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Annual Monitoring Report 2010



MWMO Watershed Bulletin: 2011-1

Annual Monitoring Report 2010

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Front Cover:

Frozen fog (pogonip) and a low sun angle combine here to form a 22° halo, sundogs on each side of the sun, a sun pillar above, and a tangent arc at the top of the halo. *Photograph by B. Jastram, Mississippi Watershed Management Organization.*



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Abstract

In 2010, The Mississippi Watershed Management Organization (MWMO) continued monitoring in the Mississippi River, Loring Pond, stormwater drainage systems, and Kasota Ponds wetlands.

Under Section 303(d) of the Federal Clean Water Act, the 12-mile reach of the Mississippi River in the MWMO is listed on the 303(d) Total Maximum Daily Load (TMDL) list as impaired for fecal coliform. The Minnesota Pollution Control Agency has moved from a fecal coliform standard to an *E. coli* standard, therefore all fecal coliform impairments are now evaluated with *E. coli* data. *E. coli* concentrations in the Mississippi River exceeded Minnesota water quality standards during the months of June, August, and September in 2010. Long-term monitoring of the river and stormwater drainage systems is necessary to evaluate bacteria inputs from within the watershed compared to inputs from upstream sources.

In Loring Pond, *E. coli* concentrations exceeded Minnesota water quality standards May through October in 2010. Loring Pond is not listed on the 303(d) TMDL list because the MPCA has not assessed lakes for bacteria. Data are submitted to the MPCA on an annual basis.

The MWMO continued monitoring stormwater and wetlands in 2010. There are no water quality standards for stormwater so, rather than comparing to standards, stormwater results are presented in the report. The MPCA wetlands' water quality criteria indicate that wetland water quality should maintain background. Background water quality has not yet been determined for MWMO wetlands.



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Annual Monitoring Report 2010

Executive Summary

This report details the results of the Mississippi Watershed Management Organization's (MWMO) 2010 monitoring season. MWMO staff complete an annual monitoring report summarizing the year's results and outlining the next year's work plan each year. The report is available on the MWMO website at www.mwmo.org.

The MWMO monitors water quality in the watershed's stormwater drainage system and in the Mississippi River, Loring Pond, and Kasota Ponds (wetlands). Within these systems, major factors influencing water quality include the amount of precipitation, timing of precipitation events, and land use practices in the watershed. Long-term monitoring is necessary to characterize the impact of various land use practices on surface water runoff within the MWMO and, ultimately, the Mississippi River. Water quality in the Mississippi River is also influenced by precipitation and land use practices in the entire Mississippi River basin upstream of the MWMO. Long-term monitoring of the river will aid the understanding of upstream weather patterns and land use impact on the MWMO watershed.

The 2010 monitoring season included collection of water quality samples from seven locations in the Mississippi River, one in Loring Pond, five stormwater outfalls to the Mississippi River, one stormwater pipe at the jurisdictional boundary of Saint Anthony Village and Minneapolis, and seven locations in the three wetlands known as Kasota Ponds. The MWMO had a total of six automated stormwater monitoring sites in 2010.

The 12-mile reach of the Mississippi River in the MWMO is listed on the Federal Clean Water Act

Section 303(d) Total Maximum Daily Load (TMDL) list as impaired for fecal coliform. The Minnesota Pollution Control Agency (MPCA) has moved from a fecal coliform standard to an *E. coli* standard, therefore all fecal coliform impairments are now evaluated with *E. coli* data. *E. coli* concentrations exceeded Minnesota water quality standards in 2010 during the months of June, August, and September. Long-term monitoring of both the river and the stormwater outfalls to the river is necessary to evaluate *E. coli* inputs from within the watershed compared to those inputs from upstream sources.

E. coli concentrations in Loring Pond exceeded Minnesota water quality standards in May through October of 2010. Loring Pond is not listed on the 303(d) TMDL list because the MPCA has not assessed lakes for bacteria. Data are submitted to the MPCA on an annual basis.

The MWMO continued monitoring stormwater in 2010. Water quality standards do not exist for stormwater, therefore data were not compared to standards but are presented in subsequent sections. The MWMO will continue to monitor stormwater drainage systems to develop a record of baseline data to characterize stormwater quality within the watershed. The MWMO also provided stormwater data to the MPCA for TMDL projects within the watershed.

The MWMO continued monitoring the Kasota Ponds wetlands in 2010. Samples were collected for nutrients, sediment, inorganics, and metals analyses. The MPCA water quality criteria indicate that wetland water quality should maintain background. Background water quality has not yet been determined for MWMO wetlands.

Introduction

This report details the results of the Mississippi Watershed Management Organization's (MWMO) 2010 monitoring season. MWMO staff will complete an annual monitoring report summarizing the year's results and outlining the next year's work plan each year. The report is available on the MWMO website at www.mwmo.org.

The MWMO established the monitoring program to provide a scientific basis for identifying and evaluating water quality and quantity issues and implementing solutions to improve water quality and reestablish natural water regimes in the watershed. The objectives of the program are to:

- Monitor biological, chemical, and physical parameters of water resources in the watershed
- Monitor water quality within the watershed
 - Develop a record of baseline data to characterize water quality and identify pollutants that exceed water quality standards
 - Assess pollutants listed on the 303(d) Total Maximum Daily Load list
- Assess the volume and rate of water movement in the watershed
- Develop and agree with organizations in the watershed on a standardized set of parameters as well as reporting standards for sample collection and data analysis
- Develop partnerships and collaborate with other organizations and/or agencies, both inside and outside the watershed boundaries, to improve water quality in the Mississippi River
- Assess land use impact on water quality

The 2010 monitoring season included collection of water quality samples from seven locations in the Mississippi River, one in Loring Pond, six stormwater sites, and seven wetland sites in the

Kasota Ponds. Refer to Figures A.1 and A.2. in Appendix A for the monitoring locations.

Descriptions of the sampling sites are found in the MWMO 2005 Annual Monitoring Report (2006), Annual Monitoring Report 2007 (2009), and the Annual Monitoring Report 2008 (2010) at www.mwmo.org.

Background

The MWMO was established in 1985 by a Joint Powers Agreement among member organizations. (The MWMO watershed boundaries are shown in Figure A.1 in Appendix A.) The MWMO is a unique organization in that it includes a reach of the Mississippi River. Other local watershed districts and organizations include land and water resources up to the river's shore, but not extending into the river itself. The reach of the Mississippi River included in the MWMO extends from 53rd Avenue in north Minneapolis downstream to Lock and Dam 1 (Ford Dam) in south Minneapolis. Another unique feature of the MWMO is that its boundaries include only one lake, Loring Pond.

Minnesota regulations require that the MWMO protect water quality in the watershed. Minnesota Rules Chapter 7050 requires that all waterbodies comply with state water quality standards. Furthermore, section 303(d) of the Federal Water Pollution Control Act (commonly known as the Clean Water Act) requires states to develop TMDLs for waters with impaired uses. Impaired waters are those waters that exceed water quality standards for their classified use. Some typical classifications include drinking water and aquatic life and recreation (swimming and fishing). According to Minnesota Rules Chapter 7050, the reach of the Mississippi River within the MWMO watershed is divided into two sections for classification. Table 1 highlights the most restrictive classifications.

The MWMO's reach of the Mississippi River is listed on Minnesota's 303(d) TMDL list. The MPCA divided the reach of the Mississippi River flowing through the MWMO into three sections. Table 2 lists the impaired reaches of the river and the corresponding pollutants of concern. The MPCA has written a statewide TMDL for mercury (MPCA, 2007).

Mercury and polychlorinated biphenyls (PCBs) are listed on the 303(d) TMDL list for aquatic consumption advisories; therefore, this report will address fecal coliform only.

Protecting water quality in the Mississippi River is a complicated task. The reach of the Mississippi River flowing through the MWMO is densely urbanized with commercial, industrial, residential, park lands, and downtown Minneapolis land uses contributing to the volume and quality of the water entering the river through the stormwater drainage system. The MWMO monitors stormwater outfalls to determine the contributions of surface runoff from the watershed to water quality in the river.

Table 1. Water use classifications for waterbodies in the MWMO

Waterbody	Water Use Classification
Mississippi River, MWMO upstream boundary to Upper Saint Anthony Falls	1C, 2Bd Domestic consumption (drinking water)
Mississippi River, Upper Saint Anthony Falls to Lock & Dam 1 (Ford Dam)	2B Aquatic life and recreation
Loring Pond	2B Aquatic life and recreation

Table 2. Pollutants in impaired waters

Impaired Mississippi River Reach	Pollutant
MWMO upstream boundary to Upper Saint Anthony Falls	Fecal coliform, mercury in fish tissue, polychlorinated biphenyls (PCBs) in fish tissue
Upper Saint Anthony Falls to Lower Saint Anthony Falls	Mercury in fish tissue, PCBs in fish tissue
Lower Saint Anthony Falls to Lock & Dam 1 (Ford Dam)	Fecal coliform, mercury in fish tissue

That being said, the entire Mississippi River basin upstream of the MWMO watershed contributes to water quality in the MWMO's reach of the river.

The upper Mississippi River is a large, dynamic river system that includes runoff from forested areas near the source at Lake Itasca, agricultural runoff from the central region of Minnesota, and the urbanized areas of Saint Cloud and the north Twin Cities Metro area. As precipitation produces surface runoff, precipitation differences throughout the upper Mississippi River basin can affect water flow and water quality in the MWMO's reach of the Mississippi River.

Thus, if large amounts of rainfall have washed pollutants from the land upstream into the river, it is possible that flows could increase and water quality could decline, even though it has not rained in the watershed. In cooperation with other watershed organizations and districts, the MWMO plans to investigate the upstream impact on water quality to discern the effect precipitation in other portions of the state has on water quality in the MWMO's reach of the Mississippi River.

Further complicating the investigation of water volume and quality in the river are the inputs of groundwater, and the recharge to groundwater from the river. Groundwater may carry pollutants from upstream in the Mississippi River basin to the MWMO's reach of the river. Pollutants may also leach from the river into the groundwater system. It is quite difficult to track potential groundwater inputs from an area as large as the Mississippi River basin to the MWMO's reach of the river. The MWMO has long-term plans to coordinate with organizations and agencies in the upper portion of the basin to improve water quality in the Mississippi River.

Methodology

In 2010, the MWMO examined water quality from four types of locations: rivers, lakes, stormwater, and wetlands. River and lake samples were collected in the Mississippi River and Loring Pond. Stormwater samples were collected from stormwater drainage systems at the point of discharge to the river and at the boundary of the cities of Saint Anthony Village and Minneapolis. Wetland samples were collected from the Kasota Ponds in St. Paul. Mississippi River and Loring Pond samples were collected between April and October, while stormwater samples were collected year-round. Wetland samples were collected between April and December. Snowmelt samples were also collected at the stormwater sampling sites.

Sample Collection, Handling, and Preservation ***Mississippi River and Loring Pond***

Grab samples were collected from seven locations in the Mississippi River and one location in Loring Pond. Staff followed sampling procedures outlined in the MWMO's Standard Operating Procedure for Surface Water Sampling (2011). Samples were collected in lab-sterilized 125mL plastic bottles. Collection occurred away from shore, in approximately three feet of water. For the river water collection, samples were taken in positive flow (no back eddies or stagnant water) and upstream of the monitoring technician to prevent contamination by the disturbed river bottom. To collect samples, the monitoring technician plunged an opened, inverted bottle one foot below the water surface, turned it upward to fill, and brought it out of the water (Figure 1). The technician then poured some of the sample out to provide headspace for the laboratory.

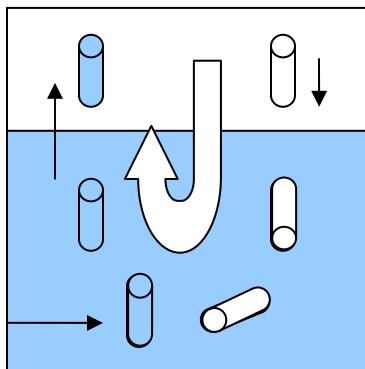


Figure 1. Diagram of sample collection method

Samples were labeled, stored on ice in a cooler, and delivered to the laboratory by the monitoring technician after the final sample was collected. Analyses conducted on these samples did not require preservation.

Dissolved oxygen, conductivity, salinity, and temperature were collected using a YSI85 meter (YSI Inc., Yellow Springs, OH) from January – June. Data for pH were collected using an ISFET pH meter (Hach Company, Loveland, CO). For the remainder of the year, MWMO used a YSI ProPlus meter (YSI Inc., Yellow Springs, OH) that included a pH probe. The meter probe was placed in the water approximately one foot below the surface. Data were recorded when the values stabilized.

Samples were collected weekly for baseflow and up to three times per month during storm events.

Stormwater

Grab samples were collected from six stormwater sites in the MWMO watershed. Staff followed sampling procedures outlined in the MWMO's Standard Operating Procedure for Stormwater Sampling (2011). Samples were collected in laboratory cleansed (non-sterile) two gallon plastic bottles. Samples were collected with the two gallon sample bottle mounted on the end of a telescoping

pole or with the automatic sampler described below. The bottle was capped after it was filled, with headspace included.

An ISCO 6712 automatic sampler (Teledyne Isco, Inc., Lincoln, NE) was used at sites 1NE, 4PP, 6UMN, and 10SA. The samplers housed twenty-four one liter plastic bottles for sample collection. Velocity, water level, and flow data were collected with an ISCO 750 Area Velocity Flow Module (Teledyne Isco, Inc., Lincoln, NE) that attached to the automatic sampler. When the meter detected water level above baseflow, it triggered the sampler to begin sampling.

Once triggered, the sampler rinsed the sample tubing twice before drawing the sample into the containers. Samples were collected on a flow-paced basis. The bottles were rinsed three times with deionized (DI) water free of pollutants between storm events. Once collected, the bottles were composited as one sample into a two gallon plastic bottle by the monitoring technician. Automated precipitation gauges were used at 1NE and 10SA to gather precipitation data in the watershed.

Stormwater samples were labeled and placed in a cooler for transport to the laboratory by the monitoring technician. Samples were dropped off at the laboratory after collection of the last sample. Laboratory personnel split the sample and preserved it as needed for the various analyses.

Dissolved oxygen, conductivity, salinity, temperature, and pH were measured using the same equipment listed in the previous section, but the data were measured directly in the stormwater drainage system or in a separate container of stormwater.

Stormwater samples were collected for a minimum of three precipitation events per month, as long as that many events occurred. If baseflow conditions were present, samples were collected twice per month during baseflow.

The MWMO collected real-time monitoring data at the stormwater sites. The network was designed to provide instantaneous data about stormwater level, velocity and flow, precipitation, and automated sample collection. The data were available instantaneously from any computer, allowing MWMO staff to respond more quickly to sample collection and equipment failures. The network used radios to link six automatic water samplers to the internet, enabling the MWMO staff to view stormwater data, automated sample collection, and rainfall from the office. Radios were located at two additional locations, the Saint Anthony Falls Laboratory (SAFL) roof and the Moos Tower roof on the University of Minnesota East Bank campus, to provide line-of-sight communication between all of the monitoring sites. Refer to Figure A.3 in Appendix A for the real-time monitoring network.

Equipment for the real-time monitoring network included the area velocity meters and automatic samplers described previously, dataloggers, antennas, and radios to send data to a central location. All data were stored at SAFL. As previously described, the area velocity meters provided stormwater level and velocity readings to the automatic samplers. The automatic samplers stored these readings and calculated the volume of water that flowed past the sensors.

MWMO staff installed a CR800 Measurement and Control Datalogger (Campbell Scientific, Inc., Logan, UT) at each stormwater monitoring location. The datalogger retrieved data from the automatic sampler. Data were then transmitted via RF450

Spread Spectrum Radios (Campbell Scientific, Inc., Logan, UT) and Yagi or Omnidirectional antennas (Campbell Scientific, Inc., Logan, UT) to an NL100 Network Link Interface (Campbell Scientific, Inc., Logan, UT). The NL100 allowed communication between the dataloggers and a network-linked computer in order to store the logged data in a useable data file. Vista Data Vision software (Vista Engineering, Reykjavik, Iceland) displayed the data on webpages in graphical and tabular form so it could be viewed in real time.

Kasota Ponds

Grab samples were collected from seven locations in the Kasota Ponds wetlands. Collection occurred away from shore, in approximately three feet of water. Samples were collected in laboratory cleansed (non-sterile) two gallon plastic bottles. To collect samples, the monitoring technician plunged an opened, inverted bottle one foot below the water surface, turned it upward to fill, and brought it out of the water. The technician then poured some of the sample out to provide headspace for the laboratory.

Samples were labeled and placed in a cooler for transport to the laboratory by the monitoring technician. Samples were dropped off at the laboratory after collection of the last sample. Laboratory personnel split the sample and preserved it as needed for the various analyses.

Dissolved oxygen, conductivity, salinity, temperature, and pH were collected using the same methodology as stormwater samples.

Kasota Ponds samples were collected once a month from April through December. When ice was present, staff conducted sampling activities through a hole in the ice.

Sampling Quality Control

The MWMO staff followed the quality control protocol outlined in the MWMO Ambient Surface Water Monitoring Quality Assurance Project Plan (2010). Blank samples of DI water were submitted to laboratories periodically to verify that sample containers were clean and samples were not contaminated during travel. Duplicate samples were submitted periodically to verify that sampling and laboratory procedures did not jeopardize the data.

Laboratory Analyses

The MWMO used three laboratories for analyses. Bacteria samples were analyzed at the Three Rivers Park District Laboratory. Fluoride samples were analyzed at Pace Analytical Services, Inc. All other samples were analyzed at the Metropolitan Council Environmental Services Laboratory. Refer to Table B.1 in Appendix B for a list of sample parameters, the laboratories used for analysis, the analysis methods, and information regarding certification.

Each laboratory followed strict protocol for quality assurance and quality control. Information regarding laboratory protocol is available from MWMO staff.

Parameters Information

The MWMO has conducted extensive research regarding the parameters of concern. Parameter information includes definitions, sources, impact on various organisms, and water quality standards, as well as others. Refer to the MWMO 2006 Annual Monitoring Report (2007) for the comprehensive list of parameters information.

Data Analysis

The following data cleaning techniques were used to ensure quality data:

- Duplicates were omitted from analysis

- Suspect data were flagged and verified with the laboratory
- Statistical regression techniques were used to interpolate automated flow data that were missing due to equipment malfunctions (MWMO, 2011)

For the Mississippi River and Loring Pond, grab sample data were compared to the Minnesota water quality standards for their most restricted water use classification. Water quality standards do not exist for stormwater. Data were therefore not compared to standards, but are presented in subsequent sections.

Cold Climate Considerations

Minnesota is considered a cold climate state, requiring special consideration in runoff management. MWMO staff takes this into consideration when writing the annual work plan for the program. The Minnesota Stormwater Manual (Minnesota Stormwater Steering Committee, 2008) outlines the cold climate considerations in Chapter 9.

Precipitation

Precipitation determines surface runoff and is arguably the greatest factor controlling surface water quality. As stated in Background, water quality in the MWMO's reach of the Mississippi River is affected by precipitation in the entire Mississippi River basin upstream of the MWMO, including tributary watersheds to the river.

Figure 2 shows precipitation for six locations along the Mississippi River: two in the watershed (Lower Saint Anthony Falls and Lock and Dam 1) and four between Saint Cloud and the MWMO northern boundary. Precipitation for the watershed only is shown in Figure 3. The MWMO acknowledges a

link between precipitation and the water quality data shown in the following sections. However, the MWMO does not support quantitative analysis of this relationship because the precipitation data are

not representative of the entire Mississippi River basin contributing to the MWMO watershed. Table C.1 in Appendix C shows which precipitation events were sampled at each stormwater monitoring site.

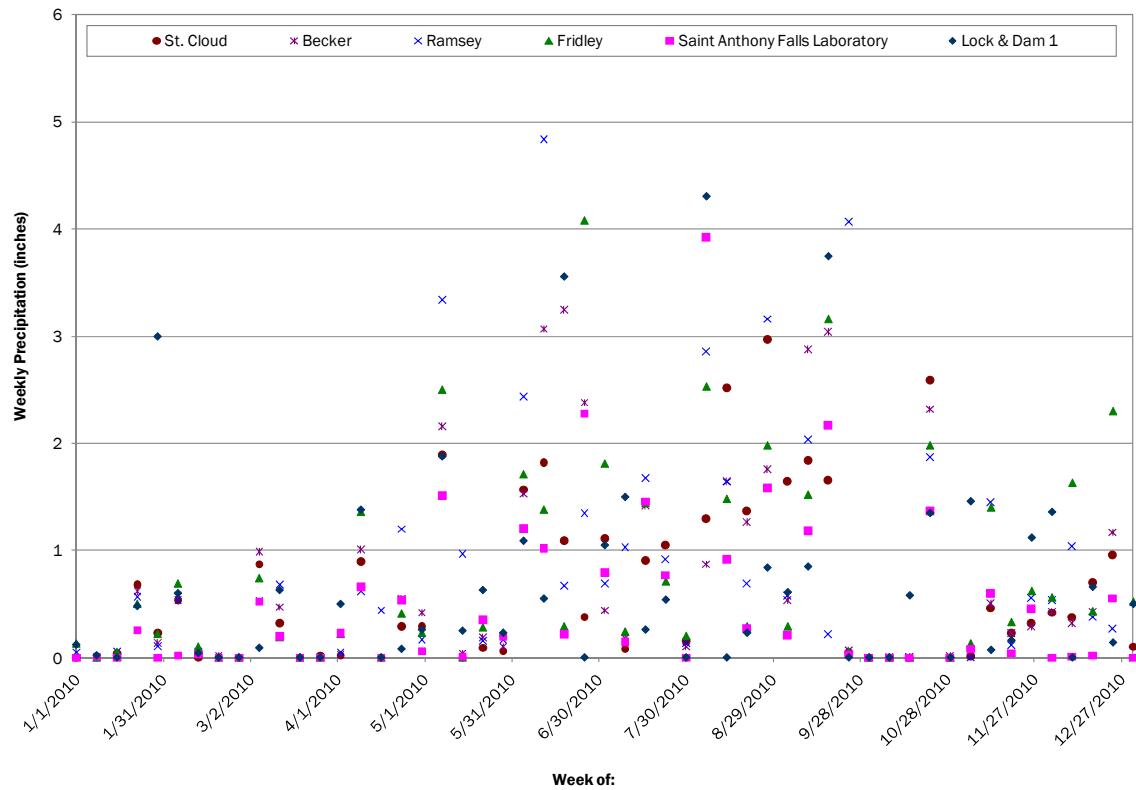


Figure 2. Precipitation for six locations along the Mississippi River

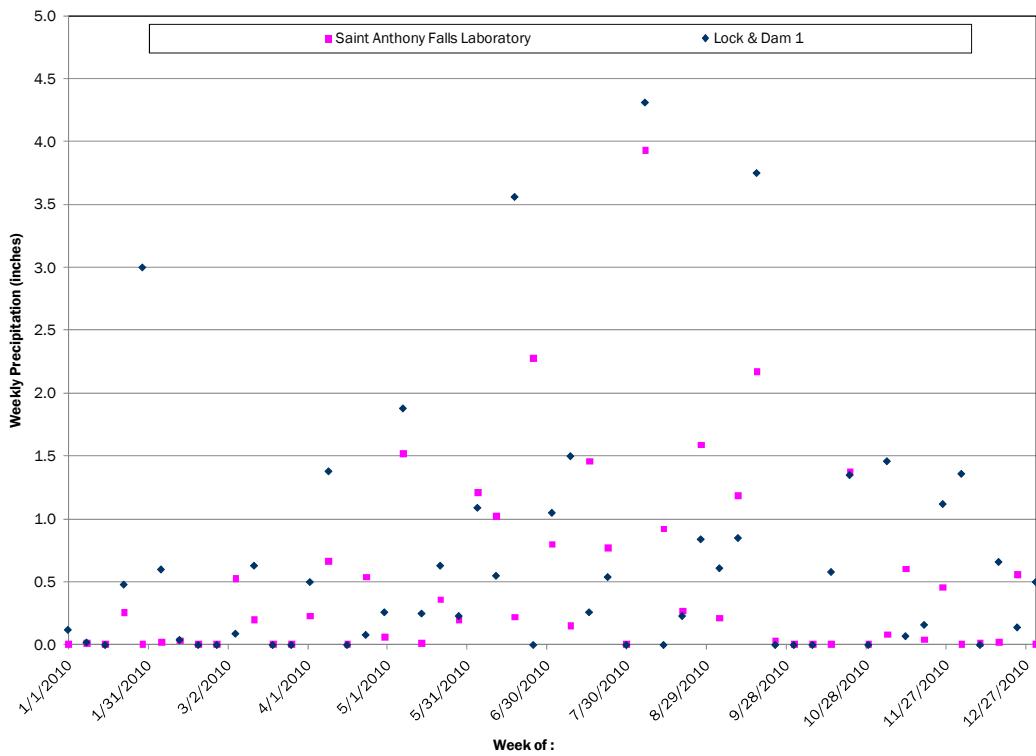


Figure 3. Precipitation for two locations in the MWMO watershed

Mississippi River

The MWMO monitors seven locations in the Mississippi River. Refer to the 2005 Annual Monitoring Report (MWMO, 2006) for site-specific details and information regarding site selection. Six sites are MWMO long-term monitoring sites. The seventh site—MR853.5E, located between the Upper and Lower Saint Anthony Falls—was added in 2010 to provide data for development of the Upper Mississippi River Bacteria TMDL project that is managed by the MPCA. All of the site names were changed in 2010 to coordinate with other agencies' work along the river. Sites are now identified by the river mile upstream from Cairo, Illinois, and from the nearest riverbank to the sample collection point. E refers to the east bank and W refers to the west bank. The highest river mile is the furthest upstream. Refer to Table 3 for the new nomenclature.

Table 3. New river monitoring site names

Former Site Name	New Site Name
1	MR859.1W
2	MR857.6W
3.1	MR854.9W
4	MR852.2E
5	MR849.9W
6.1	MR848.1W

Water Elevation

Water elevation data (typically referred to as stage data) show the rise and fall of the river in response to precipitation. In 2009, the MWMO hired Bonestroo to survey the MWMO's river monitoring site benchmarks and relate them to other agency benchmarks along the Mississippi River. In 2010, MWMO staff were able to convert water level data to elevation data that were equivalent to elevation data collected by agencies using the North American

Vertical Datum, 1988 (NAVD88). New benchmarks were established at some sites for easier access to the benchmarks. New benchmarks were related to old benchmarks to ensure that all past data would be comparable.

Water elevations in the Mississippi River are complicated by the dams at Saint Anthony Falls and Lock and Dam 1. Since the river pools behind the dams, control activities at the dam cause changes in

river elevation, even in the absence of precipitation. River elevations for the six MWMO monitoring locations on the Mississippi River are shown in Figures 4 and 5.

Time periods with missing data are the result of either high water levels (the staff gauges were submerged underwater) or low water levels (the staff gauges were located in the dry riverbed).

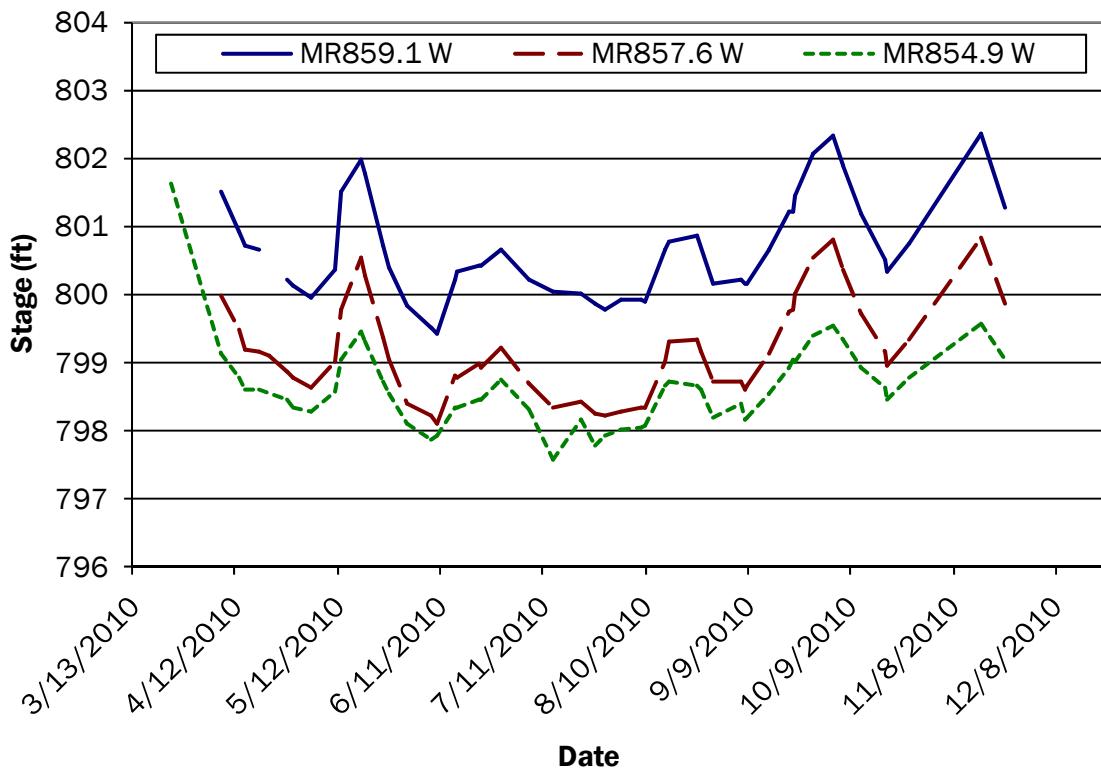


Figure 4. Mississippi River water elevations upstream of Saint Anthony Falls

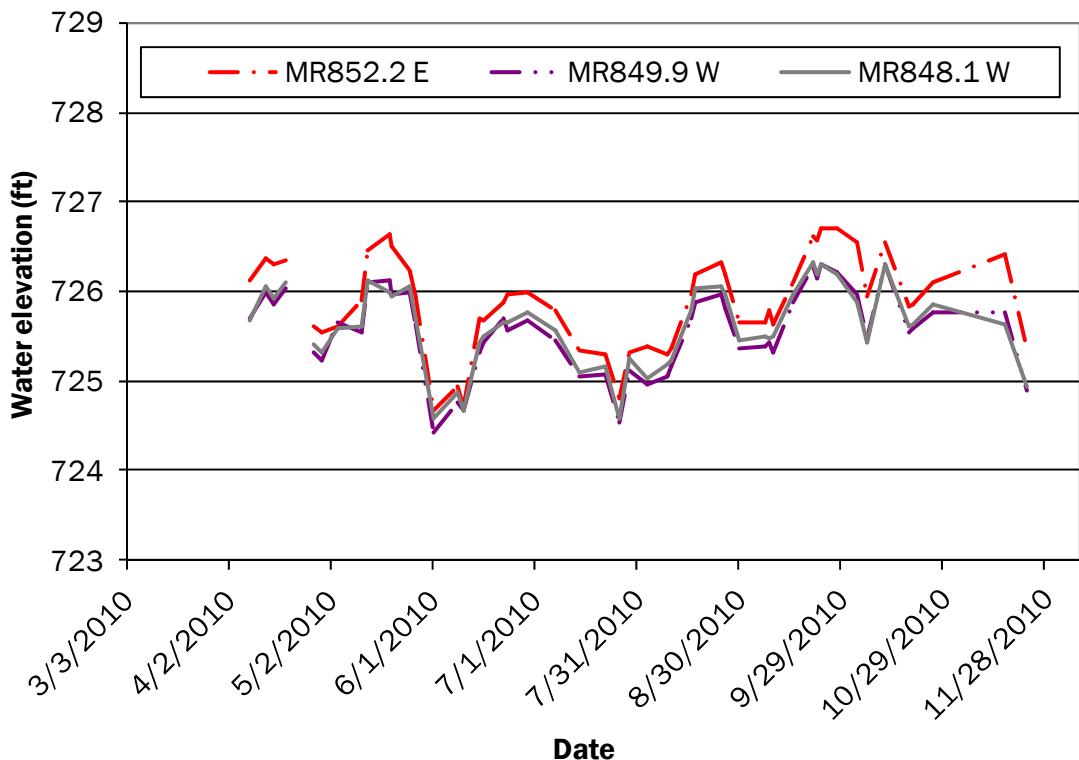


Figure 5. Mississippi River water elevations downstream of Saint Anthony Falls

Monitoring Results

E. coli

As noted under Background, the MWMO's reach of the Mississippi River is listed as an impaired water for fecal coliform pollution. In 2008, the MPCA changed the bacteria water quality standard from fecal coliform to *E. coli* for bacteria monitoring in Minnesota. The standard for *E. coli* in 2B and 2Bd waters is 126 CFU/100mL for a monthly geometric mean of at least five samples. The geometric mean is equal to the nth root of the product of the n terms:

$$\text{Geometric mean}_y = \sqrt[n]{y_1 y_2 y_3 \dots y_n}$$

Site MR857.6W exceeded the *E. coli* standard in June and August, and all of the sites exceeded the standard in September (Figure 6). The *E. coli* concentrations are shown in Appendix D.

The MPCA *E. coli* standard also states that *E. coli* cannot exceed 1260 CFU/100mL in more than 10% of the samples taken in one month. Sites MR859.1W, MR857.6W, MR849.9W, and MR848.1W exceeded this standard in various months. Table 4 presents a summary of *E. coli* exceedances. The *E. coli* concentrations for each sample collected are shown in Appendix D.

As these results are highly dependent on precipitation—both in the watershed and upstream—results may differ drastically from year to year. The MWMO does not support interpretation or assumptions based solely on one year of data. The MWMO will continue to collect data on the Mississippi River to provide baseline data for development of TMDLs in the watershed.

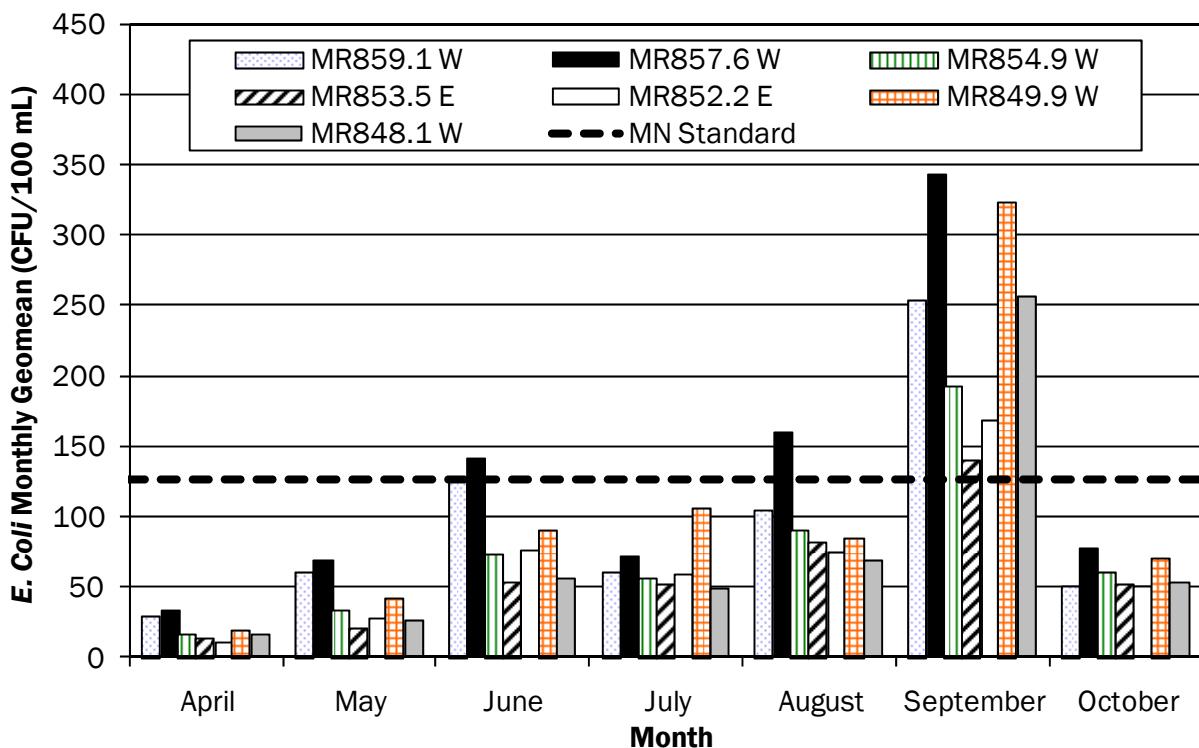


Figure 6. *E. coli* monthly geomean for the Mississippi River monitoring sites

Table 4. Sites that exceed the monthly *E. coli* geomean for the Mississippi River

Month	Sites that exceed monthly geomean	Sites that exceed 1260 CFU/100 mL in > 10% of samples	Sites that do not exceed the standards
April	None	None	All
May	None	MR857.6W	MR857.6W
June	MR857.6W	MR857.6W	MR859.1W, MR 854.9W, MR853.5E, MR852.2E, MR849.9W, MR848.1
July	None	None	All
August	MR857.6W	MR857.6W	MR859.1W, MR 854.9W, MR853.5E, MR852.2E, MR849.9W, MR848.1
September	All	MR859.1W, MR857.6W, MR849.9W, MR848.1	None
October	None	MR859.1W, MR857.6W, MR849.9W, MR848.1	MR854.9W, MR853.5E, MR852.2E

Two additional factors should be considered when evaluating these results. First, these results are based on a maximum of eight samples collected per month. Had more samples been collected, the data may have exhibited different results. Second, two unique features of the MWMO watershed are the Upper and Lower Saint Anthony Falls. The Mississippi River water mixes as it flows over the falls, likely affecting water quality.

Dissolved Oxygen, pH, Transparency, and Specific Conductivity

The MWMO monitored dissolved oxygen, pH, transparency, and specific conductivity on a weekly basis throughout the 2010 sampling season. These parameters are basic measures that indicate the health of a waterbody, as they contribute to survival of fish and other aquatic organisms and plants. Refer to Appendix D for the monitoring data.

Loring Pond

Loring Pond is the only lake in the MWMO watershed. Refer to the 2005 Annual Monitoring Report (MWMO, 2006) for an overview and history of Loring Pond. Refer to Figure A.1 in Appendix A for the location of Loring Pond.

Water Level

The MWMO monitored water level data (typically referred to as stage data) in Loring Pond with the Minneapolis Park and Recreation Board (MPRB) staff gauge installed on the South Bay outlet. Water level fluctuations throughout the 2010 sampling season are shown in Figure 7. Water levels were based on a selected benchmark of 100 feet.

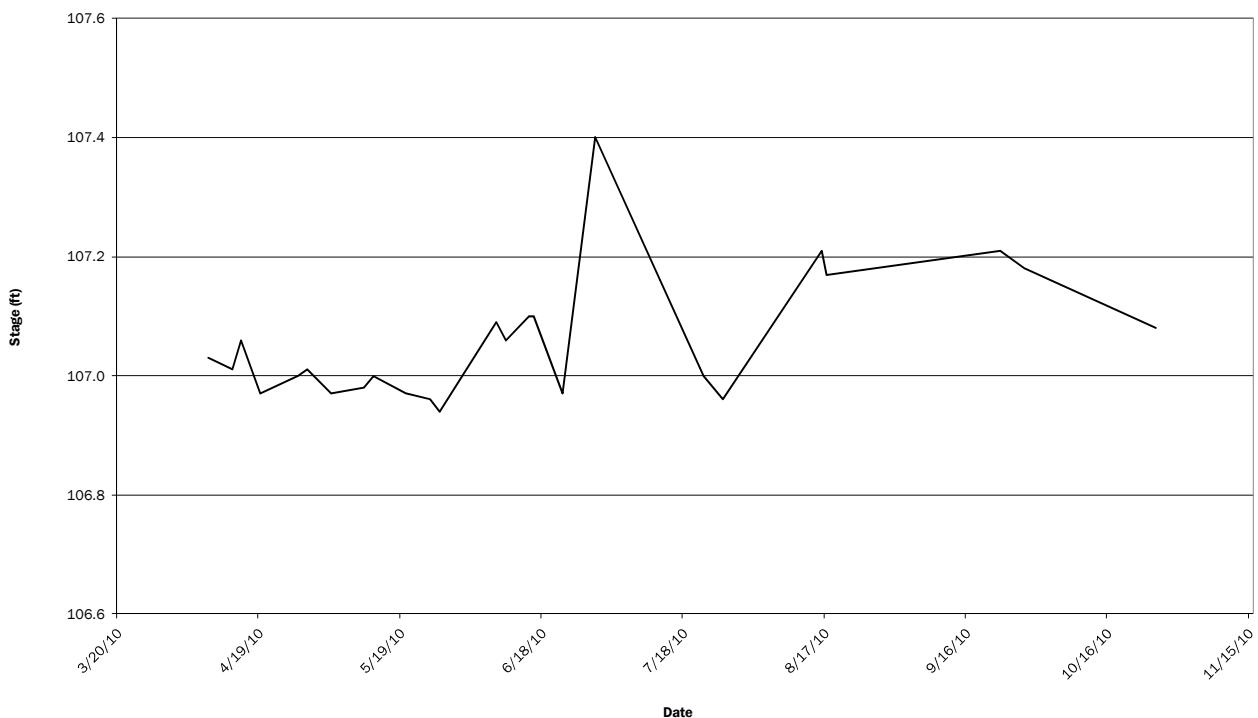


Figure 7. Loring Pond South Bay water level data based on a 100-foot benchmark

Monitoring Results

E. coli

Loring Pond is classified for 2B water use, therefore the same water quality standards apply as for the Mississippi River monitoring sites. Loring Pond exceeded the MPCA standard from May through October (Figure 8). The *E. coli* results are highly dependent on climate conditions, therefore results may differ drastically from year to year. Although *E. coli* in Loring Pond exceeded the standard for 2B waters, it is not listed on the impaired waters list. The MPCA does not currently assess lakes for bacteria.

Dissolved Oxygen, pH, Transparency, and Specific Conductivity

Due to the closed nature of a lake system, their dissolved oxygen, pH, and specific conductivity will often differ greatly from rivers. While rivers are always receiving “new” water from upstream, lakes contain the same water throughout the sampling season. Precipitation, stormwater, and occasional pumping of water from the recharge well are the major water inputs to Loring Pond. Figure 9 exhibits the dissolved oxygen, pH, transparency, and specific conductivity data for Loring Pond.

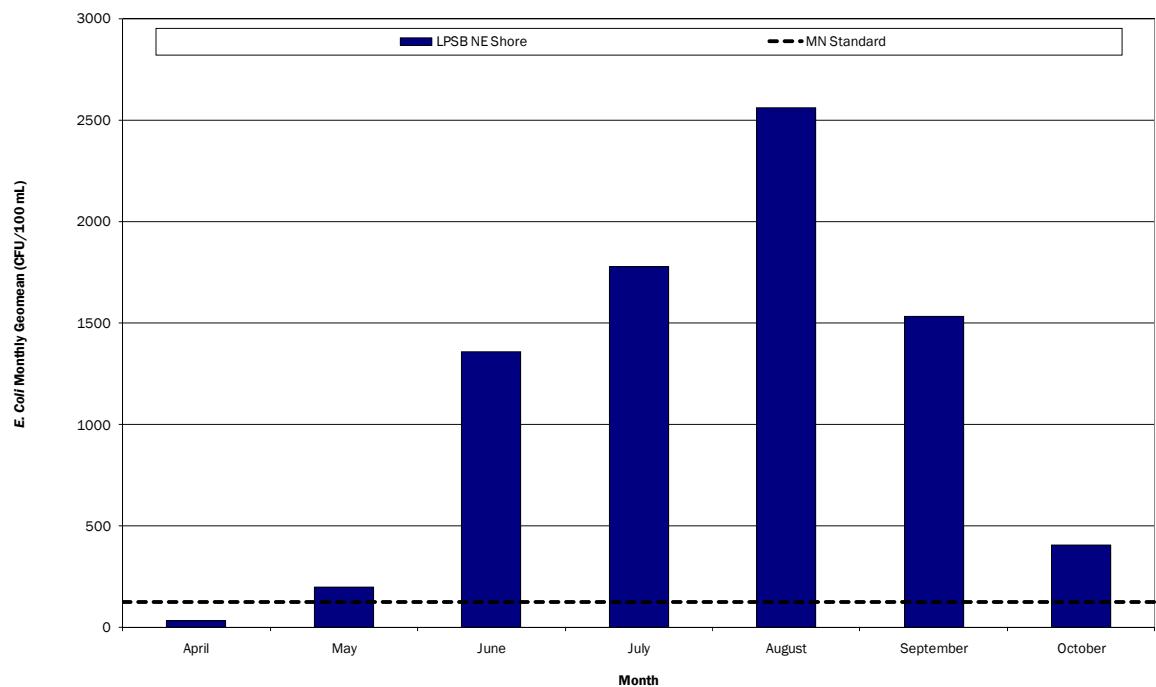


Figure 8. *E. coli* monthly geomeans for Loring Pond

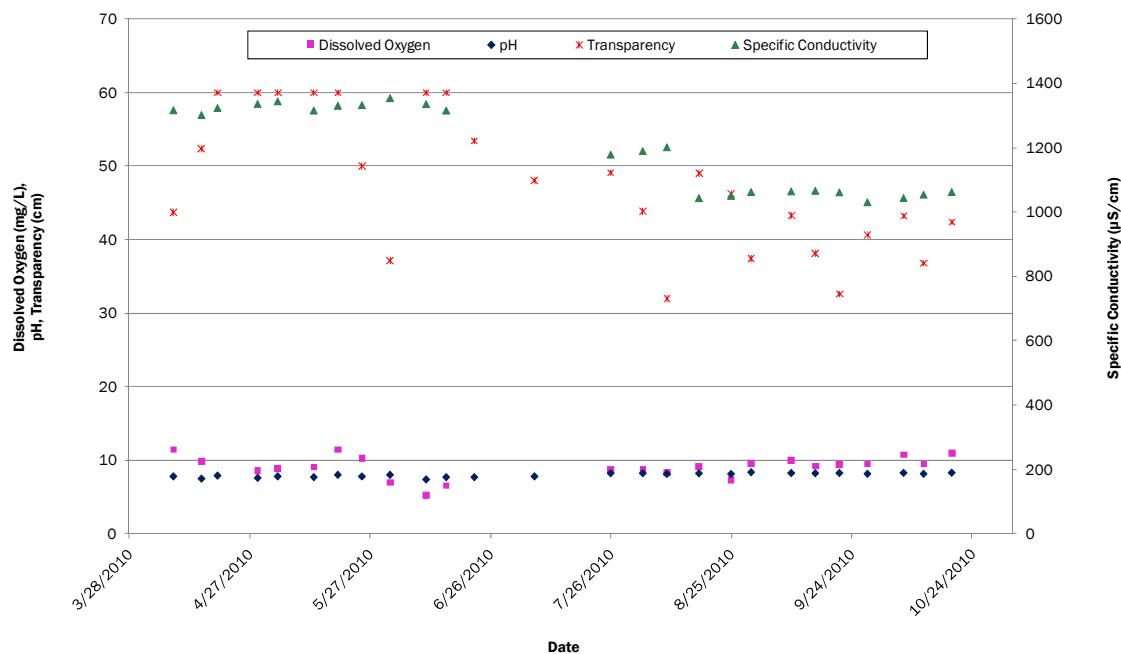


Figure 9. Dissolved oxygen, pH, transparency, and specific conductivity for Loring Pond

Stormwater

The MWMO monitored five stormwater outfalls into the Mississippi River and one stormwater pipe at the jurisdictional boundary of Saint Anthony Village and Minneapolis. The monitored outfalls were chosen because they are the most extensive drainage systems within the watershed, and they are accessible. (Refer to Figure A.1 in Appendix A for the outfall locations.) Refer to the 2005 Annual Monitoring Report (MWMO, 2006) and the Annual Monitoring Report 2007 (MWMO, 2009) for site descriptions for the stormwater monitoring sites. Water quality data for each site are provided in this section.

A stormwater drainage system refers to the area that drains to one stormwater outfall. Land uses in the stormwater drainage systems affect water quality. The amount of impervious surfaces and potential pollutants differs between industrial and residential land uses. A future objective of the monitoring program is to investigate the impact of specific land uses on water quality. Refer to the Annual Monitoring Report 2007 (MWMO, 2009) for land uses in the watershed.

Water Level

Water level in a stormwater pipe is very different from water levels in the Mississippi River and Loring Pond. Stormwater pipes respond quickly to rainfall, so water levels may rise many feet within a few minutes, depending on the size and intensity of the storm event. Some stormwater pipes only contain water during precipitation events, while others have baseflow throughout the year. Stormwater monitoring sites 1NE, 4PP, 6UMN, and 10SA have baseflow throughout the year.

Water levels (stage) for each stormwater outfall are listed in Tables E.1 – E.6 in Appendix E. Water

level data collected with the automated equipment are presented in Figures 10-13. It should be noted that, as the Mississippi River water level rises above the base of the stormwater outfalls, river tailwater affects the water level in the stormwater pipes. Water levels at 1NE show Mississippi River tailwater in the pipe between March 17 and March 25 (Figure 10). Also at 1NE, water level data were not collected between April 24 and May 21 due to equipment malfunctions. Water levels at 4PP show tailwater in the pipe from March 15 through April 2 and October 30 through November 12 (Figure 11). Data between August 10 and October 14 are not shown because the equipment was torn out of the pipe during a large storm event (Figure 11). Water levels at 6UMN show tailwater in the pipe from March 15 through April 2, September 29 through October 4, and October 30 through November 11 (Figure 12). For sites 4PP and 6UMN, data between November 26 and December 31 reflect an ice dam on the Mississippi River that caused river water to backup into the pipes (Figures 11 and 12).

Data for 7LSTU and 2NNBC are not included, as the data were not accurate due to Mississippi River tailwater in the stormwater tunnel.

Monitoring Results

The MPCA does not have water quality criteria for stormwater drainage systems, therefore data are not compared with standards. The MWMO monitors stormwater to characterize surface runoff in the watershed and determine land contributions to water quality in the Mississippi River. Samples are collected for bacteria, nutrients, sediment, inorganic, organic, and metals analyses. The MWMO will not draw conclusions or make assumptions based on this data until 3 - 5 years of accurate flow-weighted composite data are available. The data are presented in Tables E.1 – E.6 in Appendix E.

Discharge data collected with the automated equipment are presented in Figures 14 – 17. These figures show the same omissions of data described in the stormwater water level section.

Discharge data for 7LSTU and 2NNBC were not available due to Mississippi River tailwater in the stormwater tunnel.

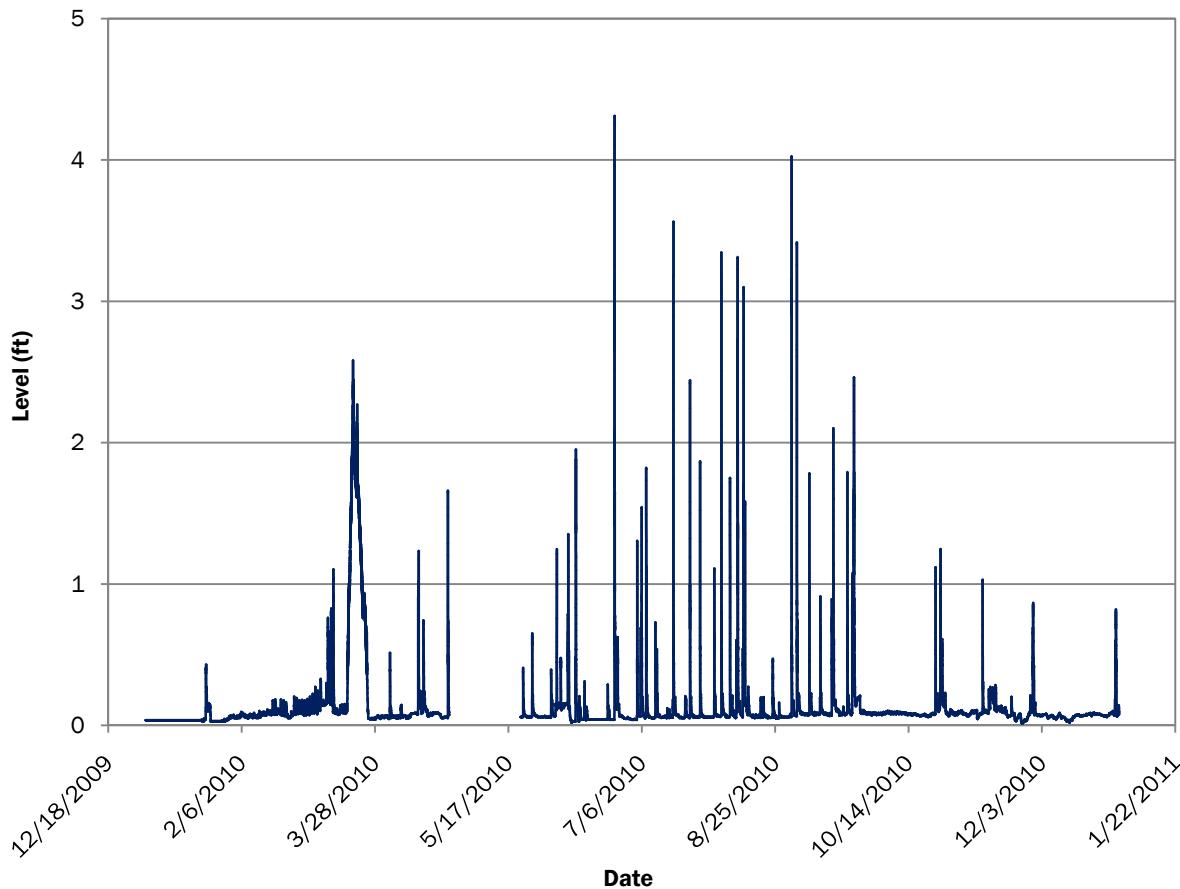


Figure 10. Water level for 1NE

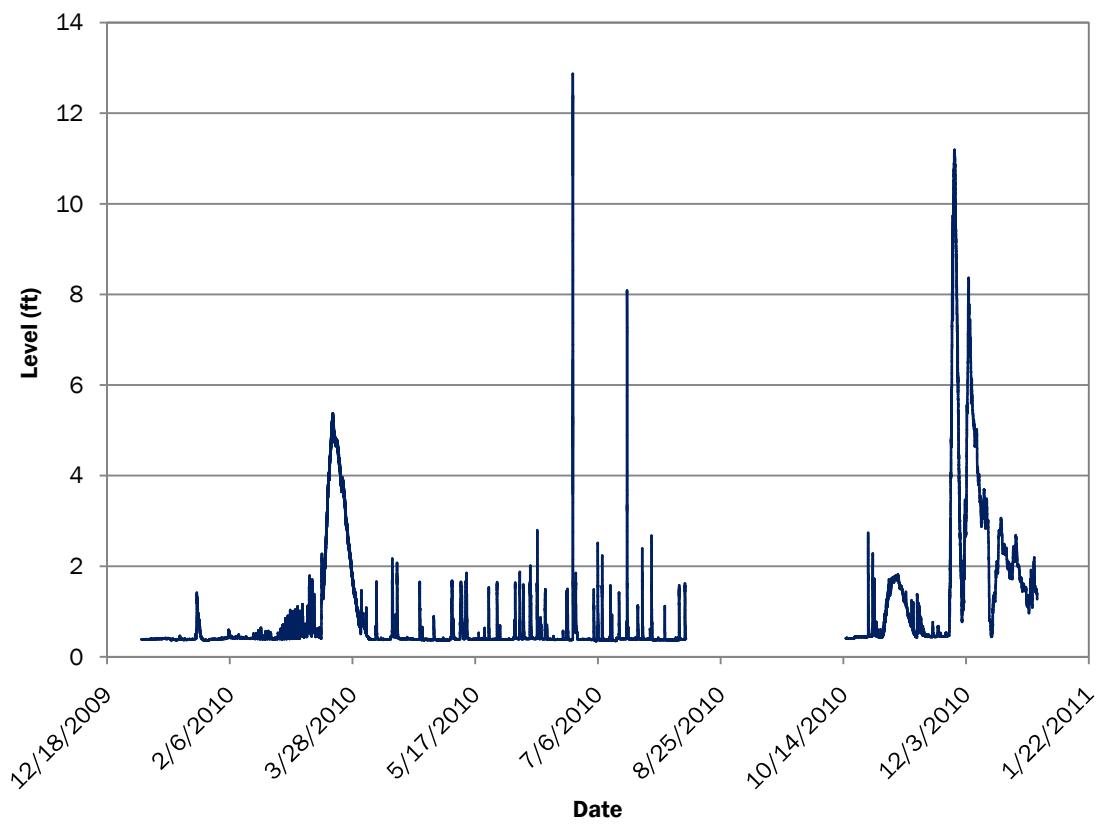


Figure 11. Water level for 4PP

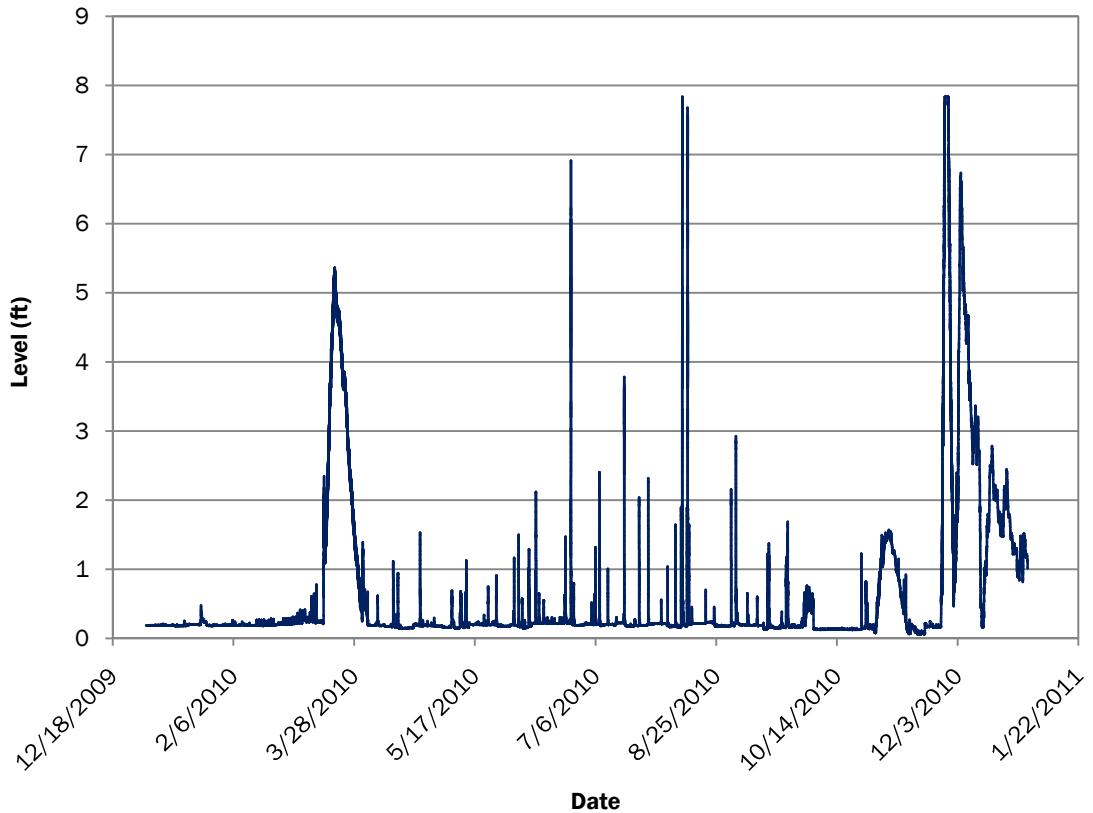


Figure 12. Water level for 6UMN

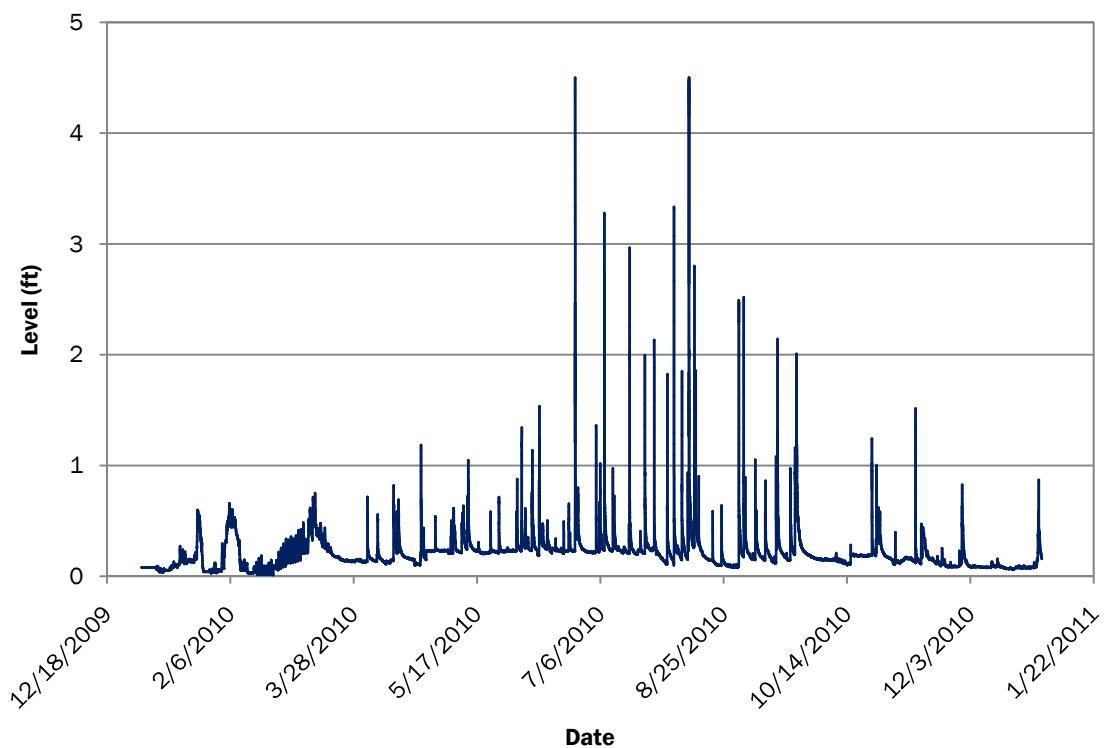


Figure 13. Water level for 10SA

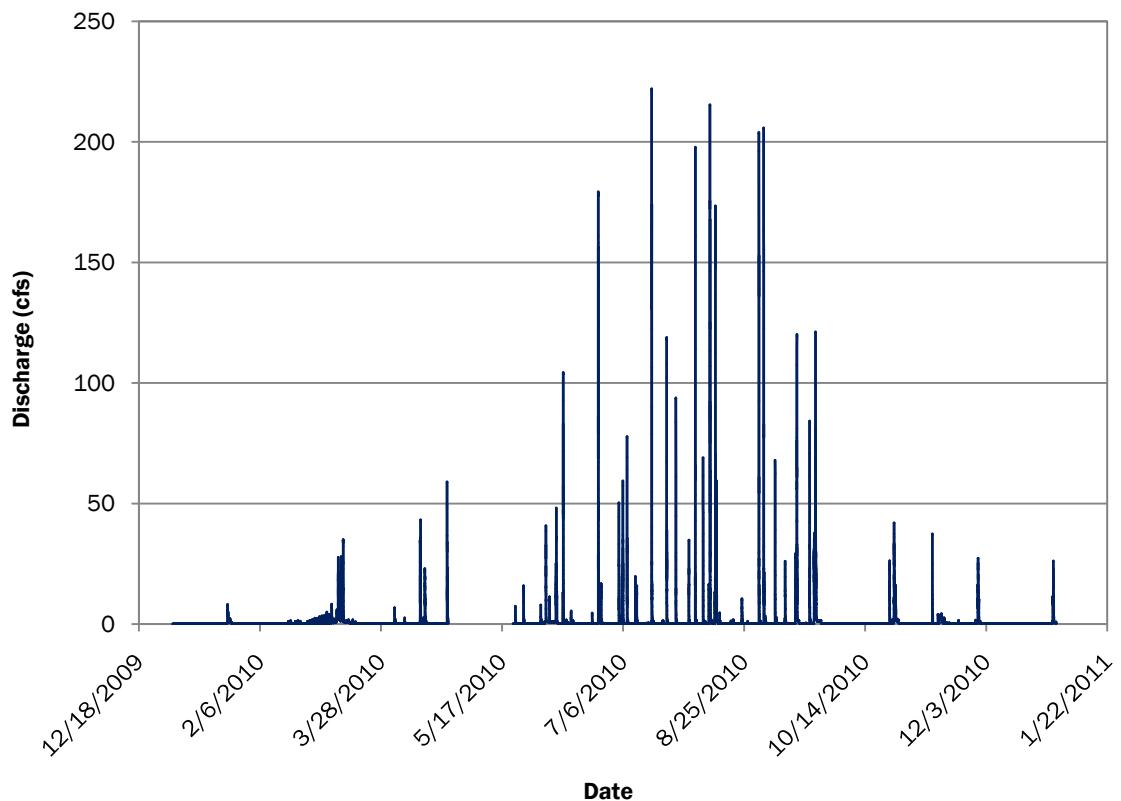


Figure 14. Discharge for 1NE

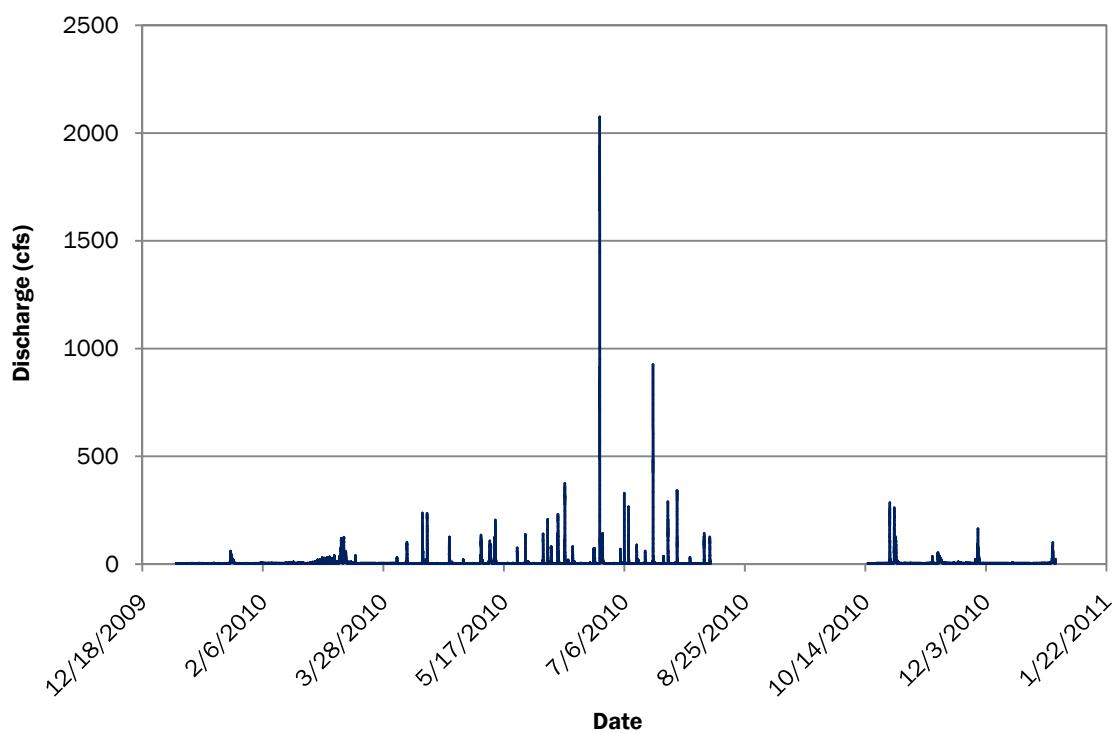


Figure 15. Discharge for 4PP

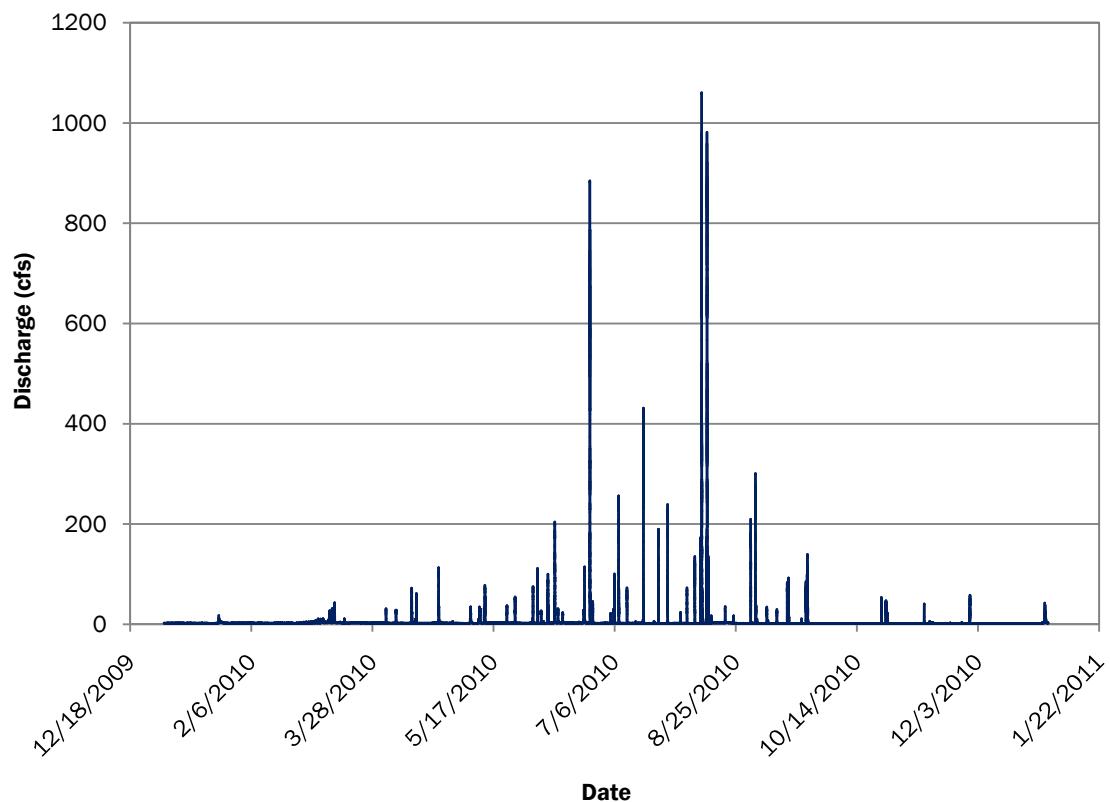


Figure 16. Discharge for 6UMN

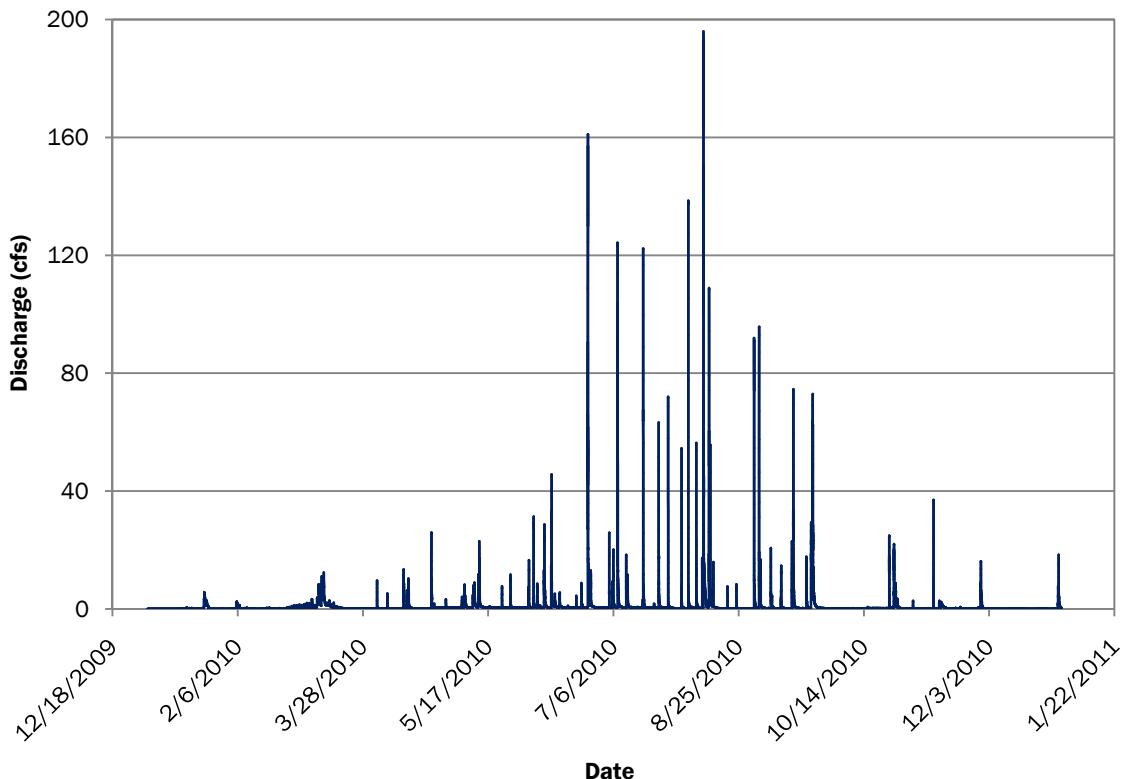


Figure 17. Discharge for 10SA

Kasota Ponds

The MWMO monitors seven locations in the Kasota Ponds. Refer to the Annual Monitoring Report 2008 (MWMO, 2010) for site-specific details. The MWMO began winter monitoring of the wetlands in December 2010. Samples were collected through a hole drilled in the ice when ice thickness permitted staff to access the wetlands.

Monitoring Results

The MWMO monitors Kasota Ponds to characterize water quality in its wetlands. Samples are collected for nutrients, sediment, inorganic, and metals analyses. The MPCA water quality criteria indicate that wetland water quality should maintain background. Background water quality has not yet been determined for MWMO wetlands. The data are presented in Tables F.1 – F.7 in Appendix F.

Work Plan

Assessment of 2010

The MWMO completed all of its monitoring objectives for 2010. Staff added a new river monitoring site to aid in data collection for unassessed reaches of the Mississippi River for the Upper Mississippi River Bacteria TMDL project. The MWMO continued to share data through the MPCA Storage and Retrieval (STORET) database and the Annual Monitoring Report. Staff also continued to assist Minneapolis with their illicit discharge detection program.

Additional work conducted by the MWMO included partnering with the MPCA to provide technical expertise and data collection for the Twin Cities Metropolitan Area (TCMA) Chloride Project.

MWMO staff improved stormwater monitoring methods to reduce time periods with no data or erroneous data for quantity measurements including level, velocity, and flow. However, the challenges of monitoring stormwater in deep, large stormwater tunnels prevented staff from collecting consistent automated composite samples at 4PP and 6UMN stormwater sampling sites. When possible, staff did collect grab samples during storm events. Staff worked with the sampling equipment manufacturers to develop solutions to the challenges and will continue to do so in 2011.

2011 Work Plan

The MWMO will continue to monitor all the sites listed in this report. Goals for 2011 include:

- Find solutions to deep stormwater tunnel automated sample collection
- Develop biological sampling protocols for the Kasota Ponds wetlands
- Install equipment at the 10SA monitoring site to measure conductivity continuously as part of the MPCA TCMA Chloride Project
- Continue working with the MPCA on the Upper Mississippi River Bacteria TMDL
- Begin work on a 5-year comprehensive monitoring plan
- Share MWMO data through the MPCA EQuIS database and the Annual Monitoring Report
- Coordinate with the City of Minneapolis to assist with their illicit discharge monitoring program
- Collect data for the City of Minneapolis's National Pollutant Discharge Elimination System (NPDES) permit

Future Recommendations

Future needs of the MWMO include (1) improvements in automated sampling technology to collect samples from deep, large stormwater tunnels, and (2) development of big river monitoring methodology to collect accurate, representative data from the Mississippi River in a dense, urban watershed with over 70 outfalls and two streams discharging to the river.

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Appendix A – Watershed Maps

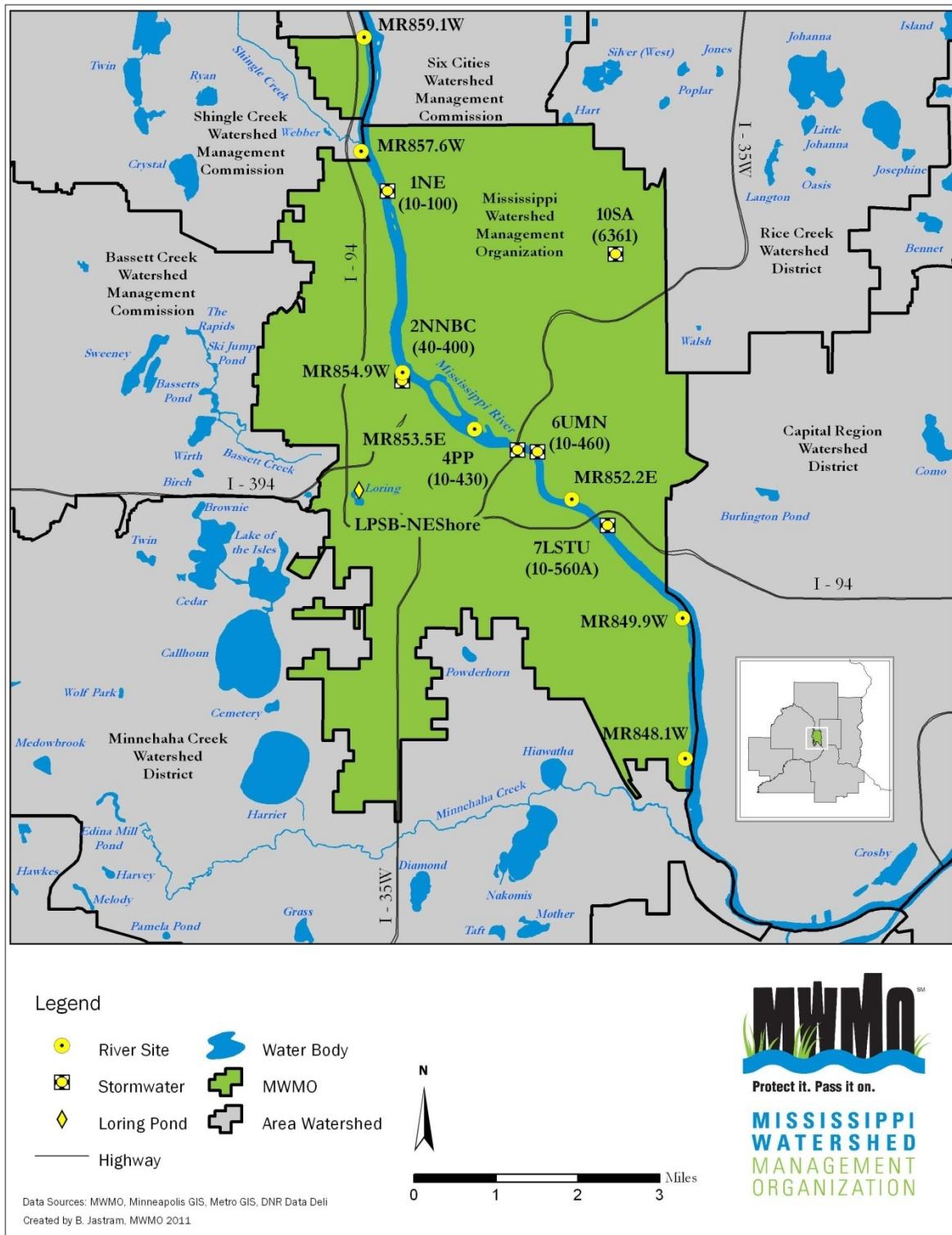
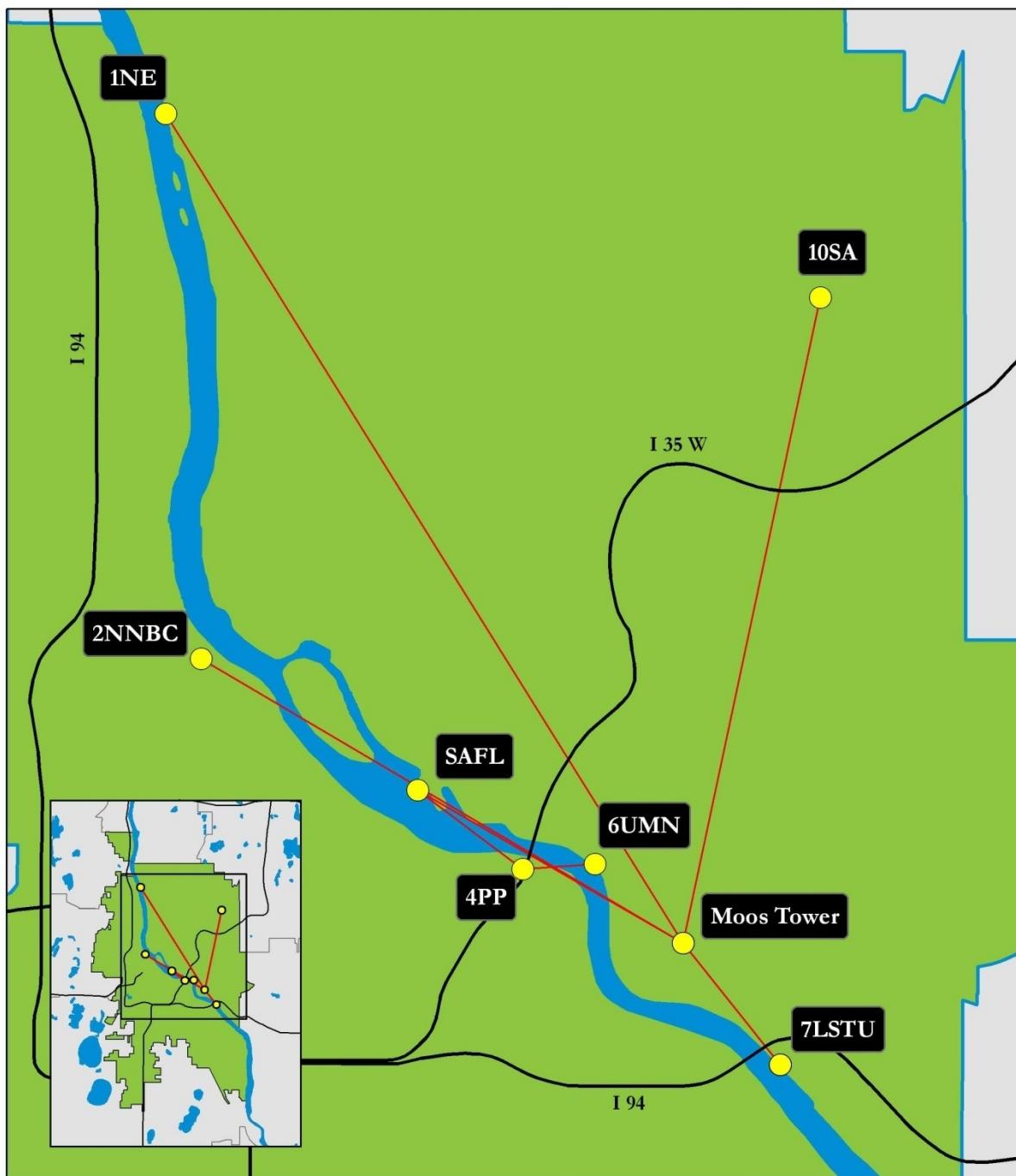


Figure A.1. MWMO watershed boundary and monitoring sites



Figure A.2. Kasota Ponds monitoring sites



- Radio
- Radio Link
- Freeway

0 0.75 1.5 Miles

Created by: Brian Jastram
Data Sources: MWMO, DNR and MetroGIS



Figure A.3. Real-time monitoring network

Appendix B – Laboratory Methods and Certification

Table B.1. Laboratory methods and certification for each analyte

Analyte	Lab	Method	Certified
Total Metals (Copper, Nickel, Lead, Zinc, Cadmium, Chromium, Mercury)	Metropolitan Council	EPA 200.8 with ATP (Mercury) EPA 245.7	Yes
Total Soluble Metals	Metropolitan Council	EPA 200.8 with ATP (Mercury) EPA 245.7	Yes
Total Chemical Oxygen Demand	Metropolitan Council	EPA 410.4 Rev 2.0	Yes
Carbonaceous Biological Oxygen Demand (CBOD) 5-Day	Metropolitan Council	SM 5210 B-01	Yes
Total 5-day BOD	Metropolitan Council	SM 5210 B-01	No*
Total Organic Carbon	Metropolitan Council	SM 5310 A & C	n/a
Total & Volatile Suspended Solids	Metropolitan Council	SM 2540 D	Yes
Total Dissolved Solids	Metropolitan Council	SM 2540 C	No
Total Alkalinity	Metropolitan Council	EPA 310.2	Yes
Total Hardness	Metropolitan Council	SM 2340 C-97	Yes
Total Chlorides	Metropolitan Council	EPA 300.0 Rev 2.1/SM 4500-CI E-97	Yes
Total Sulfates	Metropolitan Council	EPA 300.0 Rev 2.1	Yes

*No = Indicates that the lab follows standard certification test methods but has not sought certification from the Minnesota Department of Health.

n/a = The Minnesota Department of Health does not have certification for the analyte.

Table B.1 continued. Laboratory methods and certification for each analyte

Analyte	Lab	Method	Certified
Fluoride	Pace Analytical Services, Inc.	SM 4500-F SPADNS Method, Ref SM 20 th ed. P 4-82	Yes
Total Phosphorus plus Total Kjeldahl Nitrogen	Metropolitan Council	EPA 365.4 & EPA 351.2 Rev 2.0	Yes
Dissolved Phosphorus	Metropolitan Council	EPA 365.4	Yes
Orthophosphorus	Metropolitan Council	SM 4500-P E	Yes
Total Ammonia Nitrogen	Metropolitan Council	EPA 350.1 Rev 2.0	Yes
Nitrate & Nitrite Nitrogen	Metropolitan Council	4500 NO ₃ H-00	Yes
Total Volatile Organic Compounds	Metropolitan Council	EPA 624/625	Yes
Oil and Grease	Metropolitan Council	SM 5520 D	n/a
<i>E. coli</i>	Three Rivers Park District Water Resources Laboratory	SM 9223 B	Yes

n/a = The Minnesota Department of Health does not have certification for the analyte.

Appendix C – Precipitation Event Sampling Data

Table C.1. Precipitation event data and samples collected. A precipitation event is defined as being greater than 0.10 inches and separated by 8 hours. The rain gauge is located at Saint Anthony Falls Laboratory.

Event	Start Date/Time	End Date/Time	Precip. (inches)	Duration (hours)	Intensity (in/hr)	Sample Type	Site 1NE	Site 10SA	Site 2NNBC	Site 4PP	Site 6GUMN	Site 7LSTU
1	1/23/2010 915	1/23/2010 2125	0.22	12.50	0.018	Composite	X(l)	—	—	—	—	—
2†	1/25/2010	1/26/2010	n/a	n/a	n/a	Composite	X(l)	X(l)	—	—	—	—
3†	2/5/2010	2/6/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	—	—
4†	2/28/2010	2/29/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	—	—
5†	3/1/2010	3/2/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	X(l)	—
6†	3/2/2010	3/3/2010	n/a	n/a	n/a	Composite	—	X(l)	—	X	—	—
7†	3/3/2010	3/4/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	X(l)	—
8†	3/4/2010	3/5/2010	n/a	n/a	n/a	Cmp. & Grab	X	X(l)	—	—	X(l)	X(l)
9†	3/5/2010	3/5/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	X(l)	—
10†	3/6/2010	3/7/2010	n/a	n/a	n/a	Composite	—	X(l)	—	—	X(l)	—
11	3/9/2010 1355	3/10/2010 1700	0.31	27.00	0.011	Composite	X	X(l)	—	—	—	X
12	3/11/2010 855	3/11/2010 1355	0.21	5.00	0.042	Cmp. & Grab	X(l)	X(l)	X	X	X(l)	X
13	3/12/2010 400	3/12/2010 1015	0.12	6.25	0.019	Composite	X(l)	X(l)	—	—	—	—
14	4/6/2010 935	4/6/2010 1855	0.16	9.50	0.017	Composite	—	X(l)	—	—	X(l)	—
15	4/13/2010 250	4/13/2010 820	0.35	5.50	0.064	Cmp. & Grab	X(lec)	X(lec)	X(lec)	(ec)	X(lec)	(ec)
16	4/15/2010 230	4/15/2010 745	0.26	7.25	0.036	Composite	X(l)	—	—	—	X(l)	—
17	4/24/2010 505	4/24/2010 1140	0.51	5.50	0.093	Composite	X(l)	X(l)	—	X(l)	X(l)	—
18	5/7/2010 610	5/8/2010 930	0.55	27.50	0.020	Cmp. & Grab	X(l)	X(l)	X(l)	X(l)	—	X(l)
19	5/10/2010 1900	5/11/2010 1805	0.58	23.00	0.025	Cmp. & Grab	X(lec)	X(lec)	X(lec)	X(lec)	X(lec)	X(l)
20	5/12/2010 2345	5/14/2010 0710	0.39	31.50	0.012	Composite	X(l)	—	—	—	—	—
21	5/22/2010 1105	5/22/2010 1220	0.15	1.25	0.120	Composite	—	X(l)	—	X(l)	X(l)	—
22	5/25/2010 2015	5/25/2010 2200	0.20	1.75	0.114	Composite	X(l)	X(l)	—	X(l)	X(l)	—
23	6/1/2010 2340	6/2/2010 655	0.15	7.50	0.020	Composite	—	X(l)	—	X(l)	X(l)	—
24	6/3/2010 2300	6/4/2010 400	0.30	5.00	0.060	Cmp. & Grab	X(l)	X(l)	X(l)	X(l)	X(l)	—
25	6/5/2010 1300	6/5/2010 1635	0.24	3.50	0.069	Composite	X(l)	X(l)	—	X(l)	X(l)	—
26	6/8/2010 510	6/8/2010 1600	0.67	11.00	0.061	Cmp. & Grab	X(lec)	X(lec)	X(lec)	X(lec)	X(lec)	(ec)
27	6/11/2010 340	6/11/2010 810	0.68	4.50	0.151	Cmp. & Grab	X(l)	X(l)	X(l)	X(l)	X(l)	X(l)
28	6/12/2010 1215	6/12/2010 1825	0.12	6.25	0.019	—	—	—	—	—	—	—
29	6/14/2010 925	6/14/2010 1315	0.19	3.75	0.051	Grab	—	—	X(l)	—	—	X(l)
30	6/23/2010 325	6/23/2010 1605	0.22	12.75	0.017	Cmp. & Grab	(ec)	X(lec)	(ec)	X(lec)	X(lec)	—
31	6/25/2010 1750	6/25/2010 2100	1.99	3.25	0.612	Composite	—	X(l)	—	—	X(l)	—
32	6/26/2010 2035	6/26/2010 2355	0.29	3.25	0.089	—	—	—	—	—	—	—
33	7/4/2010 705	7/4/2010 810	0.14	1.00	0.140	—	—	—	—	—	—	—
34	7/5/2010 1315	7/5/2010 2355	0.43	10.25	0.042	Composite	X(l)	X(l)	—	—	X(l)	—
35	7/7/2010 1555	7/7/2010 1750	0.23	2.00	0.115	Composite	X(l)	X(l)	—	—	X(l)	—
36	7/11/2010 150	7/11/2010 235	0.13	0.75	0.173	Composite	X(l)	X(l)	—	—	—	—
37	7/17/2010 1705	7/17/2010 2140	1.38	4.50	0.307	Composite	X(l)	X(l)	—	—	X(l)	—
38	7/24/2010 110	7/24/2010 310	0.45	2.00	0.225	—	—	—	—	—	—	—
39	7/27/2010 2015	7/27/2010 2050	0.32	0.50	0.640	Composite	X(l)	X(lec)	—	—	X(l)	—
40	8/8/2010 125	8/8/2010 240	0.55	1.25	0.440	—	—	—	—	—	—	—
41	8/10/2010 1015	8/10/2010 1125	0.23	1.25	0.184	Grab	—	—	(ec)	(ec)	(ec)	—
42	8/10/2010 2045	8/10/2010 2355	3.05	2.75	1.109	—	—	—	—	—	—	—
43	8/12/2010 2030	8/13/2010 525	0.74	9.00	0.082	Composite	—	X(l)	—	—	—	—
44	8/13/2010 1605	8/13/2010 1615	0.21	0.25	0.840	—	—	—	—	—	—	—
45	8/20/2010 1240	8/20/2010 1250	0.12	0.25	0.480	—	—	—	—	—	—	—
46	8/24/2010 130	8/24/2010 330	0.15	2.00	0.075	—	—	—	—	—	—	—
47	8/31/2010 330	8/31/2010 730	0.54	4.00	0.135	Composite	X(l)	X(l)	—	—	X(l)	—
48	9/2/2010 305	9/2/2010 720	0.99	4.25	0.233	Composite	X(l)	X(l)	—	—	X(l)	—
49	9/6/2010 1915	9/6/2010 1955	0.17	0.75	0.227	Composite	X(l)	X(l)	—	—	—	—
50	9/10/2010 1950	9/11/2010 125	0.24	4.50	0.053	—	—	—	—	—	—	—
51	9/15/2010 520	9/15/2010 2315	0.95	18.00	0.053	Composite	X(l)	X(l)	—	—	X(l)	—
52	9/21/2010 50	9/21/2010 515	0.15	4.50	0.033	Composite	X(l)	X(l)	—	—	—	—
53	9/22/2010 2040	9/23/2010 1640	2.02	20.00	0.101	Cmp. & Grab	X(lec)	X(lec)	X(lec)	X(lec)	X(lec)	X(ec)
54	10/24/2010 205	10/24/2010 435	0.42	2.50	0.168	Composite	X(l)	X(l)	—	—	—	—
55	10/25/2010 1710	10/26/2010 1650	0.89	23.50	0.038	Cmp. & Grab	X(lec)	X(lec)	(ec)	X(l)	(ec)	—
56	11/13/2010 1450	11/14/2010 1000	0.54	19.00	0.028	—	—	—	—	—	—	—
57	11/29/2010 1155	11/30/2010 305	0.45	15.25	0.030	Grab	X(l)	X(l)	—	—	—	—
58	12/29/2010 1240	12/29/2010 1430	0.13	1.75	0.074	—	—	—	—	—	—	—
59	12/30/2010 710	12/30/2010 1905	0.41	12.00	0.034	Composite	X(l)	X(l)	—	—	—	—

† snowmelt event

n/a = not applicable

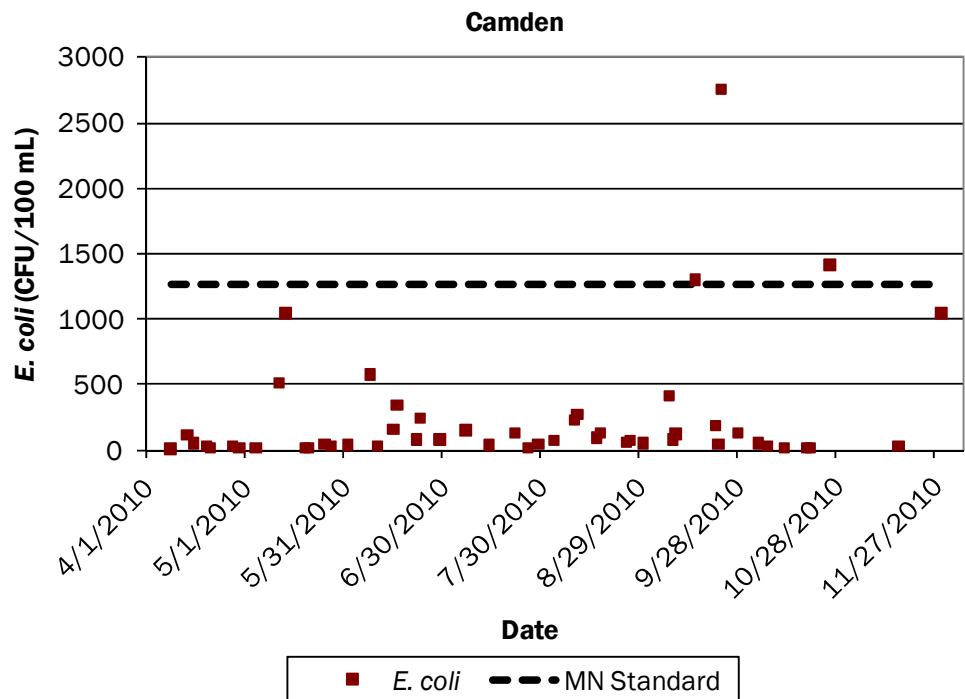
X = full suite of analytes

X(ec) = event sampled with *E. coli*

(ec) = event sampled with *E. coli* only

X(l) = event sampled with limited parameters generally due to holding times

Appendix D – Mississippi River Data



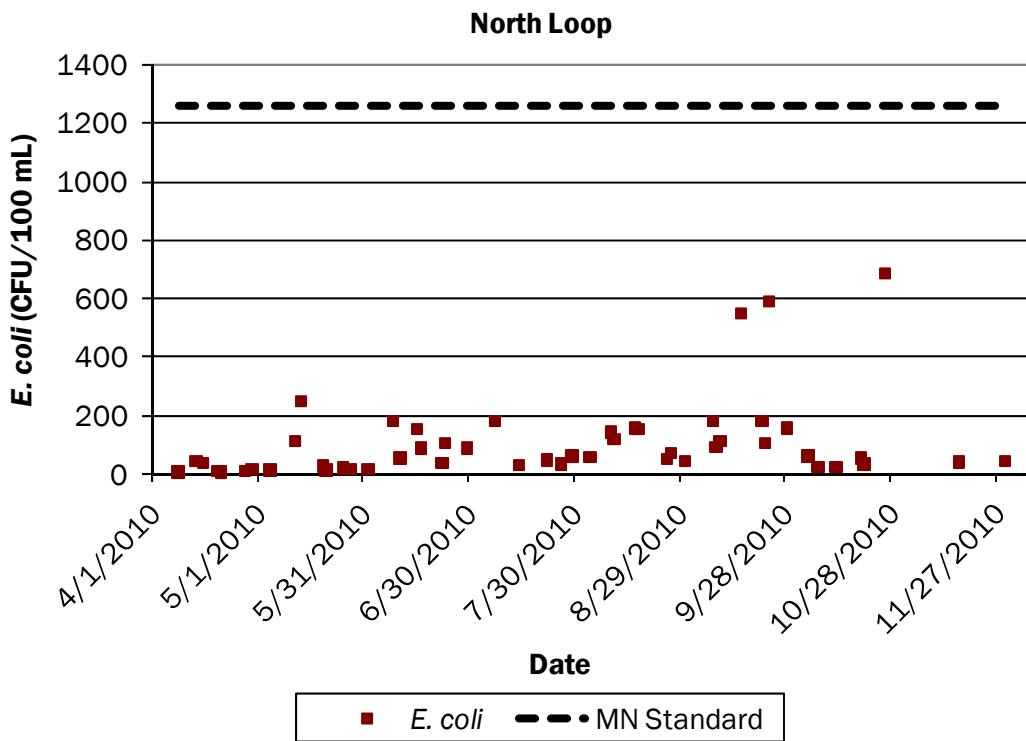


Figure D.3. *E. coli* data for MR854.9W

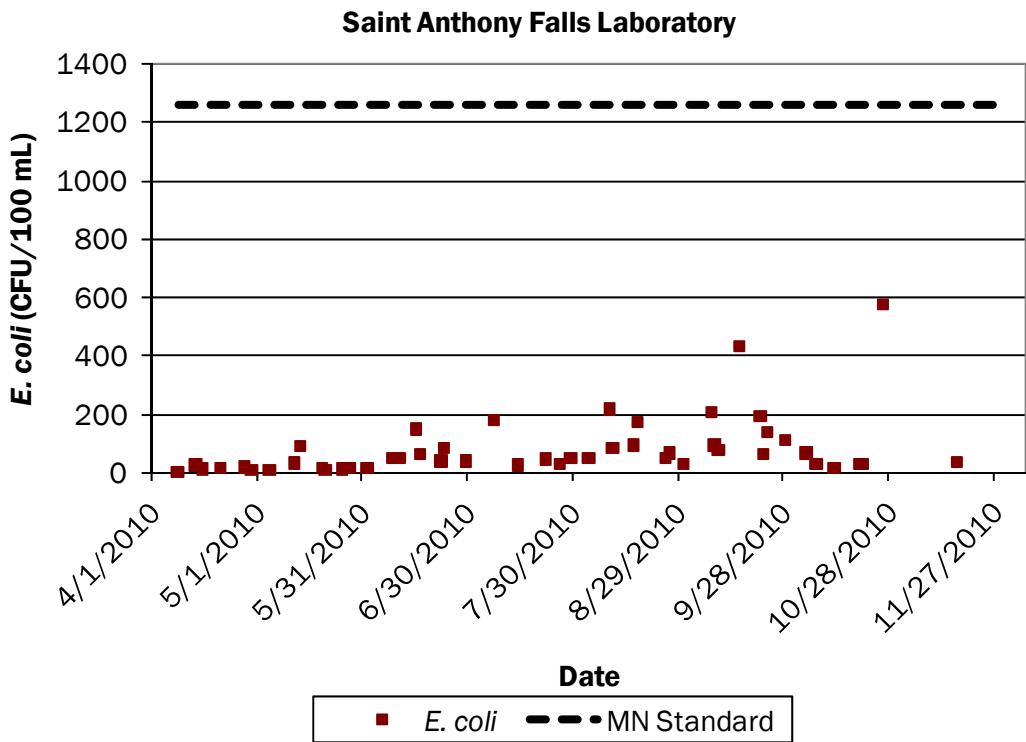


Figure D.4. *E. coli* data for MR853.5E

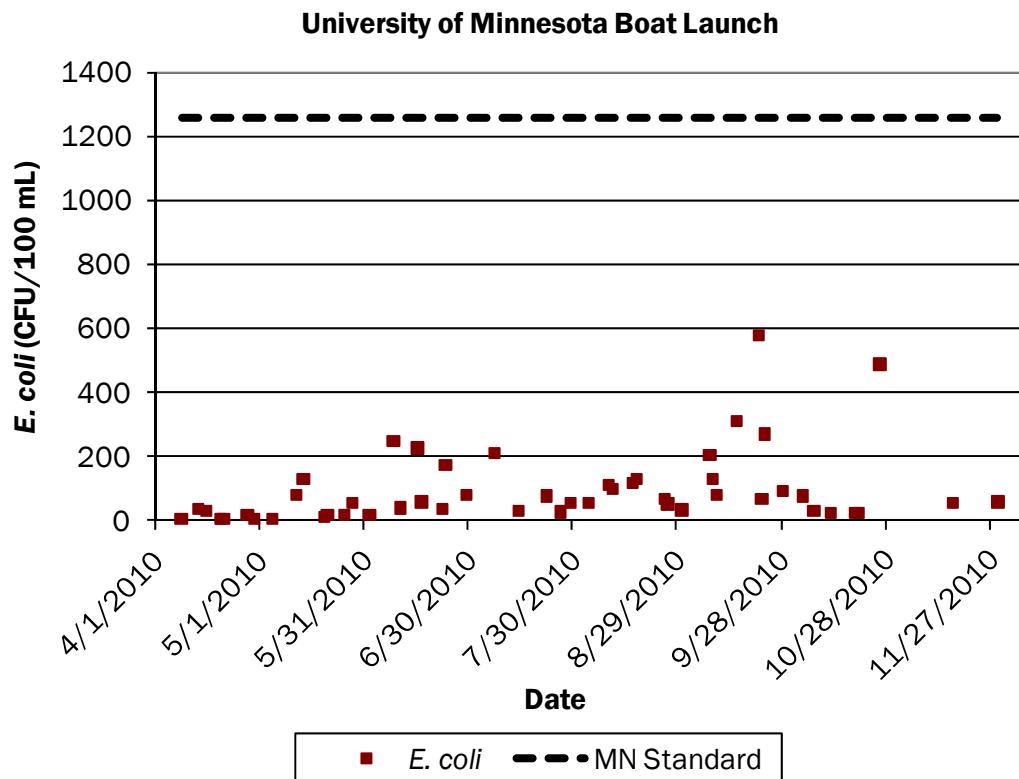


Figure D.5. E. coli data for MR852.2E

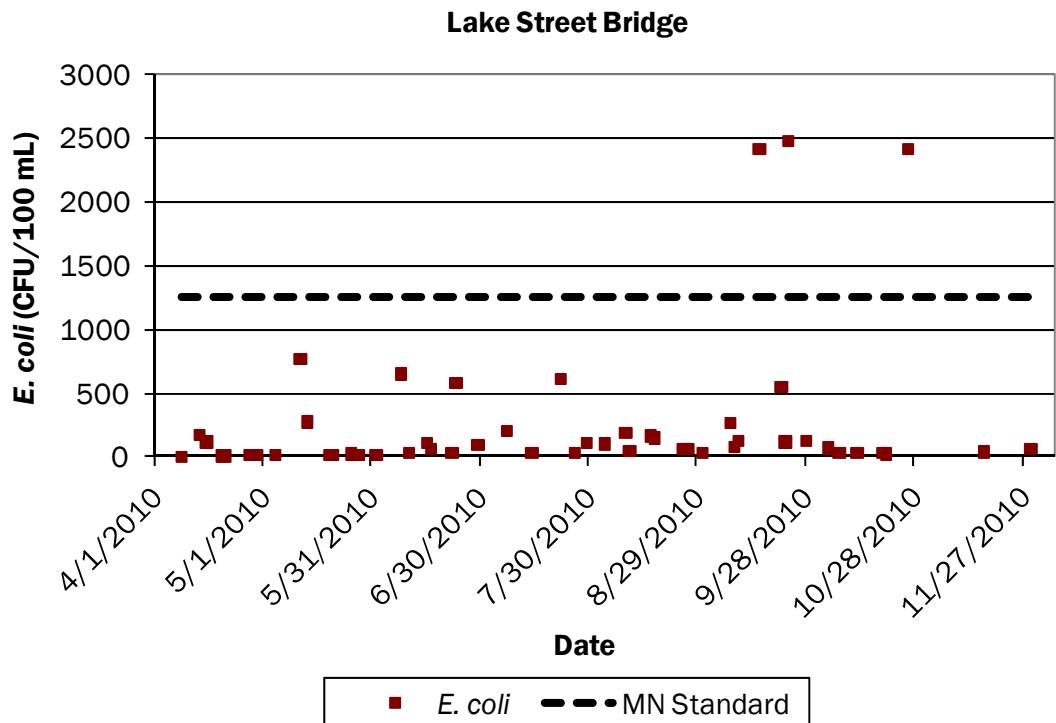


Figure D.6. E. coli data for MR849.9W

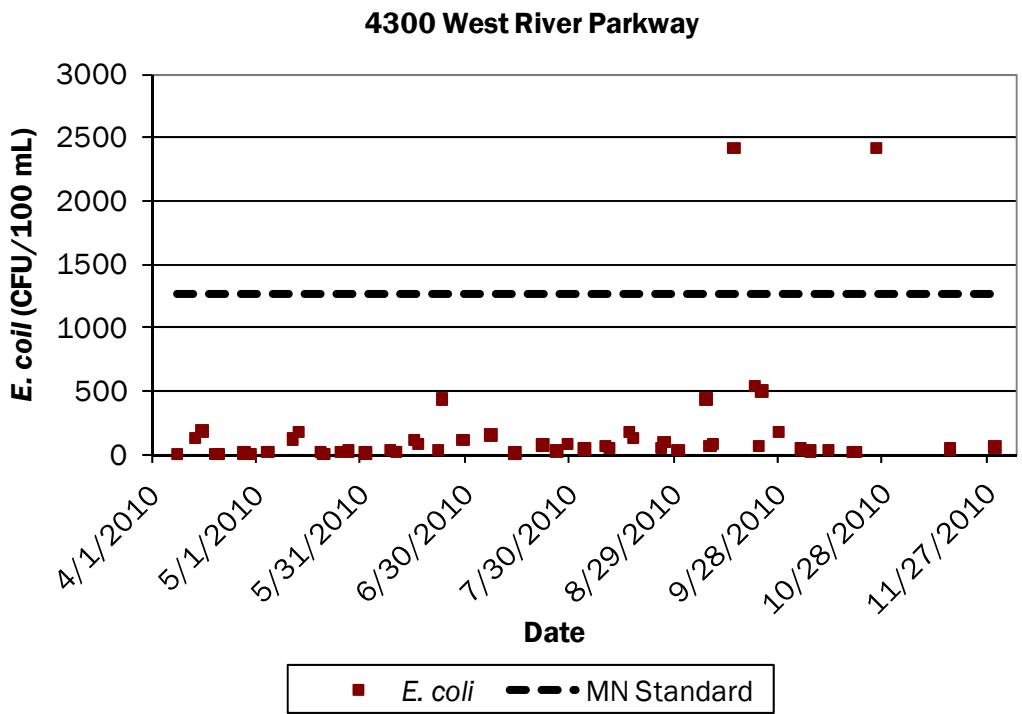


Figure D.7. *E. coli* data for MR848.1W

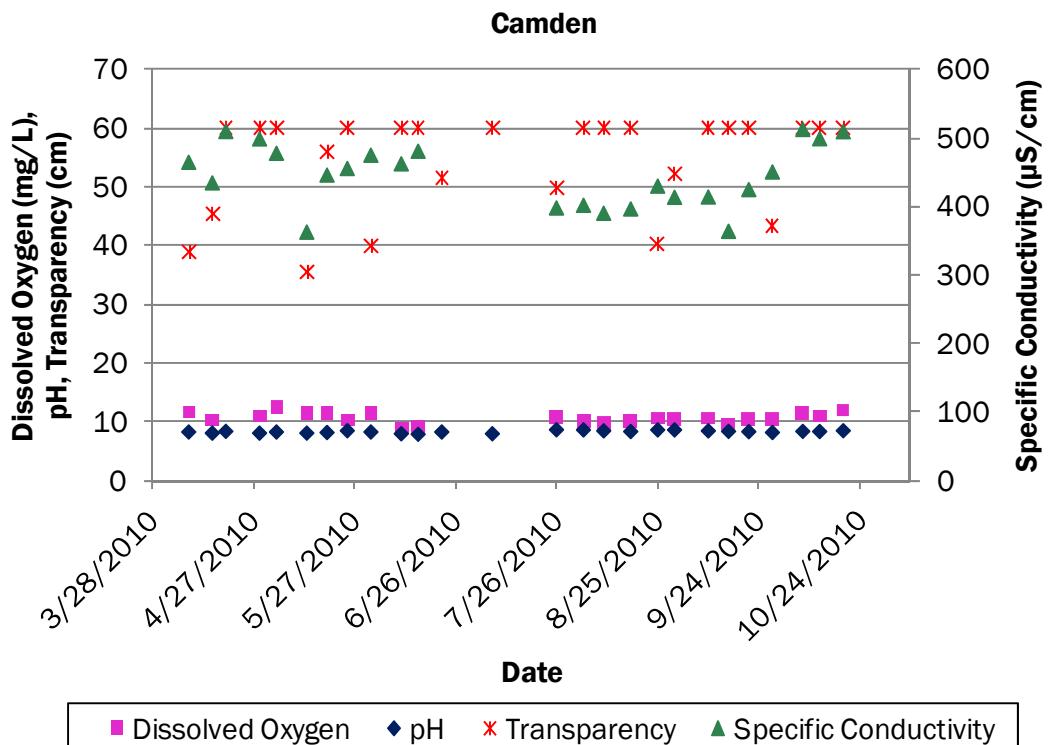


Figure D.8. Dissolved oxygen, pH, transparency, and specific conductivity for MR859.1W

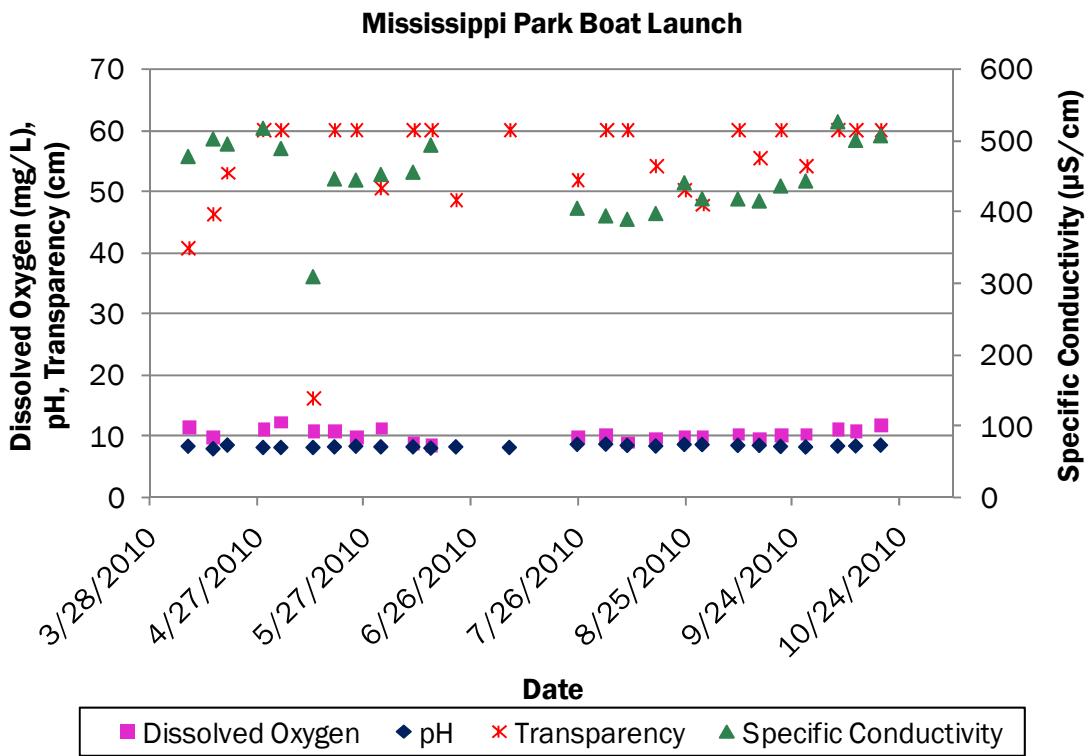


Figure D.9. Dissolved oxygen, pH, transparency and specific conductivity for MR857.6W

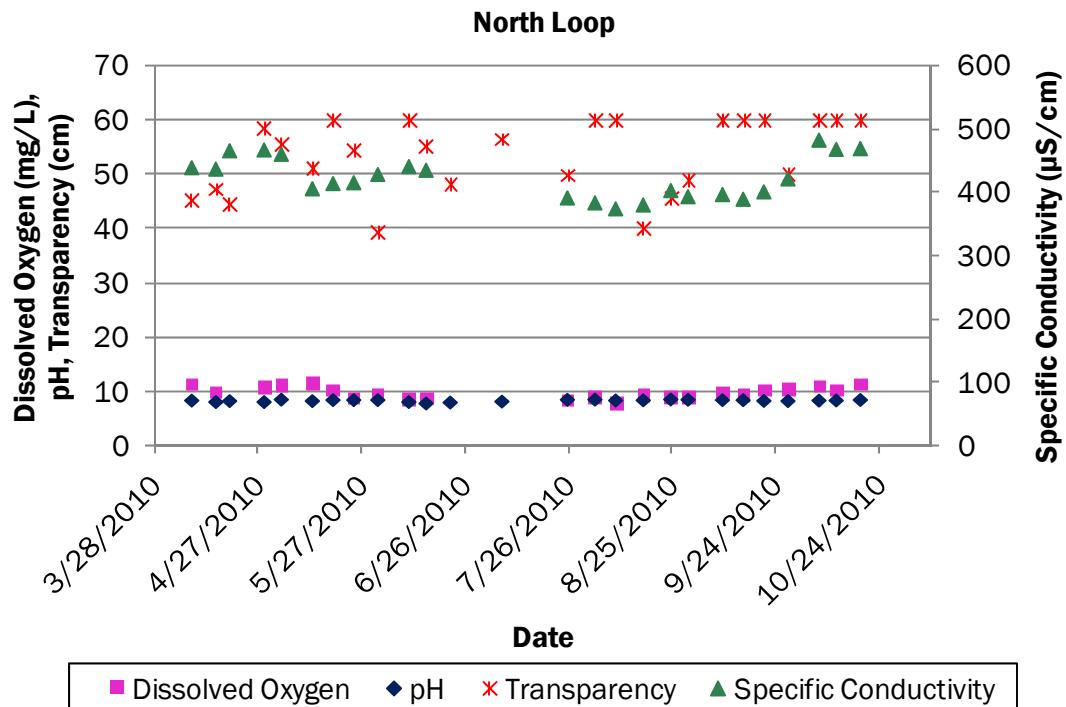


Figure D.10. Dissolved oxygen, pH, transparency, and specific conductivity for MR854.9W

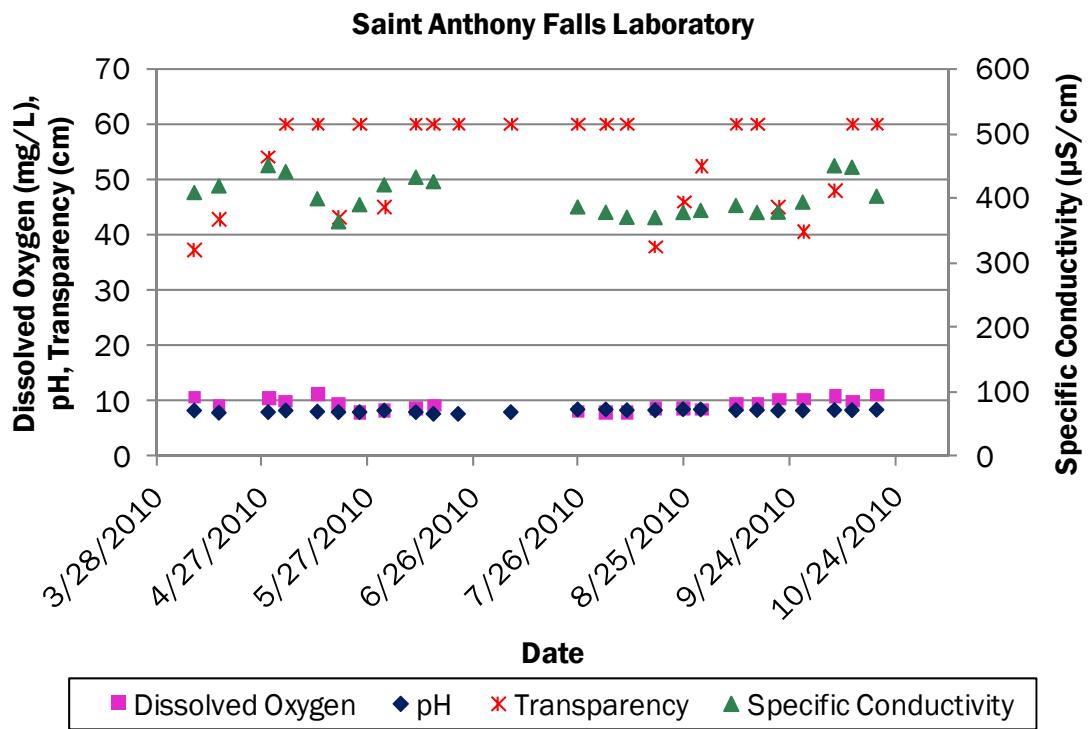


Figure D.11. Dissolved oxygen, pH, transparency, and specific conductivity for MR853.5E

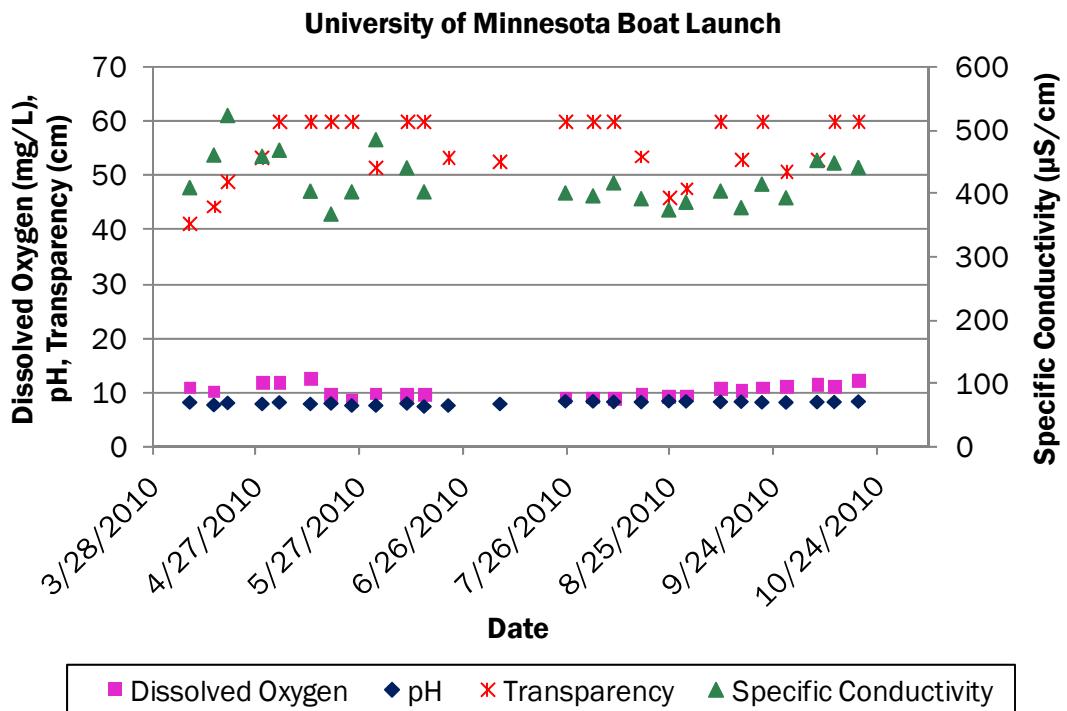


Figure D.12. Dissolved oxygen, pH, transparency, and specific conductivity for MR852.2E

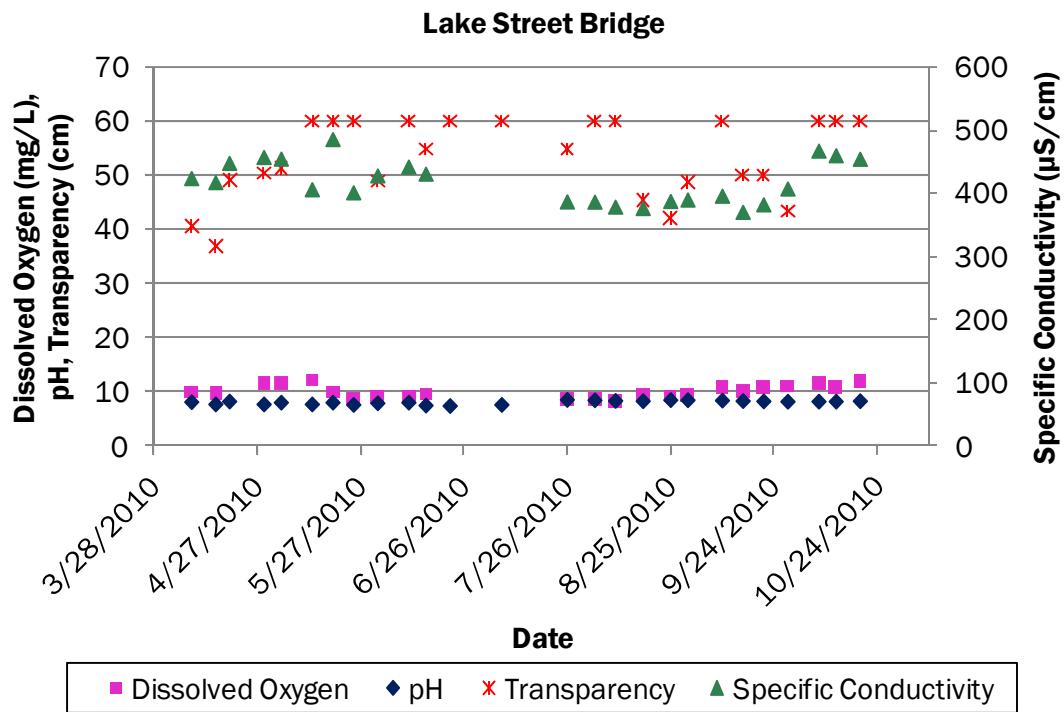


Figure D.13. Dissolved oxygen, pH, transparency, and specific conductivity for MR849.9W

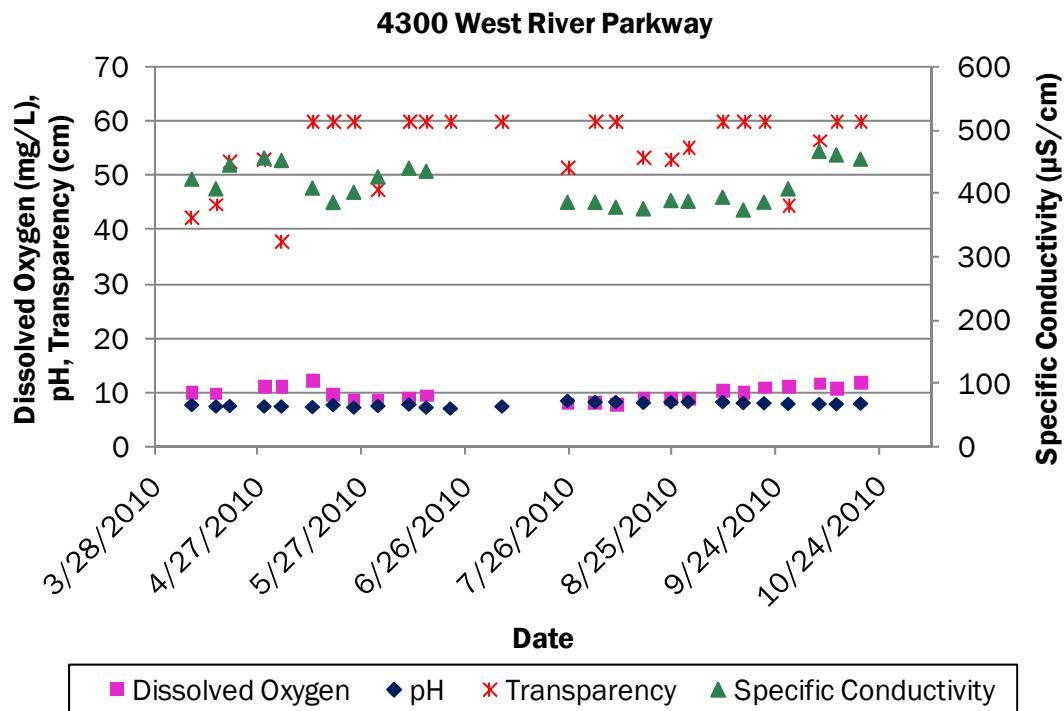


Figure D.14. Dissolved oxygen, pH, transparency, and specific conductivity for MR848.1W

Appendix E – Stormwater Monitoring Results

Table E.1. Monitoring Results for 1NE outfall

Table E.1 continued. Monitoring results for 1NE outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp	Water Temp (F)	Dissolved Oxygen (mg/L)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Phosphorus (mg/L)	Total Ortho Phosphorus (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)			
7/5/2010 15:16	7/5/2010 23:41	Storm Composite	75	76.3	—	—	—	7.70	27.2	—	—	—	—	76	3.78	0.064	0.239	0.062	1.10	0.13	0.04	0.35		
7/7/2010 15:57	7/7/2010 18:43	Storm Composite	75	75.6	—	—	—	—	7.80	14.2	—	—	—	—	65	5.18	0.077	0.329	0.066	1.80	0.20	0.03	0.73	
7/9/2010 8:55	7/9/2010 8:56	Base Grab	76	60.3	—	—	—	8.00	> 60.0	—	—	—	—	~ 2	~ 2	830	107.00	~ 0.019	0.057	0.014	0.86	~ 0.04	< 0.03	1.40
7/11/2010 2:37	7/11/2010 3:40	Storm Composite	70	71.1	—	—	—	7.20	> 20.0	—	—	—	—	—	114	4.44	0.134	0.292	0.113	1.70	0.20	0.06	0.70	
7/14/2010 7:45	7/14/2010 7:45	Base Grab	76	61.7	—	—	—	—	—	—	13	0.21	—	—	—	—	—	—	—	—	—	—	—	
7/17/2010 20:43	7/17/2010 21:57	Storm Composite	75	74.8	—	81.4	91.4	7.60	17.6	0.00	—	—	—	—	63	2.58	0.119	0.442	0.103	2.20	0.23	0.04	0.33	
7/19/2010 9:35	7/19/2010 9:36	Base Grab	75	59.7	—	1,008.0	1,235.0	7.10	> 60.0	0.60	—	—	—	~ 2	~ 2	728	97.20	~ 0.021	0.076	0.024	0.82	~ 0.05	< 0.03	1.25
7/22/2010 8:45	7/22/2010 8:45	Storm Grab	74	65.3	—	—	—	—	—	—	> 2,420	—	—	—	—	—	—	—	—	—	—	—	—	
7/27/2010 20:18	7/28/2010 22:56	Storm Composite	72	75.2	4.38	110.8	113.0	7.09	15.5	0.05	—	—	—	—	75	3.98	0.089	0.358	0.077	1.60	~ 0.03	0.03	0.47	
7/29/2010 11:30	7/29/2010 11:30	Base Grab	75	59.4	—	—	—	—	—	—	117	0.24	—	—	—	—	—	—	—	—	—	—	—	
8/2/2010 4:57	8/2/2010 6:15	Storm Composite	80	76.1	7.48	103.2	104.2	7.57	12.6	0.05	—	—	137	42	100	3.11	0.108	0.415	0.110	2.10	0.26	0.05	0.59	
8/4/2010 20:29	8/4/2010 21:43	Storm Composite	80	74.1	5.71	88.6	91.3	7.34	13.4	0.04	—	—	—	—	604	3.35	0.110	0.480	0.109	2.60	0.14	0.02	0.39	
8/5/2010 11:05	8/5/2010 11:06	Base Grab	80	67.3	8.32	416.9	464.5	7.89	> 60.0	0.22	—	—	4	~ 2	228	27.00	0.100	0.165	0.097	0.85	0.06	0.06	0.80	
8/10/2010 8:45	8/10/2010 8:45	Base Grab	79	61.0	—	—	—	—	—	20	0.22	—	—	—	—	—	—	—	—	—	—	—	—	
8/16/2010 8:43	8/16/2010 8:43	Base Grab	70	61.3	—	—	—	—	—	108	0.21	—	—	—	—	—	—	—	—	—	—	—	—	
8/26/2010 13:35	8/26/2010 13:35	Base Grab	75	64.9	—	—	—	—	—	4	0.71	—	—	—	—	—	—	—	—	—	—	—	—	
8/27/2010 8:50	8/27/2010 8:51	Base Grab	68	63.0	9.21	1,038.0	1,221.0	8.11	> 60.0	0.61	—	—	6	5	593	103.00	0.301	0.526	0.301	5.40	4.54	0.10	1.60	
8/31/2010 3:34	8/31/2010 4:49	Storm Composite	70	73.6	7.38	69.3	71.9	7.56	9.0	0.03	—	—	—	—	62	2.59	0.200	0.497	0.214	2.20	0.21	0.02	0.46	
8/31/2010 3:34	8/31/2010 4:49	Storm Composite	70	73.6	7.38	69.3	71.9	7.56	9.0	0.03	—	—	—	—	46	2.72	0.198	0.521	0.198	2.40	0.22	0.02	0.44	
9/2/2010 3:07	9/2/2010 4:17	Storm Composite	65	66.4	8.41	55.7	62.8	7.53	12.5	0.03	—	—	—	—	47	2.96	0.088	0.308	0.107	1.30	0.11	0.02	0.29	
9/6/2010 19:51	9/6/2010 21:08	Storm Composite	60	65.1	7.60	76.1	87.1	7.62	14.0	0.04	—	—	—	—	95	3.57	0.072	0.313	0.063	1.70	0.10	0.02	0.36	
9/7/2010 9:14	9/7/2010 9:14	Storm Grab	55	63.3	—	—	—	—	—	3,654	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 8:55	9/8/2010 8:55	Base Grab	50	59.0	—	—	—	—	—	238	0.24	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 8:56	9/8/2010 8:56	Base Grab	50	59.0	—	—	—	—	—	228	0.26	—	—	—	—	—	—	—	—	—	—	—	—	
9/10/2010 8:53	9/10/2010 8:54	Base Grab	62	58.6	9.76	1,156.0	1,436.0	8.03	> 60.0	0.72	—	—	3	< 1	903	125.00	< 0.010	< 0.010	0.012	0.80	~ 0.05	< 0.03	2.02	
9/15/2010 5:37	9/15/2010 7:28	Storm Composite	58	57.6	7.76	104.9	132.1	7.32	17.6	0.06	—	—	104	46	48	—	0.099	0.303	0.073	1.80	~ 0.04	< 0.03	0.37	
9/15/2010 12:37	9/15/2010 13:51	Storm Composite	58	57.4	8.46	89.1	112.5	7.34	10.0	0.05	—	—	67	19	77	—	0.147	0.266	0.123	1.10	~ 0.03	0.04	0.40	
9/15/2010 18:51	9/15/2010 19:34	Storm Composite	58	57.7	8.65	69.5	87.3	7.50	8.8	0.04	—	—	156	39	104	—	0.057	0.402	0.057	3.30	0.36	0.03	0.52	
9/21/2010 1:41	9/21/2010 3:52	Storm Composite	70	66.0	7.93	90.6	102.7	8.22	7.0	0.05	—	—	—	—	77	4.71	0.092	0.349	0.078	1.60	0.21	< 0.03	0.37	
9/22/2010 8:45	9/22/2010 8:45	Base Grab	52	58.6	—	—	—	—	—	770	0.20	—	—	—	—	—	—	—	—	—	—	—	—	
9/22/2010 21:41	9/23/2010 4:16	Storm Composite	65	64.6	8.28	73.9	85.1	7.53	24.9	0.04	—	—	—	—	68	3.30	0.065	0.152	0.070	1.00	< 0.02	< 0.03	0.21	
9/23/2010 9:05	9/23/2010 9:05	Storm Grab	55	63.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/30/2010 9:53	9/30/2010 9:54	Base Grab	62	58.5	9.76	1,264.0	1,575.0	8.05	> 60.0															

Table E.1 continued. Monitoring results for 1NE outfall

Table E.1 Continued. Monitoring results for 1NE outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO ₃)	Chloride Ion (mg/L) CaCO ₃)	Hardness (mg/L CaCO ₃)	Chemical Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
7/5/2010 15:16	7/5/2010 23:41	Storm Composite	24	14	44	37	7.2	3.3	5.2	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/7/2010 15:57	7/7/2010 18:43	Storm Composite	16	5	36	89	6.2	4.9	8.8	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/9/2010 8:55	7/9/2010 8:56	Base Grab	335	169	504	22	4.2	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/11/2010 2:37	7/11/2010 3:40	Storm Composite	38	18	40	51	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10
7/14/2010 7:45	7/14/2010 7:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7/17/2010 20:43	7/17/2010 21:57	Storm Composite	26	8	24	71	6.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/19/2010 9:35	7/19/2010 9:36	Base Grab	294	150	436	1,200	6.0	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/22/2010 8:45	7/22/2010 8:45	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7/27/2010 20:18	7/28/2010 22:56	Storm Composite	20	11	48	76	11.8	5.6	11.0	—	—	—	—	—	—	—	—	—	—	—	—	13
7/29/2010 11:30	7/29/2010 11:30	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/2/2010 4:57	8/2/2010 6:15	Storm Composite	20	10	44	94	9.8	6.9	12.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/4/2010 20:29	8/4/2010 21:43	Storm Composite	27	8	44	94	6.8	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/5/2010 11:05	8/5/2010 11:06	Base Grab	91	63	168	30	9.7	2.5	4.1	—	—	—	—	—	—	—	—	—	—	—	—	13
8/10/2010 8:45	8/10/2010 8:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/16/2010 8:43	8/16/2010 8:43	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/26/2010 13:35	8/26/2010 13:35	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/27/2010 8:50	8/27/2010 8:51	Base Grab	316	210	472	28	8.7	> 7.8	> 7.8	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/31/2010 3:34	8/31/2010 4:49	Storm Composite	20	5	60	90	8.6	9.7	20.0	—	—	—	—	—	—	—	—	—	—	—	—	7
8/31/2010 3:34	8/31/2010 4:49	Storm Composite	21	5	36	76	8.6	17.0	15.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/2/2010 3:07	9/2/2010 4:17	Storm Composite	26	5	32	56	5.8	4.3	5.8	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/6/2010 19:51	9/6/2010 21:08	Storm Composite	22	7	44	80	5.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/7/2010 9:14	9/7/2010 9:14	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/8/2010 8:55	9/8/2010 8:55	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/8/2010 8:56	9/8/2010 8:56	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/10/2010 8:53	9/10/2010 8:54	Base Grab	375	162	532	~ 13	3.4	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/15/2010 5:37	9/15/2010 7:28	Storm Composite	30	12	48	88	8.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/15/2010 12:37	9/15/2010 13:51	Storm Composite	31	13	40	62	8.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/15/2010 18:51	9/15/2010 19:34	Storm Composite	23	7	44	92	6.0	6.0	7.7	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/21/2010 1:41	9/21/2010 3:52	Storm Composite	37	7	60	94	7.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/22/2010 8:45	9/22/2010 8:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/22/2010 21:41	9/23/2010 4:16	Storm Composite	21	6	36	28	4.9	—	—	0.0032	0.008	0.0008	0.002	< 0.0005	0.0051	0.0089	0.0343	< 0.0005	< 0.0005	< 0.005	< 0.005	< 6
9/23/2010 9:05	9/23/2010 9:05	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/30/2010 9:53	9/30/2010 9:54	Base Grab	83	213	580	15	3.9	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
10/4/2010 8:40	10/4/2010 8:40	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/4/2010 8:41	10/4/2010 8:41	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/15/2010 9:20	10/15/2010 9:21	Base Grab	327	179	564	16	3.2	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
10/20/2010 8:15	10/20/2010 8:15	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/20/2010 8:15	10/20/2010 8:15	Base Grab	—	—	—</td																	

Table E.2. Monitoring results for 2NNBC outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/ 100 mL)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)			
3/11/2010 13:12	3/11/2010 13:13	Storm Grab	38	39.4	10.39	475.0	789.0	7.30	3.5	0.40	—	—	163	60	436	12.80	0.189	0.443	0.150	1.90	0.43	0.08	0.94
4/13/2010 11:38	4/13/2010 11:38	Storm Grab	50	51.8	—	—	—	—	—	—	680	—	—	—	—	—	—	—	—	—	—	—	
4/14/2010 14:20	4/14/2010 14:23	Storm Grab	66	53.8	6.11	824.0	1,094.0	7.30	15.0	0.50	—	—	28	11	616	39.80	0.256	0.443	0.171	2.30	0.49	0.08	1.19
5/7/2010 9:41	5/7/2010 9:42	Storm Grab	48	55.9	8.38	451.3	581.0	7.30	16.6	0.30	—	—	20	~ 8	988	127.00	0.769	1.010	0.490	2.80	1.04	0.11	2.32
5/7/2010 9:43	5/7/2010 9:44	Storm Grab	48	55.9	8.38	451.3	581.0	7.30	16.6	0.30	—	—	18	8	992	119.00	0.810	1.070	0.530	3.60	0.97	0.11	2.17
5/11/2010 12:50	5/11/2010 12:50	Storm Grab	40	49.8	—	—	—	—	—	—	9,804	—	—	—	—	—	—	—	—	—	—	—	
5/11/2010 12:52	5/11/2010 12:53	Storm Grab	40	49.8	10.71	141.6	198.9	8.00	17.0	0.10	—	—	39	14	98	7.02	0.066	0.173	0.051	1.10	0.22	0.04	0.50
6/3/2010 12:45	6/3/2010 12:46	Base Grab	80	63.5	3.32	1,002.0	1,168.0	7.50	> 60.0	0.60	—	—	6	~ 3	722	77.20	0.495	0.651	0.354	2.70	0.39	0.07	1.88
6/8/2010 11:30	6/8/2010 11:30	Storm Grab	60	64.2	—	—	—	—	—	—	15,530	—	—	—	—	—	—	—	—	—	—	—	
6/8/2010 11:31	6/8/2010 11:31	Storm Grab	60	64.2	—	—	—	—	—	—	9,210	—	—	—	—	—	—	—	—	—	—	—	
6/11/2010 9:30	6/11/2010 9:31	Storm Grab	65	64.2	7.30	199.1	230.2	7.20	28.0	0.10	—	—	32	10	157	6.05	0.175	0.268	0.164	1.10	0.22	< 0.03	0.26
6/11/2010 9:32	6/11/2010 9:33	Storm Grab	65	64.2	7.30	199.1	230.2	7.20	28.0	0.10	—	—	29	9	153	5.21	0.175	0.278	0.164	1.20	0.22	< 0.03	0.26
6/14/2010 13:10	6/14/2010 13:11	Storm Grab	65	—	—	—	—	7.40	24.9	—	—	—	19	8	117	13.40	0.115	0.199	0.099	0.90	0.20	0.06	0.64
6/23/2010 10:38	6/23/2010 10:38	Storm Grab	72	68.5	—	—	—	—	—	—	24,200	—	—	—	—	—	—	—	—	—	—	—	
7/19/2010 12:45	7/19/2010 12:46	Base Grab	75	71.6	—	920.0	974.0	7.60	> 60.0	0.50	—	—	3	~ 2	613	91.00	0.667	0.810	0.522	2.40	0.26	0.04	3.70
7/22/2010 11:45	7/22/2010 11:45	Storm Grab	76	72.3	—	—	—	—	—	—	> 2,420	—	—	—	—	—	—	—	—	—	—	—	
8/5/2010 11:35	8/5/2010 11:36	Base Grab	82	71.1	4.45	1,092.0	1,165.0	7.52	> 60.0	0.58	—	—	~ 2	~ 1	603	93.70	0.631	0.779	0.497	2.10	0.23	0.07	2.96
8/10/2010 11:35	8/10/2010 11:35	Storm Grab	75	77.2	—	—	—	—	—	—	> 24,200	—	—	—	—	—	—	—	—	—	—	—	
9/7/2010 11:50	9/7/2010 11:50	Storm Grab	56	66.6	—	—	—	—	—	—	3,076	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 12:05	9/23/2010 12:05	Storm Grab	65	65.7	—	—	—	—	—	—	15,400	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 12:10	9/23/2010 12:11	Storm Grab	65	65.3	8.53	48.3	55.1	7.83	22.5	0.02	—	—	56	14	58	1.40	~ 0.043	0.133	0.045	0.53	< 0.02	< 0.03	< 0.05
10/20/2010 12:40	10/20/2010 12:40	Base Grab	60	63.3	—	—	—	—	—	—	28	3.3	—	—	—	—	—	—	—	—	—	—	
10/26/2010 12:10	10/26/2010 12:10	Storm Grab	45	59.2	—	—	—	—	—	—	9,800	—	—	—	—	—	—	—	—	—	—	—	

Table E.2 continued. Monitoring results for 2NNBC outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO ₃)	Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Chemical Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
3/11/2010 13:12	3/11/2010 13:13	Storm Grab	43	177	92	184	10.3	8.8	15.0	0.0147	0.0574	0.0030	0.0122	0.0013	0.0527	0.0185	0.3450	< 0.0005	< 0.0005	< 0.010	0.0192	25
4/13/2010 11:38	4/13/2010 11:38	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/14/2010 14:20	4/14/2010 14:23	Storm Grab	164	202	248	52	11.3	2.8	4.9	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/7/2010 9:41	5/7/2010 9:42	Storm Grab	265	269	492	74	21.7	6.6	6.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/7/2010 9:43	5/7/2010 9:44	Storm Grab	285	270	508	70	20.2	5.6	5.7	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/11/2010 12:50	5/11/2010 12:50	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/11/2010 12:52	5/11/2010 12:53	Storm Grab	39	28	56	45	6.6	—	7.6	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/3/2010 12:45	6/3/2010 12:46	Base Grab	217	176	364	60	22.2	2.4	3.5	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/8/2010 11:30	6/8/2010 11:30	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/8/2010 11:31	6/8/2010 11:31	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/11/2010 9:30	6/11/2010 9:31	Storm Grab	41	36	56	33	8.2	3.6	5.3	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/11/2010 9:32	6/11/2010 9:33	Storm Grab	45	34	60	35	8.7	3.7	5.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/14/2010 13:10	6/14/2010 13:11	Storm Grab	54	33	72	41	12.4	6.5	10.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/23/2010 10:38	6/23/2010 10:38	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7/19/2010 12:45	7/19/2010 12:46	Base Grab	161	126	170	40	15.5	< 1.0	1.2	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/22/2010 11:45	7/22/2010 11:45	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/5/2010 11:35	8/5/2010 11:36	Base Grab	215	157	396	56	17.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/10/2010 11:35	8/10/2010 11:35	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/7/2010 11:50	9/7/2010 11:50	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/23/2010 12:05	9/23/2010 12:05	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/23/2010 12:10	9/23/2010 12:11	Storm Grab	18	3	48	34	3.2	1.7	3.0	0.0022	0.0084	0.0005	0.0021	< 0.0005	0.0122	0.0070	0.0485	< 0.0005	< 0.0005	< 0.005	< 0.0050	< 6
10/20/2010 12:40	10/20/2010 12:40	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/26/2010 12:10	10/26/2010 12:10	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table E.3. Monitoring results for 4PP outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	
1/12/2010 13:57	1/12/2010 13:58	Base Grab	20	47.7	10.52	1,030.0	1,497.0	8.00	> 60.0	0.80	—	—	< 1	< 1	868	—	—	~ 0.039	—	0.72	—	—	—
2/11/2010 11:36	2/11/2010 11:37	Base Grab	7	47.7	10.55	1,161.0	1,684.0	7.80	> 60.0	0.90	—	—	~ 1	~ 1	960	—	—	~ 0.026	—	0.98	—	—	—
3/2/2010 15:20	3/2/2010 15:21	Melt Grab	43	38.5	10.28	1,637.0	2,771.0	6.70	3.4	1.40	—	—	221	97	1,470	9.82	0.159	0.621	0.130	7.40	1.04	0.16	0.65
3/4/2010 10:05	3/4/2010 10:06	Base Grab	25	41.0	10.75	1,010.0	1,637.0	7.60	13.7	0.80	—	—	~ 2	~ 1	823	63.00	~ 0.038	~ 0.030	0.019	1.10	0.06	< 0.03	1.32
3/4/2010 10:07	3/4/2010 10:08	Base Grab	25	41.0	10.75	1,010.0	1,637.0	7.60	13.7	0.80	—	—	~ 2	~ 1	822	74.90	~ 0.016	~ 0.024	0.019	0.98	0.08	< 0.03	1.33
3/9/2010 16:28	3/10/2010 0:47	Storm Composite	38	36.3	11.20	378.4	666.0	6.70	4.0	0.30	—	—	135	57	1,230	30.20	0.145	0.494	—	3.90	0.59	0.12	0.83
4/13/2010 11:20	4/13/2010 11:20	Storm Grab	50	52.3	—	—	—	—	—	—	1,670	—	—	—	—	—	—	—	—	—	—	—	—
4/16/2010 12:20	4/16/2010 12:21	Base Grab	55	50.4	9.12	930.0	1,297.0	7.60	> 60.0	0.70	—	—	5	~ 2	815	90.30	~ 0.042	~ 0.033	0.019	0.45	~ 0.04	< 0.03	1.28
4/16/2010 12:22	4/16/2010 12:23	Base Grab	55	50.4	9.12	930.0	1,297.0	7.60	> 60.0	0.70	—	—	4	~ 2	819	95.30	~ 0.024	~ 0.027	0.019	0.75	~ 0.05	< 0.03	1.20
4/20/2010 11:27	4/20/2010 11:27	Base Grab	—	—	—	—	—	—	—	—	2	0.12	—	—	—	—	—	—	—	—	—	—	—
4/24/2010 7:41	4/24/2010 14:16	Storm Composite	50	53.8	—	233.5	309.7	7.70	5.1	0.10	—	—	—	—	183	11.80	~ 0.019	0.502	—	2.70	0.07	0.04	0.29
4/26/2010 11:15	4/26/2010 11:16	Base Grab	50	52.7	—	1,007.0	1,358.0	7.30	> 60.0	0.70	—	—	~ 1	~ 1	779	82.40	~ 0.031	~ 0.030	0.023	0.55	0.14	< 0.03	1.27
4/27/2010 11:10	4/27/2010 11:10	Base Grab	50	50.0	—	—	—	—	—	—	1	0.15	—	—	—	—	—	—	—	—	—	—	—
5/6/2010 11:45	5/6/2010 11:48	Base Grab	50	52.0	9.91	979.0	1,333.0	7.80	> 60.0	0.70	—	—	~ 2	< 1	755	88.30	~ 0.048	~ 0.035	0.026	0.52	~ 0.06	< 0.03	1.39
5/7/2010 8:39	5/8/2010 1:09	Storm Composite	50	53.8	6.67	220.2	292.6	7.50	16.4	0.10	—	—	75	71	164	13.60	~ 0.039	0.266	—	1.50	~ 0.03	0.06	0.46
5/10/2010 22:21	5/11/2010 14:42	Storm Composite	50	48.6	9.54	178.0	254.7	7.10	21.3	0.10	—	—	12	3	144	13.00	0.114	0.179	0.042	1.80	0.32	0.05	0.72
5/11/2010 11:56	5/11/2010 11:56	Strom Grab	40	49.8	—	—	—	—	—	—	9,804	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:50	5/20/2010 11:50	Base Grab	70	57.0	—	—	—	—	—	—	56	0.15	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:56	5/20/2010 11:57	Base Grab	73	56.3	9.38	1,034.0	1,325.0	8.00	> 60.0	0.70	—	—	~ 1	< 1	775	84.40	~ 0.030	~ 0.037	0.028	0.64	~ 0.04	< 0.03	1.35
5/22/2010 12:02	5/22/2010 14:38	Storm Composite	75	78.4	3.19	475.2	467.6	7.20	9.2	0.20	—	—	—	—	289	20.90	0.054	0.659	—	3.90	~ 0.03	< 0.03	< 0.05
5/25/2010 20:58	5/25/2010 23:07	Storm Composite	69	71.4	2.45	270.1	287.0	7.30	11.1	0.10	—	—	—	—	190	13.00	0.100	0.589	0.061	3.00	~ 0.04	0.29	0.22
6/2/2010 1:03	6/2/2010 7:45	Storm Composite	67	64.4	7.03	311.9	360.4	7.00	6.0	0.20	—	—	—	—	232	23.10	0.079	0.629	0.039	4.00	0.29	0.12	0.85
6/3/2010 13:20	6/3/2010 13:21	Base Grab	78	54.5	9.31	1,024.0	1,344.0	7.70	> 60.0	0.70	—	—	~ 3	< 2	806	98.60	~ 0.013	~ 0.028	0.030	0.66	~ 0.05	< 0.03	1.15
6/4/2010 3:13	6/4/2010 5:40	Storm Composite	65	67.8	7.29	156.7	173.7	7.30	16.0	0.10	—	—	—	—	116	7.09	0.086	0.322	0.060	1.60	0.16	0.04	0.50
6/5/2010 13:54	6/5/2010 17:56	Storm Composite	70	67.5	5.23	274.6	305.3	7.40	31.8	0.10	—	—	—	—	202	17.20	0.051	0.184	0.044	1.20	0.26	0.07	0.64
6/8/2010 6:06	6/8/2010 17:24	Storm Composite	65	65.5	6.58	142.8	162.8	7.70	22.5	0.10	—	—	—	—	69	7.29	~ 0.035	0.211	—	1.10	0.15	0.03	0.36
6/8/2010 11:05	6/8/2010 11:05	Storm Grab	60	63.0	—	—	—	—	—	—	10,460	—	—	—	—	—	—	—	—	—	—	—	—
6/11/2010 3:46	6/11/2010 9:52	Storm Composite	65	—	—	—	—	—	7.50	21.2	—	—	—	—	111	14.60	~ 0.026	0.246	—	1.40	0.22	0.04	0.39
6/16/2010 10:38	6/16/2010 10:38	Base Grab	65	59.9	—	—	—	—	—	—	56	0.17	—	—	—	—	—	—	—	—	—	—	—
6/17/2010 11:45	6/17/2010 11:46	Base Grab	75	56.3	9.46	1,405.0	1,801.0	8.00	> 60.0	0.90	—	—	~ 1	< 1	801	83.90	~ 0.021	~ 0.043	~ 0.006	0.55	0.07	< 0.03	1.26
6/17/2010 11:46	6/17/2010 11:47	Base Grab	75	56.3	9.46	1,405.0	1,801.0	8.00	> 60.0	0.90	—	—	~ 1	< 1	798	81.90	~ 0.014	~ 0.045	< 0.005	0.73	0.07	< 0.03	1.50

Table E.3 continued. Monitoring results for 4PP outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity ($\mu\text{S}/\text{cm}$)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/100 mL)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)		
7/9/2010 11:05	7/9/2010 11:06	Base Grab	78	58.5	—	—	—	8.20	> 60.0	—	—	3	~ 1	767	87.10	~ 0.045	0.090	0.041	0.61	0.07	0.04	1.44	
7/14/2010 10:05	7/14/2010 10:05	Base Grab	81	60.4	—	—	—	—	—	63	0.14	—	—	—	—	—	—	—	—	—	—	—	
7/19/2010 11:50	7/19/2010 11:51	Base Grab	75	58.3	—	1,071.0	1,337.0	7.60	> 60.0	0.70	—	—	~ 2	~ 1	747	84.40	~ 0.027	0.052	0.024	0.71	0.11	< 0.03	1.49
7/22/2010 11:23	7/22/2010 11:23	Storm Grab	76	63.3	—	—	—	—	—	>	2,420	—	—	—	—	—	—	—	—	—	—	—	
7/29/2010 12:35	7/29/2010 12:35	Base Grab	80	58.1	—	—	—	—	—	162	0.18	—	—	—	—	—	—	—	—	—	—	—	
8/5/2010 12:41	8/5/2010 12:41	Base Grab	82	56.1	10.01	1,000.0	1,284.0	8.37	> 60.0	0.65	—	—	212	46	152	86.30	~ 0.025	~ 0.041	0.029	0.48	~ 0.05	< 0.03	1.39
8/10/2010 11:13	8/10/2010 11:13	Storm Grab	80	75.4	—	—	—	—	—	>	24,200	—	—	—	—	—	—	—	—	—	—	—	
8/16/2010 11:30	8/16/2010 11:30	Base Grab	75	59.4	—	—	—	—	—	—	91	0.16	—	—	—	—	—	—	—	—	—	—	
8/26/2010 11:50	8/26/2010 11:50	Base Grab	75	57.4	—	—	—	—	—	—	179	0.20	—	—	—	—	—	—	—	—	—	—	
8/27/2010 10:44	8/27/2010 10:45	Base Grab	80	56.3	9.99	921.0	1,180.0	8.33	> 60.0	0.59	—	—	< 1	< 1	980	87.30	~ 0.029	~ 0.044	0.037	0.59	~ 0.05	< 0.03	1.29
9/7/2010 11:27	9/7/2010 11:27	Storm Grab	56	59.2	—	—	—	—	—	30	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 11:26	9/8/2010 11:26	Base Grab	65	57.0	—	—	—	—	—	336	0.22	—	—	—	—	—	—	—	—	—	—	—	
9/10/2010 10:27	9/10/2010 10:28	Base Grab	62	55.9	10.06	1,008.0	1,297.0	8.18	61.0	0.65	—	—	< 1	< 1	787	83.00	~ 0.022	~ 0.036	0.029	0.57	~ 0.06	< 0.03	1.45
9/22/2010 11:45	9/22/2010 11:45	Base Grab	58	56.3	—	—	—	—	—	1,553	0.16	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 11:30	9/23/2010 11:30	Storm Grab	60	64.9	—	—	—	—	—	9,760	—	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 11:30	9/23/2010 11:31	Storm Grab	60	64.9	9.09	43.6	50.0	7.84	20.0	0.02	—	—	55	17	54	0.79	~ 0.043	0.104	0.028	0.34	< 0.02	< 0.03	< 0.05
9/23/2010 11:32	9/23/2010 11:33	Storm Grab	60	64.9	9.09	43.6	50.0	7.84	20.0	0.02	—	—	44	14	43	1.52	~ 0.025	0.119	0.029	0.51	< 0.02	< 0.03	0.06
9/30/2010 11:00	9/30/2010 11:01	Base Grab	63	55.2	10.01	994.0	1,293.0	8.15	> 60.0	0.65	—	—	~ 2	~ 1	783	78.90	~ 0.020	0.076	0.029	0.45	~ 0.06	0.03	1.49
10/4/2010 12:45	10/4/2010 12:45	Base Grab	65	55.0	—	—	—	—	—	16	0.15	—	—	—	—	—	—	—	—	—	—	—	
10/15/2010 11:05	10/15/2010 11:06	Base Grab	50	—	9.69	1,010.0	1,319.0	8.24	> 60.0	0.66	—	—	~ 1	< 1	811	79.50	~ 0.030	~ 0.030	0.027	0.34	~ 0.04	< 0.03	1.64
10/20/2010 12:15	10/20/2010 12:15	Base Grab	60	56.7	—	—	—	—	—	285	0.14	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 11:40	10/26/2010 11:40	Storm Grab	45	51.6	—	—	—	—	—	>	24,200	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 11:41	10/26/2010 11:41	Storm Grab	45	51.6	—	—	—	—	—	>	24,200	—	—	—	—	—	—	—	—	—	—	—	
10/27/2010 9:50	10/27/2010 9:51	Storm Grab	45	51.4	9.74	416.3	571.8	7.58	25.3	0.28	—	—	—	—	350	29.80	0.162	0.192	0.127	0.78	0.12	0.04	0.67
10/28/2010 13:10	10/28/2010 13:11	Base Grab	38	53.2	9.86	978.0	1,307.0	8.14	> 60.0	0.66	—	—	~ 1	~ 1	763	79.70	~ 0.029	0.058	0.030	0.60	~ 0.05	< 0.03	1.45
11/16/2010 10:55	11/16/2010 10:55	Base Grab	34	51.1	—	—	—	—	—	411	0.15	—	—	—	—	—	—	—	—	—	—	—	

Table E.3 continued. Monitoring results for 4PP outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO3)	Chloride Ion (mg/L)	Hardness (mg/L CaCO3)	Chemical Oxygen Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
1/12/2010 13:57	1/12/2010 13:58	Base Grab	—	245	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2/11/2010 11:36	2/11/2010 11:37	Base Grab	—	319	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3/2/2010 15:20	3/2/2010 15:21	Melt Grab	88	811	212	225	12.3	18.0	25.0	0.0224	0.0619	0.0041	0.0114	0.0009	0.0504	0.0178	0.2790	< 0.0005	< 0.0005	< 0.0050	0.0221	17
3/4/2010 10:05	3/4/2010 10:06	Base Grab	272	261	488	~ 13	2.2	< 1.0	< 1.0	0.0028	0.0028	0.0063	0.0063	< 0.0001	0.0003	0.0113	0.0113	< 0.0005	< 0.0005	< 0.0050	< 0.0050	< 6
3/4/2010 10:07	3/4/2010 10:08	Base Grab	280	274	496	~ 11	2.3	< 1.0	< 1.0	0.0023	0.0030	0.0064	0.0064	< 0.0001	0.0002	0.0072	0.0072	< 0.0005	< 0.0005	< 0.0050	< 0.0050	< 6
3/9/2010 16:28	3/10/2010 0:47	Storm Composite	100	665	204	191	14.9	—	18.0	0.0271	0.0563	0.0048	0.0106	< 0.0005	0.0362	0.0362	0.2630	< 0.0005	< 0.0005	0.0094	0.0167	—
4/13/2010 11:20	4/13/2010 11:20	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/16/2010 12:20	4/16/2010 12:21	Base Grab	295	219	500	~ 13	4.2	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
4/16/2010 12:22	4/16/2010 12:23	Base Grab	293	217	508	~ 13	2.6	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 5
4/20/2010 11:27	4/20/2010 11:27	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/24/2010 7:41	4/24/2010 14:16	Storm Composite	57	45	92	182	12.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22
4/26/2010 11:15	4/26/2010 11:16	Base Grab	54	230	508	~ 14	2.9	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
4/27/2010 11:10	4/27/2010 11:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/6/2010 11:45	5/6/2010 11:48	Base Grab	278	204	504	~ 9	2.5	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/7/2010 8:39	5/8/2010 1:09	Storm Composite	54	42	84	83	7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
5/10/2010 22:21	5/11/2010 14:42	Storm Composite	51	34	84	49	7.6	—	8.9	—	—	—	—	—	—	—	—	—	—	—	—	6
5/11/2010 11:56	5/11/2010 11:56	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:50	5/20/2010 11:50	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:56	5/20/2010 11:57	Base Grab	263	204	—	~ 10	3.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/22/2010 12:02	5/22/2010 14:38	Strom Composite	90	66	144	206	18.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/25/2010 20:58	5/25/2010 23:07	Storm Composite	71	39	92	138	18.5	18.0	> 23.0	—	—	—	—	—	—	—	—	—	—	—	—	< 7
6/2/2010 1:03	6/2/2010 7:45	Storm Composite	63	50	140	192	21.4	21.0	35.0	—	—	—	—	—	—	—	—	—	—	—	—	—
6/3/2010 13:20	6/3/2010 13:21	Base Grab	261	204	512	11	3.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/4/2010 3:13	6/4/2010 5:40	Storm Composite	39	22	56	119	8.9	7.2	22.0	—	—	—	—	—	—	—	—	—	—	—	—	—
6/5/2010 13:54	6/5/2010 17:56	Storm Composite	72	40	104	55	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/8/2010 6:06	6/8/2010 17:24	Storm Composite	30	18	68	49	7.4	—	—	0.0075	0.0335	0.0014	0.0042	< 0.0005	0.0200	0.0233	0.1050	< 0.0005	< 0.0005	0.0062	0.0080	< 6
6/8/2010 11:05	6/8/2010 11:05	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/11/2010 3:46	6/11/2010 9:52	Storm Composite	48	27	96	66	9.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
6/16/2010 10:38	6/16/2010 10:38	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/17/2010 11:45	6/17/2010 11:46	Base Grab	296	195	472	16	2.4	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	19
6/17/2010 11:46	6/17/2010 11:47	Base Grab	291	202	472	~ 11	2.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/23/2010 4:26	6/23/2010 8:31	Storm Composite	98	60	152	103	16.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19
6/23/2010 10:16	6/23/2010 10:16	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/29/2010 10:54	6/29/2010 10:54	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table E.3 continued. Monitoring results for 4PP outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO ₃)	Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Chemical Oxygen Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)	
7/9/2010 11:05	7/9/2010 11:06	Base Grab	282	193	492	18	3.3	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/14/2010 10:05	7/14/2010 10:05	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
7/19/2010 11:50	7/19/2010 11:51	Base Grab	278	194	492	~ 7	3.3	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/22/2010 11:23	7/22/2010 11:23	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
7/29/2010 12:35	7/29/2010 12:35	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/5/2010 12:41	8/5/2010 12:41	Base Grab	284	194	496	~ 14	2.9	5.4	10.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
8/10/2010 11:13	8/10/2010 11:13	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/16/2010 11:30	8/16/2010 11:30	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/26/2010 11:50	8/26/2010 11:50	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/27/2010 10:44	8/27/2010 10:45	Base Grab	276	187	488	~ 5	2.8	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/7/2010 11:27	9/7/2010 11:27	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 11:26	9/8/2010 11:26	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/10/2010 10:27	9/10/2010 10:28	Base Grab	287	186	488	~ 10	2.3	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/22/2010 11:45	9/22/2010 11:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 11:30	9/23/2010 11:30	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/23/2010 11:30	9/23/2010 11:31	Storm Grab	14	4	36	33	3.5	1.9	4.6	0.0038	0.0132	< 0.0005	0.0021	< 0.0005	0.0186	0.0092	0.0608	< 0.0005	< 0.0005	< 0.0050	0.0055	—	
9/23/2010 11:32	9/23/2010 11:33	Storm Grab	20	4	48	36	2.7	2.5	4.8	0.0037	0.0157	< 0.0005	0.0024	< 0.0005	0.0221	0.0086	0.0730	< 0.0005	< 0.0005	< 0.0050	0.0066	< 6	
9/30/2010 11:00	9/30/2010 11:01	Base Grab	186	184	496	~ 12	2.8	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 5	
10/4/2010 12:45	10/4/2010 12:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/15/2010 11:05	10/15/2010 11:06	Base Grab	279	191	492	~ 14	2.3	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	14	
10/20/2010 12:15	10/20/2010 12:15	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 11:40	10/26/2010 11:40	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 11:41	10/26/2010 11:41	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/27/2010 9:50	10/27/2010 9:51	Storm Grab	133	87	224	62	13.6	> 23.0	> 23.0	—	—	—	—	—	—	—	—	—	—	—	—	6	
10/28/2010 13:10	10/28/2010 13:11	Base Grab	298	197	548	~ 10	2.8	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
11/16/2010 10:55	11/16/2010 10:55	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

Table E.4. Monitoring results for 6UMN outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/ 100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	
1/12/2010 12:55	1/12/2010 12:56	Base Grab	15	49.6	10.87	1,054.0	1,484.0	7.90	> 60.0	0.70	—	—	~ 1	< 1	910	—	—	< 0.010	—	0.57	—	—	
2/10/2010 13:45	2/10/2010 13:46	Base Grab	20	50.4	10.46	1,329.0	1,856.0	8.20	61.0	0.90	—	—	~ 2	~ 1	1,050	—	—	~ 0.021	—	0.86	—	—	
3/1/2010 12:42	3/1/2010 23:19	Melt Composite	25	48.0	9.68	1,627.0	2,348.0	6.90	7.2	1.20	—	—	99	34	1,290	43.50	0.063	0.207	—	2.40	0.21	0.06	2.67
3/3/2010 12:28	3/4/2010 3:25	Melt Composite	25	48.6	10.19	1,265.0	1,814.0	8.00	12.2	0.90	—	—	48	~ 19	1,040	37.70	0.066	0.144	—	2.20	0.26	0.05	2.86
3/4/2010 10:55	3/4/2010 10:56	Base Grab	25	46.8	10.51	1,086.0	1,601.0	8.00	> 60.0	0.80	—	—	~ 2	~ 1	915	65.40	~ 0.019	~ 0.023	0.022	1.20	~ 0.04	< 0.03	4.29
3/4/2010 12:12	3/5/2010 1:52	Melt Composite	30	46.8	10.33	1,311.0	1,933.0	7.20	11.5	1.00	—	—	64	~ 26	1,400	35.40	0.073	0.192	0.057	2.10	0.28	0.05	2.41
3/5/2010 11:56	3/5/2010 21:35	Melt Composite	35	52.2	9.22	1,459.0	1,981.0	7.20	13.2	1.00	—	—	72	24	1,030	28.90	0.068	0.187	—	1.70	0.27	0.05	1.82
3/6/2010 10:45	3/6/2010 23:40	Melt Composite	35	50.9	9.58	907.0	1,254.0	7.50	36.9	0.60	—	—	18	6	714	33.10	0.059	0.105	—	1.70	0.25	0.04	2.14
3/11/2010 11:42	3/12/2010 0:53	Storm Composite	40	44.8	9.31	465.0	707.0	7.20	6.3	0.30	—	—	—	—	395	19.20	0.106	0.271	0.077	1.80	0.31	0.05	1.32
4/6/2010 17:43	4/6/2010 20:32	Storm Composite	50	50.0	8.71	256.4	359.5	7.30	9.5	0.20	—	—	—	—	247	20.00	0.137	0.458	0.127	2.70	0.38	0.06	3.03
4/13/2010 4:42	4/13/2010 8:24	Storm Composite	66	59.2	8.08	199.3	245.7	7.20	11.2	0.10	—	—	—	—	168	14.90	0.063	0.434	—	3.10	1.01	0.06	1.10
4/13/2010 4:42	4/13/2010 8:24	Storm Composite	66	59.2	8.08	199.3	245.7	7.20	11.2	0.10	—	—	—	—	178	15.20	0.053	0.384	—	2.40	1.03	0.06	1.10
4/13/2010 10:48	4/13/2010 10:48	Storm Grab	50	54.0	—	—	—	—	—	—	260	—	—	—	—	—	—	—	—	—	—	—	
4/15/2010 3:24	4/15/2010 6:36	Storm Composite	55	59.0	7.61	174.9	216.3	7.70	14.8	0.10	—	—	~ 1	~ 1	958	97.10	~ 0.017	~ 0.010	0.015	0.50	< 0.02	< 0.03	4.51
4/16/2010 11:43	4/16/2010 11:44	Base Grab	55	53.8	9.33	1,080.0	1,432.0	7.40	> 60.0	0.70	—	—	—	—	169	12.10	~ 0.048	0.298	—	1.60	0.13	0.04	0.67
4/20/2010 10:45	4/20/2010 10:45	Base Grab	—	—	—	—	—	—	—	—	2	0.16	—	—	—	—	—	—	—	—	—	—	
4/24/2010 7:51	4/24/2010 9:18	Storm Composite	52	51.6	—	180.2	246.8	7.90	8.4	0.10	—	—	—	—	200	15.10	0.061	0.886	—	3.90	0.16	0.16	0.59
4/26/2010 12:11	4/26/2010 12:12	Base Grab	52	46.4	—	1,088.0	1,610.0	7.40	61.0	0.80	—	—	~ 2	~ 1	890	87.60	~ 0.024	< 0.010	0.016	0.64	0.08	< 0.03	4.64
4/27/2010 10:36	4/27/2010 10:36	Base Grab	48	52.2	—	—	—	—	—	—	< 1	0.28	—	—	—	—	—	—	—	—	—	—	
4/27/2010 10:37	4/27/2010 10:37	Base Grab	48	52.2	—	—	—	—	—	—	< 1	—	—	—	—	—	—	—	—	—	—	—	
5/6/2010 11:21	5/6/2010 11:22	Base Grab	52	52.9	9.15	1,103.0	1,481.0	7.30	> 60.0	0.70	—	—	3	~ 2	915	89.60	~ 0.019	~ 0.045	0.014	0.54	< 0.02	< 0.03	4.43
5/11/2010 11:15	5/11/2010 11:15	Storm Grab	45	49.6	—	—	—	—	—	—	2,851	—	—	—	—	—	—	—	—	—	—	—	
5/11/2010 11:18	5/11/2010 11:19	Storm Grab	45	49.6	10.64	301.7	424.6	7.20	12.0	0.20	—	—	42	12	283	26.20	0.056	0.142	0.051	0.86	0.22	0.04	1.66
5/20/2010 11:12	5/20/2010 11:12	Base Grab	70	58.5	—	—	—	—	—	—	11	0.16	—	—	—	—	—	—	—	—	—	—	
5/20/2010 11:30	5/20/2010 11:31	Base Grab	73	56.5	9.46	1,120.0	1,431.0	7.70	> 60.0	0.70	—	—	~ 1	< 1	766	94.40	~ 0.028	~ 0.016	0.016	0.58	< 0.02	< 0.03	4.50
5/22/2010 12:11	5/22/2010 13:25	Storm Composite	78	73.4	3.48	453.3	471.1	7.60	9.0	0.20	—	—	—	—	239	19.50	0.175	0.594	—	3.10	0.18	0.11	0.31
5/25/2010 21:06	5/26/2010 4:54	Storm Composite	70	68.0	5.74	323.5	357.3	7.30	12.6	0.20	—	—	—	—	209	16.60	0.116	0.303	0.081	1.30	0.07	0.07	1.35
5/27/2010 11:05	5/27/2010 11:05	Base Grab	72	59.7	—	—	—	—	—	—	21	0.16	—	—	—	—	—	—	—	—	—	—	
6/2/2010 6:57	6/2/2010 8:23	Storm Composite	60	62.1	8.87	184.6	219.6	7.30	12.0	0.10	—	—	—	—	144	10.20	0.191	0.485	0.180	2.10	0.41	0.05	0.88
6/3/2010 10:35	6/3/2010 10:36	Base Grab	75	55.6	10.16	1,131.0	1,465.0	7.30	> 60.0	0.70	—	—	6	< 2	866	97.80	~ 0.028	~ 0.025	0.017	0.68	< 0.02	< 0.03	3.88
6/4/2010 3:23	6/4/2010 5:00	Storm Composite	65	64.4	8.32	107.6																	

Table E.4 continued. Monitoring results for 6UMN outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/ 100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	
7/5/2010 13:54	7/6/2010 0:16	Storm Composite	78	72.0	—	—	—	7.30	32.1	—	—	—	—	211	18.40	—	0.164	—	0.76	0.07	< 0.03	1.20	
7/7/2010 15:03	7/7/2010 18:55	Storm Composite	80	72.0	—	—	—	7.90	24.0	—	—	—	—	103	6.24	0.056	0.197	0.041	1.40	0.29	0.04	0.87	
7/9/2010 10:20	7/9/2010 10:21	Base Grab	78	65.7	—	—	—	8.30	> 60.0	—	—	—	4	~ 1	824	94.60	~ 0.031	~ 0.046	0.030	0.67	~ 0.06	< 0.03	4.35
7/9/2010 10:22	7/9/2010 10:23	Base Grab	78	65.7	—	—	—	8.30	> 60.0	—	—	—	3	~ 1	927	96.20	~ 0.032	~ 0.043	0.029	0.75	0.07	< 0.03	4.45
7/14/2010 9:35	7/14/2010 9:35	Base Grab	78	65.3	—	—	—	—	—	—	20	0.19	—	—	—	—	—	—	—	—	—	—	
7/17/2010 18:46	7/17/2010 23:05	Storm Composite	75	71.2	—	101.8	108.5	7.80	25.1	0.10	—	—	—	77	4.28	0.071	0.185	0.065	0.99	0.14	0.03	0.36	
7/19/2010 11:20	7/19/2010 11:25	Base Grab	75	63.7	—	1,004.0	1,171.0	7.60	> 60.0	0.60	—	—	~ 2	~ 1	838	92.50	< 0.010	~ 0.020	0.017	0.62	< 0.02	< 0.03	3.19
7/22/2010 10:50	7/22/2010 10:50	Storm Grab	75	66.0	—	—	—	—	—	> 2,420	—	—	—	—	—	—	—	—	—	—	—	—	
7/27/2010 20:27	7/28/2010 10:35	Storm Composite	75	72.1	7.36	151.5	159.7	7.76	17.5	0.07	—	—	—	—	86	7.48	0.072	0.142	0.079	0.69	0.15	< 0.03	0.73
7/29/2010 10:47	7/29/2010 10:47	Base Grab	75	61.3	—	—	—	—	—	—	25	0.17	—	—	—	—	—	—	—	—	—	—	
7/29/2010 10:48	7/29/2010 10:48	Base Grab	75	61.3	—	—	—	—	—	—	30	—	—	—	—	—	—	—	—	—	—	—	
8/6/2010 11:13	8/6/2010 11:14	Base Grab	80	59.0	10.37	1,164.0	1,437.0	8.35	> 60.0	0.73	—	—	~ 2	< 1	949	95.30	~ 0.021	~ 0.031	0.028	0.54	< 0.02	< 0.03	4.76
8/10/2010 10:47	8/10/2010 10:47	Storm Grab	80	72.3	—	—	—	—	—	—	11,200	—	—	—	—	—	—	—	—	—	—	—	
8/17/2010 11:15	8/17/2010 11:15	Base Grab	75	59.5	—	—	—	—	—	—	—	39	0.19	—	—	—	—	—	—	—	—	—	
8/26/2010 11:10	8/26/2010 11:10	Base Grab	70	61.9	—	—	—	—	—	—	25	0.19	—	—	—	—	—	—	—	—	—	—	
8/27/2010 10:10	8/27/2010 10:11	Base Grab	70	61.9	9.58	1,203.0	1,433.0	8.38	> 60.0	0.72	—	—	~ 1	< 1	775	97.40	~ 0.039	~ 0.027	0.027	0.66	< 0.02	< 0.03	4.35
8/31/2010 3:57	8/31/2010 4:56	Storm Composite	75	71.8	8.08	110.3	116.8	8.08	17.4	0.05	—	—	—	—	91	5.59	0.131	0.271	0.120	1.10	0.23	< 0.03	0.52
9/2/2010 3:16	9/2/2010 4:12	Storm Composite	70	64.9	8.86	39.5	45.3	8.26	15.1	0.02	—	—	—	—	45	3.67	0.069	0.189	0.064	0.79	0.10	< 0.03	0.28
9/7/2010 10:56	9/7/2010 10:56	Storm Grab	56	60.3	—	—	—	—	—	—	1,421	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 10:54	9/8/2010 10:54	Base Grab	62	59.2	—	—	—	—	—	—	63	0.19	—	—	—	—	—	—	—	—	—	—	
9/10/2010 9:45	9/10/2010 9:46	Base Grab	62	59.0	9.75	1,162.0	1,437.0	8.19	> 60.0	0.73	—	—	4	< 1	916	96.60	0.074	~ 0.016	0.015	0.56	< 0.02	< 0.03	4.88
9/10/2010 9:47	9/10/2010 9:48	Base Grab	62	59.0	9.75	1,162.0	1,437.0	8.19	> 60.0	0.73	—	—	9	< 1	912	91.40	< 0.010	~ 0.024	0.015	0.58	< 0.02	< 0.03	4.89
9/15/2010 5:44	9/15/2010 6:46	Storm Composite	60	58.5	8.17	283.8	353.5	7.68	12.4	0.17	—	—	149	43	77	17.40	0.083	0.292	0.072	1.60	0.12	0.03	0.72
9/15/2010 13:10	9/15/2010 13:10	Storm Composite	60	—	—	—	—	—	—	—	—	—	—	—	201	—	0.066	0.174	—	1.00	0.13	0.04	0.75
9/15/2010 19:13	9/15/2010 21:06	Storm Composite	60	58.8	9.13	68.0	84.2	7.93	14.6	0.04	—	—	83	23	81	3.54	~ 0.022	0.154	0.042	1.10	0.45	< 0.03	0.46
9/22/2010 11:10	9/22/2010 11:10	Base Grab	55	58.8	—	—	—	—	—	—	167	0.18	—	—	—	—	—	—	—	—	—	—	
9/22/2010 11:11	9/22/2010 11:11	Base Grab	55	58.8	—	—	—	—	—	—	71	0.18	—	—	—	—	—	—	—	—	—	—	
9/22/2010 21:32	9/23/2010 2:17	Storm Composite	60	62.1	8.00	94.2	112.1	7.46	27.8	0.05	—	—	—	—	76	4.37	~ 0.047	0.118	0.047	0.40	< 0.02	< 0.03	0.20
9/23/2010 10:55	9/23/2010 10:55	Storm Grab	65	64.0	—	—	—	—	—	—	22,400	—	—	—	—	—	—	—	—	—	—	—	
9/30/2010 11:40	9/30/2010 11:41	Base Grab	65	56.7	10.08	1,035.0	1,321.0	8.25	> 60.0	0.67	—	—	~ 2	1	853	93.40	~ 0.026	~ 0.042	0.029	0.42	< 0.02	< 0.03	1.44
9/30/2010 11:42	9/30/2010 11:43	Base Grab	65	56.7	10.08	1,035.0	1,321.0	8.25	> 60.0	0.67	—	—	~ 1	1	859	94.50	~ 0.026	~ 0.018	0.030	0.34	< 0.02	< 0.03	1.44
10/4/2010 9:55	10/4/2010 9:55	Base Grab	50	54.3	—	—	—	—	—	—	7	0.18	—	—</td									

Table E.4 continued. Monitoring results for 6UMN outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO3)	Chloride Ion (mg/L)	Hardness (mg/L CaCO3)	Chemical Oxygen Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
1/12/2010 12:55	1/12/2010 12:56	Base Grab	—	209	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2/10/2010 13:45	2/10/2010 13:46	Base Grab	—	345	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3/1/2010 12:42	3/1/2010 23:19	Melt Composite	212	599	404	92	6.4	—	7.7	0.0113	0.0238	0.0074	0.0111	< 0.0001	0.0180	0.0168	0.1010	< 0.0005	< 0.0005	0.0077	0.0144	8
3/3/2010 12:28	3/4/2010 3:25	Melt Composite	189	438	384	57	6.6	—	4.1	0.0072	0.0153	0.0061	0.0086	< 0.0001	0.0116	0.0126	0.0643	< 0.0005	< 0.0005	0.0087	0.0093	< 6
3/4/2010 10:55	3/4/2010 10:56	Base Grab	305	284	540	22	2.7	< 1.0	< 1.0	0.0034	0.0034	0.0090	0.0090	< 0.0001	0.0005	0.0092	0.0092	< 0.0005	< 0.0005	0.0072	0.0072	< 6
3/4/2010 12:12	3/5/2010 1:52	Melt Composite	172	481	316	72	6.0	4.4	—	0.0091	0.0178	0.0061	0.0086	< 0.0001	0.0158	0.0074	0.0977	< 0.0005	< 0.0005	0.0062	0.0101	< 6
3/5/2010 11:56	3/5/2010 21:35	Melt Composite	135	484	248	65	4.4	—	—	0.0092	0.0208	0.0047	0.0080	0.0002	0.0165	0.0405	0.0863	< 0.0005	< 0.0005	< 0.0050	0.0092	12
3/6/2010 10:45	3/6/2010 23:40	Melt Composite	153	282	284	26	4.7	—	—	0.0064	0.0094	0.0049	0.0057	< 0.0001	0.0032	0.0105	0.0294	< 0.0005	< 0.0005	< 0.0050	0.0057	< 6
3/11/2010 11:42	3/12/2010 0:53	Storm Composite	77	146	180	110	8.5	4.0	6.1	—	—	—	—	—	—	—	—	—	—	—	—	9
4/6/2010 17:43	4/6/2010 20:32	Storm Composite	83	68	176	142	12.3	—	16.0	—	—	—	—	—	—	—	—	—	—	—	—	—
4/13/2010 4:42	4/13/2010 8:24	Storm Composite	67	43	100	151	8.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21
4/13/2010 4:42	4/13/2010 8:24	Storm Composite	68	43	116	156	9.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21
4/13/2010 10:48	4/13/2010 10:48	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/15/2010 3:24	4/15/2010 6:36	Storm Composite	335	222	596	~ 13	3.0	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
4/16/2010 11:43	4/16/2010 11:44	Base Grab	56	37	92	88	6.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
4/20/2010 10:45	4/20/2010 10:45	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/24/2010 7:51	4/24/2010 9:18	Storm Composite	103	52	148	207	7.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/26/2010 12:11	4/26/2010 12:12	Base Grab	318	214	600	~ 10	2.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
4/27/2010 10:36	4/27/2010 10:36	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/27/2010 10:37	4/27/2010 10:37	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/6/2010 11:21	5/6/2010 11:22	Base Grab	206	253	588	16	3.8	1.1	1.3	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/11/2010 11:15	5/11/2010 11:15	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/11/2010 11:18	5/11/2010 11:19	Storm Grab	94	70	192	40	4.9	—	3.2	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/20/2010 11:12	5/20/2010 11:12	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:30	5/20/2010 11:31	Base Grab	340	189	520	~ 10	3.5	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/22/2010 12:11	5/22/2010 13:25	Storm Composite	83	71	140	133	15.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 7
5/25/2010 21:06	5/26/2010 4:54	Storm Composite	91	47	140	81	15.4	7.5	17.0	—	—	—	—	—	—	—	—	—	—	—	—	< 7
5/27/2010 11:05	5/27/2010 11:05	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/2/2010 6:57	6/2/2010 8:23	Storm Composite	43	27	84	107	11.0	18.0	15.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/3/2010 10:35	6/3/2010 10:36	Base Grab	344	213	576	~ 11	3.4	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/4/2010 3:23	6/4/2010 5:00	Storm Composite	40	17	60	61	5.8	4.5	11.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/5/2010 14:27	6/5/2010 16:59	Storm Composite	53	25	80	32	5.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/8/2010 6:11	6/8/2010 13:09	Storm Composite	38	16	76	48	7.9	—	—	0.0039	0.0154	0.0016	0.0055	< 0.0005	0.0165	0.0057	0.0728	< 0.0005	< 0.0005	0.0062	0.0064	< 6
6/8/2010 6:11	6/8/2010 13:09	Storm Composite	34	16	68	44	5.2	—	—	0.0038	0.0165	0.0017	0.0061	< 0.0005	0.0177	0.0095	0.0787	< 0.0005	< 0.0005	0.0053	0.0073	< 6
6/8/2010 10:27	6/8/2010 10:27	Storm Grab	—	—	—	—																

Table E.4 continued. Monitoring results for 6UMN outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO3)	Chloride Ion (mg/L)	Hardness (mg/L CaCO3)	Chemical Oxygen Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
7/5/2010 13:54	7/6/2010 0:16	Storm Composite	82	47	136	41	—	2.8	4.8	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/7/2010 15:03	7/7/2010 18:55	Storm Composite	29	13	68	56	5.0	2.9	4.5	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/9/2010 10:20	7/9/2010 10:21	Base Grab	326	214	576	~ 13	2.9	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/9/2010 10:22	7/9/2010 10:23	Base Grab	330	207	572	17	2.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/14/2010 9:35	7/14/2010 9:35	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
7/17/2010 18:46	7/17/2010 23:05	Storm Composite	25	10	36	31	5.2	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/19/2010 11:20	7/19/2010 11:25	Base Grab	317	205	588	72	3.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/22/2010 10:50	7/22/2010 10:50	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
7/27/2010 20:27	7/28/2010 10:35	Storm Composite	27	16	66	30	6.1	2.4	3.8	—	—	—	—	—	—	—	—	—	—	—	< 6	
7/29/2010 10:47	7/29/2010 10:47	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
7/29/2010 10:48	7/29/2010 10:48	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/6/2010 11:13	8/6/2010 11:14	Base Grab	319	207	540	~ 10	2.6	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
8/10/2010 10:47	8/10/2010 10:47	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/17/2010 11:15	8/17/2010 11:15	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/26/2010 11:10	8/26/2010 11:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8/27/2010 10:10	8/27/2010 10:11	Base Grab	303	148	540	~ 9	3.2	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
8/31/2010 3:57	8/31/2010 4:56	Storm Composite	33	12	56	60	8.8	10.0	17.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/2/2010 3:16	9/2/2010 4:12	Storm Composite	24	5	32	46	4.9	1.2	3.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/7/2010 10:56	9/7/2010 10:56	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 10:54	9/8/2010 10:54	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/10/2010 9:45	9/10/2010 9:46	Base Grab	321	193	580	~ 13	2.8	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 5	
9/10/2010 9:47	9/10/2010 9:48	Base Grab	322	198	556	~ 10	2.9	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	9	
9/15/2010 5:44	9/15/2010 6:46	Storm Composite	81	44	124	86	6.9	—	—	—	—	—	—	—	—	—	—	—	—	—	8	
9/15/2010 13:10	9/15/2010 13:10	Storm Composite	65	36	120	59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/15/2010 19:13	9/15/2010 21:06	Storm Composite	24	5	36	48	4.4	3.7	5.9	—	—	—	—	—	—	—	—	—	—	—	6	
9/22/2010 11:10	9/22/2010 11:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/22/2010 11:11	9/22/2010 11:11	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/22/2010 21:32	9/23/2010 2:17	Storm Composite	27	9	44	36	3.3	—	—	0.0026	0.0088	0.0011	0.0029	< 0.0005	0.0105	0.006	0.0483	< 0.0005	< 0.0005	< 0.005	< 6	
9/23/2010 10:55	9/23/2010 10:55	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/30/2010 11:40	9/30/2010 11:41	Base Grab	349	170	516	19	6.1	5.9	6.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
9/30/2010 11:42	9/30/2010 11:43	Base Grab	320	169	528	20	5.5	5.7	5.7	—	—	—	—	—	—	—	—	—	—	—	7	
10/4/2010 9:55	10/4/2010 9:55	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/15/2010 10:40	10/15/2010 10:41	Base Grab	315	156	508	~ 10	2.4	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
10/20/2010 9:20	10/20/2010 9:20	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 11:09	10/26/2010 11:09	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/28/2010 11:20	10/28/2010 11:21	Base Grab	344	151	504	~ 12	3.1	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	< 6	
12/2/2010 10:50	12/2/2010 10:51	Base Grab	—	149	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
12/28/2010 13:35	12/28/2010 13:36	Base Grab	—	272	—	—	—															

Table E.5. Monitoring results for 7LSTU outfall

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity ($\mu\text{S}/\text{cm}$)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/100 mL)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)		
3/4/2010 14:30	3/4/2010 14:31	Melt Grab	40	39.9	11.15	1,454.0	2,396.0	8.00	2.0	1.20	—	592	156	< 10	17.30	0.709	2.090	0.520	8.5	1.03	0.13	0.50	
3/10/2010 10:29	3/10/2010 10:30	Storm Grab	43	37.6	10.45	689.0	1,186.0	7.30	3.2	0.60	—	204	70	633	11.60	0.153	0.627	0.117	3.1	0.48	0.16	0.74	
3/10/2010 10:31	3/10/2010 10:32	Storm Grab	43	37.6	10.45	689.0	1,186.0	7.30	3.2	0.60	—	176	72	621	12.80	0.153	0.560	0.119	2.5	0.49	0.18	0.68	
3/11/2010 12:00	3/11/2010 12:01	Storm Grab	35	36.3	11.20	378.4	666.0	7.20	2.0	0.30	—	386	82	439	13.40	0.235	1.450	0.157	4.9	0.67	0.07	0.62	
4/13/2010 10:18	4/13/2010 10:18	Storm Grab	51	50.9	—	—	—	—	—	—	520	—	—	—	—	—	—	—	—	—	—	—	
4/14/2010 13:51	4/14/2010 13:52	Storm Grab	68	50.4	8.76	698.0	974.0	7.30	50.5	0.50	—	—	10	5	281	20.40	~ 0.012	0.062	< 0.005	1.1	< 0.02	< 0.03	0.50
5/7/2010 10:23	5/7/2010 10:24	Storm Grab	50	51.4	10.15	384.4	528.0	7.40	9.1	0.30	—	—	84	30	347	19.90	1.210	1.720	0.840	3.1	0.64	0.11	0.88
5/11/2010 10:45	5/11/2010 10:45	Storm Grab	45	48.2	—	—	—	—	—	—	4,611	—	—	—	—	—	—	—	—	—	—	—	
5/11/2010 10:45	5/11/2010 10:46	Storm Grab	45	48.2	11.11	262.8	378.1	7.50	5.2	0.20	—	—	15	3	241	9.86	~ 0.037	0.356	0.027	1.8	0.24	0.05	0.48
6/8/2010 9:43	6/8/2010 9:43	Storm Grab	60	63.5	—	—	—	—	—	> 24,200	—	—	—	—	—	—	—	—	—	—	—	—	
6/11/2010 10:05	6/11/2010 10:06	Storm Grab	65	63.7	9.25	168.1	195.9	7.30	7.4	0.10	—	—	75	15	158	4.96	0.051	0.218	0.049	0.7	0.16	0.04	0.31
6/14/2010 11:20	6/14/2010 11:21	Storm Grab	65	63.5	8.32	326.9	381.4	7.40	10.0	0.20	—	—	50	14	189	11.60	0.152	0.291	0.082	0.8	0.21	0.06	0.44
9/23/2010 10:15	9/23/2010 10:15	Storm Grab	60	63.9	—	—	—	—	—	—	10,960	—	—	—	—	—	—	—	—	—	—	—	
9/23/2010 10:20	9/23/2010 10:21	Storm Grab	60	63.9	9.38	163.6	190.0	7.80	5.0	0.09	—	—	122	~ 22	153	4.58	0.053	0.283	0.053	1.0	< 0.02	0.03	2.28

Table E.5 continued. Monitoring results for 7LSTU outfall

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO ₃)	Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Chemical Oxygen Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
3/4/2010 14:30	3/4/2010 14:31	Melt Grab	114	722	196	368	42.1	73.0	84.0	0.0294	0.0700	0.0060	0.0233	0.0006	0.1480	0.0155	0.344	< 0.0005	< 0.0005	0.0056	0.0253	19
3/10/2010 10:29	3/10/2010 10:30	Storm Grab	70	326	136	186	13.9	17.0	24.0	0.0154	0.0502	0.0036	0.0132	0.0010	0.0500	0.0141	0.285	< 0.0005	< 0.0005	0.0059	0.0180	19
3/10/2010 10:31	3/10/2010 10:32	Storm Grab	63	295	152	188	15.8	17.0	24.0	0.0151	0.0458	0.0033	0.0117	0.0011	0.0492	0.0229	0.391	< 0.0005	< 0.0005	0.0082	0.0165	13
3/11/2010 12:00	3/11/2010 12:01	Storm Grab	74	130	156	332	16.9	21.0	25.0	0.0117	0.0769	0.0033	0.0237	< 0.0005	0.1180	0.0431	0.375	< 0.0005	< 0.0005	< 0.0050	0.0272	28
4/13/2010 10:18	4/13/2010 10:18	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/14/2010 13:51	4/14/2010 13:52	Storm Grab	170	55	212	31	9.7	1.9	3.1	—	—	—	—	—	—	—	—	—	—	—	—	< 6
5/7/2010 10:23	5/7/2010 10:24	Storm Grab	48	84	148	125	22.7	17.0	20.0	—	—	—	—	—	—	—	—	—	—	—	—	6
5/11/2010 10:45	5/11/2010 10:45	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/11/2010 10:45	5/11/2010 10:46	Storm Grab	70	70	120	75	13.0	—	13.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/8/2010 9:43	6/8/2010 9:43	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/11/2010 10:05	6/11/2010 10:06	Storm Grab	43	24	64	51	11.2	4.7	6.3	—	—	—	—	—	—	—	—	—	—	—	—	< 6
6/14/2010 11:20	6/14/2010 11:21	Storm Grab	75	54	116	56	14.4	5.9	7.7	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/23/2010 10:15	9/23/2010 10:15	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/23/2010 10:20	9/23/2010 10:21	Storm Grab	48	23	100	72	5.7	2.5	4.7	0.0046	0.0188	0.0014	0.0066	0.0009	0.0311	0.0073	0.119	< 0.0005	< 0.0005	< 0.0050	0.0079	41

Table E.6. Monitoring results for 10SA stormwater drainage system

Start Date Start Time	End Date End Time	Sample Type	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/ 100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Sulfate (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	
1/23/2010 15:44	1/25/2010 4:54	Storm Composite	20	34.5	12.86	1,962.0	3,782.0	7.70	12.5	1.80	—	—	23	~ 14	1,880	—	—	0.183	—	3.20	—	—	—
2/5/2010 12:52	2/5/2010 19:54	Melt Composite	20	47.8	6.56	15,750.0	22,820.0	6.70	7.2	13.70	—	—	210	86	13,200	—	—	0.295	—	5.40	—	—	—
2/10/2010 12:05	2/2/2010 12:06	Base Grab	20	39.4	11.05	13,390.0	22,310.0	7.90	> 60.0	13.20	—	—	8	3	13,000	—	—	~ 0.036	—	1.60	—	—	—
2/28/2010 15:46	3/1/2010 1:23	Melt Composite	20	39.2	10.26	1,592.0	2,659.0	7.10	—	1.40	—	—	—	—	5.86	0.147	0.268	0.134	2.80	0.42	0.06	0.44	
3/1/2010 13:21	3/2/2010 6:08	Melt Composite	25	43.0	10.16	1,418.0	2,221.0	6.60	—	1.10	—	—	40	~ 19	1,200	—	0.147	0.271	—	2.80	0.37	0.06	0.46
3/2/2010 14:59	3/2/2010 18:09	Melt Composite	25	40.1	10.92	1,345.0	2,206.0	6.60	—	1.10	—	—	—	—	—	—	—	—	—	—	—	—	—
3/3/2010 13:32	3/3/2010 23:56	Melt Composite	35	39.4	10.79	1,248.0	2,077.0	8.10	13.4	1.10	—	—	34	15	1,090	4.16	0.165	0.215	—	2.30	0.39	0.06	0.60
3/4/2010 13:17	3/4/2010 19:44	Melt Composite	25	41.0	10.93	1,192.0	1,928.0	7.10	14.0	1.00	—	—	34	16	981	11.40	0.163	0.265	0.141	2.50	0.36	0.06	0.59
3/5/2010 9:35	3/5/2010 9:36	Base Grab	25	37.6	10.70	1,514.0	2,602.0	7.10	39.3	1.30	—	—	7	3	1,020	17.20	0.093	0.130	0.066	2.00	0.21	0.04	0.94
3/5/2010 12:53	3/6/2010 1:14	Melt Composite	35	—	9.53	1,212.0	1,808.0	7.00	16.2	0.90	—	—	37	16	1,020	12.50	0.129	0.218	—	2.60	0.37	0.06	0.63
3/6/2010 9:13	3/7/2010 6:18	Melt Composite	35	47.5	10.42	1,353.0	1,973.0	7.40	24.0	1.00	—	—	17	7	1,070	12.20	0.103	0.173	—	2.40	0.39	0.05	0.73
3/9/2010 16:57	3/11/2010 2:15	Storm Composite	35	45.7	10.84	772.0	1,155.0	7.00	15.1	0.60	—	—	73	28	617	8.19	0.155	0.287	—	2.60	0.24	0.04	0.84
3/11/2010 11:08	3/12/2010 6:10	Storm Composite	48	41.4	9.56	413.4	665.0	7.20	9.3	0.30	—	—	—	—	380	9.51	0.139	0.302	0.124	2.00	0.29	0.04	0.93
4/6/2010 17:34	4/6/2010 18:26	Storm Composite	50	50.2	8.39	302.6	423.3	7.10	—	0.20	—	—	—	—	250	7.43	0.125	0.418	0.119	2.90	0.48	0.07	0.43
4/13/2010 3:32	4/13/2010 12:10	Storm Composite	66	60.6	7.69	312.7	378.7	7.20	14.0	0.20	—	—	—	—	203	7.83	0.058	0.226	—	2.00	0.96	0.05	0.82
4/13/2010 9:15	4/13/2010 9:15	Storm Grab	55	51.6	—	—	—	—	—	—	960	—	—	—	—	—	—	—	—	—	—	—	—
4/16/2010 10:25	4/16/2010 10:26	Base Grab	55	51.3	—	1,029.0	1,415.0	7.10	> 60.0	0.70	—	—	7	6	765	24.80	~ 0.031	0.100	< 0.005	1.60	< 0.02	< 0.03	0.46
4/20/2010 8:50	4/20/2010 8:50	Base Grab	—	—	—	—	—	—	—	—	108	0.12	—	—	—	—	—	—	—	—	—	—	—
4/24/2010 7:54	4/24/2010 16:15	Storm Composite	50	53.4	—	276.5	368.9	7.40	11.8	0.20	—	—	—	—	199	5.37	~ 0.020	0.439	—	2.30	0.14	0.03	0.40
4/26/2010 9:17	4/26/2010 9:18	Base Grab	50	50.5	—	969.0	1,347.0	7.00	> 60.0	0.70	—	—	3	3	750	16.20	~ 0.025	0.079	0.012	1.00	0.08	< 0.03	0.33
4/27/2010 8:44	4/27/2010 8:44	Base Grab	40	51.8	—	—	—	—	—	—	27	0.15	—	—	—	—	—	—	—	—	—	—	—
5/6/2010 10:30	5/6/2010 10:31	Base Grab	52	50.9	9.56	684.0	945.0	7.30	30.7	0.50	—	—	46	26	576	52.50	0.239	0.462	0.192	2.70	0.17	< 0.03	1.40
5/6/2010 10:32	5/6/2010 10:33	Base Grab	52	50.9	9.56	684.0	945.0	7.30	30.7	0.50	—	—	49	29	568	59.10	0.222	0.321	0.182	1.30	0.13	< 0.03	1.44
5/7/2010 7:31	5/8/2010 6:44	Storm Composite	48	51.8	9.20	299.9	409.0	7.50	28.2	0.20	—	—	—	—	238	14.60	~ 0.036	0.134	—	0.86	~ 0.05	< 0.03	0.72
5/10/2010 19:39	5/11/2010 18:41	Storm Composite	45	48.2	10.67	246.7	355.4	7.00	35.0	0.20	—	—	19	~ 6	233	9.10	~ 0.037	0.105	0.027	0.96	0.26	< 0.03	1.00
5/11/2010 9:25	5/11/2010 9:25	Storm Grab	45	50.2	—	—	—	—	—	—	4,884	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 9:13	5/20/2010 9:13	Base Grab	65	57.0	—	—	—	—	—	—	517	0.14	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 9:14	5/20/2010 9:14	Base Grab	65	57.0	—	—	—	—	—	—	345	0.14	—	—	—	—	—	—	—	—	—	—	—
5/20/2010 11:05	5/20/2010 11:06	Base Grab	73	60.4	9.32	846.0	1,026.0	7.70	> 60.0	0.50	—	—	~ 1	< 1	594	85.30	~ 0.017	~ 0.018	0.017	0.42	~ 0.02	< 0.03	1.98
5/22/2010 11:41	5/22/2010 13:04	Storm Composite	80	83.7	4.53	336.4	314.5	7.50	11.9	0.20	—	—	—	—	190	10.70	0.070	0.406	—	3.00	0.13	0.08	0.09
5/25/2010 22:39	5/26/2010 2:44	Storm Composite	70	74.7	6.02	308.8	316.9	7.20	14.4	0.20	—	—	—	—	240	10.80	0.071	0.290	0.052	1.80	0.08	0.06	0.74
5/27/2010 9:17	5/27/2010 9:17	Base Grab																					

Table E.6 continued. Monitoring results for 10SA stormwater drainage system

Start Date Start Time	End Date End Time	Sample Type	Air Temp	Water Temp	Dissolved Oxygen	Conductivity	Specific Conductivity	pH	Transparency (cm)	Salinity (ppt)	E. coli (CFU/100 mL)	Fluoride (mg/L)	Total Suspended Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)		
			(F)	(F)	(mg/L)	(μS/cm)	(μS/cm)				(100 mL)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		
7/5/2010 13:42	7/6/2010 1:04	Storm Composite	78	—	—	—	—	7.10	36.6	—	—	—	—	116	7.17	~ 0.044	0.108	0.038	0.51	0.11	0.03	0.42		
7/7/2010 15:36	7/7/2010 16:42	Storm Composite	80	79.7	—	—	—	—	7.70	18.2	—	—	—	—	55	2.00	~ 0.030	0.233	0.029	1.30	0.18	< 0.03	0.56	
7/9/2010 9:23	7/9/2010 9:24	Base Grab	78	73.6	—	—	—	—	8.10	> 60.0	—	—	—	3	~ 2	401	40.20	~ 0.033	0.064	0.032	0.60	~ 0.02	< 0.03	1.04
7/11/2010 2:01	7/11/2010 2:54	Storm Composite	72	75.9	—	—	—	—	7.30	> 15.0	—	—	—	—	114	7.04	~ 0.044	0.139	0.038	1.10	0.10	0.04	0.66	
7/14/2010 8:06	7/14/2010 8:06	Base Grab	78	66.2	—	—	—	—	—	—	28	0.16	—	—	—	—	—	—	—	—	—	—	—	
7/17/2010 20:42	7/17/2010 22:20	Storm Composite	75	75.4	—	69.5	70.9	7.30	36.6	—	—	—	—	68	2.10	0.069	0.198	0.064	1.00	0.20	< 0.03	0.31		
7/19/2010 10:40	7/19/2010 10:45	Base Grab	75	66.4	—	624.0	703.0	7.40	> 60.0	0.30	—	—	—	3	~ 2	398	42.80	~ 0.035	0.063	0.036	0.39	< 0.02	< 0.03	0.98
7/19/2010 10:44	7/19/2010 10:50	Base Grab	75	66.4	—	624.0	703.0	7.40	> 60.0	0.30	—	—	—	~ 2	~ 2	421	44.60	~ 0.042	0.072	0.036	0.49	< 0.02	< 0.03	0.99
7/22/2010 9:07	7/22/2010 9:07	Storm Grab	75	68.4	—	—	—	—	—	—	1,553	—	—	—	—	—	—	—	—	—	—	—	—	
7/27/2010 20:12	7/27/2010 21:38	Storm Composite	75	82.4	5.41	141.8	134.2	7.33	18.8	0.06	—	—	—	—	61	4.85	~ 0.047	0.248	0.045	1.40	0.12	< 0.03	0.39	
7/29/2010 12:10	7/29/2010 12:10	Base Grab	80	74.7	—	—	—	—	—	—	113	ND	—	—	—	—	—	—	—	—	—	—	—	
8/2/2010 2:18	8/2/2010 6:24	Storm Composite	80	79.7	7.33	127.0	123.4	7.66	21.8	0.06	—	—	50	~ 25	95	4.18	0.154	0.266	0.057	1.90	0.25	0.05	0.68	
8/4/2010 20:26	8/4/2010 21:17	Storm Composite	80	75.7	6.54	56.8	57.5	7.47	17.8	0.03	—	—	—	—	57	2.19	0.060	0.238	0.058	1.30	0.14	< 0.03	0.31	
8/5/2010 10:15	8/5/2010 10:16	Base Grab	80	74.1	7.82	179.7	185.4	8.00	43.4	0.09	—	—	14	11	170	4.67	~ 0.031	0.161	0.017	1.20	< 0.02	< 0.03	0.08	
8/10/2010 9:00	8/10/2010 9:00	Base Grab	79	74.1	—	—	—	—	—	60	0.17	—	—	—	—	—	—	—	—	—	—	—	—	
8/10/2010 9:01	8/10/2010 9:01	Base Grab	79	74.1	—	—	—	—	—	—	0.16	—	—	—	—	—	—	—	—	—	—	—	—	
8/13/2010 2:51	8/13/2010 5:33	Storm Composite	76	76.8	7.38	72.7	72.8	7.34	22.9	0.03	—	—	—	—	51	2.35	~ 0.049	0.155	0.051	0.69	0.14	< 0.03	0.32	
8/13/2010 2:51	8/13/2010 5:33	Storm Composite	76	76.8	7.38	72.7	72.8	7.34	22.9	0.03	—	—	—	—	51	2.40	0.074	0.161	0.065	0.90	0.15	< 0.03	0.32	
8/16/2010 9:10	8/16/2010 9:10	Base Grab	70	72.0	—	—	—	—	—	—	249	0.11	—	—	—	—	—	—	—	—	—	—	—	
8/26/2010 13:15	8/26/2010 13:15	Base Grab	75	71.8	—	—	—	—	—	—	98	0.30	—	—	—	—	—	—	—	—	—	—	—	
8/27/2010 9:15	8/27/2010 9:16	Base Grab	70	68.9	8.10	853.0	933.0	8.57	> 60.0	0.46	—	—	~ 1	~ 1	772	34.80	0.125	0.152	0.122	0.86	< 0.02	< 0.03	1.41	
8/31/2010 3:34	8/31/2010 7:57	Storm Composite	73	74.7	7.48	98.8	101.3	7.53	24.5	0.05	—	—	—	—	78	3.67	0.141	0.251	0.147	1.10	0.21	< 0.03	0.38	
9/2/2010 3:11	9/2/2010 4:21	Storm Composite	70	67.5	8.39	44.2	49.1	7.46	33.6	0.02	—	—	—	—	37	1.76	0.069	0.124	0.464	0.75	0.12	< 0.03	0.20	
9/6/2010 19:53	9/7/2010 6:23	Storm Composite	60	64.2	7.99	127.2	147.3	7.68	> 30.0	0.07	—	—	—	—	103	6.00	~ 0.019	0.125	0.020	1.10	0.11	< 0.03	0.74	
9/7/2010 8:55	9/7/2010 8:55	Storm Grab	55	64.2	—	—	—	—	—	784	—	—	—	—	—	—	—	—	—	—	—	—	—	
9/8/2010 9:20	9/8/2010 9:20	Base Grab	52	65.5	—	—	—	—	—	—	85	ND	—	—	—	—	—	—	—	—	—	—	—	
9/10/2010 9:20	9/10/2010 9:21	Base Grab	62	64.8	8.65	607.0	696.0	8.35	> 60.0	0.34	—	—	~ 2	~ 2	423	28.30	0.070	0.093	0.071	0.71	< 0.02	< 0.03	1.03	
9/15/2010 5:34	9/15/2010 6:13	Storm Composite	58	59.7	7.43	86.4	105.8	7.42	> 14.0	0.05	—	—	109	38	186	—	0.058	0.203	0.048	2.10	0.11	< 0.03	0.39	
9/15/2010 12:15	9/15/2010 13:04	Storm Composite	58	58.6	9.05	90.2	112.1	7.54	> 10.0	0.05	—	—	—	—	77	3.09	0.073	0.138	0.051	0.90	0.10	< 0.03	0.45	
9/15/2010 19:04	9/15/2010 20:58	Storm Composite	58	60.1	8.80	59.0	71.9	7.62	23.2	0.03	—	—	77	20	78	—	0.050	0.153	0.046	1.20	0.38	< 0.03	0.31	
9/21/2010 0:53	9/21/2010 3:02	Storm Composite	70	67.1	8.00	94.4	105.5	7.90	17.8	0.05	—	—	—	—	75	3.68	0.084	0.205	0.053	1.30	0.37	0.03	0.56	
9/22/2010 9:05	9/22/2010 9:05	Base Grab	52	62.4	—	—	—	—	—	225	ND	—	—	—	—	—	—	—	—	—	—	—	—	
9/22/2010 21:16	9/23/2010 2:57	Storm Composite	65	61.5	8.30	74.4	85.2	7.53	55.0	0.04	—	—	—	—	52	2.04	0.056	0.090	0.046	0.49	< 0.02	< 0.03	0.16	
9/23/2010 9:15	9/23/2010 9:15	Storm Grab	65	64.4	—	—	—	—	—	—	2,480	—	—	—	—	—	—	—	—	—	—	—	—	
9/30/2010 9:30	9/30/2010 9:31	Base Grab	62	62.8	9.10	839.0	989.0	8.18	> 60.0	0.49	—	—	3	~ 2	634	49.00	0.102	0.085	0.075	0.64	~ 0.03	0.05	2.54	
10/4/2010 9:10	10/4/2010 9:10	Base Grab	50	59.2	—	—	—	—	—	> 2,420	0.25	—	—	—	—	—	—	—	—	—	—	—	—	
10/15/2010 9:40	10/15/2010 9:41	Base Grab	49	57.6	9.68	797.0	1,003.0	8.40	> 60.0	0.50	—	—	~ 1	~ 1	639	45.70	0.110	0.130	0.106	0.66	< 0.02	0.04	1.53	
10/15/2010 9:42	10/15/2010 9:43	Base Grab	49	57.6	9.68	797.0	1,003.0	8.40	> 60.0	0.50	—	—	~ 1	~ 1	634	45.30	0.117	0.135	0.105	2.70	< 0.02	< 0.03	1.53	
10/20/2010 8:45	10/20/2010 8:45	Base Grab	50	55.8	—	—	—	—	—	687	0.52	—	—	—	—	—	—	—	—	—	—	—	—	
10/24/2010 2:21	10/24/2010 4:06	Storm Composite	55	56.3	5.71	110.3	141.2	7.02	16.3	0.07	—	—	—	—	106	4.95	0.233	0.590	0.204	1.20	~ 0.03	< 0.03	0.54	
10/25/2010 22:32	10/26/2010 3:32	Storm Composite	45	55.9	8.93	84.7	109.2	7.44	35.3	0.05	—	—	—	—	67	4.03	0.124	0.206	0.123	0.68	0.28	< 0.03	0.36	
10/26/2010 9:14	10/26/2010 9:14	Storm Grab	48	56.8	—	—	—	—	—	9,800	—	—	—	—	—	—	—	—	—	—	—	—	—	
10/26/2010 14:23	10/26/2010 19:26	Storm Composite	40	46.0	10.16	91.8	137.0	8.01	26.4	0.06	—	—	—	—	76	4.63	0.122	0.204	0.100	1.20	~ 0.02	< 0.03	0.16	
10/28/2010 10:45	10/28/2010 10:46	Base Grab	35	50.7</td																				

Table E.6 continued. Monitoring results for 10SA stormwater drainage system

Table E.6 continued. Monitoring results for 10SA stormwater drainage system

Start Date Start Time	End Date End Time	Sample Type	Alkalinity (mg/L CaCO3)	Chloride Ion (mg/L CaCO3)	Hardness (mg/L CaCO3)	Chemical Demand (mg/L)	Total Organic Carbon (mg/L)	Carbonaceous Biological Oxygen Demand 5-day (mg/L)	Total Biological Oxygen Demand 5-day (mg/L)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	Oil and Grease (mg/L)
7/5/2010 13:42	7/6/2010 1:04	Storm Composite	51	16	84	35	8.4	3.1	5.5	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/7/2010 15:36	7/7/2010 16:42	Storm Composite	13	4	40	66	3.8	2.5	5.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/9/2010 9:23	7/9/2010 9:24	Base Grab	229	55	312	16	4.0	1.1	1.3	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/11/2010 2:01	7/11/2010 2:54	Storm Composite	46	21	60	48	11.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/14/2010 8:06	7/14/2010 8:06	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7/17/2010 20:42	7/17/2010 22:20	Storm Composite	14	6	24	40	5.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/19/2010 10:40	7/19/2010 10:45	Base Grab	226	62	340	~ 10	4.8	< 1.0	1.3	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/19/2010 10:44	7/19/2010 10:50	Base Grab	235	64	352	~ 12	5.0	< 1.0	1.1	—	—	—	—	—	—	—	—	—	—	—	—	< 6
7/22/2010 9:07	7/22/2010 9:07	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7/27/2010 20:12	7/27/2010 21:38	Storm Composite	23	13	64	62	8.1	4.6	6.7	—	—	—	—	—	—	—	—	—	—	—	—	14
7/29/2010 12:10	7/29/2010 12:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/2/2010 2:18	8/2/2010 6:24	Storm Composite	23	12	56	65	14.8	7.6	12.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/4/2010 20:26	8/4/2010 21:17	Storm Composite	20	5	40	54	5.7	4.1	6.5	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/5/2010 10:15	8/5/2010 10:16	Base Grab	50	17	84	37	6.2	4.8	7.5	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/10/2010 9:00	8/10/2010 9:00	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/10/2010 9:01	8/10/2010 9:01	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/13/2010 2:51	8/13/2010 5:33	Storm Composite	17	5	40	34	4.8	2.8	4.8	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/13/2010 2:51	8/13/2010 5:33	Storm Composite	18	5	52	39	5.0	3.4	5.1	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/16/2010 9:10	8/16/2010 9:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/26/2010 13:15	8/26/2010 13:15	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8/27/2010 9:15	8/27/2010 9:16	Base Grab	274	106	356	22	6.7	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
8/31/2010 3:34	8/31/2010 7:57	Storm Composite	23	9	84	45	8.2	7.4	14.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/2/2010 3:11	9/2/2010 4:21	Storm Composite	< 10	4	28	25	4.9	< 1.0	1.9	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/6/2010 19:53	9/7/2010 6:23	Storm Composite	39	11	64	36	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/7/2010 8:55	9/7/2010 8:55	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/8/2010 9:20	9/8/2010 9:20	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/10/2010 9:20	9/10/2010 9:21	Base Grab	199	91	260	22	6.2	1.2	1.8	—	—	—	—	—	—	—	—	—	—	—	—	7
9/15/2010 5:34	9/15/2010 6:13	Storm Composite	24	10	36	115	10.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/15/2010 12:15	9/15/2010 13:04	Storm Composite	27	11	36	45	8.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/15/2010 19:04	9/15/2010 20:58	Storm Composite	19	6	40	34	4.1	3.3	4.8	—	—	—	—	—	—	—	—	—	—	—	—	10
9/21/2010 0:53	9/21/2010 3:02	Storm Composite	29	8	36	66	9.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 6
9/22/2010 9:05	9/22/2010 9:05	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/22/2010 21:16	9/23/2010 2:57	Storm Composite	25	6	40	18	3.9	—	—	0.0024	0.0074	0.0006	0.0012	< 0.0005	0.0013	< 0.005	0.0148	< 0.0005	< 0.0005	< 0.005	< 6	
9/23/2010 9:15	9/23/2010 9:15	Storm Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9/30/2010 9:30	9/30/2010 9:31	Base Grab	281	106	380	21	6.2	< 1.0	< 1.0	—	—	—	—	—	—	—	—	—	—	—	—	< 6
10/4/2010 9:10	10/4/2010 9:10	Base Grab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/15/2010 9:40	10/15/2010 9:41	Base Grab	313	97	396	29	10.9	6.8	7.6	—	—	—	—	—	—	—	—	—	—	—	—	< 6
10/15/2010 9:42	10/15/2010 9:43	Base Grab	322	104	404	32	10.3	7.1														

Appendix F – Kasota Ponds Monitoring Results

Table F.1. Monitoring results for KPEE

Date	Sample Time	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH	Salinity (ppt)	Total Suspended Solids (mg/L)	Volatile Dissolved Solids (mg/L)	Total Dissolved Solids (mg/L)	Total Ortho Phosphate (mg/L)	Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N Ion (mg/L)	Nitrate N (mg/L)	Chloride (mg/L)	Hardness (mg/L CaCO3)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	
4/12/2010	12:05	55	57.7	8.96	1,674	2,104	7.60	1.10	~ 2	~ 1	1,170	0.059	< 0.005	1.7	~ 0.05	< 0.03	< 0.05	555	408	0.0049	0.0049	0.0059	0.0059	< 0.0001	< 0.0001	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.010	< 0.010
5/17/2010	10:25	68	64.9	10.75	1,696	1,943	8.20	1.00	~ 2	~ 1	1,060	~ 0.041	~ 0.005	1.1	~ 0.02	< 0.03	< 0.05	516	332	0.0055	0.0055	0.0040	0.0040	< 0.0001	< 0.0001	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
6/21/2010	12:55	74	79.5	9.11	1,813	1,753	8.50	0.90	16	10	1,040	0.129	0.017	1.8	~ 0.05	< 0.03	< 0.05	517	260	0.0042	0.0042	0.0027	0.0032	< 0.0001	0.0008	0.0063	0.0063	< 0.0005	< 0.0005	< 0.005	< 0.005
7/23/2010	10:35	75	76.5	4.69	1,447	1,455	7.48	0.73	6	5	795	0.158	0.022	1.6	~ 0.04	< 0.03	0.39	367	268	0.0025	0.0025	0.0032	0.0032	< 0.0001	0.0002	< 0.0050	0.0137	< 0.0005	< 0.0005	< 0.005	< 0.005
8/18/2010	11:30	75	70.7	1.79	1,060	1,135	7.17	0.56	~ 1	~ 1	684	0.058	0.018	1.2	~ 0.03	< 0.03	< 0.05	248	244	0.0033	0.0033	0.0031	0.0031	< 0.0001	< 0.0001	< 0.0100	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
9/14/2010	10:00	60	62.2	4.13	1,078	1,277	7.39	0.64	~ 2	3	404	~ 0.049	~ 0.007	1.2	0.16	< 0.03	< 0.05	309	280	0.0020	0.0020	0.0029	0.0029	< 0.0001	< 0.0001	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.005	< 0.005
10/21/2010	11:25	50	48.6	7.03	899	1,287	7.55	0.65	5	4	716	~ 0.048	< 0.005	1.4	0.16	< 0.03	< 0.05	289	320	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010
11/18/2010	10:55	35	36.0	11.97	760	1,346	7.75	0.67	10	8	754	0.127	0.090	2.3	< 0.02	< 0.03	< 0.05	332	320	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	0.0350	0.045	< 0.0010	< 0.0010	< 0.010	< 0.010

Table F.2. Monitoring results for KPEN

Date	Air			Water			Dissolved			Specific			Total Suspended Solids	Volatile Dissolved Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen			Ammonia			Chloride	Hardness	Soluble Copper	Total Copper	Soluble Nickel	Total Nickel	Soluble Lead	Total Lead	Soluble Zinc	Total Zinc	Soluble Cadmium	Total Cadmium	Soluble Chromium	Total Chromium
	Sample Time	Temp (F)	Temp (F)	Oxygen (mg/L)	Conductivity (µS/cm)	Conductivity (µS/cm)	pH	Salinity (ppt)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Ion (mg/L)	(mg/L CaCO3)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
4/12/2010	11:55	55	57.7	9.12	1,664	2,092	7.40	1.10	~ 2	~ 1	1,150	~ 0.025	< 0.005	1.30	0.07	< 0.03	< 0.05	556	412	0.0051	0.0051	0.0061	0.0061	< 0.0001	0.0001	0.0426	0.0426	< 0.0005	< 0.0005	< 0.010	< 0.010				
5/17/2010	10:15	68	66.7	11.89	1,707	1,914	7.70	1.00	~ 2	~ 1	1,040	~ 0.030	< 0.005	0.94	~ 0.04	< 0.03	< 0.05	514	320	0.0062	0.0062	0.0041	0.0042	< 0.0001	< 0.0001	< 0.050	< 0.050	< 0.0005	< 0.0005	< 0.005	< 0.005				
6/21/2010	12:43	74	77.0	7.16	1,811	1,812	7.80	0.90	3	3	990	0.074	0.016	1.30	~ 0.04	< 0.03	< 0.05	327	304	0.0048	0.0048	0.0032	0.0032	< 0.0001	< 0.0001	0.0109	0.0109	< 0.0005	< 0.0005	< 0.005	< 0.005				
7/23/2010	10:30	75	75.2	3.32	1,407	1,435	7.32	0.72	~ 2	~ 2	814	0.130	0.020	1.00	~ 0.04	< 0.03	0.05	351	240	0.0049	0.0049	0.0034	0.0034	0.0002	< 0.0001	0.0057	0.0057	< 0.0005	< 0.0005	< 0.005	< 0.005				
8/18/2010	11:25	75	70.7	2.66	1,035	1,108	7.31	0.55	6	3	653	0.081	0.014	1.40	~ 0.02	< 0.03	< 0.05	251	240	0.0028	0.0028	0.0032	0.0032	< 0.0001	0.0003	0.0121	0.0121	< 0.0005	< 0.0005	< 0.005	< 0.005				
9/14/2010	9:45	60	61.9	2.60	1,043	1,243	7.41	0.62	5	~ 1	815	0.074	~ 0.009	1.90	0.12	< 0.03	< 0.05	314	280	0.0030	0.0030	0.0029	0.0029	< 0.0001	0.0002	< 0.0100	0.0107	< 0.0005	< 0.0005	< 0.005	< 0.005				
10/21/2010	11:15	50	49.6	6.16	908	1,280	7.51	0.64	4	3	712	~ 0.046	~ 0.005	1.50	0.17	< 0.03	0.07	288	316	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010				
11/18/2010	10:43	34	36.7	11.41	772	1,349	7.72	0.67	8	7	765	0.110	~ 0.008	1.90	< 0.02	< 0.03	0.82	296	324	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010				
12/22/2010	12:47	30	32.4	5.10	1,038	1,972	7.40	0.98	20	18	1,160	0.236	~ 0.005	4.20	0.68	< 0.03	< 0.05	442	500	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010				

Table F.3. Monitoring results for KPEW

Date	Air		Water		Dissolved		Specific		Total Suspended Solids (mg/L)	Volatile Solids (mg/L)	Total Suspended Solids (mg/L)		Total Dissolved Phosphorus (mg/L)		Ortho Phosphate (mg/L)	Kjeldahl Ammonia Nitrogen (mg/L)		Chloride Ion (mg/L)		Hardness (mg/L CaCO ₃)	Soluble Copper (mg/L)	Total Copper (mg/L)		Soluble Nickel (mg/L)	Total Nickel (mg/L)		Soluble Lead (mg/L)		Total Lead (mg/L)		Soluble Zinc (mg/L)		Total Zinc (mg/L)		Soluble Cadmium (mg/L)		Total Cadmium (mg/L)		Soluble Chromium (mg/L)		Total Chromium (mg/L)	
	Sample Time	Air Temp (F)	Water Temp (F)	Oxygen (mg/L)	Conductivity (μS/cm)	Specific Conductivity (μS/cm)	pH	Salinity (ppt)			Total Phosphorus (mg/L)	Suspended Solids (mg/L)	Total Dissolved Phosphorus (mg/L)	Ortho Phosphate (mg/L)		Kjeldahl Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Chloride Ion (mg/L)			Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)									
4/12/2010	11:45	55	57.2	9.18	1,652	2,092	7.20	1.10	~ 2	~ 2	1,160	~ 0.035	< 0.005	1.3	~ 0.05	< 0.03	< 0.05	556	404	0.0047	0.0047	0.0055	0.0059	< 0.0001	0.0001	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.010	< 0.010											
5/17/2010	10:05	68	65.7	12.22	1,676	1,907	7.60	1.00	~ 2	~ 1	1,010	~ 0.030	~ 0.005	1.1	~ 0.04	< 0.03	< 0.05	522	344	0.0047	0.0047	0.0039	0.0042	< 0.0001	< 0.0001	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005											
6/21/2010	12:35	74	69.4	7.36	2,040	2,218	7.70	1.10	~ 2	~ 2	1,010	~ 0.047	0.010	1.1	~ 0.03	< 0.03	< 0.05	491	296	0.0037	0.0048	0.0027	0.0034	< 0.0005	< 0.0005	0.0239	0.0239	< 0.0005	< 0.0005	< 0.005	< 0.005											
7/23/2010	10:25	75	74.3	2.54	1,376	1,417	7.49	0.71	9	6	796	0.089	0.017	1.3	~ 0.03	< 0.03	0.16	345	272	0.0031	0.0031	0.0032	< 0.0001	0.0001	< 0.0050	0.0214	< 0.0005	< 0.0005	< 0.005	< 0.005												
8/18/2010	11:10	75	70.5	0.59	1,034	1,112	7.17	0.55	11	6	658	0.089	0.016	1.4	0.10	< 0.03	< 0.05	254	240	0.0027	0.0027	0.0030	< 0.0001	0.0002	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005												
8/18/2010	11:12	75	70.5	0.59	1,034	1,112	7.17	0.55	—	—	677	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										
9/14/2010	9:35	60	61.0	2.42	1,031	1,221	7.48	0.61	~ 2	3	681	~ 0.042	~ 0.007	1.0	0.09	< 0.03	< 0.05	286	280	0.0022	0.0022	0.0032	0.0032	< 0.0001	< 0.0001	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005											
9/14/2010	9:36	60	61.0	2.42	1,031	1,221	7.48	0.61	~ 2	~ 2	694	~ 0.038	0.022	1.1	0.09	< 0.03	< 0.05	310	252	0.0020	0.0020	0.0026	0.0026	< 0.0001	< 0.0001	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.005	< 0.005											
10/21/2010	11:08	50	48.0	5.18	879	1,269	7.52	0.64	11	6	705	~ 0.043	~ 0.005	1.2	0.10	< 0.03	0.09	278	308	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	0.0290	0.0290	< 0.0010	< 0.0010	< 0.010	< 0.010											
11/18/2010	10:34	35	35.8	11.91	748	1,331	7.70	0.66	13	12	758	0.083	0.012	1.7	< 0.02	< 0.03	< 0.05	293	304	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010											
12/22/2010	12:25	30	35.8	1.50	1,038	1,848	7.38	0.93	18	17	1,080	0.250	~ 0.005	3.6	0.60	< 0.03	< 0.05	424	452	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	0.0260	0.0260	< 0.0010	< 0.0010	< 0.010	< 0.010											
12/22/2010	12:26	30	35.8	1.50	1,038	1,848	7.38	0.93	16	13	1,100	0.162	~ 0.006	3.4	0.61	< 0.03	< 0.05	425	468	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010											

Table F.4. Monitoring results for KPNS

Date	Air		Water		Dissolved			Specific			Total Solids (mg/L)	Volatile Solids (mg/L)	Total Suspended Solids (mg/L)	Total			Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	
	Sample Time	Temp (F)	Temp (F)	Oxygen (mg/L)	Conductivity (μS/cm)	Specific Conductivity (μS/cm)	pH	Salinity (ppt)	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)				Kjeldahl Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)															
4/12/2010	12:25	55	54.3	7.20	1,310	1,725	7.70	0.90	4	3	931	~ 0.021	< 0.005	1.20	~ 0.04	< 0.03	< 0.05	420	360	0.0039	0.0039	0.0059	0.0059	< 0.0001	0.0003	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.010	< 0.010
5/17/2010	9:20	68	61.7	9.23	1,347	1,607	7.00	0.80	5	4	883	0.058	~ 0.007	1.10	< 0.02	< 0.03	< 0.05	363	324	0.0037	0.0037	0.0042	0.0046	< 0.0001	0.0001	0.0063	< 0.0005	< 0.0005	< 0.005	< 0.005	
6/21/2010	11:18	74	73.0	2.51	1,399	1,460	7.20	0.70	5	5	821	0.069	~ 0.007	1.10	< 0.02	< 0.03	0.12	326	288	0.0037	0.0037	0.0036	0.0036	< 0.0005	< 0.0005	< 0.0128	< 0.0005	< 0.0005	< 0.005	< 0.005	
7/23/2010	11:20	75	73.9	2.23	719	743	7.18	0.36	6	4	408	0.096	0.019	1.00	~ 0.04	< 0.03	< 0.05	131	180	0.0015	0.0015	0.0023	0.0023	< 0.0001	0.0002	< 0.0050	0.0321	< 0.0005	< 0.0005	< 0.005	< 0.005
8/18/2010	10:35	75	69.6	2.19	393	427	6.97	0.21	5	4	247	0.119	0.017	0.66	< 0.02	< 0.03	< 0.05	75	140	0.0027	0.0027	0.0030	0.0030	< 0.0001	0.0002	0.0061	< 0.0005	< 0.0005	< 0.005	< 0.005	
9/14/2010	9:10	60	61.5	9.13	525	627	7.53	0.31	4	3	353	~ 0.031	< 0.005	0.51	< 0.02	< 0.03	< 0.05	97	156	0.0011	0.0011	0.0019	0.0019	< 0.0001	0.0003	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.005	< 0.005
10/21/2010	10:00	50	47.1	9.44	536	784	7.20	0.39	28	18	433	0.060	< 0.005	0.84	< 0.02	< 0.03	< 0.05	132	212	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010
10/21/2010	10:02	50	47.1	9.44	536	784	7.20	0.39	13	9	421	~ 0.038	< 0.005	0.77	~ 0.02	< 0.03	< 0.05	93	208	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010
11/18/2010	9:45	34	37.8	7.18	537	918	7.38	0.45	~ 2	~ 2	494	~ 0.043	0.012	0.69	< 0.02	< 0.03	< 0.05	153	208	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	0.0330	0.0440	< 0.0010	< 0.0010	< 0.010	< 0.010
12/22/2010	10:45	30	34.3	2.10	811	1,483	6.69	0.73	19	10	858	0.181	~ 0.007	1.50	0.08	< 0.03	< 0.05	283	392	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010

Table F.5. Monitoring results for KPNW

Date	Sample Time	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	Total Solids (mg/L)	Volatile Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Total Ortho Phosphate (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Chloride Ion (mg/L)	Hardness ($\text{mg}/\text{L CaCO}_3$)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)		
		pH	Salinity (ppt)																										
4/12/2010	12:21	55	55.0	7.42	1,325	1,727	7.70	0.90	4	3	974	~ 0.028	< 0.005	1.20	< 0.02	< 0.03	< 0.05	416	364	0.0039	0.0052	0.0052 < 0.0001	0.0003 < 0.0100	< 0.0005	< 0.0005	< 0.010	< 0.010		
5/17/2010	9:10	68	61.7	6.83	1,353	1,614	6.70	0.80	3	~ 2	873	~ 0.034	~ 0.006	1.60	0.40	< 0.03	0.12	399	312	0.0037	0.0039	0.0039 < 0.0001	0.0003 < 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005		
6/21/2010	11:10	74	68.2	0.87	1,699	1,874	6.70	1.00	3	~ 2	794	0.064	~ 0.009	1.40	~ 0.02	< 0.03	< 0.05	326	292	0.0031	0.0032	0.0035 < 0.0005	< 0.0005	0.0332	0.0332 < 0.0005	< 0.0005	< 0.005		
6/21/2010	11:12	74	68.2	0.87	1,699	1,874	6.70	1.00	~ 2	~ 2	817	0.059	0.012	1.30	~ 0.03	< 0.03	0.05	398	304	0.0026	0.0033	0.0033 < 0.0001	0.0002	0.0233	0.0233 < 0.0005	< 0.0005	< 0.005		
7/23/2010	11:15	75	74.7	2.47	721	739	7.21	0.36	8	~ 5	400	0.096	0.023	0.79	0.06	< 0.03	0.10	130	164	0.0023	0.0023	0.0024 < 0.0001	0.0002	< 0.0050	0.0676 < 0.0005	< 0.0005	< 0.005		
8/18/2010	10:30	75	69.6	1.85	388	421	7.10	0.20	6	4	249	0.123	0.051	0.80	< 0.02	< 0.03	< 0.05	73	104	0.0024	0.0024	0.0020	0.0021	0.0001	0.0003 < 0.0050	< 0.0050	< 0.005		
9/14/2010	9:00	60	62.1	8.01	520	618	7.44	0.30	6	5	353	~ 0.049	< 0.005	0.70	< 0.02	< 0.03	< 0.05	98	176	0.0011	0.0013	0.0024	0.0024 < 0.0001	0.0003	< 0.0050	< 0.0050	< 0.005		
10/21/2010	9:50	50	48.0	8.02	535	773	7.41	0.38	3	3	435	~ 0.022	< 0.005	0.58	< 0.02	< 0.03	< 0.05	130	200	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200		
11/18/2010	9:35	30	38.8	8.14	548	920	7.68	0.45	6	3	518	~ 0.047	~ 0.006	0.77	< 0.02	< 0.03	< 0.05	159	240	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200		
12/22/2010	10:15	29	36.3	0.17	800	1,407	6.56	0.70	15	8	771	0.110	0.022	1.50	0.07	< 0.03	< 0.05	246	348	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	0.0290	0.0290 < 0.0010	< 0.0010	< 0.010

Table F.6. Monitoring results for KPWE

Date	Sample Time	Air Temp (F)	Water Temp (F)	Dissolved Oxygen (mg/L)	Conductivity ($\mu\text{S}/\text{cm}$)	Specific Conductivity ($\mu\text{S}/\text{cm}$)	pH	Salinity (ppt)	Total Suspended Solids (mg/L)	Volatile Dissolved Solids (mg/L)	Total Dissolved Solids (mg/L)	Ortho Phosphate (mg/L)	Kjeldahl Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	
4/12/2010	11:36	55	55.6	10.18	1,065	1,378	7.30	0.70	3	~ 2	752	~ 0.015	< 0.005	1.1	~ 0.03	< 0.03	0.08	341	252	0.0037	0.0037	0.0042	0.0042	< 0.0001	< 0.0001	< 0.0100	< 0.0100	< 0.0005	< 0.0005	< 0.010	< 0.010
5/17/2010	9:40	68	62.1	11.99	1,361	1,615	7.70	0.80	~ 2	~ 2	878	~ 0.023	< 0.005	1.5	0.34	< 0.03	0.14	394	316	0.0047	0.0047	0.0042	0.0042	< 0.0001	0.0002	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
6/21/2010	11:55	74	69.3	4.24	1,825	1,989	7.60	1.00	~ 1	~ 1	815	~ 0.017	< 0.005	1.4	0.35	0.07	0.10	394	300	0.0048	0.0053	0.0041	0.0041	< 0.0001	0.0001	0.0130	< 0.0005	< 0.0005	< 0.005	< 0.005	
7/23/2010	10:16	75	77.2	2.07	1,323	1,322	7.43	0.66	~ 1	~ 1	737	~ 0.041	0.013	1.1	0.33	< 0.03	0.09	316	252	0.0027	0.0027	0.0034	0.0034	< 0.0001	0.0002	0.0259	0.0269	< 0.0005	< 0.0005	< 0.005	< 0.005
8/18/2010	11:04	75	73.4	2.79	1,013	1,052	7.30	0.52	~ 2	~ 1	620	0.065	0.028	1.2	0.27	—	—	238	220	0.0015	0.0027	0.0018	0.0032	0.0002	0.0004	0.0066	0.0066	< 0.0005	< 0.0005	< 0.005	< 0.005
9/14/2010	9:30	60	64.8	5.51	955	1,097	7.64	0.55	3	3	630	0.055	~ 0.006	1.2	0.35	0.04	0.13	242	232	0.0022	0.0024	0.0033	0.0034	< 0.0001	0.0005	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
10/21/2010	11:00	50	52.3	4.68	824	1,116	7.51	0.56	~ 4	~ 3	627	~ 0.044	~ 0.005	1.4	0.35	< 0.03	< 0.05	244	260	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0300	< 0.0300	< 0.0200	< 0.0200	< 0.0100	< 0.0100	< 0.010	< 0.010
11/18/2010	10:25	35	38.3	8.32	658	1,117	7.57	0.55	~ 2	~ 1	650	0.052	0.013	1.8	0.64	< 0.03	0.08	256	244	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0300	< 0.0300	< 0.0200	0.0290	< 0.0010	< 0.0010	< 0.010	< 0.010
12/22/2010	11:30	30	34.3	2.97	765	1,393	7.27	0.69	~ 2	~ 2	830	0.075	~ 0.007	2.6	0.83	< 0.03	0.12	316	340	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0300	< 0.0300	< 0.0200	< 0.0200	< 0.0100	< 0.0100	< 0.010	< 0.010

Table F.7. Monitoring results for KPWN

Date	Air		Water		Dissolved		Specific		Total Solids (mg/L)	Volatile Solids (mg/L)	Total		Kjeldahl		Ammonia		Chloride Ion (mg/L)	Hardness (mg/L CaCO ₃)	Soluble Copper (mg/L)	Total Copper (mg/L)	Soluble Nickel (mg/L)	Total Nickel (mg/L)	Soluble Lead (mg/L)	Total Lead (mg/L)	Soluble Zinc (mg/L)	Total Zinc (mg/L)	Soluble Cadmium (mg/L)	Total Cadmium (mg/L)	Soluble Chromium (mg/L)	Total Chromium (mg/L)	
	Sample Time	Air Temp (F)	Water Temp (F)	Oxygen (mg/L)	Conductivity (μS/cm)	Conductivity (μS/cm)	pH	Salinity (ppt)			Total Dissolved Solids (mg/L)	Total Dissolved Solids (mg/L)	Ortho Phosphate (mg/L)	Nitrogen (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Ammonia (mg/L)														
4/12/2010	11:25	55	55.8	10.26	1,065	1,375	7.20	0.70	~ 2	~ 2	738	~ 0.031	< 0.005	1.2	0.09	< 0.03	0.07	341	248	0.0040	0.0040	0.0036	0.0038	< 0.0001	0.0001	0.0164	0.0164	< 0.0005	< 0.0050	< 0.010	< 0.010
4/12/2010	11:27	55	55.8	10.26	1,065	1,375	7.20	0.70	3	~ 2	754	~ 0.021	< 0.005	1.1	< 0.02	< 0.03	0.09	372	256	0.0039	0.0039	0.0042	0.0046	< 0.0001	< 0.0001	0.0543	0.0543	< 0.0005	< 0.0005	< 0.010	< 0.010
5/17/2010	9:33	68	63.0	7.33	1,375	1,615	7.00	0.80	5	4	879	0.051	~ 0.007	1.2	< 0.02	< 0.03	< 0.05	371	324	0.0038	0.0038	0.0043	0.0048	< 0.0001	0.0001	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
6/21/2010	11:47	74	69.4	4.75	1,829	1,989	7.40	1.00	3	~ 2	885	~ 0.018	~ 0.006	1.8	0.36	0.07	0.09	369	312	0.0042	0.0042	0.0039	0.0042	< 0.0001	0.0014	0.0064	0.0064	< 0.0005	< 0.0005	< 0.005	< 0.005
7/23/2010	10:05	75	77.0	1.67	1,324	1,325	7.43	0.66	~ 2	~ 1	707	~ 0.048	0.013	1.2	0.35	< 0.03	0.07	322	236	0.0028	0.0028	0.0035	0.0035	< 0.0001	0.0003	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
8/18/2010	10:56	75	73.4	2.73	1,010	1,050	7.26	0.52	11	3	619	0.061	0.012	1.5	0.26	0.03	< 0.05	246	228	0.0027	0.0034	0.0031	0.0035	< 0.0001	0.0013	0.0054	0.0078	< 0.0005	< 0.0005	< 0.005	< 0.005
9/14/2010	9:20	60	65.1	5.61	956	1,093	7.61	0.54	3	3	619	~ 0.036	~ 0.009	1.1	0.36	0.04	0.15	244	244	0.0021	0.0021	0.0032	0.0032	< 0.0001	0.0004	< 0.0050	< 0.0050	< 0.0005	< 0.0005	< 0.005	< 0.005
10/21/2010	10:50	50	52.7	4.95	826	1,115	7.44	0.56	~ 2	~ 2	617	0.053	~ 0.006	1.3	0.22	< 0.03	< 0.05	234	256	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010
11/18/2010	10:20	35	38.5	8.53	660	1,115	7.52	0.55	~ 1	~ 1	625	0.062	0.013	1.9	0.65	< 0.03	0.08	234	240	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010
12/22/2010	11:10	30	36.0	2.26	782	1,383	7.14	0.69	~ 2	~ 1	805	0.050	~ 0.006	2.4	0.92	< 0.03	0.10	305	328	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0030	< 0.0030	< 0.0200	< 0.0200	< 0.0010	< 0.0010	< 0.010	< 0.010