

**MI/DEQ/WB-06/045**

**MICHIGAN WATER CHEMISTRY MONITORING  
Great Lakes Tributaries**

**2004 Report**

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## SECTION 1.0

### HIGHLIGHTS

- The Michigan Water Chemistry Monitoring Project (WCMP) was initiated in 1998. This report summarizes results obtained from tributary monitoring efforts undertaken between March and November 2004. Results obtained from tributary monitoring efforts undertaken between March and November 2003 are summarized in the June 2005 report (MI/DEQ/WB-05/058) (Aiello, 2005). Additional tributary monitoring reports include MI/DEQ/WD-04/049, covering February through November 2002 (Aiello, 2004); MI/DEQ/WD-03/085, covering February through November 2001 (Aiello, 2003); MI/DEQ/SWQ-02/092, covering July through November 2000 (Aiello, 2002); and MI/DEQ/SWQ-02/025, covering June 1998 through September 1999 (Aiello and Smith, 2002).
- The WCMP was expanded in 2001 to more fully address the 4 goals identified in the January 1997 report entitled, "A Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters." These goals are:
  1. Assess the current status and condition of individual waters of the state and determine whether standards are being met.
  2. Measure temporal and spatial trends in the quality of Michigan's surface waters.
  3. Provide data to support the Michigan Department of Environmental Quality (MDEQ) water quality programs and evaluate their effectiveness.
  4. Detect new and emerging water quality problems.
- Samples were collected at 38 stations in 31 tributary watersheds in 2004. Sampling stations were located at or near the mouth of the main stream of each watershed; at a midreach location in selected large watersheds; and, for each in-monitoring-year watershed, at a location considered representative of the highest overall water quality to be found within the watershed (such locations are referred to in this report as minimally impacted sites).
- Eleven of 38 stations were sampled intensively (12 times) during periods of high flow and base/low flow, with an emphasis on the former. The remaining 27 stations were sampled nonintensively (4 times) without respect to stream flow conditions.
- Contaminants of interest at all stations included nutrients; conventionals; base/neutral organics; methyl tert butyl ether (MTBE); benzene, toluene, ethylbenzene, and xylene (BTEX); total cyanide (CN); and low level mercury (Hg) and trace metals. Contaminants designated as water quality indicators for purposes of comprehensive data analysis included total phosphorus, chloride, total suspended solids (TSS), Hg, chromium (Cr), copper (Cu), and lead (Pb); water quality indicators were sampled at all sampling events at all stations. Spatial trend analysis focused on water quality indicators, as will future temporal trend analyses.
- In 2004, polychlorinated biphenyls (PCBs) were sampled at selected stations, including all minimally impacted sites and 3 intensively monitored sites (the Au Sable, Pine, and Saginaw Rivers).

- Data analysis consisted of spatial comparisons, loading rate estimates, and comparisons with Michigan Rule 57 water quality values. Temporal trend analyses will be presented for the first time in the next WCMP report on Great Lakes tributary monitoring.
- The lowest concentration of total PCB was found in a sample collected at the Au Sable River (0.048 nanograms per liter [ng/L]), and the highest concentration was found in a sample collected at the Saginaw River (12 ng/L).
- Among stations for which total PCB loading rates were estimated, the Au Sable River contributed the smallest loadings (0.0002 kilograms per year [kg/year]), and the Saginaw River contributed the largest (37 kg/year).
- Total PCB concentrations exceeded the PCB Rule 57 water quality value of 0.026 ng/L in all samples collected.
- Among intensively monitored sites, the Au Sable River ranked lowest for median normalized total Hg (0.41 ng/L), Cr (0.065 micrograms per liter [ug/L]), Cu (0.28 ug/L), and Pb (0.049 ug/L). The Pine River ranked highest for Hg (5.8 ng/L) and Cr (2.2 ug/L), and the Clinton River ranked highest for Cu (4.3 ug/L) and Pb (2.4 ug/L).
- Among nonintensively monitored sites, the Thunder Bay River ranked lowest for median total Hg (0.48 ng/L) and Cr (0.06 ug/L); the Fox River ranked lowest for median total Cu (0.19 ug/L); and the Cheboygan River ranked lowest for median total Pb (0.039 ug/L). The River Rouge ranked highest for Hg (7.3 ng/L), Cr (2 ug/L), Cu (4.1 ug/L), and Pb (3.3 ug/L).
- Among stations for which contaminant loading rates were estimated, the Au Sable River contributed the smallest total Hg loadings (1 kg/year), Cr loadings (70 kg/year), Cu loadings (390 kg/year), and Pb loadings (70 kg/year) to the Great Lakes. The Saginaw River contributed the largest total Hg loadings (60 kg/year), Cr loadings (10,000 kg/year), Cu loadings (18,000 kg/year), and Pb loadings (13,000 kg/year) to the Great Lakes.
- All samples analyzed for total Cr, Cu, and Pb met applicable Michigan Rule 57 water quality values.
- All total Hg samples collected at 3 of the 38 stations sampled met the Hg Rule 57 water quality value of 1.3 ng/L; specifically, the Au Sable and Cheboygan Rivers, and the Tahquamenon River headwaters. At 31 monitoring stations, total Hg exceeded 1.3 ng/L in at least 50% of samples collected. The remaining 4 monitoring stations showed at least 1 sample in exceedance of the Hg Rule 57 water quality value.
- Among intensively monitored sites, the Au Sable River ranked lowest for median normalized total phosphorus (0.01 milligrams per liter [mg/L]) and TSS (<4 mg/L), and the Manistique River ranked lowest for median normalized total chloride (2 mg/L). The Clinton River ranked highest for phosphorus (0.12 mg/L) and chloride (172 mg/L), and the Pine River ranked highest for TSS (66 mg/L).
- Among nonintensively monitored sites, the Cheboygan River ranked lowest for median total phosphorus (0.006 mg/L), the Fox River and Tahquamenon River headwaters ranked lowest for median total chloride (1 mg/L), and Bellamy Creek and the Cheboygan River ranked lowest for median TSS (<4.0 mg/L). The Flint River ranked highest for phosphorus

(0.13 mg/L), and the River Rouge ranked highest for chloride (100 mg/L) and TSS (23 mg/L).

- Among stations for which contaminant loading rates were estimated, the Au Sable River contributed the smallest total phosphorus loadings (12 metric tons per year [mt/year]) and TSS loadings (2,500 mt/year) to the Great Lakes, while the Pine River contributed the smallest total chloride loadings (920 mt/year). The Saginaw River contributed the largest total phosphorus loadings (720 mt/year), total chloride loadings (260,000 mt/year), and TSS loadings (350,000 mt/year) to the Great Lakes.
- Concentrations of most water quality indicators at most minimally impacted sites were lower than or comparable to those measured at their respective potentially impacted sites. One exception was Hg at Anderson Creek - minimally impacted site for the Manistee River. Median Hg concentrations at Anderson Creek were 2.35 ng/L, compared with 1.38 ng/L at the Manistee River. Anderson Creek Hg concentrations ranged from 0.69 – 4.6 ng/L, compared with 0.55 – 2.7 ng/L at the Manistee River. Differences were not statistically significant ( $p > 0.05$ )
- All but 3 samples analyzed for total CN were below analytical quantification (5.0 ug/L). All samples below analytical quantification met the Michigan Rule 57 water quality value for free CN (5.2 ug/L). Samples collected at the Upper Grand, Pere Marquette, and Upper Muskegon Rivers had total CN concentrations of 6 ug/L, 7 ug/L, and 7 ug/L, respectively, and may have exceeded the Michigan Rule 57 water quality value for free CN, although a definitive determination cannot be made based on these results.
- All samples analyzed for base/neutral organics, MTBE, and BTEX met applicable Michigan Rule 57 water quality values.

## SECTION 2.0

### INTRODUCTION

In June 1998, the MDEQ, Water Bureau (WB), initiated the WCMP using part of a \$500,000 appropriation by the state Legislature. This project was a first step towards improving water quality monitoring in Michigan since funding reductions imposed in the mid-1990s resulted in severely restricted monitoring capabilities. Past limitations in analytical quantification levels further restricted the effectiveness of monitoring activities. Technological advances in affordable, low-concentration analytical techniques incorporated into the WCMP have made it possible to assess Michigan's surface waters for bioaccumulative chemicals of concern, such as Hg and PCBs, at environmentally relevant levels.

The WCMP is an important component of the statewide surface water quality monitoring activities outlined in the January 1997 report prepared by the MDEQ, WB, and the MDEQ, Land and Water Management Division, entitled, "A Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters" (Strategy). The WCMP incorporates the goals of the Strategy, which are:

1. Assess the current status and condition of individual waters of the state and determine whether standards are being met.
2. Measure temporal and spatial trends in the quality of Michigan's surface waters.
3. Provide data to support MDEQ water quality programs and evaluate their effectiveness.
4. Detect new and emerging water quality problems.

As initiated in 1998, the WCMP called for annual water chemistry monitoring at selected Michigan streams tributary to the Great Lakes, and at Great Lakes connecting waters, Saginaw Bay, and Grand Traverse Bay. With the November 1998 passage of the Clean Michigan Initiative bond proposal, a substantial increase in annual funding became available for statewide surface water quality monitoring beginning in 2000. The study design of the WCMP was subsequently modified and expanded to help ensure implementation of statewide water chemistry monitoring activities capable of more fully realizing the goals set forth in the Strategy.

This report describes the current study design of that portion of the WCMP which targets tributary watersheds, and presents and discusses results from monitoring efforts undertaken March through November 2004 within these watersheds. Details of the complete WCMP study design are presented in Great Lakes and Environmental Assessment Section Procedure 58: Water Quality Monitoring (available upon request from the MDEQ, WB, or on the MDEQ's Web page at <https://www.Michigan.gov/waterquality>, then select Assessment of Michigan Waters, and then under Monitoring Elements select Water Chemistry).

Results obtained from tributary monitoring efforts undertaken in 1998-2003 are summarized in the following annual reports: MI/DEQ/WB-05/058 (2003) (Aiello, 2005); MI/DEQ/WD-04/049 (2002) (Aiello, 2004); MI/DEQ/WD-03/085 (2001) (Aiello, 2003); MI/DEQ/SWQ-02/092 (2000) (Aiello, 2002); and MI/DEQ/SWQ-02/025 (1998-1999) (Aiello and Smith, 2002). Results obtained from monitoring efforts undertaken in 2001-2003 at Saginaw Bay and Grand Traverse Bay are presented and discussed with previously published results in the March 2003 report entitled, "Water Quality Monitoring of Saginaw Bay and Grand Traverse Bay" (MI/DEQ/WB-05/042) (Great Lakes Environmental Center [GLEC], 2005). Results obtained from monitoring

efforts undertaken in 2003 on Great Lakes connecting waters are presented and discussed with previously published results in the report entitled, "Great Lakes Connecting Channels Data Evaluation and Trend Analysis Report" (MI/DEQ/WB-05/049) (GLEC and LimnoTech, 2005). These reports are available upon request from the MDEQ, WB, or on the MDEQ's Web page at <https://www.michigan.gov/waterquality>, then select Water Quality Monitoring, then select Assessment of Michigan Waters, and then under Monitoring Elements select Water Chemistry).

In accordance with one of the key principles of the Strategy, the WCMP was planned and conducted in partnership with several outside organizations. In 2004, these included the United States Geological Survey (USGS); MDEQ, Environmental Science and Services Division, Laboratory Section; the Wisconsin State Laboratory of Hygiene (WSLH); and the GLEC. The WCMP is coordinated by the MDEQ, WB.

## SECTION 3.0

### STUDY DESIGN AND METHODS

A total of 38 stations in 31 tributary watersheds were monitored between March and November 2004 as part of the WCMP. This report summarizes all available analytical results from samples collected during this period.

#### 3.1 WATERSHED SELECTION, STATION SELECTION, AND MONITORING SCHEDULES

When the study design of the WCMP was enhanced in 2000, one primary objective was consistency with existing MDEQ programs and activities to ensure that monitoring would contribute to resource management decisions. This objective led to adapting the WCMP to the 5-year rotating permit basin cycle defined and utilized by the National Pollutant Discharge Elimination System (NPDES) permitting program. Consistent with this cycle, the WCMP recognizes 45 watershed units. Each watershed unit is based on drainage to 1 of the 4 Great Lakes and is allocated to 1 of 5 monitoring years. Figure 1 shows the watershed units allocated to monitoring year 3, which coincides with 2004. Figures 2-5 show the watershed units allocated to monitoring years 4, 5, 1, and 2, which coincide with 2005, 2006, 2007, and 2008, respectively.

Of the 45 watershed units recognized, 31 were selected for placement of water chemistry monitoring stations within the WCMP. The locations of these 31 monitoring stations were selected based on consideration of a number of criteria, including surrounding land use, availability of historical water quality data, proximity to USGS stream flow gauging stations, accessibility, and avoidance of stream reaches subject to flow reversals (although this objective was not achievable on the Saginaw River). These 31 monitoring stations were categorized as either intensive sites or integrator sites. Integrator sites are further categorized as either intensively or nonintensively monitored; this categorization changes depending upon monitoring year.

Additionally, one minimally impacted site was located within each of the watersheds described above, with the exception of the Muskegon and Kalamazoo River watersheds, each of whose upper and lower reaches share a minimally impacted site. Minimally impacted sites are chosen to provide data on the best water quality that can be expected within each watershed, and are further categorized as nonintensively monitored sites. Watershed selection and monitoring schedules are described below.

##### 3.1.1 Intensive Sites

Of the 31 watersheds selected for placement of monitoring stations, the following 6 were chosen for intensive sampling annually, irrespective of monitoring year: Au Sable, Clinton, Lower Grand, Lower Kalamazoo, Lower Muskegon, and Saginaw River watersheds (Figure 6). High flow volume and known or expected contamination were important watershed selection criteria in the intensive sites category, as these combined factors are associated with the most significant sources of contaminant loading to the Great Lakes. Monitoring stations were located at or near the mouth of the main stream within each watershed. Table 1 provides detailed station location information.

Intensive sites are sampled 12 times per year on a flow-stratified schedule beginning with the first significant snowmelt or spring rain event and continuing through November. Of these 12 samples, approximately 75% are to be collected at each site during high flow events and the remaining 25% are to be collected during base/low flow. A high flow event is defined by one or more of the following conditions: stream flow at or above the 20% exceedance flow; an increase in stream flow of approximately 100% above the preceding base flow condition; or an increase in stream flow following a lengthy period of discharge at base flow and considered likely to produce a measurable change in the concentration of sampled constituents. This monitoring schedule was adopted specifically for those contaminants for which loading rate estimates would be calculated, based on its application in the Lake Michigan Mass Balance Project (United States Environmental Protection Agency [USEPA], 1997a); not all contaminants monitored at intensive sites are sampled according to this schedule (see Section 3.2 of this report for details).

### **3.1.2 Integrator Sites**

The 25 of 31 watersheds not chosen for intensive sampling annually are designated as integrator sites within the WCMP (Figure 7). Integrator sites represent water quality conditions of major streams and rivers in large, heterogeneous basins. Monitoring stations associated with integrator sites are generally located at or near the mouth of the main stream; however, 4 monitoring stations associated with integrator sites are located midreach, to represent the upper reaches of the largest watersheds. Midreach monitoring stations are located on the St. Joseph, Kalamazoo, Grand, and Muskegon Rivers. Table 1 provides detailed station location information.

Integrator sites are sampled intensively on a staggered, 5-year rotation. Once every 5 years (consistent with the NPDES permitting program's basin year cycle), each integrator site will be sampled 12 times on a flow-stratified schedule identical to that adopted for intensive sites. As with intensive sites, this schedule allows for calculation of estimated loading rates for selected contaminants. During the other 4 years in this 5-year cycle, integrator sites are sampled 4 times per year. These sampling events are prearranged within the period between ice breakup and November, irrespective of stream flow.

### **3.1.3 Minimally Impacted Sites**

Monitoring year 3 (2004) watersheds included the Clinton, Lower Grand, Kalamazoo, Manistee, Manistique, Pine, and Tahquamenon River watersheds. The minimally impacted sites selected to represent each of these in-monitoring-year watersheds included the North Branch Clinton River, Bellamy Creek, the South Branch Kalamazoo River, Anderson Creek, Fox River, Bear Creek, and the Tahquamenon River headwaters, respectively. These sites were believed to represent the best water quality that might be expected within each in-monitoring-year watershed, based on consideration of both water chemistry and biota. Data obtained from minimally impacted sites allow for a comparison of water chemistry data collected at downstream, potentially impacted sites in a watershed, to the minimally impacted site.

Minimally impacted sites are sampled nonintensively on a staggered, 5-year rotation. Once every 5 years (again, consistent with the NPDES permitting program's basin year cycle), each minimally impacted site is sampled 4 times per year. As with nonintensively monitored integrator sites, sampling events are prearranged within the period between ice breakup and November, irrespective of stream flow.

## **3.2 SAMPLE COLLECTION AND CHEMICAL ANALYSES**

Sample collection and chemical analyses are discussed below by analyte category. All participating analytical laboratories have quality assurance programs and use peer-reviewed analytical methods.

### **3.2.1 Nutrients, Conventionals, Cyanide, Base/Neutral Organics, MTBE, and BTEX**

The nutrient and conventional parameters identified in Table 2 were measured at all stations during each sampling event. Table 2 also provides quantification levels where applicable. Field measurements of dissolved oxygen, temperature, pH, and specific conductance were taken during each sampling event using a multiparameter water quality monitoring device.

Samples for analysis of total CN were added to the WCMP in 2001 to support the Strategy's goal to detect new and emerging water quality problems. Concern over potential CN contamination of Michigan's surface waters developed following information obtained from the Minnesota Pollution Control Agency (Drullinger, 2000). This information indicated that winter and spring runoff from stored piles of road salt may contain ferro cyanide, which is commonly used as an anticlumping agent and which under certain conditions may convert to a form of CN that is toxic to aquatic life. All total CN results obtained from monitoring efforts undertaken in 2001 were below the Michigan Rule 57 water quality value of 5.2 ug/L. In 2004, monitoring for total CN continued at a rate of one sample per station, as a spot-checking measure. Samples were collected during the earliest part of the sampling period when snow melt and/or early spring rains were present. Total CN is included with its analytical quantification level and Michigan Rule 57 water quality value in Table 2.

Samples for analysis of selected base/neutral organics, MTBE, and BTEX were added to the WCMP in 1999 to support the Strategy's goal to detect new and emerging water quality problems. Monitoring for these analytes continued in 2004 at a rate of one sample per station during the base/low flow season. This rate was established as a spot-checking measure after more frequent sampling in 1999 yielded very few results above analytical quantification. The base/neutral organics analyzed are identified in Table 3 along with analytical quantification levels and, where available, Michigan Rule 57 water quality values. BTEX and MTBE are listed with analytical quantification levels and Michigan Rule 57 water quality values in Table 4.

In most cases, grab samples were collected from a single point in the flow of the stream at approximately 0.3-1.0 meter depth. A subset of grab samples were collected using the method described for PCBs in Section 3.2.3. Samples were collected and handled in accordance with MDEQ-approved procedures (available upon request), and were analyzed by the MDEQ, Environmental Laboratory.

### **3.2.2 Mercury and Trace Metals**

Samples for total Hg and trace metals were collected at all stations during each sampling event, and were analyzed by the WSLH. All metals analyzed are shown in Table 5 with analytical detection and quantification levels. Sample collection and handling was carried out in accordance with USEPA Method 1669, "Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels" (USEPA, 1996a). Samples were collected from a single point in the flow of the stream at approximately 0.3-1.0 meter depth.



Total Hg samples were analyzed by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, consistent with USEPA Method 1631 (USEPA, 2001a). Samples were analyzed for the trace metals cadmium (Cd), Cr, Cu, Pb, nickel (Ni), and zinc (Zn) by Inductively Coupled Plasma – Mass Spectrometry, consistent with USEPA Method 1638 (USEPA, 1996b).

### **3.2.3 Polychlorinated Biphenyls**

During 2000-2003 of the WCMP, PCBs were sampled at all monitoring stations at a rate of at least one sample per station, for purposes of statewide spot checks of this contaminant. This approach enabled limited spatial comparisons, and comparisons with Michigan Rule 57 water quality values. Results during that 4-year period showed that all but 1 of the 229 PCB samples collected had a total PCB concentration in exceedance of the Michigan PCB Rule 57 water quality value (0.026 ng/L).

In 2004, the study design of the WCMP was modified with respect to PCBs. Minimally impacted sites scheduled for sampling in 2004 were each sampled once for PCBs, as in prior years; however, remaining PCB sampling efforts were focused on 3 monitoring stations (the Au Sable, Pine, and Saginaw Rivers), each of which was sampled intensively for PCBs. This approach ensured that minimally impacted sites for all WCMP watersheds were sampled at least once for PCBs, but it also enabled PCB loading rate estimates to be calculated for selected tributaries.

PCB samples were collected in accordance with the sample collection and handling protocol described in the “Lake Michigan Mass Balance Study Methods Compendium, Volume 1: Sample Collection Techniques” (USEPA, 1997a). A 160 liter sample volume was obtained by drawing water from 2 depths (at 0.2 and 0.8 of the total stream depth) at each of 3 points in a transect (at 0.25, 0.5, and 0.75 of the stream channel width). The WSLH performed the chemical analyses in accordance with the analytical protocol described in the “Lake Michigan Mass Balance Study Methods Compendium, Volume 2: Organic and Mercury Sample Analysis Techniques” (USEPA, 1997b), with the exception that dissolved and particulate fractions were combined. Table 6 shows all PCB congeners analyzed, along with their analytical detection and quantification levels.

## **3.3 SUMMARY STATISTICS**

Summary statistics presented in this report include measures of central tendency, spatial comparisons, loading rate estimates, and comparisons with Michigan Rule 57 water quality values. Temporal trend analyses require larger data sets than are currently available, and will be presented for the first time in the next WCMP report on Great Lakes tributary monitoring.

### **3.3.1 Handling of Coded and Censored Data**

Coded data, censored data, and data below analytical quantification or detection levels, and the handling of these in the development of summary statistics, are discussed by analyte category, below. Table 7 provides a comprehensive list of laboratory result remark codes relevant to WCMP data, along with their definitions.

### **3.3.1.1 Nutrients, Conventionals, Cyanide, Base/Neutral Organics, MTBE, and BTEX**

In many cases, the MDEQ, Environmental Laboratory sensors (i.e., does not report) observed concentrations below analytical quantification. In such cases, the laboratory reports only nondetect (ND).

It is impossible to calculate the true mean of a data set containing censored data. In such cases, mean concentrations were calculated using half the quantification level in place of censored values. Calculated means were then footnoted to indicate that estimated values were used. Estimated values were likewise used in spatial comparisons and calculations of estimated contaminant loading rates developed for this report. Results coded with a T or W were used, unmodified, in all calculations.

Occasionally, due to travel distances and day or time of sample collection, field staff were unable to deliver samples to the laboratory in time to meet the recommended maximum holding times before analysis for certain analytes; the analytical results for such samples are coded H by the laboratory. Results coded H are considered sufficiently reliable for use in the development of all summary statistics prepared for the WCMP (MDEQ, 1999).

### **3.3.1.2 Mercury and Trace Metals**

Total Hg and trace metal concentrations below analytical quantification or detection levels were reported and were used in all calculations, as were all coded results. Sample results below the WSLH's daily instrument calibration blank were reported as zero by the WSLH, and these zero values were used in all calculations.

### **3.3.1.3 Polychlorinated Biphenyls**

Total PCB concentrations were estimated by summing the concentrations of the individual and coeluting congeners identified in Table 6. Congener concentrations below analytical quantification or detection levels were reported and used in calculating total PCB. Congener concentrations not detected above noise were reported as zero by the WSLH, and zero values were used for the purpose of calculating total concentrations. In samples where the presence of uncontrollable interference made analysis impossible, the WSLH reported "not analyzed due to uncontrollable interference" (NAI) in place of a result. Such congeners were assigned a concentration equal to zero for the purpose of calculating total PCB concentrations. If all congeners in a given sample were coded NAI, then total PCB for that sample was reported as NAI, and that sample was not counted in developing summary statistics. In some cases, sample dilution was necessary to bring analyte concentration ranges within the instrument calibration range. Occasionally, as a result of dilution, congeners already present in low concentrations could not be detected after dilution. In such cases, the WSLH reported "not detected due to dilution" (NDD) in place of a result. Such congeners were assigned a concentration equal to zero for the purpose of calculating total concentrations.

### **3.3.2 Measures of Central Tendency**

Where possible, arithmetic mean and median concentrations were calculated for each analyte at each monitoring station.

### **3.3.3 Spatial Comparisons**

Graphs were developed showing concentrations of all designated water quality indicators, as well as total PCB measured at each monitoring location. Comparisons were made among stations sampled at the same frequency (i.e., intensively or nonintensively), and between minimally impacted sites and associated downstream, potentially impacted sites. Where necessary to render differences among data groups more readily discernible, data were logarithmically transformed.

The current implementation of the WCMP does not include a randomized sampling component. The use of water quality information yielded by the WCMP is therefore restricted to sites that have actually been sampled; this information cannot be extrapolated to unsampled sites. Consequently, the WCMP is currently limited in its ability to provide information that helps the MDEQ, WB, formulate conclusions concerning water quality throughout the state. In 2005, a randomized sampling design component was added to the WCMP, from which the first results will be published in 2007.

### **3.3.4 Loading Rate Estimates**

Loading rate estimates were calculated for all water quality indicators from intensively monitored sites, and for total PCB from the Au Sable, Pine, and Saginaw Rivers. Calculations were performed using the Stratified Beale Ratio Estimator described by Richards (1994).

### **3.3.5 Comparisons with Michigan Rule 57 Water Quality Values**

Data obtained for Hg and trace metal water quality indicators, as well as data obtained for total CN, base/neutral organics, MTBE, BTEX, and total PCB, were compared with applicable Rule 57 water quality values. These values were developed in accordance with the Michigan Part 4 Rules (MAC, 2006).

For Hg, the applicable Rule 57 water quality value is the wildlife value; and for Cr, Cu, and Pb, the applicable Rule 57 water quality value is the final chronic value (FCV). The FCV for Cr, Cu, and Pb is hardness-dependent and was calculated for each tributary watershed using tributary-specific hardness data. Ambient Cr, Cu, and Pb concentrations are for total metal, whereas the FCVs for these trace metals are expressed as dissolved metal; therefore, a direct comparison between ambient total Cr, Cu, and Pb concentrations and their Rule 57 water quality values cannot be made. This is not an important consideration when the ambient total metal concentration meets the applicable Rule 57 water quality value; however, when it exceeds this value, the available data cannot show whether the ambient concentration of dissolved metal exceeds the Rule 57 water quality value. Additional, more sophisticated monitoring would be necessary to resolve an ambiguity of this nature, and caution must be exercised when drawing conclusions from the available data.

For CN, MTBE, and BTEX, the applicable Rule 57 water quality value is the FCV. Ambient CN concentrations are expressed as total CN, whereas the FCV for this contaminant is expressed as free CN; therefore, as with the trace metals discussed above, a direct comparison between ambient total CN concentrations and the Rule 57 water quality value cannot be made.

For base/neutral organics, the applicable Rule 57 water quality value differs among the 28 of 50 chemicals in this category for which these values have been developed (see Section 4.4.2 for

further details). Base/neutral organics and (where available) their Rule 57 water quality values are shown in Table 3.

For total PCB, the applicable Rule 57 water quality value is the human cancer value.

### **3.3.6 Temporal Trend Analyses**

Measurement of temporal trends is one of the key goals of the WCMP; however, temporal trend analyses require relatively large data sets and will therefore be presented for the first time in the next WCMP report on Great Lakes tributary monitoring. The WCMP will evaluate temporal trends in all designated water quality indicators (i.e., total phosphorus, chloride, TSS, Hg, Cr, Cu, and Pb).

## SECTION 4.0

### RESULTS, SUMMARY STATISTICS, AND DISCUSSION

Field staff collected a total of 240 water samples at Great Lakes tributaries between March and November 2004. Table 8 lists all fixed WCMP monitoring stations along with year(s) sampled since the WCMP was initiated in 1998.

#### 4.1 MEASURES OF CENTRAL TENDENCY

Analytical results and measures of central tendency are presented for all analytes in Appendix A.

#### 4.2 SPATIAL COMPARISONS

Concentrations of designated water quality indicators were compared among monitoring stations sampled at the same frequency (i.e., intensively or nonintensively), and between minimally impacted sites and associated downstream, potentially impacted sites. A comparison of mean total phosphorus, chloride, and TSS concentrations among all intensive and integrator sites is also provided (see Figures 31, 32, and 33, respectively). Concentrations of total PCB were compared among all stations. Where censored values were present in a data set, estimated values were used in their place.

##### 4.2.1 Spatial Comparisons Among Intensively Monitored Sites

Monitoring for total phosphorus, chloride, TSS, Hg, Cr, Cu, and Pb took place at 11 intensively monitored sites, including intensive sites and intensively monitored integrator sites, in 2004 (Table 1). These sites were ranked lowest to highest according to median normalized contaminant concentration, and the resulting graphs (Figures 8-14) are discussed below.

###### 4.2.1.1 *Phosphorus, Chloride, and Suspended Solids*

Among intensively monitored sites, the Au Sable River ranked lowest for median normalized total phosphorus (0.01 mg/L) and TSS (<4 mg/L), and the Manistique River ranked lowest for chloride (2 mg/L). The Clinton River ranked highest for median normalized total phosphorus (0.12 mg/L) and chloride (172 mg/L), and the Pine River ranked highest for TSS (66 mg/L). In comparison, historic (1967-1968) background water quality stream data published by the Michigan Department of Natural Resources (MDNR, 1970) show statewide median total chloride and TSS concentrations of 8 mg/L and 11 mg/L, respectively. Similar data for total phosphorus were not published in that MDNR report; however, the USEPA published more recent (1990-2000) stream data representing reference conditions in Michigan, and an estimated median concentration of 0.061 mg/L total phosphorus was derived from those data (USEPA, 2001b; 2000a; and 2000b).

###### 4.2.1.2 *Mercury and Trace Metals*

Among intensively monitored sites, the Au Sable River ranked lowest for median normalized total Hg (0.41 ng/L), Cr (0.065 ug/L), Cu (0.28 ug/L), and Pb (0.049 ug/L). The Pine River

ranked highest for median normalized total Hg (5.8 ng/L) and Cr (2.2 ug/L), and the Clinton River ranked highest for Cu (4.3 ug/L) and Pb (2.4 ug/L).

#### **4.2.2 Spatial Comparisons Among Nonintensively Monitored Sites**

Monitoring for total phosphorus, chloride, TSS, Hg, Cr, Cu, and Pb took place at 27 nonintensively monitored sites, including minimally impacted sites, in 2004 (Table 1). These sites were ranked lowest to highest according to median actual contaminant concentration, and the resulting graphs (Figures 15-21) are discussed below.

##### **4.2.2.1 Phosphorus, Chloride, and Suspended Solids**

Among nonintensively monitored sites, the Cheboygan River ranked lowest for median total phosphorus (0.006 mg/L), the Fox River and Tahquamenon River headwaters ranked lowest for chloride (1 mg/L), and Bellamy Creek and the Cheboygan River ranked lowest for TSS (<4.0 mg/L). The Flint River ranked highest for median total phosphorus (0.13 mg/L), and the River Rouge ranked highest for chloride (100 mg/L) and TSS (23 mg/L). Background concentrations of these contaminants are discussed in Section 4.2.1.1.

##### **4.2.2.2 Mercury and Trace Metals**

Among nonintensively monitored sites, the Thunder Bay River ranked lowest for median total Hg (0.48 ng/L) and Cr (0.06 ug/L); the Fox River ranked lowest for Cu (0.19 ug/L); and the Cheboygan River ranked lowest for Pb (0.039 ug/L). The River Rouge ranked highest for median total Hg (7.3 ng/L), Cr (2 ug/L), Cu (4.1 ug/L), and Pb (3.3 ug/L).

#### **4.2.3 Spatial Comparisons Between Minimally Impacted and Potentially Impacted Sites**

Comparisons between minimally impacted sites and associated downstream, potentially impacted sites are presented in Figures 23-29 for concentrations of water quality indicators measured at each location in 2004. Data sets obtained at minimally impacted sites were not large enough to support normalization to stream discharge; therefore, comparisons were made using actual contaminant concentrations. The diagram shown in Figure 22 gives an explanation of the features of a typical box plot and provides a means of interpreting the box plot graphs presented in Figures 23-29.

For most water quality indicators at most minimally impacted sites, concentrations were lower than or comparable to those measured at respective potentially impacted sites. One exception was Hg at Anderson Creek - minimally impacted site for the Manistee River. Median total Hg concentrations at Anderson Creek were 2.35 ng/L, compared with 1.38 ng/L at the Manistee River. Anderson Creek Hg concentrations ranged from 0.69-4.6 ng/L, compared with 0.55-2.7 ng/L at the Manistee River. Differences were not statistically significant ( $p > 0.05$ ).

#### **4.2.4 Polychlorinated Biphenyls**

In 2004, minimally impacted sites were each sampled once for PCBs, while the Au Sable, Pine, and Saginaw Rivers were sampled intensively for PCBs. The graph presented in Figure 30 shows all stations ranked lowest to highest according to total PCB concentration; median concentrations were used to rank intensively sampled sites. The lowest concentration of total

PCB was found in a sample collected at the Au Sable River (0.048 ng/L), and the highest concentration was found in a sample collected at the Saginaw River (12 ng/L).

### **4.3 LOADING RATE ESTIMATES**

Loading rate estimates of designated water quality indicators were calculated for stations in the intensive and intensively monitored integrator site categories. PCB loading rate estimates were also calculated for the Au Sable, Pine, and Saginaw Rivers. Results of these calculations are presented in Table 9, along with actual mean contaminant concentrations, mean stream flows based on flow measurements taken during the sampling period, and the 95% confidence intervals associated with the loading rate estimates. Stations are shown in the tables ranked from highest to lowest estimated loading rate for each contaminant.

Hydrographs of stream flow discharge are presented in Figures 34-44 for each station for which contaminant loading rates were estimated. In addition to showing mean daily stream flow associated with the sampling period, most of these figures also show the range of stream flow, represented by the 25th and 75th percentiles, calculated from historic stream flow data available for each station (this information could not be calculated for the Lower Kalamazoo River due to insufficient data).

#### **4.3.1 Phosphorus, Chloride, and Suspended Solids**

Among stations for which contaminant loading rates were estimated, the Au Sable River contributed the smallest total phosphorus loadings (12 mt/year) and TSS loadings (2,500 mt/year) to the Great Lakes, while the Pine River contributed the smallest total chloride loadings (920 mt/year). The Saginaw River contributed the largest total phosphorus loadings (720 mt/year), total chloride loadings (260,000 mt/year), and TSS loadings (350,000 mt/year) to the Great Lakes.

#### **4.3.2 Mercury and Trace Metals**

Among stations for which contaminant loading rates were estimated, the Au Sable River contributed the smallest total Hg loadings (1 kg/year), Cr loadings (70 kg/year), Cu loadings (390 kg/year), and Pb loadings (70 kg/year) to the Great Lakes. The Saginaw River contributed the largest total Hg loadings (60 kg/year), Cr loadings (10,000 kg/year), Cu loadings (18,000 kg/year), and Pb loadings (13,000 kg/year) to the Great Lakes.

#### **4.3.3 Polychlorinated Biphenyls**

Among stations for which total PCB loading rates were estimated, the Au Sable River contributed the smallest loadings (0.0002 kg/year), and the Saginaw River contributed the largest (37 kg/year).

### **4.4 COMPARISONS WITH MICHIGAN RULE 57 WATER QUALITY VALUES**

Analyte concentrations were compared with their applicable Rule 57 water quality value. Exceedance rate is represented by the number of individual samples in exceedance of the applicable Rule 57 water quality value/the total number of analyses completed for that contaminant at each monitoring station.

#### **4.4.1 Cyanide**

All but 3 samples analyzed for total CN were below analytical quantification (5.0 ug/L). The Michigan Rule 57 water quality value, based on free CN, is 5.2 ug/L. Therefore, all samples below analytical quantification met the Michigan Rule 57 water quality value for free CN. Samples collected at the Upper Grand, Pere Marquette, and Upper Muskegon Rivers had total CN concentrations of 6 ug/L, 7 ug/L, and 7 ug/L, respectively, and may have exceeded the Michigan Rule 57 water quality value for free CN, although a definitive determination cannot be made based on these results.

#### **4.4.2 Base/Neutral Organics, MTBE, and BTEX**

Table 3 identifies the base/neutral organics analyzed, along with their analytical quantification levels. Group 3 of Table 3 identifies the base/neutral organics for which no Rule 57 water quality values have been developed; all sample analyses for contaminants in this group showed concentrations below analytical quantification. Group 2 of Table 3 shows the base/neutral organics for which Rule 57 water quality values have been developed, but whose quantification levels are above these Rule 57 water quality values. All sample analyses for contaminants in this group showed concentrations below analytical quantification; however, a definitive comparison against Rule 57 water quality values cannot be made for these contaminants. Group 1 of Table 3 shows the base/neutral organics for which Rule 57 water quality values have been developed and whose quantification levels are below these Rule 57 water quality values. All contaminant concentrations in this group met applicable Rule 57 water quality values. Base/neutral organic results above analytical quantification are shown in Table 10.

Table 4 lists MTBE and BTEX with their quantification levels and Rule 57 water quality values. All MTBE samples collected in 2004 met the MTBE Rule 57 water quality value (FCV = 730 ug/L), as did all BTEX samples (Rule 57 water quality value range = 18-200 ug/L). All MTBE samples were below analytical quantification (QL = 5.0 ug/L). BTEX results above analytical quantification are shown in Table 11.

#### **4.4.3 Mercury and Trace Metals**

Hg, Cr, Cu, and Pb concentrations are compared with applicable Rule 57 water quality values in Table 12. Also shown in this table are the means and ranges of concentrations, and the exceedance rate for each contaminant. A comparison of the occurrence of Hg Rule 57 water quality value exceedances among integrator and intensive sites is also provided (Figure 45).

All samples analyzed for total Cr, Cu, and Pb met applicable Michigan Rule 57 water quality values at the 38 stations sampled. All total Hg samples collected at 3 of these stations met the Hg Rule 57 water quality value of 1.3 ng/L; specifically, the Au Sable and Cheboygan Rivers and the Tahquamenon River headwaters. At 31 monitoring stations, total Hg exceeded 1.3 ng/L in at least 50% of samples collected. The remaining 4 monitoring stations showed at least 1 sample in exceedance of the Hg Rule 57 water quality value.

#### **4.4.4 Polychlorinated Biphenyls**

Total PCB concentrations measured at each monitoring station are shown in Table 13. Concentrations exceeded the PCB Rule 57 water quality value of 0.026 ng/L in all samples collected at all stations.



Prepared by: Christine Aiello, Environmental Quality Analyst  
Surface Water Assessment Section  
Water Bureau  
Michigan Department of Environmental Quality  
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## SECTION 5.0

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Table 1. WCMP tributary station location information, 2004.

Station	Location	County	STORET ID#	Latitude	Longitude
<b>Intensive Sites</b>					
Au Sable	Rea Rd. below Foote Dam, Oscoda Twp.	Iosco	350061	44.43611 °N, -	83.43417 °W
Clinton	Shadyside Pk., Gratiot Ave., city of Mt. Clemens	Macomb	500233	42.58417 °N, -	82.88278 °W
Grand (Lower)	Riverside Pk., vic. of Ottawa Ctr., Robinson Twp.	Ottawa	700123	43.02667 °N, -	86.03389 °W
Kalamazoo (Lower)	57th St., vic. New Richmond, Manlius Twp.	Allegan	030077	42.65111 °N, -	86.10611 °W
Muskegon (Lower)	Maple Island Rd., Cedar Creek Twp. Sec. 25	Muskegon	610273	43.31778 °N, -	86.03889 °W
Saginaw	Main St., City of Essexville, Bangor Twp. Sec. 14	Bay	090177	43.61751 °N, -	83.84278 °W
<b>Integrator Sites - Year 2004 Intensively Monitored</b>					
Kalamazoo (Upper)	G Ave., city of Augusta	Kalamazoo	390057	42.33528 °N, -	85.34528 °W
Manistee	M-55 bridge, Manistee Twp., Sec. 31	Manistee	510088	44.26430 °N, -	86.29538 °W
Manistique	Vic. old RR bridge N of old US-2, city of Manistique	Schoolcraft	770073	45.96889 °N, -	86.24611 °W
Pine	M-134 bridge, St. Ignace Twp. Sec. 10	Mackinac	490006	46.05117 °N, -	84.65681 °W
Tahquamenon	State Campground on U.S. 123	Chippewa	170141	46.55583 °N, -	85.03889 °W
<b>Integrator Sites - Year 2004 Non-Intensively Monitored</b>					
Black	Water St. boat launch DS of RR bridge	St. Clair	740385	42.97356 °N, -	82.42029 °W
Boardman	Beitner Rd., Garfield Twp. Sec. 3	Grand Traverse	280014	44.67528 °N, -	85.63070 °W
Cass	M-13 bridge, Spaulding Twp. Sec. 12	Saginaw	730024	43.36500 °N, -	83.95473 °W
Cheboygan	Lincoln Ave., city of Cheboygan	Cheboygan	160073	45.63334 °N, -	84.48195 °W
Escanaba	0.35 mi. US of Soo Line RR Bridge	Delta	210102	45.80028 °N, -	87.09583 °W
Flint	M-13, Spaulding Twp. Sec. 35	Saginaw	730285	43.30857 °N, -	83.95328 °W
Grand (Upper)	M-66 bridge, Ionia Twp. Sec. 30	Ionia	340025	42.97195 °N, -	85.07000 °W
Huron	2000' DS of Rockwood WWTP, Berlin Twp.	Monroe	580364	42.04528 °N, -	83.21417 °W
Menominee	26th St. bridge, city of Menominee	Menominee	550038	45.10625 °N, -	87.63556 °W
Muskegon (Upper)	Hersey Rd., Hersey Twp.	Osceola	670008	43.84722 °N, -	85.43231 °W
Ontonagon	RR bridge, Ontonagon Twp. Sec. 25	Ontonagon	660038	46.86751 °N, -	89.31695 °W
Pere Marquette	Scottville Road, Amber Twp. Sec. 24	Mason	530027	43.94444 °N, -	86.28000 °W
Raisin	ERA Dock, city of Monroe	Monroe	580046	41.90056 °N, -	83.35444 °W
Rouge	W. Jefferson Ave. Bridge	Wayne	820070	42.28056 °N, -	83.12889 °W
Shiawassee	Fergus Rd., St. Charles Twp. Sec. 22	Saginaw	730023	43.25472 °N, -	84.10556 °W
St. Joseph (Lower)	Riverview Park off Zollar Dr.	Berrien	110628	42.06333 °N, -	86.44889 °W
St. Joseph (Upper)	Rt. 12 bridge, city of Mottville	St. Joseph	750273	41.80003 °N, -	85.75694 °W
Sturgeon	Co. Rd. 499, Nahma Twp. Sec. 20	Delta	210032	45.83417 °N, -	86.66862 °W
Thunder Bay	Bagley St., Alpena Twp. Sec. 20	Alpena	040123	45.06694 °N, -	83.47194 °W
Tittabawassee	Center Road., James Twp. Sec. 4	Saginaw	730025	43.39278 °N, -	84.01111 °W
<b>Minimally Impacted Sites - Year 2004 (Non-Intensively Monitored)</b>					
N. Br. Clinton <sup>1</sup>	Fisher Road, Bruce Twp. Sec. 5	Macomb	500467	42.88360 °N, -	83.07840 °W
Bellamy Creek <sup>2</sup>	End of Potters Road, Easton Twp. Sec. 23	Ionia	340186	42.97918 °N, -	85.11105 °W
S. Br. Kalamazoo <sup>3</sup>	25½ Mile Road, Albion Twp. Sec. 32	Calhoun	130331	42.16103 °N, -	84.80253 °W
Anderson Creek <sup>4</sup>	US No. 6 Road, Hanover Twp., Sec. 10	Wexford	830159	44.48217 °N, -	85.62027 °W
Fox River <sup>5</sup>	Fox River Forest Camp Ground, Seney Twp. Sec. 11	Schoolcraft	770082	46.40002 °N, -	86.02881 °W
Bear Creek <sup>6</sup>	1 mi. W. of Dryburg at Biscuit Road., Sec. 17	Chippewa	170154	46.20451 °N, -	84.69751 °W
Tahquamenon (Headwaters) <sup>7</sup>	Co. Rd. 442, Lakefield Twp. Sec. 22	Luce	480033	46.37281 °N, -	85.78184 °W

<sup>1</sup> Clinton River watershed<sup>2</sup> Lower Grand River watershed<sup>3</sup> Kalamazoo River watershed<sup>4</sup> Manistee River watershed<sup>5</sup> Manistique River watershed<sup>6</sup> Pine River watershed<sup>7</sup> Tahquamenon River watershed

Table 2. Nutrients, conventionals and cyanide analyzed for the WCMP in 2004, and their analytical quantification levels. All units are mg/L unless otherwise indicated.

Analyte	Quantification Level
Alkalinity (as CaCO <sub>3</sub> )	20
Ammonia	0.010
Carbon, Total Organic	0.5
Chloride	1
Conductance*	---
Cyanide@	0.005
Hardness	5
Nitrate + Nitrite	0.010
Nitrite	0.002
Nitrogen, Kjeldahl	0.10
Oxygen, Dissolved*	---
pH*	---
Phosphate, Ortho	0.003
Phosphorus, Total	0.005
Potassium	0.1
Sodium	1
Solids, Total Dissolved (Calculated)	20
Solids, Total Suspended	4
Sulfate	2
Temperature*	---
Turbidity	1 NTU

\* = Field measured parameter; may additionally be measured in the laboratory.

@ = Michigan Rule 57 water quality value = 0.0052 mg/L.

NTU = Nephelometric Turbidity Units.

Table 3. Base/neutral organics analyzed for the WCMP in 2004, and their analytical quantification levels and Michigan Rule 57 water quality values.

Analyte	Quantification Level (ug/L)	R. 57 Water Quality Value (ug/L)
<b>Group 1: Quantification Level Below R. 57 Water Quality Value</b>		
1,2,4-Trichlorobenzene	2.0	FCV = 30
1,2-Dichlorobenzene	1.0	FCV = 13
1,3-Dichlorobenzene	1.0	FCV = 28
1,4-Dichlorobenzene	1.0	FCV = 16
Acenaphthylene	1.0	FCV = 7.2*
Acenaphthene	1.0	FCV = 38
Anthracene	1.0	FCV = 2.8*
Bis(2-chloroethyl)ether	1.0	HCV = 15
Bis(2-chloroisopropyl)ether	1.0	HCV = 290
Bis(2-ethylhexyl)phthalate	2.0	HCV = 32
Butyl benzyl phthalate	1.0	FCV = 67
Chrysene	1.0	HCV = 1.5*
Diethyl phthalate	1.0	FCV = 110
Di-n-butyl phthalate	1.0	FCV = 9.7
Fluoranthene	1.0	FCV = 1.6
Fluorene	1.0	FCV = 12
Hexachloroethane	1.0	HCV = 6.7
Isophorone	1.0	FCV = 1300
Naphthalene	1.0	FCV = 13
Nitrobenzene	2.0	HCV = 180
Phenanthrene	1.0	FCV = 2.4
Pyrene	1.0	FCV = 2.5*
<b>Group 2: Quantification Level Above R. 57 Water Quality Value</b>		
2-Methylnaphthalene	5.0	FCV = 4.8*
Carbazole	10	FCV = 4
Dibenzofuran	5.0	FCV = 4
Hexachlorobenzene	2.0	WV = 0.0003
Hexachlorobutadiene	2.0	WV = 0.053
Hexachlorocyclopentadiene	10	FCV = 0.07*
<b>Group 3: No R. 57 Water Quality Value Currently Developed</b>		
2,4-Dinitrotoluene	5.0	
2,6-Dinitrotoluene	5.0	
2-Chloronaphthalene	2.0	
2-Nitroaniline	20	
3-Nitroaniline	20	
4-Bromophenyl phenylether	2.0	
4-Chlorophenyl phenylether	1.0	
4-Nitroaniline	20	
Azobenzene	2.0	
Benzo(a)anthracene	1.0	
Benzo(a)pyrene	2.0	
Benzo(b)fluoranthene	2.0	
Benzo(g,h,i)perylene	2.0	
Benzo(k)fluoranthene	2.0	
Bis(2-chloroethoxy)methane	2.0	
Dibenz(a,h)anthracene	2.0	
Dimethyl phthalate	2.0	
Di-n-octyl phthalate	2.0	
Indeno(1,2,3-cd)pyrene	2.0	
N-Nitrosodimethylamine	5.0	
N-Nitrosodi-n-propylamine	2.0	
N-Nitrosodiphenylamine	2.0	

FCV = Final Chronic Value.

HCV = Human Cancer Value (Non-Drinking Water).

HNV = Human Non-Cancer Value (Non-Drinking Water).

WV = Wildlife Value.

\* = Value shown is an estimate based on available data.

Table 4. BTEX and MTBE, and their analytical quantification levels and Michigan Rule 57 water quality values (WCMP 2004).

Analyte	Quantification Level (ug/L)	R. 57 Water Quality Value (ug/L)
Benzene	1.0	FCV = 200
Toluene	1.0	FCV = 140
Ethylbenzene	1.0	FCV = 18
m- & p-Xylene	2.0	FCV = 35*
o-Xylene	1.0	
Methyl tert butyl ether	5.0	FCV = 730

\* = Value applies to total xylene. (Total xylene = m- & p-xylene + o-xylene).

Table 5. Mercury and trace metals analyzed for the WCMP in 2004, and their analytical detection and quantification levels. All units are ug/L unless otherwise specified.

Analyte	Detection Level	Quantification Level	Units
Hg	0.14	0.45	ng/L
Cd	0.011	0.037	ug/L
Cr	0.057	0.19	ug/L
Cu	0.03	0.1	ug/L
Pb	0.0041	0.014	ug/L
Ni	0.093	0.31	ug/L
Zn	0.13	0.43	ug/L



Table 6. PCB congeners analyzed for the WCMP in 2004, and the analytical detection and quantification levels for a 160 liter sample.

Congener #	Detection Level (ng/L)	Quantification Level (ng/L)	Congener #	Detection Level (ng/L)	Quantification Level (ng/L)
3	0.22	0.72	97	0.0030	0.010
4/10	0.025	0.083	87	0.0050	0.017
7/9	0.0055	0.018	85	0.0055	0.018
6	0.011	0.037	136	0.015	0.050
8/5	0.024	0.080	77/110	0.011	0.037
19	0.0035	0.012	82	0.0035	0.012
18	0.0070	0.023	151	0.0050	0.017
15/17	0.015	0.050	135/144	0.0065	0.022
24/27	0.0035	0.012	123/149	0.0050	0.017
16/32	0.011	0.037	118	0.0080	0.027
26	0.0070	0.023	146	0.0055	0.018
25	0.0060	0.020	132/153/105	0.010	0.033
28/31	0.020	0.070	141	0.0040	0.013
33	0.0075	0.025	137/176	0.0065	0.022
53	0.0040	0.013	163/138	0.011	0.037
51	0.0035	0.012	158	0.0075	0.025
22	0.011	0.037	178	0.0070	0.023
45	0.0045	0.015	187/182	0.0050	0.017
46	0.0045	0.015	183	0.0055	0.018
52	0.0075	0.025	128	0.0045	0.015
49	0.0050	0.017	167	0.0060	0.020
47/48	0.0090	0.030	185	0.0035	0.012
44	0.0065	0.022	174	0.0055	0.018
37/42	0.010	0.033	177	0.0060	0.020
41/71/64	0.010	0.033	202/171	0.0040	0.013
40	0.0050	0.017	172	0.0075	0.025
63	0.012	0.040	180	0.0065	0.022
74	0.0065	0.022	193	0.0075	0.025
70/76	0.012	0.040	199	0.0045	0.015
66	0.012	0.040	170/190	0.0055	0.018
95	0.0060	0.020	198	0.0075	0.025
91	0.0055	0.018	201	0.0090	0.030
56/60	0.0080	0.027	203/196	0.014	0.047
92/84	0.012	0.040	208/195	0.0040	0.013
89	0.0030	0.010	207	0.0035	0.012
101	0.0055	0.018	194	0.0055	0.018
99	0.0040	0.013	206	0.0035	0.012
83	0.0045	0.015			

Note: Coelution is signified by the "/" notation. Coeluting congeners cannot be separated analytically using analytical methods employed by the WCMP.

Table 7. Summary of laboratory result remark codes and their definitions, WCMP 2004.

Analyte Category	Code	Definition
Nutrients and Conventionals	A	Value reported is the mean of two or more determinations.
	D	Analyte value quantified from a dilution(s); quantification level raised.
	H	Recommended laboratory holding time was exceeded.
	I	Dilution required due to matrix interference; quantification level raised.
	J	Analyte was positively identified. Value is an estimate.
	ND	Observed result was below the quantification level.
	P	Recommended sample collection/preservation technique not used; reported result(s) is an estimate.
	T	Reported value is less than the quantification level.
W	Reported value is less than the method detection level.	
Base/Neutral Organics, MTBE, BTEX, and Cyanide	ND	Observed result was below the quantification level.
Mercury and Trace Metals	BSQC	Batch spike exceeded quality control criteria.
	CCB	Continuing calibration blank exceeded level of detection.
	CCV	Continuing calibration standard exceeded quality control criteria.
	ELOD	Matrix problem; elevated level of detection reported.
	HT	Recommended laboratory holding time was exceeded before analysis.
	ICB	Initial calibration blank exceeded level of detection.
	ISQC	Internal standard exceeded quality control criteria.
	LCQC	Laboratory control exceeded quality control criteria.
	MBQC	Method blank exceeded level of detection.
	MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.	
PCBs	EST	Estimated value; analyte present above detection limit but not quantified within expected limits of precision.
	FBK	Analyte had measurable value above established QC limit when blank was analyzed using same equipment and analytical method.
	FMS	Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.
	NAI	Not analyzed due to uncontrollable interference.
	NDD	Not detected due to dilution.

Table 8. WCMP tributary station sampling history.

Station	STORET ID	1998	1999	2000	2001	2002	2003	2004
<b>Intensive and Integrator Sites</b>								
Au Sable	350061	X		X	X	X	X	X
Black	740385			X	X	X	X	X
Boardman	280014				X	X	X	X
Cass	730024			X	X	X	X	X
Cheboygan	160073			X	X	X	X	X
Clinton	500233	X		X	X	X	X	X
Escanaba	210102		X	X	X	X	X	X
Flint	730285			X	X	X	X	X
Grand (Lower)	700123		X	X	X	X	X	X
Grand (Upper)	340025			X	X	X	X	X
Huron	580364	X		X	X	X	X	X
Kalamazoo (Lower)	030077		X	X	X	X	X	X
Kalamazoo (Upper)	390057			X	X	X	X	X
Manistee	510088			X	X	X	X	X
Manistique	770073		X	X	X	X	X	X
Menominee	550038			X	X	X	X	X
Muskegon (Lower)	610273		X	X	X	X	X	X
Muskegon (Upper)	670008			X	X	X	X	X
Ontonagon	660038			X	X	X	X	X
Pere Marquette	530027		X	X	X	X	X	X
Pine	490006			X	X	X	X	X
Raisin	580046	X		X	X	X	X	X
Rouge	820070	X		X	X	X	X	X
Saginaw	090177	X			X	X	X	X
Shiawassee	730023	X		X	X	X	X	X
St. Joseph (Lower)	110628		X	X	X	X	X	X
St. Joseph (Upper)	750273			X	X	X	X	X
Sturgeon	210032			X	X	X	X	X
Tahquamenon	170141		X	X	X	X	X	X
Thunder Bay	040123	X		X	X	X	X	X
Tittabawassee	730025	X		X	X	X	X	X
<b>Monitoring Year 5 Minimally Impacted Sites</b>								
Bigelow Creek	630291				X			
Evergreen Creek	790157				X			
Grand (Headwaters)	380083				X			
Pokagon Creek	140126				X			
Tioga River	070070				X			
<b>Monitoring Year 1 Minimally Impacted Sites</b>								
Huron (Headwaters)	470521					X		
Paint River	360124					X		
Perry Creek	680056					X		
W. Br. Tittabawassee	260068					X		
<b>Monitoring Year 2 Minimally Impacted Sites</b>								
East Creek	280318						X	
S. Br. Flint	440173						X	
Raisin (Headwaters)	380393						X	
<b>Monitoring Year 3 Minimally Impacted Sites</b>								
Anderson Creek	830159							X
Bear Creek	170154							X
Bellamy Creek	340186							X
Fox River	770082							X
N. Br. Clinton	500467							X
S. Br. Kalamazoo	130331							X
Tahquamenon (Headwaters)	480033							X

Table 9.1 Loading rate estimates for designated water quality indicators and total PCBs. Calculations are based on actual contaminant concentrations (WCMP 2004).

Parameter	Station	Loading Rate+	95% C.I.	Mean Concentration+	Mean Flow +*
Chloride		metric tons/year	(+/-)	mg/L	cfs
	Saginaw River	261,116	18%	70.17	5,730
	Grand River (Lower)	190,539	13%	47.83	5,090
	Clinton River	80,268	27%	172.42	709
	Kalamazoo River (Lower)	73,825	11%	41.42	2,140
	Muskegon River (Lower)	35,187	5%	15.58	2,650
	Kalamazoo River (Upper)	23,645	16%	37.08	796
	Manistee River	21,289	10%	10.92	2,610
	Au Sable River	10,465	47%	8.75	1,420
	Manistique River	4,848	3%	2.25	2,580
Phosphorus		metric tons/year	(+/-)	mg/L	cfs
	Saginaw River	724	18%	0.12	5,730
	Grand River (Lower)	658	14%	0.12	5,090
	Kalamazoo River (Lower)	162	14%	0.08	2,140
	Clinton River	152	22%	0.22	709
	Muskegon River (Lower)	88	15%	0.04	2,650
	Kalamazoo River (Upper)	57	12%	0.08	796
	Manistique River	49	19%	0.02	2,580
	Manistee River	48	5%	0.02	2,610
	Pine River	37	18%	0.12	1,140
Suspended Solids		metric tons/year	(+/-)	mg/L	cfs
	Saginaw River	349,882	40%	48.08	5,730
	Grand River (Lower)	156,689	55%	36.64	5,090
	Clinton River	59,478	39%	68.33	709
	Muskegon River (Lower)	36,302	29%	15.45	2,650
	Kalamazoo River (Lower)	30,989	28%	19.00	2,140
	Pine River	29,825	13%	67.58	1,140
	Manistee River	18,657	10%	10.18	2,610
	Manistique River	16,705	33%	8.50	2,580
	Kalamazoo River (Upper)	9,981	47%	17.64	796
Chromium		kg/year	(+/-)	ug/L	cfs
	Saginaw River	10,299	39%	1.45	5,730
	Grand River (Lower)	5,709	37%	1.18	5,090
	Clinton River	3,047	42%	3.48	709
	Manistique River	1,095	20%	0.40	2,580
	Kalamazoo River (Lower)	1,067	26%	0.53	2,140
	Pine River	954	21%	2.59	1,140
	Kalamazoo River (Upper)	693	45%	1.14	796
	Muskegon River (Lower)	690	24%	0.30	2,650
	Manistee River	494	10%	0.27	2,610
Tahquamenon River	438	25%	0.34	1,130	
	Au Sable River	73	23%	0.05	1,420

+ = Calculated values; not rounded to appropriate number of significant figures.

\* = Estimates of mean flow are based on measurements taken within the period sampled.

C.I. = Confidence interval of loading rate estimate. True loading rate = estimated loading rate +/- (estimated loading rate x confidence interval).

Table 9.2 Loading rate estimates for designated water quality indicators and total PCBs. Calculations are based on actual contaminant concentrations (WCMP 2004).

Parameter	Station	Loading Rate+	95% C.I.	Mean Concentration+	Mean Flow +*
Copper		kg/year	(+/-)	ug/L	cfs
	Saginaw River	17,538	19%	2.96	5,730
	Grand River (Lower)	12,982	13%	2.67	5,090
	Clinton River	4,185	20%	5.77	709
	Kalamazoo River (Lower)	3,051	10%	1.54	2,140
	Muskegon River (Lower)	2,013	7%	0.87	2,650
	Kalamazoo River (Upper)	1,204	18%	1.78	796
	Manistique River	1,019	13%	0.38	2,580
	Manistee River	893	8%	0.51	2,610
	Pine River	767	16%	2.13	1,140
Tahquamenon River	467	15%	0.37	1,130	
Au Sable River	386	17%	0.30	1,420	
Lead		kg/year	(+/-)	ug/L	cfs
	Saginaw River	13,489	45%	1.91	5,730
	Grand River (Lower)	7,676	36%	1.55	5,090
	Clinton River	3,788	35%	4.52	709
	Kalamazoo River (Lower)	2,384	14%	1.24	2,140
	Kalamazoo River (Upper)	1,168	48%	1.96	796
	Muskegon River (Lower)	675	22%	0.28	2,650
	Manistique River	620	32%	0.20	2,580
	Pine River	440	20%	1.21	1,140
	Manistee River	380	7%	0.21	2,610
Tahquamenon River	292	26%	0.22	1,130	
Au Sable River	73	18%	0.05	1,420	
Mercury		kg/year	(+/-)	ng/L	cfs
	Saginaw River	64	27%	6.05	5,730
	Grand River (Lower)	25	27%	4.90	5,090
	Kalamazoo River (Lower)	10	12%	5.26	2,140
	Clinton River	8	39%	9.23	709
	Manistique River	8	19%	2.82	2,580
	Tahquamenon River	6	15%	4.37	1,130
	Muskegon River (Lower)	5	16%	2.00	2,650
	Kalamazoo River (Upper)	4	25%	6.05	796
	Pine River	2	10%	6.80	1,140
Manistee River	2	20%	1.38	2,610	
Au Sable River	1	10%	0.61	1,420	
PCB		kg/year	(+/-)	ng/L	cfs
	Saginaw River	37.0000	18%	6.06	5,730
	Pine River	0.1640	100%	0.57	1,140
Au Sable River	0.0002	23%	0.16	1,420	

+ = Calculated values; may not be rounded to appropriate number of significant figures.

\* = Estimates of mean flow are based on measurements taken within the period sampled.

C.I. = Confidence interval of loading rate estimate. True loading rate = estimated loading rate +/- (estimated loading rate x confidence interval).

Table 10. Base/neutral organic concentrations in samples having one or more result above analytical quantification (WCMP 2004).

STORET ID	Station	Date	Diethyl phthalate (ug/L)	Di-n-butyl phthalate (ug/L)	Pyrene (ug/L)
210102	Escanaba River	7/20/2004	0.29	ND	ND
500467	North Branch Clinton River	7/14/2004	0.19	3	ND
550038	Menominee River	7/20/2004	0.25	ND	ND
580046	River Raisin	7/13/2004	0.16	ND	ND
580364	Huron River	7/13/2004	0.16	ND	ND
740385	Black River	7/13/2004	0.21	ND	ND
820070	River Rouge	7/13/2004	0.32	ND	0.3
Rule 57 Water Quality Value			110	9.7	2.5

ND = Observed result was below the quantification level.

Table 11. BTEX concentrations in samples having one or more results above analytical quantification (WCMP 2004).

STORET ID	Station	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylene* (ug/L)
340186	Bellamy Creek	7/1/2004	0.12	ND	ND	ND
740385	Black River	7/13/2004	ND	0.36	ND	0.29
340025	Grand River (Upper)	7/1/2004	0.14	ND	ND	ND
490006	Pine River	8/4/2004	ND	1.30	ND	ND
580046	River Raisin	7/13/2004	ND	0.57	ND	ND
130331	S. Br. Kalamazoo River	6/30/2004	0.15	ND	ND	ND
110628	St. Joseph River (Lower)	7/1/2004	0.15	ND	ND	ND
750273	St. Joseph River (Upper)	6/30/2004	0.16	ND	ND	ND
Rule 57 Water Quality Value			200	140	18	35

\* = Values apply to total xylene. (Total xylene = m- & p-xylene + o-xylene).

ND = Observed result was below the quantification level.

Table 12.1 Rule 57 water quality values, means and ranges of concentrations, and exceedance rates for mercury and designated trace metal water quality indicators (WCMP 2004).

STORET ID	Station	Mercury (ng/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)
<b>830159</b>	<b>Anderson Creek</b>				
	R.57 Water Quality Value@	1.3	120.0	14.0	19.0
	Mean Concentration+	2.500	0.157	0.386	0.165
	Range of Concentrations	0.69 - 4.61	0.058 - 0.229	0.221 - 0.582	0.087 - 0.339
	Exceedance Rate*	2 / 4	0 / 4	0 / 4	0 / 4
<b>350061</b>	<b>Au Sable River</b>				
	R.57 Water Quality Value@	1.3	100.0	12.0	15.0
	Mean Concentration+	0.609	0.048	0.297	0.053
	Range of Concentrations	0.16 - 1.08	0 - 0.117	0.198 - 0.49	0.032 - 0.104
	Exceedance Rate*	0 / 12	0 / 12	0 / 12	0 / 12
<b>170154</b>	<b>Bear Creek</b>				
	R.57 Water Quality Value@	1.3	88.0	11.0	13.0
	Mean Concentration+	3.918	0.500	0.682	0.229
	Range of Concentrations	1.15 - 6.17	0.325 - 0.751	0.364 - 0.936	0.119 - 0.45
	Exceedance Rate*	3 / 4	0 / 4	0 / 4	0 / 4
<b>340186</b>	<b>Bellamy Creek</b>				
	R.57 Water Quality Value@	1.3	190.0	24.0	35.0
	Mean Concentration+	0.890	0.174	1.553	0.094
	Range of Concentrations	0.38 - 1.73	0 - 0.372	1.07 - 2.53	0.036 - 0.128
	Exceedance Rate*	1 / 4	0 / 4	0 / 4	0 / 4
<b>740385</b>	<b>Black River</b>				
	R.57 Water Quality Value@	1.3	130.0	17.0	22.0
	Mean Concentration+	1.788	0.689	2.008	0.608
	Range of Concentrations	0.85 - 2.95	0.277 - 1.08	1.18 - 2.65	0.386 - 0.86
	Exceedance Rate*	2 / 4	0 / 4	0 / 4	0 / 4
<b>280014</b>	<b>Boardman River</b>				
	R.57 Water Quality Value@	1.3	106.0	13.0	16.0
	Mean Concentration+	1.658	0.212	0.350	0.173
	Range of Concentrations	0.53 - 3.79	0.119 - 0.413	0.185 - 0.729	0.088 - 0.398
	Exceedance Rate*	2 / 4	0 / 4	0 / 4	0 / 4
<b>730024</b>	<b>Cass River</b>				
	R.57 Water Quality Value@	1.3	190.0	24.0	34.0
	Mean Concentration+	2.223	0.715	2.080	0.614
	Range of Concentrations	1.61 - 2.68	0.43 - 1.12	1.59 - 2.38	0.435 - 0.921
	Exceedance Rate*	4 / 4	0 / 4	0 / 4	0 / 4
<b>160073</b>	<b>Cheboygan River</b>				
	R.57 Water Quality Value@	1.3	106.0	13.0	16.0
	Mean Concentration+	0.448	0.061	0.587	0.039
	Range of Concentrations	0.29 - 0.52	0 - 0.085	0.501 - 0.665	0.018 - 0.061
	Exceedance Rate*	0 / 4	0 / 4	0 / 4	0 / 4

@ = With the exception of mercury, Rule 57 water quality values are expressed as dissolved metal.

+ = Calculated value; may not be rounded to appropriate number of significant figures.

\* = Number of samples exceeding Rule 57 water quality value / number of samples analyzed.



Table 12.2 Rule 57 water quality values, means and ranges of concentrations, and exceedance rates for mercury and designated trace metal water quality indicators (WCMP 2004).

STORET ID	Station	Mercury (ng/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)
<b>500233</b>	<b>Clinton River</b>				
R.57 Water Quality Value@		1.3	150.0	18.0	25.0
Mean Concentration+		9.228	3.478	5.770	4.520
Range of Concentrations		1.71 - 40.69	0.536 - 14.6	2.32 - 13.9	0.909 - 18.2
Exceedance Rate*		12 / 12	0 / 12	0 / 12	0 / 12
<b>210102</b>	<b>Escanaba River</b>				
R.57 Water Quality Value@		1.3	76.0	9.3	11.0
Mean Concentration+		2.980	0.468	0.938	0.143
Range of Concentrations		2.43 - 4.03	0.336 - 0.734	0.703 - 1.14	0.114 - 0.165
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>730285</b>	<b>Flint River</b>				
R.57 Water Quality Value@		1.3	150.0	19.0	27.0
Mean Concentration+		4.673	1.331	3.125	2.195
Range of Concentrations		3.18 - 6.79	0.839 - 2.11	2.35 - 4.51	1.36 - 3.12
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>770082</b>	<b>Fox River</b>				
R.57 Water Quality Value@		1.3	43.0	5.0	4.9
Mean Concentration+		1.283	0.246	0.214	0.107
Range of Concentrations		0.94 - 2.13	0.205 - 0.301	0.145 - 0.324	0.074 - 0.156
Exceedance Rate*		1 / 4	0 / 4	0 / 4	0 / 4
<b>700123</b>	<b>Grand River (Lower)</b>				
R.57 Water Quality Value@		1.3	160.0	20.0	29.0
Mean Concentration+		4.901	1.179	2.667	1.547
Range of Concentrations		0.81 - 15.22	0.246 - 4.16	1.54 - 4.65	0.325 - 5.38
Exceedance Rate*		10 / 12	0 / 12	0 / 12	0 / 12
<b>340025</b>	<b>Grand River (Upper)</b>				
R.57 Water Quality Value@		1.3	180.0	23.0	34.0
Mean Concentration+		2.475	0.473	2.548	0.725
Range of Concentrations		1.26 - 3.54	0.143 - 0.721	2.3 - 2.86	0.272 - 1.04
Exceedance Rate*		3 / 4	0 / 4	0 / 4	0 / 4
<b>580364</b>	<b>Huron River</b>				
R.57 Water Quality Value@		1.3	240.0	30.0	47.0
Mean Concentration+		1.715	0.400	1.775	1.586
Range of Concentrations		0.78 - 3.25	0.148 - 0.556	1.34 - 2.44	0.763 - 2.84
Exceedance Rate*		3 / 4	0 / 4	0 / 4	0 / 4
<b>030077</b>	<b>Kalamazoo River (Lower)</b>				
R.57 Water Quality Value@		1.3	150.0	19.0	27.0
Mean Concentration+		5.260	0.533	1.544	1.242
Range of Concentrations		2.26 - 7.33	0.172 - 1.09	1.19 - 2.12	0.618 - 2.06
Exceedance Rate*		12 / 12	0 / 12	0 / 12	0 / 12

@ = With the exception of mercury, Rule 57 water quality values are expressed as dissolved metal.

+ = Calculated value; may not be rounded to appropriate number of significant figures.

\* = Number of samples exceeding Rule 57 water quality value / number of samples analyzed.

Table 12.3 Rule 57 water quality values, means and ranges of concentrations, and exceedance rates for mercury and designated trace metal water quality indicators (WCMP 2004).

STORET ID	Station	Mercury (ng/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)
<b>390057</b>	<b>Kalamazoo River (Upper)</b>				
R.57 Water Quality Value@		1.3	160.0	20.0	28.0
Mean Concentration+		6.048	1.139	1.783	1.960
Range of Concentrations		1.01 - 13.21	0.105 - 2.83	0.944 - 3.49	0.269 - 6.29
Exceedance Rate*		11 / 12	0 / 12	0 / 12	0 / 12
<b>510088</b>	<b>Manistee River</b>				
R.57 Water Quality Value@		1.3	102.0	12.0	16.0
Mean Concentration+		1.378	0.266	0.507	0.209
Range of Concentrations		0.55 - 2.7	0.059 - 0.418	0.328 - 0.775	0.124 - 0.298
Exceedance Rate*		7 / 12	0 / 12	0 / 12	0 / 12
<b>770073</b>	<b>Manistique River</b>				
R.57 Water Quality Value@		1.3	60.0	7.2	7.7
Mean Concentration+		2.816	0.397	0.377	0.202
Range of Concentrations		1.1 - 5.11	0.219 - 0.614	0.275 - 0.568	0.09 - 0.391
Exceedance Rate*		10 / 12	0 / 12	0 / 12	0 / 12
<b>550038</b>	<b>Menominee River</b>				
R.57 Water Quality Value@		1.3	85.0	10.0	12.0
Mean Concentration+		2.560	0.257	0.767	0.121
Range of Concentrations		1.99 - 3.33	0.23 - 0.289	0.723 - 0.815	0.104 - 0.139
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>610273</b>	<b>Muskegon River (Lower)</b>				
R.57 Water Quality Value@		1.3	99.0	12.0	15.0
Mean Concentration+		2.003	0.300	0.870	0.283
Range of Concentrations		0.31 - 3.56	0.039 - 0.618	0.541 - 1.25	0.065 - 0.563
Exceedance Rate*		9 / 12	0 / 12	0 / 12	0 / 12
<b>670008</b>	<b>Muskegon River (Upper)</b>				
R.57 Water Quality Value@		1.3	101.0	12.0	16.0
Mean Concentration+		1.985	0.314	0.764	0.235
Range of Concentrations		0.66 - 3.45	0.143 - 0.56	0.407 - 1.39	0.122 - 0.352
Exceedance Rate*		2 / 4	0 / 4	0 / 4	0 / 4
<b>500467</b>	<b>North Branch Clinton River</b>				
R.57 Water Quality Value@		1.3	205.0	26.0	39.0
Mean Concentration+		1.505	0.070	2.348	0.130
Range of Concentrations		0.44 - 2.58	0 - 0.101	1.12 - 3.61	0.050 - 0.244
Exceedance Rate*		2 / 4	0 / 4	0 / 4	0 / 4
<b>660038</b>	<b>Ontonagon River</b>				
R.57 Water Quality Value@		1.3	54.0	6.4	6.8
Mean Concentration+		2.978	1.319	3.153	0.322
Range of Concentrations		1.68 - 4.32	0.694 - 1.66	2.36 - 4.04	0.139 - 0.461
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4

@ = With the exception of mercury, Rule 57 water quality values are expressed as dissolved metal.  
 + = Calculated value; may not be rounded to appropriate number of significant figures.  
 \* = Number of samples exceeding Rule 57 water quality value / number of samples analyzed.

Table 12.4 Rule 57 water quality values, means and ranges of concentrations, and exceedance rates for mercury and designated trace metal water quality indicators (WCMP 2004).

STORET ID	Station	Mercury (ng/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)
<b>530027</b>	<b>Pere Marquette River</b>				
R.57 Water Quality Value@		1.3	100.0	12.0	15.0
Mean Concentration+		2.690	0.533	0.703	0.407
Range of Concentrations		1.78 - 3.71	0.368 - 0.817	0.43 - 1.24	0.335 - 0.49
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>490006</b>	<b>Pine River</b>				
R.57 Water Quality Value@		1.3	69.0	8.3	9.3
Mean Concentration+		6.796	2.594	2.127	1.212
Range of Concentrations		0.2 - 17.76	0.724 - 7.39	0.804 - 4.93	0.323 - 3.37
Exceedance Rate*		11 / 12	0 / 12	0 / 12	0 / 12
<b>580046</b>	<b>River Raisin</b>				
R.57 Water Quality Value@		1.3	170.0	21.0	30.0
Mean Concentration+		2.200	0.525	2.693	0.651
Range of Concentrations		1.4 - 2.82	0.421 - 0.615	2.1 - 3.12	0.538 - 0.824
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>820070</b>	<b>River Rouge</b>				
R.57 Water Quality Value@		1.3	120.0	15.0	20.0
Mean Concentration+		6.545	1.883	4.095	3.383
Range of Concentrations		3.3 - 8.3	1.39 - 2.19	3.2 - 4.97	2.22 - 4.79
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>090177</b>	<b>Saginaw River</b>				
R.57 Water Quality Value@		1.3	150.0	18.0	25.0
Mean Concentration+		6.048	1.446	2.958	1.906
Range of Concentrations		1.25 - 21.95	0.431 - 4.64	1.78 - 5.62	0.659 - 6.9
Exceedance Rate*		10 / 12	0 / 12	0 / 12	0 / 12
<b>730023</b>	<b>Shiawassee River</b>				
R.57 Water Quality Value@		1.3	170.0	22.0	31.0
Mean Concentration+		2.053	0.633	2.110	0.627
Range of Concentrations		1.61 - 2.37	0.324 - 0.761	1.8 - 2.48	0.359 - 0.778
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>130331</b>	<b>South Branch Kalamazoo River</b>				
R.57 Water Quality Value@		1.3	180.0	23.0	33.0
Mean Concentration+		1.298	0.195	0.485	0.336
Range of Concentrations		0.37 - 2.18	0.015 - 0.315	0.214 - 0.795	0.085 - 0.514
Exceedance Rate*		2 / 4	0 / 4	0 / 4	0 / 4
<b>110628</b>	<b>St. Joseph River (Lower)</b>				
R.57 Water Quality Value@		1.3	170.0	21.0	30.0
Mean Concentration+		2.960	0.330	1.495	0.708
Range of Concentrations		1.76 - 5.32	0.227 - 0.495	1.2 - 1.98	0.457 - 1.17
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4

@ = With the exception of mercury, Rule 57 water quality values are expressed as dissolved metal.  
 + = Calculated value; may not be rounded to appropriate number of significant figures.  
 \* = Number of samples exceeding Rule 57 water quality value / number of samples analyzed.

Table 12.5 Rule 57 water quality values, means and ranges of concentrations, and exceedance rates for mercury and designated trace metal water quality indicators (WCMP 2004).

STORET ID	Station	Mercury (ng/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)
<b>750273</b>	<b>St. Joseph River (Upper)</b>				
R.57 Water Quality Value@		1.3	160.0	20.0	28.0
Mean Concentration+		1.038	0.083	0.597	0.243
Range of Concentrations		0.65 - 1.41	0.057 - 0.124	0.472 - 0.715	0.139 - 0.39
Exceedance Rate*		1 / 4	0 / 4	0 / 4	0 / 4
<b>210032</b>	<b>Sturgeon River</b>				
R.57 Water Quality Value@		1.3	65.0	7.8	8.6
Mean Concentration+		4.380	0.430	0.423	0.214
Range of Concentrations		2.03 - 7.45	0.344 - 0.494	0.239 - 0.608	0.106 - 0.346
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4
<b>170141</b>	<b>Tahquamenon River</b>				
R.57 Water Quality Value@		1.3	51.0	6.1	6.3
Mean Concentration+		4.367	0.345	0.369	0.215
Range of Concentrations		1.18 - 8.79	0.133 - 0.571	0.25 - 0.562	0.066 - 0.387
Exceedance Rate*		11 / 12	0 / 12	0 / 12	0 / 12
<b>480033</b>	<b>Tahquamenon River (Headwaters)</b>				
R.57 Water Quality Value@		1.3	57.0	6.8	7.2
Mean Concentration+		0.560	0.272	0.227	0.049
Range of Concentrations		0.29 - 0.67	0.225 - 0.309	0.144 - 0.356	0.030 - 0.072
Exceedance Rate*		0 / 4	0 / 4	0 / 4	0 / 4
<b>040123</b>	<b>Thunder Bay River</b>				
R.57 Water Quality Value@		1.3	120.0	14.0	19.0
Mean Concentration+		0.795	0.070	0.366	0.086
Range of Concentrations		0.39 - 1.82	0.011 - 0.148	0.243 - 0.667	0.068 - 0.105
Exceedance Rate*		1 / 4	0 / 4	0 / 4	0 / 4
<b>730025</b>	<b>Tittabawassee River</b>				
R.57 Water Quality Value@		1.3	140.0	17.0	23.0
Mean Concentration+		2.348	0.459	2.048	0.499
Range of Concentrations		1.46 - 3.24	0.353 - 0.533	1.55 - 2.46	0.349 - 0.672
Exceedance Rate*		4 / 4	0 / 4	0 / 4	0 / 4

@ = With the exception of mercury, Rule 57 water quality values are expressed as dissolved metal.

+ = Calculated value; may not be rounded to appropriate number of significant figures.

\* = Number of samples exceeding Rule 57 water quality value / number of samples analyzed.

Table 13. Concentrations of total PCB measured at Michigan rivers on sampling dates shown. The Rule 57 water quality value for total PCB = 0.026 ng/L. WCMP 2004.

STORET ID	Station	Sample Collection Date	Total PCB+ (ng/L)
830159	Anderson Creek	8/10/2004	0.254
350061	Au Sable River	3/31/2004	0.091
		4/27/2004	0.108
		5/12/2004	0.188
		5/19/2004	0.105
		6/8/2004	0.166
		7/13/2004	0.175
		7/29/2004	0.395
		8/25/2004	0.236
		9/14/2004	0.129
		10/13/2004	0.160
		10/27/2004	0.048
11/23/2004	0.130		
170154	Bear Creek	8/24/2004	0.319
340186	Bellamy Creek	7/1/2004	0.359
770082	Fox River	8/31/2004	0.121
500467	North Branch Clinton River	7/14/2004	0.399
490006	Pine River	4/5/2004	0.122
		4/20/2004	0.799
		5/13/2004	0.448
		5/24/2004	2.449
		6/1/2004	0.436
		7/6/2004	0.555
		8/4/2004	0.489
		8/10/2004	0.630
		9/7/2004	0.391
		9/27/2004	0.216
		10/18/2004	0.098
10/25/2004	0.232		
090177	Saginaw River	3/10/2004	8.667
		4/6/2004	3.108
		4/28/2004	5.086
		5/4/2004	3.266
		5/10/2004	7.670
		5/24/2004	7.640
		6/23/2004	5.625
		7/28/2004	11.998
		8/24/2004	7.968
		10/12/2004	5.812
		11/4/2004	3.596
11/22/2004	2.326		
130331	South Branch Kalamazoo River	6/30/2004	0.319
480033	Tahquamenon River (Headwaters)	6/29/2004	0.219

+ = Calculated value; may not be rounded to appropriate number of significant figures.

Figure 1. Monitoring cycle year 2004 watersheds. Not all watersheds shown have been selected for sampling within the WCMP.

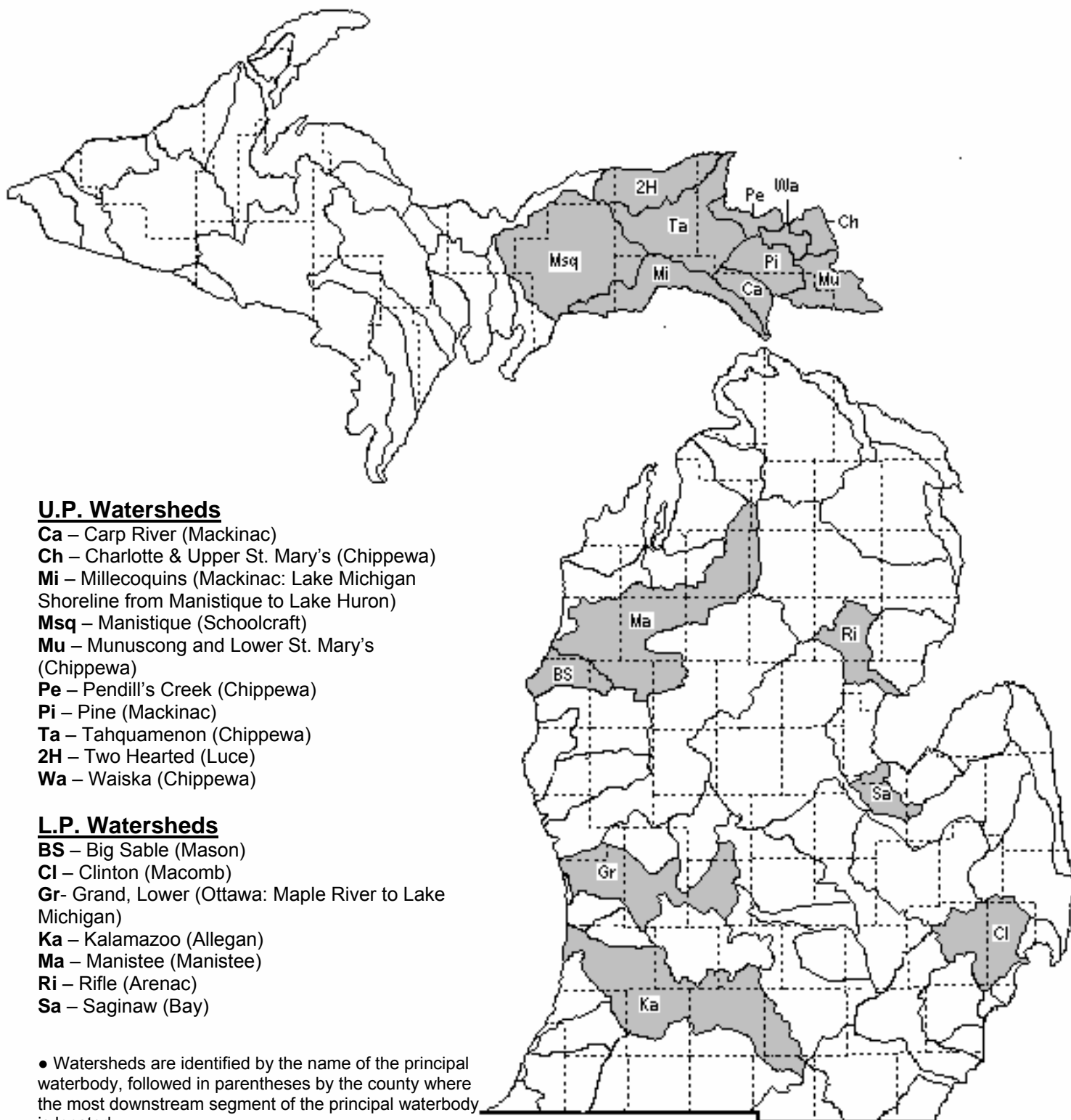


Figure 2. Monitoring cycle year 2005 watersheds. Not all watersheds shown have been selected for sampling within the WCMP.

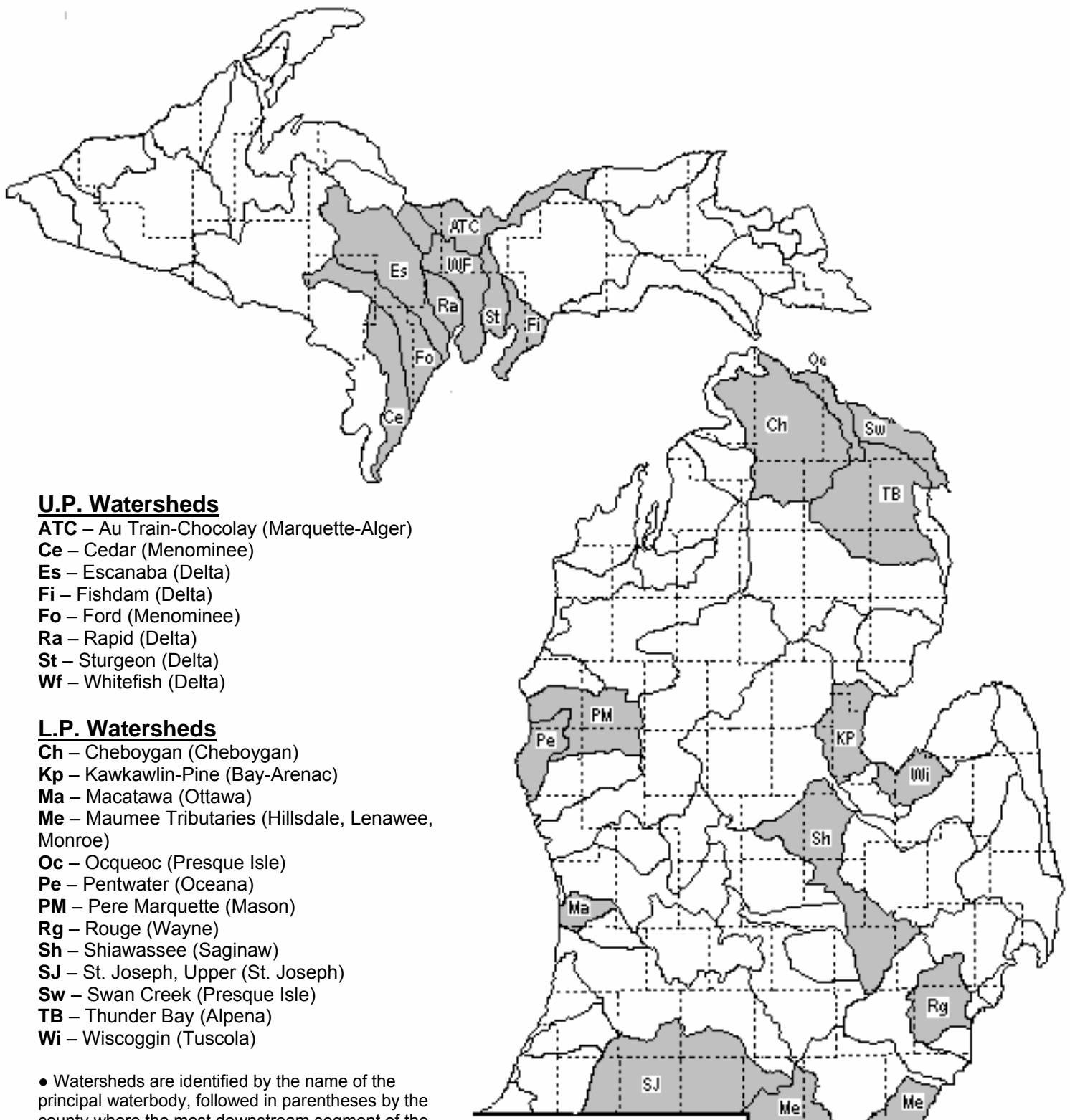


Figure 3. Monitoring cycle year 2006 watersheds. Not all watersheds shown have been selected for sampling within the WCMP.

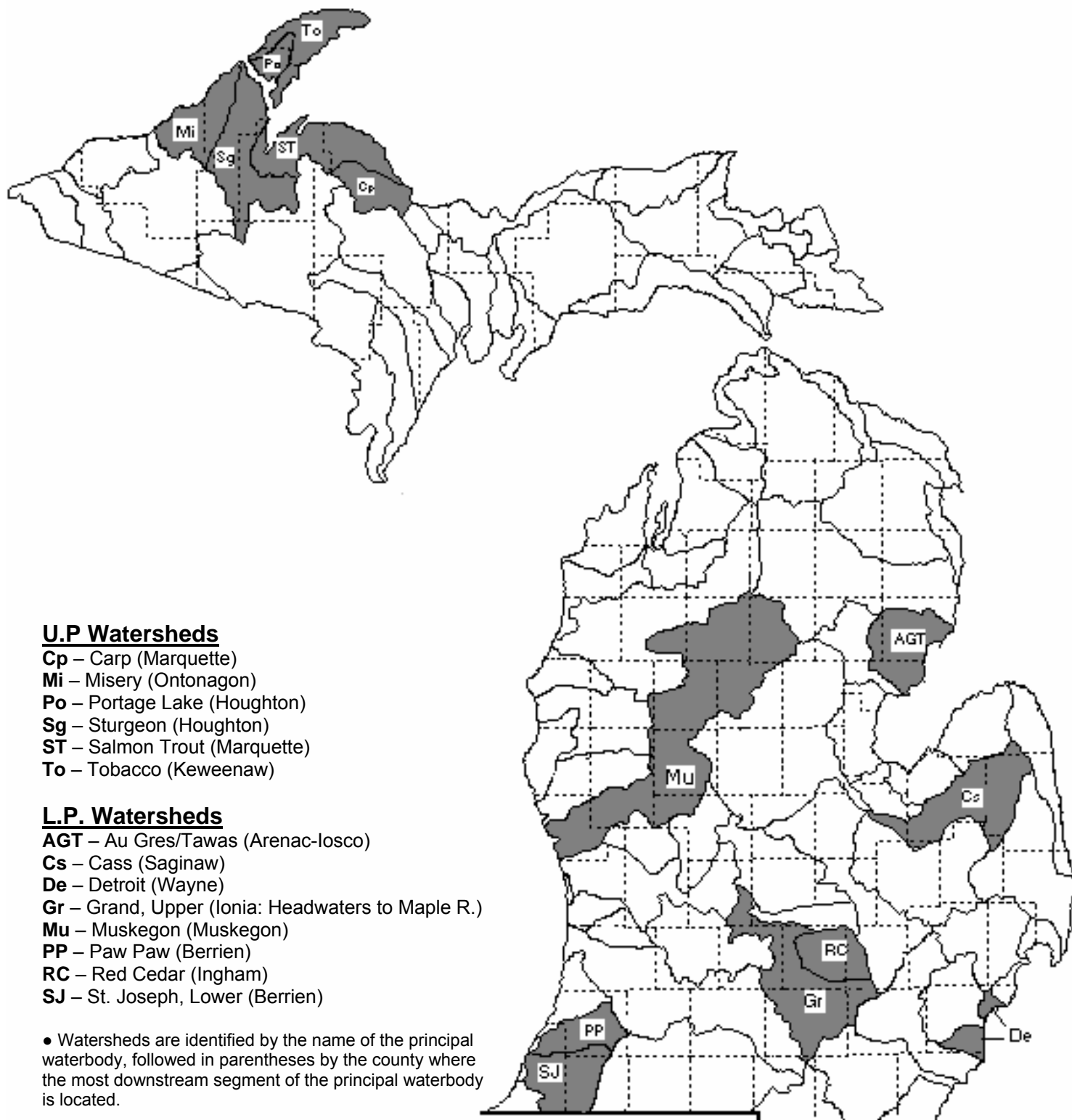




Figure 4. Monitoring cycle year 2007 watersheds. Not all watersheds shown have been selected for sampling within the WCMP.

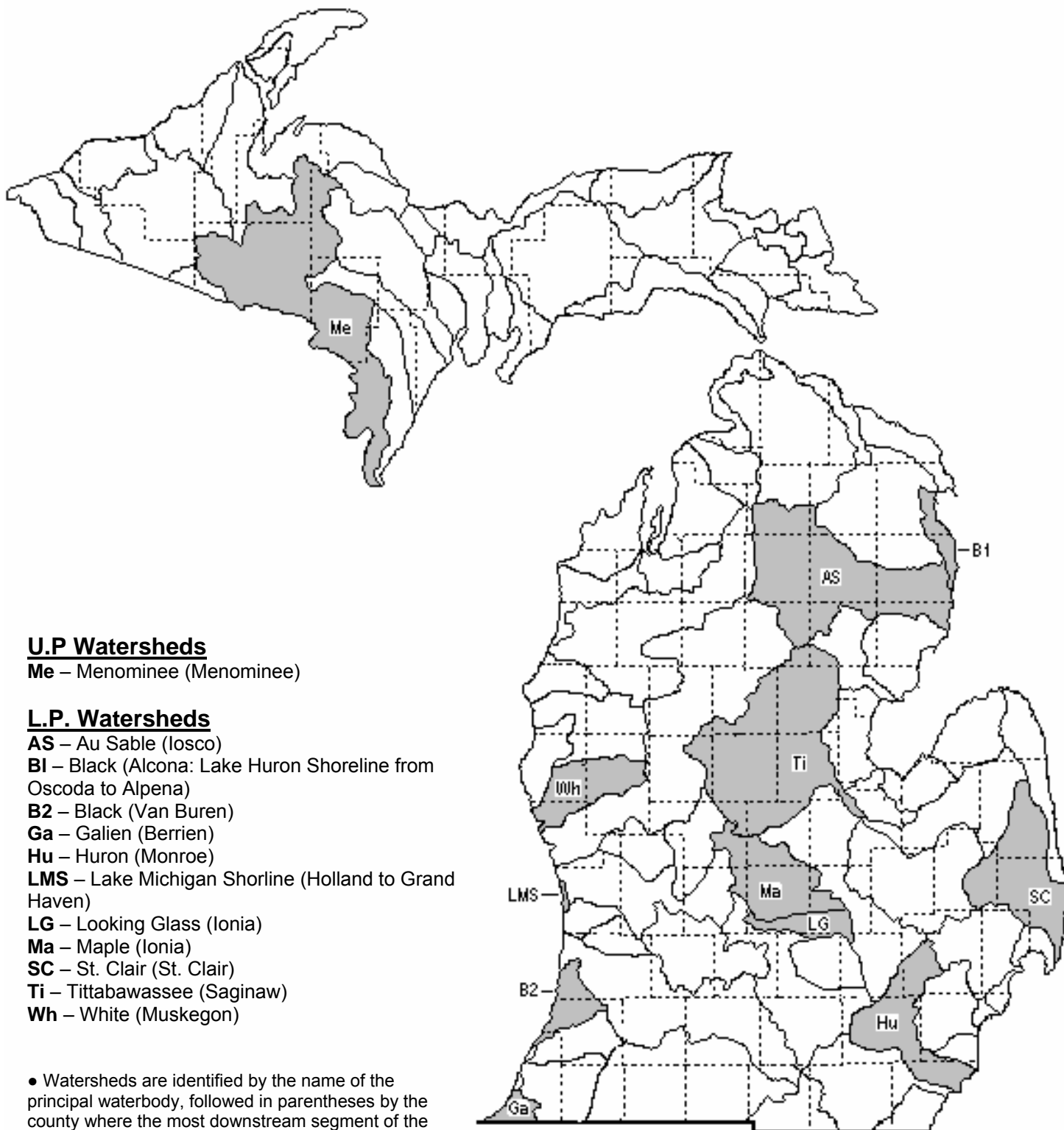
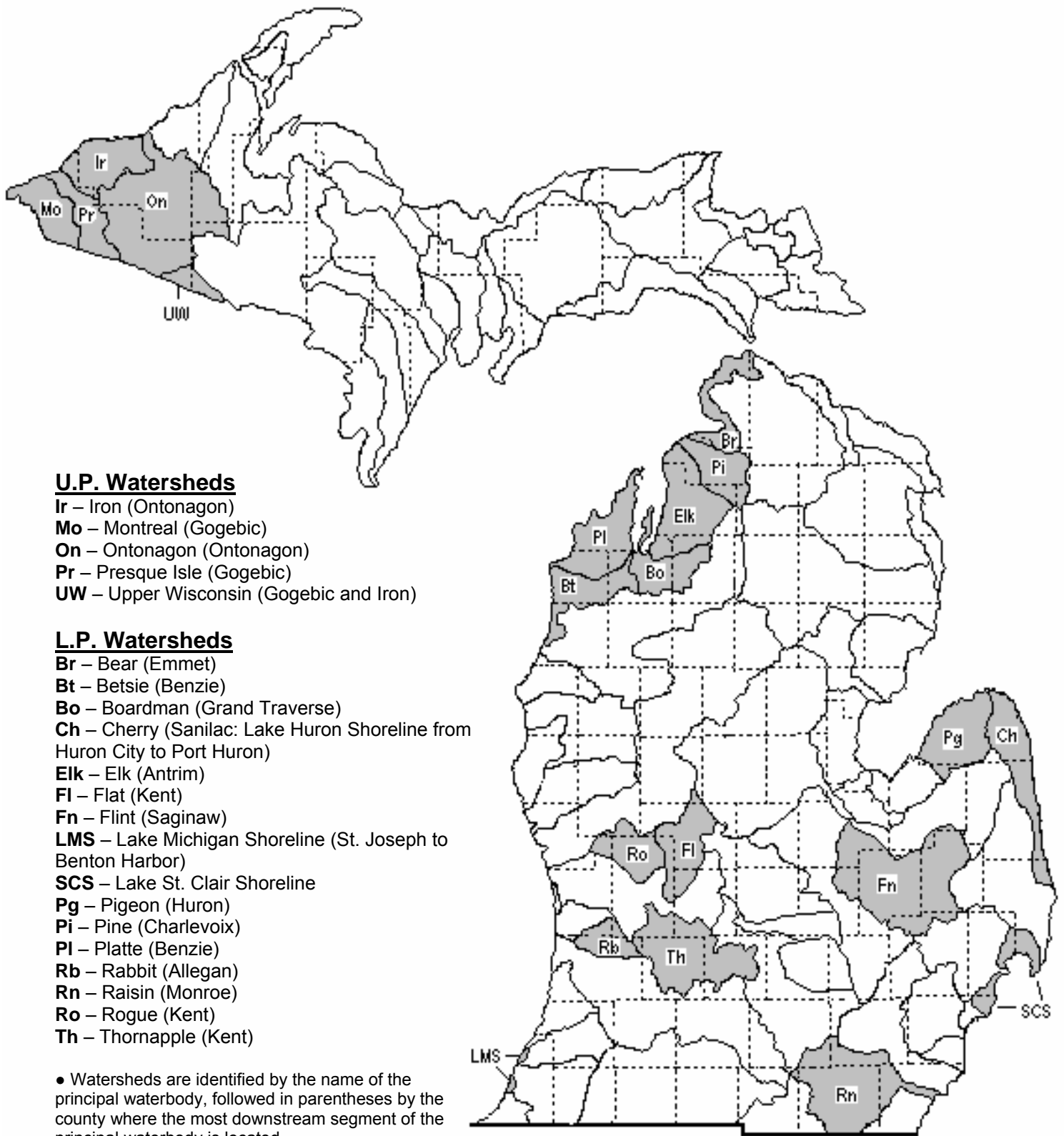


Figure 5. Monitoring cycle year 2008 watersheds. Not all watersheds shown have been selected for sampling within the WCMP.



**Figure 6. Intensive water chemistry monitoring locations and associated watersheds.**



Figure 7. Integrator water chemistry monitoring locations and associated watersheds.

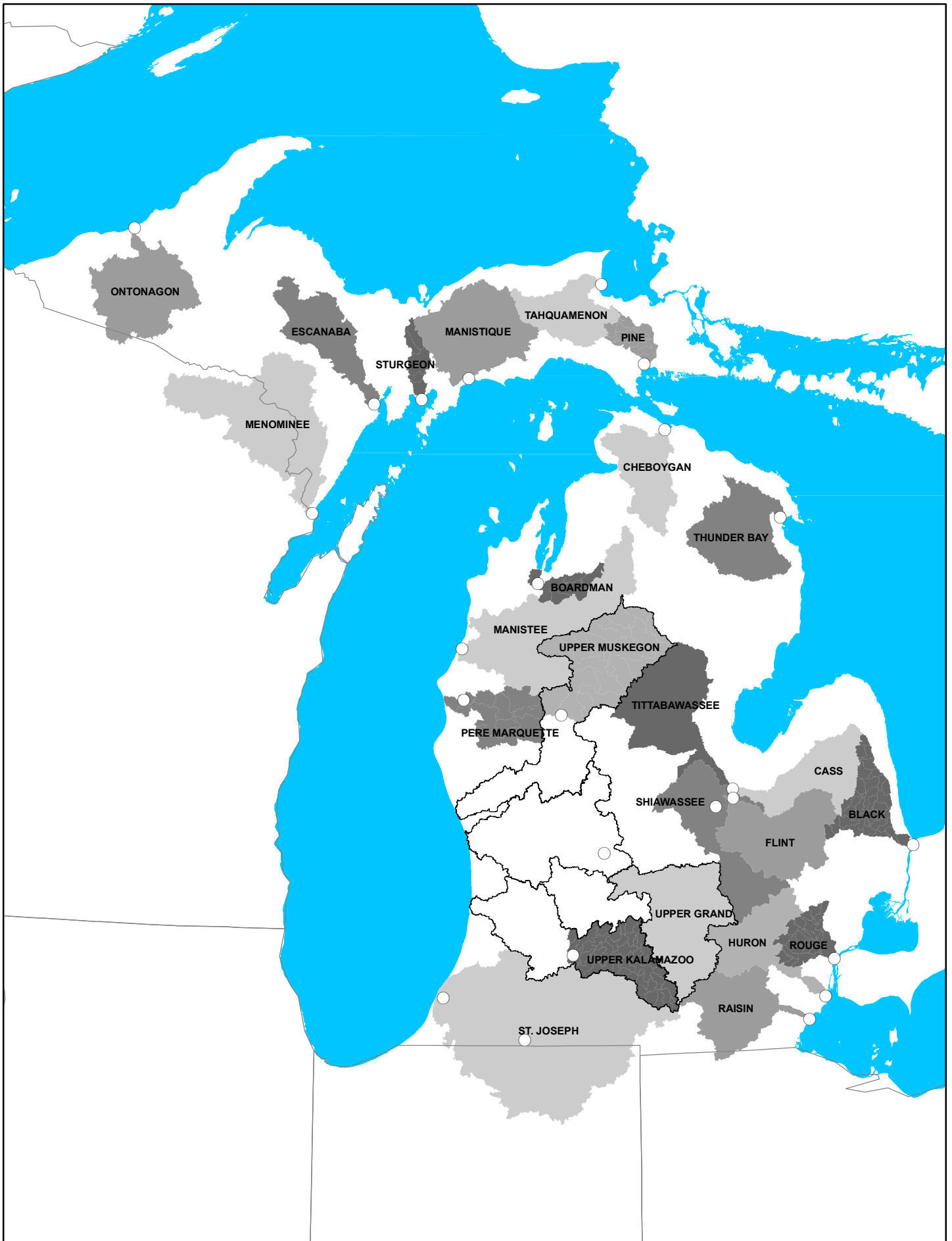


Figure 8. Comparison of total phosphorus among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

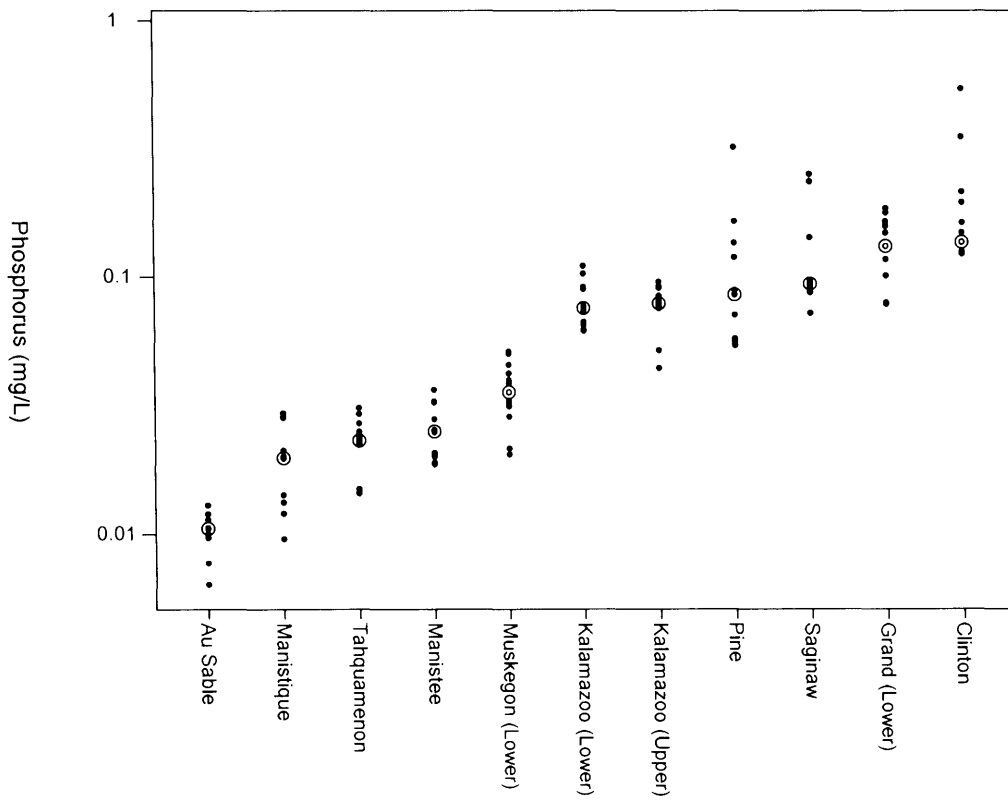


Figure 9. Comparison of total chloride among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

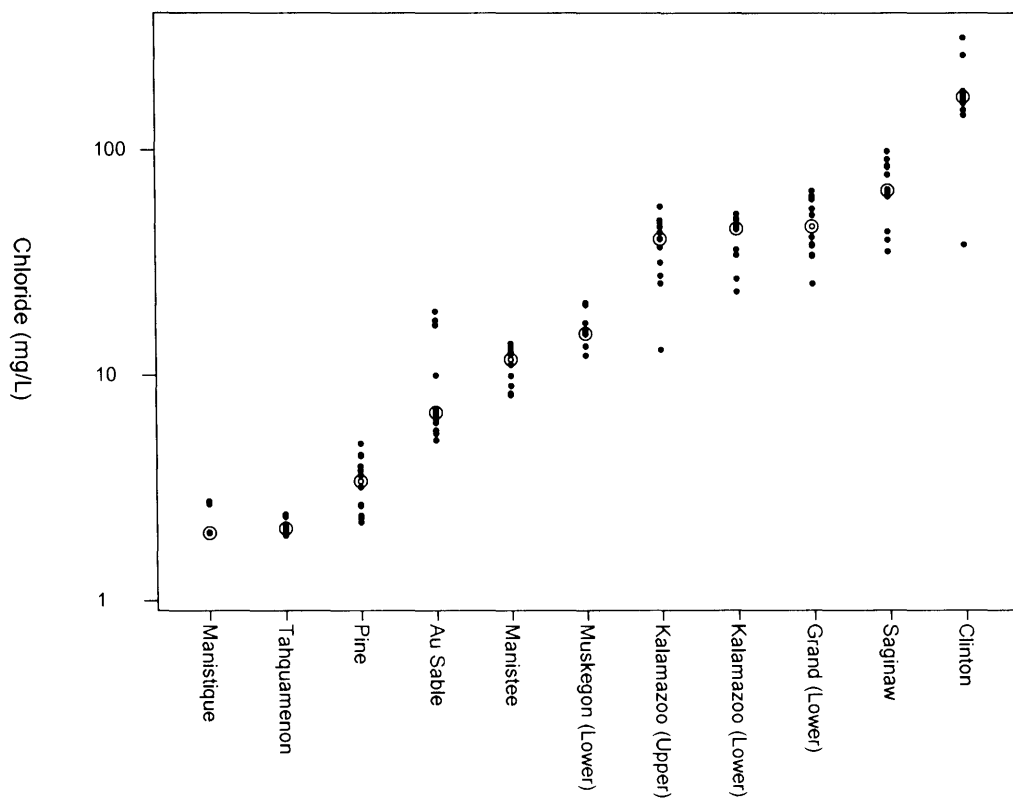


Figure 10. Comparison of total suspended solids among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

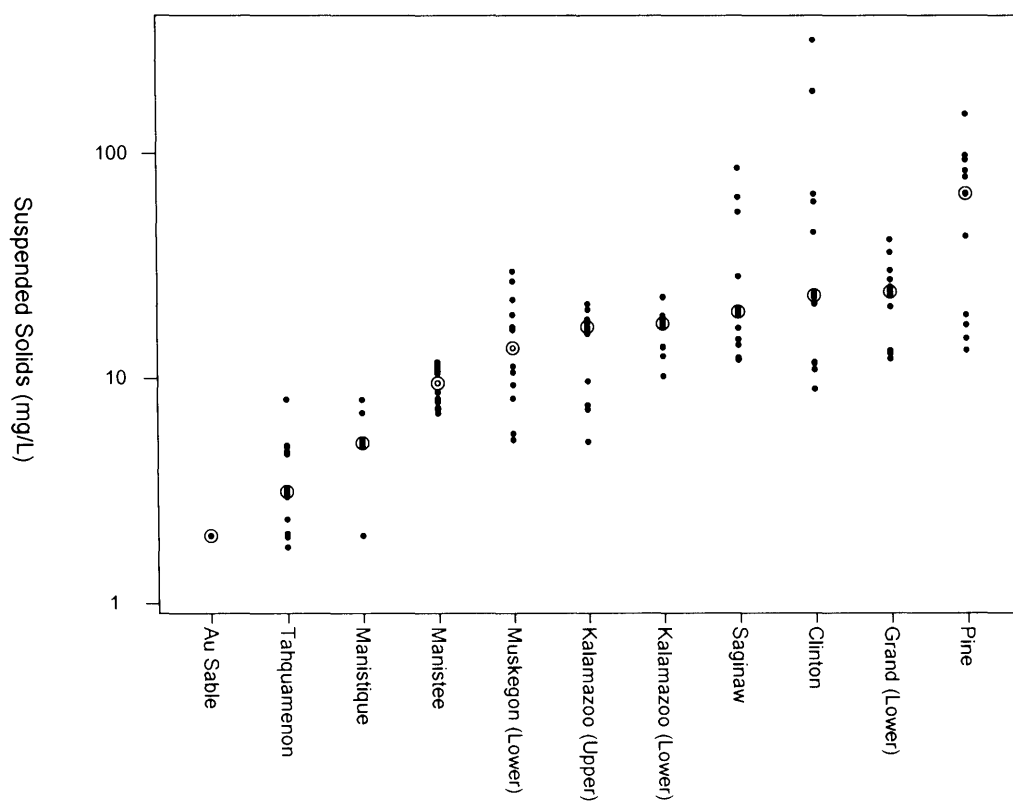


Figure 11. Comparison of total mercury among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

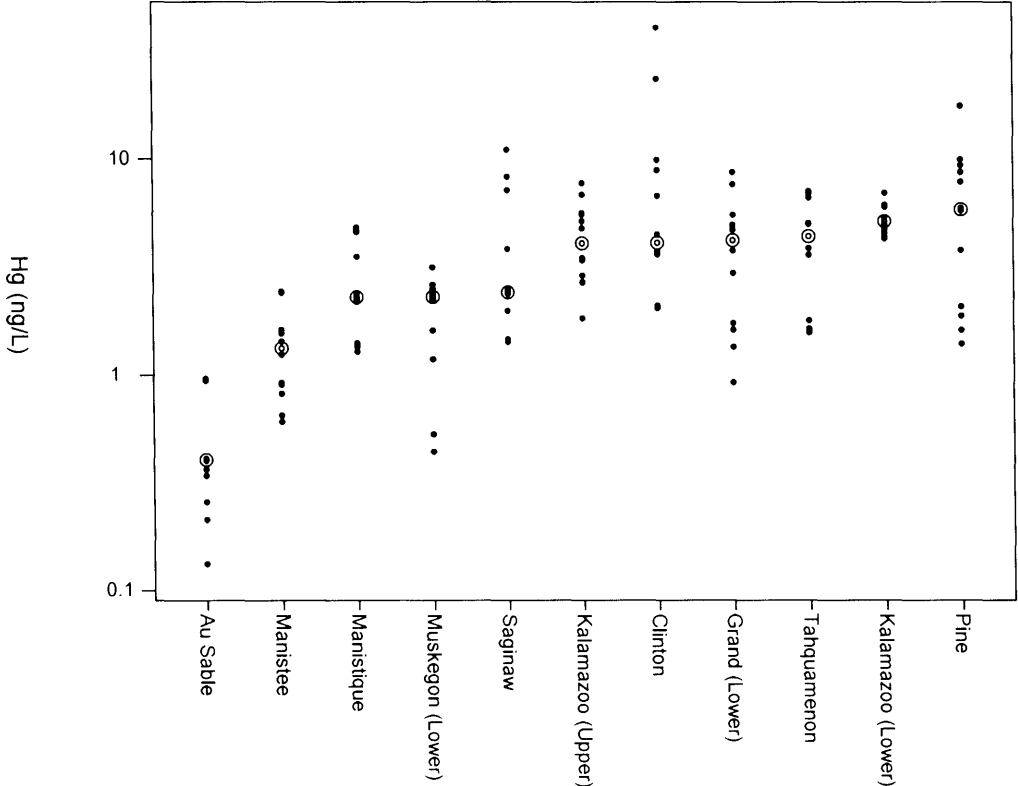




Figure 12. Comparison of total chromium among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

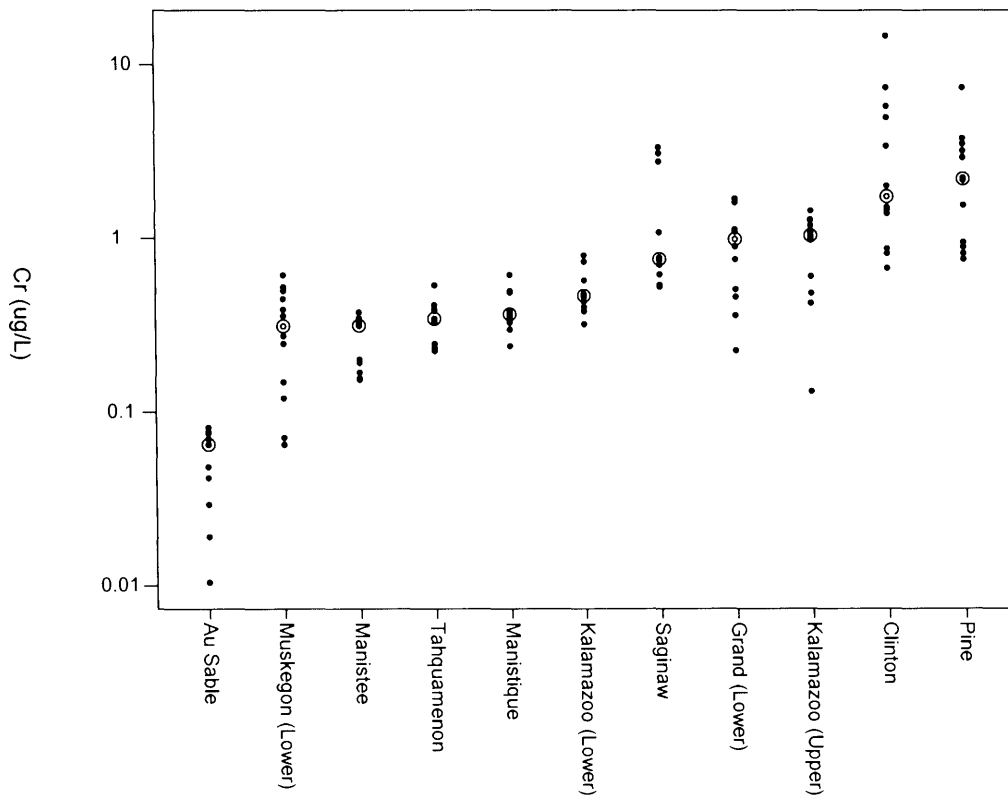


Figure 13. Comparison of total copper among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

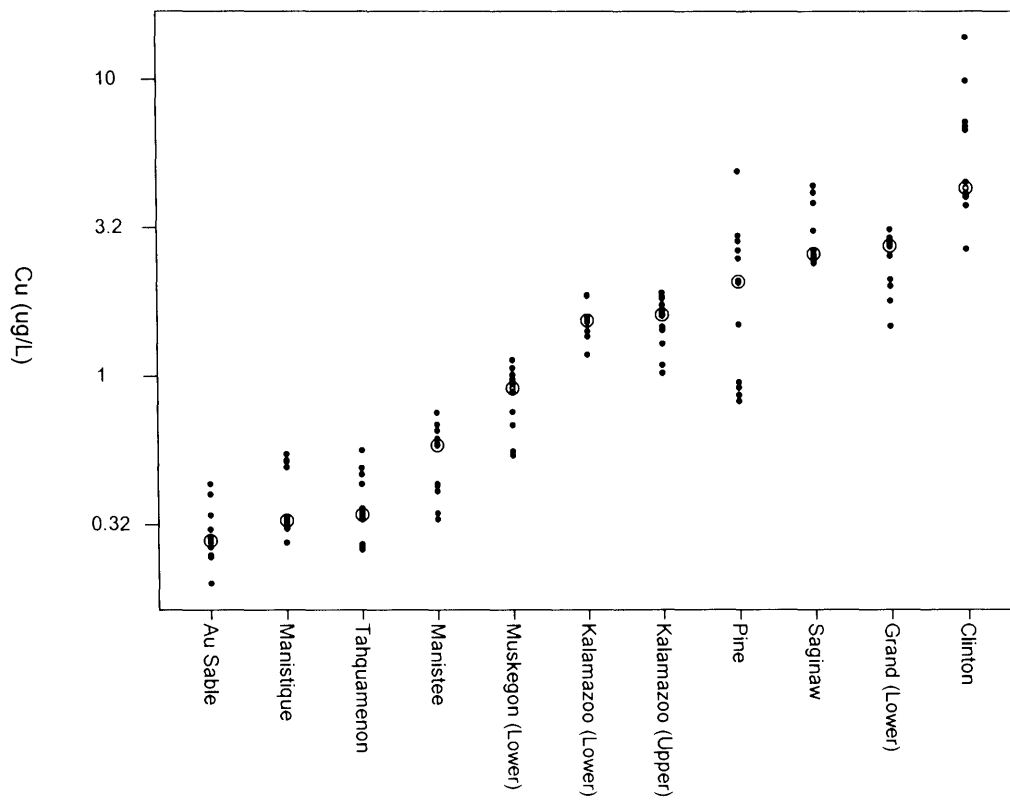


Figure 14. Comparison of total lead among intensively monitored sites. Double circle designates the median. Graph represents concentrations normalized to stream discharge (WCMP 2004).

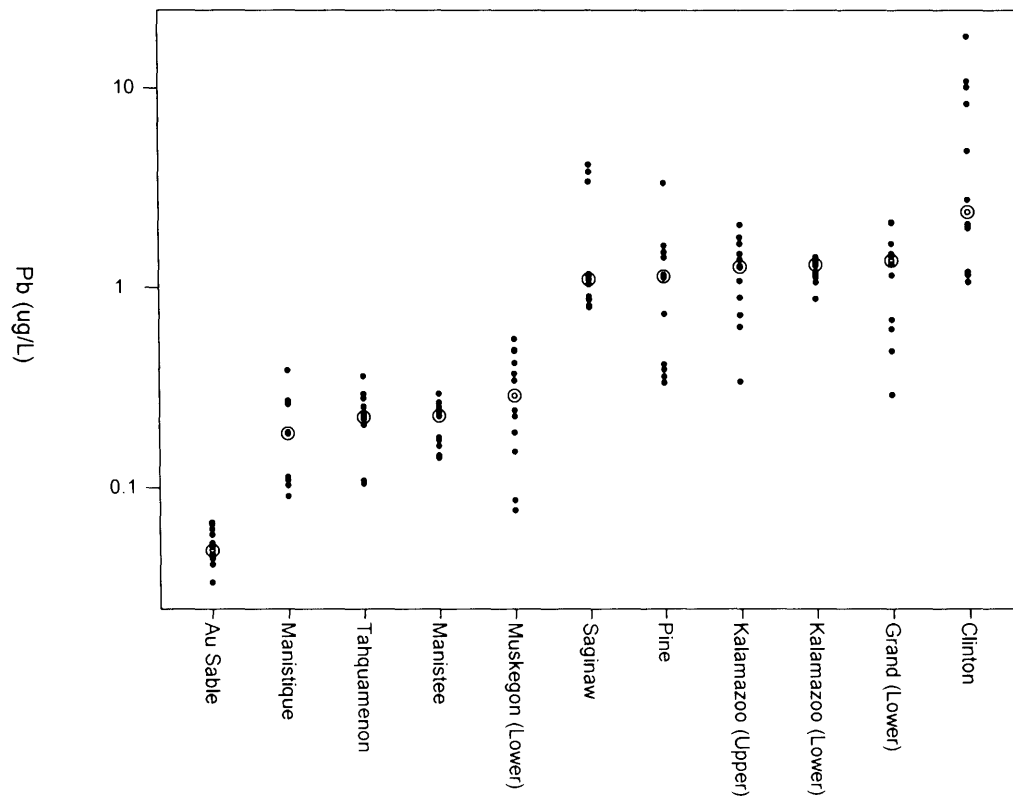


Figure 15. Comparison of total phosphorus among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

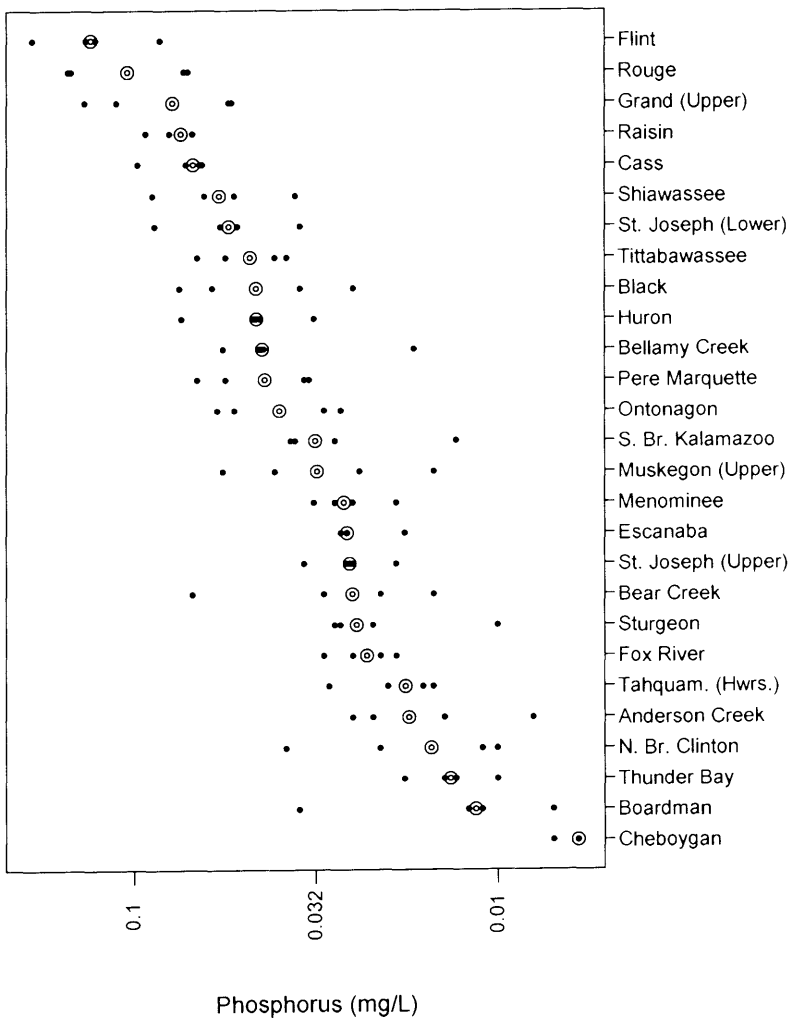


Figure 16. Comparison of total chloride among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

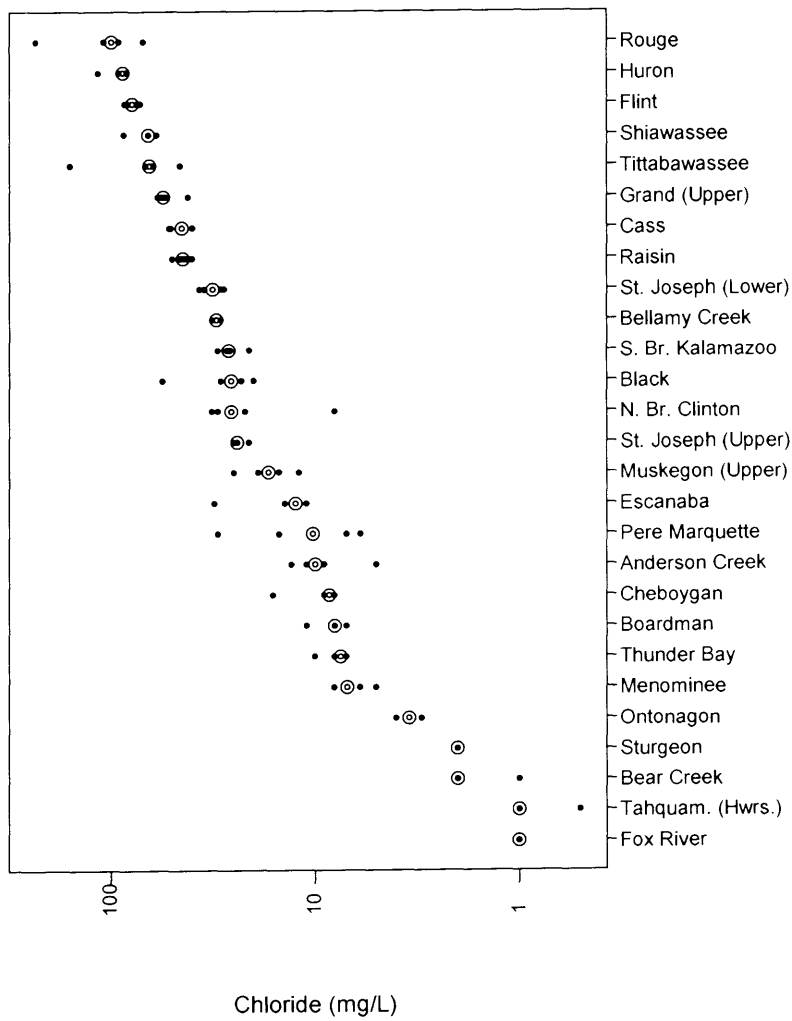


Figure 17. Comparison of total suspended solids among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

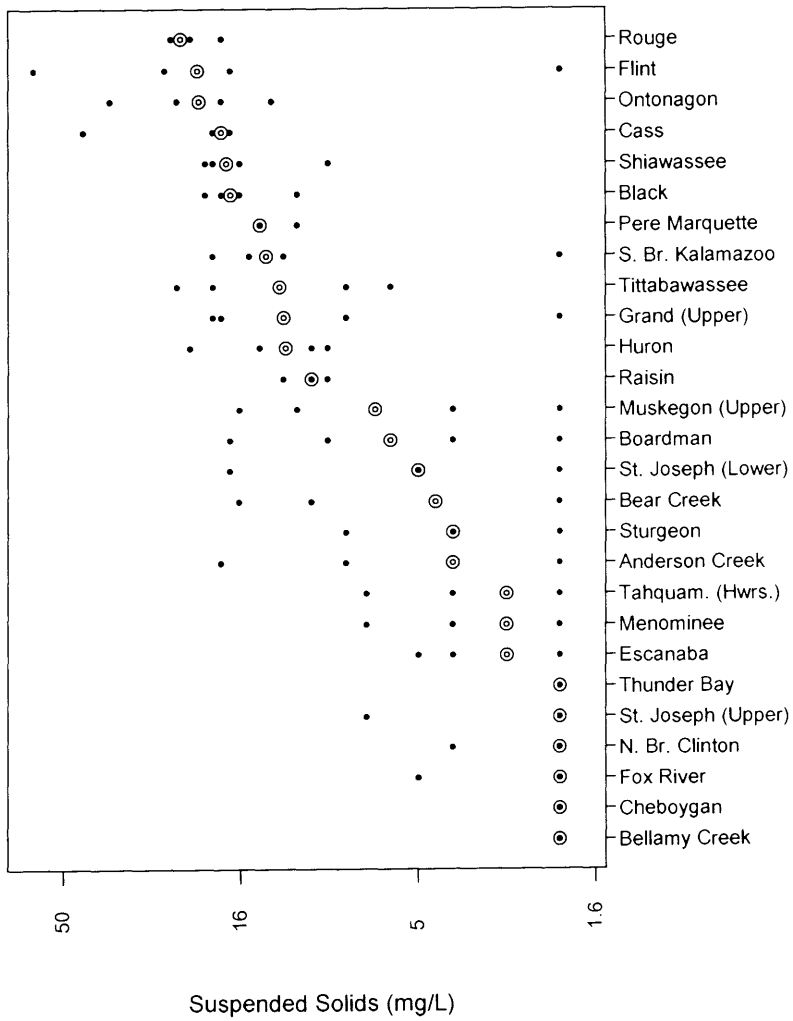


Figure 18. Comparison of total mercury among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

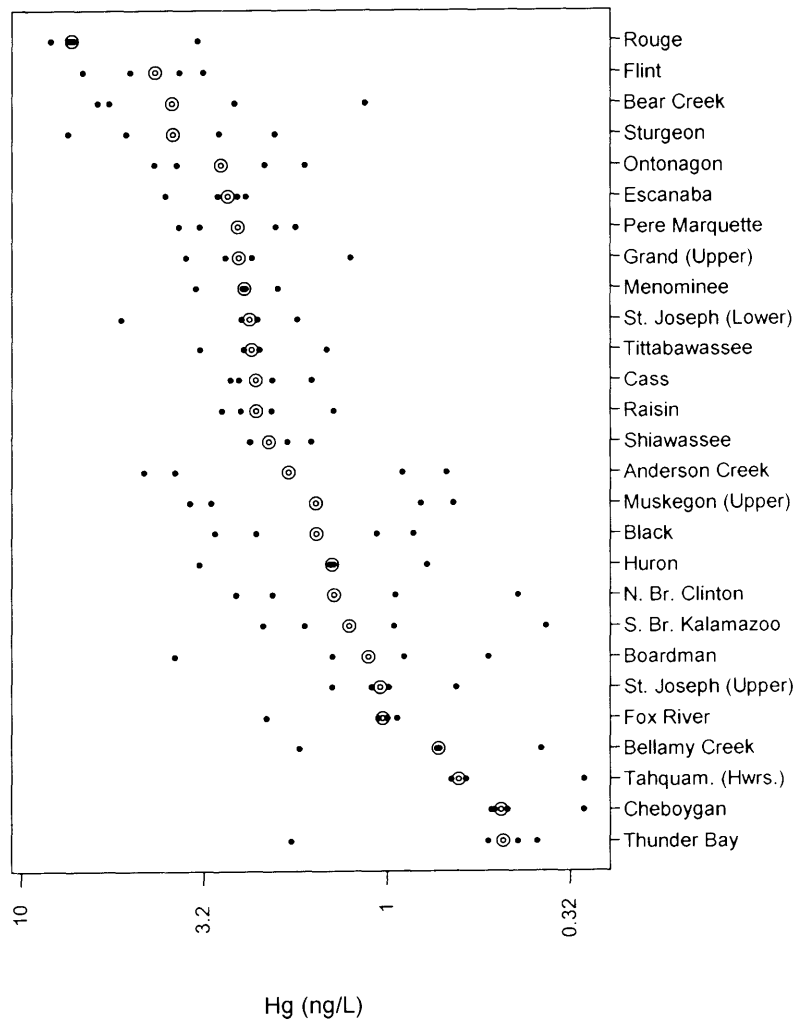


Figure 19. Comparison of total chromium among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

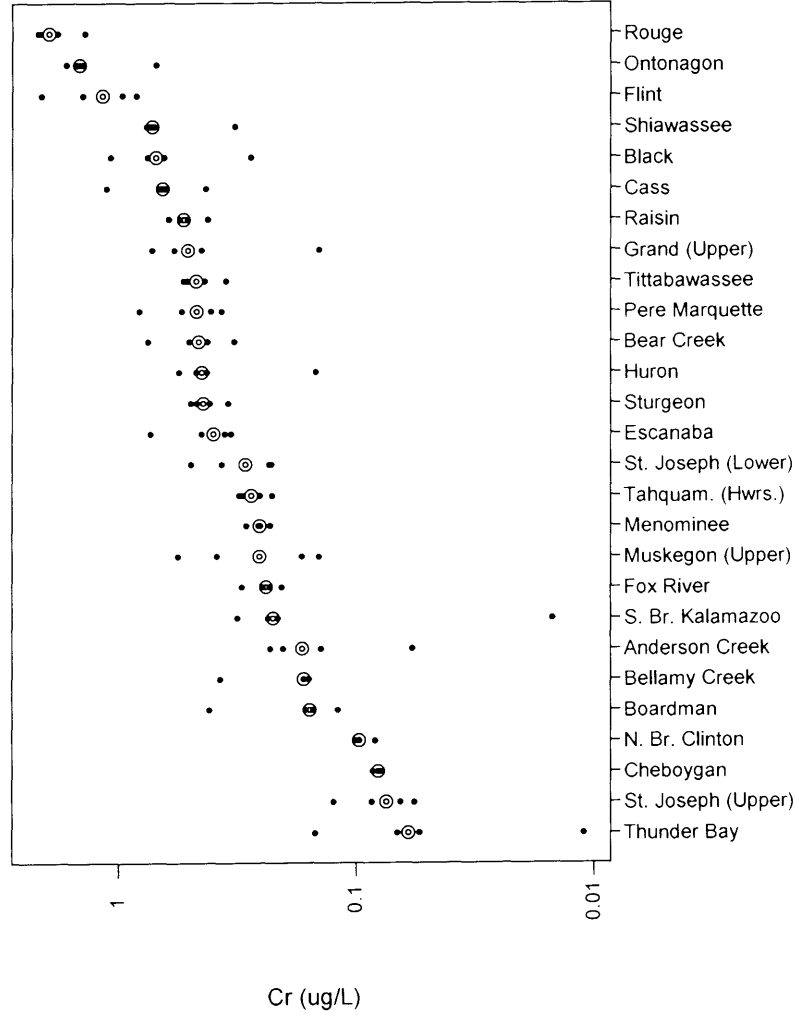




Figure 20. Comparison of total copper among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

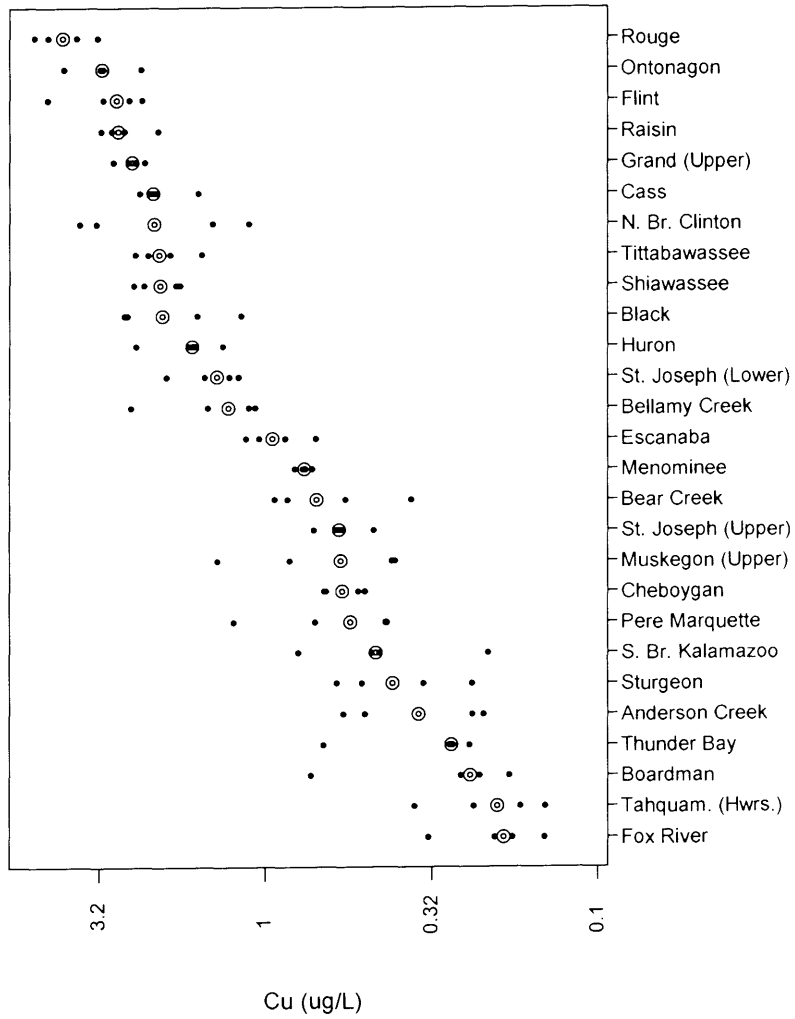


Figure 21. Comparison of total lead among non-intensively monitored sites. Double circle designates the median. All sites were sampled 4 times (WCMP 2004).

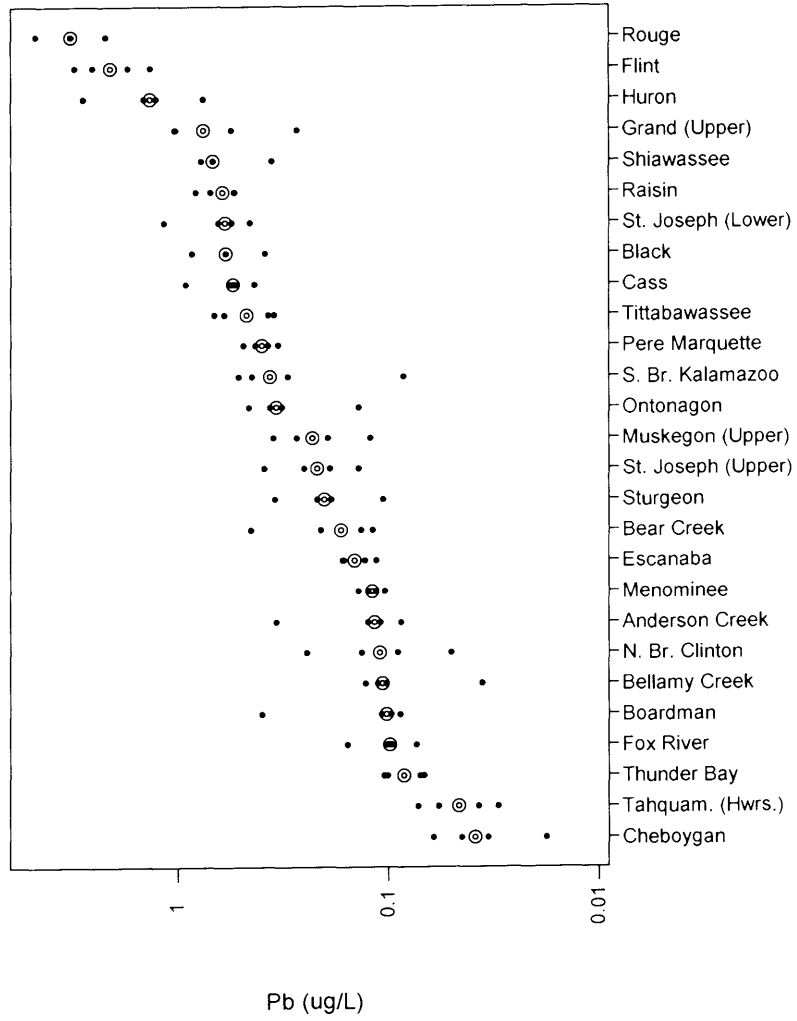


Figure 22. Diagram of the features of a box plot.

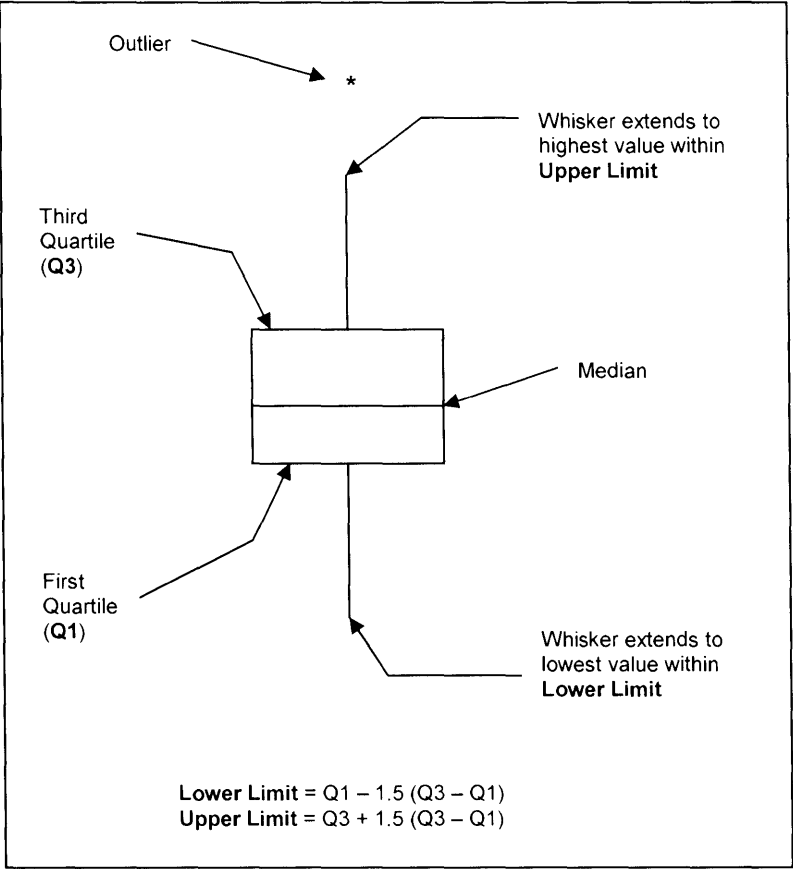


Figure 23. Total phosphorus concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

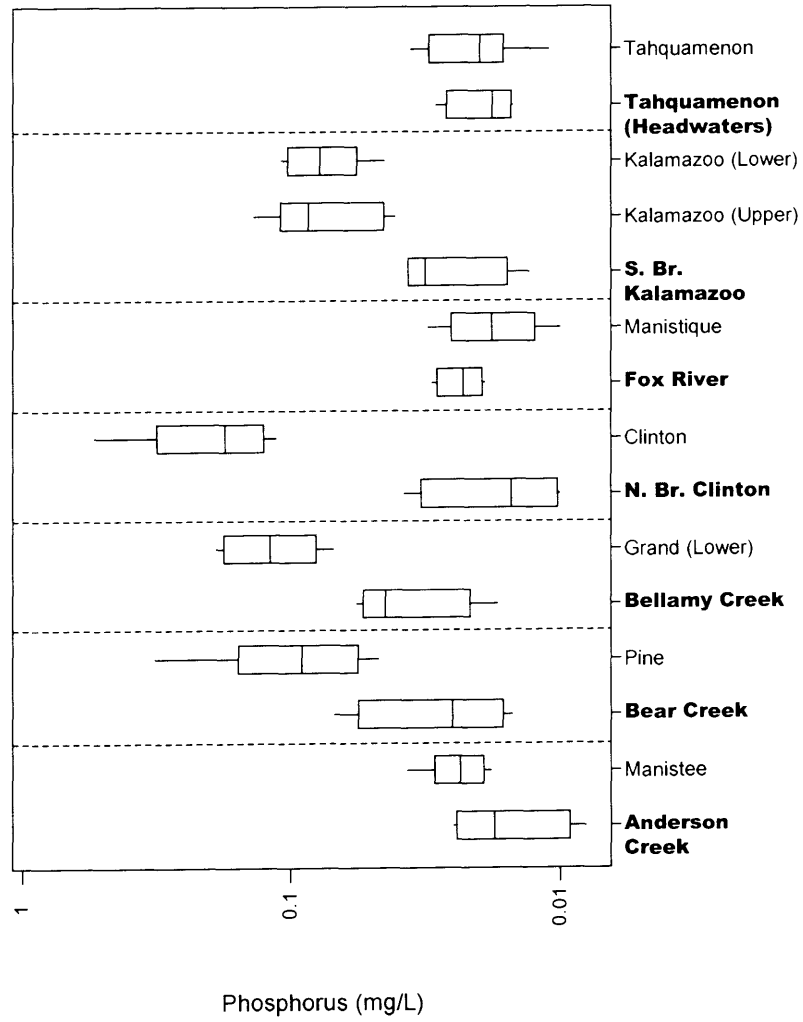


Figure 24. Total chloride concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

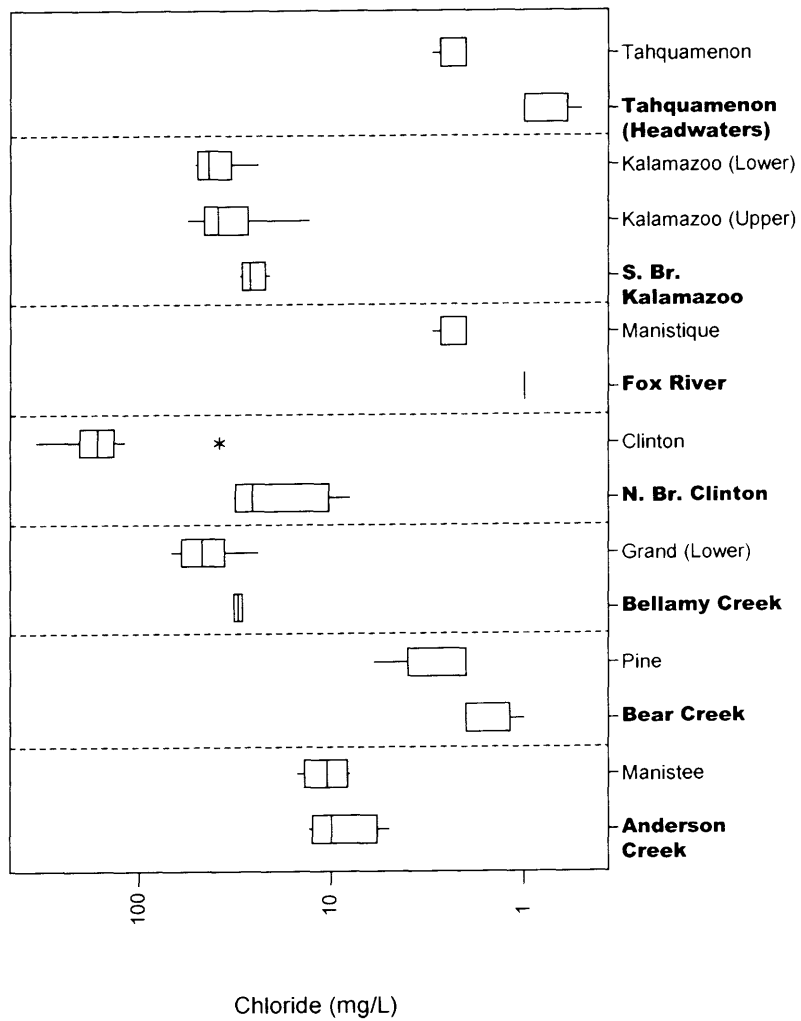


Figure 25. Total suspended solids concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

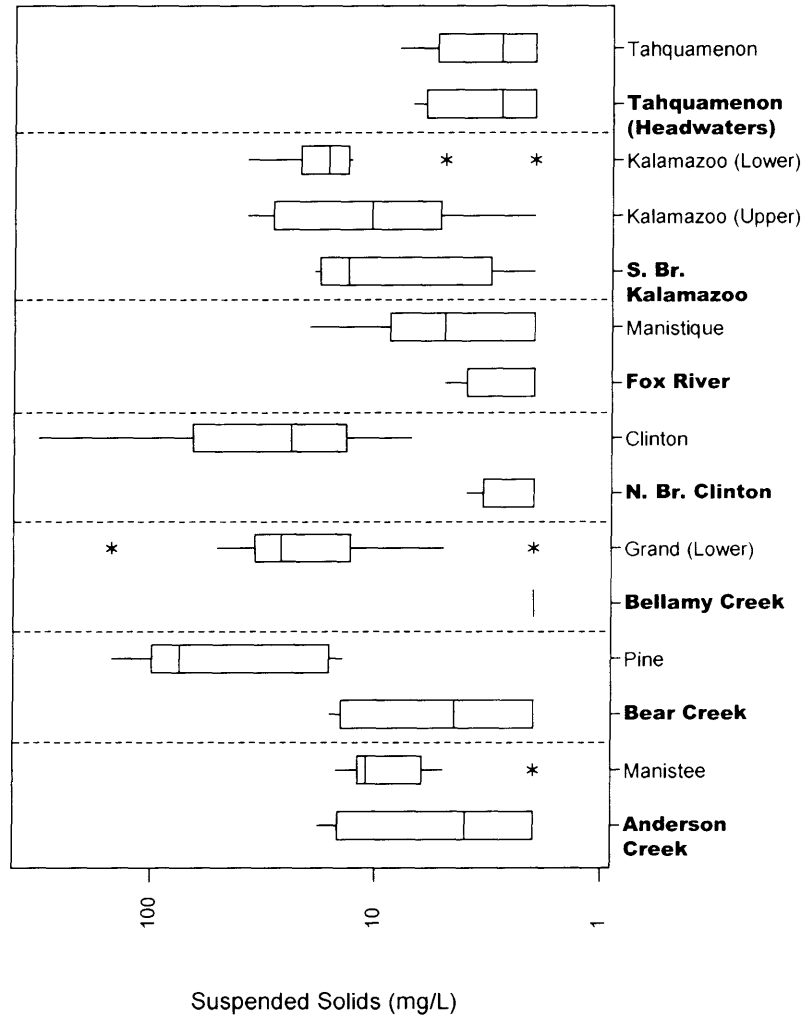


Figure 26. Total mercury concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

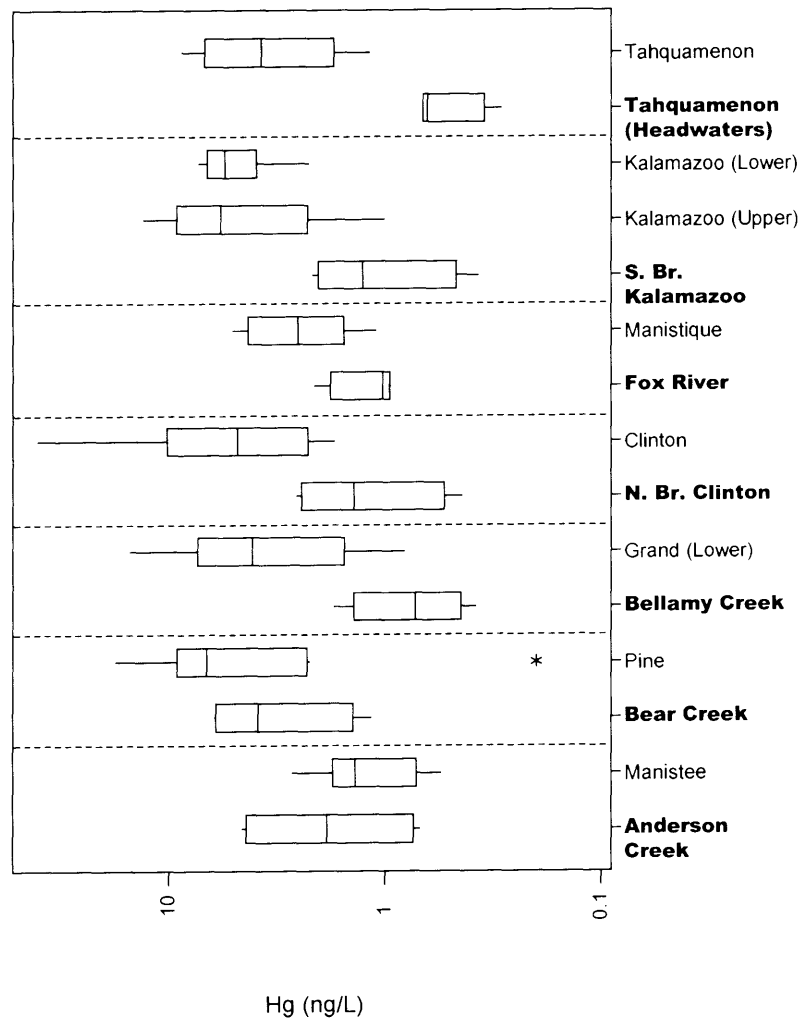


Figure 27. Total chromium concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

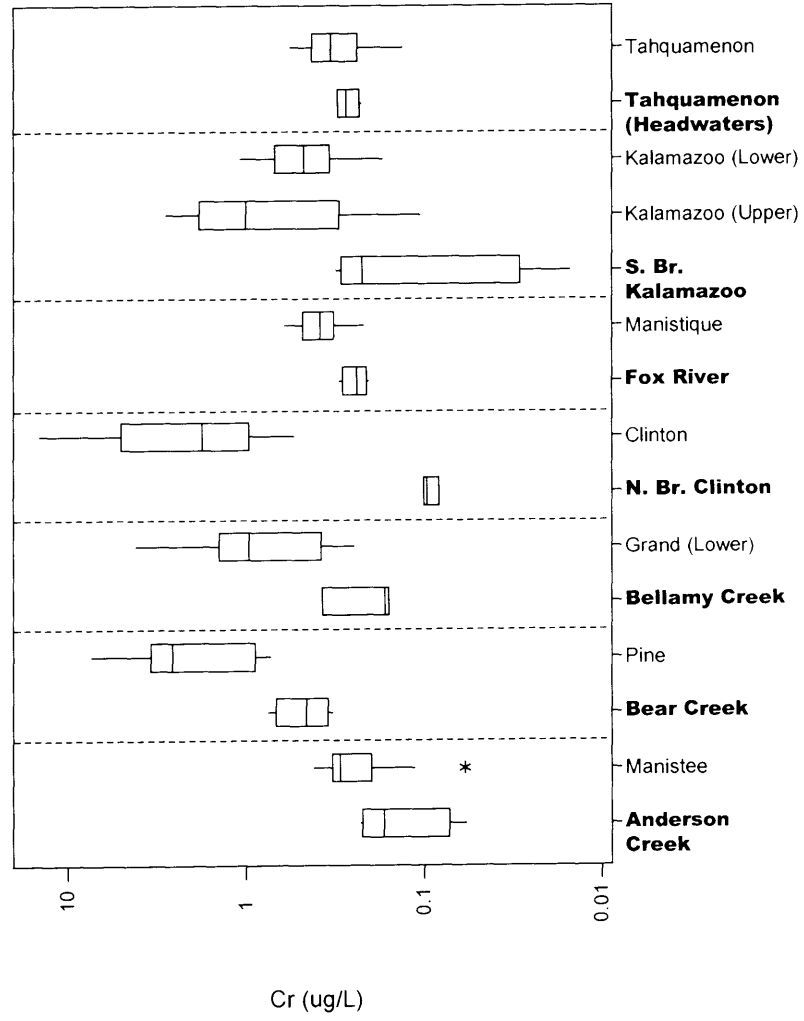




Figure 28. Total copper concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

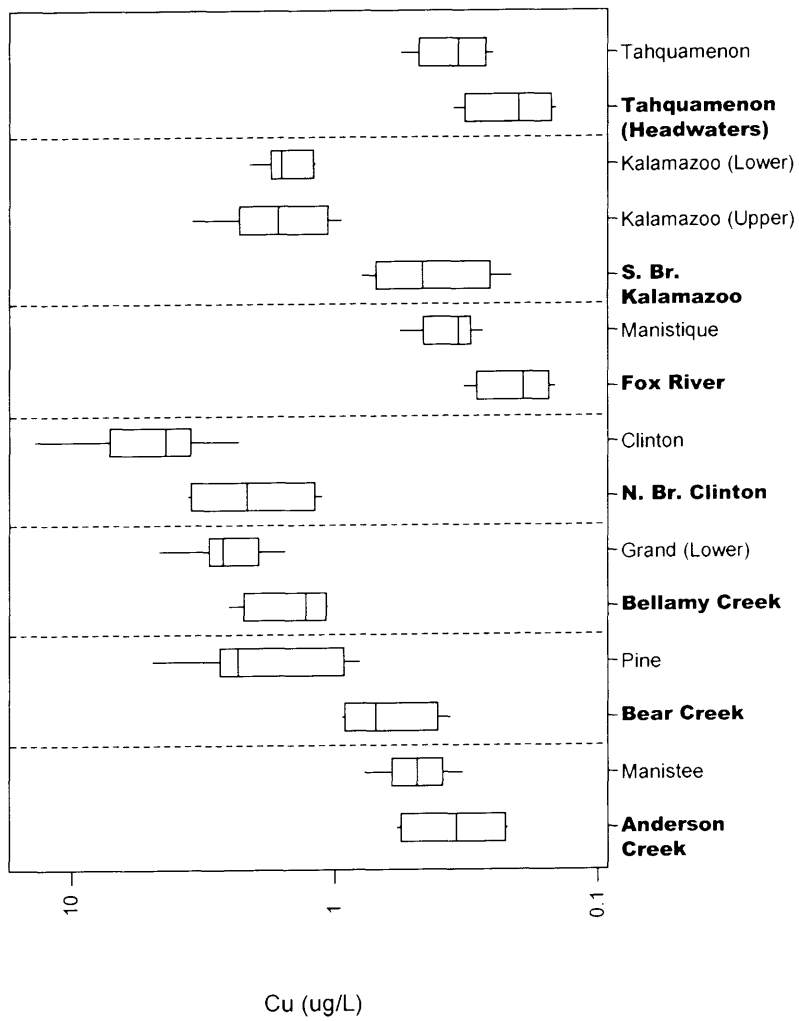


Figure 29. Total lead concentrations at minimally impacted sites compared with potentially impacted sites. Minimally impacted sites are identified in bold (WCMP 2004).

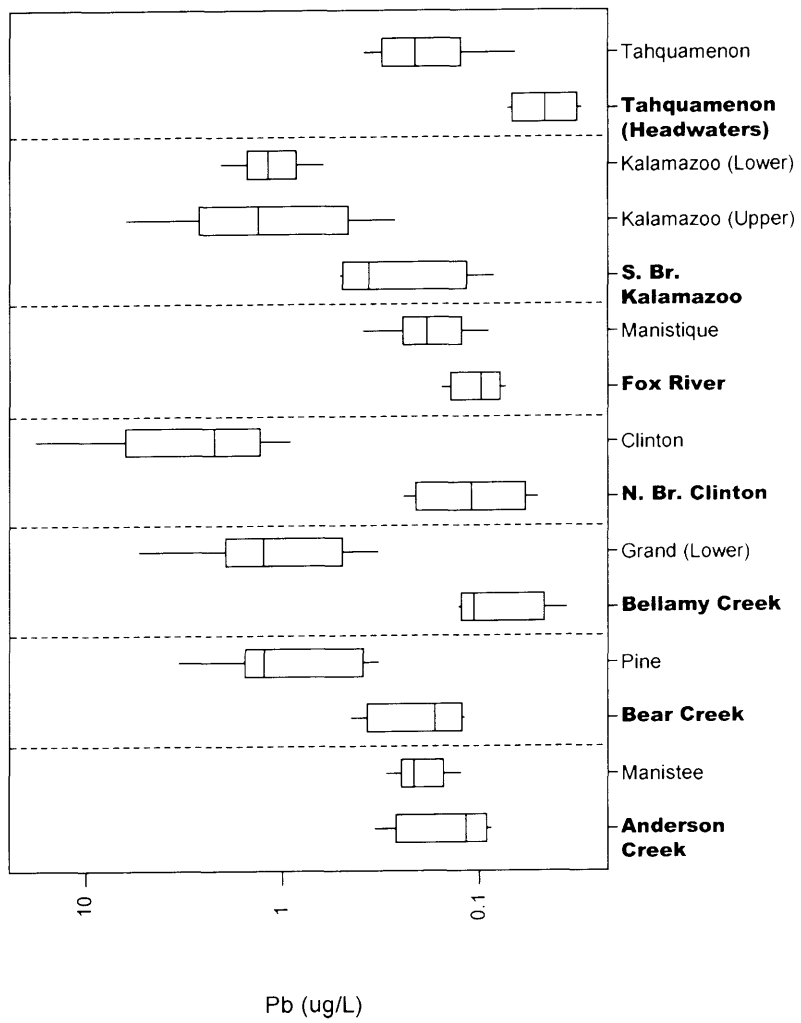
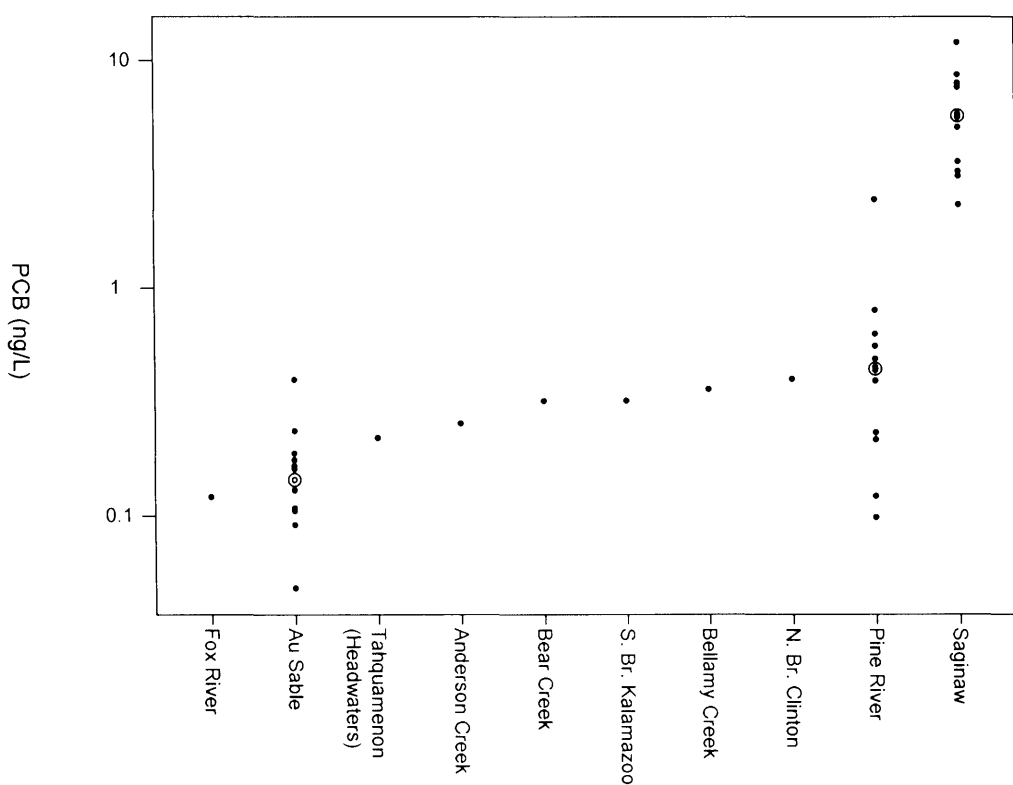


Figure 30. Total PCB concentrations among all stations sampled. For stations at which more than one sample was collected, a double circle designates the median. PCB Rule 57 water quality value = 0.026 ng/L (WCMP 2004).



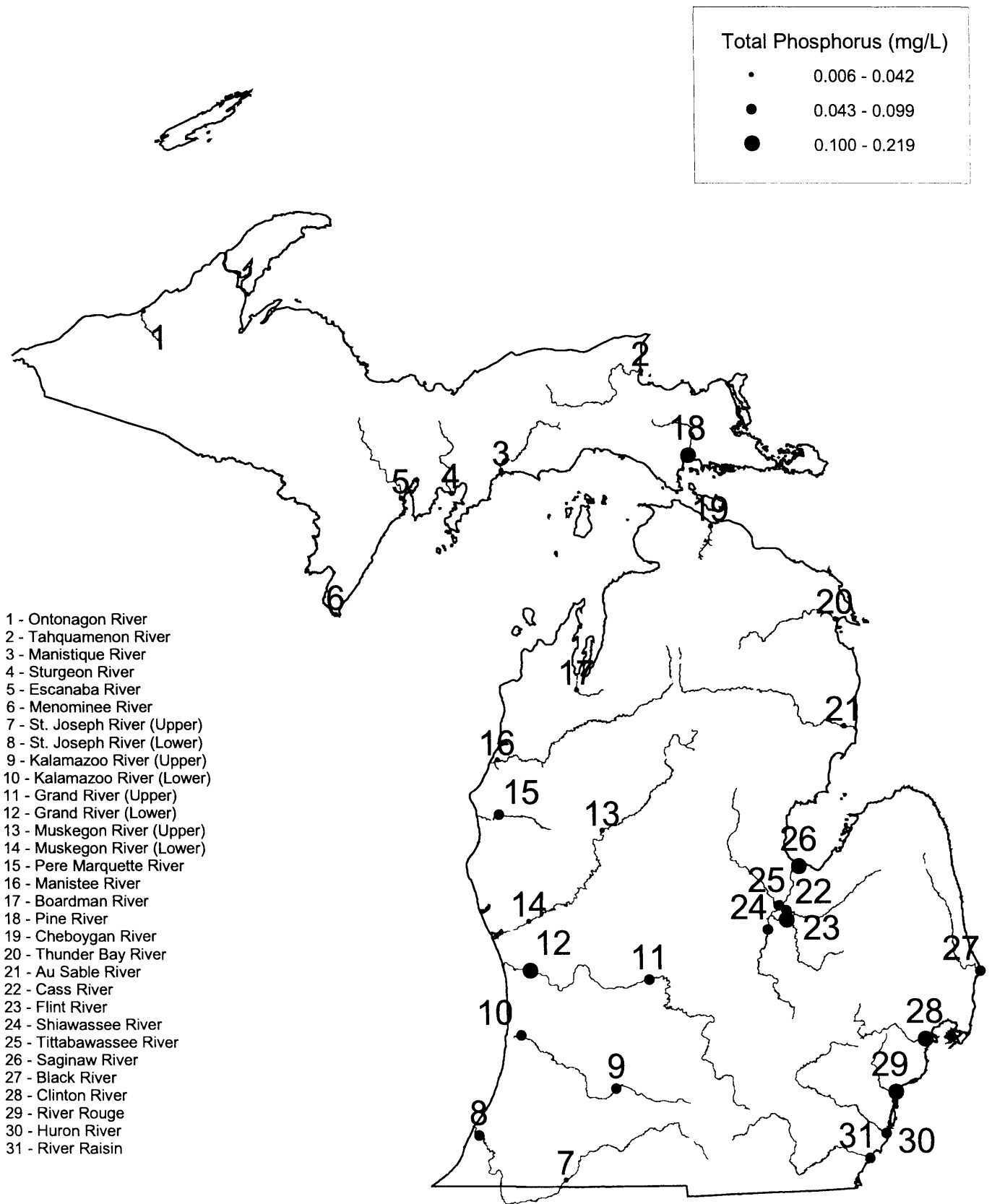


Figure 31. Mean total phosphorus concentrations at integrator and intensive sites, WCMP 2004.

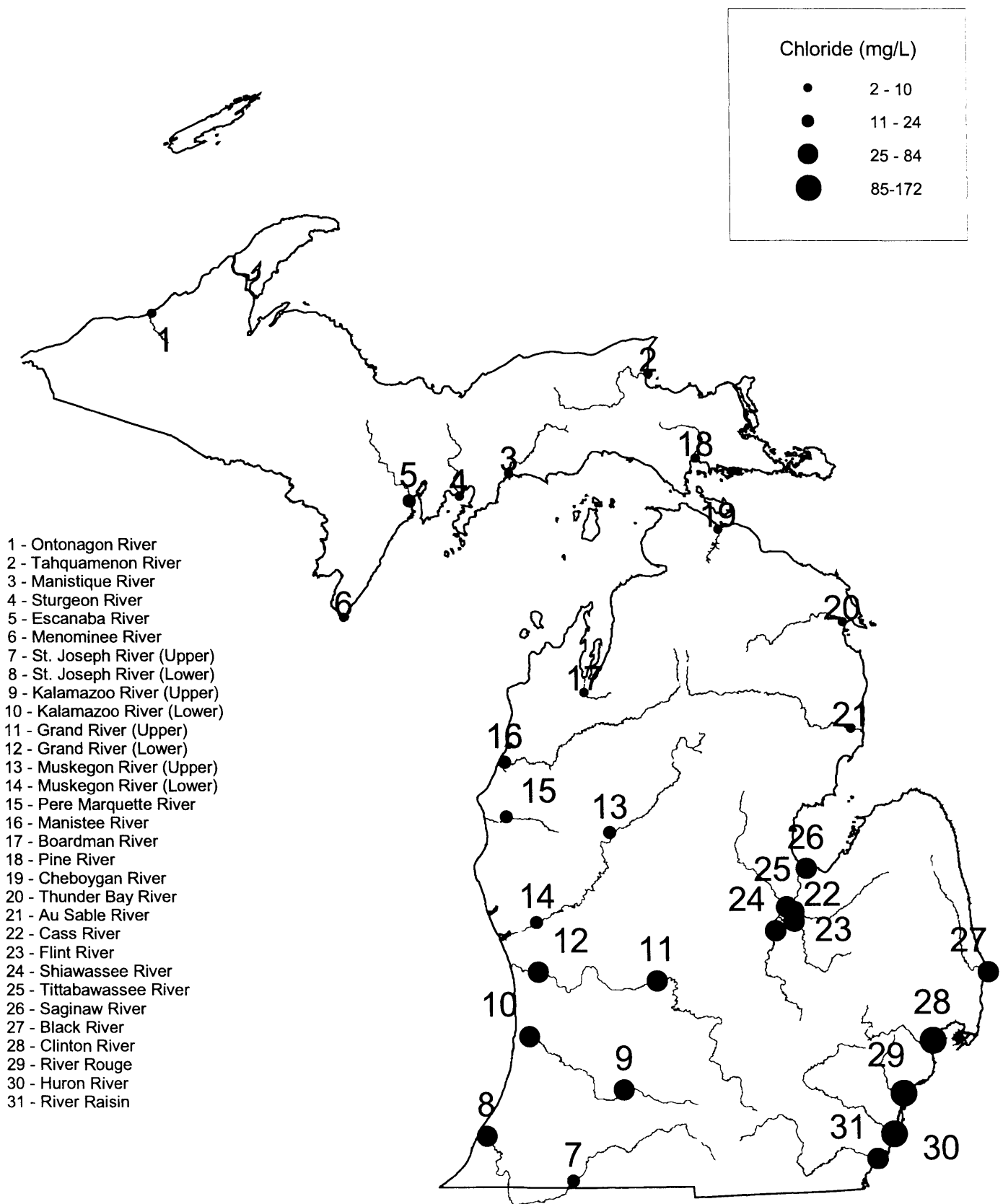


Figure 32. Mean total chloride concentrations at integrator and intensive sites, WCMP 2004.

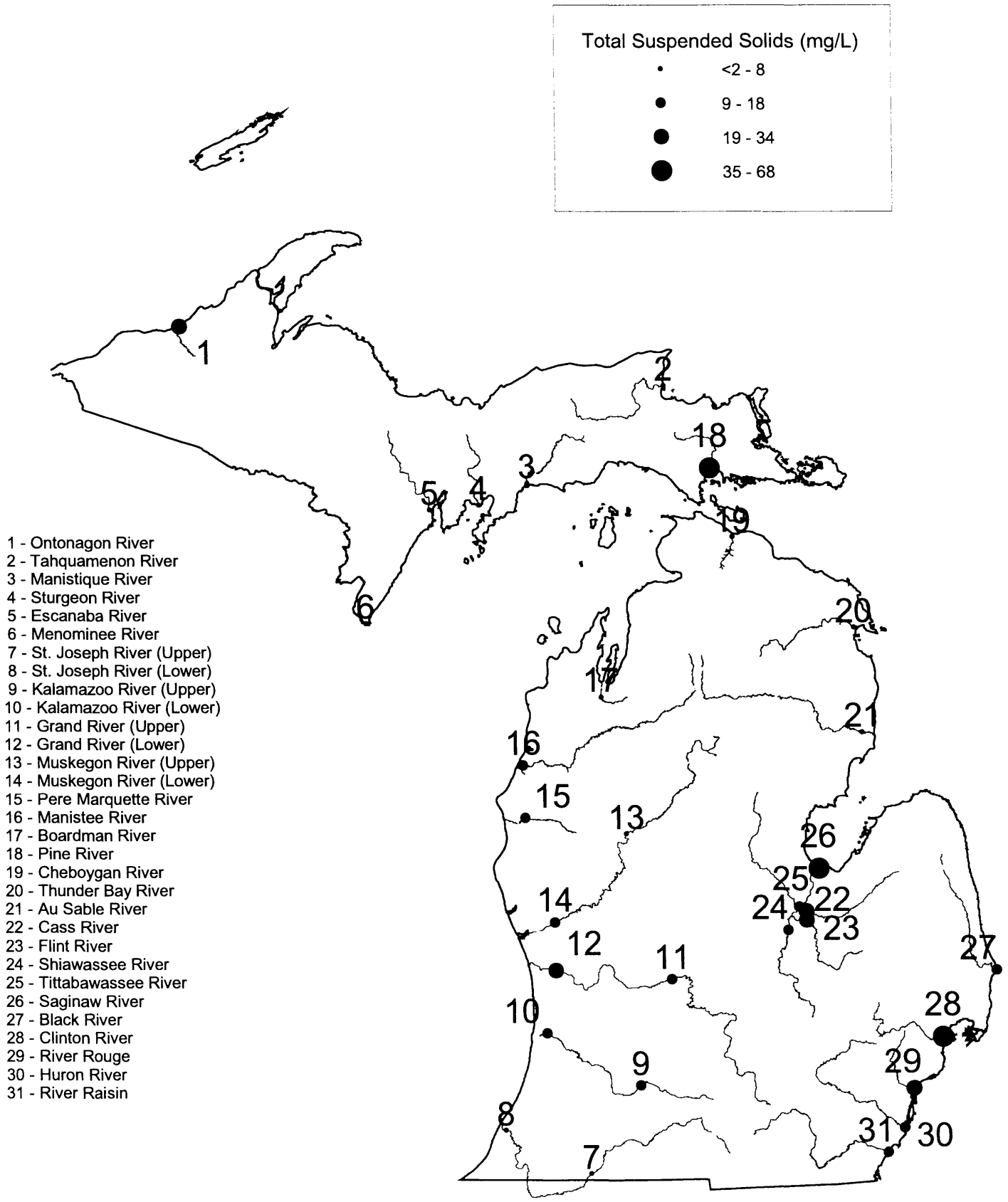


Figure 33. Mean total suspended solids concentrations at integrator and intensive sites, WCMP 2004.

Figure 34. Au Sable River hydrograph.

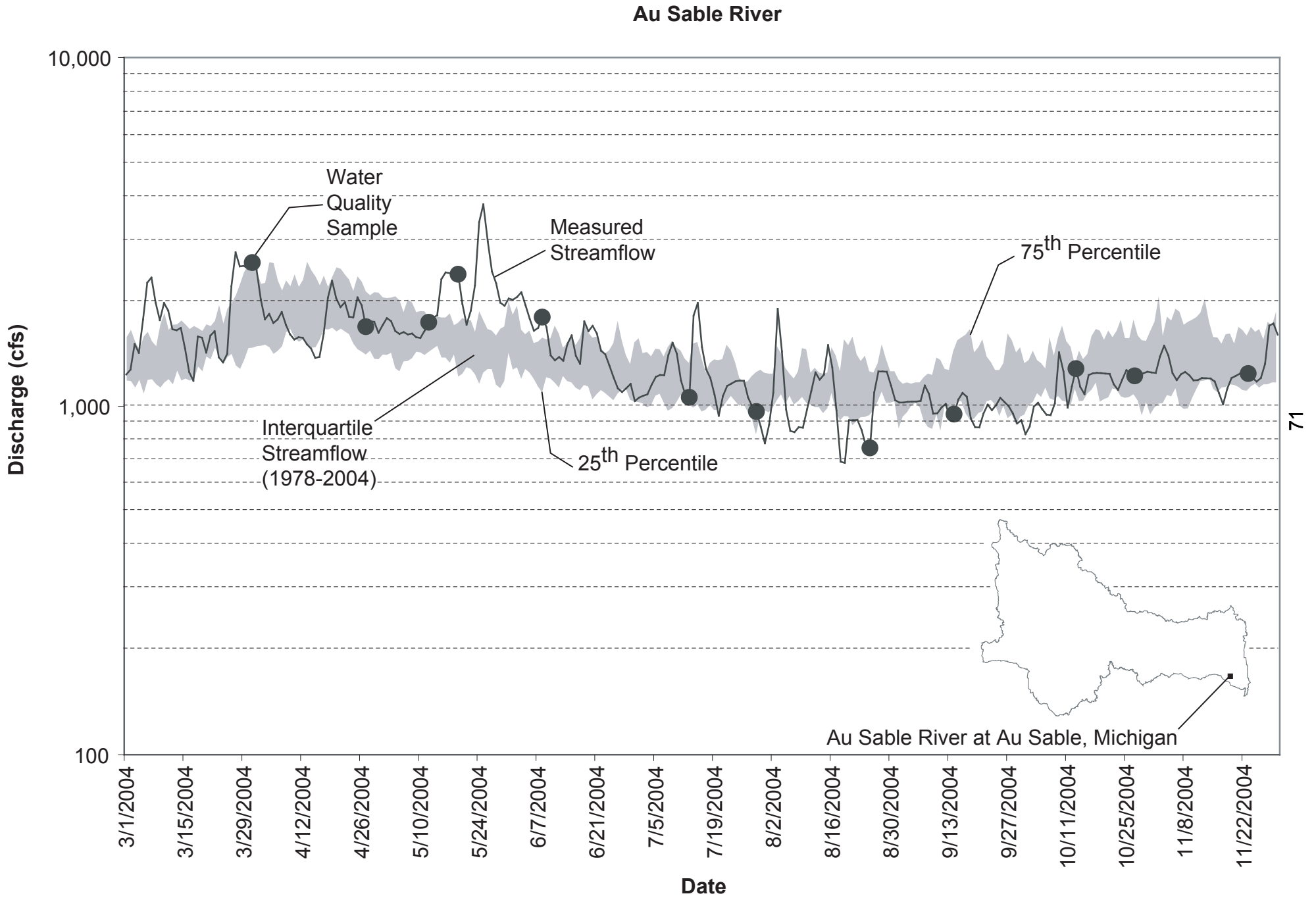


Figure 35. Clinton River hydrograph.

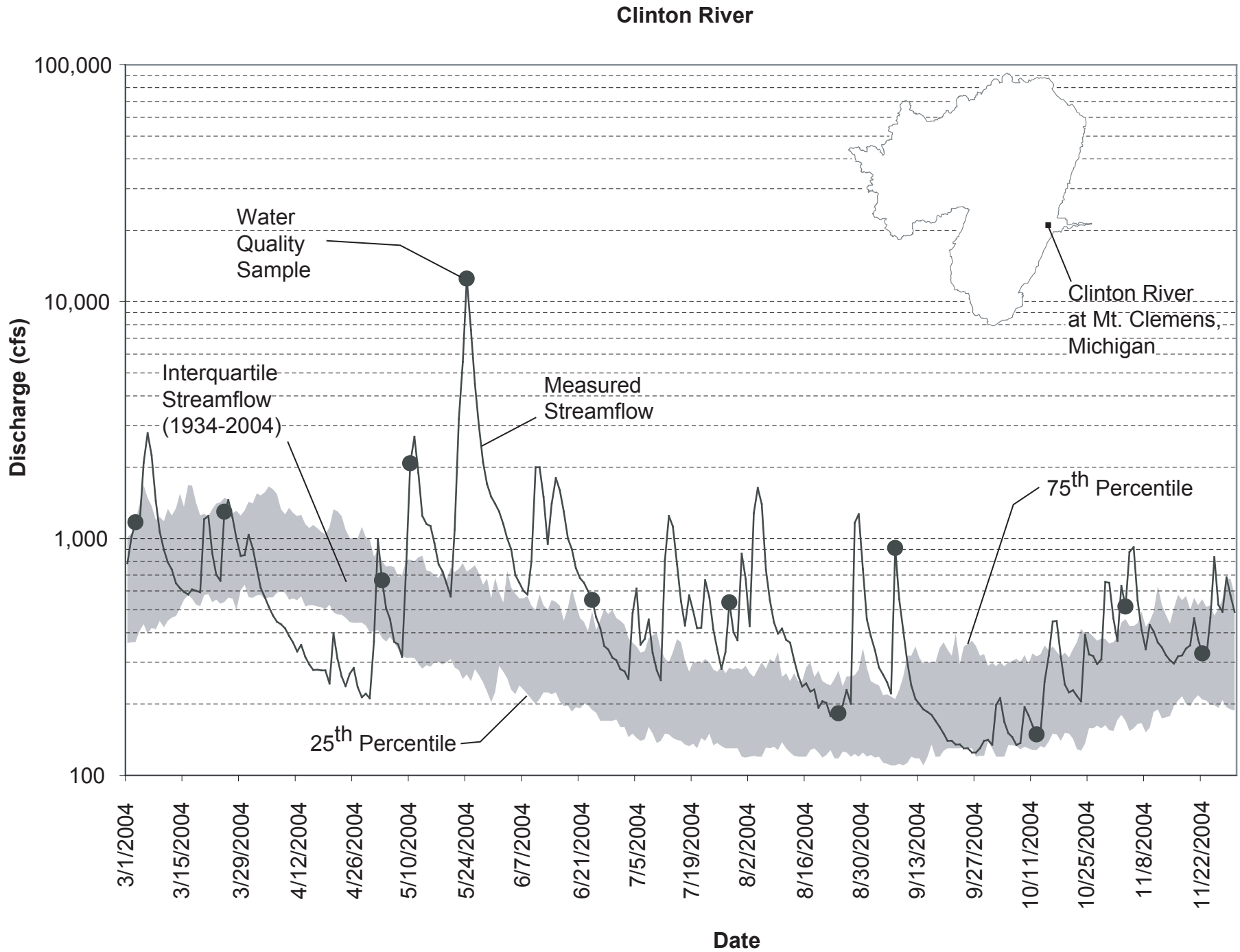




Figure 36. Lower Grand River hydrograph.

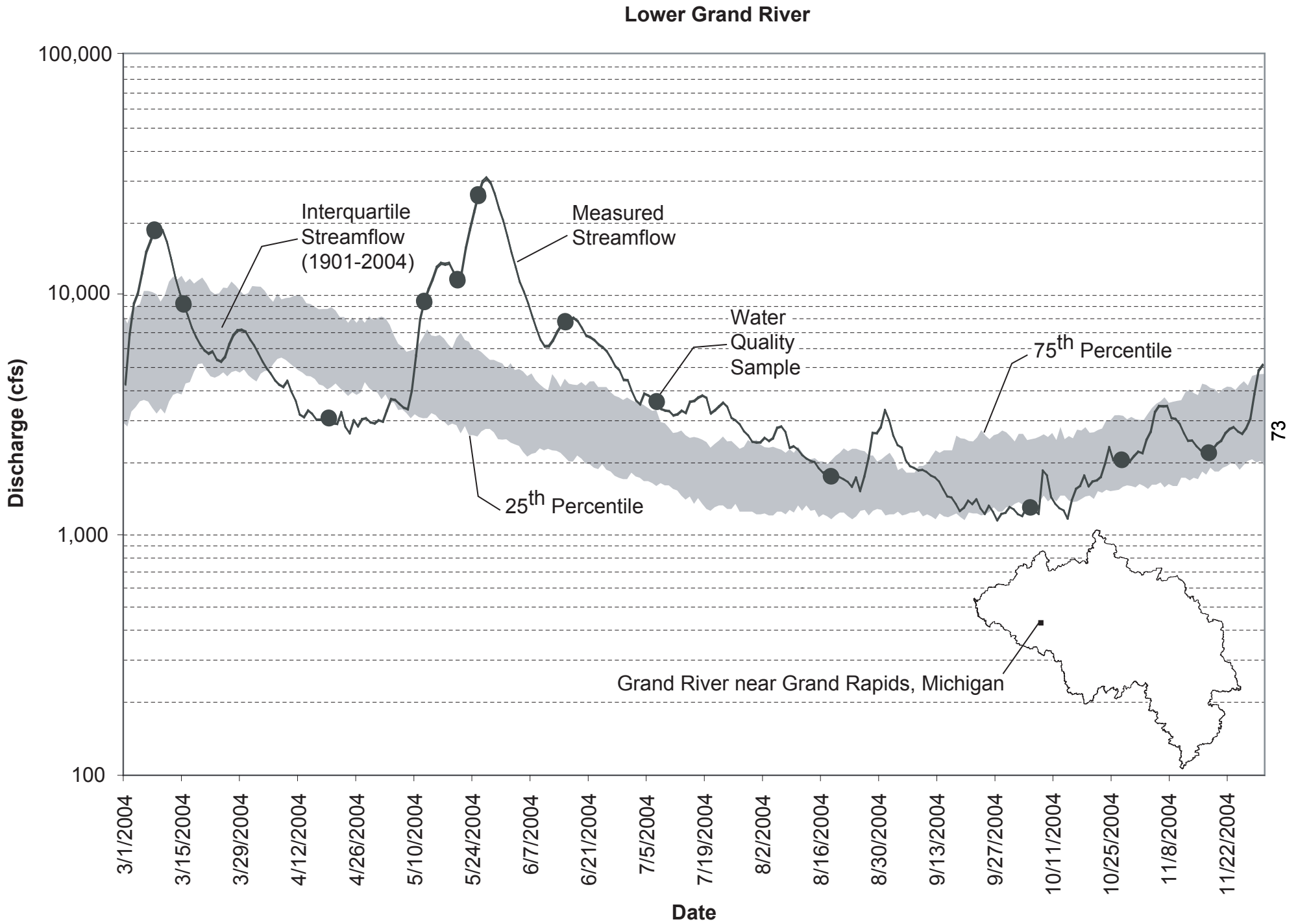


Figure 37. Lower Kalamazoo River hydrograph.

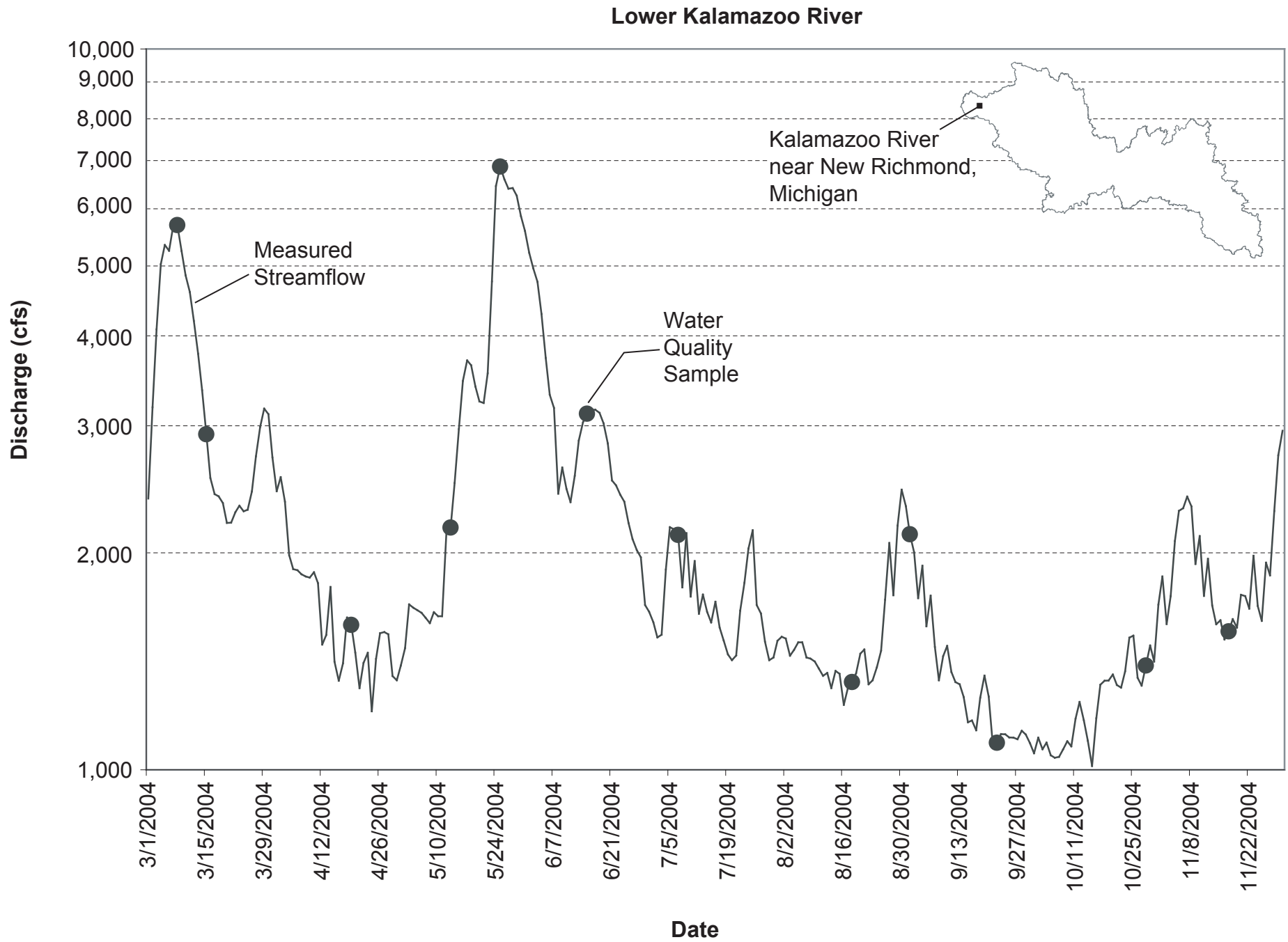


Figure 38. Upper Kalamazoo River hydrograph.

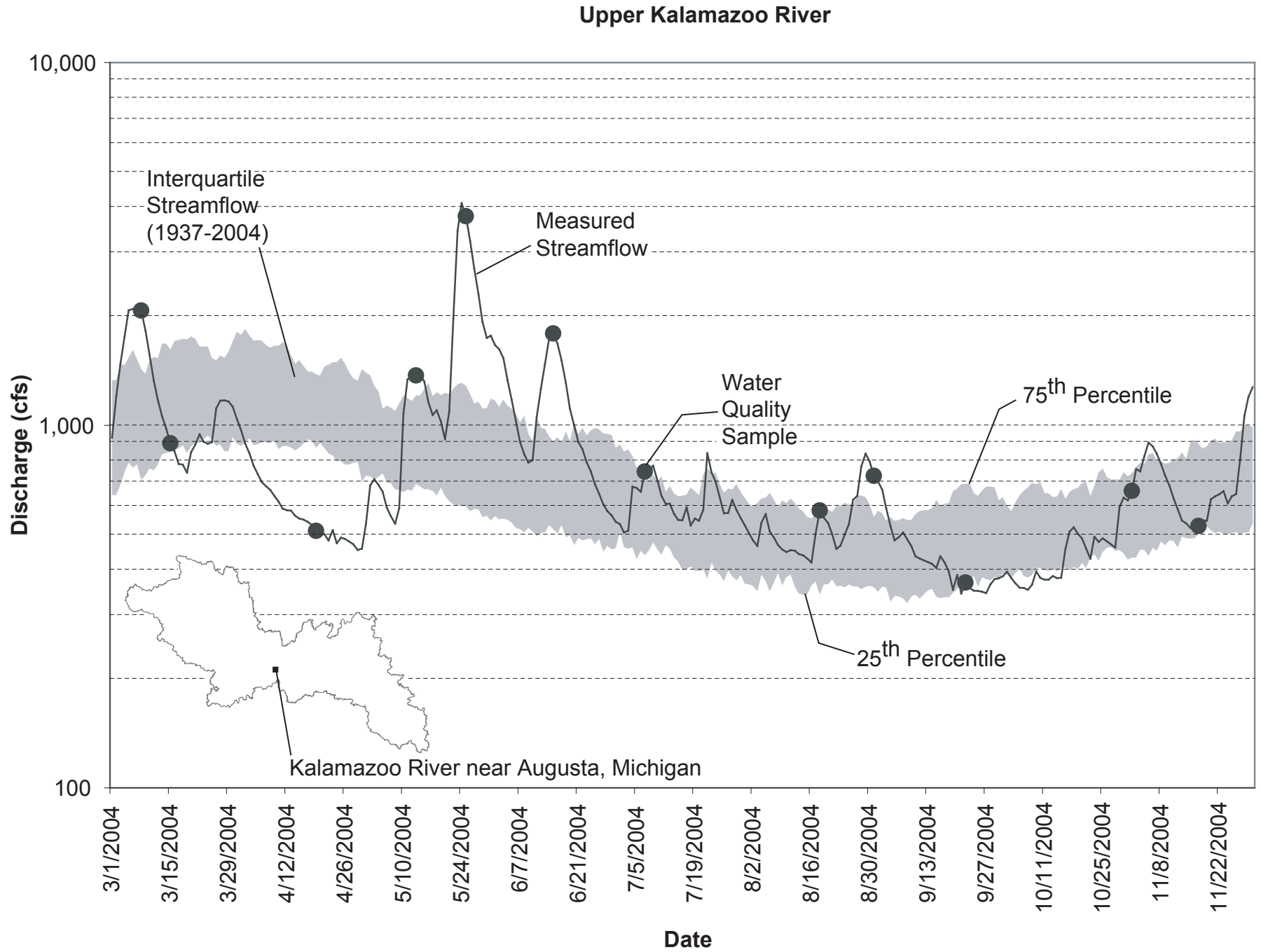


Figure 39. Manistee River hydrograph.

### Manistee River

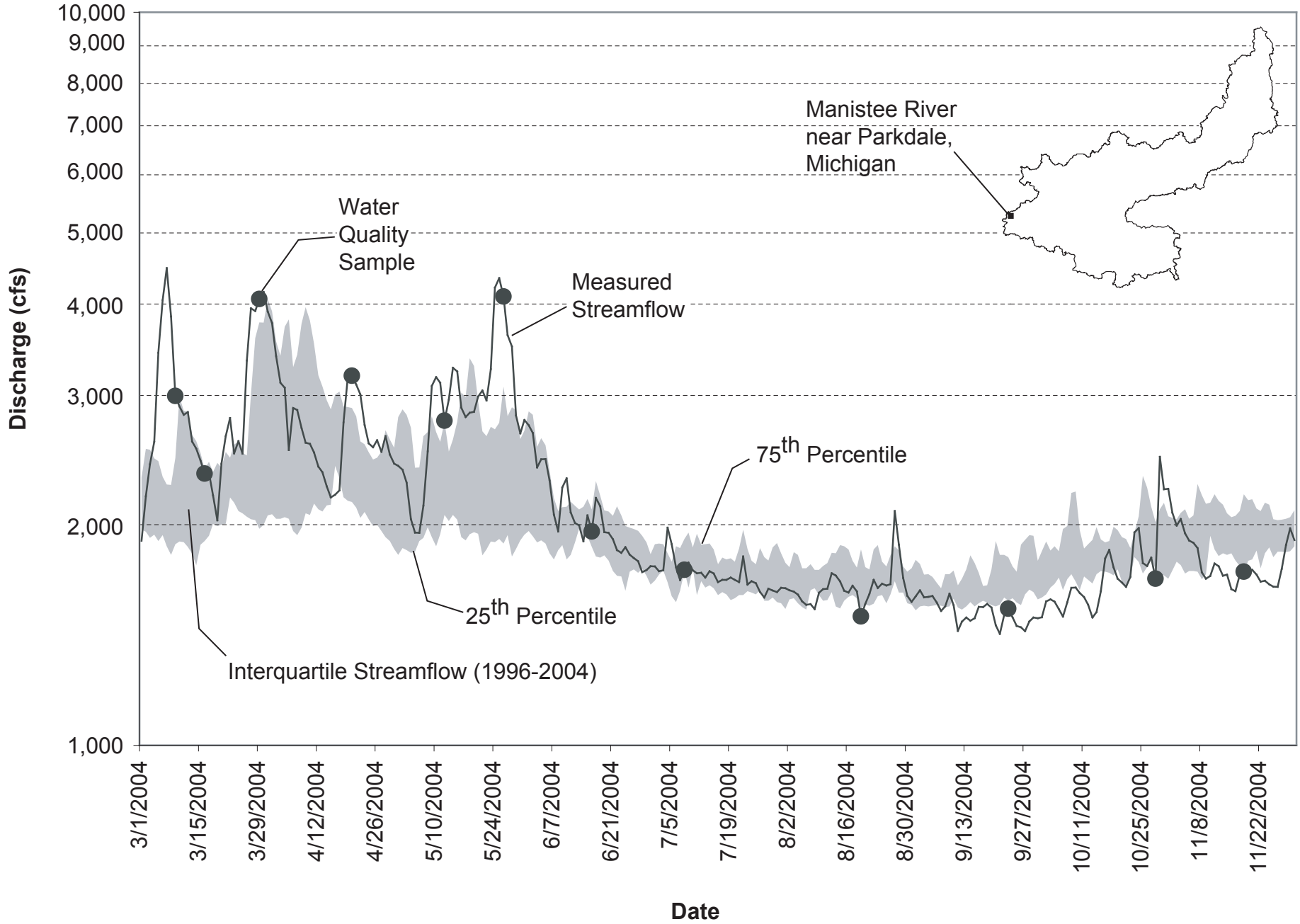


Figure 40. Manistique River hydrograph.

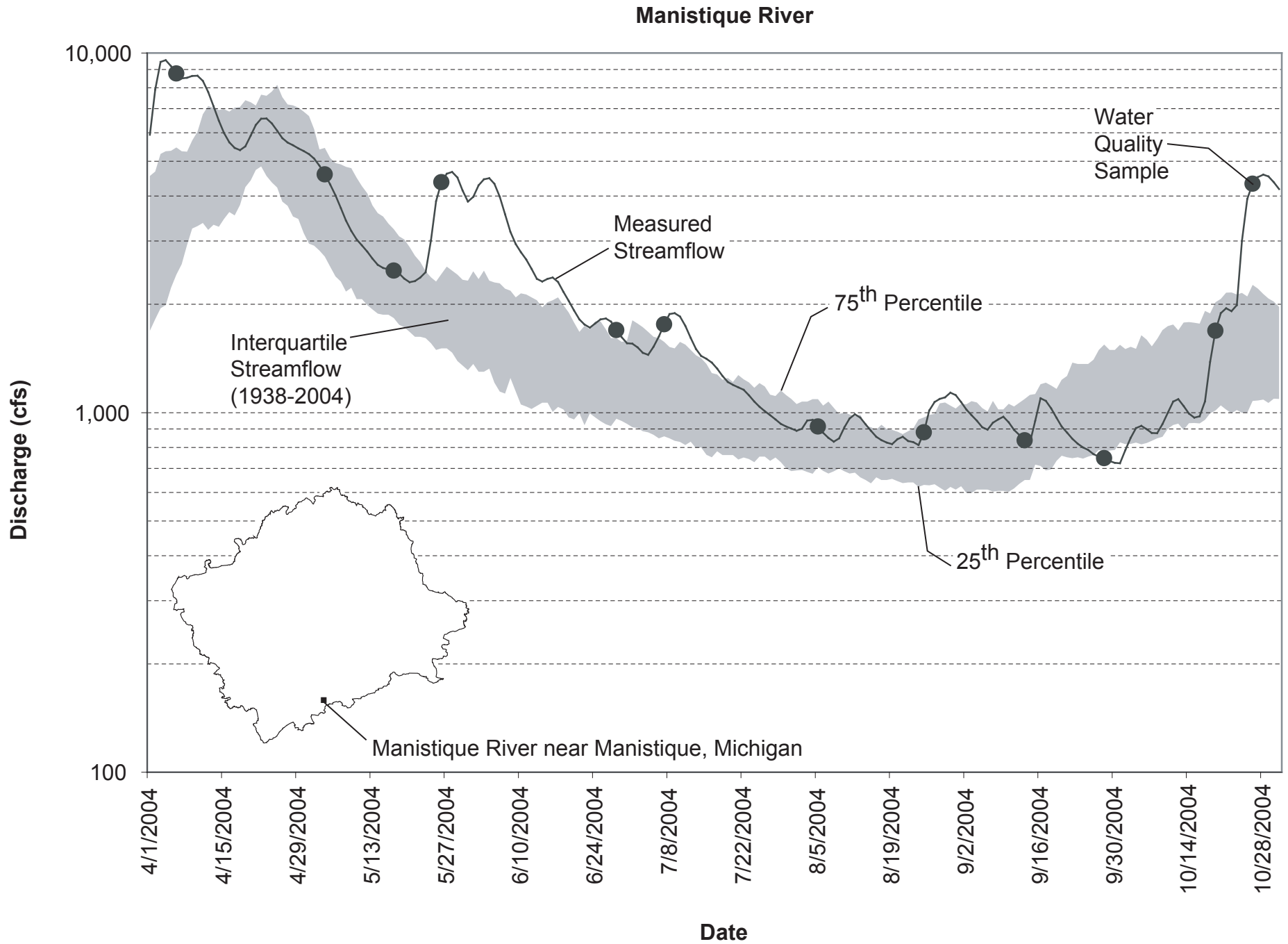


Figure 41. Lower Muskegon River hydrograph.

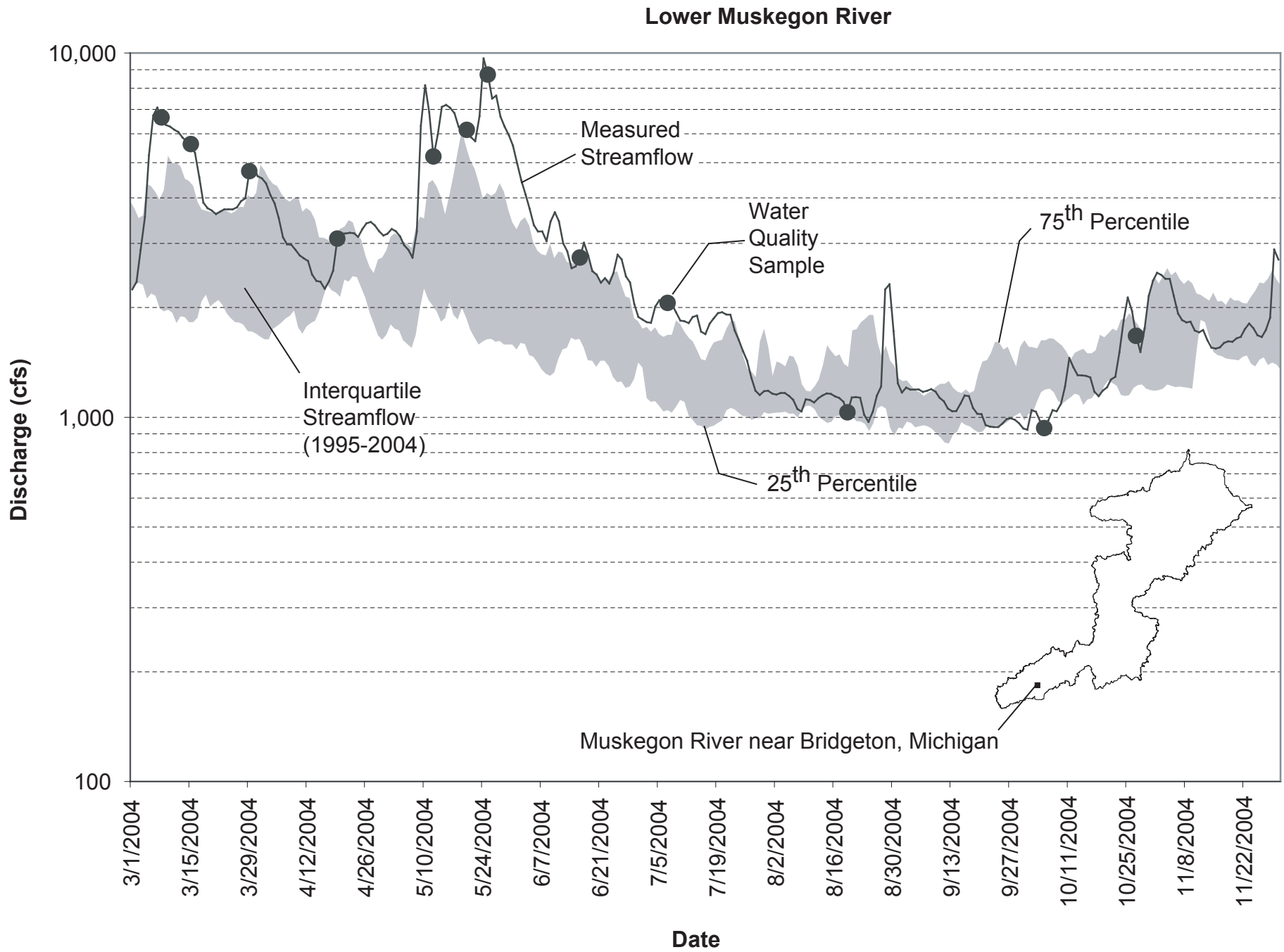


Figure 42. Pine River hydrograph.

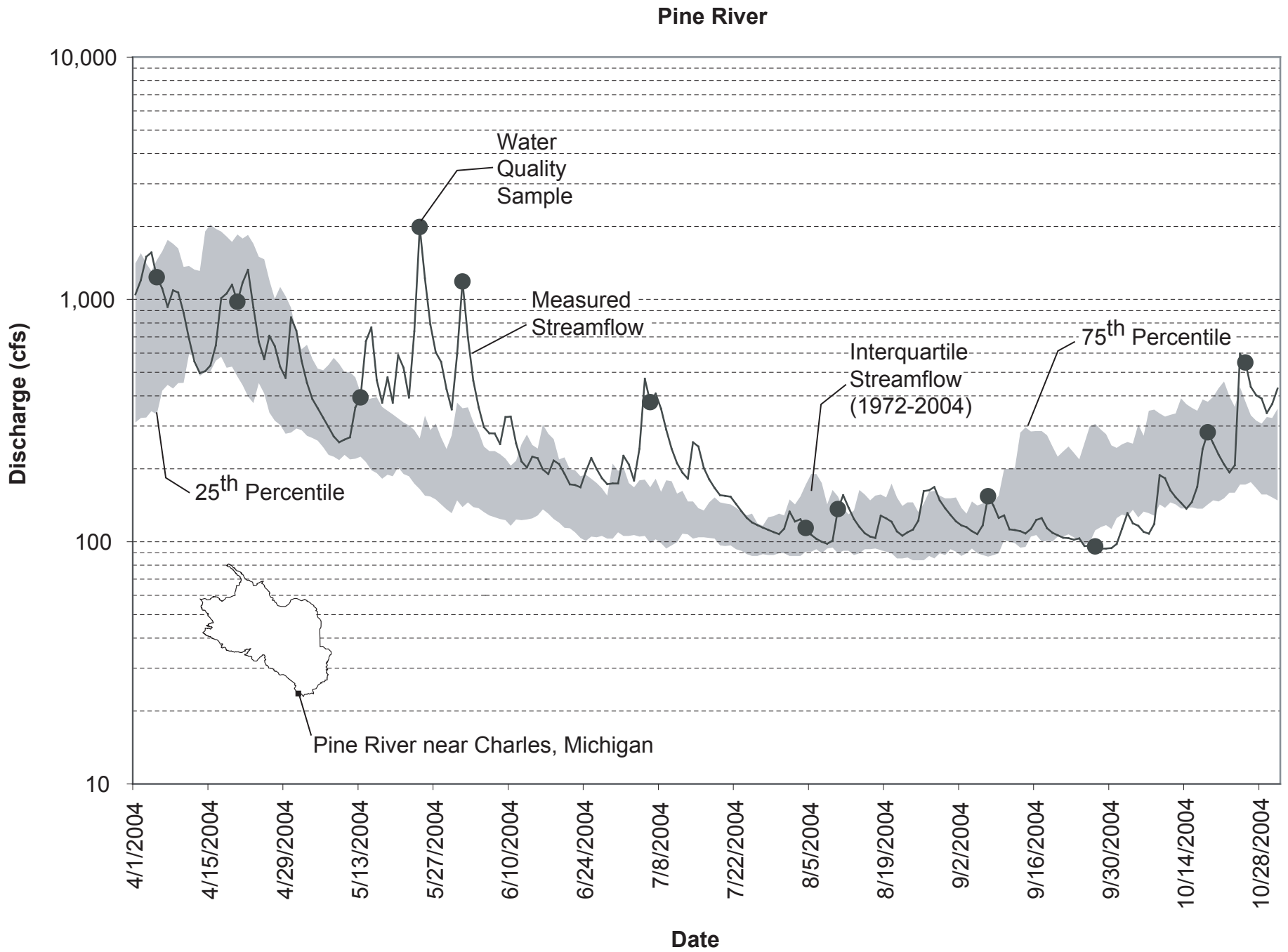


Figure 43. Saginaw River hydrograph.

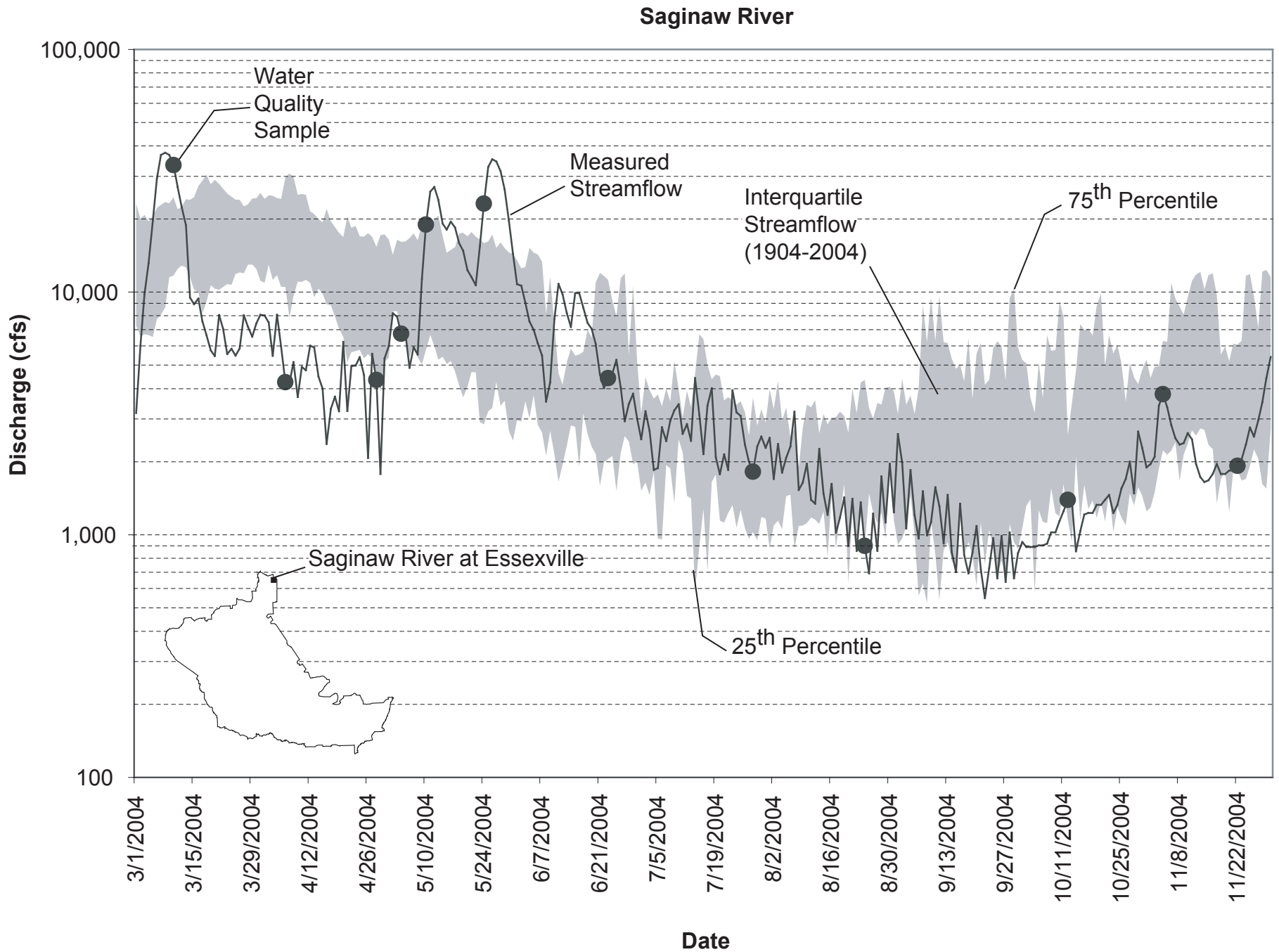
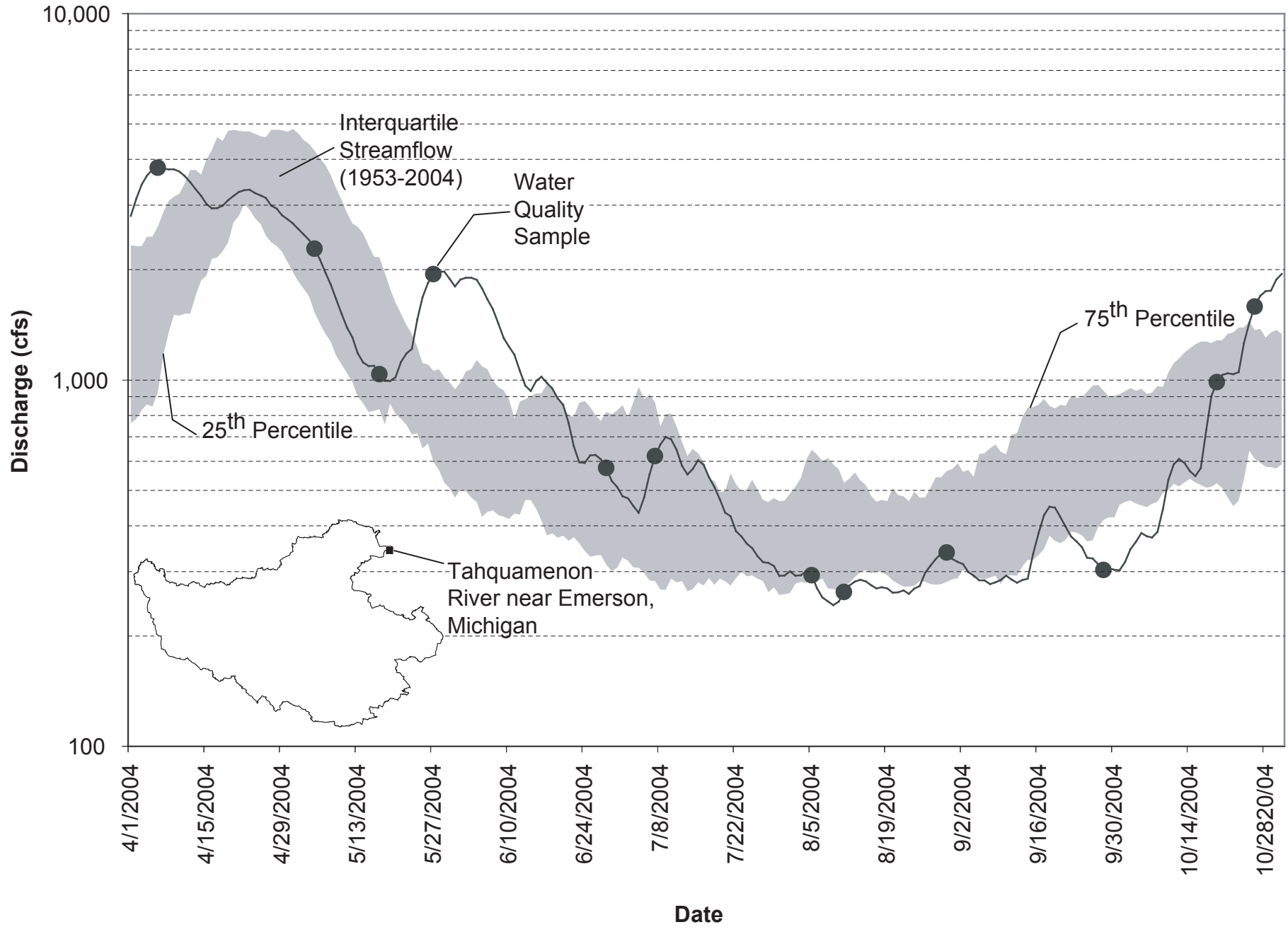




Figure 44. Tahquamenon River hydrograph.

### Tahquamenon River



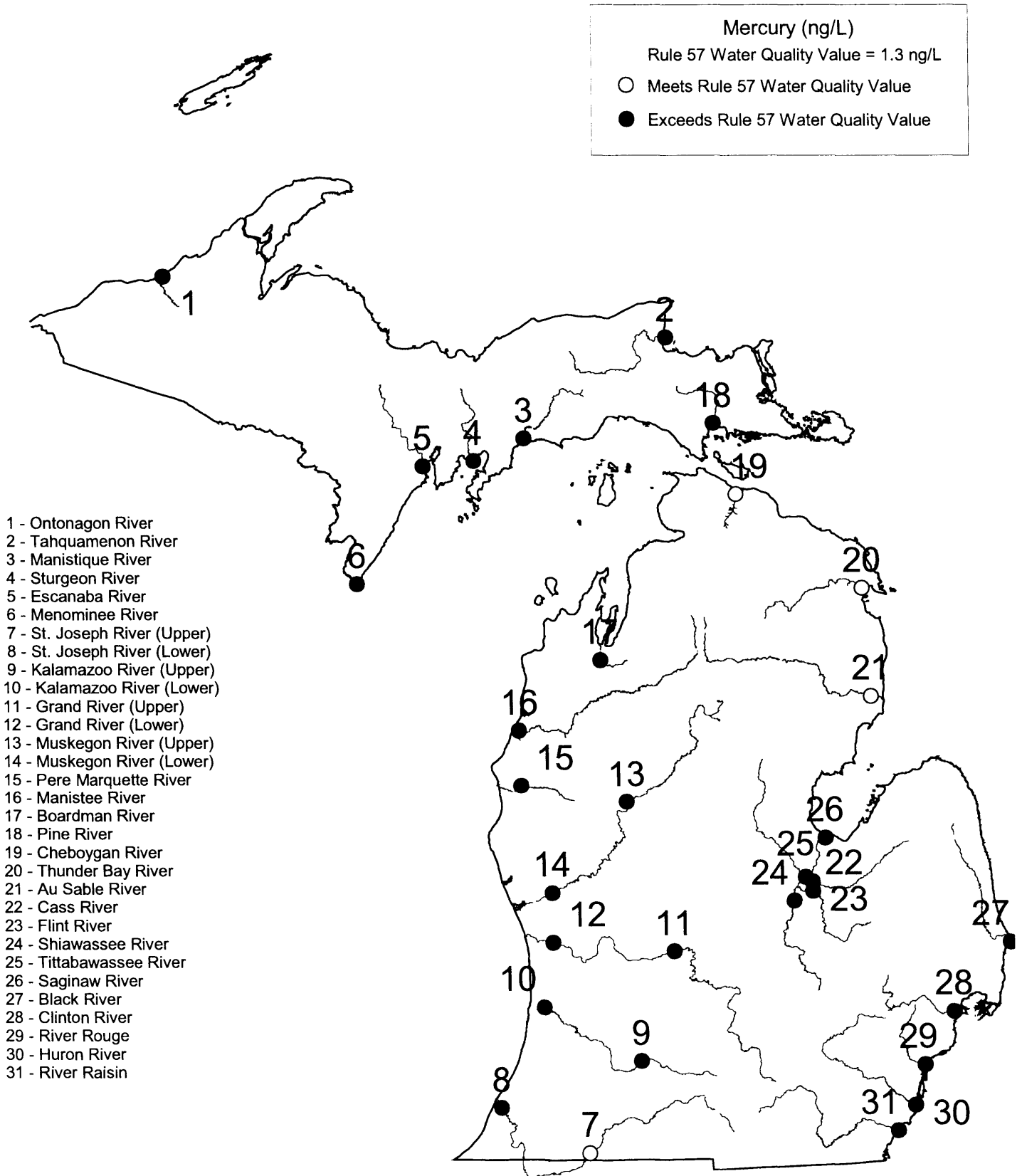


Figure 45. The occurrence of mercury Rule 57 water quality value exceedances at integrator and intensive sites, WCMP 2004. Mean mercury concentration was used to determine exceedance.

**APPENDIX A**

**Additional Water Chemistry Data Summarized in the 2004 Report**

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
830159	Anderson Creek										
	3/30/2004	T 0.009	0.300	0.004	0.480	0.022	0.004	6.0	0.7	5.0	4.3
	5/13/2004	0.024	0.510	0.008	H 0.620	H 0.025	T 0.001	6.0	1.0	9.0	4.2
	8/10/2004	0.020	0.710	0.007	0.270	0.014	0.005	7.0	1.2	11.0	4.7
	9/15/2004	0.013	0.720	0.005	0.260	0.008	T 0.002	11.0	1.4	13.0	4.0
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.017	0.560	0.006	0.408	0.017	0.003	7.5	1.1	9.5	4.3
	Median+:	0.017	0.610	0.006	0.375	0.018	0.003	6.5	1.1	10.0	4.3
350061	Au Sable River										
	3/31/2004	0.021	0.151	0.003	0.180	0.006	0.003	8.0	0.9	7.0	5.6
	4/27/2004	0.030	0.073	0.003	H 0.350	H 0.012	T 0.002	6.0	0.7	6.0	3.8
	5/12/2004	0.027	0.060	0.004	H 0.240	H 0.008	T 0.002	6.0	0.6	6.0	5.1
	5/19/2004	0.022	0.060	0.004	0.370	0.008	ND W	8.0	0.7	6.0	4.9
	6/8/2004	0.021	0.048	H 0.005	0.370	0.015	T H 0.001	4.0	0.9	5.0	5.3
	7/13/2004	0.019	0.011	0.003	0.310	0.011	T 0.002	5.0	4.1	10.0	5.0
	7/29/2004	0.013	T 0.005	T 0.001	0.210	0.012	0.005	3.0	0.5	6.0	4.5
	8/25/2004	0.011	T 0.004	T 0.001	0.190	0.010	0.007	5.0	0.4	6.0	4.6
	9/14/2004	T 0.009	T 0.008	T 0.001	0.180	0.007	0.004	8.0	0.4	6.0	4.7
	10/13/2004	0.010	T 0.008	ND W	0.160	0.012	0.005	5.0	0.5	6.0	5.2
	10/27/2004	0.012	0.011	T 0.001	0.130	0.012	0.004	4.0	0.6	34.0	5.3
	11/23/2004	T 0.002	0.010	T 0.001	0.170	0.006	T 0.002	6.0	0.7	7.0	5.0
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.016	0.037	0.002	0.238	0.010	0.003	5.7	0.9	8.8	4.9
	Median+:	0.016	0.011	0.003	0.200	0.011	0.003	5.5	0.7	6.0	5.0

A-1

+ = Calculated value; not rounded to the appropriate number of significant figures.

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A = Value reported is the mean of two or more determinations.

D = Analyte value quantified from a dilution(s); quantification level raised.

H = Recommended laboratory holding time was exceeded.

I = Dilution required due to matrix interference; quantification level raised.

J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

P = Recommended sample collection/preservation technique not used; reported result(s) is an estimate.

PI = Possible interference may have affected the accuracy of the laboratory result.

T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
170154	Bear Creek										
	5/11/2004	0.015	ND	0.009	H 0.500	H 0.030	PI 0.011	6.0	0.6	2.0	ND
	7/14/2004	0.019	0.028	0.011	0.780	0.069	0.020	8.0	1.0	2.0	ND
	8/24/2004	T 0.007	T 0.002	0.003	0.250	0.015	0.005	11.0	0.8	1.0	1.8
	11/9/2004	0.012	0.058	0.004	0.520	0.021	0.005	12.0	0.8	2.0	2.3
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.013	* 0.023	0.007	0.513	0.034	0.010	9.3	0.8	1.8	* 1.3
	Median+:	0.014	0.017	0.007	0.510	0.026	0.008	9.5	0.8	2.0	1.2
340186	Bellamy Creek										
	3/23/2004	ND D	7.380	0.016	1.050	0.044	0.023	54.0	3.1	29.0	8.6
	7/1/2004	ND D	3.300	0.008	0.560	0.045	0.020	28.0	3.2	29.0	8.1
	9/1/2004	ND D	2.190	0.010	0.450	0.057	0.043	28.0	D 7.2	32.0	9.3
	11/18/2004	ND D	3.390	0.012	0.360	0.017	0.005	40.0	3.0	32.0	10.9
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.015	4.065	0.012	0.605	0.041	0.023	37.5	4.1	30.5	9.2
	Median+:	0.000	3.345	0.011	0.505	0.045	0.022	34.0	3.2	30.5	9.0
740385	Black River										
	4/6/2004	ND D	3.880	0.021	0.880	0.061	0.022	79.0	4.2	56.0	21.0
	7/13/2004	ND D	3.400	0.035	0.650	0.075	0.021	33.0	3.5	23.0	8.8
	9/8/2004	0.028	0.220	0.006	0.310	0.035	0.010	26.0	2.2	20.0	10.7
	10/21/2004	0.028	0.230	0.003	0.260	0.025	0.004	27.0	3.2	29.0	17.3
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.028	1.933	0.016	0.525	0.049	0.014	41.3	3.3	32.0	14.5
	Median+:	0.028	1.815	0.014	0.480	0.048	0.016	30.0	3.4	26.0	14.0

A-2

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PI = Possible interference may have affected the accuracy of the laboratory result.

T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
280014	Boardman River										
	3/29/2004	0.017	0.300	0.005	0.400	0.035	0.006	7.0	0.7	7.0	4.4
	5/12/2004	T 0.009	0.210	0.004	H 0.240	H 0.012	ND	6.0	0.8	8.0	5.2
	8/10/2004	T 0.008	0.188	0.002	0.160	0.011	0.004	4.0	D 5.5	11.0	3.4
	9/15/2004	T 0.006	0.188	0.002	0.160	0.007	T 0.002	7.0	0.7	8.0	4.1
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.010	0.222	0.003	0.240	0.016	* 0.003	6.0	1.9	8.5	4.3
	Median+:	# 0.009	0.199	0.003	0.200	0.012	0.003	6.5	0.8	8.0	4.3
730024	Cass River										
	4/1/2004	D 0.070	5.070	0.028	0.890	0.065	0.028	74.0	4.0	40.0	14.5
	6/9/2004	ND D	3.180	0.019	1.110	0.072	T 0.002	62.0	3.6	40.0	17.4
	8/12/2004	0.029	0.490	0.011	0.990	0.098	0.005	53.0	4.4	52.0	28.9
	11/3/2004	0.028	0.760	0.005	0.510	0.066	0.016	54.0	4.9	51.0	26.4
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.042	2.375	0.016	0.875	0.075	0.013	60.8	4.2	45.8	21.8
	Median+:	0.029	1.970	0.015	0.940	0.069	0.011	58.0	4.2	45.5	21.9
160073	Cheboygan River										
	5/11/2004	0.014	0.064	0.004	H 0.210	H 0.006	T 0.001	7.0	0.8	8.0	5.0
	7/12/2004	0.020	0.034	0.002	0.280	0.007	0.003	6.0	D 9.6	16.0	5.2
	8/26/2004	0.012	0.012	T 0.001	0.240	0.006	T 0.002	6.0	0.8	8.0	5.4
	10/28/2004	0.014	0.046	0.003	0.210	0.006	T 0.002	5.0	0.8	9.0	6.5
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.015	0.039	0.003	0.235	0.006	0.002	6.0	3.0	10.3	5.5
	Median+:	0.014	0.040	0.003	0.225	0.006	# 0.002	6.0	0.8	8.5	5.3

+ = Calculated value; not rounded to the appropriate number of significant figures.

\* = Mean includes censored value(s), which for calculation purposes was assigned a value equal to 1/2 the quantification level.

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T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
500233	Clinton River										
	3/3/2004	D 0.100	2.970	0.035	0.990	0.126	0.034	45.0	5.2	D 233.0	D 111.0
	3/25/2004	0.320	1.580	0.071	1.320	0.174	0.034	D 44.0	4.8	D 344.0	D 197.0
	5/3/2004	0.114	1.340	0.034	1.160	0.124	0.034	45.0	4.9	D 208.0	D 113.0
	5/10/2004	0.260	1.070	0.061	2.100	0.350	0.045	28.0	4.0	D 135.0	79.5
	5/24/2004	0.126	0.970	0.054	1.900	0.540	0.065	12.0	5.2	38.0	20.7
	6/24/2004	0.090	1.310	0.041	0.990	0.126	0.064	34.0	4.6	D 159.0	85.2
	7/28/2004	0.116	1.770	0.052	1.100	0.190	0.107	37.0	D 5.7	D 191.0	D 114.0
	8/24/2004	D 0.070	3.160	0.036	0.920	0.177	0.133	D 45.0	D 6.6	D 190.0	101.0
	9/7/2004	0.176	1.650	0.069	1.500	0.350	0.195	D 37.0	D 5.4	D 143.0	78.6
	10/12/2004	D 0.100	2.970	0.033	0.970	0.230	0.169	57.0	D 7.0	D 171.0	97.5
	11/3/2004	0.047	0.980	0.022	0.740	0.127	0.053	30.0	5.0	D 118.0	64.3
	11/22/2004	0.063	1.460	0.023	0.740	0.113	0.080	35.0	4.7	D 139.0	78.0
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.132	1.769	0.044	1.203	0.219	0.084	37.4	5.3	172.4	95.0
	Median+:	0.107	1.520	0.039	1.045	0.176	0.065	37.0	5.1	165.0	91.4
210102	Escanaba River										
	5/20/2004	0.050	0.073	0.009	0.520	0.018	0.003	23.0	2.0	11.0	23.7
	7/20/2004	0.072	0.092	0.020	0.590	0.027	0.004	35.0	2.6	14.0	38.8
	8/26/2004	0.046	0.089	0.017	0.450	0.026	0.007	51.0	3.0	31.0	58.4
	11/1/2004	0.043	0.092	0.008	0.630	0.026	0.003	21.0	1.9	11.0	22.2
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.053	0.087	0.014	0.548	0.024	0.004	32.5	2.4	16.8	35.8
	Median+:	0.048	0.091	0.013	0.555	0.026	0.004	29.0	2.3	12.5	31.3

A-4

+ = Calculated value; not rounded to the appropriate number of significant figures.

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A = Value reported is the mean of two or more determinations.

D = Analyte value quantified from a dilution(s); quantification level raised.

H = Recommended laboratory holding time was exceeded.

I = Dilution required due to matrix interference; quantification level raised.

J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

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PI = Possible interference may have affected the accuracy of the laboratory result.

T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
730285	Flint River										
	4/1/2004	D 0.050	2.180	0.021	0.940	0.085	0.022	51.0	3.9	86.0	45.4
	6/9/2004	0.039	2.070	0.026	1.100	0.136	0.048	28.0	4.4	72.0	37.3
	8/12/2004	0.026	1.840	0.010	0.870	0.128	0.071	27.0	4.1	83.0	46.8
	11/4/2004	0.042	1.920	0.010	0.770	0.191	0.084	29.0	4.4	75.0	41.2
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.039	2.003	0.017	0.920	0.135	0.056	33.8	4.2	79.0	42.7
	Median+:	0.041	1.995	0.016	0.905	0.132	0.060	28.5	4.3	79.0	43.3
770082	Fox River										
	5/4/2004	0.013	0.072	0.004	H 0.220	H 0.019	0.004	5.0	0.7	1.0	1.3
	6/29/2004	T 0.009	0.082	0.002	0.290	0.030	0.007	2.0	0.6	1.0	ND
	8/31/2004	T 0.007	0.098	0.003	0.190	0.021	0.009	2.0	0.7	1.0	ND
	11/8/2004	0.011	0.106	0.002	0.180	0.025	0.006	2.0	0.7	1.0	1.5
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.010	0.090	0.003	0.220	0.024	0.007	2.8	0.7	1.0	*
	Median+:	# 0.010	0.090	0.003	0.205	0.023	0.007	2.0	0.7	1.0	# 0.9

+ = Calculated value; not rounded to the appropriate number of significant figures.

\* = Mean includes censored value(s), which for calculation purposes was assigned a value equal to 1/2 the quantification level.

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
700123	Grand River (Lower)										
	3/8/2004	D 0.190	5.150	0.049	1.290	0.190	0.056	37.0	4.5	39.0	16.5
	3/15/2004	D 0.220	5.160	0.043	1.000	0.111	0.047	51.0	4.1	46.0	21.3
	4/19/2004	0.081	1.910	0.026	1.040	0.081	0.004	63.0	3.1	63.0	31.0
	5/12/2004	D 0.160	3.030	0.068	H 1.070	H 0.181	0.027	37.0	3.6	35.0	15.7
	5/20/2004	D 0.080	3.400	0.102	1.130	0.139	0.047	36.0	3.8	32.0	15.1
	5/25/2004	D 0.090	2.610	0.090	1.290	0.181	0.058	24.0	4.2	24.0	11.2
	6/15/2004	D 0.050	2.370	0.032	1.120	0.165	0.050	38.0	3.5	40.0	19.4
	7/7/2004	0.013	1.020	0.018	1.410	0.128	PI 0.005	42.0	3.0	48.0	23.8
	8/18/2004	0.014	0.980	0.042	1.150	0.087	PI 0.016	51.0	3.2	60.0	33.0
	10/5/2004	0.095	1.610	0.060	0.820	0.077	0.010	55.0	3.6	68.0	37.4
	10/27/2004	0.157	1.530	0.036	0.770	0.069	0.013	44.0	3.8	59.0	34.3
	11/17/2004	0.240	1.700	0.032	0.720	0.080	0.045	57.0	3.9	60.0	31.7
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.116	2.539	0.050	1.068	0.124	0.032	44.6	3.7	47.8	24.2
	Median+:	0.093	2.140	0.043	1.095	0.120	0.036	43.0	3.7	47.0	22.6
340025	Grand River (Upper)										
	3/23/2004	ND D	4.680	0.021	0.850	0.055	0.022	75.0	3.3	54.0	24.0
	7/1/2004	0.013	1.760	0.011	1.060	0.112	0.047	41.0	3.8	42.0	20.6
	9/1/2004	0.011	1.680	0.025	0.870	0.137	0.061	50.0	D 6.7	59.0	29.4
	11/18/2004	0.010	1.850	0.009	0.610	0.054	0.027	69.0	4.3	57.0	28.9
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.011	2.493	0.017	0.848	0.090	0.039	58.8	4.5	53.0	25.7
	Median+:	0.011	1.805	0.016	0.860	0.084	0.037	59.5	4.1	55.5	26.5

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I = Dilution required due to matrix interference; quantification level raised.

J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
580364	Huron River										
	4/7/2004	0.027	1.040	0.011	0.840	0.045	0.008	D 121.0	3.5	D 116.0	62.3
	7/13/2004	0.069	0.480	0.019	0.860	0.074	0.017	100.0	3.6	84.0	42.1
	9/7/2004	0.071	0.163	0.011	0.670	0.047	0.022	D 227.0	3.6	D 84.0	44.7
	10/20/2004	0.118	0.112	0.010	0.630	0.032	0.012	D 285.0	3.7	92.0	49.1
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.071	0.449	0.013	0.750	0.050	0.015	183.3	3.6	94.0	49.6
	Median+:	0.070	0.322	0.011	0.755	0.046	0.015	174.0	3.6	88.0	46.9
030077	Kalamazoo River (Lower)										
	3/8/2004	D 0.080	2.170	0.034	0.760	0.109	0.051	30.0	3.9	26.0	14.3
	3/15/2004	D 0.050	2.290	0.015	0.610	0.052	0.015	38.0	2.6	32.0	15.7
	4/19/2004	0.014	1.040	0.016	0.900	0.080	0.010	42.0	2.6	49.0	27.3
	5/13/2004	0.016	0.960	0.035	H 0.920	H 0.076	0.011	37.0	2.4	44.0	24.0
	5/25/2004	0.088	1.350	0.076	0.960	0.106	0.041	25.0	3.3	24.0	13.4
	6/15/2004	0.037	1.220	0.027	0.830	0.093	0.025	32.0	2.9	37.0	19.5
	7/7/2004	0.013	0.770	0.022	1.190	0.107	PI 0.019	32.0	2.7	42.0	22.8
	8/18/2004	0.029	0.670	0.020	0.890	0.075	PI 0.008	35.0	2.6	51.0	29.6
	9/1/2004	0.077	0.960	0.032	0.880	0.089	0.016	32.0	D 7.1	48.0	22.9
	9/22/2004	0.017	0.710	0.017	0.820	0.075	0.005	35.0	2.8	51.0	27.8
	10/28/2004	0.040	1.230	0.017	0.600	0.050	0.009	30.0	3.2	50.0	29.6
	11/17/2004	0.078	1.240	0.015	0.530	0.045	0.011	37.0	2.9	43.0	24.7
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.045	1.218	0.027	0.824	0.080	0.018	33.8	3.3	41.4	22.6
	Median+:	0.039	1.130	0.021	0.855	0.078	0.013	33.5	2.9	43.5	23.5

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
390057	Kalamazoo River (Upper)										
	3/8/2004	D 0.050	2.380	0.023	0.830	0.065	0.015	40.0	2.5	26.0	13.4
	3/15/2004	0.084	1.810	0.011	0.620	0.044	0.007	44.0	2.2	37.0	18.0
	4/19/2004	0.091	0.830	0.016	0.960	0.101	0.005	44.0	2.1	50.0	24.5
	5/13/2004	0.088	0.890	0.044	H 1.110	H 0.107	0.018	32.0	2.0	28.0	13.5
	5/25/2004	0.062	1.030	0.063	1.030	0.094	0.029	18.0	3.3	13.0	6.5
	6/15/2004	0.044	1.130	0.021	1.120	0.110	0.033	26.0	2.4	27.0	12.3
	7/7/2004	0.038	0.810	0.023	0.840	0.138	0.034	30.0	1.8	38.0	18.5
	8/18/2004	0.081	0.760	0.015	0.760	0.110	0.023	28.0	1.8	40.0	21.8
	8/31/2004	0.042	0.700	0.013	0.780	0.079	0.026	27.0	D 5.7	40.0	17.4
	9/22/2004	0.013	0.650	0.006	0.470	0.041	0.006	38.0	2.1	56.0	28.2
	11/1/2004	0.039	0.900	0.013	0.450	0.042	0.011	31.0	2.4	43.0	21.5
	11/17/2004	0.033	1.170	0.012	0.430	0.049	0.007	42.0	2.1	47.0	25.0
No. of Samples:		12	12	12	12	12	12	12	12	12	12
Mean+:		0.055	1.088	0.022	0.783	0.082	0.018	33.3	2.5	37.1	18.4
Median+:		0.047	0.895	0.016	0.805	0.087	0.017	31.5	2.2	39.0	18.3

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STORET ID	Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
510088 Manistee River										
3/9/2004	0.024	0.280	0.005	0.260	0.021	0.006	8.0	0.8	9.0	5.8
3/16/2004	0.031	0.280	0.007	0.250	0.024	0.008	7.0	1.0	8.0	4.7
3/29/2004	0.018	0.184	0.006	0.300	0.030	0.010	8.0	0.9	8.0	4.6
4/20/2004	0.022	0.155	0.007	0.410	0.027	0.005	6.0	0.8	14.0	8.1
5/12/2004	0.013	0.144	0.006	H 0.380	H 0.026	0.003	8.0	0.8	9.0	5.2
5/26/2004	0.019	0.104	0.008	0.490	0.035	0.003	6.0	0.9	8.0	4.1
6/16/2004	0.018	0.150	0.007	0.370	0.037	0.005	10.0	0.8	11.0	5.3
7/8/2004	0.020	0.155	0.006	0.290	0.023	0.008	6.0	0.7	14.0	6.9
8/19/2004	0.011	0.136	0.006	0.170	0.018	0.003	10.0	0.7	13.0	7.8
9/23/2004	0.010	0.145	0.005	0.170	0.020	0.004	10.0	0.7	15.0	8.7
10/28/2004	0.020	0.186	0.004	0.240	0.019	0.005	7.0	0.8	10.0	6.0
11/18/2004	0.028	0.250	0.005	0.190	0.018	0.005	9.0	1.0	12.0	6.2
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	0.020	0.181	0.006	0.293	0.025	0.005	7.9	0.8	10.9	6.1
Median+:	0.020	0.155	0.006	0.275	0.024	0.005	8.0	0.8	10.5	5.9

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
770073	Manistique River										
	4/6/2004	0.030	0.088	0.005	0.430	0.021	0.005	4.0	0.7	2.0	ND
	5/4/2004	0.011	0.036	0.005	H 0.400	H 0.014	T 0.001	12.0	0.5	2.0	1.9
	5/17/2004	0.017	0.053	0.005	0.410	0.020	0.006	14.0	0.7	2.0	ND
	5/26/2004	0.014	0.049	H 0.006	0.590	0.027	T H 0.001	14.0	0.5	2.0	1.6
	6/28/2004	0.016	0.040	0.004	0.480	0.027	T 0.002	15.0	0.5	3.0	1.3
	7/7/2004	0.021	0.052	0.004	0.450	0.019	0.004	16.0	0.5	3.0	1.8
	8/5/2004	0.012	0.062	0.003	0.350	0.016	0.003	17.0	0.7	2.0	1.6
	8/25/2004	0.019	0.058	0.003	0.300	0.011	0.003	15.0	0.6	2.0	1.3
	9/13/2004	0.014	0.052	0.003	0.380	0.012	T 0.001	18.0	0.6	3.0	1.3
	9/28/2004	0.016	0.060	0.002	0.340	0.010	T 0.001	14.0	0.7	2.0	1.7
	10/19/2004	0.013	0.042	0.003	0.400	0.017	T 0.001	14.0	0.7	2.0	ND
	10/26/2004	0.014	0.045	0.004	0.600	0.031	T 0.002	12.0	0.8	2.0	1.3
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.016	0.053	0.004	0.428	0.019	0.003	13.8	0.6	2.3	* 1.3
	Median+:	0.015	0.052	0.004	0.405	0.018	# 0.002	14.0	0.7	2.0	1.3
550038	Menominee River										
	5/20/2004	T 0.008	0.053	0.005	0.480	0.025	0.003	10.0	1.8	5.0	4.6
	7/20/2004	T 0.007	T 0.002	0.003	0.480	0.028	0.003	11.0	1.0	6.0	6.9
	8/26/2004	T 0.009	T 0.003	0.002	0.310	0.019	0.006	14.0	1.4	8.0	10.8
	11/1/2004	0.011	0.072	0.003	0.370	0.032	0.006	14.0	1.6	8.0	8.2
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.009	0.033	0.003	0.410	0.026	0.005	12.3	1.5	6.8	7.6
	Median+:	# 0.009	0.028	0.003	0.425	0.027	0.005	12.5	1.5	7.0	7.6

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STORET ID	Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
610273 Muskegon River (Lower)										
3/8/2004	0.089	0.630	0.011	0.510	0.055	0.013	13.0	1.6	17.0	10.2
3/15/2004	0.099	0.550	0.009	0.490	0.037	0.006	10.0	1.5	18.0	10.1
3/29/2004	0.081	0.520	0.009	0.440	0.036	0.009	12.0	1.6	16.0	8.6
4/19/2004	0.032	0.280	0.009	0.480	0.025	0.003	9.0	1.5	14.0	6.8
5/12/2004	0.045	0.320	0.020	H 0.620	H 0.049	0.010	9.0	1.5	13.0	6.8
5/20/2004	0.028	0.300	0.012	0.560	0.033	0.006	9.0	1.4	12.0	7.2
5/25/2004	0.037	0.300	0.011	0.700	0.050	0.007	8.0	1.5	12.0	7.0
6/16/2004	0.013	0.250	0.011	0.590	0.041	0.009	8.0	1.5	12.0	5.9
7/7/2004	0.016	0.250	0.005	0.590	0.031	0.006	6.0	1.2	13.0	6.3
8/19/2004	0.015	0.200	0.009	0.400	0.020	0.005	12.0	1.1	17.0	10.4
10/5/2004	0.013	0.310	0.008	0.290	0.021	0.004	15.0	1.2	23.0	14.3
10/27/2004	0.024	0.310	0.014	0.360	0.031	0.012	12.0	1.2	20.0	11.8
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	0.041	0.352	0.011	0.503	0.036	0.008	10.3	1.4	15.6	8.8
Median+:	0.030	0.305	0.010	0.500	0.035	0.007	9.5	1.5	15.0	7.9
670008 Muskegon River (Upper)										
3/30/2004	0.020	0.127	0.006	0.490	0.041	0.012	6.0	1.4	12.0	5.9
5/13/2004	0.034	0.106	0.012	H 0.770	H 0.057	0.011	4.0	1.5	15.0	7.8
8/11/2004	0.017	0.250	0.008	0.290	0.024	0.005	8.0	D 8.3	25.0	10.8
9/15/2004	T 0.007	0.230	0.005	0.240	0.015	T 0.002	12.0	1.1	19.0	10.3
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	0.020	0.178	0.008	0.448	0.034	0.008	7.5	3.1	17.8	8.7
Median+:	0.019	0.179	0.007	0.390	0.033	0.008	7.0	1.5	17.0	9.1

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500467	North Branch Clinton River										
	4/6/2004	0.014	0.600	0.002	0.300	0.011	0.005	29.0	1.5	30.0	8.9
	7/14/2004	0.014	0.480	0.003	0.530	0.038	0.016	20.0	2.2	32.0	8.4
	9/7/2004	0.011	0.710	0.002	0.320	0.021	0.010	9.0	2.5	8.0	8.9
	10/20/2004	0.010	0.800	T 0.001	0.180	0.010	0.004	32.0	1.6	22.0	8.6
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.012	0.648	0.002	0.333	0.020	0.009	22.5	2.0	23.0	8.7
	Median+:	0.013	0.655	0.002	0.310	0.016	0.008	24.5	1.9	26.0	8.8
660038	Ontonagon River										
	5/6/2004	T 0.007	0.040	0.006	0.290	0.030	0.009	3.0	1.2	3.0	1.5
	6/30/2004	T 0.007	ND W	0.006	0.330	0.027	0.012	2.0	1.9	4.0	2.3
	9/1/2004	0.024	T 0.008	0.006	0.350	0.053	0.015	ND	1.8	4.0	3.4
	11/3/2004	T 0.008	0.021	0.007	0.410	0.059	0.011	6.0	1.4	3.0	3.3
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.012	0.023	0.006	0.345	0.042	0.012	* 3.0	1.6	3.5	2.6
	Median+:	# 0.008	0.021	0.006	0.340	0.042	0.012	2.5	1.6	3.5	2.8
530027	Pere Marquette River										
	3/29/2004	0.037	0.110	0.013	0.560	0.067	0.030	10.0	1.4	7.0	4.4
	5/12/2004	0.021	0.046	0.008	H 0.910	H 0.056	0.013	7.0	1.4	6.0	3.5
	8/11/2004	0.027	0.122	0.003	0.320	0.033	0.009	14.0	D 19.3	30.0	8.1
	9/15/2004	P 0.030	0.115	0.005	P 0.320	P 0.034	0.011	17.0	0.8	15.0	9.6
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.029	0.098	0.007	0.528	0.048	0.016	12.0	5.7	14.5	6.4
	Median+:	0.029	0.113	0.007	0.440	0.045	0.012	12.0	1.4	11.0	6.3

+ = Calculated value; not rounded to the appropriate number of significant figures.

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STORET ID	Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
490006 Pine River										
4/5/2004	0.023	0.045	0.031	0.380	0.099	0.071	3.0	1.8	2.0	1.1
4/20/2004	0.014	0.035	H 0.010	0.600	0.119	H 0.015	5.0		2.0	
5/13/2004	0.015	0.060	ND I	0.450	0.098	ND I	5.0	1.4	4.0	ND
5/24/2004	0.110	0.055	ND I	H 0.820	H 0.320	ND I	4.0	2.1	4.0	ND
6/1/2004	0.029	0.025	H 0.024	1.110	0.250	H 0.038	2.0	2.1	3.0	1.8
7/6/2004	0.020	0.034	0.012	0.960	0.171	0.020	5.0	1.3	4.0	2.2
8/4/2004	0.018	T 0.008	0.005	0.400	0.074	0.013	7.0	0.9	2.0	1.7
8/10/2004	0.022	0.022	0.004	0.310	0.053	0.012	2.0	4.8	4.0	2.2
9/7/2004	0.014	0.010	0.011	0.360	0.052	0.028	5.0	1.2	4.0	2.6
9/27/2004	0.017	ND W	0.009	0.300	0.047	0.024	2.0	1.0	2.0	2.9
10/18/2004	T 0.009	0.020	0.005	0.420	0.067	0.009	6.0	1.5	6.0	4.4
10/25/2004	0.015	0.160	0.011	0.550	0.084	0.028	7.0	2.4	4.0	3.0
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	0.026	0.043	0.012	0.555	0.120	0.026	4.4	1.9	3.4	* 2.1
Median+:	0.018	0.034	0.011	0.435	0.091	0.022	5.0	1.5	4.0	2.2
580046 River Raisin										
4/7/2004	ND D	4.290	0.015	0.690	0.069	0.020	60.0	3.1	46.0	18.8
7/13/2004	0.036	1.340	0.014	0.660	0.080	0.031	62.0	4.1	50.0	23.4
9/7/2004	T 0.009	0.460	0.011	0.860	0.093	0.012	46.0	4.0	40.0	21.3
10/20/2004	0.094	0.440	0.008	0.540	0.069	0.032	48.0	3.7	43.0	24.3
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	0.046	1.633	0.012	0.688	0.078	0.024	54.0	3.7	44.8	22.0
Median+:	0.036	0.900	0.013	0.675	0.075	0.026	54.0	3.9	44.5	22.4

A-13

+ = Calculated value; not rounded to the appropriate number of significant figures.

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A = Value reported is the mean of two or more determinations.

D = Analyte value quantified from a dilution(s); quantification level raised.

H = Recommended laboratory holding time was exceeded.

I = Dilution required due to matrix interference; quantification level raised.

J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

P = Recommended sample collection/preservation technique not used; reported result(s) is an estimate.

PI = Possible interference may have affected the accuracy of the laboratory result.

T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.



STORET ID	Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
820070 River Rouge										
4/7/2004	0.200	1.460	0.023	0.900	0.071	0.021	51.0	D 7.3	D 236.0	D 112.0
7/13/2004	0.490	0.870	0.037	1.240	0.149	0.053	25.0	3.2	92.0	50.3
9/8/2004	0.300	1.030	0.048	1.110	0.152	0.065	30.0	D 5.8	D 109.0	60.6
10/20/2004	0.119	0.890	0.012	0.480	0.073	0.022	25.0	4.3	70.0	39.0
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	0.277	1.063	0.030	0.933	0.111	0.040	32.8	5.2	126.8	65.5
Median+:	0.250	0.960	0.030	1.005	0.111	0.038	27.5	5.1	100.5	55.5
090177 Saginaw River										
3/10/2004	D 0.150	4.260	0.037	0.760	0.134	0.041	27.0	4.5	36.0	15.7
4/6/2004	D 0.130	2.580	0.021	0.890	0.068	0.013	51.0	3.1	D 62.0	30.0
4/28/2004	0.052	0.950	0.019	H 0.900	H 0.094	0.004	44.0	3.0	72.0	35.4
5/4/2004	D 0.080	2.270	0.035	0.980	0.071	0.016	45.0	3.4	68.0	30.9
5/10/2004	D 0.180	4.230	0.072	1.690	0.270	0.035	29.0	3.5	42.0	20.7
5/24/2004	D 0.090	3.940	0.065	1.620	0.270	0.043	20.0	3.9	38.0	17.0
6/23/2004	D 0.180	2.940	0.058	1.240	0.113	0.041	27.0	4.1	58.0	29.1
7/28/2004	0.184	0.880	0.034	1.070	0.105	0.046	28.0	3.7	83.0	44.4
8/24/2004	0.107	0.730	0.026	1.050	0.097	0.036	33.0	4.3	101.0	52.6
10/12/2004	0.210	1.340	0.037	1.140	0.091	0.029	42.0	4.3	D 132.0	78.7
11/4/2004	0.175	0.860	0.022	0.840	0.092	0.026	32.0	3.9	78.0	45.3
11/22/2004	0.075	1.300	0.024	0.830	0.072	0.016	42.0	3.9	72.0	42.9
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	0.134	2.190	0.038	1.084	0.123	0.029	35.0	3.8	70.2	36.9
Median+:	0.140	1.805	0.035	1.015	0.096	0.032	32.5	3.9	70.0	33.2

A-14

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A = Value reported is the mean of two or more determinations.

D = Analyte value quantified from a dilution(s); quantification level raised.

H = Recommended laboratory holding time was exceeded.

I = Dilution required due to matrix interference; quantification level raised.

J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

P = Recommended sample collection/preservation technique not used; reported result(s) is an estimate.

PI = Possible interference may have affected the accuracy of the laboratory result.

T = Reported value is less than the quantification level.

W = Reported value is less than the method detection level.

STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
730023	Shiawassee River										
	4/1/2004	ND D	2.390	0.012	0.760	0.053	0.015	51.0	3.4	66.0	30.4
	6/9/2004	0.013	0.720	0.011	1.350	0.089	0.008	34.0	3.3	60.0	26.1
	8/12/2004	0.023	0.700	0.005	0.740	0.064	0.030	26.0	3.6	66.0	37.1
	11/4/2004	0.015	1.180	0.008	0.580	0.036	0.008	32.0	D 5.7	87.0	45.3
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.017	1.248	0.009	0.858	0.061	0.015	35.8	4.0	69.8	34.7
	Median+:	0.015	0.950	0.010	0.750	0.059	0.012	33.0	3.5	66.0	33.8
130331	South Branch Kalamazoo R										
	3/22/2004	D 0.040	2.690	0.012	0.650	0.028	0.004	52.0	1.4	21.0	7.6
	6/30/2004	0.012	2.100	0.011	0.500	0.036	0.007	41.0	2.2	26.0	7.2
	8/31/2004	0.024	1.660	0.010	0.620	0.037	0.003	33.0	5.0	30.0	7.3
	10/6/2004	ND D	2.190	0.006	0.210	0.013	T 0.002	36.0	1.2	27.0	7.6
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.025	2.160	0.010	0.495	0.029	0.004	40.5	2.5	26.0	7.4
	Median+:	0.024	2.145	0.011	0.560	0.032	0.004	38.5	1.8	26.5	7.5
110628	St. Joseph River (Lower)										
	3/22/2004	D 0.040	2.280	0.017	0.490	0.035	0.006	45.0	2.1	28.0	14.6
	7/1/2004	T 0.007	1.480	0.010	0.660	0.088	0.025	34.0	3.2	29.0	13.8
	8/31/2004	0.028	1.360	0.013	0.460	0.058	0.029	36.0	3.6	35.0	17.3
	10/5/2004	0.031	1.480	0.009	0.380	0.052	0.021	38.0	2.5	37.0	20.0
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.027	1.650	0.012	0.498	0.058	0.020	38.3	2.9	32.3	16.4
	Median+:	0.030	1.480	0.012	0.475	0.055	0.023	37.0	2.9	32.0	16.0

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A = Value reported is the mean of two or more determinations.

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J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
750273	St. Joseph River (Upper)										
	3/22/2004	D 0.030	2.090	0.015	0.420	0.019	0.004	40.0	1.7	21.0	8.6
	6/30/2004	0.058	1.280	0.016	0.650	0.034	0.010	29.0	2.4	24.0	9.5
	8/31/2004	0.058	1.120	0.022	0.480	0.026	0.008	31.0	2.8	24.0	9.9
	10/6/2004	0.036	1.500	0.013	0.410	0.025	0.003	34.0	1.9	25.0	10.6
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.046	1.498	0.017	0.490	0.026	0.006	33.5	2.2	23.5	9.7
	Median+:	0.047	1.390	0.016	0.450	0.026	0.006	32.5	2.2	24.0	9.7
210032	Sturgeon River										
	5/4/2004	0.014	0.034	0.005	H 0.510	H 0.022	0.003	20.0	0.7	2.0	ND
	6/28/2004	0.023	0.062	0.004	0.530	0.027	0.003	27.0	0.6	2.0	1.1
	8/25/2004	0.022	0.064	0.004	0.370	0.010	0.003	38.0	0.7	2.0	1.2
	11/1/2004	0.015	0.034	0.006	0.760	0.028	0.003	14.0	0.8	2.0	ND
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.019	0.049	0.005	0.543	0.022	0.003	24.8	0.7	2.0	* 0.8
	Median+:	0.019	0.048	0.005	0.520	0.025	0.003	23.5	0.7	2.0	# 0.8

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J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

P = Recommended sample collection/preservation technique not used; reported result(s) is an estimate.

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STORET ID		Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
170141	Tahquamenon River										
	4/6/2004	0.019	0.095	0.007	0.580	0.032	0.006	6.0	0.8	2.0	1.2
	5/5/2004	0.010	0.015	0.006	H 0.530	H 0.018	0.003	8.0	0.5	2.0	1.8
	5/17/2004	0.034	0.041	0.007	0.660	0.026	0.004	8.0	0.8	2.0	ND
	5/27/2004	0.021	0.034	H 0.010	0.790	0.033	H 0.003	8.0	0.5	2.0	1.6
	6/28/2004	0.012	0.063	0.007	0.720	0.027	0.004	5.0	0.4	2.0	1.4
	7/7/2004	0.035	0.096	0.006	0.560	0.022	0.005	7.0	0.4	2.0	1.7
	8/5/2004	0.011	0.085	0.005	0.500	0.018	0.003	7.0	0.4	2.0	ND
	8/11/2004	0.014	0.084	0.004	0.400	0.016	0.004	6.0	0.6	2.0	3.2
	8/30/2004	T 0.005	0.066	0.004	0.280	0.011	0.006	8.0	0.6	3.0	ND
	9/28/2004	0.012	0.071	0.003	0.390	0.012	T 0.002	8.0	0.8	2.0	2.9
	10/19/2004	0.016	0.077	0.004	0.480	0.017	T 0.002	10.0	0.8	3.0	2.4
	10/26/2004	0.013	0.051	0.006	0.690	0.036	0.003	9.0	0.7	3.0	ND
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	0.017	0.065	0.006	0.548	0.022	0.004	7.5	0.6	2.3	* 1.5
	Median+:	0.014	0.069	0.006	0.545	0.020	0.004	8.0	0.6	2.0	1.5
480033	Tahquamenon River (Head)										
	5/4/2004	T 0.009	0.061	0.002	H 0.150	H 0.020	0.003	5.0	0.7	1.0	1.6
	6/29/2004	T 0.009	0.043	0.002	0.220	0.029	0.007	3.0	0.6	1.0	ND
	8/30/2004	T 0.009	0.072	0.005	0.120	0.015	0.007	4.0	0.7	1.0	1.1
	11/8/2004	T 0.008	0.115	0.002	T 0.080	0.016	0.005	3.0	0.7	ND	1.5
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	0.009	0.073	0.003	0.143	0.020	0.006	3.8	0.7	* 0.9	* 1.2
	Median+:	# 0.009	0.067	0.002	0.135	0.018	0.006	3.5	0.7	1.0	1.3

A-17

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STORET ID	Ammonia (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Kjeldahl Nitrogen (mg N/L)	Phosphorus (mg P/L)	Ortho Phosphate (mg P/L)	Sulfate (mg/L)	Potassium (mg/L)	Chloride (mg/L)	Sodium (mg/L)
040123 Thunder Bay River										
5/11/2004	0.026	0.021	0.005	H 0.560	H 0.013	T 0.001	7.0	1.0	8.0	6.2
7/12/2004	0.021	0.014	0.003	0.430	0.018	0.004	6.0	3.7	10.0	5.5
8/25/2004	0.010	T 0.007	0.002	0.330	0.010	0.006	6.0	0.4	7.0	6.3
10/27/2004	0.015	0.013	0.002	0.320	0.014	T 0.002	3.0	1.0	7.0	6.4
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	0.018	0.014	0.003	0.410	0.014	0.003	5.5	1.5	8.0	6.1
Median+:	0.018	0.014	0.003	0.380	0.014	0.003	6.0	1.0	7.5	6.3
730025 Tittabawassee River										
4/1/2004	0.099	1.650	0.027	0.730	0.041	0.014	38.0	2.5	62.0	32.5
6/9/2004	0.037	1.190	0.023	0.900	0.067	0.009	23.0	2.7	68.0	33.5
8/12/2004	0.031	0.310	0.013	0.840	0.038	0.006	36.0	2.8	D 159.0	100.0
11/3/2004	0.057	0.240	0.009	0.500	0.056	0.010	28.0	1.9	46.0	26.4
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	0.056	0.848	0.018	0.743	0.051	0.010	31.3	2.5	83.8	48.1
Median+:	0.047	0.750	0.018	0.785	0.049	0.010	32.0	2.6	65.0	33.0

+ = Calculated value; not rounded to the appropriate number of significant figures.

\* = Mean includes censored value(s), which for calculation purposes was assigned a value equal to 1/2 the quantification level.

# = Median was obtained using reported value(s) below quantification and/or censored value(s) assigned a value equal to 1/2 the quantification level.

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
830159	Anderson Creek										
	3/30/2004	8.0	130.0	10.0	193	10.4	7.5	5.2	96	2.7	75.00
	5/13/2004	18.0	230.0	9.5	346	8.4	7.6	16.7	174	4.6	153.00
	8/10/2004	ND	280.0	3.8	431	9.0	8.1	16.5	218	ND	181.00
	9/15/2004	ND	280.0	3.6	423	10.6	8.0	17.2	220	ND	189.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 7.5	230.0	6.7	348	9.6	7.8	13.9	177	* 2.1	149.50
	Median+:	5.0	255.0	6.7	385	9.7	7.8	16.6	196	1.6	167.00
350061	Au Sable River										
	3/31/2004	ND	190.0	3.9	283	12.0	7.7	2.8	140	ND	127.00
	4/27/2004	ND	170.0	7.1	253	10.4	7.8	10.0	123	ND	100.00
	5/12/2004	ND	180.0	5.6	279	9.8	7.9	12.7	137	ND	119.00
	5/19/2004	ND	180.0	6.5	278	8.7	7.7	15.3	136	ND	121.00
	6/8/2004	ND	180.0	7.8	282	8.3	8.0	18.2	139	ND	122.00
	7/13/2004	ND	190.0	7.4	293	7.8	7.6	21.9	136	ND	122.00
	7/29/2004	ND	200.0	5.5	299	7.5	8.0	22.8	147	ND	136.00
	8/25/2004	ND	200.0	4.1	297	7.8	7.7	20.7	151	ND	126.00
	9/14/2004	ND	200.0	3.6	295	9.1	7.8	22.0	151	ND	128.00
	10/13/2004	ND	200.0	2.7	296	8.9	7.5	15.3	150	ND	133.00
	10/27/2004	ND	200.0	2.6	305	9.6	8.1	12.0	155	ND	141.00
	11/23/2004	ND	210.0	2.7	292	11.1	7.7	6.9	160	ND	149.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	* 2.0	191.7	5.0	288	9.3	7.8	15.1	144	* 0.5	127.00
	Median+:	# 2.0	195.0	4.8	293	9.0	7.8	15.3	144	# 0.5	126.50

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D = Analyte value quantified from a dilution(s); quantification level raised.

H = Recommended laboratory holding time was exceeded.

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J = Analyte was positively identified. Value is an estimate.

ND = Observed result was below the quantification level.

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
170154	Bear Creek										
	5/11/2004	10.0	110.0	15.0	165	10.5	7.4	11.0	91	8.1	70.00
	7/14/2004	16.0	140.0	16.0	228	7.4	7.7	17.9	113	18.0	101.00
	8/24/2004	ND	220.0	7.0	337	9.9	8.1	14.6	178	4.7	150.00
	11/9/2004	ND	140.0	15.0	200	12.4	7.1	1.2	114	4.4	79.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 7.5	152.5	13.3	233	10.1	7.6	11.2	124	8.8	100.00
	Median+:	6.0	140.0	15.0	214	10.2	7.6	12.8	114	6.4	90.00
340186	Bellamy Creek										
	3/23/2004	ND	410.0	12.0	625	13.6	8.1	2.4	299	3.1	212.00
	7/1/2004	ND	420.0	8.0	650	9.4	8.0	17.5	322	2.6	270.00
	9/1/2004	ND	440.0	5.9	647	9.3	7.9	14.7	321	2.6	275.00
	11/18/2004	ND	440.0	4.5	594	11.5	7.9	9.0	335	ND	290.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 2.0	427.5	7.6	629	11.0	8.0	10.9	319	* 2.2	261.75
	Median+:	# 2.0	430.0	7.0	636	10.5	8.0	11.9	322	2.6	272.50
740385	Black River										
	4/6/2004	11.0	480.0	10.0	740	13.1	8.1	6.3	347	16.0	215.00
	7/13/2004	20.0	270.0	6.5	421	7.5	8.0	23.7	178	25.0	117.00
	9/8/2004	18.0	220.0	2.9	331	7.3	7.7	22.1	146	14.0	103.00
	10/21/2004	16.0	250.0	2.9	373	9.6	8.1	10.5	155	10.0	114.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	16.3	305.0	5.6	466	9.4	8.0	15.7	207	16.3	137.25
	Median+:	17.0	260.0	4.7	397	8.6	8.1	16.3	167	15.0	115.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
280014	Boardman River										
	3/29/2004	17.0	170.0	6.4	256	11.8	8.4	6.8	122	6.7	100.00
	5/12/2004	9.0	210.0	4.0	321	9.6	8.2	16.7	154	1.6	138.00
	8/10/2004	4.0	220.0	2.5	331	9.4	8.1	16.3	165	1.8	136.00
	9/15/2004	ND	220.0	2.7	336	9.7	7.8	15.8	173	1.4	150.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 8.0	205.0	3.9	311	10.1	8.1	13.9	154	2.9	131.00
	Median+:	6.5	215.0	3.4	326	9.7	8.2	16.1	160	1.7	137.00
730024	Cass River										
	4/1/2004	17.0	440.0	9.2	666	10.8	8.0	7.4	327	17.0	202.00
	6/9/2004	19.0	480.0	10.0	733	7.7	8.1	23.0	337	14.0	254.00
	8/12/2004	44.0	450.0	8.7	699	7.5	8.2	20.4	303	46.0	217.00
	11/3/2004	17.0	430.0	6.0	644	7.6	7.8	9.8	272	18.0	204.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	24.3	450.0	8.5	686	8.4	8.0	15.2	310	23.8	219.25
	Median+:	18.0	445.0	9.0	683	7.7	8.1	15.1	315	17.5	210.50
160073	Cheboygan River										
	5/11/2004	ND	210.0	5.2	318	11.2	7.7	11.3	161	ND	138.00
	7/12/2004	ND	230.0	5.6	329	9.2	8.0	21.4	147	ND	129.00
	8/26/2004	ND	200.0	5.0	310	8.7	7.8	20.1	153	ND	131.00
	10/28/2004	ND	210.0	4.4	315	10.5	7.5	10.6	156	ND	141.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 2.0	212.5	5.1	318	9.9	7.8	15.9	154	* 0.5	134.75
	Median+:	# 2.0	210.0	5.1	317	9.9	7.8	15.7	155	# 0.5	134.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
500233	Clinton River										
	3/3/2004	61.0	740.0	I 7.5	1130	11.6	7.9	3.0	262	47.0	144.00
	3/25/2004	66.0	960.0	I 7.9	1460	9.3	7.9	6.2	255	49.0	150.00
	5/3/2004	20.0	680.0	7.8	1030	9.1	7.7	9.7	237	H 14.0	142.00
	5/10/2004	190.0	460.0	I 12.0	700	7.0	7.6	15.2	151	130.0	91.00
	5/24/2004	320.0	230.0	I 14.0	352	5.3	7.3	18.2	121	310.0	75.00
	6/24/2004	21.0	640.0	7.4					285	17.0	211.00
	7/28/2004	24.0	670.0	8.2	1080	6.4	8.1	17.9	239	22.0	172.00
	8/24/2004	12.0	700.0	6.4	1070	7.0	7.7	19.2	298	11.0	205.00
	9/7/2004	64.0	490.0	8.5	750	5.2	7.5	22.0	169	47.0	D 106.00
	10/12/2004	11.0	670.0	6.8	1025	9.3	7.7	12.2	292	11.0	D 171.00
	11/3/2004	24.0	480.0	7.6	723	8.2	7.7	10.6	210	21.0	150.00
	11/22/2004	7.0	570.0	6.1	833	10.0	7.7	8.6	267	7.1	204.00
	No. of Samples:	12	12	12	11	11	11	11	12	12	12
	Mean+:	68.3	607.5	8.4	923	8.0	7.7	13.0	232	57.2	151.75
	Median+:	24.0	655.0	7.7	1025	8.2	7.7	12.2	247	21.5	150.00
210102	EsCANABA River										
	5/20/2004	ND	180.0	15.0	274	8.4	7.6	17.2	86	2.9	86.00
	7/20/2004	4.0	250.0	15.0	378	5.1	7.9	23.0	109	3.9	125.00
	8/26/2004	ND	320.0	15.0	497	8.3	8.2	20.9	130	2.8	148.00
	11/1/2004	5.0	180.0	20.0	270	11.1	8.0	9.2	91	5.1	91.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 3.3	232.5	16.3	355	8.2	7.9	17.6	104	3.7	112.50
	Median+:	# 3.0	215.0	15.0	326	8.4	8.0	19.1	100	3.4	108.00

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
730285	Flint River										
	4/1/2004	17.0	480.0	8.2	731	11.8	8.3	7.2	283	10.0	194.00
	6/9/2004	26.0	450.0	11.0	695	7.0	8.0	24.2	250	16.0	204.00
	8/12/2004	ND	470.0	13.0	720	8.2	8.1	19.1	253	14.0	186.00
	11/4/2004	61.0	390.0	6.7	574	10.0	7.8	9.4	189	18.0	135.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 26.5	447.5	9.7	680	9.3	8.1	15.0	244	14.5	179.75
	Median+:	21.5	460.0	9.6	708	9.1	8.1	14.3	252	15.0	190.00
770082	Fox River										
	5/4/2004	5.0	60.0	6.2	85	10.6	7.4	7.5	39	2.1	35.00
	6/29/2004	ND	80.0	4.3	114	9.6	7.8	14.8	54	2.2	46.00
	8/31/2004	ND	80.0	3.8	114	10.2	7.5	11.4	60	2.6	50.00
	11/8/2004	ND	72.0	4.3	103	12.4	7.2	3.0	51	2.3	36.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 2.8	73.0	4.7	104	10.7	7.5	9.2	51	2.3	41.75
	Median+:	# 2.0	76.0	4.3	109	10.4	7.5	9.5	53	2.3	41.00

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
700123	Grand River (Lower)										
	3/8/2004	51.0	320.0	I 9.2	479	10.8	7.9	3.1	195	51.0	108.00
	3/15/2004	13.0	390.0	9.1	582	12.6	8.0	2.2	239	21.0	150.00
	4/19/2004	13.0	470.0	7.1	731	12.8	8.2	16.5	301	9.3	217.00
	5/12/2004	150.0	350.0	I 11.0	527	6.8	7.6	18.0	237	130.0	160.00
	5/20/2004	24.0	350.0	11.0	526	7.1	7.7	18.5	231	20.0	168.00
	5/25/2004	33.0	280.0	10.0	419	6.3	7.2	17.0	174	38.0	129.00
	6/15/2004	35.0	400.0	11.0	608	7.4	7.9	21.3	271	22.0	210.00
	7/7/2004	33.0	420.0	11.0	653	11.6	8.4	23.1	297	19.0	231.00
	8/18/2004	29.0	450.0	7.9	686	12.6	8.5	21.4	290	9.4	218.00
	10/5/2004	5.0	480.0	5.4	729	11.1	8.1	12.8	289	3.9	221.00
	10/27/2004	17.0	450.0	5.2	687	9.4	7.9	11.6	286	5.7	220.00
	11/17/2004	ND	480.0	6.0	687	11.7	8.0	6.1	322	2.8	245.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	* 33.8	403.3	8.7	610	10.0	8.0	14.3	261	27.7	189.75
	Median+:	26.5	410.0	9.2	631	11.0	8.0	16.8	279	19.5	213.50
340025	Grand River (Upper)										
	3/23/2004	8.0	460.0	9.0	700	11.9	8.0	3.4	300	8.0	197.00
	7/1/2004	18.0	450.0	13.0	695	7.9	7.9	22.3	305	12.0	262.00
	9/1/2004	19.0	460.0	7.0	686	8.8	8.0	21.4	288	13.0	213.00
	11/18/2004	ND	490.0	7.8	671	14.5	8.0	7.2	336	2.1	257.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 11.8	465.0	9.2	688	10.8	8.0	13.6	307	8.8	232.25
	Median+:	13.0	460.0	8.4	691	10.4	8.0	14.3	303	10.0	235.00

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STORET ID	Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
580364	Huron River									
4/7/2004	14.0	630.0	6.7	975	11.0	8.1	7.8	360	8.9	207.00
7/13/2004	22.0	550.0	9.0	845	6.4	7.9	24.8	331	19.0	201.00
9/7/2004	10.0	650.0	7.2	962	7.7	7.0	23.4	453	8.3	D 157.00
10/20/2004	9.0	730.0	6.8	1080	9.2	7.6	10.8	522	4.4	188.00
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	13.8	640.0	7.4	966	8.6	7.7	16.7	417	10.2	188.25
Median+:	12.0	640.0	7.0	969	8.5	7.8	17.1	407	8.6	194.50
030077	Kalamazoo River (Lower)									
3/8/2004	15.0	280.0	7.0	450	10.6	7.9	3.2	182	32.0	118.00
3/15/2004	5.0	340.0	7.4	513	12.2	8.2	2.1	228	8.2	166.00
4/19/2004	30.0	420.0	5.6	652	8.8	8.1	16.3	270	13.0	222.00
5/13/2004	19.0	400.0	6.5	608	8.4	8.1	20.4	264	7.6	213.00
5/25/2004	13.0	290.0	9.8	418	5.9	7.2	17.0	179	20.0	147.00
6/15/2004	16.0	380.0	8.4	582	6.4	7.9	20.8	254	8.8	210.00
7/7/2004	38.0	370.0	8.4	567	8.7	8.0	23.0	233	19.0	185.00
8/18/2004	23.0	380.0	5.4	584	8.8	7.9	20.3	238	11.0	186.00
9/1/2004	17.0	390.0	6.2	574	6.8	7.6	19.8	245	12.0	193.00
9/22/2004	18.0	410.0	5.4	610	11.1	8.2	19.2	262	8.7	211.00
10/28/2004	15.0	430.0	4.6	633	9.3	8.0	11.0	286	5.1	240.00
11/17/2004	ND	410.0	5.7	587	11.0	8.0	6.8	271	3.3	232.00
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	* 17.6	375.0	6.7	565	9.0	7.9	15.0	243	12.4	193.58
Median+:	16.5	385.0	6.4	583	8.8	8.0	18.1	250	9.9	201.50

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STORET ID	Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
390057	Kalamazoo River (Upper)									
3/8/2004	8.0	310.0	8.8	466	11.5	7.8	3.2	210	10.0	136.00
3/15/2004	5.0	390.0	7.4	585	12.4	7.9	2.5	267	3.8	202.00
4/19/2004	29.0	430.0	5.1	681	7.3	7.8	17.8	302	12.0	234.00
5/13/2004	29.0	340.0	10.0	522	6.6	7.8	21.1	240	12.0	196.00
5/25/2004	8.0	220.0	13.0	338	6.3	7.1	16.9	150	15.0	128.00
6/15/2004	18.0	350.0	13.0	527	6.6	7.6	20.5	259	13.0	199.00
7/7/2004	35.0	370.0	6.1	564	6.4	7.7	22.6	242	16.0	198.00
8/18/2004	38.0	340.0	4.9	508	7.3	7.8	19.0	220	18.0	168.00
8/31/2004	14.0	400.0	8.5	591	7.5	7.8	19.0	273	8.8	223.00
9/22/2004	4.0	450.0	4.7	682	10.7	7.8	17.6	300	3.0	246.00
11/1/2004	ND	420.0	5.4	624	8.8	7.9	10.8	302	1.9	D 241.00
11/17/2004	6.0	450.0	5.0	645	10.8	7.8	7.3	319	3.4	262.00
No. of Samples:	12	12	12	12	12	12	12	12	12	12
Mean+:	* 16.3	372.5	7.7	561	8.5	7.7	14.9	257	9.7	202.75
Median+:	11.0	380.0	6.8	575	7.4	7.8	17.7	263	11.0	200.50

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STORET ID	Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)	
510088	Manistee River										
3/9/2004	15.0	190.0	4.4	278	11.1	7.6	0.1	131	8.2	109.00	
3/16/2004	12.0	190.0	4.5	274	12.0	8.0	1.6	140	11.0	118.00	
3/29/2004	12.0	180.0	5.9	269	10.2	7.8	8.1	125	7.5	103.00	
4/20/2004	7.0	190.0	6.2	282	9.4	7.5	10.2	135	8.3	108.00	
5/12/2004	12.0	200.0	6.5	302	8.6	7.8	16.0	145	5.6	128.00	
5/26/2004	10.0	190.0	10.0	276	9.0	7.6	13.9	133	6.6	117.00	
6/16/2004	11.0	200.0	6.7	313	8.1	7.7	19.0	146	8.3	132.00	
7/8/2004	11.0	230.0	4.5	344	8.0	7.7	17.2	161	5.9	142.00	
8/19/2004	11.0	220.0	2.5	342	8.1	8.0	18.4	165	4.6	145.00	
9/23/2004	ND	240.0	2.2	353	10.9	7.8	17.5	165	3.3	146.00	
10/28/2004	6.0	220.0	2.6	325	9.9	7.8	10.2	164	3.3	151.00	
11/18/2004	5.0	220.0	2.9	297	10.8	7.7	7.3	167	3.5	145.00	
No. of Samples:	12	12	12	12	12	12	12	12	12	12	
Mean+:	* 9.5	205.8	4.9	305	9.7	7.8	11.6	148	6.3	128.67	
Median+:	11.0	200.0	4.5	300	9.7	7.8	12.1	146	6.3	130.00	

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
770073	Manistique River										
	4/6/2004	7.0	50.0	9.6	67	11.5	6.9	1.9	35	4.4	29.00
	5/4/2004	10.0	80.0	12.0	109	10.4	7.3	8.5	54	3.8	39.00
	5/17/2004	8.0	100.0	11.0	157	9.2	7.4	13.1	77	4.5	55.00
	5/26/2004	A 4.0	80.0	13.0	129	9.3	7.0	11.1	61	5.8	43.00
	6/28/2004	5.0	120.0	11.0	178	9.5	7.6	16.0	86	5.8	59.00
	7/7/2004	9.0	120.0	10.0	180	8.4	7.4	16.5	86	6.1	65.00
	8/5/2004	ND	130.0	7.6	198	8.2	8.1	21.0	96	5.0	74.00
	8/25/2004	ND	120.0	6.7	191	8.7	7.6	18.0	90	4.8	63.00
	9/13/2004	ND	130.0	8.3	199	8.5	7.6	18.9	102	4.5	70.00
	9/28/2004	ND	130.0	7.6	200	8.8	7.6	16.2	93	5.1	61.00
	10/19/2004	5.0	110.0	9.5	170	11.3	7.7	6.1	88	6.6	59.00
	10/26/2004	20.0	79.0	16.0	118	9.4	7.1	8.7	59	11.0	42.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	* 6.3	104.1	10.2	158	9.4	7.4	13.0	77	5.6	54.92
	Median+:	5.0	115.0	9.8	174	9.3	7.5	14.6	86	5.1	59.00
550038	Menominee River										
	5/20/2004	ND	140.0	11.0	210	9.3	7.8	17.1	97	2.5	78.00
	7/20/2004	7.0	170.0	9.8	265	5.6	8.0	23.5	124	3.4	106.00
	8/26/2004	ND	190.0	6.9	285	7.6	8.1	20.9	128	2.2	114.00
	11/1/2004	4.0	190.0	9.1	278	10.9	8.0	9.0	128	2.7	111.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 3.8	172.5	9.2	260	8.4	8.0	17.6	119	2.7	102.25
	Median+:	# 3.0	180.0	9.5	272	8.5	8.0	19.0	126	2.6	108.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
610273	Muskegon River (Lower)										
	3/8/2004	30.0	220.0	6.5	314	12.2	7.9	1.1	147	20.0	109.00
	3/15/2004	13.0	220.0	6.8	320	13.0	8.1	1.2	143	8.3	114.00
	3/29/2004	15.0	200.0	7.0	309	12.3	7.8	4.8	134	5.9	108.00
	4/19/2004	10.0	180.0	8.0	270	10.0	7.8	10.9	120	3.1	95.00
	5/12/2004	22.0	180.0	9.6	275	8.7	7.8	14.5	117	15.0	99.00
	5/20/2004	12.0	180.0	9.9	279	8.7	7.5	15.1	130	5.7	106.00
	5/25/2004	29.0	180.0	9.8	279	9.0	7.4	15.2	125	13.0	103.00
	6/16/2004	12.0	180.0	12.0	282	8.2	7.8	19.8	130	4.2	112.00
	7/7/2004	10.0	200.0	11.0	301	7.8	7.8	20.2	132	3.8	118.00
	8/19/2004	10.0	230.0	7.5	351	8.1	8.2	20.6	165	ND	137.00
	10/5/2004	ND	270.0	5.3	402	12.2	8.0	12.5	183	ND	154.00
	10/27/2004	7.0	260.0	4.5	392	9.8	8.0	12.8	180	2.2	161.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	* 14.3	208.3	8.2	315	10.0	7.8	12.4	142	* 6.9	118.00
	Median+:	12.0	200.0	7.8	305	9.4	7.8	13.7	133	5.0	110.50
670008	Muskegon River (Upper)										
	3/30/2004	11.0	150.0	9.3	223	10.8	7.7	7.8	95	7.5	76.00
	5/13/2004	16.0	180.0	12.0	279	8.0	7.7	17.7	123	7.5	105.00
	8/11/2004	ND	260.0	3.9	403	9.0	8.1	16.0	185	3.2	152.00
	9/15/2004	4.0	260.0	3.7	391	11.9	8.2	19.8	184	2.0	159.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 8.3	212.5	7.2	324	9.9	7.9	15.3	147	5.1	123.00
	Median+:	7.5	220.0	6.6	335	9.9	7.9	16.9	154	5.4	128.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
500467	North Branch Clinton River										
	4/6/2004	4.0	410.0	4.4	630	12.9	8.2	5.4	335	1.8	287.00
	7/14/2004	ND	440.0	8.5	673	7.4	7.9	16.9	335	3.1	308.00
	9/7/2004	ND	450.0	5.4	696	8.2	7.7	16.6	360	1.8	98.00
	10/20/2004	ND	440.0	3.4					362	ND	D 300.00
	No. of Samples:	4	4	4	3	3	3	3	4	4	4
	Mean+:	* 2.5	435.0	5.4	666	9.5	7.9	13.0	348	* 1.8	248.25
	Median+:	# 2.0	440.0	4.9	673	8.2	7.9	16.6	348	1.8	293.50
660038	Ontonagon River										
	5/6/2004	37.0	80.0	9.1	109	10.6	7.4	10.0	53	43.0	41.00
	6/30/2004	13.0	100.0	8.1	144	7.9	7.7	21.2	64	16.0	65.00
	9/1/2004	24.0	110.0	6.9	164	8.2	7.8	16.4	84	39.0	71.00
	11/3/2004	18.0	99.0	9.0	146	11.2	7.6	6.6	72	44.0	53.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	23.0	97.3	8.3	141	9.5	7.6	13.6	68	35.5	57.50
	Median+:	21.0	99.5	8.6	145	9.4	7.7	13.2	68	41.0	59.00
530027	Pere Marquette River										
	3/29/2004	14.0	160.0	9.3	242	9.1	7.6	10.9	116	16.0	91.00
	5/12/2004	14.0	150.0	15.0	231	6.2	7.4	18.0	109	6.4	104.00
	8/11/2004	11.0	240.0	3.1	368	5.2	8.1	15.2	175	8.0	137.00
	9/15/2004	14.0	250.0	P 3.0	368	9.3	8.0	17.9	178	7.5	144.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	13.3	200.0	7.6	302	7.5	7.8	15.5	145	9.5	119.00
	Median+:	14.0	200.0	6.2	305	7.7	7.8	16.6	146	7.8	120.50

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490006	Pine River										
	4/5/2004	100.0	70.0	I 15.0	90	12.9	7.3	1.0	52	100.0	41.00
	4/20/2004	77.0	80.0	14.0	99	11.0	7.9	6.5		H 81.0	48.00
	5/13/2004	96.0	110.0	16.0	166	9.4	7.8	15.0	89	110.0	66.00
	5/24/2004	150.0	90.0	I 26.0	131	9.9	7.7	8.8	77	200.0	56.00
	6/1/2004	140.0	90.0	20.0	134	9.6	7.4	10.8	67	140.0	50.00
	7/6/2004	76.0	110.0	21.0	161	8.5	7.8	15.3	85	83.0	73.00
	8/4/2004	20.0	150.0	9.6	228	8.1	7.8	21.0	118	26.0	107.00
	8/10/2004	15.0	140.0	7.4	223	7.9	8.1	18.8	113	25.0	94.00
	9/7/2004	14.0	150.0	8.3	231	7.8	7.9	18.5	111	H 21.0	101.00
	9/27/2004	14.0	150.0	8.3	223	8.4	7.8	15.2	115	H 23.0	92.00
	10/18/2004	36.0	130.0	11.0	189	12.1	7.9	5.5	97	42.0	74.00
	10/25/2004	73.0	100.0	19.0	155	10.1	7.5	9.1	76	86.0	66.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	67.6	114.2	14.6	169	9.6	7.7	12.1	91	78.1	72.33
	Median+:	74.5	110.0	14.5	164	9.5	7.8	12.9	89	82.0	69.50
580046	River Raisin										
	4/7/2004	10.0	460.0	6.5	702	10.5	8.1	8.2	334	9.3	237.00
	7/13/2004	12.0	460.0	6.7	712	6.7	8.2	26.2	316	13.0	226.00
	9/7/2004	9.0	330.0	5.1	666	9.0	7.9	25.0	212	10.0	133.00
	10/20/2004	10.0	340.0	4.4	517	9.5	7.6	10.4	210	12.0	154.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	10.3	397.5	5.7	649	8.9	8.0	17.5	268	11.1	187.50
	Median+:	10.0	400.0	5.8	684	9.3	8.0	17.7	264	11.0	190.00

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820070 River Rouge										
4/7/2004	18.0	780.0	4.8	1190	7.9	7.8	10.8	287	14.0	183.00
7/13/2004	22.0	360.0	5.2	549	3.3	7.4	25.7	135	29.0	91.00
9/8/2004	25.0	420.0	5.2	636	3.2	7.4	25.4	161	23.0	109.00
10/20/2004	25.0	320.0	3.7	982	7.8	7.7	14.1	148	21.0	109.00
No. of Samples:	4	4	4	4	4	4	4	4	4	4
Mean+:	22.5	470.0	4.7	839	5.6	7.6	19.0	183	21.8	123.00
Median+:	23.5	390.0	5.0	809	5.6	7.6	19.8	155	22.0	109.00
090177 Saginaw River										
3/10/2004	86.0	290.0	I 10.0	431	10.5	7.5	2.5	172	75.0	96.00
4/6/2004	17.0	430.0	9.0	649	12.2	8.1	7.4	272	13.0	172.00
4/28/2004	27.0	430.0	8.2	643	9.5	8.0	11.6	240	22.0	159.00
5/4/2004	28.0	420.0	10.0	623	9.0	7.7	10.7	236	21.0	164.00
5/10/2004	160.0	320.0	I 15.0	490	9.0	7.6	14.1	186	110.0	120.00
5/24/2004	170.0	320.0	I 15.0	486	6.8	7.6	15.6	191	130.0	133.00
6/23/2004	21.0	420.0	11.0					257	20.0	201.00
7/28/2004	11.0	450.0	8.9	686	6.7	8.0	24.0	245	13.0	194.00
8/24/2004	18.0	480.0	8.7	746	6.8	8.1	21.6	249	14.0	191.00
10/12/2004	14.0	550.0	7.4	831	9.4	8.0	15.2	240	15.0	D 147.00
11/4/2004	15.0	420.0	7.0	626	6.9	7.6	11.1	223	15.0	167.00
11/22/2004	10.0	450.0	7.3	656	10.3	7.9	6.4	269	11.0	207.00
No. of Samples:	12	12	12	11	11	11	11	12	12	12
Mean+:	48.1	415.0	9.8	624	8.8	7.8	12.7	232	38.3	162.58
Median+:	19.5	425.0	9.0	643	9.0	7.9	11.6	240	17.5	165.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
730023	Shiawassee River										
	4/1/2004	19.0	460.0	8.3	698	11.1	8.2	8.6	306	9.1	217.00
	6/9/2004	20.0	440.0	11.0	678	9.5	8.5	25.2	274	12.0	230.00
	8/12/2004	16.0	440.0	8.7	680	8.5	8.3	19.6	275	11.0	212.00
	11/4/2004	9.0	480.0	7.0	714	11.2	8.0	8.4	271	3.4	214.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	16.0	455.0	8.8	693	10.1	8.3	15.5	282	8.9	218.25
	Median+:	17.5	450.0	8.5	689	10.3	8.3	14.1	275	10.1	215.50
130331	South Branch Kalamazoo R										
	3/22/2004	12.0	380.0	6.1	565	12.0	8.0	2.2	289	7.3	212.00
	6/30/2004	15.0	410.0	3.2	626	8.8	7.7	19.0	302	8.8	246.00
	8/31/2004	19.0	400.0	4.7	596	8.4	7.6	16.5	296	11.0	235.00
	10/6/2004	ND	400.0	2.2	596	11.4	7.9	8.8	296	2.2	244.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 12.0	397.5	4.1	596	10.2	7.8	11.6	296	7.3	234.25
	Median+:	13.5	400.0	4.0	596	10.1	7.8	12.7	296	8.1	239.50
110628	St. Joseph River (Lower)										
	3/22/2004	5.0	380.0	5.3	564	12.1	8.3	5.0	266	4.3	214.00
	7/1/2004	17.0	380.0	7.1	589	8.1	7.7	21.6	272	11.0	223.00
	8/31/2004	ND	380.0	4.5	565	7.6	7.9	22.7	257	5.0	197.00
	10/5/2004	5.0	400.0	3.8	608	9.6	8.0	14.8	280	4.0	225.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 7.3	385.0	5.2	582	9.4	8.0	16.0	269	6.1	214.75
	Median+:	5.0	380.0	4.9	577	8.9	8.0	18.2	269	4.7	218.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
750273	St. Joseph River (Upper)										
	3/22/2004	ND	340.0	5.4	505	12.5	8.0	4.2	256	2.1	193.00
	6/30/2004	7.0	360.0	7.4	549	6.7	7.8	21.9	259	4.3	216.00
	8/31/2004	ND	340.0	5.1	513	7.6	7.8	22.7	240	2.5	192.00
	10/6/2004	ND	360.0	4.1	525	13.3	7.9	13.5	250	1.4	205.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 3.3	350.0	5.5	523	10.0	7.9	15.6	251	2.6	201.50
	Median+:	# 2.0	350.0	5.3	519	10.1	7.9	17.7	253	2.3	199.00
210032	Sturgeon River										
	5/4/2004	8.0	80.0	15.0	116	10.0	7.1	7.5	55	4.7	34.00
	6/28/2004	4.0	130.0	16.0	203	9.2	7.2	14.2	96	4.6	61.00
	8/25/2004	ND	170.0	10.0	262	8.6	7.7	17.6	128	4.1	74.00
	11/1/2004	4.0	74.0	26.0	109	10.1	7.2	8.5	59	6.0	44.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 4.5	113.5	16.8	173	9.5	7.3	12.0	85	4.9	53.25
	Median+:	4.0	105.0	15.5	160	9.6	7.2	11.4	78	4.7	52.50

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
170141	Tahquamenon River										
	4/6/2004	8.0	40.0	16.0	55	13.6	6.8	0.8	28	6.6	23.00
	5/5/2004	4.0	50.0	18.0	71	11.4	7.0	7.5	37	2.6	26.00
	5/17/2004	6.0	70.0	18.0	100	8.9	7.4	14.4	51	3.7	41.00
	5/27/2004	ND	60.0	22.0	80	9.8	6.8	11.4	44	5.6	31.00
	6/28/2004	6.0	90.0	20.0	136	9.0	7.6	19.3	65	3.3	51.00
	7/7/2004	4.0	90.0	16.0	138	7.6	7.1	17.0	69	3.5	56.00
	8/5/2004	ND	110.0	12.0	171	7.9	7.9	20.5	81	2.7	70.00
	8/11/2004	ND H	110.0	9.9	176	8.0	8.0	18.6	84	2.4	69.00
	8/30/2004	ND	120.0	7.1	184	8.5	7.9	17.9	91	2.0	71.00
	9/28/2004	ND	130.0	10.0	193	8.2	7.4	16.4	91	2.4	68.00
	10/19/2004	4.0	100.0	14.0	149	10.7	7.6	7.3	75	3.2	55.00
	10/26/2004	ND	73.0	21.0	108	11.0	7.2	7.3	56	5.3	39.00
	No. of Samples:	12	12	12	12	12	12	12	12	12	12
	Mean+:	* 3.8	86.9	15.3	130	9.5	7.4	13.2	64	3.6	50.00
	Median+:	4.0	90.0	16.0	137	9.0	7.4	15.4	67	3.3	53.00
480033	Tahquamenon River (Head)										
	5/4/2004	7.0	100.0	1.6	136	10.9	8.3	8.0	72	ND	59.00
	6/29/2004	ND	90.0	2.2	136	9.5	8.6	13.7	70	ND	56.00
	8/30/2004	4.0	96.0	1.4	144	10.6	8.0	10.7	74	ND	61.00
	11/8/2004	ND	96.0	1.3	140	12.9	7.8	3.5	73	ND	57.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 3.8	95.5	1.6	139	11.0	8.2	9.0	72	* 0.5	58.25
	Median+:	# 3.0	96.0	1.5	138	10.8	8.2	9.4	73	# 0.5	58.00

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STORET ID		Suspended Solids (mg/L)	Dissolved Solids (mg/L)	Organic Carbon (mg/L)	Conductance (umho/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Temperature (°C)	Hardness (mg/L)	Turbidity (NTU)	Alkalinity (mg CaCO3/L)
040123	Thunder Bay River										
	5/11/2004	ND	240.0	12.0	357	9.4	7.5	13.8	186	ND	164.00
	7/12/2004	ND	230.0	7.9	349	8.0	8.1	22.2	166	ND	152.00
	8/25/2004	ND	220.0	6.4	323	8.7	8.1	19.8	168	ND	140.00
	10/27/2004	ND	240.0	5.0	364	9.2	7.9	9.9	186	ND	190.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	* 2.0	232.5	7.8	348	8.8	7.9	16.4	177	* 0.5	161.50
	Median+:	# 2.0	235.0	7.2	353	9.0	8.0	16.8	177	# 0.5	158.00
730025	Tittabawassee River										
	4/1/2004	6.0	370.0	8.6	559	11.2	7.8	6.9	217	6.2	141.00
	6/9/2004	19.0	380.0	12.0	590	6.8	7.8	22.7	205	10.0	158.00
	8/12/2004	8.0	600.0	8.5	917	7.9	8.1	20.2	232	5.1	150.00
	11/3/2004	24.0	340.0	6.2	508	9.7	8.0	10.1	205	7.9	162.00
	No. of Samples:	4	4	4	4	4	4	4	4	4	4
	Mean+:	14.3	422.5	8.8	644	8.9	7.9	15.0	215	7.3	152.75
	Median+:	13.5	375.0	8.6	575	8.8	7.9	15.2	211	7.1	154.00

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STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)		Zinc (ug/L)
830159	Anderson Creek								
	3/30/2004	3.790	0.011	0.202	0.582	0.727	0.125	MBQC	1.390
	5/13/2004	4.610	0.020	0.229	0.501	0.783	0.339		1.930
	8/10/2004	0.910	0.006	0.058	0.239	0.728	0.087	MBQC	1.090
	9/15/2004	0.690	0.004	0.140	0.221	1.090	0.109	LCQC	0.400
	No. of Samples:	4	4	4	4	4	4		4
	Mean+:	2.500	0.010	0.157	0.386	0.832	0.165		1.203
	Median+:	2.350	0.009	0.171	0.370	0.756	0.117		1.240
350061	Au Sable River								
	3/31/2004	0.880	0.002	0.105	0.348	0.709	0.048	MBQC	0.240
	4/27/2004	1.010	0.003	0.095	0.490	1.260	0.079		0.640
	5/12/2004	1.050	0.003	0.000	0.461	1.260	0.037		0.300
	5/19/2004	1.080	0.002	0.040	0.226	0.464	0.045	CCV	0.210
	6/8/2004	0.820	0.003	0.034	0.247	0.419	0.045		0.260
	7/13/2004	0.830	0.003	0.093	0.367	0.521	0.104		0.420
	7/29/2004	0.450	0.005	0.000	0.225	0.434	0.039	MSD	0.120
	8/25/2004	0.360	0.002	0.076	0.219	0.779	0.053	LCQC	0.520
	9/14/2004	0.250	0.002	0.117	0.198	0.711	0.072	LCQC	0.100
	10/13/2004	0.160	0.003	0.000	0.240	0.563	0.049		0.250
	10/27/2004	0.190	0.002	0.021	0.225	0.479	0.034		0.160
	11/23/2004	0.230	0.002	0.000	0.315	0.636	0.032	MBQC	2.990
	No. of Samples:	12	12	12	12	12	12		12
	Mean+:	0.609	0.003	0.048	0.297	0.686	0.053		0.518
	Median+:	0.635	0.003	0.037	0.244	0.600	0.046		0.255

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CCV = Continuing calibration standard exceeded quality control criteria.

ELOD = Matrix problem; elevated detection level reported.

HT = Recommended laboratory holding time was exceeded before analysis.

ICB = Initial calibration blank exceeded level of detection.

ISQC = Internal standard exceeded quality control criteria.

LCQC = Laboratory control exceeded quality control criteria.

MBQC = Method blank exceeded level of detection.

MS = Matrix spike exceeded quality control criteria.

MSD = Matrix spike duplicate exceeded quality control criteria.



STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
170154	Bear Creek							
	5/11/2004	5.740	0.013	0.502	0.855	1.150	0.210	2.000
	7/14/2004	MSD 6.170	0.023	0.751	0.936	1.150	0.450	3.100
	8/24/2004	1.150	0.005	0.325	0.364	1.000	0.119	LCQC 0.720
	11/9/2004	2.610	0.007	0.420	MBQC 0.573	1.000	0.135	1.220
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	3.918	0.012	0.500	0.682	1.075	0.229	1.760
	Median+:	4.175	0.010	0.461	0.714	1.075	0.173	1.610
340186	Bellamy Creek							
	3/23/2004	1.730	0.021	0.372	2.530	2.860	0.112	MBQC 3.550
	7/1/2004	0.730	0.011	0.158	1.490	1.870	0.128	1.140
	9/1/2004	0.720	0.007	0.166	1.120	2.240	0.102	LCQC 1.160
	11/18/2004	0.380	0.005	0.000	1.070	1.530	0.036	0.950
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	0.890	0.011	0.174	1.553	2.125	0.094	1.700
	Median+:	0.725	0.009	0.162	1.305	2.055	0.107	1.150
740385	Black River							
	4/6/2004	2.280	0.035	1.080	2.650	3.280	0.593	MS 4.580
	7/13/2004	2.950	0.025	0.756	2.600	2.130	0.860	4.520
	9/8/2004	1.070	0.016	0.643	1.600	1.740	0.594	LCQC 3.070
	10/21/2004	0.850	0.014	0.277	1.180	1.330	0.386	2.200
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.788	0.023	0.689	2.008	2.120	0.608	3.593
	Median+:	1.675	0.021	0.700	2.100	1.935	0.594	3.795

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CCV = Continuing calibration standard exceeded quality control criteria.  
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LCQC = Laboratory control exceeded quality control criteria.  
MBQC = Method blank exceeded level of detection.  
MS = Matrix spike exceeded quality control criteria.  
MSD = Matrix spike duplicate exceeded quality control criteria.

STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
280014	Boardman River							
	3/29/2004	3.790	0.015	0.413	0.729	0.897	0.398	MBQC 1.580
	5/12/2004	1.410	0.006	0.151	0.259	0.486	0.108	0.520
	8/10/2004	0.900	0.005	0.119	0.227	0.536	0.088	MBQC 1.250
	9/15/2004	0.530	0.003	0.163	0.185	0.834	0.097	LCQC 0.230
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.658	0.007	0.212	0.350	0.688	0.173	0.895
Median+:	1.155	0.006	0.157	0.243	0.685	0.102	0.885	
730024	Cass River							
	4/1/2004	2.680	0.023	0.674	2.120	2.620	0.567	MBQC 3.960
	6/9/2004	1.610	0.019	0.430	1.590	2.040	0.435	2.510
	8/12/2004	2.540	0.031	1.120	2.230	2.880	0.921	MBQC 4.810
	11/3/2004	2.060	0.021	0.637	MBQC 2.380	2.840	0.534	CCB 3.500
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.223	0.024	0.715	2.080	2.595	0.614	3.695
Median+:	2.300	0.022	0.656	2.175	2.730	0.551	3.730	
160073	Cheboygan River							
	5/11/2004	0.510	0.003	0.085	0.657	1.460	0.018	0.430
	7/12/2004	0.520	0.003	0.079	0.665	0.473	0.045	1.950
	8/26/2004	0.470	0.002	0.081	0.525	0.735	0.061	LCQC 0.240
	10/28/2004	0.290	0.002	0.000	0.501	0.487	0.034	CCV 0.510
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	0.448	0.003	0.061	0.587	0.789	0.039	0.783
Median+:	0.490	0.003	0.080	0.591	0.611	0.039	0.470	

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MBQC = Method blank exceeded level of detection.

MS = Matrix spike exceeded quality control criteria.

MSD = Matrix spike duplicate exceeded quality control criteria.

STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
500233	Clinton River							
	3/3/2004	5.690	0.061	2.180	3.480	3.780	2.020	MBQC 11.800
	3/25/2004	11.030	0.143	5.740	7.200	5.040	6.860	54.800
	5/3/2004	3.230	0.048	1.760	3.400	4.670	1.510	9.720
	5/10/2004	23.640	0.358	7.250	9.910	7.080	10.800	64.900
	5/24/2004	40.690	0.398	14.600	13.900	12.700	18.200	71.300
	6/24/2004	2.870	0.060	1.170	3.730	3.720	2.270	9.490
	7/28/2004	4.710	0.065	1.770	4.800	4.260	2.240	MSD 16.200
	8/24/2004	2.110	0.050	0.907	3.830	6.910	1.240	LCQC 8.710
	9/7/2004	8.040	0.152	3.390	7.050	6.480	4.840	LCQC 29.700
	10/12/2004	2.090	0.059	0.812	4.030	6.610	1.150	12.900
	11/3/2004	4.930	0.056	1.620	5.590	4.000	2.200	MSD 13.900
	11/22/2004	1.710	0.030	0.536	2.320	4.430	0.909	8.460
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	9.228	0.123	3.478	5.770	5.807	4.520	25.990
	Median+:	4.820	0.061	1.765	4.415	4.855	2.220	13.400
210102	Escanaba River							
	5/20/2004	2.900	0.022	0.336	0.703	0.516	0.114	CCV 2.610
	7/20/2004	2.560	0.060	0.447	0.868	0.578	0.129	MSD 3.820
	8/26/2004	2.430	0.050	0.734	1.140	0.912	0.163	LCQC 4.960
	11/1/2004	4.030	0.015	0.356	1.040	0.505	0.165	CCV 2.030
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.980	0.037	0.468	0.938	0.628	0.143	3.355
	Median+:	2.730	0.036	0.402	0.954	0.547	0.146	3.215

+ = Calculated value; not rounded to the appropriate number of significant figures.

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STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
730285	Flint River							
	4/1/2004	3.180	0.026	0.839	2.350	3.120	1.360	MBQC 7.980
	6/9/2004	5.030	0.043	1.410	3.070	3.550	2.560	9.840
	8/12/2004	3.690	0.032	0.964	2.570	3.410	1.740	MBQC 8.430
	11/4/2004	6.790	0.044	2.110	4.510	4.600	3.120	MSD 13.500
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	4.673	0.036	1.331	3.125	3.670	2.195	9.938
	Median+:	4.360	0.038	1.187	2.820	3.480	2.150	9.135
770082	Fox River							
	5/4/2004	2.130	0.007	0.205	0.324	0.433	0.156	0.710
	6/29/2004	LCQC 0.940	0.005	0.301	0.181	0.199	0.101	0.520
	8/31/2004	1.060	0.004	0.247	0.145	0.292	0.074	LCQC 0.640
	11/8/2004	1.000	0.004	0.230	MBQC 0.205	0.333	0.096	0.420
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.283	0.005	0.246	0.214	0.314	0.107	0.573
	Median+:	1.030	0.005	0.239	0.193	0.313	0.098	0.580

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STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
700123	Grand River (Lower)							
	3/8/2004	8.050	0.048	2.070	3.400	3.110	2.550	MBQC 8.970
	3/15/2004	4.120	0.027	0.998	2.580	2.680	1.000	MBQC 5.280
	4/19/2004	2.390	0.029	0.929	2.850	4.560	1.250	5.960
	5/12/2004	15.220	0.094	4.160	4.650	4.770	5.380	19.600
	5/20/2004	5.600	0.030	1.070	2.730	2.630	1.250	CCV 5.850
	5/25/2004	8.530	0.036	1.500	2.750	2.560	1.990	6.500
	6/15/2004	4.880	0.046	1.180	3.050	2.900	1.800	6.460
	7/7/2004	LCQC 4.110	0.036	0.797	2.570	2.570	1.380	5.300
	8/18/2004	1.340	0.016	0.322	1.560	2.410	0.409	MBQC 2.880
	10/5/2004	0.810	0.015	0.246	1.540	2.550	0.325	2.900
	10/27/2004	2.600	0.023	0.613	2.540	2.410	0.888	CCV 4.880
	11/17/2004	1.160	0.014	0.268	1.780	2.350	0.345	3.350
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	4.901	0.035	1.179	2.667	2.958	1.547	6.494
	Median+:	4.115	0.030	0.964	2.655	2.600	1.250	5.575
340025	Grand River (Upper)							
	3/23/2004	2.340	0.025	0.446	2.300	2.770	0.559	MBQC 3.530
	7/1/2004	3.540	0.032	0.582	2.450	2.990	1.040	3.720
	9/1/2004	2.760	0.033	0.721	2.860	3.350	1.030	LCQC 5.070
	11/18/2004	1.260	0.024	0.143	2.580	2.500	0.272	2.550
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.475	0.029	0.473	2.548	2.903	0.725	3.718
	Median+:	2.550	0.029	0.514	2.515	2.880	0.795	3.625

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STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
580364	Huron River							
	4/7/2004	1.430	0.035	0.470	1.630	3.100	1.460	MS 4.970
	7/13/2004	3.250	0.052	0.556	2.440	3.010	2.840	8.110
	9/7/2004	1.400	0.027	0.424	1.690	3.730	1.280	LCQC 4.130
	10/20/2004	0.780	0.021	0.148	1.340	3.670	0.763	3.570
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.715	0.034	0.400	1.775	3.378	1.586	5.195
	Median+:	1.415	0.031	0.447	1.660	3.385	1.370	4.550
030077	Kalamazoo River (Lower)							
	3/8/2004	5.540	0.029	1.090	2.120	2.090	1.540	MBQC 5.810
	3/15/2004	MBQC 3.810	0.017	0.418	1.470	1.740	0.833	MBQC 2.960
	4/19/2004	6.610	0.026	0.765	1.810	3.500	2.060	4.720
	5/13/2004	4.380	0.019	0.489	1.240	1.610	1.020	2.470
	5/25/2004	7.330	0.024	0.704	1.720	4.320	1.160	3.320
	6/15/2004	5.650	0.020	0.462	1.610	1.980	1.450	2.740
	7/7/2004	LCQC 6.810	0.029	0.652	1.760	1.890	1.830	3.690
	8/18/2004	5.400	0.018	0.460	1.200	1.770	1.210	MBQC 2.570
	9/1/2004	6.700	0.021	0.576	1.590	2.470	1.430	LCQC 3.000
	9/22/2004	5.510	0.016	0.319	1.200	1.920	0.921	1.990
	10/28/2004	3.120	0.014	0.291	1.620	1.780	0.828	CCV 2.430
	11/17/2004	2.260	0.013	0.172	1.190	1.760	0.618	2.660
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	5.260	0.021	0.533	1.544	2.236	1.242	3.197
	Median+:	5.525	0.020	0.476	1.600	1.905	1.185	2.850

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390057	Kalamazoo River (Upper)							
	3/8/2004	4.230	0.029	0.824	1.520	1.730	0.905	MBQC 3.400
	3/15/2004	MBQC 2.280	0.021	0.415	1.190	1.720	0.463	MBQC 3.030
	4/19/2004	5.710	0.073	2.140	2.340	3.880	2.710	9.810
	5/13/2004	9.670	0.067	1.800	2.210	3.270	2.520	8.480
	5/25/2004	5.840	0.019	0.514	1.450	1.670	0.955	3.100
	6/15/2004	7.990	0.069	1.460	1.940	1.990	2.340	9.210
	7/7/2004	LCQC 12.400	0.078	1.850	2.520	1.750	4.330	11.900
	8/18/2004	13.210	0.091	2.830	3.490	1.950	6.290	MBQC 17.000
	8/31/2004	6.140	0.045	1.230	1.780	2.430	1.860	LCQC 5.880
	9/22/2004	2.340	0.017	0.271	0.944	1.570	0.475	2.800
	11/1/2004	1.010	0.010	0.105	1.030	1.350	0.269	CCV 2.570
	11/17/2004	1.750	0.013	0.231	0.977	1.570	0.402	3.310
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	6.048	0.044	1.139	1.783	2.073	1.960	6.708
	Median+:	5.775	0.037	1.027	1.650	1.740	1.408	4.640

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510088	Manistee River							
	3/9/2004	MBQC 1.610	0.006	0.321	0.567	0.847	0.220	MBQC 0.930
	3/16/2004	MBQC 1.370	0.006	0.388	0.614	0.921	0.230	MBQC 0.910
	3/29/2004	2.190	0.007	0.418	0.646	0.905	0.231	MBQC 0.950
	4/20/2004	1.560	0.007	0.322	0.775	1.530	0.256	1.030
	5/12/2004	1.800	0.005	0.282	0.444	0.648	0.194	1.130
	5/26/2004	2.700	0.008	0.329	0.504	0.733	0.293	1.200
	6/16/2004	1.240	0.007	0.311	0.587	0.745	0.298	1.740
	7/8/2004	1.380	0.005	0.224	0.409	0.624	0.210	0.620
	8/19/2004	0.700	0.004	0.240	0.328	0.646	0.162	MBQC 0.980
	9/23/2004	0.550	0.004	0.059	0.350	0.659	0.124	0.440
	10/28/2004	0.780	0.003	0.113	0.385	0.603	0.140	CCV 0.550
	11/18/2004	0.660	0.004	0.190	0.471	0.707	0.150	0.700
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	1.378	0.006	0.266	0.507	0.797	0.209	0.932
	Median+:	1.375	0.006	0.297	0.488	0.720	0.215	0.940

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770073	Manistique River							
	4/6/2004	4.810	0.016	0.614	0.490	0.484	0.386	MSD 2.300
	5/4/2004	3.470	0.007	0.389	0.544	0.667	0.163	0.950
	5/17/2004	3.510	0.007	0.380	0.304	0.366	0.186	CCV 0.870
	5/26/2004	4.620	0.010	0.497	0.389	0.404	0.263	1.150
	6/28/2004	LCQC 2.640	0.008	0.393	0.336	0.390	0.184	0.860
	7/7/2004	LCQC 2.440	0.008	0.443	0.361	0.448	0.196	1.010
	8/5/2004	1.100	0.005	0.322	0.344	0.428	0.109	MBQC 0.700
	8/25/2004	1.510	0.005	0.328	0.309	0.561	0.114	LCQC 0.510
	9/13/2004	1.710	0.004	0.342	0.311	0.600	0.155	LCQC 0.470
	9/28/2004	1.100	0.005	0.219	0.275	0.438	0.090	0.790
	10/19/2004	1.770	0.007	0.271	0.297	0.419	0.187	0.770
	10/26/2004	5.110	0.014	0.567	0.568	0.506	0.391	1.720
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	2.816	0.008	0.397	0.377	0.476	0.202	1.008
	Median+:	2.540	0.007	0.385	0.340	0.443	0.185	0.865
550038	Menominee River							
	5/20/2004	3.330	0.007	0.289	0.757	0.544	0.125	CCV 1.390
	7/20/2004	2.440	0.008	0.253	0.815	0.606	0.139	MSD 1.060
	8/26/2004	1.990	0.012	0.257	0.771	0.793	0.104	LCQC 1.330
	11/1/2004	2.480	0.007	0.230	0.723	0.523	0.115	CCV 1.080
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.560	0.009	0.257	0.767	0.617	0.121	1.215
	Median+:	2.460	0.008	0.255	0.764	0.575	0.120	1.205

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610273	Muskegon River (Lower)							
	3/8/2004	MBQC 2.630	0.011	0.618	1.130	1.290	0.563	MBQC 2.210
	3/15/2004	MBQC 2.080	0.007	0.386	0.964	0.967	0.327	MBQC 1.520
	3/29/2004	2.370	0.008	0.336	0.939	0.952	0.326	MBQC 1.290
	4/19/2004	2.060	0.006	0.281	0.990	1.420	0.214	1.020
	5/12/2004	3.560	0.009	0.601	1.250	0.906	0.475	2.060
	5/20/2004	1.710	0.007	0.258	0.793	0.718	0.248	CCV 0.980
	5/25/2004	3.120	0.010	0.481	0.963	0.930	0.477	1.650
	6/16/2004	2.930	0.007	0.256	0.871	0.774	0.261	2.330
	7/7/2004	LCQC 1.810	0.005	0.183	0.766	0.710	0.216	0.800
	8/19/2004	0.890	0.004	0.114	0.557	0.663	0.112	MBQC 0.460
	10/5/2004	0.310	0.003	0.050	0.541	0.794	0.065	0.390
	10/27/2004	0.560	0.003	0.039	0.679	0.661	0.115	CCV 0.620
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	2.003	0.007	0.300	0.870	0.899	0.283	1.278
	Median+:	2.070	0.007	0.270	0.905	0.850	0.255	1.155
670008	Muskegon River (Upper)							
	3/30/2004	3.020	0.010	0.384	0.843	0.796	0.272	MBQC 1.520
	5/13/2004	3.450	0.012	0.560	1.390	0.832	0.352	2.060
	8/11/2004	0.810	0.004	0.143	0.416	0.659	0.122	MBQC 0.680
	9/15/2004	0.660	0.005	0.169	0.407	0.970	0.194	LCQC 0.700
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.985	0.008	0.314	0.764	0.814	0.235	1.240
	Median+:	1.915	0.008	0.277	0.630	0.814	0.233	1.110

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500467	North Branch Clinton River							
	4/6/2004	0.950	0.007	0.083	3.220	1.620	0.090	MS 1.650
	7/14/2004	2.050	0.012	0.097	3.610	1.240	0.244	2.090
	9/7/2004	2.580	0.010	0.101	1.440	1.890	0.134	LCQC 1.210
	10/20/2004	0.440	0.007	0.000	1.120	1.160	0.050	0.890
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.505	0.009	0.070	2.348	1.478	0.130	1.460
Median+:	1.500	0.009	0.090	2.330	1.430	0.112	1.430	
660038	Ontonagon River							
	5/6/2004	4.320	0.012	1.420	4.040	1.920	0.365	3.060
	6/30/2004	LCQC 1.680	0.007	0.694	2.360	0.768	0.139	1.290
	9/1/2004	2.160	0.010	1.500	3.080	1.640	0.321	LCQC 2.140
	11/3/2004	3.750	0.011	1.660	3.130	1.800	0.461	CCB 3.020
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.978	0.010	1.319	3.153	1.532	0.322	2.378
Median+:	2.955	0.011	1.460	3.105	1.720	0.343	2.580	
530027	Pere Marquette River							
	3/29/2004	3.710	0.013	0.817	1.240	1.120	0.490	MBQC 2.420
	5/12/2004	3.250	0.011	0.541	0.707	0.732	0.335	1.410
	8/11/2004	2.020	0.010	0.368	0.430	0.668	0.374	MBQC 1.240
	9/15/2004	1.780	0.010	0.407	0.435	0.976	0.430	LCQC 1.190
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.690	0.011	0.533	0.703	0.874	0.407	1.565
Median+:	2.635	0.011	0.474	0.571	0.854	0.402	1.325	

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490006	Pine River							
	4/5/2004	8.990	0.031	3.550	2.730	3.070	1.590	MSD 6.770
	4/20/2004	8.420	0.025	2.930	2.500	2.820	1.270	5.790
	5/13/2004	9.240	0.028	3.030	2.730	3.110	1.350	6.340
	5/24/2004	17.760	0.066	7.390	4.930	5.920	3.370	14.300
	6/1/2004	13.570	0.050	4.310	3.180	3.600	2.230	8.940
	7/6/2004	LCQC 6.000	0.030	2.370	2.300	2.460	1.210	5.620
	8/4/2004	2.290	0.010	0.804	0.911	1.030	0.383	MBQC 2.350
	8/10/2004	2.340	0.010	0.834	0.868	1.010	0.387	MBQC 2.130
	9/7/2004	2.230	0.010	1.080	0.973	1.370	0.402	LCQC 2.000
	9/27/2004	0.200	0.008	0.724	0.804	0.950	0.323	1.640
	10/18/2004	3.060	0.015	1.290	1.240	1.360	0.597	3.050
	10/25/2004	7.450	0.026	2.810	2.360	2.500	1.430	5.610
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	6.796	0.026	2.594	2.127	2.433	1.212	5.378
	Median+:	6.725	0.026	2.590	2.330	2.480	1.240	5.615
580046	River Raisin							
	4/7/2004	2.510	0.030	0.421	2.100	2.730	0.542	MSD 2.830
	7/13/2004	2.070	0.033	0.553	2.650	2.910	0.824	4.050
	9/7/2004	1.400	0.029	0.512	3.120	2.660	0.538	LCQC 3.060
	10/20/2004	2.820	0.047	0.615	2.900	2.790	0.701	4.030
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.200	0.035	0.525	2.693	2.773	0.651	3.493
	Median+:	2.290	0.032	0.533	2.775	2.760	0.622	3.545

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MS = Matrix spike exceeded quality control criteria.  
MSD = Matrix spike duplicate exceeded quality control criteria.

STORET ID		Mercury (ng/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Nickel (ug/L)	Lead (ug/L)	Zinc (ug/L)
820070	River Rouge							
	4/7/2004	3.300	0.070	1.390	3.200	3.450	2.220	16.600
	7/13/2004	7.390	0.148	2.140	4.970	3.450	4.790	28.100
	9/8/2004	8.300	0.085	2.190	4.510	3.750	3.250	LCQC 15.900
	10/20/2004	7.190	0.084	1.810	3.700	2.670	3.270	14.200
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	6.545	0.097	1.883	4.095	3.330	3.383	18.700
	Median+:	7.290	0.085	1.975	4.105	3.450	3.260	16.250
090177	Saginaw River							
	3/10/2004	11.030	0.066	2.730	3.800	3.490	3.340	MBQC 13.100
	4/6/2004	2.160	0.017	0.595	1.880	2.400	0.667	MSD 3.680
	4/28/2004	3.540	0.025	1.140	2.460	4.050	1.280	5.920
	5/4/2004	3.810	0.024	1.080	2.500	3.840	1.070	5.340
	5/10/2004	21.950	0.075	3.340	4.380	5.020	4.120	21.100
	5/24/2004	19.840	0.117	4.640	5.620	5.230	6.900	27.200
	6/23/2004	2.630	0.023	0.804	2.530	2.760	1.170	5.020
	7/28/2004	1.490	0.014	0.431	2.180	2.150	0.729	MSD 2.890
	8/24/2004	1.590	0.021	0.821	2.740	3.060	1.030	LCQC 3.470
	10/12/2004	1.290	0.025	0.609	2.520	2.990	1.030	4.380
	11/4/2004	2.000	0.020	0.716	MBQC 3.100	3.070	0.872	CCB 4.830
	11/22/2004	1.250	0.015	0.450	1.780	2.460	0.659	MBQC 4.120
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	6.048	0.037	1.446	2.958	3.377	1.906	8.421
	Median+:	2.395	0.024	0.813	2.525	3.065	1.050	4.925

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730023	Shiawassee River							
	4/1/2004	1.870	0.019	0.736	1.800	2.320	0.687	MBQC 2.930
	6/9/2004	2.360	0.023	0.761	1.850	1.930	0.684	2.680
	8/12/2004	2.370	0.024	0.709	2.310	2.000	0.778	MBQC 2.580
	11/4/2004	1.610	0.018	0.324	MBQC 2.480	2.460	0.359	2.020
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.053	0.021	0.633	2.110	2.178	0.627	2.553
	Median+:	2.115	0.021	0.723	2.080	2.160	0.686	2.630
130331	South Branch Kalamazoo River							
	3/22/2004	2.180	0.015	0.213	0.795	1.740	0.300	MBQC 1.470
	6/30/2004	1.680	0.016	0.235	0.479	1.210	0.446	1.500
	8/31/2004	0.960	0.018	0.315	0.453	2.010	0.514	LCQC 1.750
	10/6/2004	0.370	0.004	0.015	0.214	1.260	0.085	0.470
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.298	0.013	0.195	0.485	1.555	0.336	1.298
	Median+:	1.320	0.016	0.224	0.466	1.500	0.373	1.485
110628	St. Joseph River (Lower)							
	3/22/2004	2.260	0.023	0.232	1.200	1.910	0.457	MBQC 2.320
	7/1/2004	5.320	0.049	0.495	1.980	1.910	1.170	3.950
	8/31/2004	2.500	0.028	0.367	1.520	2.100	0.646	LCQC 2.740
	10/5/2004	1.760	0.029	0.227	1.280	1.900	0.558	2.470
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.960	0.032	0.330	1.495	1.955	0.708	2.870
	Median+:	2.380	0.029	0.300	1.400	1.910	0.602	2.605

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750273	St. Joseph River (Upper)							
	3/22/2004	0.990	0.007	0.086	0.715	1.350	0.139	MBQC 0.750
	6/30/2004	1.410	0.011	0.065	0.610	1.140	0.390	0.950
	8/31/2004	1.100	0.008	0.124	0.590	1.620	0.252	LCQC 0.750
	10/6/2004	0.650	0.008	0.057	0.472	1.230	0.190	0.710
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	1.038	0.009	0.083	0.597	1.335	0.243	0.790
	Median+:	1.045	0.008	0.076	0.600	1.290	0.221	0.750
210032	Sturgeon River							
	5/4/2004	5.160	0.012	0.468	0.608	0.758	0.218	1.740
	6/28/2004	LCQC 2.880	0.009	0.494	0.334	0.515	0.187	1.380
	8/25/2004	2.030	0.006	0.344	0.239	0.743	0.106	LCQC 0.860
	11/1/2004	7.450	0.012	0.412	0.512	0.406	0.346	CCV 1.840
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	4.380	0.010	0.430	0.423	0.606	0.214	1.455
	Median+:	4.020	0.011	0.440	0.423	0.629	0.203	1.560

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170141	Tahquamenon River							
	4/6/2004	7.030	0.025	0.548	0.562	0.463	0.370	MSD 3.520
	5/5/2004	6.340	0.017	0.272	0.486	0.555	0.197	2.400
	5/17/2004	7.070	0.016	0.405	0.375	0.392	0.235	CCV 2.130
	5/27/2004	8.790	0.022	0.571	0.462	0.531	0.387	2.940
	6/28/2004 LCQC	4.710	0.010	0.429	0.382	0.460	0.264	1.250
	7/7/2004 LCQC	2.980	0.008	0.377	0.301	0.410	0.228	1.030
	8/5/2004	2.200	0.006	0.298	0.301	0.406	0.164	MBQC 0.680
	8/11/2004	1.600	0.005	0.241	0.251	0.344	0.115	MBQC 0.870
	8/30/2004	1.180	0.004	0.238	0.250	0.511	0.066	LCQC 0.510
	9/28/2004	1.430	0.005	0.133	0.257	0.423	0.070	0.430
	10/19/2004	2.790	0.008	0.196	0.309	0.409	0.159	1.150
	10/26/2004	6.280	0.018	0.426	0.490	0.439	0.330	3.090
	No. of Samples:	12	12	12	12	12	12	12
	Mean+:	4.367	0.012	0.345	0.369	0.445	0.215	1.667
	Median+:	3.845	0.009	0.338	0.342	0.431	0.213	1.200
480033	Tahquamenon River (Headwaters)							
	5/4/2004	0.670	0.003	0.225	0.356	0.634	0.058	0.340
	6/29/2004 LCQC	0.670	0.003	0.309	0.236	0.190	0.072	0.800
	8/30/2004	0.610	0.002	0.299	0.144	0.369	0.037	LCQC 0.150
	11/8/2004	0.290	0.001	0.253	MBQC 0.171	0.472	0.030	0.100
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	0.560	0.002	0.272	0.227	0.416	0.049	0.348
	Median+:	0.640	0.003	0.276	0.204	0.421	0.048	0.245

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040123	Thunder Bay River							
	5/11/2004	1.820	0.005	0.148	0.667	1.880	0.071	0.900
	7/12/2004	0.390	0.004	0.054	0.279	0.537	0.101	0.320
	8/25/2004	0.530	0.003	0.067	0.243	0.735	0.105	LCQC 1.580
	10/27/2004	0.440	0.002	0.011	0.273	0.546	0.068	CCV 0.340
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	0.795	0.004	0.070	0.366	0.925	0.086	0.785
	Median+:	0.485	0.004	0.061	0.276	0.641	0.086	0.620
730025	Tittabawassee River							
	4/1/2004	2.230	0.013	0.434	1.550	1.650	0.349	MBQC 2.560
	6/9/2004	3.240	0.017	0.514	1.930	1.460	0.602	2.950
	8/12/2004	1.460	0.012	0.353	2.250	1.540	0.372	MBQC 1.960
	11/3/2004	2.460	0.013	0.533	MBQC 2.460	1.930	0.672	CCB 2.670
	No. of Samples:	4	4	4	4	4	4	4
	Mean+:	2.348	0.014	0.459	2.048	1.645	0.499	2.535
	Median+:	2.345	0.013	0.474	2.090	1.595	0.487	2.615

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STORET ID	Cong. 101 (ng/L)	Cong. 118 (ng/L)	Cong. 123+149 (ng/L)	Cong. 128 (ng/L)	Cong. 132+153+105 (ng/L)	Cong. 135+144 (ng/L)	Cong. 136 (ng/L)	Cong. 137+176 (ng/L)	Cong. 141 (ng/L)	Cong. 146 (ng/L)	Cong. 15+17 (ng/L)	Cong. 151 (ng/L)
830159 Anderson Creek												
8/10/2004	0.003	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.022	0.000
350061 Au Sable River												
3/31/2004	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000
4/27/2004	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000
5/12/2004	0.006	0.001	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.015	0.000
5/19/2004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000
6/8/2004	0.000	0.009	0.002	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/13/2004	0.006	0.002	0.000	0.000	0.005	0.000	0.000	0.000	0.001	0.000	0.021	0.000
7/29/2004	0.005	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.000
8/25/2004	0.008	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	NAI	0.025	0.000
9/14/2004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000
10/13/2004	0.005	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.000
10/27/2004	0.003	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.010	0.000
11/23/2004	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000
170154 Bear Creek												
8/24/2004	0.010	0.002	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.025	0.000
340186 Bellamy Creek												
7/1/2004	0.000	0.007	0.003	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.023	0.000
770082 Fox River												
8/31/2004	0.003	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500467 North Branch Clinton River												
7/14/2004	0.002	0.003	0.002	0.001	0.006	0.000	0.000	0.000	0.005	0.000	0.025	0.000

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490006 Pine River												
4/5/2004	NAI	0.003	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.009	0.000
4/20/2004	0.018	0.005	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.059	0.000
5/13/2004	0.015	0.010	0.004	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.028	0.000
5/24/2004	0.053	0.049	0.022	0.008	0.065	0.007	0.000	0.000	0.007	0.010	0.128	0.007
6/1/2004	0.017	0.008	0.005	0.002	0.014	0.002	0.000	0.000	0.000	0.000	0.028	0.000
7/6/2004	0.019	0.007	0.006	0.002	0.012	0.002	0.000	0.000	0.000	0.000	0.040	0.000
8/4/2004	0.015	0.006	0.000	0.000	0.006	0.000	0.000	0.000	0.000	NAI	0.024	0.001
8/10/2004	0.018	0.004	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.030	0.001
9/7/2004	0.009	0.002	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.025	0.000
9/27/2004	0.007	0.001	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000		0.000
10/18/2004	0.007	0.006	0.002	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.009	0.000
10/25/2004	0.009	0.007	0.004	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.019	0.000
090177 Saginaw River												
3/10/2004	0.210	0.180	0.140	0.044	0.380	0.053	0.000	0.000	0.051	0.028	0.228	0.055
4/6/2004	0.062	0.049	0.030	0.012	0.079	0.013	0.000	0.000	0.010	NAI	0.137	0.012
4/28/2004	0.105	0.090	0.052	0.021	0.144	0.024	0.000	0.000	0.017	NAI	0.242	0.022
5/4/2004	0.081	0.069	0.042	0.015	0.108	0.019	0.000	0.001	0.013	0.007	0.129	0.017
5/10/2004	0.227	0.221	0.155	0.066	0.398	0.065	NAI	0.004	0.055	NAI	0.172	0.061
5/24/2004	0.218	0.217	0.174	0.066	0.424	0.066	0.000	0.004	0.034	0.038	0.241	0.062
6/23/2004	0.084	0.088	0.060	0.020	0.135	0.026	0.000	0.001	0.011	0.015	0.474	0.023
7/28/2004	0.175	0.132	0.079	0.026	0.186	0.037	0.000	0.002	0.025	0.018	0.834	0.033
8/24/2004	0.143	0.117	0.068	0.024	0.180	0.030	0.000	0.000	0.010	0.020	0.533	NAI
10/12/2004	0.132	0.112	0.067	0.024	0.180	0.029	0.000	0.000	0.010	0.019	0.326	NAI
11/4/2004	0.087	0.065	0.040	0.015	0.103	0.017	0.000	0.000	0.013	NAI	0.185	0.016
11/22/2004	0.053	0.045	0.028	0.011	0.072	0.012	0.000	0.000	0.009	NAI	0.093	0.011
130331 South Branch Kalamazoo River												
6/30/2004	0.009	0.008	0.005	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.021	0.001

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STORET ID	Cong. 101 (ng/L)	Cong. 118 (ng/L)	Cong. 123+149 (ng/L)	Cong. 128 (ng/L)	Cong. 132+153+105 (ng/L)	Cong. 135+144 (ng/L)	Cong. 136 (ng/L)	Cong. 137+176 (ng/L)	Cong. 141 (ng/L)	Cong. 146 (ng/L)	Cong. 15+17 (ng/L)	Cong. 151 (ng/L)
480033 Tahquamenon River (Headwaters)												
6/29/2004	0.004	0.001	0.000	0.000	0.003	0.000	0.000	0.000	0.002	0.000	0.022	0.000

+ = Calculated value; may not be rounded to appropriate number of significant figures.

EST = Estimated value; analyte present above detection limit but not quantified within expected limits of precision.

FBK = Analyte had a measurable value above the established quality control limit when blank was analyzed using the same equipment and analytical method.

FMS = Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.

NAI = Not analyzed due to uncontrollable interference.

NDD = Not detected due to dilution.

STORET ID	Cong. 158 (ng/L)	Cong. 16+32 (ng/L)	Cong. 163+138 (ng/L)	Cong. 167 (ng/L)	Cong. 170+190 (ng/L)	Cong. 172 (ng/L)	Cong. 174 (ng/L)	Cong. 177 (ng/L)	Cong. 178 (ng/L)	Cong. 18 (ng/L)	Cong. 180 (ng/L)	Cong. 183 (ng/L)	Cong. 185 (ng/L)
830159 Anderson Creek													
8/10/2004	0.000	0.018	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.000	0.000
350061 Au Sable River													
3/31/2004	0.000	0.007	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.002	0.000	0.000
4/27/2004	0.000	0.011	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.002	0.000	0.000
5/12/2004	0.000	0.010	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.001	0.000	0.000
5/19/2004	0.000	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.000	0.000
6/8/2004	0.000	0.013	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.020	0.004	0.000	0.000
7/13/2004	0.000	0.012	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.001	0.000	0.000
7/29/2004	0.000	0.027	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.001	0.000	0.000
8/25/2004	0.000	0.016	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.002	0.000	0.000
9/14/2004	0.000	0.015	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.011	0.004	0.000	0.000
10/13/2004	0.000	0.011	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
10/27/2004	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
11/23/2004	0.000	0.007	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
170154 Bear Creek													
8/24/2004	0.000	0.019	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000
340186 Bellamy Creek													
7/1/2004	0.000	0.000	0.009	0.003	0.000	0.000	0.000	0.000	0.000	0.021	0.002	0.000	0.000
770082 Fox River													
8/31/2004	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	NAI	0.000	0.000	0.000
500467 North Branch Clinton River													
7/14/2004	0.000	0.018	0.008	0.000	0.001	0.000	0.001	0.000	0.000	0.017	0.003	0.000	0.000

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STORET ID	Cong. 158 (ng/L)	Cong. 16+32 (ng/L)	Cong. 163+138 (ng/L)	Cong. 167 (ng/L)	Cong. 170+190 (ng/L)	Cong. 172 (ng/L)	Cong. 174 (ng/L)	Cong. 177 (ng/L)	Cong. 178 (ng/L)	Cong. 18 (ng/L)	Cong. 180 (ng/L)	Cong. 183 (ng/L)	Cong. 185 (ng/L)
490006	Pine River												
4/5/2004	0.000	0.000	0.007	0.000	0.000	0.000	0.001	0.000	0.000	0.004	0.003	0.000	0.000
4/20/2004	0.000	0.054	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.003	0.000	0.000
5/13/2004	0.000	NAI	0.011	0.000	0.000	0.000	0.001	0.000	0.000	0.024	0.003	0.000	0.000
5/24/2004	0.007	0.161	0.063	0.000	0.007	0.000	0.007	0.005	0.003	0.116	0.018	0.003	0.000
6/1/2004	0.000	0.018	0.014	0.000	0.002	0.000	0.003	0.001	0.002	0.011	0.005	0.000	0.000
7/6/2004	0.000	0.036	0.012	0.000	0.001	0.000	0.001	0.001	0.002	0.023	0.003	0.000	0.000
8/4/2004	0.000	0.026	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.002	0.000	0.000
8/10/2004	0.000	0.036	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.000
9/7/2004	0.000	0.030	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000
9/27/2004	0.000	0.014	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000
10/18/2004	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.000	0.000
10/25/2004	0.000	NAI	0.012	0.000	0.001	0.000	0.002	0.000	0.000	0.010	0.004	0.000	0.000
090177	Saginaw River												
3/10/2004	0.031	1.352	0.342	NAI	0.073	0.016	0.084	0.057	0.013	0.096	0.182	0.044	0.005
4/6/2004	0.007	0.117	0.073	0.000	0.013	0.000	0.014	NAI	0.003	0.093	0.033	0.008	0.000
4/28/2004	0.014	0.188	0.129	0.000	0.022	0.005	0.024	NAI	0.005	0.156	0.057	0.015	0.000
5/4/2004	0.011	0.105	0.112	0.000	0.020	0.003	0.023	NAI	0.003	0.085	0.051	0.013	0.002
5/10/2004	0.045	NAI	0.432	0.014	0.126	0.025	0.089	0.067	0.014	0.115	0.205	0.051	0.006
5/24/2004	0.056	NAI	0.436	0.015	0.147	0.021	0.091	0.063	0.017	0.127	0.192	0.052	0.005
6/23/2004	0.015	0.258	0.135	0.000	0.031	0.008	0.028	0.024	0.007	0.153	0.069	0.016	0.002
7/28/2004	0.022	0.556	0.167	0.000	0.031	0.007	0.034	NAI	0.010	0.404	0.076	0.021	0.003
8/24/2004	0.017	0.377	0.157	0.000	0.030	0.008	0.034	0.024	0.008	0.277	0.075	0.019	0.002
10/12/2004	0.019	0.234	0.155	0.000	0.030	0.008	0.033	0.028	0.007	0.183	0.071	0.018	0.002
11/4/2004	0.011	0.172	0.096	0.000	0.017	0.004	0.019	NAI	0.004	0.099	0.044	0.011	0.001
11/22/2004	0.007	0.074	0.068	0.000	0.011	0.003	0.014	0.010	0.002	0.073	0.031	0.008	0.001
130331	South Branch Kalamazoo River												
6/30/2004	0.000	0.040	0.014	0.000	0.002	0.000	0.000	0.000	0.000	0.018	0.004	0.001	0.000

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STORET ID	Cong. 158 (ng/L)	Cong. 16+32 (ng/L)	Cong. 163+138 (ng/L)	Cong. 167 (ng/L)	Cong. 170+190 (ng/L)	Cong. 172 (ng/L)	Cong. 174 (ng/L)	Cong. 177 (ng/L)	Cong. 178 (ng/L)	Cong. 18 (ng/L)	Cong. 180 (ng/L)	Cong. 183 (ng/L)	Cong. 185 (ng/L)
480033 Tahquamenon River (Headwaters)													
6/29/2004	0.000	0.013	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.001	0.000	0.000

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STORET ID		Cong. 187+182 (ng/L)	Cong. 19 (ng/L)	Cong. 193 (ng/L)	Cong. 194 (ng/L)	Cong. 198 (ng/L)	Cong. 199 (ng/L)	Cong. 201 (ng/L)	Cong. 202+171 (ng/L)	Cong. 203+196 (ng/L)	Cong. 206 (ng/L)	Cong. 207 (ng/L)	Cong. 208+195 (ng/L)	Cong. 22 (ng/L)
830159	Anderson Creek													
	8/10/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	NAI
350061	Au Sable River													
	3/31/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4/27/2004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	5/12/2004	0.001	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
	5/19/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
	6/8/2004	0.005	NAI	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	NAI
	7/13/2004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
	7/29/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.008
	8/25/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	9/14/2004	0.001	NAI	0.000	0.001	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000
	10/13/2004	0.001	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	10/27/2004	0.000	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	11/23/2004	0.000	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
170154	Bear Creek													
	8/24/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
340186	Bellamy Creek													
	7/1/2004	0.005	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.068
770082	Fox River													
	8/31/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
500467	North Branch Clinton River													
	7/14/2004	0.002	NAI	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019

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STORET ID	Cong. 187+182 (ng/L)	Cong. 19 (ng/L)	Cong. 193 (ng/L)	Cong. 194 (ng/L)	Cong. 198 (ng/L)	Cong. 199 (ng/L)	Cong. 201 (ng/L)	Cong. 202+171 (ng/L)	Cong. 203+196 (ng/L)	Cong. 206 (ng/L)	Cong. 207 (ng/L)	Cong. 208+195 (ng/L)	Cong. 22 (ng/L)
490006 Pine River													
4/5/2004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000
4/20/2004	0.004	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.026
5/13/2004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	NAI
5/24/2004	0.009	0.000	0.000	NAI	0.000	0.000	0.000	0.003	0.007	NAI	0.000	0.003	0.117
6/1/2004	0.003	NAI	0.000	NAI	0.000	0.000	0.000	0.001	0.004	0.003	0.000	0.002	0.012
7/6/2004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.002	0.000	0.001	0.016
8/4/2004	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.013
8/10/2004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017
9/7/2004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.010
9/27/2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/18/2004	0.002	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/25/2004	0.003	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
090177 Saginaw River													
3/10/2004	0.067	NAI	NAI	0.050	0.000	0.006	0.057	0.034	0.049	0.025	0.000	0.035	0.170
4/6/2004	0.013	0.008	0.000	0.011	0.000	0.000	0.013	0.008	0.009	0.005	0.000	0.006	0.056
4/28/2004	0.022	0.010	0.000	0.019	0.000	0.002	0.021	0.015	0.019	0.009	0.000	0.012	0.106
5/4/2004	0.018	0.010	0.000	0.016	0.000	0.000	0.019	0.011	0.015	0.009	0.000	NAI	0.060
5/10/2004	0.072	0.006	NAI	0.061	0.009	0.004	0.068	0.041	0.059	0.032	0.000	NAI	0.155
5/24/2004	0.076	0.014	NAI	0.057	0.000	0.004	0.078	0.029	0.069	0.041	0.005	0.037	0.146
6/23/2004	0.028	0.048	0.000	0.021	0.000	0.002	0.031	0.010	0.023	0.012	0.000	0.012	0.074
7/28/2004	0.034	0.103	0.003	0.023	0.000	0.002	0.031	0.016	0.024	0.009	0.000	NAI	0.162
8/24/2004	0.032	0.039	0.000	0.020	0.003	0.001	0.027	NAI	0.026	0.012	0.000	0.013	0.165
10/12/2004	0.030	0.020	0.000	0.019	0.000	0.001	0.026	NAI	0.024	0.011	0.000	0.013	0.112
11/4/2004	0.018	0.012	0.000	0.012	0.000	0.000	0.018	0.006	0.012	0.007	0.000	0.008	0.066
11/22/2004	0.012	0.007	0.000	0.008	0.000	0.000	0.012	0.005	0.008	0.005	0.000	0.006	0.049
130331 South Branch Kalamazoo River													
6/30/2004	0.003	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000

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STORET ID	Cong. 187+182 (ng/L)	Cong. 19 (ng/L)	Cong. 193 (ng/L)	Cong. 194 (ng/L)	Cong. 198 (ng/L)	Cong. 199 (ng/L)	Cong. 201 (ng/L)	Cong. 202+171 (ng/L)	Cong. 203+196 (ng/L)	Cong. 206 (ng/L)	Cong. 207 (ng/L)	Cong. 208+195 (ng/L)	Cong. 22 (ng/L)
480033 Tahquamenon River (Headwaters)													
6/29/2004	0.001	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012

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STORET ID		Cong. 24+27 (ng/L)	Cong. 25 (ng/L)	Cong. 26 (ng/L)	Cong. 28+31 (ng/L)	Cong. 3 (ng/L)	Cong. 33 (ng/L)	Cong. 37+42 (ng/L)	Cong. 4+10 (ng/L)	Cong. 40 (ng/L)	Cong. 41+71+64 (ng/L)	Cong. 44 (ng/L)	Cong. 45 (ng/L)	Cong. 46 (ng/L)
830159	Anderson Creek													
	8/10/2004	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.029	0.000	0.005	0.005	0.000	0.000
350061	Au Sable River													
	3/31/2004	0.000	0.000	0.000	0.008	0.000	0.000	NAI	0.000	0.000	0.003	NAI	0.000	0.000
	4/27/2004	0.000	0.000	0.000	0.012	0.000	0.000	NAI	0.000	0.000	0.000	NAI	0.000	0.000
	5/12/2004	0.000	0.000	0.000	0.014	0.000	0.006	NAI	0.000	NAI	0.003	0.006	0.000	0.000
	5/19/2004	0.000	0.000	0.000	0.012	0.000	0.006	NAI	0.000	0.000	0.004	0.005	0.000	0.000
	6/8/2004	NAI	0.000	0.000	0.021	0.000	0.010	0.000	0.000	0.000	0.000	0.006	0.000	0.000
	7/13/2004	0.002	0.000	0.000	0.012	0.000	0.009	0.000	0.000	NAI	0.004	0.009	0.000	0.000
	7/29/2004	0.000	0.002	0.004	0.029	0.000	0.000	NAI	0.037	0.000	0.009	0.011	0.002	0.001
	8/25/2004	0.000	0.000	0.000	0.021	0.000	0.000	NAI	0.000	0.000	0.007	NAI	0.000	0.000
	9/14/2004	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.008	0.006	0.000	0.000
	10/13/2004	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.007	0.007	0.000	0.000
	10/27/2004	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000
	11/23/2004	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000
170154	Bear Creek													
	8/24/2004	0.000	0.000	0.000	0.034	0.000	0.008	NAI	0.000	0.000	0.009	0.010	0.000	0.000
340186	Bellamy Creek													
	7/1/2004	0.000	0.000	0.000	0.028	0.000	NAI	0.000	0.045	0.000	NAI	0.000	0.000	0.000
770082	Fox River													
	8/31/2004	0.000	0.000	0.000	0.020	0.000	0.002	0.000	0.000	0.000	0.004	0.004	0.000	0.000
500467	North Branch Clinton River													
	7/14/2004	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.036	0.000	NAI	0.006	0.000	0.000

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+ = Calculated value; may not rounded to appropriate number of significant figures.

EST = Estimated value; analyte present above detection limit but not quantified within expected limits of precision.

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FMS = Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.

NAI = Not analyzed due to uncontrollable interference.

NDD = Not detected due to dilution.

STORET ID	Cong. 24+27 (ng/L)	Cong. 25 (ng/L)	Cong. 26 (ng/L)	Cong. 28+31 (ng/L)	Cong. 3 (ng/L)	Cong. 33 (ng/L)	Cong. 37+42 (ng/L)	Cong. 4+10 (ng/L)	Cong. 40 (ng/L)	Cong. 41+71+64 (ng/L)	Cong. 44 (ng/L)	Cong. 45 (ng/L)	Cong. 46 (ng/L)
490006 Pine River													
4/5/2004	0.000	0.000	0.000	0.008	0.000	0.000	NAI	0.000	NAI	0.000	0.006	0.000	0.000
4/20/2004	0.003	0.003	0.005	0.086	0.000	0.026	NAI	0.043	0.000	0.015	0.021	0.000	0.000
5/13/2004	0.005	0.004	0.004	NAI	0.000	NAI	NAI	0.053	0.000	0.012	0.021	0.006	0.000
5/24/2004	0.006	0.012	0.025	0.327	0.000	0.123	NAI	0.053	NAI	0.077	0.087	0.014	0.000
6/1/2004	0.000	0.000	0.000	0.033	0.000	0.012	NAI	0.000	NAI	0.003	0.016	0.003	0.000
7/6/2004	0.002	0.002	0.002	0.055	0.000	0.014	NAI	0.000	NAI	0.004	0.019	0.000	0.000
8/4/2004	0.000	0.000	NAI	0.047	0.000	0.016	NAI	0.000	0.000	0.014	0.020	0.003	0.000
8/10/2004	0.000	0.000	0.014	0.064	0.000	0.019	0.023	0.000	0.000	0.016	0.022	0.002	0.000
9/7/2004	0.000	0.000	NAI	0.035	0.000	0.015	NAI	0.000	0.000	0.012	0.015	0.000	0.000
9/27/2004	0.000	0.000	0.008	0.019	0.000	0.006	NAI	0.000	0.000	0.007	0.008	0.000	0.000
10/18/2004	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.006	0.007	0.000	0.000
10/25/2004	0.000	0.000	0.000	0.028	0.000	0.000	NAI	0.000	0.000	0.009	0.011	0.000	0.000
090177 Saginaw River													
3/10/2004	0.022	0.070	NAI	NAI	NAI	NAI	NAI	0.274	NAI	0.218	0.287	0.027	0.000
4/6/2004	0.014	0.041	NAI	0.257	0.000	0.032	0.111	0.087	0.027	0.101	0.114	0.013	0.010
4/28/2004	0.021	0.086	NAI	0.496	0.000	0.051	0.160	0.106	0.048	0.189	0.205	0.028	0.021
5/4/2004	0.011	0.024	NAI	0.245	0.000	0.040	0.104	0.109	0.031	0.100	0.117	0.013	0.009
5/10/2004	0.014	0.050	NAI	NAI	NAI	0.191	NAI	0.083	0.073	0.220	0.260	0.026	NAI
5/24/2004	0.022	0.061	NAI	NAI	0.000	NAI	NAI	0.099	0.071	0.231	0.258	0.031	0.010
6/23/2004	0.047	0.072	NAI	0.438	0.000	NAI	0.120	0.323	0.042	0.157	0.161	0.025	0.016
7/28/2004	0.083	0.249	0.616	1.130	0.000	0.099	0.294	0.547	0.102	0.411	0.426	0.076	0.058
8/24/2004	0.061	0.170	NAI	0.763	0.000	0.051	0.281	0.265	0.090	0.304	0.307	0.050	0.038
10/12/2004	0.035	0.101	NAI	0.494	0.000	0.045	0.171	0.161	0.073	0.237	0.239	0.037	0.028
11/4/2004	0.019	0.045	NAI	0.311	0.000	0.034	0.105	0.108	NAI	0.130	0.141	0.017	0.012
11/22/2004	0.007	0.017	NAI	0.173	0.000	0.028	0.063	0.033	NAI	0.076	0.090	0.013	0.007
130331 South Branch Kalamazoo River													
6/30/2004	0.000	0.000	0.000	NAI	0.000	0.012	0.000	0.000	0.000	0.005	0.000	0.000	0.000

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FMS = Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.  
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STORET ID	Cong. 24+27 (ng/L)	Cong. 25 (ng/L)	Cong. 26 (ng/L)	Cong. 28+31 (ng/L)	Cong. 3 (ng/L)	Cong. 33 (ng/L)	Cong. 37+42 (ng/L)	Cong. 4+10 (ng/L)	Cong. 40 (ng/L)	Cong. 41+71+64 (ng/L)	Cong. 44 (ng/L)	Cong. 45 (ng/L)	Cong. 46 (ng/L)
480033 Tahquamenon River (Headwaters)													
6/29/2004	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	NAI	0.003	0.007	0.000	0.000

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NDD = Not detected due to dilution.

STORET ID		Cong. 47+48 (ng/L)	Cong. 49 (ng/L)	Cong. 51 (ng/L)	Cong. 52 (ng/L)	Cong. 53 (ng/L)	Cong. 56+60 (ng/L)	Cong. 6 (ng/L)	Cong. 63 (ng/L)	Cong. 66 (ng/L)	Cong. 7+9 (ng/L)	Cong. 70+76 (ng/L)	Cong. 74 (ng/L)	Cong. 77+110 (ng/L)
830159	Anderson Creek													
	8/10/2004	0.002	0.000	0.000	0.014	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.003
350061	Au Sable River													
	3/31/2004	0.002	0.003	0.000	0.018	0.000	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.004
	4/27/2004	0.004	0.003	0.000	0.020	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.004
	5/12/2004	0.007	0.003	0.000	0.018	0.000	0.002	0.000	0.000	0.003	0.003	0.009	0.000	0.007
	5/19/2004	0.003	0.004	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.004
	6/8/2004	0.003	0.005	0.000	NAI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
	7/13/2004	0.008	0.005	0.000	0.016	0.000	0.002	0.000	0.000	0.004	0.000	0.010	0.000	0.008
	7/29/2004	0.006	0.013	0.002	0.022	0.000	0.002	0.010	0.000	0.005	0.000	0.006	0.000	0.007
	8/25/2004	0.004	0.006	0.000	0.017	0.000	0.000	0.000	0.000	0.004	0.000	0.005	0.000	0.009
	9/14/2004	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.004
	10/13/2004	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
	10/27/2004	0.003	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
	11/23/2004	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
170154	Bear Creek													
	8/24/2004	0.009	NAI	0.002	0.019	0.005	0.003	0.000	0.000	0.005	0.000	0.010	0.001	0.009
340186	Bellamy Creek													
	7/1/2004	0.000	NAI	0.000	NAI	0.000	0.007	0.000	0.014	0.000	0.000	0.000	0.000	0.010
770082	Fox River													
	8/31/2004	0.005	0.000	0.001	0.010	0.000	0.001	0.000	0.000	0.002	0.000	0.005	0.000	0.004
500467	North Branch Clinton River													
	7/14/2004	0.002	0.000	0.000	0.062	0.000	0.000	0.000	0.000	0.003	0.000	0.019	0.000	0.003

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STORET ID	Cong. 47+48 (ng/L)	Cong. 49 (ng/L)	Cong. 51 (ng/L)	Cong. 52 (ng/L)	Cong. 53 (ng/L)	Cong. 56+60 (ng/L)	Cong. 6 (ng/L)	Cong. 63 (ng/L)	Cong. 66 (ng/L)	Cong. 7+9 (ng/L)	Cong. 70+76 (ng/L)	Cong. 74 (ng/L)	Cong. 77+110 (ng/L)
490006 Pine River													
4/5/2004	0.000	NAI	0.000	NAI	0.000	0.006	0.000	0.000	0.000	NAI	0.010	0.000	0.007
4/20/2004	0.012	0.012	0.002	0.041	0.000	0.009	NAI	0.000	0.015	0.011	0.019	0.007	0.016
5/13/2004	NAI	0.012	0.000	NAI	0.000	0.010	0.000	0.000	0.019	0.000	0.016	0.007	0.017
5/24/2004	0.034	0.055	0.007	0.094	0.005	0.079	0.024	0.006	0.134	NAI	0.083	0.040	0.071
6/1/2004	0.009	0.005	0.003	0.019	0.000	0.013	NAI	0.000	0.015	NAI	0.023	0.004	0.017
7/6/2004	0.011	0.010	0.002	0.034	0.003	0.008	0.013	0.000	0.023	NAI	0.018	0.005	0.017
8/4/2004	0.012	NAI	0.004	0.030	0.003	0.009	0.000	0.000	0.016	0.000	0.015	0.006	0.018
8/10/2004	0.014	0.011	0.003	0.036	0.006	0.007	0.000	0.000	0.011	0.000	0.016	0.007	0.020
9/7/2004	0.009	NAI	0.003	0.024	0.000	0.005	0.013	0.000	0.008	0.000	0.013	0.003	0.012
9/27/2004	0.024	0.000	0.008	0.011	0.000	0.003	0.000	0.000	0.005	0.000	0.012	0.002	0.008
10/18/2004	0.000	0.000	0.000	0.009	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.002	0.007
10/25/2004	0.007	0.000	0.000	0.019	0.000	0.006	0.000	0.000	0.017	0.000	0.000	0.004	0.011
090177 Saginaw River													
3/10/2004	0.135	0.244	0.019	1.245	NAI	0.160	NAI	0.000	0.347	NAI	0.217	NAI	0.345
4/6/2004	0.061	0.104	0.008	0.381	0.013	0.050	0.045	0.007	0.123	NAI	0.053	0.034	0.095
4/28/2004	0.116	NAI	0.013	0.570	0.028	0.093	0.080	0.014	0.234	0.030	0.082	0.067	0.175
5/4/2004	0.060	0.092	0.007	0.373	0.014	0.064	0.033	0.006	0.133	NAI	0.069	0.042	0.115
5/10/2004	0.138	0.200	0.014	1.039	0.038	0.177	NAI	0.012	0.330	0.016	0.181	0.108	0.393
5/24/2004	0.144	0.218	0.021	0.700	0.033	0.163	0.064	0.014	0.419	0.010	0.180	0.102	0.386
6/23/2004	0.124	0.158	0.024	0.366	0.031	0.076	0.090	0.011	0.175	NAI	0.094	0.052	0.151
7/28/2004	0.287	0.421	0.052	0.772	0.089	0.125	0.210	0.030	0.315	0.032	0.171	0.101	0.291
8/24/2004	0.204	0.309	0.037	0.469	0.037	0.113	NAI	0.020	0.353	NAI	0.166	0.084	0.222
10/12/2004	0.150	0.236	0.022	0.364	0.025	0.102	NAI	0.015	0.302	0.000	0.143	0.070	0.199
11/4/2004	0.080	0.127	0.012	0.376	0.015	0.064	0.046	0.008	0.165	NAI	0.088	0.044	0.124
11/22/2004	0.044	0.070	0.006	0.310	0.011	0.045	NAI	0.005	0.109	0.000	0.061	0.029	0.075
130331 South Branch Kalamazoo River													
6/30/2004	0.003	0.000	0.004	0.018	0.000	0.004	0.010	0.000	0.000	0.016	0.000	0.000	0.009

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STORET ID	Cong. 47+48 (ng/L)	Cong. 49 (ng/L)	Cong. 51 (ng/L)	Cong. 52 (ng/L)	Cong. 53 (ng/L)	Cong. 56+60 (ng/L)	Cong. 6 (ng/L)	Cong. 63 (ng/L)	Cong. 66 (ng/L)	Cong. 7+9 (ng/L)	Cong. 70+76 (ng/L)	Cong. 74 (ng/L)	Cong. 77+110 (ng/L)
480033 Tahquamenon River (Headwaters)													
6/29/2004	0.009	0.008	0.001	0.007	0.000	0.002	0.000	0.000	0.003	NAI	NAI	0.002	0.006

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STORET ID	Cong. 8+5 (ng/L)	Cong. 82 (ng/L)	Cong. 83 (ng/L)	Cong. 85 (ng/L)	Cong. 87 (ng/L)	Cong. 89 (ng/L)	Cong. 91 (ng/L)	Cong. 92+84 (ng/L)	Cong. 95 (ng/L)	Cong. 97 (ng/L)	Cong. 99 (ng/L)
830159 Anderson Creek											
8/10/2004	0.099	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.000	0.000
350061 Au Sable River											
3/31/2004	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.004	0.004	0.000	0.000
4/27/2004	NAI	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.004	0.000	0.001
5/12/2004	0.046	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.006	0.001	0.002
5/19/2004	NAI	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
6/8/2004	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
7/13/2004	NAI	NAI	0.000	0.000	0.004	0.000	0.000	0.000	0.009	0.001	0.002
7/29/2004	0.097	0.000	0.000	0.000	0.003	0.000	0.000	0.007	0.009	0.001	0.002
8/25/2004	0.069	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.009	0.002	0.002
9/14/2004	NAI	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.004	0.000	0.000
10/13/2004	0.053	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.009	0.000	0.002
10/27/2004	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
11/23/2004	0.044	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.006	0.000	0.000
170154 Bear Creek											
8/24/2004	0.063	0.002	0.000	0.001	0.007	0.002	0.000	0.012	0.014	0.002	0.003
340186 Bellamy Creek											
7/1/2004	0.107	0.000	NAI	0.000	0.000	0.000	0.000	NAI	0.000	0.000	0.000
770082 Fox River											
8/31/2004	0.036	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.004	0.000	0.001
500467 North Branch Clinton River											
7/14/2004	0.127	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.005	0.000	0.002

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STORET ID	Cong. 8+5 (ng/L)	Cong. 82 (ng/L)	Cong. 83 (ng/L)	Cong. 85 (ng/L)	Cong. 87 (ng/L)	Cong. 89 (ng/L)	Cong. 91 (ng/L)	Cong. 92+84 (ng/L)	Cong. 95 (ng/L)	Cong. 97 (ng/L)	Cong. 99 (ng/L)	
490006	Pine River											
4/5/2004	0.037	NAI	0.000	0.000	0.004	0.000	0.000	0.000	0.004	0.000	0.000	
4/20/2004	0.177	NAI	0.000	0.004	0.009	0.000	0.005	0.000	0.022	0.004	0.005	
5/13/2004	0.101	0.002	0.000	0.005	0.009	0.002	0.000	NAI	0.019	0.003	0.007	
5/24/2004	NAI	NAI	0.005	0.016	0.032	0.005	0.008	0.051	0.059	0.015	0.018	
6/1/2004	0.062	NAI	0.002	0.005	0.009	NAI	0.000	NAI	0.013	0.003	0.007	
7/6/2004	0.063	NAI	0.002	0.004	0.009	NAI	0.004	NAI	0.027	0.004	0.006	
8/4/2004	0.089	0.002	0.000	0.004	0.009	0.002	0.000	0.016	0.022	0.003	0.005	
8/10/2004	0.114	0.002	0.000	0.004	0.011	0.002	0.000	0.022	0.026	0.004	0.005	
9/7/2004	0.087	0.000	0.000	0.002	0.006	0.000	0.000	0.000	0.015	0.001	0.003	
9/27/2004	0.040	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.007	0.000	0.002	
10/18/2004	0.000	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.001	0.002	
10/25/2004	0.000	0.000	0.000	0.003	0.005	0.000	0.000	0.011	0.012	0.002	0.002	
090177	Saginaw River											
3/10/2004	0.219	0.028	0.030	0.062	0.106	0.048	NAI	NAI	0.259	0.071	0.079	
4/6/2004	0.177	0.009	0.008	0.020	0.029	0.014	NAI	0.040	0.087	0.019	0.028	
4/28/2004	0.165	0.015	0.015	0.037	0.053	0.024	NAI	0.079	0.131	0.035	0.054	
5/4/2004	0.115	0.010	0.010	0.026	0.039	0.020	0.000	NAI	0.084	0.025	0.037	
5/10/2004	0.258	0.030	NAI	0.076	0.127	0.068	NAI	NAI	0.240	0.077	0.110	
5/24/2004	0.184	0.030	0.028	0.078	0.116	0.078	0.085	NAI	0.303	0.071	0.109	
6/23/2004	0.555	0.015	0.013	0.029	0.044	0.021	0.049	NAI	0.131	0.029	0.046	
7/28/2004	0.831	0.025	0.029	0.055	0.074	0.026	0.075	0.200	0.277	0.051	0.085	
8/24/2004	0.372	NAI	0.022	0.046	0.063	0.025	0.086	0.124	0.235	0.044	0.068	
10/12/2004	NAI	NAI	0.018	0.042	0.061	0.022	0.069	0.106	0.198	0.039	0.065	
11/4/2004	NAI	0.014	0.011	0.025	0.039	0.015	NAI	0.065	0.114	0.025	0.038	
11/22/2004	0.094	0.008	0.006	0.015	0.025	0.010	NAI	0.034	0.070	0.016	0.024	
130331	South Branch Kalamazoo River											
6/30/2004	0.075	0.000	0.000	0.002	0.004	0.000	0.000	0.000	0.007	0.002	0.003	

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+ = Calculated value; may not be rounded to appropriate number of significant figures.

EST = Estimated value; analyte present above detection limit but not quantified within expected limits of precision.

FBK = Analyte had a measurable value above the established quality control limit when blank was analyzed using the same equipment and analytical method.

FMS = Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.

NAI = Not analyzed due to uncontrollable interference.

NDD = Not detected due to dilution.

STORET ID	Cong. 8+5 (ng/L)	Cong. 82 (ng/L)	Cong. 83 (ng/L)	Cong. 85 (ng/L)	Cong. 87 (ng/L)	Cong. 89 (ng/L)	Cong. 91 (ng/L)	Cong. 92+84 (ng/L)	Cong. 95 (ng/L)	Cong. 97 (ng/L)	Cong. 99 (ng/L)
480033 Tahquamenon River (Headwaters)											
6/29/2004	0.067	NAI	0.000	0.000	0.004	NAI	0.000	0.000	0.006	0.001	0.003

+ = Calculated value; may not be rounded to appropriate number of significant figures.

EST = Estimated value; analyte present above detection limit but not quantified within expected limits of precision.

FBK = Analyte had a measurable value above the established quality control limit when blank was analyzed using the same equipment and analytical method.

FMS = Failed matrix spike criteria; recovery of matrix spike was outside established quality control limits.

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NDD = Not detected due to dilution.