**
Block	1	0.007	0.007	0.62	10.1
Error	3	0.033	0.011		

Treatment Effect (i.e., difference between Control and S-V Series) **Not Significant**

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TABLE 30a
GRANNY CREEK - STATISTICAL ANALYSIS - TOTAL MERCURY - 2012
(filtered samples, concentrations in ng/L)

NORTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	US NWF (G1)	DS NEF (G3)	Sum r.
Jan*	1.39	1.61	3
Feb	0.46	0.38	0.84
Mar	0.42	0.34	0.76
Apr*	1.39	1.61	3
May	1.66	1.56	3.22
Jun	3.47	3.16	6.63
Jul	1.54	1.60	3.14
Aug	0.86	0.98	1.84
Sep	1.13	1.46	2.59
Oct*	1.39	1.61	3.00
Nov*	1.39	3.10	4.49
Dec	1.59	1.88	3.47
Sum c.	16.69	19.29	35.98

Total SS	15.141
Treat SS	0.282
Block SS	13.441
Error SS	1.418

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	23	15.141	-		
Treatment	1	0.282	0.282	**2.19**	**4.84**
Block	11	13.441	1.222	9.48	2.98
Error	11	1.418	0.129		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US NWF - Upstream Northwest Fen; DS NEF - Downstream Northeast Fen
r. - rows; c. - columns
* Samples discarded due to lab miscommunication (substituted mean value for other months)

SOUTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	US SWF (G5)	DS SWF (G6)	Sum r.
Jan	1.68	0.99	2.67
Feb	1.03	0.49	1.52
Mar	0.41	0.38	0.79
Apr	1.84	1.44	3.28
May	1.58	1.52	3.10
Jun	2.63	2.28	4.91
Jul	1.57	1.61	3.18
Aug	1.30	1.02	2.32
Sep*	2.09	2.09	4.18
Oct	2.13	1.48	3.61
Nov	1.94	1.81	3.75
Dec	1.67	1.49	3.16
Sum c.	19.87	16.60	36.47

Total SS	7.678
Treat SS	0.446
Block SS	6.874
Error SS	0.358

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	23	7.678	-		
Treatment	1	0.446	0.446	**13.70**	**4.84**
Block	11	6.874	0.625	19.22	2.98
Error	11	0.358	0.033		

Treatment Effect (i.e., difference between US and DS) **Statistically Significant**

Notes: US SWF - Upstream Southwest Fen; DS SWF - Downstream Southwest Fen
r. - rows; c. - columns
* Samples discarded due to lab miscommunication (substituted mean value for other months)

TABLE 30b
GRANNY CREEK - STATISTICAL ANALYSIS - METHYL MERCURY - 2012
(filtered samples, concentrations in ng/L)

NORTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	US NWF (G1)	DS NEF (G3)	US CONF (G4)	Sum r.
Jan / Feb	0.01	0.02	0.08	0.11
Apr / May	0.04	0.09	0.08	0.20
Jul	0.05	0.10	0.28	0.43
Sep / Oct	0.04	0.18	0.27	0.49
Sum c.	0.14	0.39	0.70	1.23

The July value for DS NEF is June value
The Sep / Oct value for DS NEF is July value

Total SS	0.093
Treat SS	0.040
Block SS	0.033
Error SS	0.020

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.093	-		
Treatment	2	0.040	0.020	**6.05**	**5.14**
Block	3	0.033	0.011	3.28	4.76
Error	6	0.020	0.003		

Treatment Effect (i.e., difference between US and DS)
Statistically Significant

Notes: US NWF - Upstream Northwest Fen; DS NEF - Downstream Northeast Fen; US CONF - Upstream Confluence
r. - rows; c. - columns

SOUTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	US SWF (G5)	DS SWF (G6)	US CONF (G7)	Sum r.
Jan / Feb	0.10	0.04	0.09	0.23
Apr	0.03	0.07	0.06	0.16
Jul	0.05	0.12	0.14	0.31
Oct	0.03	0.08	0.30	0.41
Sum c.	0.21	0.31	0.59	1.12

Total SS	0.059
Treat SS	0.020
Block SS	0.012
Error SS	0.027

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.059	-		
Treatment	2	0.020	0.010	**2.16**	**5.14**
Block	3	0.012	0.004	0.87	4.76
Error	6	0.027	0.005		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US SWF - Upstream Southwest Fen; DS SWF - Downstream Southwest Fen; US CONF - Upstream Confluence
r. - rows; c. - columns

TABLE 30c
NAYSHKOOTAYAOW RIVER - STATISTICAL ANALYSIS - MERCURY - 2012
(filtered samples, concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Nash R. US (N1)	Nash R. M (N2)	Nash R. DS (N3)	Sum r.
Jan / Feb	1.47	0.68	0.84	2.99
Apr / May	1.07	1.06	1.23	3.36
Jul	0.99	0.99	1.02	3.00
Oct	1.08	0.96	1.08	3.12
Sum c.	4.61	3.69	4.17	12.47

Notes: US - Upstream; M - Middle; DS - Downstream
r. - rows; c. - columns

Total SS	0.407
Treat SS	0.106
Block SS	0.030
Error SS	0.271

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.407	-		
Treatment	2	0.106	0.053	**1.17**	**5.14**
Block	3	0.030	0.010	0.22	4.76
Error	6	0.271	0.045		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Nash R. US (N1)	Nash R. M (N2)	Nash R. DS (N3)	Sum r.
Jan / Feb	0.01	0.02	0.04	0.07
Apr / May	0.04	0.02	0.04	0.11
Jul	0.04	0.05	0.05	0.14
Oct	0.02	0.02	0.04	0.09
Sum c.	0.11	0.12	0.17	0.41

Notes: US - Upstream; M - Middle; DS - Downstream
r. - rows; c. - columns

Total SS	0.002
Treat SS	0.001
Block SS	0.001
Error SS	0.000

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.002	-		
Treatment	2	0.001	0.000	**4.25**	**5.14**
Block	3	0.001	0.000	4.69	4.76
Error	6	0.000	0.000		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

TABLE 30d
ATTAWAPISKAT RIVER - STATISTICAL ANALYSIS - MERCURY - 2012
(filtered samples, concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Jan	0.77	0.72	0.75	0.73	2.97
Apr / May	0.94	0.81	0.86	0.87	3.48
Jul	1.23	1.28	1.18	1.03	4.72
Oct	0.78	0.80	0.69	0.66	2.93
Sum c.	3.72	3.61	3.48	3.29	14.1

Notes: US - Upstream; DN - Downstream
r. - rows; c. - columns

Total SS	0.582
Treat SS	0.026
Block SS	0.523
Error SS	0.033

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	15	0.582	-		
Treatment	3	0.026	0.009	**2.31**	**3.86**
Block	3	0.523	0.174	47.08	3.86
Error	9	0.033	0.004		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Jan	<0.01	0.04	0.05	0.02	0.12
Apr/May	0.03	0.04	0.02	0.02	0.11
Jul	0.03	0.05	0.02	0.02	0.12
Oct	<0.02	0.03	<0.01	<0.02	0.08
Sum c.	0.09	0.16	0.10	0.08	0.43

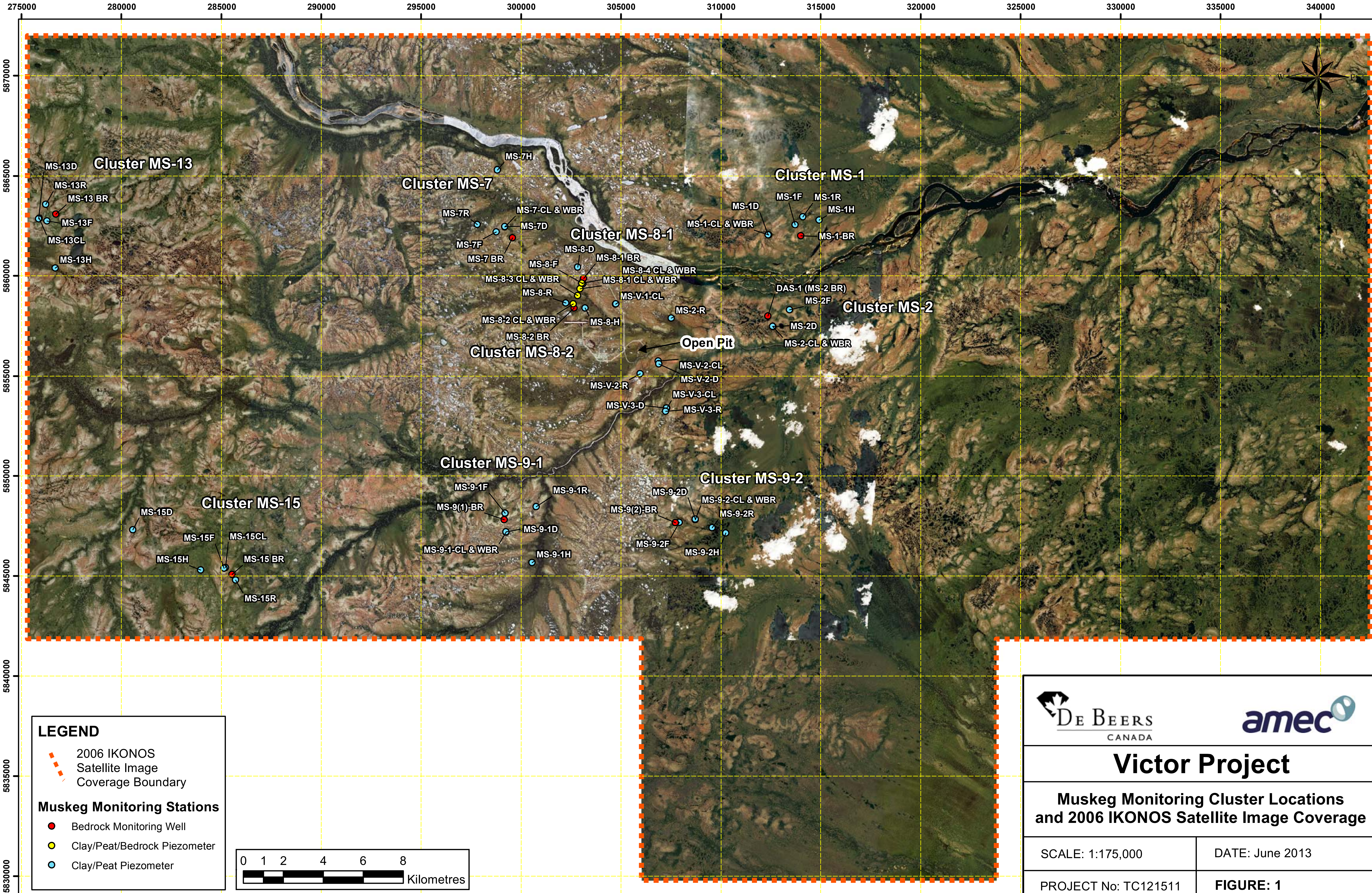
Notes: US - Upstream;DN - Downstream
r. - rows; c. - columns

Total SS	0.002
Treat SS	0.001
Block SS	0.000
Error SS	0.001

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	15	0.002	-		
Treatment	3	0.001	0.000	**2.68**	**3.86**
Block	3	0.000	0.000	0.95	3.86
Error	9	0.001	0.000		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

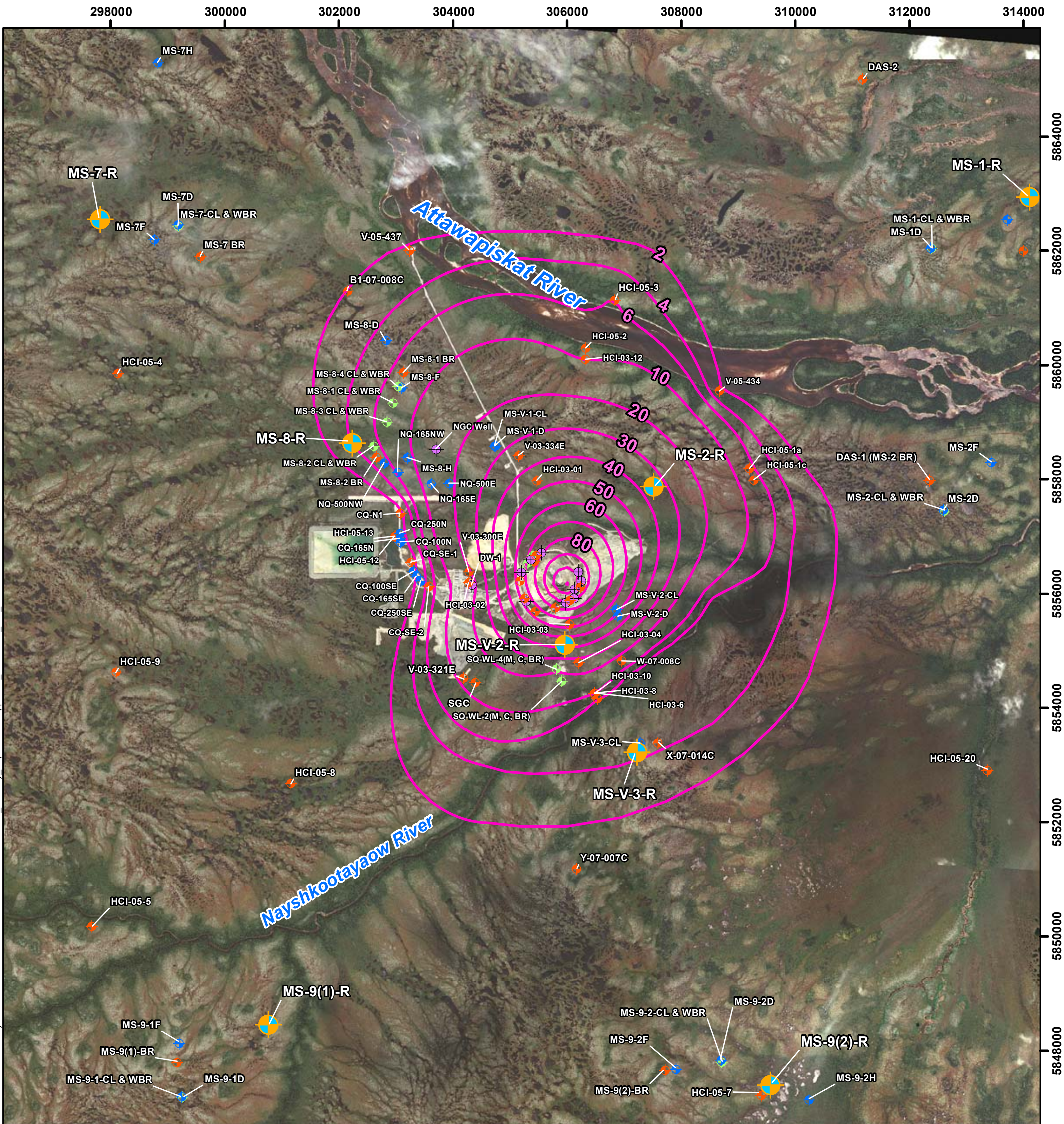


Victor Project

Muskeg Monitoring Cluster Locations and 2006 IKONOS Satellite Image Coverage

SCALE: 1:175,000	DATE: June 2013
PROJECT No: TC121511	**FIGURE: 1**

P:\EM\Projects\2012\TC121511 De Beers Victor Mine\GIS\2012_Mercury_Report\MXD\Muskeg Overview_SatImageCoverageOLD_MuskegMonitoringStations_May2009.mxd



Path: P:\EM\Projects\2012\TC121511 De Beers Victor Mine\GIS\2012_Mercury_Report\MXD\UpperBR_Drawdown_and_RibbedFenStations.mxd

LEGEND

Monitoring Locations

- Pumping Wells
- Bedrock Monitoring Well
- Clay/Peat Piezometer
- Clay/Peat/Bedrock Piezometer
- Ribbed Fen Station (Clay/Peat Piezometer)

10 Drawdown in Upper Bedrock (m)

0 0.5 1 2 3 4 5
Kilometres

NOTE:
- GeoEye 1 Satellite imagery scene date is September 2012

Datum: NAD83
Projection: UTM Zone 17N

N
W E
S

DE BEERS CANADA

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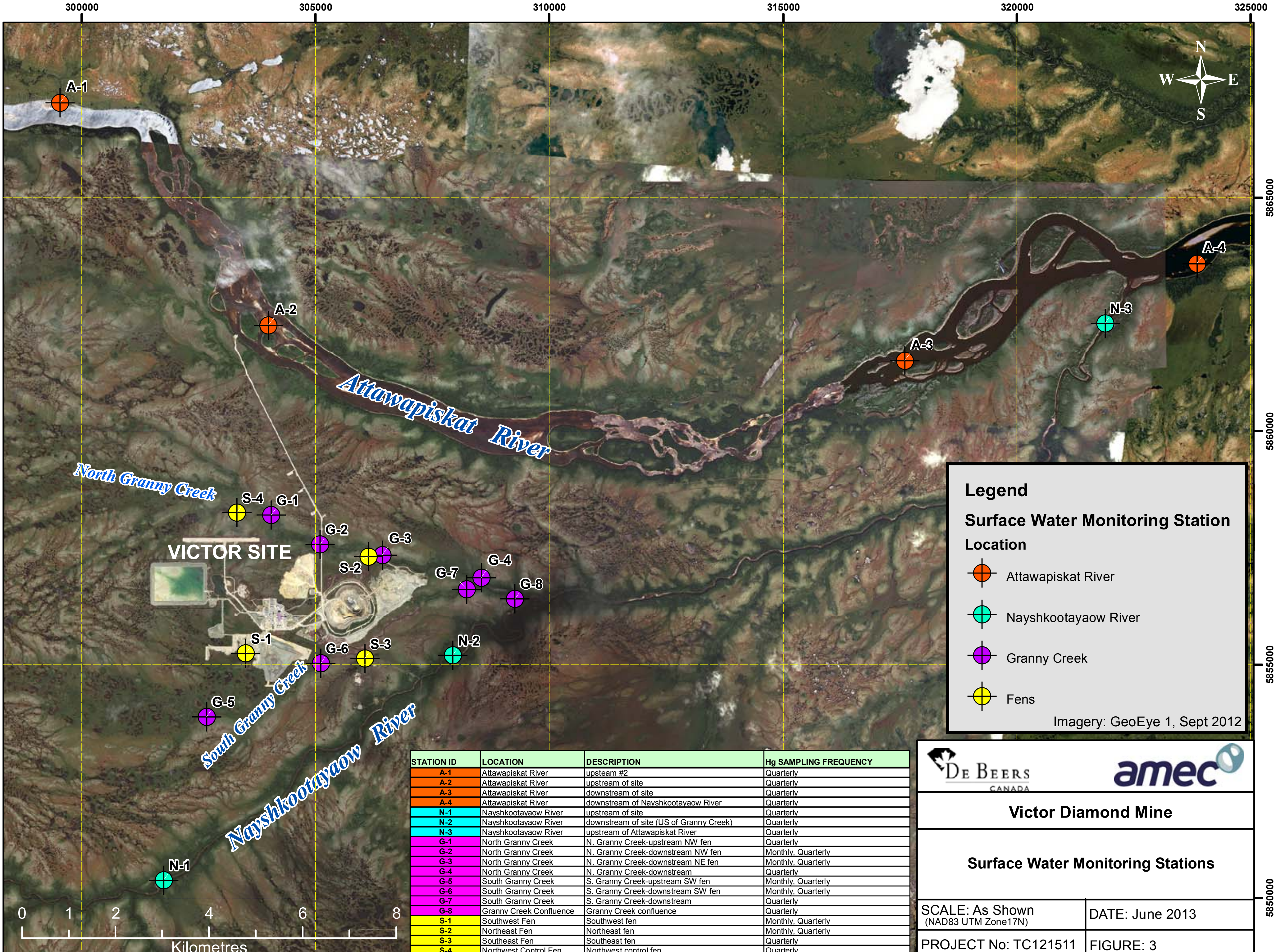
VICTOR MINE

Interpreted Drawdown Contours (m) in Upper Bedrock Aquifer (July 2012 data)

SCALE: 1:90,000	DATE: June 2013
PROJECT No: TC121511	FIGURE: 2



STATION ID	LOCATION	DESCRIPTION	Hg SAMPLING FREQUENCY
A-1	Attawapiskat River	upsteam #2	Quarterly
A-2	Attawapiskat River	upstream of site	Quarterly
A-3	Attawapiskat River	downstream of site	Quarterly
A-4	Attawapiskat River	downstream of Nayshkootayaow River	Quarterly
N-1	Nayshkootayaow River	upstream of site	Quarterly
N-2	Nayshkootayaow River	downstream of site (US of Granny Creek)	Quarterly
N-3	Nayshkootayaow River	upstream of Attawapiskat River	Quarterly
G-1	North Granny Creek	N. Granny Creek-upstream NW fen	Quarterly
G-2	North Granny Creek	N. Granny Creek-downstream NW fen	Monthly, Quarterly
G-3	North Granny Creek	N. Granny Creek-downstream NE fen	Monthly, Quarterly
G-4	North Granny Creek	N. Granny Creek-downstream	Quarterly
G-5	South Granny Creek	S. Granny Creek-upstream SW fen	Monthly, Quarterly
G-6	South Granny Creek	S. Granny Creek-downstream SW fen	Monthly, Quarterly
G-7	South Granny Creek	S. Granny Creek-downstream	Quarterly
G-8	Granny Creek Confluence	Granny Creek confluence	Quarterly
S-1	Southwest Fen	Southwest fen	Monthly, Quarterly
S-2	Northeast Fen	Northeast fen	Monthly, Quarterly
S-3	Southeast Fen	Southeast fen	Quarterly
S-4	Northwest Control Fen	Northwest control fen	Quarterly

DE BEERS CANADA

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Victor Diamond Mine

Surface Water Monitoring Stations

SCALE: As Shown (NAD83 UTM Zone17N)

DATE: June 2013

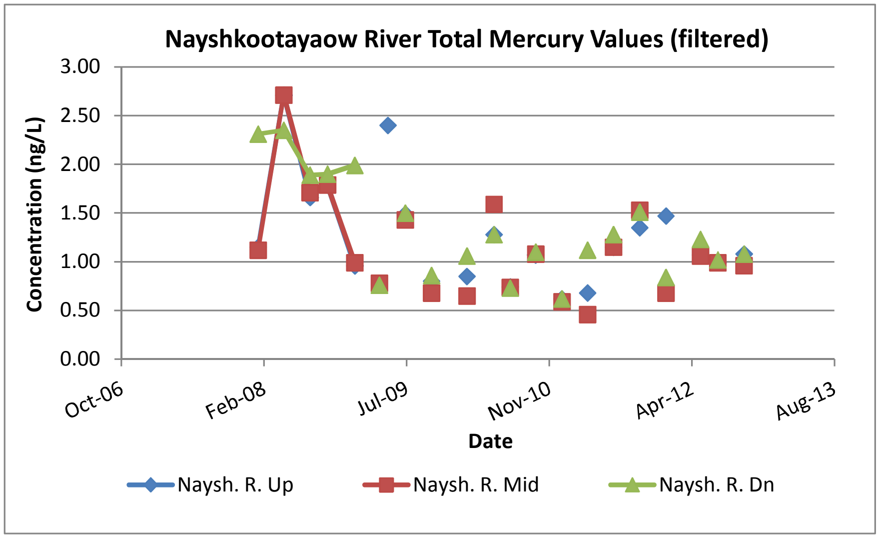
PROJECT No: TC121511

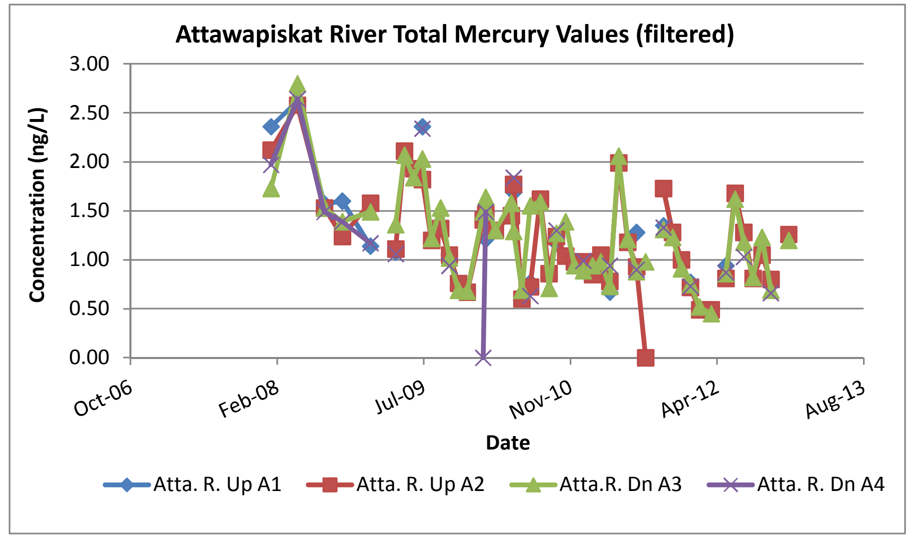
FIGURE: 3

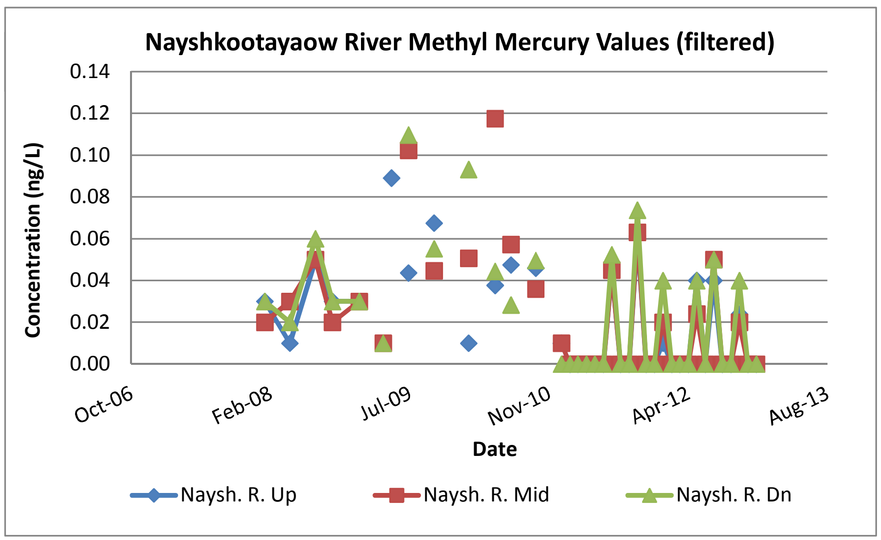
Path: P:\EM\Projects\2012\TC121511 De Beers Victor Mine\GIS\2012_Mercury_Report\MXD\Surface_Water_Monitoring_Stations.mxd

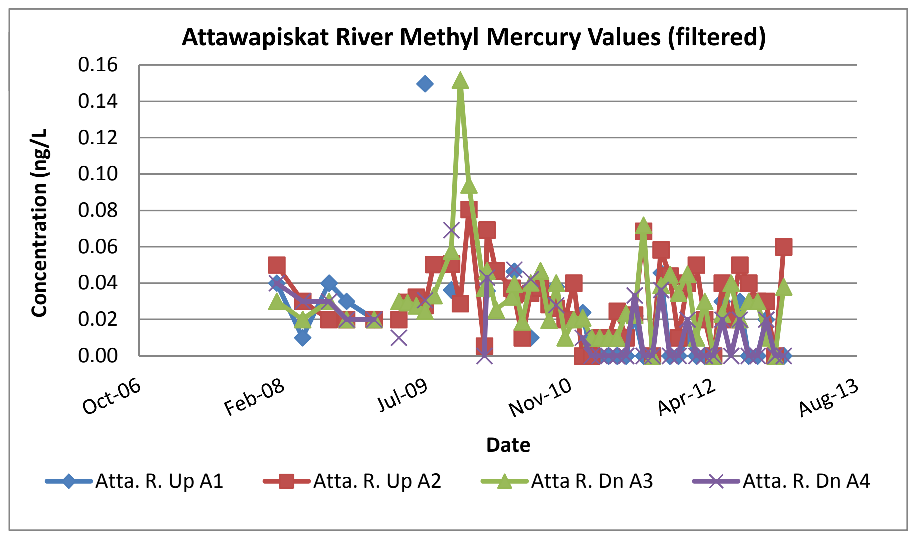
FIGURE 4

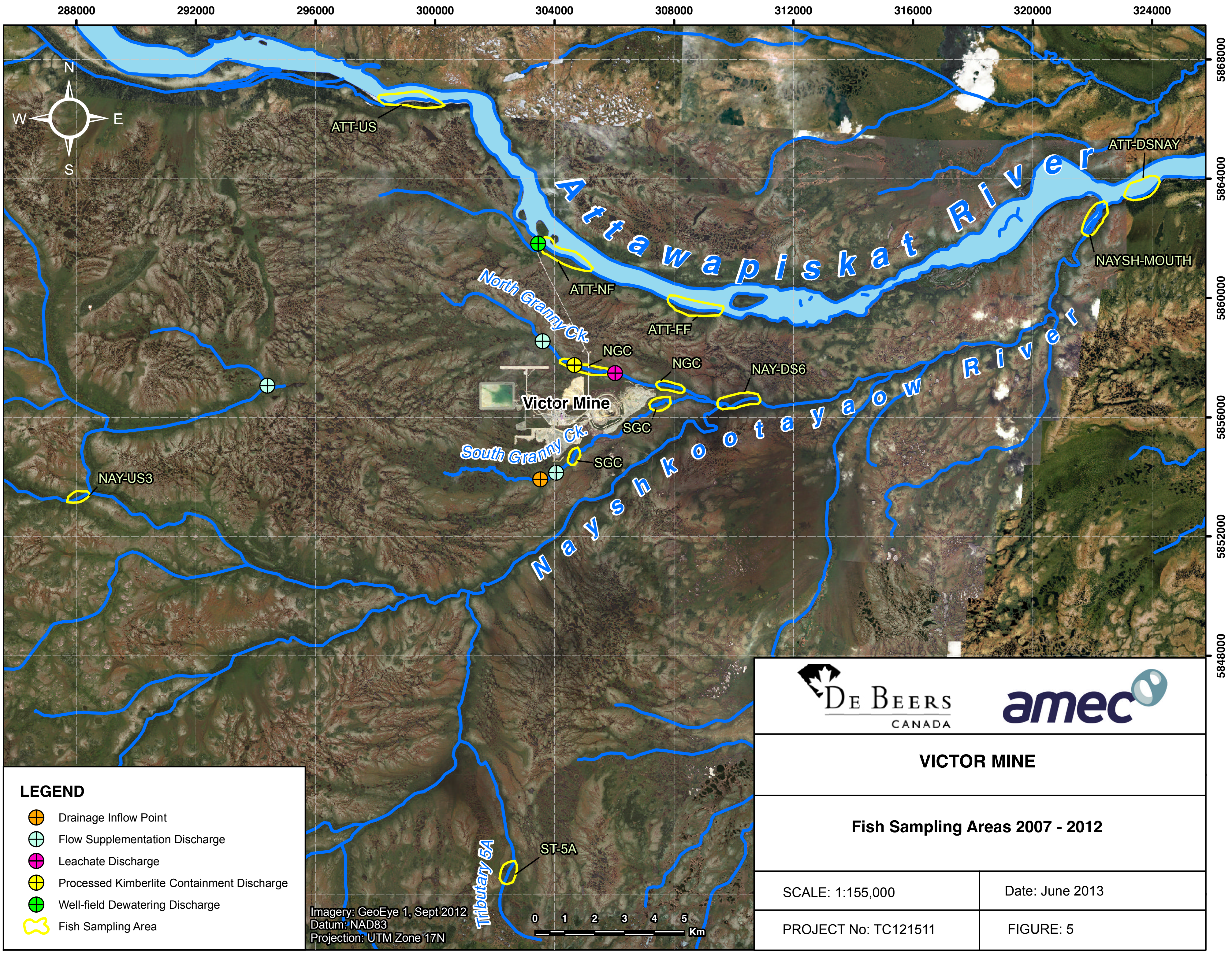
NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVER TOTAL AND METHYL MERCURY TRENDS (filtered values)











Path: P:\EM\Projects\2012\TC121511 De Beers Victor Mine\GIS\2012_Mercury_Report\MXD\Angling_2012_2.mxd

FIGURE 6: MEAN TOTAL MERCURY CONCENTRATION (ARCSIN TRANSFORMED AND ADJUSTED FOR TOTAL LENGTH) FOR EACH SPECIES FOR ALL SITES AND YEARS COMBINED

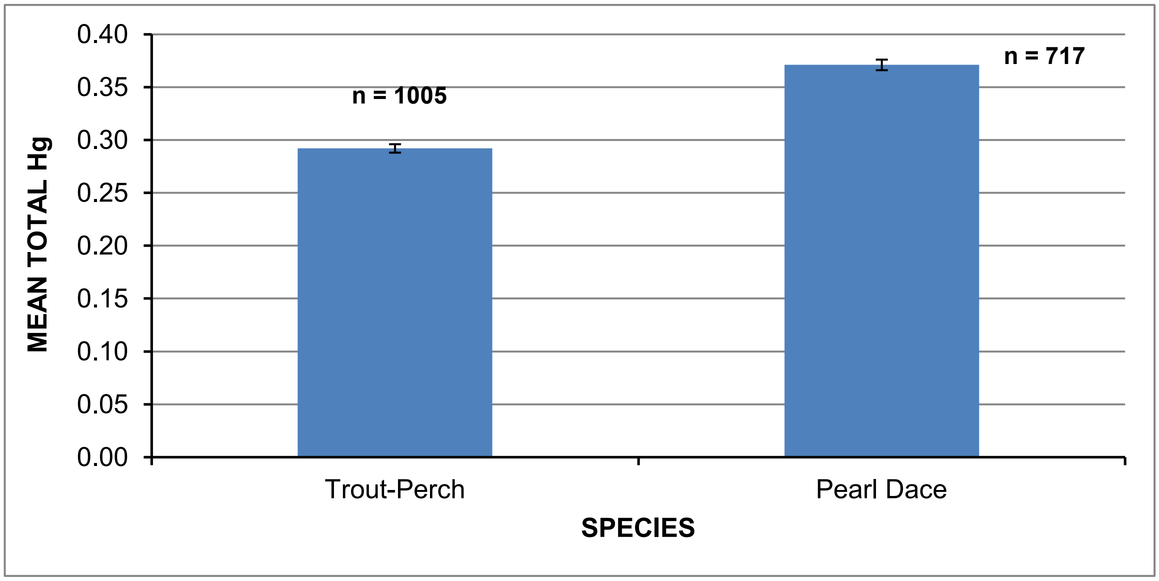


FIGURE 7: MEAN TOTAL MERCURY CONCENTRATION (ARCSIN TRANSFORMED AND ADJUSTED FOR TOTAL LENGTH) FOR EACH SPECIES FOR LOCATIONS WITH BOTH SPECIES PRESENT

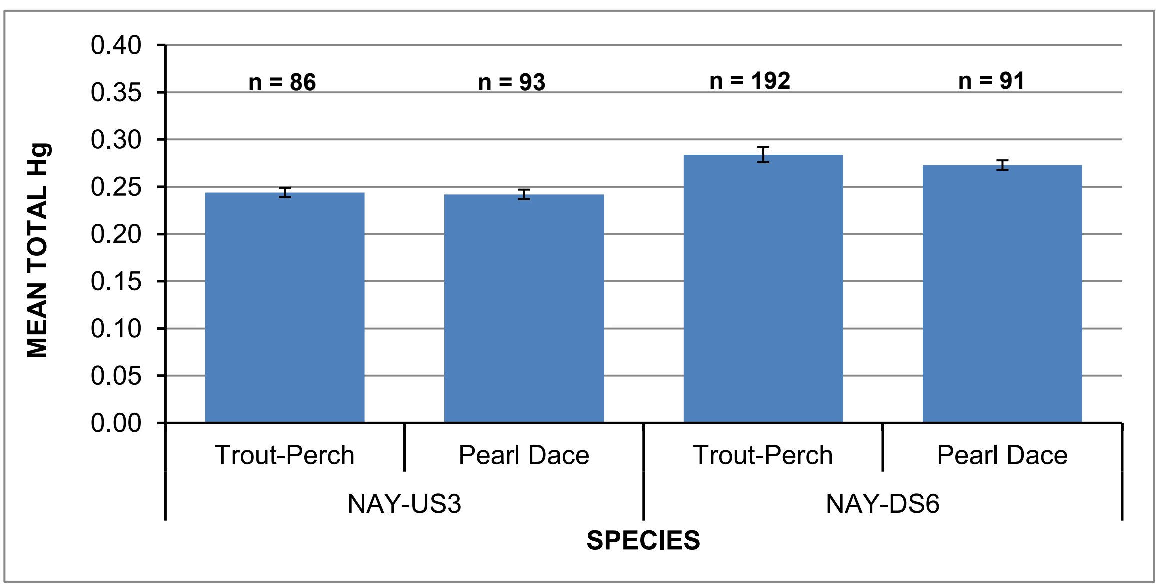


FIGURE 8: SITE SPECIFIC PEARL DACE MEAN MERCURY BODY BURDEN (± 1 SE)

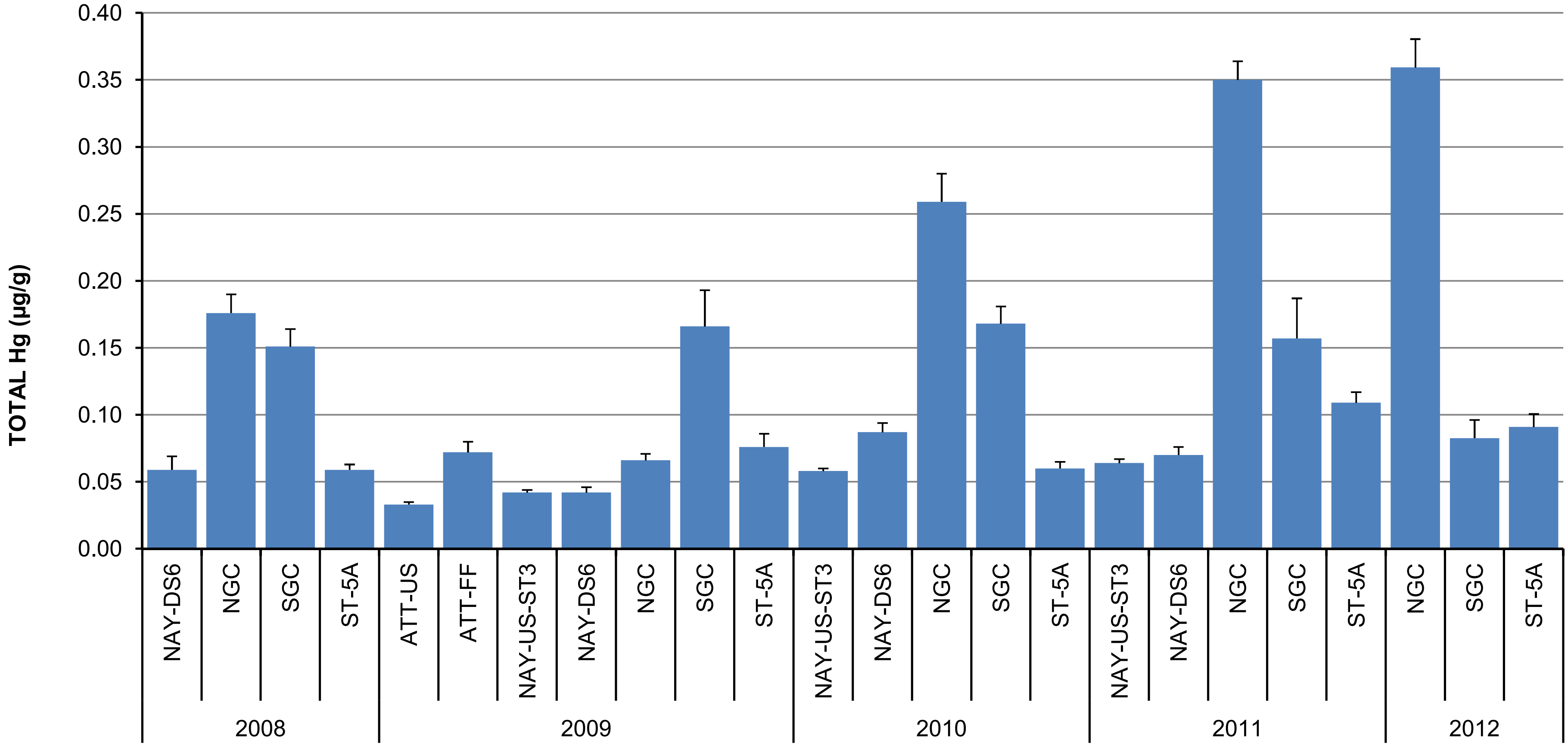


FIGURE 9: SITE SPECIFIC PEARL DACE MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

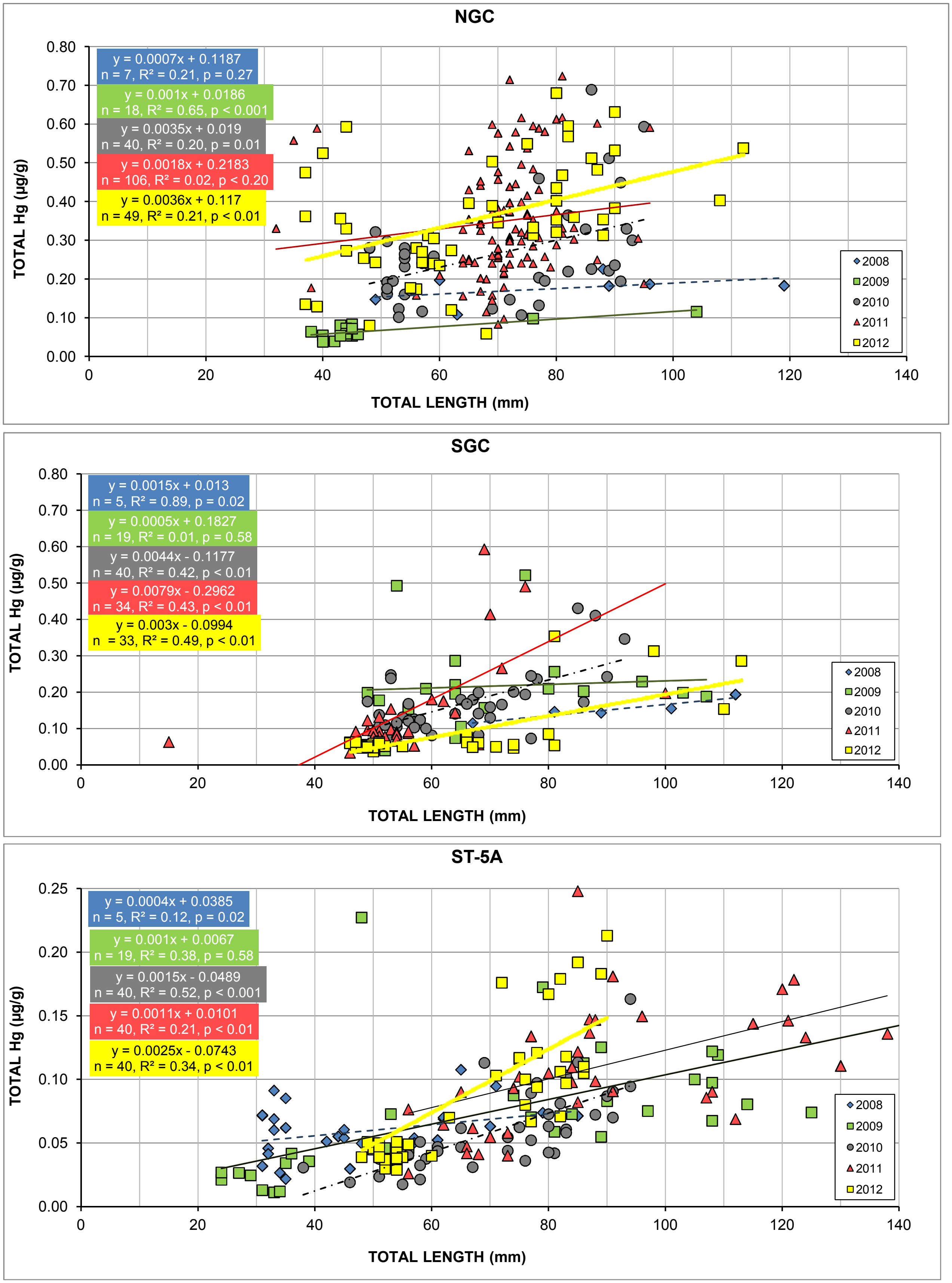


FIGURE 10: SITE SPECIFIC LENGTH FREQUENCY DISTRIBUTIONS FOR PEARL DACE CAPTURED FROM 2008 TO 2012

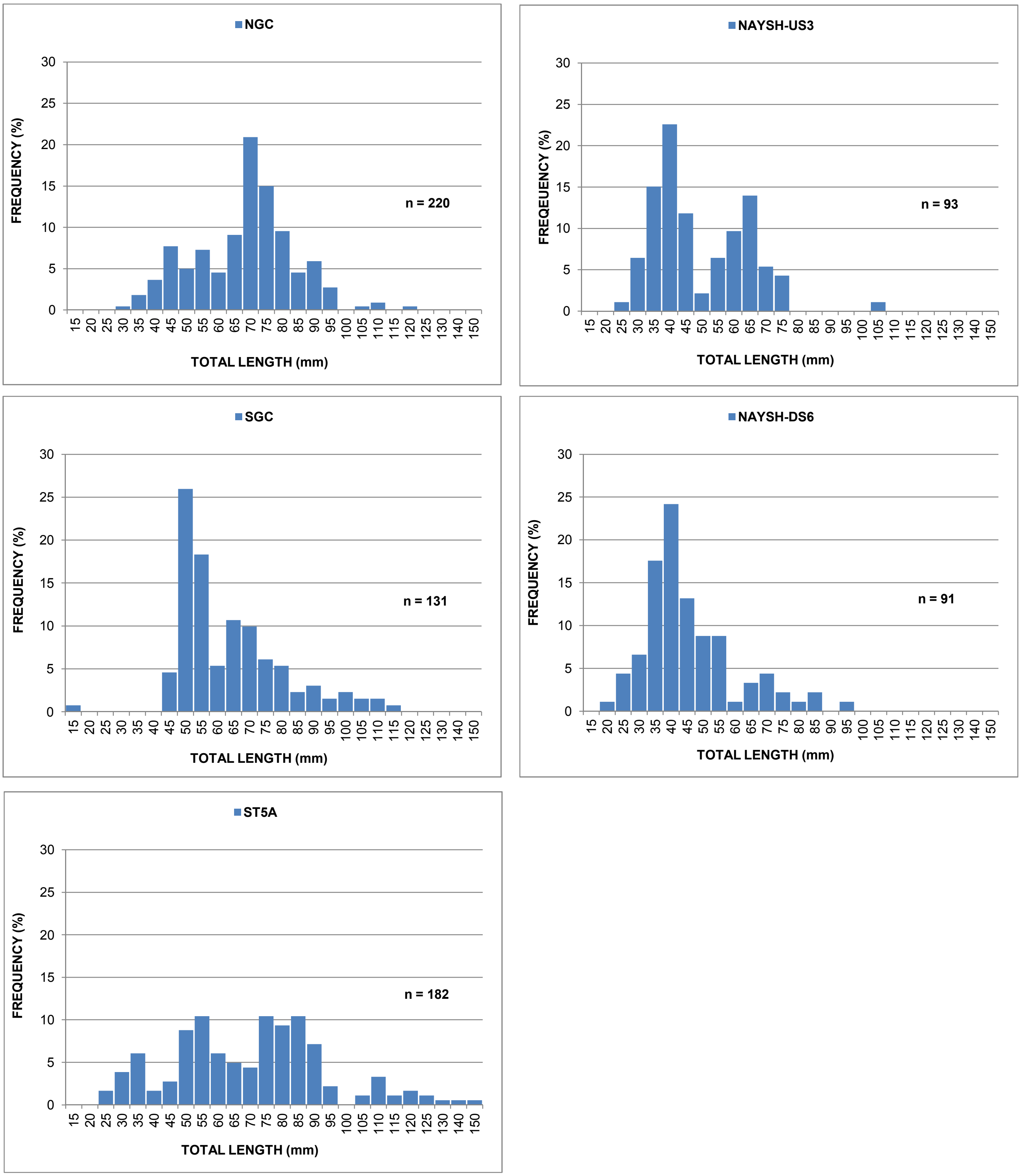


FIGURE 11: MEAN TOTAL MERCURY CONCENTRATION (ARCSIN TRANSFORMED AND ADJUSTED FOR AGECLASS) (± 1 SE) FOR PEARL DACE FROM EACH SAMPLING AREA

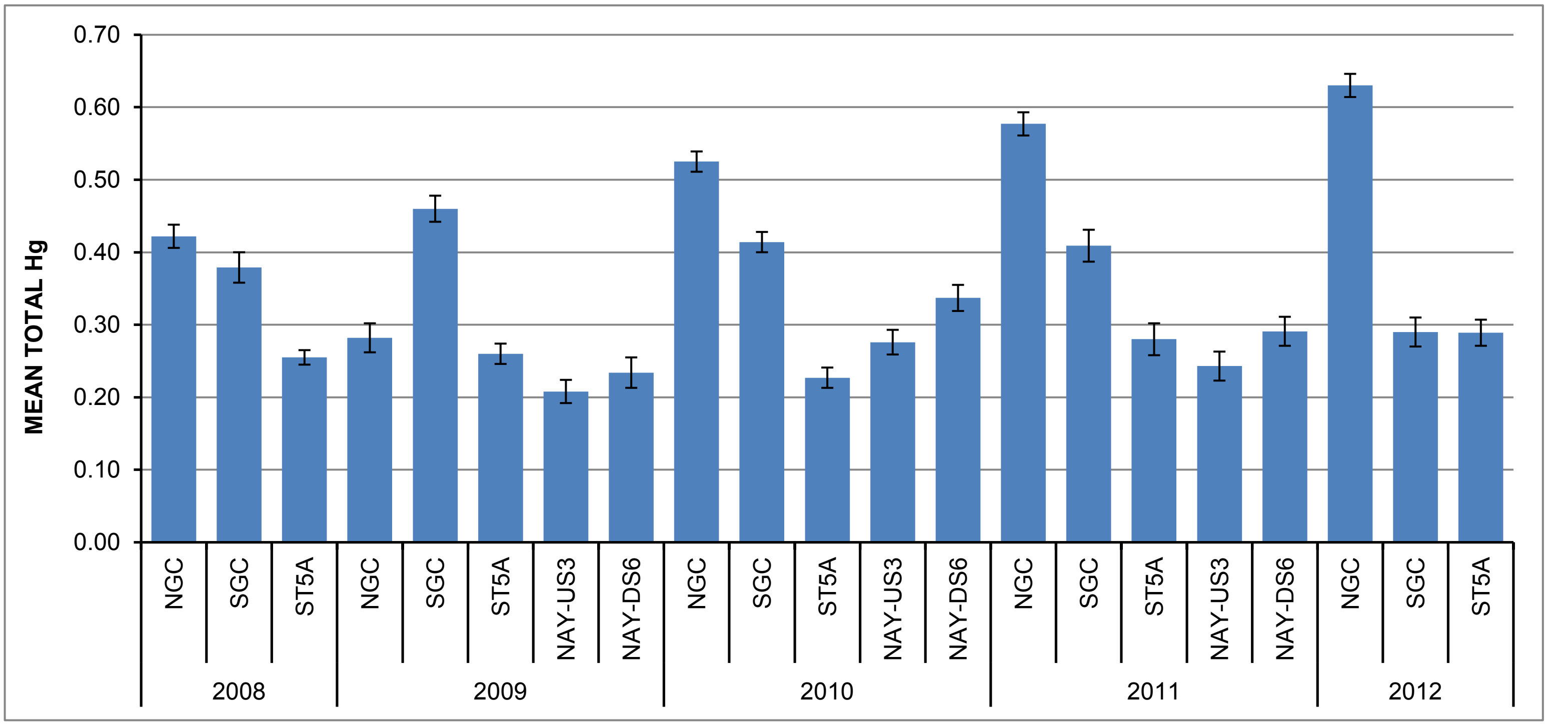


FIGURE 12: SITE SPECIFIC TROUT-PERCH MEAN MERCURY BODY BURDEN (± 1 SE)

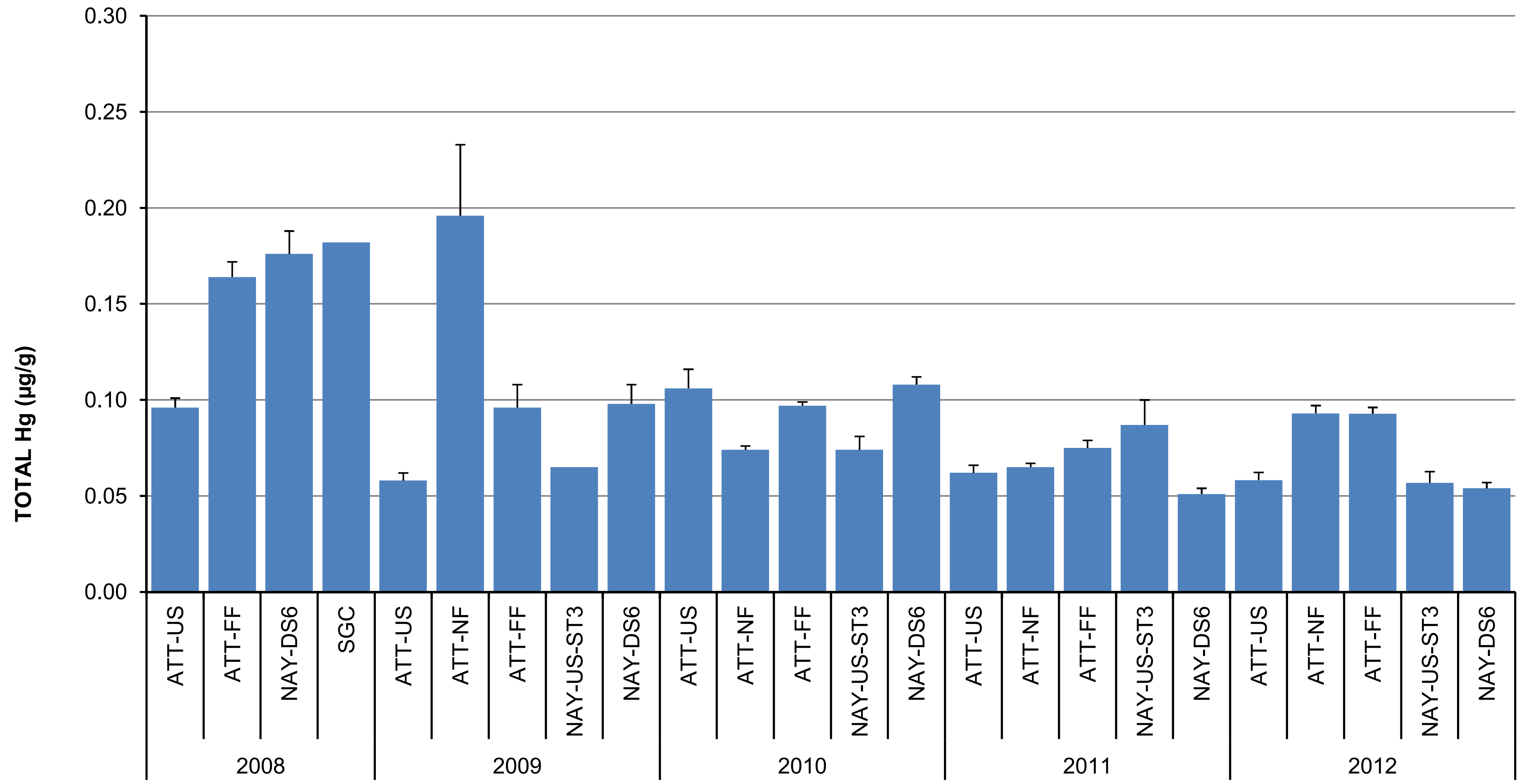


FIGURE 13: SITE SPECIFIC TROUT-PERCH MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

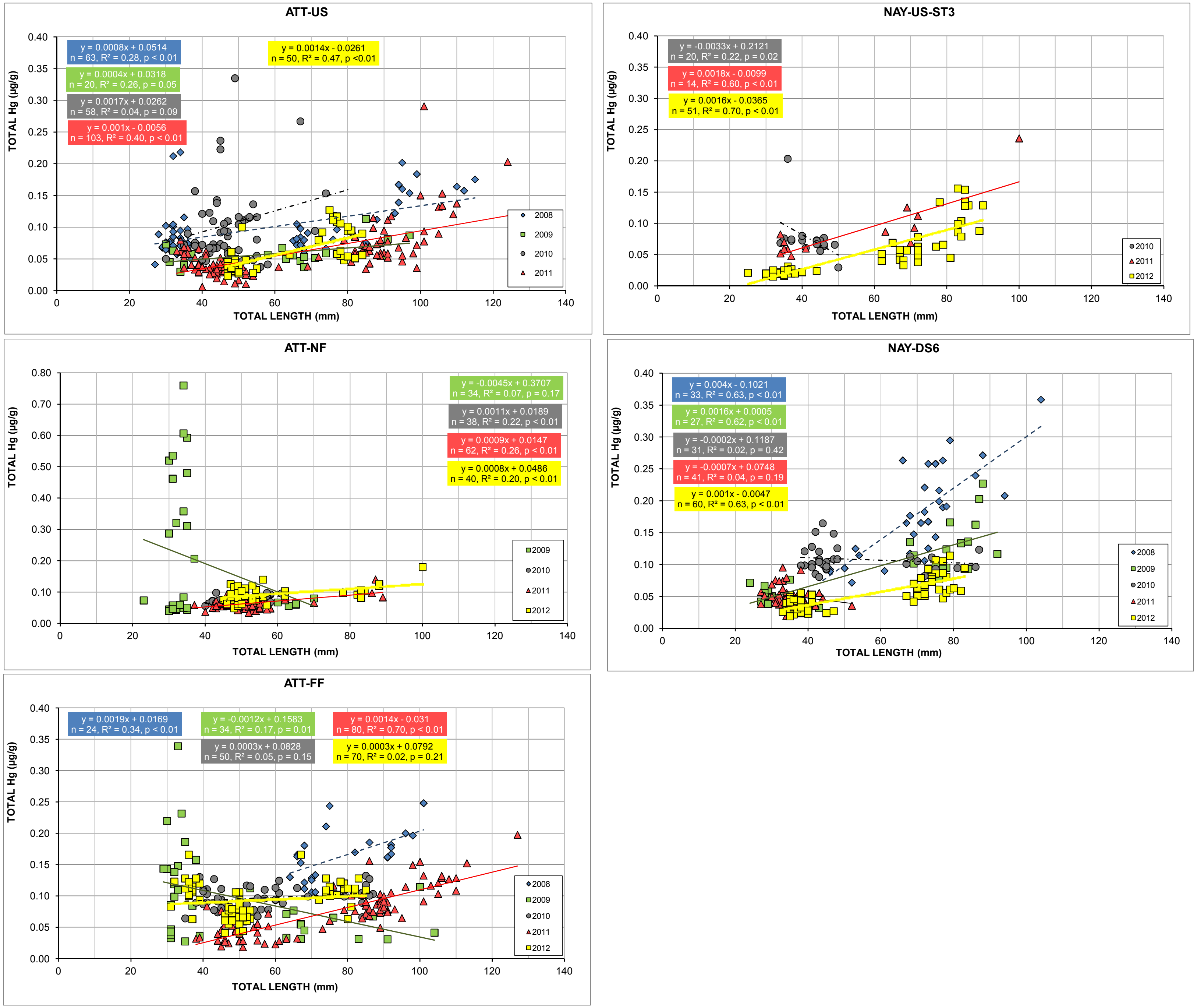


FIGURE 14: SITE SPECIFIC TROUT-PERCH MERCURY BODY BURDENS AS A FUNCTION OF AGE FOR 2011

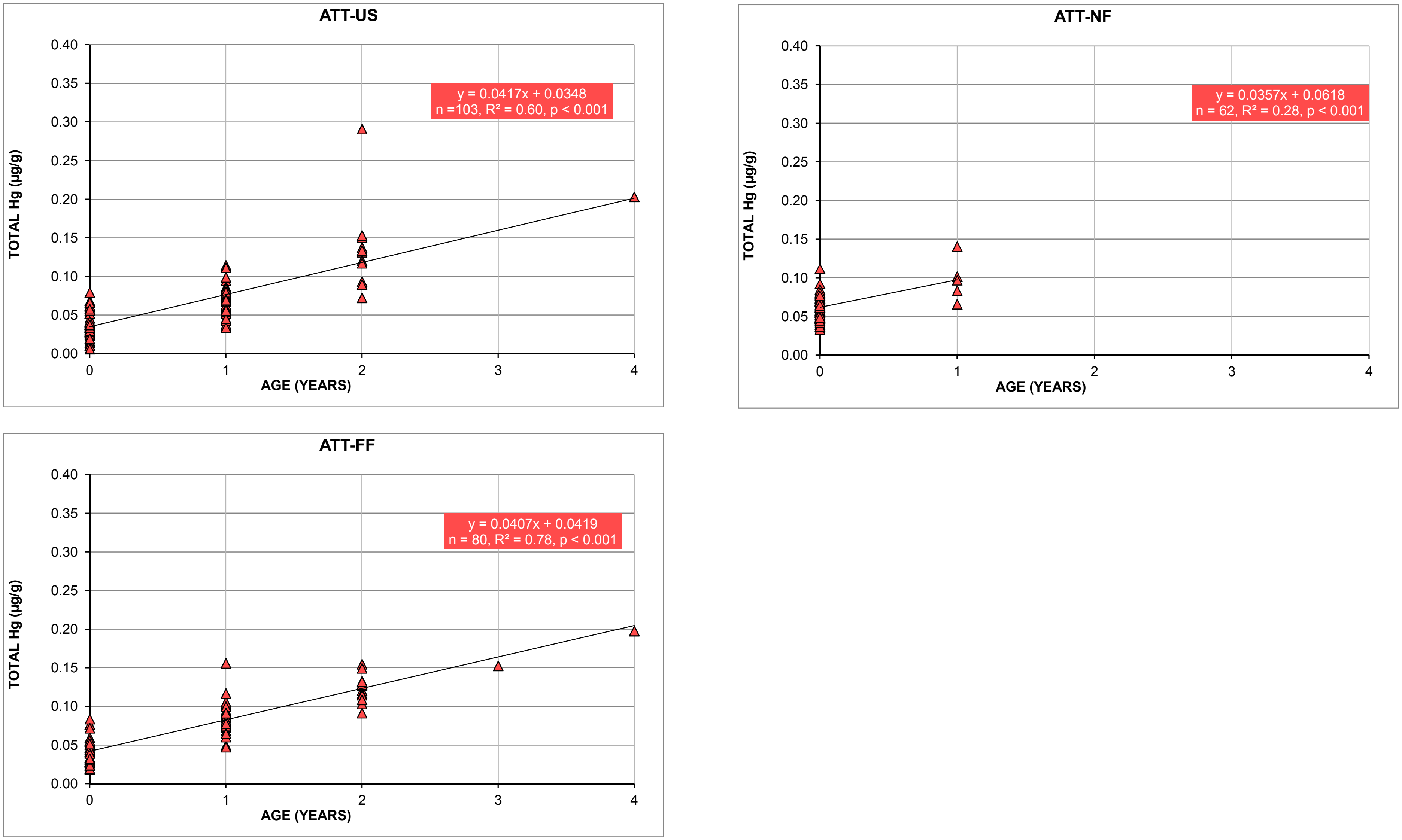


FIGURE 15: MEAN TOTAL MERCURY CONCENTRATION (ARCSIN TRANSFORMED AND ADJUSTED FOR AGE) FOR TROUT-PERCH (2011)

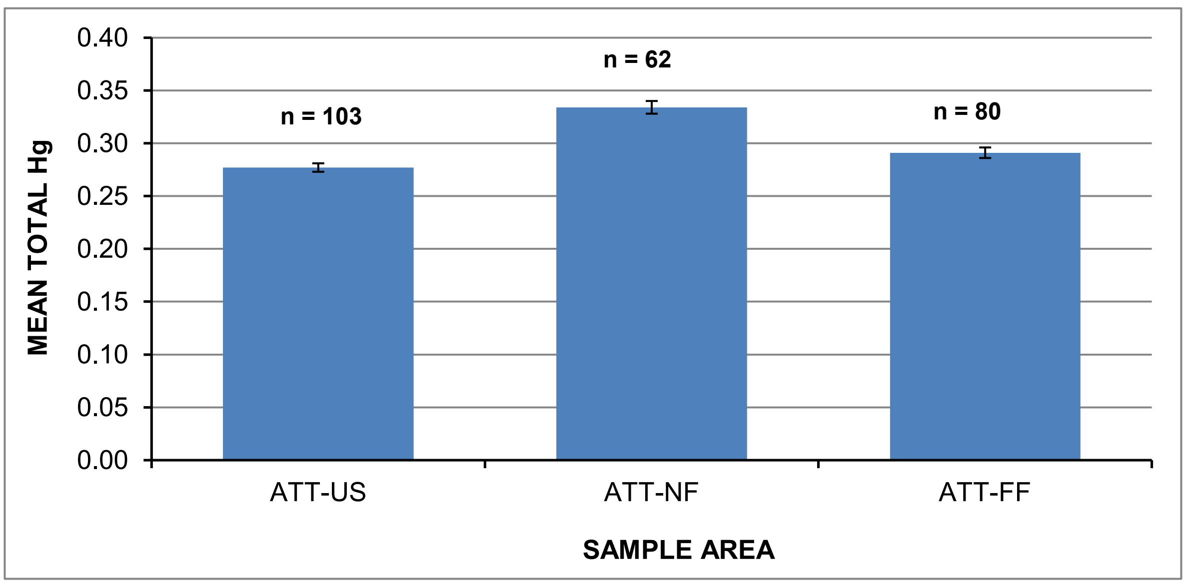


FIGURE 16: SITE SPECIFIC LENGTH FREQUENCY DISTRIBUTIONS FOR TROUT-PERCH CAPTURED FROM 2008 TO 2012

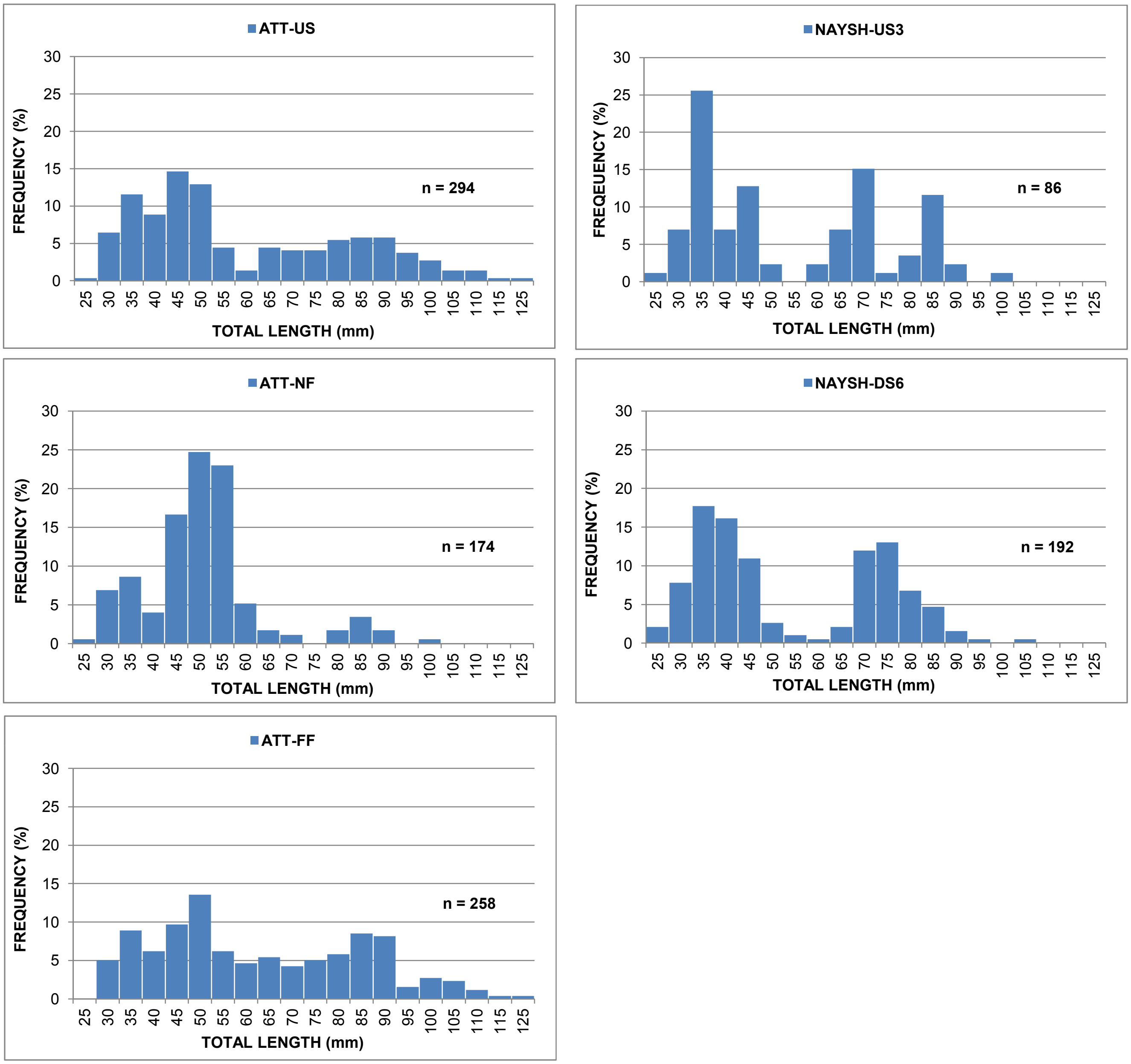
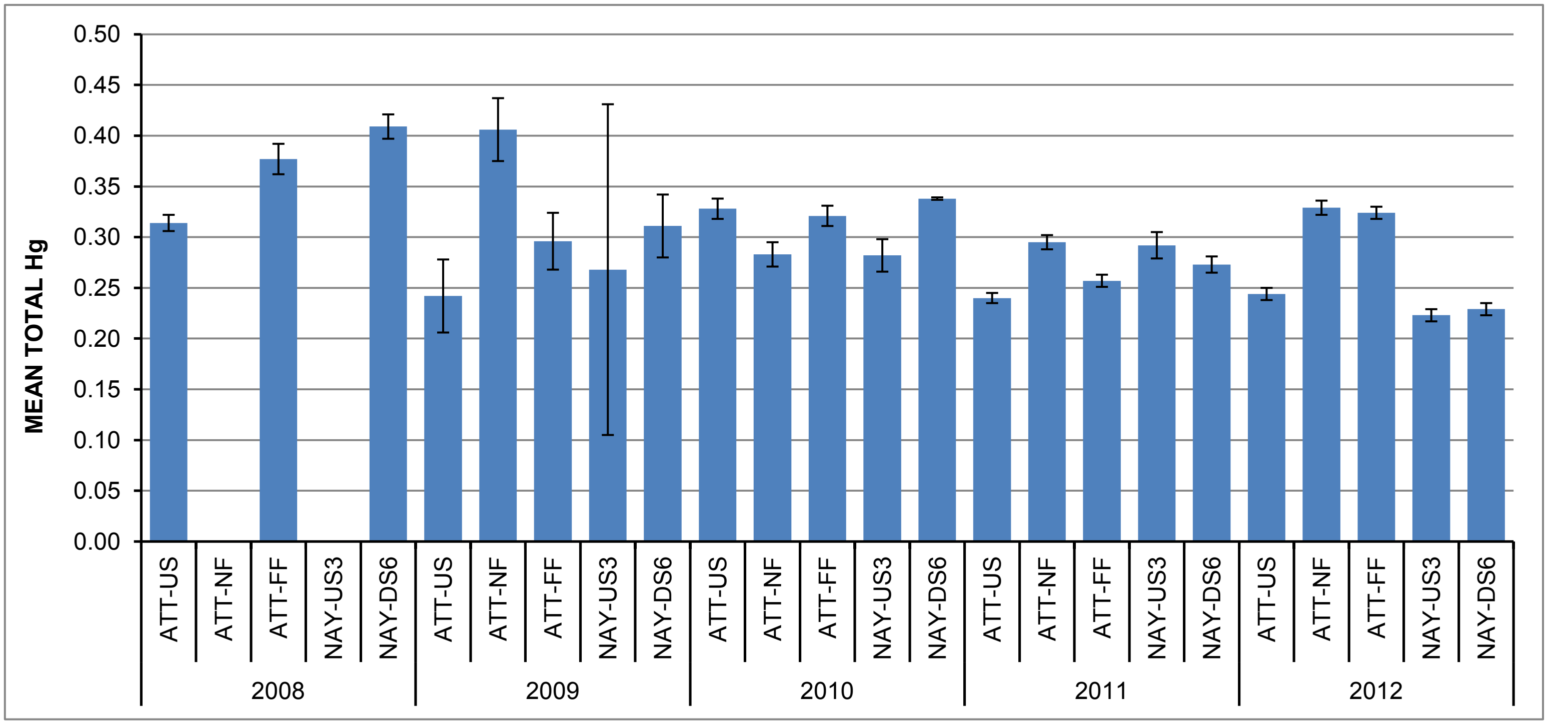


FIGURE 17: MEAN TOTAL MERCURY CONCENTRATION (ARCSIN TRANSFORMED AND ADJUSTED FOR AGECLASS) FOR TROUT-PERCH FROM EACH SAMPLING AREA



APPENDIX A

FINAL NORTHEAST FEN WATER QUALITY RESULTS (2007 TO 2012)

Appendix A: Raw Data for NEF (2007 to 2012)

Date	Lab pH	Sulphate mg/L	Total Phosphorous mg/L	Dissolved Organic Carbon mg/L	Iron Dissolved mg/L	Iron Total mg/L
1-Jan-07	6.81	30.10		10.20		
1-Jan-07	6.81	30.10		10.20	0.17	0.20
3-Jan-07	6.81			12.20		
5-Jan-07	6.76			11.20		
8-Jan-07	6.78	28.00	0.02	13.30	0.41	0.42
9-Jan-07	6.67			15.70		
9-Jan-07	6.83					
13-Jan-07	6.69			17.30		
15-Jan-07	6.93	30.10		14.00	0.16	0.34
17-Jan-07	6.88			12.80		
20-Jan-07	7.01			27.70		
22-Jan-07	6.95	31.10		15.70	0.15	0.36
24-Jan-07	6.90			14.10		
26-Jan-07	6.91			27.50		
29-Jan-07	6.75	32.40		15.80	0.28	0.45
31-Jan-07	6.78			17.80		
2-Feb-07	6.87			15.90		
5-Feb-07	6.71	33.90		24.70	0.35	0.52
7-Feb-07	6.79			15.50		
9-Feb-07	6.79			15.50		
11-Feb-07	6.67	3.70		24.00	0.36	0.57
16-Feb-07	6.68			15.30		
17-Feb-07	6.66			16.40		
18-Feb-07	6.71	37.10		23.10	0.70	0.89
21-Feb-07	6.64			22.30		
23-Feb-07	6.73			20.10		
26-Feb-07	6.64	37.70		18.10	0.65	0.67
28-Feb-07	6.74			20.20		
2-Mar-07	6.59			17.30		
5-Mar-07	6.61	37.60	0.01	20.20	0.61	0.78
7-Mar-07	6.63			21.30		
9-Mar-07	6.59			16.30		
13-Mar-07	6.61	41.20		17.70	0.53	0.84
15-Mar-07	6.94			58.30		
16-Mar-07	6.97			23.90		
20-Mar-07	6.93	40.30		19.70	0.53	0.82
21-Mar-07	6.73			22.00		
23-Mar-07	6.77			26.70		
26-Mar-07	6.85	40.30		24.20	0.47	0.97
28-Mar-07	6.78			15.80		
30-Mar-07	6.82			7.70		
1-Apr-07	6.54	3.40		11.30	0.12	0.14
4-Apr-07	6.73			11.30		
6-Apr-07	6.81			9.90		
9-Apr-07	6.61	11.20		14.20	0.35	0.60
11-Apr-07	6.99			14.20		
13-Apr-07	6.75			17.50		
16-Apr-07	6.78	3.40	0.27	12.00	0.12	0.18
18-Apr-07	6.56					
18-Apr-07	6.91			13.80		
20-Apr-07	6.72			13.90		
24-Apr-07	6.99	9.80		8.90	0.07	0.11
25-Apr-07	6.97			5.30		
27-Apr-07	7.01			5.10		
30-Apr-07	7.16	8.20		5.80	0.04	0.06
2-May-07	7.17			5.90		
4-May-07	7.18			6.20		
7-May-07	7.28	8.30	<0.01	8.10	0.02	0.05
9-May-07	7.10			8.00		
11-May-07	6.97			7.00		
14-May-07	7.16	6.80		34.20	0.04	0.05
16-May-07	7.08			7.90		
18-May-07	7.18					
21-May-07	7.15	6.80		7.30	0.03	0.05
23-May-07	7.16			7.20		
23-May-07	6.92					
25-May-07	7.15			7.00		
26-May-07	6.89					
28-May-07	7.26	7.70		7.90	0.02	0.02
30-May-07	7.21			11.30		
1-Jun-07	7.24			8.50		
4-Jun-07	7.22	4.40		8.30	0.05	0.06
6-Jun-07	7.18			10.20		
8-Jun-07	7.27			11.50		
11-Jun-07	7.19	4.00	<0.01	10.10	0.06	0.08
13-Jun-07	7.18			11.80		
15-Jun-07	6.88			12.40		
18-Jun-07	7.13	4.70		11.50	0.10	
20-Jun-07	7.40			10.50		
22-Jun-07	7.32			10.30		
25-Jun-07	7.36	6.40		9.20	0.05	0.06
27-Jun-07	7.19			9.70		
29-Jun-07	7.23			9.30		
2-Jul-07	7.25	3.30	<0.01	9.80	0.05	0.05
4-Jul-07	7.23			10.10		
6-Jul-07	7.31			10.50		

9-Jul-07	7.22	6.60		9.60	0.02	0.03
11-Jul-07	7.36			10.70		
13-Jul-07	7.42			9.50		
16-Jul-07	7.20	7.30		9.30	0.02	0.03
18-Jul-07	7.26			10.00		
20-Jul-07	7.34			8.30		
23-Jul-07	7.26	5.40		9.80	0.03	0.05
26-Jul-07	7.34			10.50		
27-Jul-07	7.37			13.00		
30-Jul-07	7.37	3.30		10.70	0.10	0.12
1-Aug-07	7.41			10.40		
3-Aug-07	7.32			10.70		
6-Aug-07	7.45	5.00	0.01	10.80	0.03	0.03
8-Aug-07	7.29			11.00		
10-Aug-07	7.28			10.10		
13-Aug-07	7.32	6.20		9.10	0.04	0.05
15-Aug-07	7.55			10.20		
17-Aug-07	7.49			9.85		
20-Aug-07	7.32	6.60		12.80	0.03	0.04
22-Aug-07	7.41			8.80		
24-Aug-07	7.27			9.90		
27-Aug-07	7.48	6.50		24.10	0.03	0.06
29-Aug-07	7.49			9.00		
31-Aug-07	7.43			12.40		
3-Sep-07	7.55	4.60		9.60	0.03	0.08
5-Sep-07	7.53			10.30		
7-Sep-07	7.38			9.50		
10-Sep-07	7.39			9.10		
14-Sep-07	7.29					
14-Sep-07	7.61			8.40		
17-Sep-07	7.71	10.70		7.80	0.01	0.02
19-Sep-07	7.66			7.81		
21-Sep-07	7.49					
21-Sep-07	7.65			7.64		
24-Sep-07	7.72	8.50		6.80		0.02
26-Sep-07	7.69			7.01		
28-Sep-07	7.65			8.10		
1-Oct-07	7.66	32.10	0.01	7.60	0.01	0.03
4-Oct-07	7.53			8.00		
5-Oct-07	7.49			8.20		
8-Oct-07	7.35	25.90		7.40	0.02	0.05
10-Oct-07	7.44			8.90		
12-Oct-07	7.62			7.10		
15-Oct-07	7.29	44.50		7.00	0.01	0.03
17-Oct-07	7.65			6.90		
19-Oct-07	7.57			6.80		
22-Oct-07	7.57	42.10		6.60	0.01	0.01
24-Oct-07	7.60			6.40		
26-Oct-07	7.55			7.00		
29-Oct-07	7.86	44.40		6.40	0.01	0.01
31-Oct-07	7.76			6.10		
2-Nov-07	7.73					
2-Nov-07	7.68			19.80		
5-Nov-07	7.67	63.10	<0.01	14.00	0.02	0.07
7-Nov-07	7.64			13.40		
9-Nov-07	7.64			6.10		
12-Nov-07	7.54	64.80		6.60	0.01	0.02
14-Nov-07	7.50			11.40		
16-Nov-07	7.50			8.70		
19-Nov-07	7.44	66.10		6.20	0.01	0.02
21-Nov-07	7.35			7.00		
23-Nov-07	7.43			6.70		
26-Nov-07	7.41	88.10		10.20	0.02	0.04
28-Nov-07	7.21			6.40		
30-Nov-07	7.12			6.80		
3-Dec-07	7.05	95.00	<0.01	6.80	0.07	0.12
5-Dec-07	7.18			7.70		
7-Dec-07	7.20			7.70		
10-Dec-07	7.20	104.00		9.10	0.08	0.32
12-Dec-07	7.10			8.50		
14-Dec-07	7.13			7.80		
17-Dec-07	7.09	105.00		10.50	0.06	0.37
19-Dec-07	7.28			8.60		
21-Dec-07	7.29			9.10		
24-Dec-07	7.32	109.00		9.10	0.07	0.61
26-Dec-07	7.29			9.30		
28-Dec-07	7.49			9.50		
31-Dec-07	7.54	114.00		9.50	0.12	0.86
2007 Min	6.54	0.01	0.01	5	0.01	0.01
2007 Max	7.86	114	0.27	58	0.70	0.97
2007 Average	7.17	30	0.06	12	0.14	0.25
2007 St Dev.	0.33	31	0.12	7	0.19	0.29
2007 N	164	54	5	157	52	52
2007 75th %	7.41	40	0.02	14	0.15	0.38

2-Jan-08	7.35			10.90		
4-Jan-08	7.37			10.10		
7-Jan-08	7.24	107.50	0.01	10.80	0.10	1.12
9-Jan-08	7.16			10.80		
11-Jan-08	7.04			10.20		
14-Jan-08	7.27	113.00		9.90	1.84	2.30
16-Jan-08	7.04			10.70		
18-Jan-08	7.03			10.80		
21-Jan-08	7.06	119.00		11.30	2.15	2.58
23-Jan-08	6.94			10.30		
25-Jan-08	6.93	119.00	0.02	10.00	0.11	2.40
28-Jan-08	6.97	119.00		11.60	3.02	3.26
31-Jan-08	7.05			12.10		
1-Feb-08	6.88			11.80		
4-Feb-08	7.12	118.00	0.02	13.10	0.03	2.68
6-Feb-08	6.87			11.80		
8-Feb-08	6.89			11.90		
11-Feb-08	6.94	124.00		10.60	0.03	4.08
13-Feb-08	6.85			12.00		
15-Feb-08	6.89			11.70		
17-Feb-08	6.82	130.00		13.50	0.31	7.16
18-Feb-08	6.87	127.00		12.20	0.03	4.96
20-Feb-08	6.83			12.80		
22-Feb-08	6.79			12.50		
25-Feb-08	6.77	113.00		13.60	0.21	5.15
27-Feb-08	6.86			12.90		
29-Feb-08	6.85			11.90		
3-Mar-08	6.89	131.00		12.30	1.12	4.10
7-Mar-08	6.95			13.1		
10-Mar-08	7.08	125		13.2	1.35	1.15
12-Mar-08	6.88			13.20		
14-Mar-08	6.96			13.10		
17-Mar-08	6.81					
19-Mar-08	6.80			13.10		
21-Mar-08	6.78			13.10		
24-Mar-08	6.84	131.00		15.10	0.08	7.64
26-Mar-08	7.05			14.30		
28-Mar-08	7.02			13.00		
31-Mar-08	7.10	130.00		13.00	0.03	7.52
2-Apr-08	6.83			12.30		
4-Apr-08	6.81			13.60		
7-Apr-08	6.75	127.00	0.02	13.60	0.22	6.54
9-Apr-08	6.89			13.20		
11-Apr-08	6.83			24.00		
14-Apr-08	6.91			13.70		
16-Apr-08	8.28			6.40		
18-Apr-08	6.66	9.50		6.20	0.12	0.25
21-Apr-08	7.05	34.60		8.20	0.24	0.38
23-Apr-08	7.25					
25-Apr-08	7.24					
28-Apr-08	7.34					
30-Apr-08	6.99			7.50		
2-May-08	6.89			7.40		
4-May-08	6.86	20.00	0.05	7.30	0.06	0.24
7-May-08	6.89			7.70		
9-May-08	6.86			7.70		
12-May-08	6.87	21.70		7.30	0.01	0.02
14-May-08	6.91			31.10		
16-May-08	7.06			29.80		
19-May-08	6.97	20.60		30.40	0.00	0.01
21-May-08	6.67			7.10		
23-May-08	6.92			7.70		
26-May-08	7.26					
28-May-08	6.83			8.00		
30-May-08	6.89			8.10		
2-Jun-08	7.59	23.00	0.02	8.40	0.04	0.04
4-Jun-08	7.35			8.70		
6-Jun-08	7.48			8.80		
9-Jun-08	7.49			8.50		
9-Jun-08	7.26					
11-Jun-08	7.78			8.50		
13-Jun-08	7.63			8.40		
16-Jun-08	7.56	15.70		8.90	0.04	0.06
18-Jun-08	7.56			8.50		
20-Jun-08	7.61			9.10		
23-Jun-08	7.44	12.90		9.60	0.02	0.04
25-Jun-08	7.78			9.30		
27-Jun-08	7.58			8.90		
30-Jun-08	7.62			9.40		

2-Jul-08	7.65			10.00		
4-Jul-08	7.62			10.20		
9-Jul-08	7.58			10.0		
11-Jul-08	7.71			9.6		
14-Jul-08	7.66	12.0		9.5	0.041	0.063
16-Jul-08	7.72			9.1		
18-Jul-08	7.62			10.2		
21-Jul-08	7.63	12.0		10.9	0.051	0.064
23-Jul-08	7.61			11.4		
25-Jul-08	7.59			15.9		
28-Jul-08	7.65	18.5	<0.01	11.5		
30-Jul-08	7.69			11.8		
1-Aug-08	7.74			11.4		
3-Aug-08	7.86	17.4	<0.01	11.8	0.092	0.121
6-Aug-08	7.44			12.0		
8-Aug-08	7.44			12.3		
11-Aug-08	7.72	13.7	<0.01	11.4	0.028	0.043
13-Aug-08	7.55			11.6		
15-Aug-08	7.57			12.0		
18-Aug-08	7.60	5.7	<0.01	11.9	0.068	0.070
20-Aug-08	7.65			10.1		
22-Aug-08	7.58			11.6		
25-Aug-08	7.77	15.3		11.8	0.024	0.041
27-Aug-08	7.61			12.9		
29-Aug-08	7.50			12.9		
1-Sep-08	7.51	9.4	0.2	13.1	0.063	0.130
3-Sep-08	7.56			14.0		
5-Sep-08	7.40			13.6		
8-Sep-08	7.47	7.4		12.9	0.084	0.164
10-Sep-08	7.58			12.2		
12-Sep-08	7.47			17.4		
15-Sep-08	7.30	7.5		12.4	0.067	0.155
17-Sep-08	7.66			12.1		
22-Sep-08	7.59	6.8		9.6	0.048	0.090
26-Sep-08	7.55			10.5		
29-Sep-08	7.56	5.7		11.7	0.086	0.188
1-Oct-08	7.53			11.5		
3-Oct-08	7.63			11.3		
6-Oct-08	7.48	6.3	0.01	55.3	0.062	0.089
8-Oct-08	7.62			46.7		
10-Oct-08	7.55			46.7		
13-Oct-08	7.56	7.5		45.0	0.081	0.120
15-Oct-08	7.34			9.7		
17-Oct-08	7.43			9.7		
20-Oct-08	7.70	13.5		9.3	0.009	0.032
22-Oct-08	7.63			10.3		
27-Oct-08	7.83	20.0		13.3	0.007	0.029
29-Oct-08	7.67			11.5		
31-Oct-08	7.52			11.0		
3-Nov-08	7.63	20.8	0.02	10.3	0.104	0.159
5-Nov-08	7.56			10.4		
7-Nov-08	7.55			10.4		
10-Nov-08	7.44	19.6		10.4	0.028	0.054
12-Nov-08	7.61			0.8		
14-Nov-08	7.59			<0.5		
17-Nov-08	7.54	27.4		10.1	0.007	0.011
19-Nov-08	7.62			11.3		
21-Nov-08	7.55			11.5		
24-Nov-08	7.57	31.6		21.8	0.025	0.111
26-Nov-08	7.50			10.9		
28-Nov-08	7.46			10.5		
1-Dec-08	7.43	30.7	<0.01	11.2	0.029	0.051
3-Dec-08	7.45			11.2		
5-Dec-08	7.43			11.5		
8-Dec-08	7.21	31.2		12.1	0.027	0.099
10-Dec-08	7.42			12.6		
12-Dec-08	7.49			13.1		
16-Dec-08	7.49	31.4		12.7	0.108	0.386
17-Dec-08	7.58			12.8		
19-Dec-08	7.57			13.2		
22-Dec-08	7.52	34.1		13.3	0.069	0.473
24-Dec-08	7.46			13.2		
26-Dec-08	7.43			13.6		
29-Dec-08	7.43	34.0		13.9	0.050	0.905
31-Dec-08	7.41			13.7		
2008 Min	6.66	6	0.01	0.8	0	0.01
2008 Max	8.28	131	0.20	55	3.02	7.64
2008 Average	7.31	51	0.041	13	0.26	1.4
2008 St Dev.	0.34	50	0.06	7	0.61	2.3
2008 N	154	48	9	147	47	47
2008 75th %	7.58	114	0.02	13	0.11	2.35

2-Jan-09	7.48			14.1		
5-Jan-09	7.50	33.7	0.01	14.4	0.376	0.735
7-Jan-09	7.39			14.6		
9-Jan-09	7.39			14.6		
12-Jan-09	7.54	33.5		14.7	0.728	1.35
14-Jan-09	7.39			15.9		
16-Jan-09	7.34			15.9		
19-Jan-09	7.41	35.2		16.2	0.925	1.68
21-Jan-09	7.38			16.1		
23-Jan-09	7.40			15.9		
26-Jan-09	7.27	34.1		17.0	1.61	2.14
28-Jan-09	7.24			16.6		
30-Jan-09	7.20			17.0		
2-Feb-09	7.58	32.7	<0.01	14.2	1.35	2.00
4-Feb-09	7.44			16.7		
6-Feb-09	7.17			17.1		
8-Feb-09	7.25	33.2		17.2	1.37	2.50
11-Feb-09	7.32			16.9		
13-Feb-09	7.38			17.2		
16-Feb-09	7.40	32.2		17.9	1.64	2.94
18-Feb-09	7.22			18.0		
20-Feb-09	7.22			17.8		
23-Feb-09	7.19	31.9		18.1	2.14	3.32
1-Apr-09	7.31			18.3		
3-Apr-09	7.24			18.4		
6-Apr-09	7.25	29.5	0.01	17.8	0.725	2.86
8-Apr-09	7.08			19.8		
10-Apr-09	7.14			18.7		
13-Apr-09	7.21	28.5		17.9	0.039	3.36
15-Apr-09	7.16			19.4		
17-Apr-09	7.56			8.7		
20-Apr-09	7.07	3.6		6.7	0.065	0.321
22-Apr-09	7.40			6.5		
24-Apr-09	7.36			7.5		
27-Apr-09	6.81					
1-May-09	7.41					
4-May-09	7.33					
6-May-09	7.19					
8-May-09	7.18					
11-May-09	7.50	14.4		7.0	0.012	0.018
13-May-09	7.62			7.3		
15-May-09	7.73			6.9		
18-May-09	7.77	11.4		6.7	0.007	0.008
20-May-09	7.62			6.5		
22-May-09	7.70			7.5		
25-May-09	7.56	26.9		7.6	0.006	0.009
27-May-09	7.59			7.8		
27-May-09	7.30					
29-May-09	7.68			8.0		
1-Jun-09	7.86	27.4	<0.01	7.8	0.028	0.030
3-Jun-09	7.68			7.7		
5-Jun-09	7.68			7.8		
8-Jun-09	7.75	26.5		7.6	0.008	0.009
10-Jun-09	7.67			7.8		
12-Jun-09	7.64			8.1		
15-Jun-09	7.59	24.1		9.3	0.017	0.032
17-Jun-09	7.62			10.0		
19-Jun-09	7.56			10.4		
22-Jun-09	7.62	22.9		11.3	0.065	0.098
24-Jun-09	7.65			11.7		
26-Jun-09	7.55			12.0		
29-Jun-09	7.64	16.3		10.3	0.013	0.042

1-Jul-09	7.65			9.8		
3-Jul-09	7.65			9.6		
6-Jul-09	7.78	35.0	<0.01	9.6	0.013	0.025
8-Jul-09	7.78			10.9		
10-Jul-09	7.83			11.0		
13-Jul-09	7.86	38.3		10.3	0.010	0.011
15-Jul-09	7.65			10.0		
17-Jul-09	7.61			9.8		
20-Jul-09	7.51	35.9		10.4	0.010	0.020
22-Jul-09	7.67			46.3		
24-Jul-09	7.51			12.7		
27-Jul-09	7.32			56.6		
29-Jul-09	7.67			11.3		
31-Jul-09	7.84			10.9		
3-Aug-09	7.89	41.0	0.03	11.1	0.007	0.016
5-Aug-09	7.63			11.1		
7-Aug-09	7.69			11.1		
10-Aug-09	7.52	42.2		11.0	0.040	0.088
12-Aug-09	7.54			11.5		
14-Aug-09	7.66			10.9		
17-Aug-09	7.88	42.7		10.3	0.014	0.020
19-Aug-09	7.62			11.3		
21-Aug-09	7.64			11.7		
24-Aug-09	7.57	40.8		10.4	0.037	0.049
26-Aug-09	7.88			8.8		
28-Aug-09	7.90			10.7		
31-Aug-09	7.90	49.2		11.8	0.008	0.013
2-Sep-09	7.77			10.8		
4-Sep-09	7.72			12.0		
7-Sep-09	7.93	45.1	<0.01	11.7	0.055	0.074
9-Sep-09	7.65			11.9		
11-Sep-09	7.68			11.9		
14-Sep-09	7.58	35.4		10.5	0.035	0.044
16-Sep-09	7.78			11.5		
18-Sep-09	7.81			10.0		
21-Sep-09	7.74	41.2		11.2	<0.001	0.027
23-Sep-09	7.64			11.2		
25-Sep-09	7.62			11.1		
28-Sep-09	7.87	27.6		9.5	0.015	0.019
30-Sep-09	7.9			10.3		
2-Oct-09	7.83			10.4		
5-Oct-09	7.72	41.3	<0.01	10.6	0.124	0.251
7-Oct-09	7.81			10		
9-Oct-09	7.79			10.5		
12-Oct-09	7.83	40.7		10.1	0.005	0.01
14-Oct-09	7.92			10		
16-Oct-09	7.84			10.04		
19-Oct-09	7.84	47.8		10	0.063	0.53
21-Oct-09	7.70			13.9		
23-Oct-09	7.83			9.8		
26-Oct-09	7.78	47.7		9.3	0.008	0.012
28-Oct-09	7.72			9.6		
30-Oct-09	7.73			9.3		
2-Nov-09	7.39	28.7	0.0578	12.6	<0.02	<0.02
4-Nov-09	7.60			34		
6-Nov-09	7.44			37.6		
9-Nov-09	7.38	31.1		33.2	<0.02	0.088
11-Nov-09	7.31			29.7		
13-Nov-09	7.47			30.4		
16-Nov-09	7.39	35.4		30.1	<0.02	0.035
18-Nov-09	7.26			27.1		
20-Nov-09	6.92			27.8		
23-Nov-09	7.47	32.1		9.65	<0.02	0.024
25-Nov-09	7.31			31.7		
27-Nov-09	6.85			31.3		
30-Nov-09	7.23	38.8		29.5	0.023	0.037
2-Dec-09	7.10			36.4		
4-Dec-09	7.35			37.4		
7-Dec-09	7.22	36.9	<0.002	40	0.099	0.254
9-Dec-09	7.33			28		
11-Dec-09	7.43			31		
14-Dec-09	7.29	80.6		13.9	0.284	0.454
16-Dec-09	7.28			16		
18-Dec-09	7.32			24		
21-Dec-09	7.22	51.6		39.3	0.206	0.518
23-Dec-09	7.28			39.3		
25-Dec-09	7.27			39.9		
28-Dec-09	7.27	52.2		35.6	0.392	0.66
30-Dec-09	7.53			18		
2009 Min	6.81	4	0.01	7	0.01	0.008
2009 Max	7.93	81	0.06	57	2.14	3.36
2009 Average	7.52	35	0.03	16	0.32	0.622
2009 St Dev.	0.24	12	0.02	10	0.56	1.02
2009 N	141	44	4	135	39	43
2009 75th %	7.7	41	0.04	18	0.33	0.595

1-Jan-10	7.50			23		
6-Jan-10	7.23			31		
8-Jan-10	7.10			30		
11-Jan-10	7.18	48.9		32	0.997	1.28
13-Jan-10	7.19			18		
15-Jan-10	7.22			31		
18-Jan-10	7.03	44.3		35	1.1	2.01
20-Jan-10	6.72			39.2		
22-Jan-10	6.96			17		
25-Jan-10	6.98	49.6		18.5	1.3	1.7
27-Jan-10	7.23			24		
29-Jan-10	7.16			47		
2-Apr-10	7.06			10.3		
5-Apr-10	7.22	2.8		8.87	0.058	0.14
7-Apr-10	7.39			15.1		
9-Apr-10	7.47			11.5		
12-Apr-10	7.55	6.8		11.1	<0.020	0.092
14-Apr-10	7.74			9.79		
16-Apr-10	7.67			10		
21-Apr-10	7.53			12.2		
23-Apr-10	7.28			8.31		
26-Apr-10	7.67	12.2		10.6	<0.020	0.034
28-Apr-10	7.72			8.17		
30-Apr-10	7.88			9.78		
2-May-10	7.65	12.7	0.0059	8.29	0.020	0.047
5-May-10	7.74			9.27		
7-May-10	7.64			9.39		
10-May-10	7.85	13.1		10.3	<0.020	<0.020
12-May-10	8.02			7.82		
14-May-10	8.04			8.17		
17-May-10	8.17	14.4		9.41	<0.020	0.037
19-May-10	7.61			8.56		
21-May-10	7.93			9.37		
24-May-10	7.75	13.6		10.9	<0.020	0.022
26-May-10	7.65			8.7		
31-May-10	7.79	11.5		15.7	0.024	0.095
2-Jun-10	7.99			17.6		
6-Jun-10	7.63	10.7	0.0033	11	0.022	0.056
9-Jun-10	7.93			11.2		
11-Jun-10	7.81			10.8		
14-Jun-10	8.04	13.8		11.6	0.025	0.071
16-Jun-10	8.09			22.7		
18-Jun-10	7.90			21.9		
21-Jun-10	7.70	11.4		12.8	<0.020	0.083
23-Jun-10	7.79			13.2		
25-Jun-10	7.75			14.3		
28-Jun-10	7.84	8.9		13.2	0.035	0.084
30-Jun-10	8.21			13.5		

2-Jul-10	8.20			12.8		
5-Jul-10	8.03	10	0.0027	14.5	<0.020	0.080
7-Jul-10	7.91			21.7		
9-Jul-10	8.03			25.4		
12-Jul-10	8.06	9.1		15	0.19	0.18
14-Jul-10	7.71			18.9		
16-Jul-10	7.85			14.7		
19-Jul-10	7.77	5.1		17.2	0.11	0.18
21-Jul-10	8.02			38		
23-Jul-10	7.95			17.6		
26-Jul-10	7.82	4.2		15.9	0.074	0.206
28-Jul-10	7.99			17.4		
30-Jul-10	8.01			13.9		
2-Aug-10	7.99	19.8	<0.002	13.2	0.024	0.052
4-Aug-10	8.08			16.1		
6-Aug-10	8.07			20		
9-Aug-10	7.78	29.6		23.3	0.055	0.11
11-Aug-10	7.74			15.6		
13-Aug-10	7.80			15.7		
15-Aug-10	7.93	26.5		15.4	0.049	0.089
18-Aug-10	8.04			13		
20-Aug-10	7.93			17.8		
23-Aug-10	7.80	27		11.6	0.081	0.19
27-Aug-10	8.02			11.5		
30-Aug-10	7.95	22.4		8.86	0.047	0.14
1-Sep-10	7.78			9.61		
3-Sep-10	7.82			9.88		
6-Sep-10	7.89	25.8	0.0246	7.39	0.026	0.039
8-Sep-10	7.93			10.3		
10-Sep-10	7.93			10.4		
13-Sep-10	7.88	44.4		10.4	0.030	0.053
15-Sep-10	7.81			10.9		
17-Sep-10	7.76			10.1		
20-Sep-10	7.96	43.7		10.2	0.023	0.051
22-Sep-10	8.12			11		
24-Sep-10	8.03			10.8		
27-Sep-10	8.16	44.3		10.1	0.021	0.080
29-Sep-10	8.17			10.8		
1-Oct-10	8.13			10.3		
4-Oct-10	7.93	43.9	0.0048	9.18	<0.020	0.025
6-Oct-10	8.12			8.55		
8-Oct-10	8.00			7.87		
11-Oct-10	8.24	51.3		12.6	0.091	0.507
13-Oct-10	8.02			10.2		
15-Oct-10	8.08			11.6		
18-Oct-10	8.17	47.4		12.1	<0.020	0.041
20-Oct-10	8.05			9.89		
22-Oct-10	8.04			9.95		
25-Oct-10	7.91	65.2		10.7	0.028	0.086
27-Oct-10	7.97			8.51		
29-Oct-10	7.97			8.69		
1-Nov-10	8.13	51	<0.002	9.33	<0.020	0.038
3-Nov-10	7.81			7.95		
5-Nov-10	7.89			8.84		
8-Nov-10	7.85	41.5		8.16	<0.020	0.094
10-Nov-10	7.88			7.84		
12-Nov-10	7.85			7.32		
15-Nov-10	8.08	46.3		8.24	<0.020	0.040
17-Nov-10	8.18			13.1		
19-Nov-10	8.14			15.2		
22-Nov-10	8.09	51.8		17.8	0.051	0.13
24-Nov-10	8.01			13.6		
26-Nov-10	7.97			12.6		
29-Nov-10	7.60	59.6		10.7	0.209	0.471
1-Dec-10	7.79			8.5		
3-Dec-10	7.76			8.65		
6-Dec-10	8.01	55	<0.002	9.2	0.056	0.12
8-Dec-10	7.84			7.91		
10-Dec-10	7.81			9.59		
13-Dec-10	7.99	53.4		8.72	0.030	0.053
15-Dec-10	7.83			10.1		
17-Dec-10	7.81			9.34		
20-Dec-10	7.76	47.7		10.4	0.036	0.11
22-Dec-10	7.90			8.7		
24-Dec-10	7.82			8.02		
27-Dec-10	7.95	48		8.17	0.054	0.15
29-Dec-10	7.92			7.41		
31-Dec-10	7.90			7.65		
2010 Min	6.72	3	0.003	7	0.02	0.022
2010 Max	8.24	65	0.02	47	1.30	2.01
2010 Average	7.81	30	0.01	14	0.17	0.227
2010 St Dev.	0.30	19	0.01	7	0.34	0.434
2010 N	126	41	5	126	29	40
2010 75th %	8.02	48	0.01	15	0.08	0.143

7-Jan-11	7.90	50.1		9.03	0.070	0.17
8-Jan-11	7.89			9.45		
9-Jan-11	7.96	47.9	<0.002	9.2	0.096	0.253
10-Jan-11	7.83	46.3		9.59	0.11	0.265
12-Jan-11	7.75			9.24		
14-Jan-11	7.81			9.29		
17-Jan-11	7.47	41.3		7.72	0.088	0.244
19-Jan-11	7.82			9.53		
21-Jan-11	7.81			9.13		
24-Jan-11	7.87	45.2		7.79	0.10	0.543
26-Jan-11	7.85			8.63		
28-Jan-11	7.87			8.14		
31-Jan-11	7.90	50.7		9.13	0.090	0.487
1-Apr-11	7.66			11.6		
4-Apr-11	8.10		0.014	11.1	0.17	2.64
6-Apr-11	7.81			11.5		
8-Apr-11	7.76			12.3		
11-Apr-11	7.99	1.9		1.3	<0.020	0.243
13-Apr-11	8.06			8.55		
15-Apr-11	7.96			9.75		
18-Apr-11	8.12	12.7		9.37	0.042	0.061
20-Apr-11	8.13			9.83		
22-Apr-11	8.07			2.7		
25-Apr-11	7.85	17.4		6.87	<0.020	<0.020
27-Apr-11	7.98			6.74		
29-Apr-11	7.96			6.81		
1-May-11	8.07	24.5	0.0053	7.21	<0.020	<0.020
4-May-11	8.04			8.13		
6-May-11	8.04			9.18		
9-May-11	8.18	26.3		7.95	0.039	<0.020
11-May-11	8.04			6.75		
13-May-11	8.15			7.05		
16-May-11	8.16	23.1		6.8	0.023	<0.020
18-May-11	8.01			8.87		
20-May-11	7.94			8.74		
23-May-11	8.04	17.3		9.33	<0.020	<0.020
25-May-11	8.22			8.53		
27-May-11	8.17			8.49		
30-May-11	8.04	20.6		9.07	<0.020	0.042
1-Jun-11	8.26			10.1		
3-Jun-11	8.27			9.94		
5-Jun-11	8.16	21.9	<0.002	10.9	0.022	<0.020
8-Jun-11	8.20			8.69		
10-Jun-11	8.21			9.01		
13-Jun-11	8.07	22.5		10.1	0.065	0.084
15-Jun-11	7.98			10.9		
17-Jun-11	7.96			11.5		
20-Jun-11	8.13	21.7		11.1	0.037	0.079
22-Jun-11	7.99			13.1		
24-Jun-11	8.00			12.8		
27-Jun-11	8.00	12.6		12.3	0.042	0.034
29-Jun-11	8.13			12.1		
1-Jul-11	8.05			11.5		
3-Jul-11	7.94	10.4	0.005	12.8	0.039	0.070
6-Jul-11	8.19			10.9		
8-Jul-11	8.35			12.3		
11-Jul-11	8.08	10.5		11.4	<0.020	0.11
13-Jul-11	8.19			15.4		
15-Jul-11	8.19			16.1		
18-Jul-11	7.94	3.9		16.5	0.204	0.419
20-Jul-11	8.02			18.1		
22-Jul-11	7.95			18.7		
25-Jul-11	7.93	9.7		20	0.052	0.040
27-Jul-11	7.92			19.5		
29-Jul-11	8.02			19.3		
1-Aug-11	8.03	10.1		17.4	0.069	0.12
3-Aug-11	7.97			20.9		
5-Aug-11	8.00			20.8		
8-Aug-11	7.82	5.7	0.0092	18.9	0.063	0.219
10-Aug-11	8.13			18.9		
12-Aug-11	8.11			17.4		
15-Aug-11	7.93	10.9		16	0.054	0.14
17-Aug-11	8.20			16.1		
19-Aug-11	8.15			15.2		
22-Aug-11	8.06	17		15.4	0.289	0.076
24-Aug-11	7.95			16		
26-Aug-11	7.90			14		
29-Aug-11	8.07	35		14.2	0.031	<0.020
31-Aug-11	8.01			14.6		
2-Sep-11	7.99			15.2		
5-Sep-11	7.88	59.2	0.003	15.9	0.023	0.058
7-Sep-11	8.05			12		
9-Sep-11	8.03			12.2		
12-Sep-11	7.99	72.4		12.7	<0.020	<0.020
14-Sep-11	8.02			8.07		
16-Sep-11	8.11			9.31		
19-Sep-11	8.06	84.4		10.6	<0.020	<0.020
21-Sep-11	8.26			10.8		
23-Sep-11	8.36			11.1		
26-Sep-11	8.07	135		12	<0.020	0.58
28-Sep-11	8.00			11.5		
30-Sep-11	7.98			10.7		
3-Oct-11	7.91	127	0.0039	11.3	<0.020	<0.020
5-Oct-11	7.98			17.4		

7-Oct-11	8.08			17.7		
10-Oct-11	8.05	110		10.9	0.023	0.028
12-Oct-11	7.83			9.11		
14-Oct-11	8.16			9.75		
17-Oct-11	8.05	86.5		9.54	<0.020	0.043
19-Oct-11	8.05			12.1		
21-Oct-11	8.04			12.1		
24-Oct-11	8.06	115		10.8	<0.020	<0.020
26-Oct-11	8.17			10.6		
28-Oct-11	8.00			10.1		
31-Oct-11	8.08	122		10.4	<0.020	<0.020
2-Nov-11	8.12			9		
4-Nov-11	8.10			9.19		
7-Nov-11	8.13	106	0.0203	10.1	<0.020	<0.020
9-Nov-11	8.02			8.87		
11-Nov-11	7.99			8.9		
14-Nov-11	7.91	108		7.31	<0.020	0.17
16-Nov-11	7.90			37		
18-Nov-11	7.91			35		
21-Nov-11	8.03	118		7.61	<0.020	<0.020
23-Nov-11	7.93			9.47		
25-Nov-11	7.92			10.1		
28-Nov-11	7.79	141		10.2	0.074	0.079
30-Nov-11	7.83			8.49		
2-Dec-11	7.82			8.97		
5-Dec-11	7.85	153	0.0063	9.5	0.090	0.12
7-Dec-11	7.91			10.4		
9-Dec-11	7.87			10.5		
12-Dec-11	7.78	163		10.7	0.082	0.23
14-Dec-11	7.86			12.1		
16-Dec-11	7.80			12.7		
19-Dec-11	7.70	166		10.8	0.067	0.496
21-Dec-11	7.95			10.3		
23-Dec-11	7.91			10.5		
26-Dec-11	7.74	155		11.2	0.18	0.738
28-Dec-11	7.85			10.9		
30-Dec-11	7.69			11.1		
2011 Min	7.47	1.9	0.003	1	0.02	0.028
2011 Max	8.36	166	0.02	37	0.29	2.64
2011 Average	7.99	60	0.01	12	0.08	0.286
2011 St Dev.	0.14	52	0.01	5	0.06	0.475
2011 N	131	44	8	131	29	31
2011 75th %	8.08	109	0.01	13	0.09	0.259

2-Jan-12	7.15	148			0.419	1.4
6-Jan-12	7.06					
7-Jan-12	7.03					
8-Jan-12	6.97	176	0.011		0.514	1.4
11-Jan-12	7.1					
13-Jan-12	7.15					
16-Jan-12	7.09	176			0.628	2.33
18-Jan-12	7.14					
20-Jan-12	6.59					
23-Jan-12	7.12	188			0.48	1.7
25-Jan-12	7.11					
27-Jan-12	7.05					
30-Jan-12	7.07	195			0.36	1.3
21-Mar-12	8.07	25.9			0.13	0.23
23-Mar-12	8.09					
26-Mar-12	7.89	59.3	0.013		<0.020	0.251
28-Mar-12	8.07					
30-Mar-12	8.11					
2-Apr-12	8.03	59		9.82	<0.020	0.305
4-Apr-12	7.94			9.89		
6-Apr-12	7.94			11		
8-Apr-12	7.76	53.5	<0.002	8.7	<0.020	<0.020
11-Apr-12	8.01			6.27		
13-Apr-12	7.97			6.27		
16-Apr-12	7.94	58.5		6.9	0.034	0.036
18-Apr-12	7.85			6.49		
20-Apr-12	8.30			5.73		
23-Apr-12	7.95	62.2		6.49	<0.020	<0.020
25-Apr-12	8.08			5.95		
27-Apr-12	8.06			5.9		
30-Apr-12	8.03	52.1		6.63	0.071	<0.020
2-May-12	8.08			7.42		
4-May-12	8.10			7.68		
6-May-12	7.34		<0.001	8.08	<0.020	<0.020
9-May-12	8.19			6.11		
11-May-12	8.19			6.51		
14-May-12	7.62	69.9		8.18	0.039	<0.020
16-May-12	8.13			8.31		
18-May-12	8.13			7.97		
21-May-12	8.09	72.2		8.19	<0.020	<0.020
23-May-12	8.08			9.77		
25-May-12	8.18			9.54		
28-May-12	8.05	65.2		8.6	<0.020	0.11
29-May-12	7.87	64.3	0.0231	8.32	0.023	0.11
30-May-12	8.07			9.06		
1-Jun-12	8.09			9.81		
3-Jun-12	8.03	75	0.0112	10.2	0.19	0.18
6-Jun-12	7.95			10.9		
8-Jun-12	7.97			11.4		
11-Jun-12	7.89	86.2		10.7	0.056	0.077
13-Jun-12	8.11			11.3		
15-Jun-12	8.08			11.4		
18-Jun-12	8.02	52.1		12.6	0.056	0.12
20-Jun-12	7.91			13.1		
22-Jun-12	7.98			12.6		
25-Jun-12	8.05	72.8		13.9	0.045	0.066
27-Jun-12	8.04			12.8		
29-Jun-12	7.97			13.1		
2-Jul-12	7.99	74.6	0.0069	130	<0.020	0.15
4-Jul-12	7.96			13.3		
6-Jul-12	7.95			13.6		
9-Jul-12	7.93	68.4		13.7	0.17	0.228
11-Jul-12	7.94			13.9		
13-Jul-12	7.92			13.7		
16-Jul-12	7.86	64.5		10.9	0.14	0.347
18-Jul-12	7.89			18.9		
20-Jul-12	7.96			18		
23-Jul-12	7.89	52.2		18.3	0.19	0.534
25-Jul-12	7.89			16.9		
27-Jul-12	7.91			26		
30-Jul-12	7.91	47.9		16.7	0.088	0.475
1-Aug-12	8.03			17.3		
3-Aug-12	7.97			17.4		
7-Aug-12	8.17	46	0.008	16.9	0.19	0.41
8-Aug-12	8.02			17.8		
10-Aug-12	7.97			17.7		
13-Aug-12	7.97	43		25	0.10	0.31
15-Aug-12	8.23			17.2		
17-Aug-12	8.09			26		
20-Aug-12	8.03	54		26	0.10	0.15
22-Aug-12	8.09			17.5		
24-Aug-12	8.03			20.5		
27-Aug-12	8.24	51		38	0.12	0.22
29-Aug-12	7.23			17.8		
31-Aug-12	8.01			18.0		
3-Sep-12	8.09	52	0.005	18.5	0.10	0.20
5-Sep-12	7.83			19.3		
7-Sep-12	8.00			18.9		
10-Sep-12	8.18	72		16.4		
12-Sep-12	8.34			16.5		
14-Sep-12	8.13			17.0		
17-Sep-12	8.34	79.9		16.1		
19-Sep-12	6.79			16.9		

21-Sep-12	7.25			17.1		
24-Sep-12	7.67	74.8		14.9		
26-Sep-12	7.04			14.8		
28-Sep-12	7.06			15.0		
3-Oct-12	7.06	77.6		15.4	0.043	0.056
5-Oct-12	6.97			15.1		
8-Oct-12	7.96	81.2	<0.001	13.0	<0.020	0.052
10-Oct-12	7.89			12.1		
12-Oct-12	7.93			12.4		
15-Oct-12	7.35	96.8		11.7	<0.020	<0.020
17-Oct-12	7.16			16.1		
19-Oct-12	7.15			15.0		
22-Oct-12	7.22	95.2		12.3	0.021	0.035
24-Oct-12	8.13			12.8		
26-Oct-12	8.05			11.6		
29-Oct-12	6.96	113		11.6	<0.020	0.066
31-Oct-12	8.04			10.7		
2-Nov-12	8.05			10.6		
5-Nov-12	8.01	130		10.7	<0.020	<0.020
7-Nov-12	7.03			10.7		
9-Nov-12	7.08			11.2		
11-Nov-12	7.59	113	0.003	11.8	0.12	0.14
14-Nov-12	7.92			10.9		
16-Nov-12	7.77			11.5		
19-Nov-12	7.67	100		11.7	0.23	0.27
21-Nov-12	7.79			10.6		
23-Nov-12	7.78			11.7		
26-Nov-12	7.83	107		11.7	0.050	0.060
28-Nov-12	7.93			11.7		
30-Nov-12	7.95			12		
3-Dec-12	7.80	121	0.0048	11.7	0.103	0.318
5-Dec-12	7.96			12.5		
7-Dec-12	7.77			12.6		
10-Dec-12	7.59	116		13	0.209	0.222
12-Dec-12	7.74			13.3		
14-Dec-12	7.39			13.8		
17-Dec-12	7.70	119		12.4	0.119	0.146
19-Dec-12	7.89			16.5		
21-Dec-12	7.91			16.5		
24-Dec-12	7.85	116		13.6	0.118	0.203
26-Dec-12	7.89			13.5		
28-Dec-12	7.78			15		
31-Dec-12	7.61	121		13.5	0.254	0.662
2012 Min	6.59	26	0.001	6	0.02	0.035
2012 Max	8.34	195	0.02	130	0.63	2.33
2012 Average	7.79	87	0.01	14	0.17	0.402
2012 St Dev.	0.39	40	0.01	12	0.15	0.529
2012 N	136	47	12	118	33	37
2012 75th %	8.05	113	0.01	16	0.19	0.347

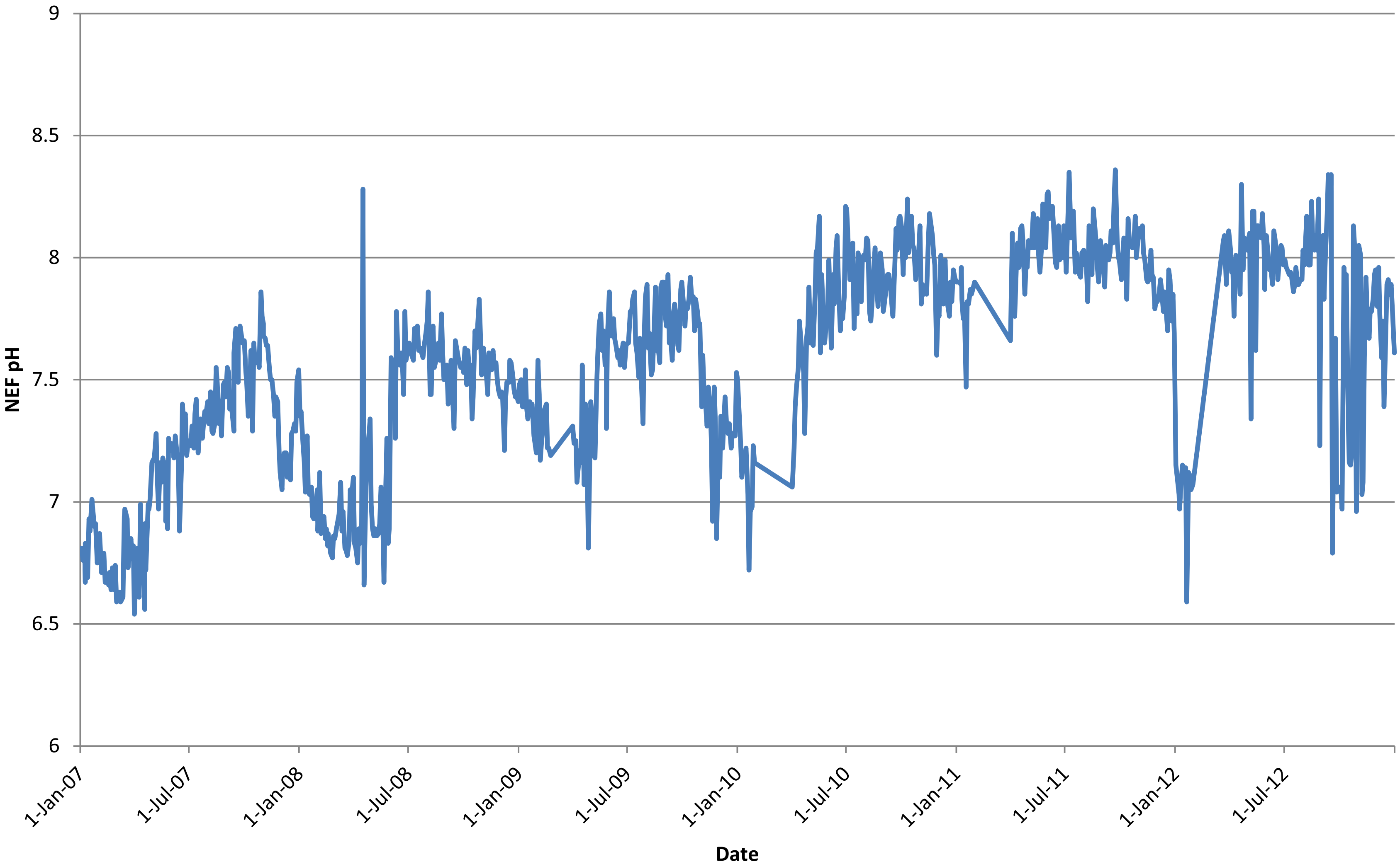


Figure A-1: NEF pH

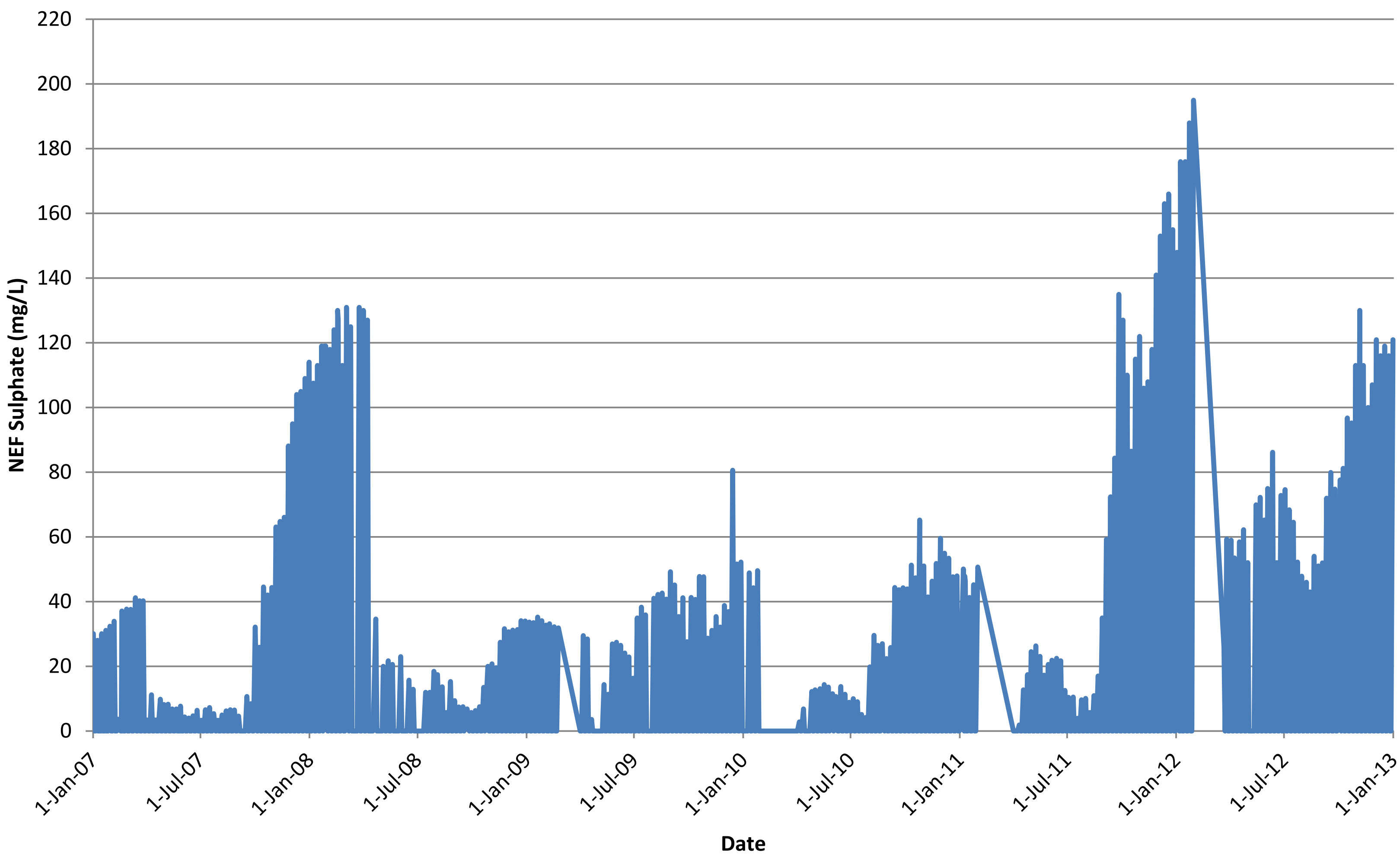


Figure A-2: NEF Sulphate (mg/L) All Data

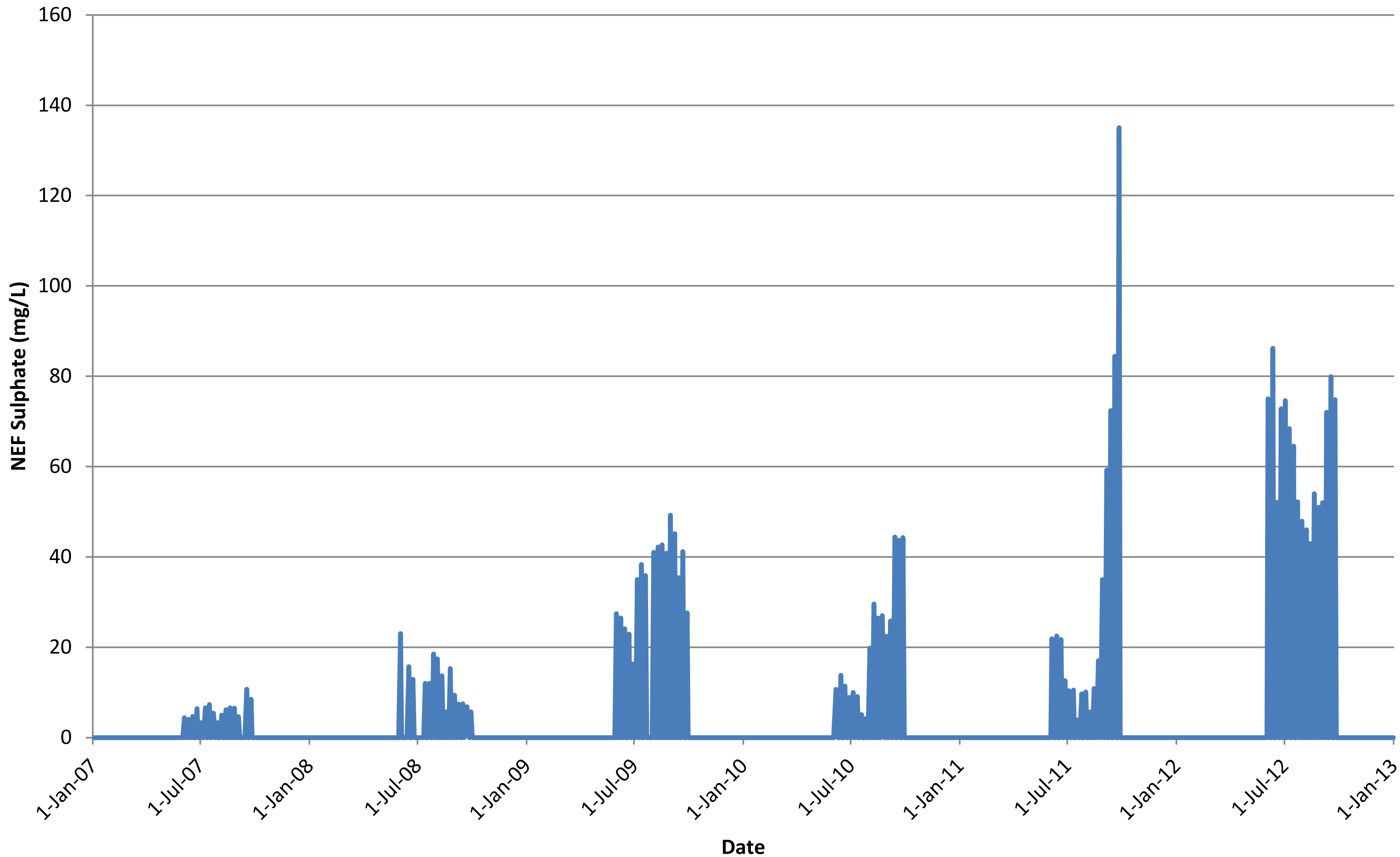


Figure A-3: NEF Sulphate (mg/L) June - September data only

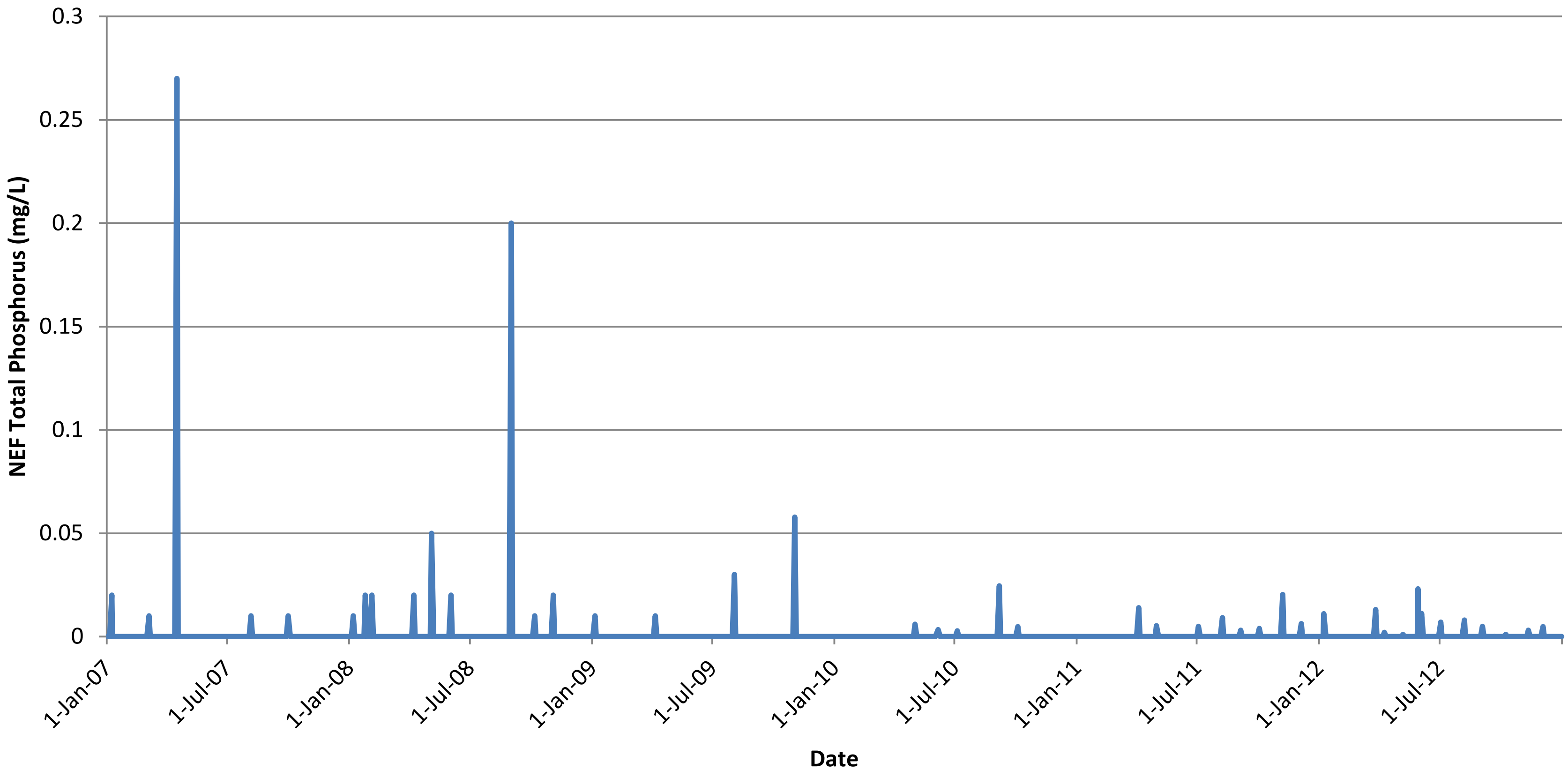


Figure A-4: NEF Total Phosphorus (mg/L)

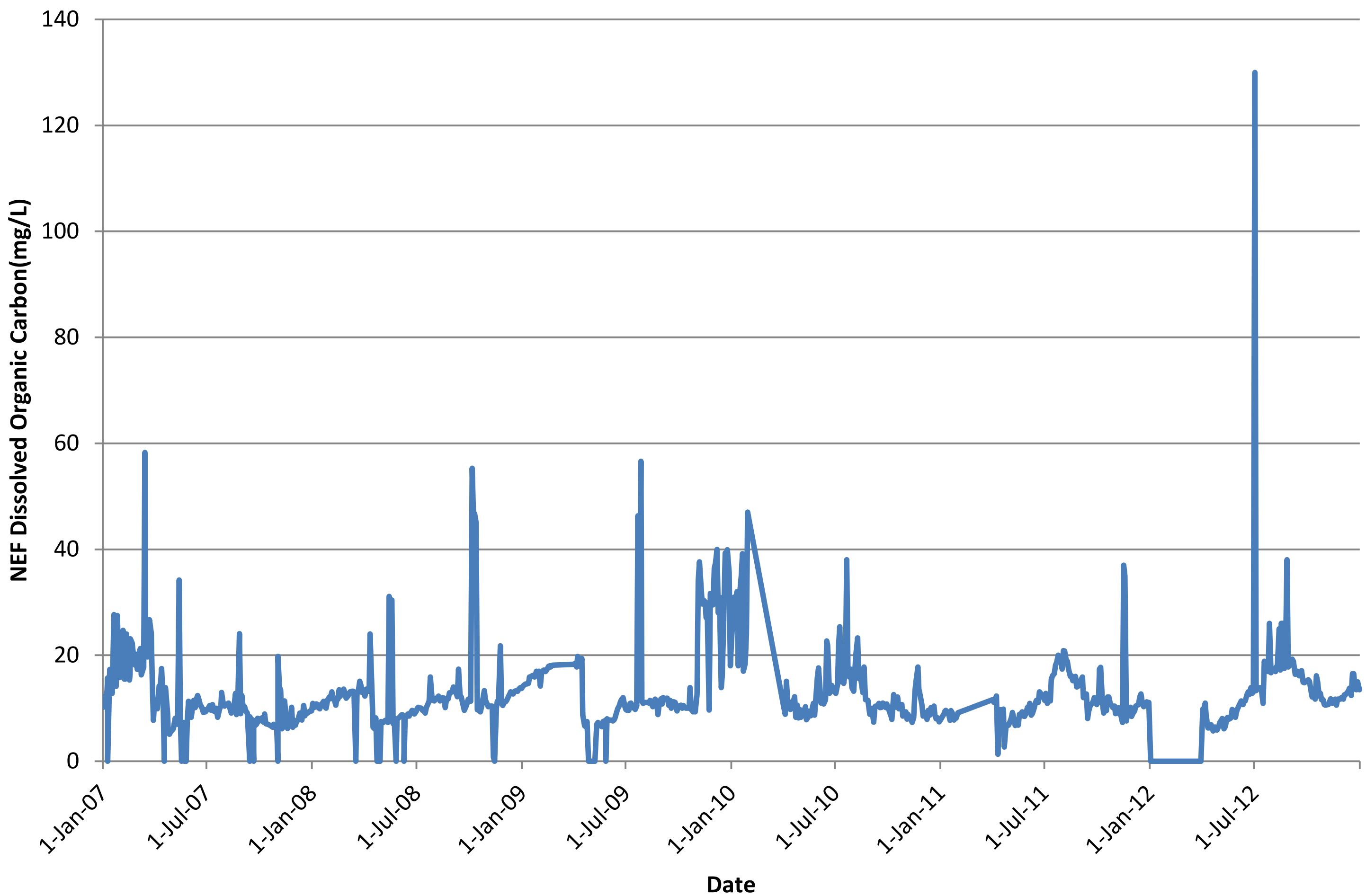


Figure A-5: NEF Dissolved Organic Carbon(mg/L)

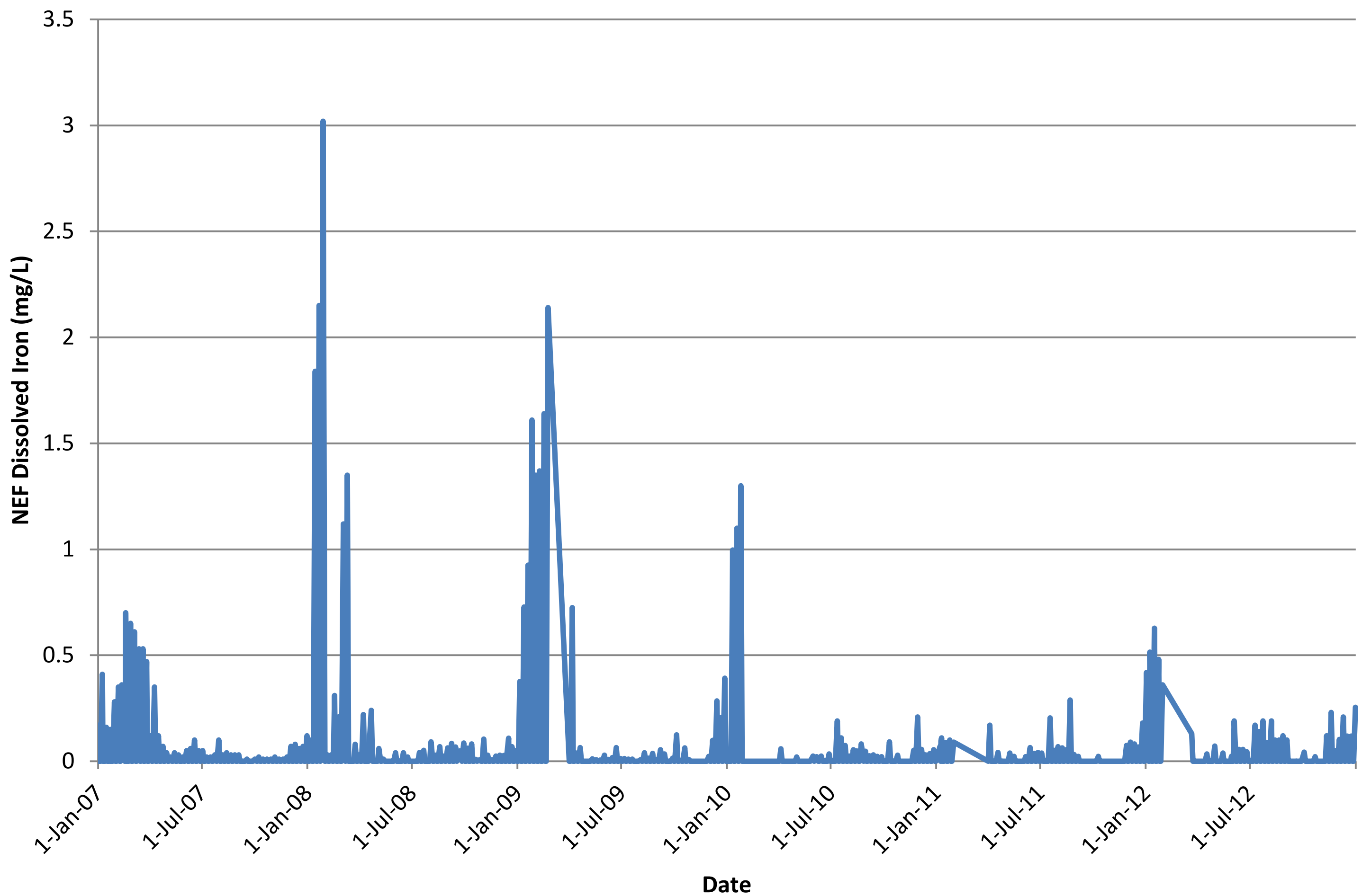


Figure A-6: NEF Dissolved Iron (mg/L)

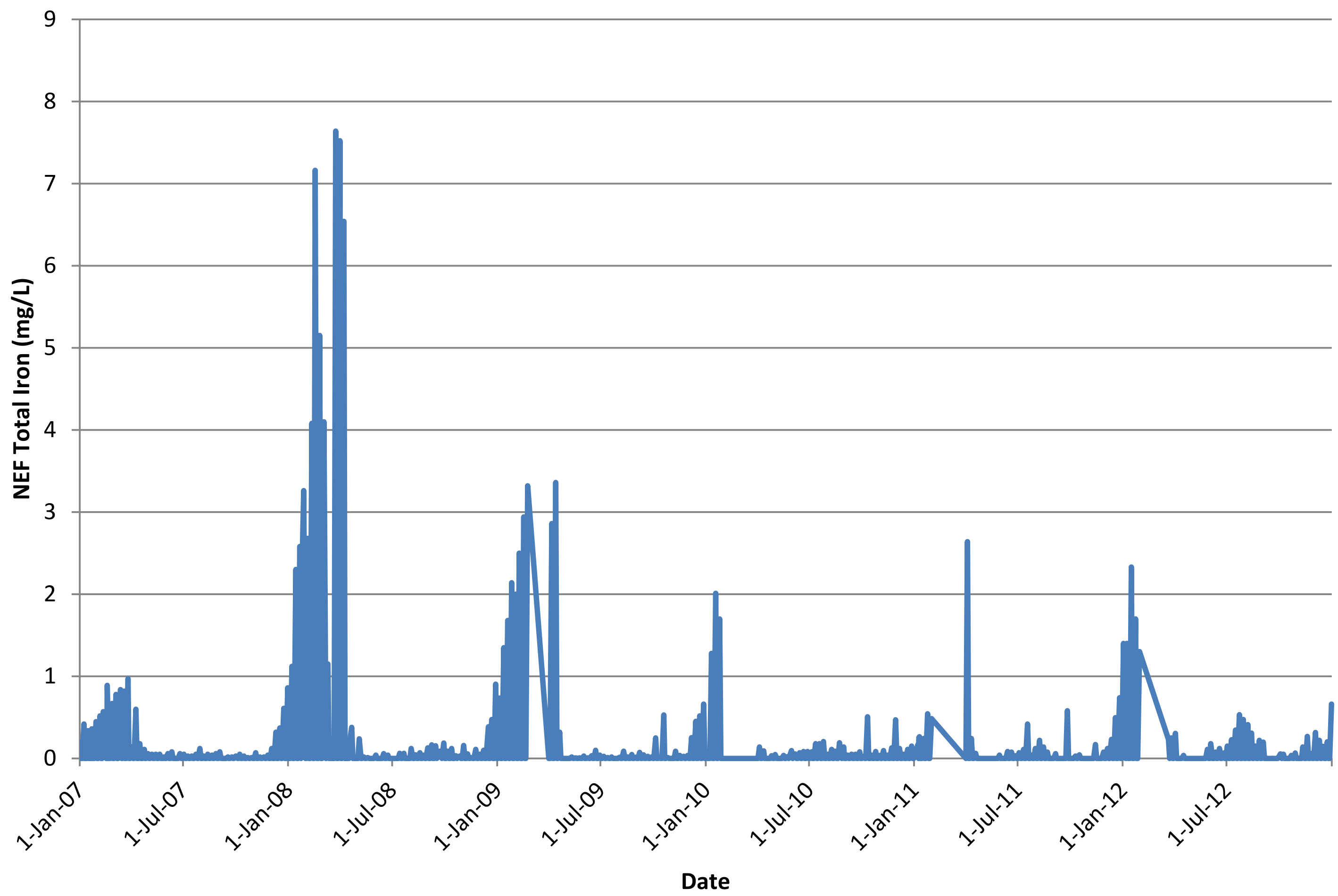


Figure A-7: NEF Total Iron (mg/L)

APPENDIX B

VICTOR MINE SITE PRECIPITATION DATA

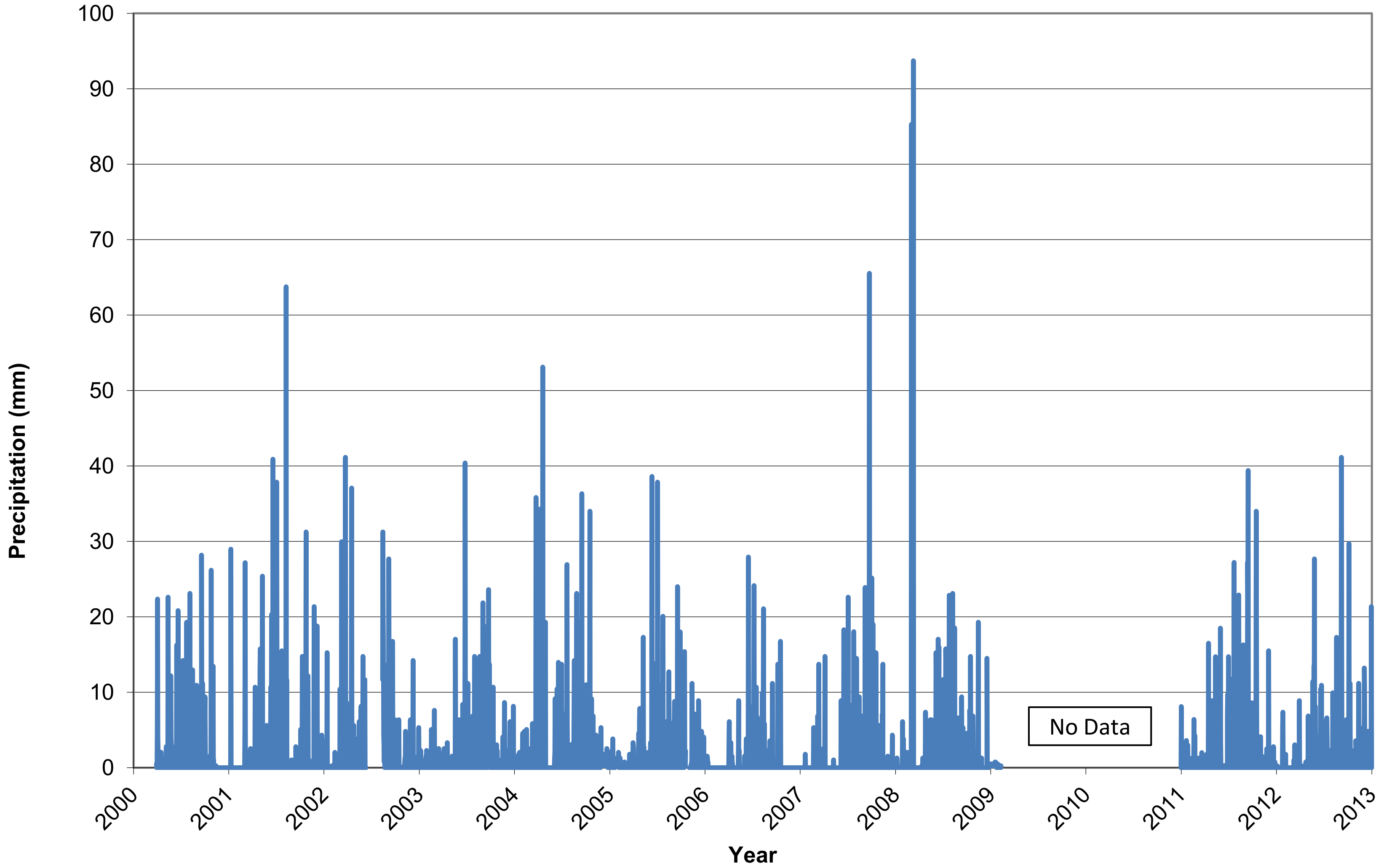


Figure B-1: Daily Precipitation (mm)