Memorandum

To:	**Michael Hahn (SEWRPC)**	**Date:**	**September 17, 2012 (FINAL)**
From:	**Kevin Kratt, J. Butcher**	**Subject:**	**Milwaukee Climate Change Risk Modeling**
cc:		**Proj. No.**	**100-CLE-T27944**

1 Introduction

The National Oceanic and Atmospheric Administration (NOAA) is sponsoring a study entitled "Evaluating Climate Change Risks and Impacts on Urban Coastal Water Resources in the Great Lakes." This project is a collaborative effort involving the University of Wisconsin-Milwaukee Great Lakes WATER Institute, the University of Wisconsin-Milwaukee Department of Civil Engineering and Mechanics, the University of Wisconsin-Madison Center for Climate Research, and the Southeastern Wisconsin Regional Planning Commission (SEWRPC). The overall objective of this project is to create a decision support tool for understanding climate impacts on water resources within the greater Milwaukee watersheds. The results of this project will be disseminated through the Wisconsin Initiative on Climate Change Impacts Milwaukee Working Group to both water resources managers for planning purposes, and the public to increase awareness of the potential consequences of climate change.

The overall analysis includes simulation of both the Greater Milwaukee watersheds draining to Lake Michigan and the receiving waters in Lake Michigan. The receiving water modeling, which requires the watershed model output as boundary conditions, is being conducted at the University of Wisconsin-Milwaukee. The watershed modeling component, documented in this memorandum, was conducted by Tetra Tech under contract to SEWRPC.

Watershed flow and water quality modeling uses the calibrated and validated continuous simulation models developed by Tetra Tech in support of the Milwaukee Metropolitan Sewerage District 2020 facilities plan and SEWRPC regional water quality management plan update for the greater Milwaukee watersheds (collectively referred to as the Water Quality Initiative or WQI). These models are documented in Milwaukee Metropolitan Sewerage District, *MMSD 2020 Facilities Plan*, June 2007 and SEWRPC Planning Report No. 50 (PR No. 50), *A Regional Water Quality Management Plan for the Greater Milwaukee Watersheds*, December 2007. These models simulate instream water quality conditions and flow in the Kinnickinnic, Menomonee, Milwaukee, and Root River watersheds, the Oak Creek watershed, the area draining directly to the Milwaukee Harbor estuary, and the Lake Michigan direct drainage area (collectively referred to as the greater Milwaukee watersheds) in the Southeastern Wisconsin Region. Models for the Kinnickinnic River, Menomonee River, Root River, and Oak Creek

watersheds are built using EPA's Hydrologic Simulation Program – FORTRAN (HSPF)[1], while the Milwaukee River model (the largest individual model) uses a recompiled version of HSPF called Loading Simulation Program in C++ (LSPC), developed by Tetra Tech[2].

The original HSPF and LSPC watershed water quality model runs from the WQI were developed for the 10-year meteorological period from 1988 through 1997. The models were developed to represent both year 2000 and planned year 2020 land use conditions and management practices, assuming climate conditions characteristic of the period from 1988 through 1997, which was determined to approximate normal conditions in the absence of major climate change influences. For this study, the watershed representation (independent of climate change) is provided by the models for revised 2020 baseline population and land use and recommended regional water quality management plan conditions (the "preferred alternative") with 1988 – 1997 climate. In Tetra Tech's library of multiple model scenarios this is referred to as the "PA2" and/or the "PrefAlt2" model run.

2 Climate Scenarios

Potential climate impacts are estimated based on expected conditions at mid-century (from 2046 through 2065). The envelope of potential impacts is estimated by comparing "best case" and "worst case" climate change conditions for rainfall, air temperature, and potential evapotranspiration to current conditions, where current conditions are represented by the 1988 through 1997 meteorological time series. To provide a consistent basis for comparison, the future weather series were based on perturbations of the 1987 – 1997 time series (allowing a year for model spin-up). Specifically, the UW-Madison Center for Climate Research created downscaled versions of 1987 – 1997 precipitation and temperature representing the 10th percentile and 90th percentile of predicted climate statistics for mid-century under the A1B emissions scenario (which projects emissions for a future world of very rapid economic growth, low population growth and rapid introduction of new and more efficient technology).. The underlying ensemble is derived from the suite of archived output from 14 general circulation models (GCMs) contained in the World Climate Research Programme's (WCRP's) CMIP3 multi-model dataset, statistically downscaled to the local scale using the CRU CL 2.0 20th century climate dataset. Results were provided at a 15-minute time step. Potential evapotranspiration (PET) was computed using the Penman Pan Evaporation formula along with some localized monthly adjustments.

The climate models are generally in agreement that spring rainfall will increase in the Milwaukee area. The "best case" (10th percentile) and "worst case" (90th percentile) scenarios for mid-century were defined relative to the spring rainfall thresholds associated with SSO and CSO events over the past ten years[3]. Specifically, the choice of a particular distribution for rescaling the historical precipitation and temperature records was based on interpolating the two models closest to the upper 90th percentile and the two closest to the lower 10th percentile for increases in the number of spring precipitation events larger than 1 inch in 24 hours. The 10th percentile ("best case") simulations are based on a 50/50 blend of ipsl_cm4 and csiro_mk3_0; the 90th percentile ("worst case") simulations are based on a 50/50 blend of the miub_echo_g and microc3_2_hires simulations. The future time series were created from observed data using a remapping approach in which the gridded climate output is related to the probability density function of temperature and precipitation at a point meteorological station and the time-mean cumulative

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[1] Bicknell, B.R., J.C. Imhoff, J.L. Kittle, Jr., T.H. Jobes, and A.S. Donigian, Jr. 2005. HSPF Version 12.2 User's Manual. Aqua Terra Consultants in Cooperation with the U.S. Geological Survey for the U.S. Environmental Protection Agency, National Exposure Research Laboratory, Office of Research and Development, Athens, GA.

[2] Tetra Tech. 2009. Loading Simulation Program in C++ (LSPC) Version 3.1 User's Manual. Fairfax, VA. LSPC is available at: http://www.epa.gov/athens/wwqtsc/html/lspc.html.

[3] McLellan, S., M. Hahn, D. Lorenz, G. Pinter, I. Lauko, E. Suer, D. Bennett, D. Perry, and J. McMullin. 2011. Impact of Climate Change on CSOs and SSOs in Milwaukee Watersheds. University of Wisconsin-Milwaukee and Southeastern Wisconsin Regional Planning Commission.

distribution function for the present and future conditions is used to map percentiles between present and future. This approach allows the future time series to incorporate any changes in the probability distribution that are predicted by the GCM, such as a higher frequency of intense rainfall events.

For the watershed model application, the two scenarios represent an increase of from 5.6 to 8.7 degrees Fahrenheit in annual average temperature relative to the 1988-1997 baseline (Table 1). While the two scenarios were selected to describe the potential range of frequency of large spring rainfall events, the resulting differences in annual average precipitation are small. On the other hand, PET is estimated to increase by 25 to 38 percent, with predictions for a more arid future in which average annual PET exceeds precipitation.

Table 1.   Comparison of 2050 Climate Scenarios to 1988 – 1997 Baseline

	Baseline (1988 – 1997)	10th Percentile ("Best Case")	90th Percentile ("Worst Case")
Precipitation (in/yr)	32.5	33.2	33.4
Average Temperature (°F)	47.7	53.3	56.4
Potential Evapotranspiration (in/yr)	30.4	37.5	42.1

The existing watershed models were built using multiple weather stations to capture local variability in precipitation amounts, temperature, and other meteorological variables. In contrast, the future climate scenarios provide output for only one station in Milwaukee – General Mitchell International Airport. Therefore, it was first necessary to re-run the existing condition models using a single meteorological station. This means that the baseline results will not exactly match (and indeed should be less accurate) than those presented under the WQI based on model calibration to multiple meteorological stations. In addition, using a single meteorological station is equivalent to an assumption that rain events occur everywhere in the watershed at exactly the same time, which can lead to an artificial increase in the predicted intensity of extreme events, particularly high flow events. Nevertheless, the results should provide a reasonable basis for *relative* comparison of the potential range of impacts of climate change.

The model uses additional meteorological variables, including wind travel, solar radiation, dew point temperature, and cloud cover. Wind, solar radiation, and dew point temperature are used in the upland simulation only in the estimation of snow melt and snow sublimation. All four variables are used in the stream reach simulation, where they affect water temperature and algal growth. All four variables are also inputs to the calculation of Penman Pan PET. The statistical approach used for downscaling the climate results did not produce estimates of these meteorological time series. Therefore, they are represented by the existing condition time series from General Mitchell International Airport in all scenarios. As a result, the PET time series differs between climate scenarios only as a function of air temperature and does not reflect any potential changes in wind, changes in incident solar radiation as a result of changes in cloudiness, or changes in dew point temperature. For the reach simulation, water temperature in shallow streams is most strongly controlled by air temperature, so holding the other meteorological variables that affect sensible and evaporative heat exchange should have only a small impact. Finally, simulations of algal growth do not reflect any changes in light availability due to changes in cloudiness.

Another important, but sometimes ignored, aspect of climate change is the predicted increase in ground level CO_2 concentrations. IPCC predictions of CO_2 concentrations in the atmosphere under the A1B emissions scenario call for an increase from 369 ppmv in 2000 to about 532 ppmv (using the ISAM

model reference run) or 522 ppmv (using the Bern-CC model reference run) in 2050[4]. Plants require CO_2 from the atmosphere for photosynthesis. An important effect of CO_2 fertilization is increased stomatal closure, as plants do not need to transpire as much water to obtain the CO_2 they need for growth. This effect can potentially counterbalance predicted increases in temperature and potential evapotranspiration. It may also reduce water stress on plants, resulting in greater biomass and litter production, which in turn will influence pollutant loads. Recent research, particularly the FACE experiments summary[5], seems to confirm that significant evapotranspiration reductions do occur at the ecosystem level under CO_2 fertilization. Although there are differences in responses among plant species, with lesser effects with C_4 photosynthesis, the magnitude of the response to CO_2 levels predicted by the mid-21st century appears to be on the order of a 10 percent reduction in evapotranspiration response[6].

This feedback effect from increased CO_2 may in part offset the predicted increase in PET. Unfortunately, a limitation of the HSPF model is that it does not include an integrated plant growth model and therefore cannot directly simulate this feedback effect on actual evapotranspiration. The major impact of this shortcoming is to introduce a potential bias in which summer low flows may be underestimated. To a lesser extent, peak flows from summer convective storms may also be underestimated if antecedent soil moisture is underestimated.

3 Simulation Results

The WQI recommended plan simulations were run three times for each watershed: once using existing climate (restricted to General Mitchell International Airport time series), and once each using the 10 percent and 90 percent mid-century climate scenarios. These runs include seasonal disinfection, which is represented in HSPF by combining the results of simulations with and without the disinfection units in place.[7] The disinfection units have a major impact on fecal coliform loads, and also slightly alter hydrology by delaying some storm flows.

3.1 LOAD AND CONCENTRATION SUMMARIES

Annual average loads delivered from each watershed over the ten-year simulation period are summarized in Table 2. Table 3 summarizes the average annual flow and concentrations at the watershed outlets for

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[4] Appendix II *in* IPCC (Intergovernmental Panel on Climate Change). 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Houghton, J.T.,Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (eds.)]. Cambridge University Press, Cambridge, UK.

[5] Leakey, A.D.B., E.A. Ainsworth, C.J. Bernacchi, A. Rogers, S.P. Long, and D.R. Ort. 2009. Elevated CO_2 effects on plant carbon, nitrogen, and water relations: six important lessons from FACE. *Journal of Experimental Botany*, 60(10): 2859-2876.

[6] See, for instance, Bernacchi, C.J., B.A. Kimball, D.R. Quarles, S.P. Long, and D.R. Ort. 2007. Decreases in stomatal conductance of soybean under open-air elevation of [CO_2] are closely coupled with decreases in ecosystem evapotranspiration. *Plant Physiology*, 143: 134-144.

[7] Within the water quality models for the recommended plan and extreme measures condition, the detection and elimination of illicit discharges to storm sewer systems and control of urban sourced pathogens, including those in stormwater runoff, are represented using stormwater disinfection units. Such units were initially considered as a recommended approach to treatment of runoff under the SEWRPC regional water quality management plan update, but were eliminated from consideration based on comments from the Technical Advisory Committee that guided preparation of the plan. However, the use of such units is considered to be appropriate as a surrogate representation of the varied and as yet undetermined means that would be applied to implement the plan recommendation to detect and eliminate illicit discharges and to control pathogens in urban stormwater runoff. Those units explicitly address the control of bacteria in stormwater runoff, and, based on the way that bacteria loads are represented in the calibrated model, they also implicitly provide some control of bacteria that may reach streams through illicit connections that contribute to baseflow.

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pollutants of interest. Concentration results are not provided for the Lake Michigan direct drainages as these consist of multiple small drainages that are not represented by a single output concentration.

Significant decreases in annual flow are predicted for both the "best" and "worst" case climate scenarios for 2050. This occurs because PET is predicted to increase at a much faster rate than precipitation. In many, but not all cases, annual pollutant load is also predicted to decrease due to lower total volumes of storm runoff. This is offset by the observation that both the "best" and "worst" case scenarios predict an increase in the frequency of large spring rainfall events – resulting in less total storm runoff but more high runoff events. The predicted effects on total suspended solids (TSS) loads reflect the complex interplay between upland loading rates and channel scour/resuspension events. In the Menomonee and Kinnickinnic watersheds the TSS load is greater than the recommended plan under both climate scenarios, whereas net reductions are predicted under both climate scenarios for the Milwaukee River, Oak Creek, and Root River watersheds.

Effects on pollutant concentration reflect the combined impact of changes in flow and load. If both flow and load decrease, average concentration can go up or down depending on which component changes more. For TSS, there is a tendency in the more urban parts of the Menomonee River, Kinnickinnic River, and Oak Creek watersheds for average concentrations to increase while the median concentration decreases (see Appendix A). This reflects a situation in which concentrations are generally predicted to decrease in the future, but the averages are higher due to a small number of large, scouring events.

Table 2.   Average Annual Flow Volume and Pollutant Load by Watershed

Watershed	Parameter	Recommended Plan based on GMIA Weather Inputs	Recommended Plan under Best-Case (10%) Climate Change Scenario	Recommended Plan under Worst-Case (90%) Climate Scenario
Milwaukee River	Flow (AF/yr)	451,927	379,457	348,428
	Fecal Coliform Bacteria (#/yr)	4.13E+15	3.41E+15	3.01E+15
	Total Phosphorus (MT/yr)	95.05	83.68	84.72
	Total Nitrogen (MT/yr)	878.8	706.1	686.7
	Total Suspended Solids (MT/yr)	14,270	12,611	13,236
	Copper (kg/yr)	4,395	4,002	3,811
Menomonee River	Flow (AF/yr)	97,117	85,877	81,391
	Fecal Coliform Bacteria (#/yr)	7.21E+15	6.59E+15	6.12E+15
	Total Phosphorus (MT/yr)	15.65	14.36	14.23
	Total Nitrogen (MT/yr)	124.8	110.4	107.5
	Total Suspended Solids (MT/yr)	5,251	5,338	5,544
	Copper (kg/yr)	825	768	733
Kinnickinnic River	Flow (AF/yr)	18,766	17,244	16,614
	Fecal Coliform Bacteria (#/yr)	2.18E+15	2.10E+15	2.01E+15
	Total Phosphorus (MT/yr)	4.52	4.13	4.01
	Total Nitrogen (MT/yr)	27.0	24.2	23.2
	Total Suspended Solids (MT/yr)	1,779	1,814	1,892
	Copper (kg/yr)	209	197	187

Watershed	Parameter	Recommended Plan based on GMIA Weather Inputs	Recommended Plan under Best-Case (10%) Climate Change Scenario	Recommended Plan under Worst-Case (90%) Climate Scenario
Oak Creek	Flow (AF/yr)	20,581	18,128	17,202
	Fecal Coliform Bacteria (#/yr)	1.52E+15	1.46E+15	1.42E+15
	Total Phosphorus (MT/yr)	3.10	2.88	2.80
	Total Nitrogen (MT/yr)	25.8	24.0	23.3
	Total Suspended Solids (MT/yr)	1,122	1,086	1,093
	Copper (kg/yr)	188	179	174
Root River	Flow (AF/yr)	119,550	92,897	83,781
	Fecal Coliform Bacteria (#/yr)	3.28E+15	2.94E+15	2.64E+15
	Total Phosphorus (MT/yr)	21.93	16.63	15.84
	Total Nitrogen (MT/yr)	262.5	190.5	179.3
	Total Suspended Solids (MT/yr)	11,502	8,882	8,960
	Copper (kg/yr)	148	128	118
Lake Michigan Direct Drainage	Flow (AF/yr)	31,596	27,479	25,757
	Fecal Coliform Bacteria (#/yr)	2.69E+15	2.57E+15	2.44E+15
	Total Phosphorus (MT/yr)	7.030	6.016	5.767
	Total Nitrogen (MT/yr)	57.18	48.28	45.92
	Total Suspended Solids (MT/yr)	2617	2591	2705
	Copper (kg/yr)	286.2	259.5	245.1

Table 3   Average Annual Flow Rate and Downstream Pollutant Concentration by Watershed

Watershed	Parameter	Recommended Plan based on GMIA Weather Inputs	Recommended Plan under Best-Case (10%) Climate Change Scenario	Recommended Plan under Worst-Case (90%) Climate Scenario
Milwaukee River	Flow (cfs)	623.7	523.7	480.9
	Fecal Coliform Bacteria (#/100 ml)	460	420	373
	Dissolved Oxygen (mg/L)	9.915	9.215	8.756
	Total Phosphorus (mg/L)	0.109	0.109	0.114
	Total Nitrogen (mg/L)	1.384	1.328	1.312
	Total Suspended Solids (mg/L)	55.67	43.11	44.19
	Copper (mg/L)	0.040	0.045	0.048
Menomonee River	Flow (cfs)	134.0	118.5	112.3
	Fecal Coliform Bacteria (#/100 ml)	3,835	3,437	3,209
	Dissolved Oxygen (mg/L)	11.13	10.79	10.59
	Total Phosphorus (mg/L)	0.136	0.149	0.160
	Total Nitrogen (mg/L)	1.150	1.191	1.243
	Total Suspended Solids (mg/L)	13.09	13.55	13.54
	Copper (mg/L)	0.045	0.044	0.043

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Watershed	Parameter	Recommended Plan based on GMIA Weather Inputs	Recommended Plan under Best-Case (10%) Climate Change Scenario	Recommended Plan under Worst-Case (90%) Climate Scenario
Kinnickinnic River	Flow (cfs)	25.90	23.80	22.93
	Fecal Coliform Bacteria (#/100 ml)	2,928	2,571	2,263
	Dissolved Oxygen (mg/L)	11.05	10.66	10.43
	Total Phosphorus (mg/L)	0.180	0.188	0.200
	Total Nitrogen (mg/L)	1.398	1.401	1.442
	Total Suspended Solids (mg/L)	10.41	10.63	10.70
	Copper (mg/L)	0.038	0.035	0.033
Oak Creek	Flow (cfs)	28.41	25.02	23.74
	Fecal Coliform Bacteria (#/100 ml)	3,696	3,181	2,918
	Dissolved Oxygen (mg/L)	11.22	10.91	10.74
	Total Phosphorus (mg/L)	0.070	0.068	0.068
	Total Nitrogen (mg/L)	0.811	0.803	0.810
	Total Suspended Solids (mg/L)	13.19	14.29	14.94
	Copper (mg/L)	0.047	0.046	0.048

Watershed	Parameter	Recommended Plan based on GMIA Weather Inputs	Recommended Plan under Best-Case (10%) Climate Change Scenario	Recommended Plan under Worst-Case (90%) Climate Scenario
Root River	Flow (cfs)	165.0	128.2	115.6
	Fecal Coliform Bacteria (#/100 ml)	2,836	3,280	3,373
	Dissolved Oxygen (mg/L)	11.11	10.90	10.75
	Total Phosphorus (mg/L)	0.100	0.105	0.114
	Total Nitrogen (mg/L)	1.191	1.158	1.183
	Total Suspended Solids (mg/L)	22.08	19.69	19.37
	Copper (mg/L)	0.012	0.014	0.014

3.2 WATER QUALITY CONDITION COMPARISON

Consistent with the WQI, instream water quality summary statistic condition comparison tables were developed for multiple water quality indicators at each assessment point in the five watersheds. The full set of tables is included as an appendix to this report. In general, the changes associated with future climate are small, as is the difference between the best case (10th percentile) and worst case (90th percentile) climate scenarios.

Both the best case and worst case climate scenarios can result in prediction of a slight improvement or slight degradation of conditions relative to the existing baseline. The result depends on the balance between changes in load and flow, especially the tradeoff between more intense events (which increase load) and lower frequency of events (which decreases load and concentration).

As an example of the complexities of the relationships in the model output, consider the downstream station on the Kinnickinnic. At this station, both total flow volume and total phosphorus load are predicted to decrease under both future scenarios, while total phosphorus concentration increases. Despite the overall decrease in flow and load, the highest flows increase under the future scenarios, as do the highest phosphorus concentrations. For TSS, both loads and concentrations increase under the future scenarios.

Figure 1 shows the flows for April – May 1990 under the baseline and 90th percentile scenarios. The flow peaks are higher under the 90th percentile scenario, while the intervening dry weather flows are lower (due primarily to increased ET). For TSS, which is loaded only by surface pathways, the higher flow peaks result in higher TSS concentrations, as the transport capacity for solids in overland flow is a nonlinear function of flow depth (Figure 2). The pattern differs from that of flow, however, as the amount of solids available for transport depends on the time since the last event. Thus, the May 10 event shows a smaller increase in TSS than might be expected from the magnitude of the flow because it occurred soon after another storm event on May 4, resulting in a reduced amount of stored sediment available for transport. In contrast, the TSS concentrations associated with events of May 16 and May 19 are relatively large because they mobilized sediment from the May 10 event that had been temporarily

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stored in the channel. Total phosphorus (Figure 3) shows yet another pattern, with small increases in large event concentrations accompanied by more significant increases in concentrations during dry weather conditions, when less flow is available to dilute point source loads (which are assumed to remain equal to baseline conditions.)
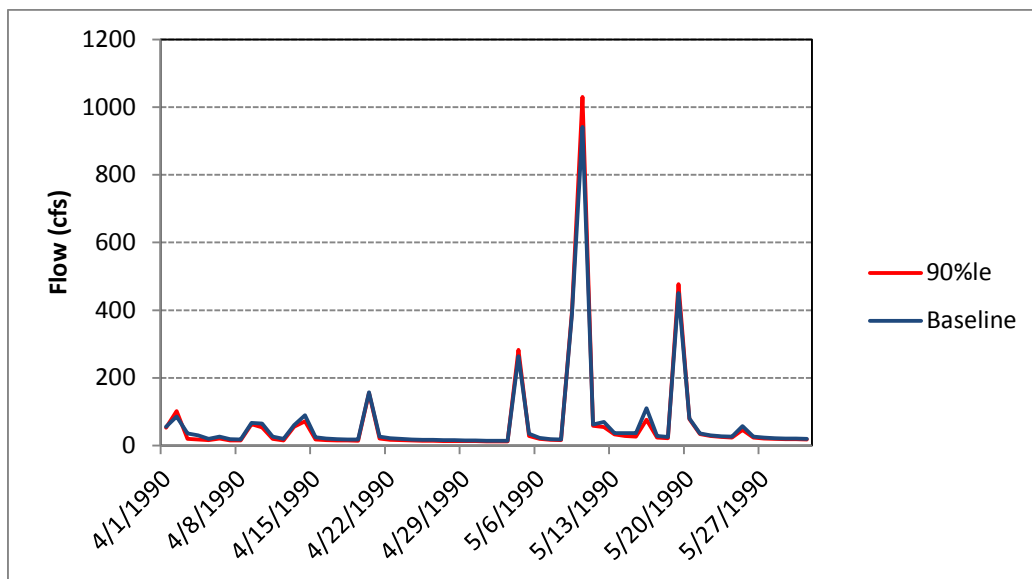
Figure 1.   Flow in Kinnickinnic River, April – May 1990
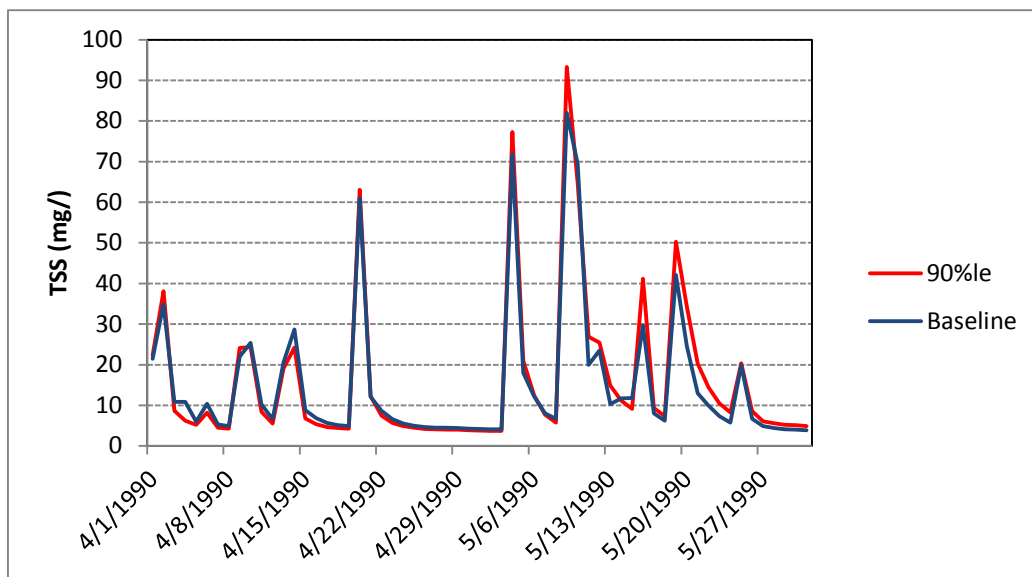
Figure 2.   TSS Concentrations in Kinnickinnic River, April – May 1990
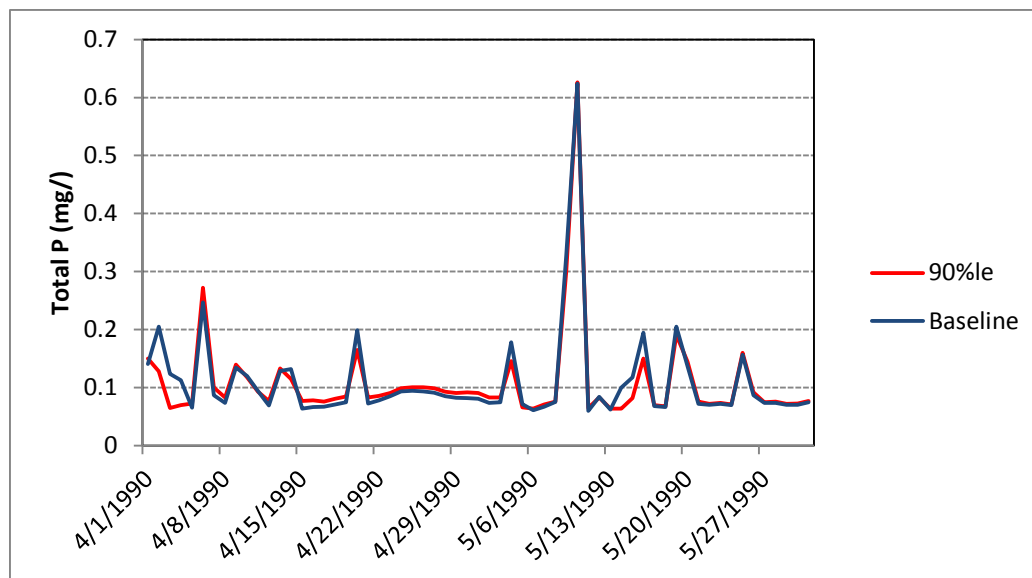
Figure 3.   Total Phosphorus Concentrations in Kinnickinnic River, April – May 1990

3.3 IMPACTS ON TEMPORAL DISTRIBUTION OF LOAD

Future climate may result in changes in the timing as well as the magnitude of flows and pollutant loads. These potential impacts are summarized graphically in Figure 5 through Figure 9, which display results at the outlet of each major watershed. In each of these figures the left hand column shows the average flow and loading by month over the 10-year simulation period (1988 – 1997 for the baseline), while the right hand side shows duration or exceedance curves.

Seasonal results for flow are striking as average flow is predicted to decline in all months except for the winter, with the largest reduction in spring flows. There does not appear to be a pronounced shift in the timing of flows in response to climate scenarios; however, there is a systematic difference between watersheds as a result of impervious area cover, with the more urban watersheds exhibiting relatively higher summer runoff.

Monthly patterns of nutrient loads generally follow flow volume. In contrast, the TSS loads are more closely related to the frequency of intense events. Figure 4 shows the distribution of rainfall intensities greater than 0.1 in/15-min during 1987-1997 under the 90th percentile distribution (crosses) along with the number of 15-minute intervals with intensity greater than 0.15 in/15-min. The highest intensities are found in May through August, while June and August have the greatest frequency of intense rainfall as well as the largest sediment loads – even though the total flow volume for August is relatively low compared to the spring.

Nutrient loads tend to decline more than TSS loads under future climate because the nutrient loads are focused more toward the early part of the year when the flow reductions are greater. The seasonal patterns for fecal coliform loads reflect the fact that the Preferred Alternative simulation includes a representation of recreation-season disinfection at selected locations. Because only a limited number of disinfection units were included in the Kinnickinnic River model, the seasonal pattern of fecal coliform loads is less affected by disinfection than in the other waterbodies.
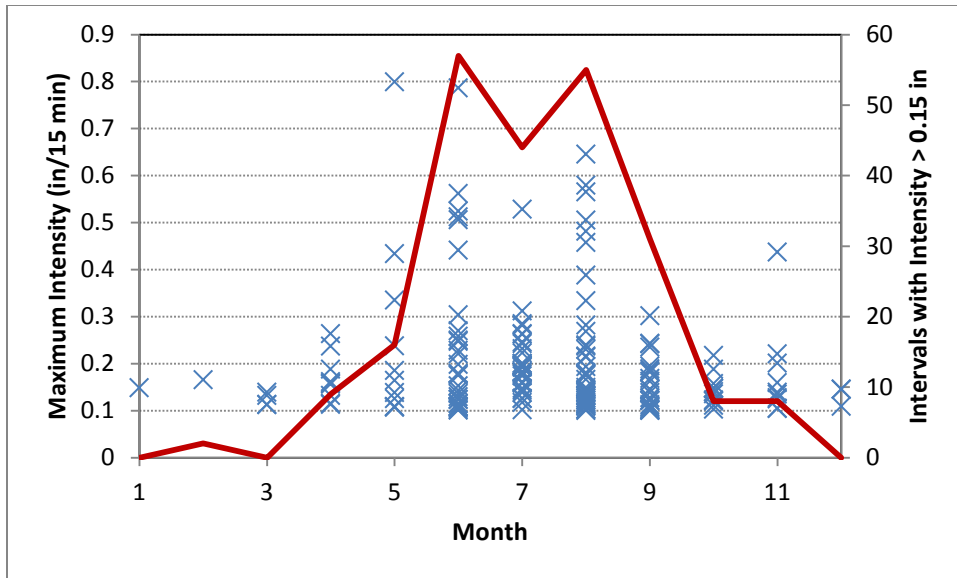
Figure 4. **Seasonal Distribution of Intense Rainfall under the 90th Percentile Scenario**
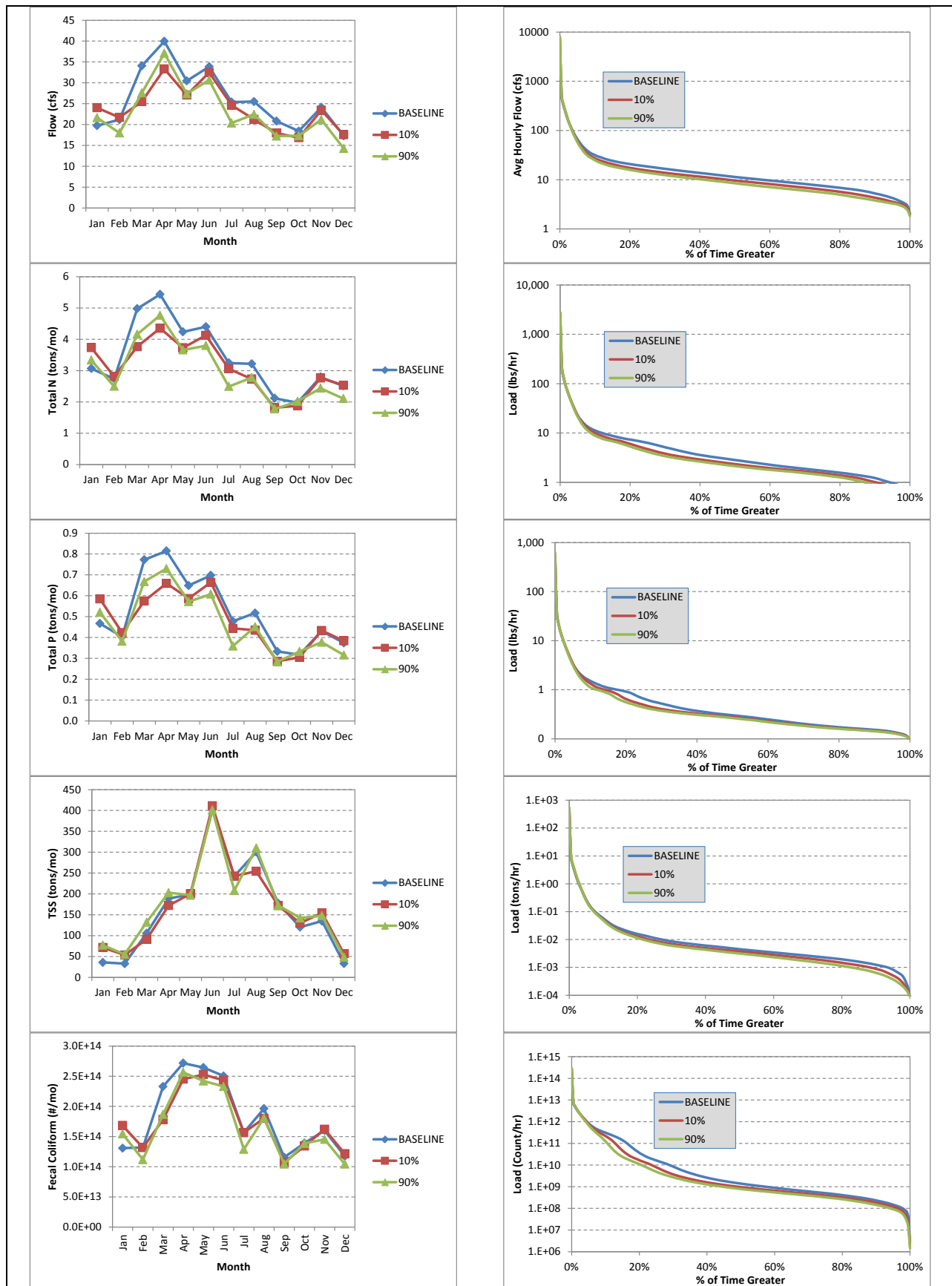
Figure 5.   Monthly Loading and Duration Curves for Kinnickinnic River
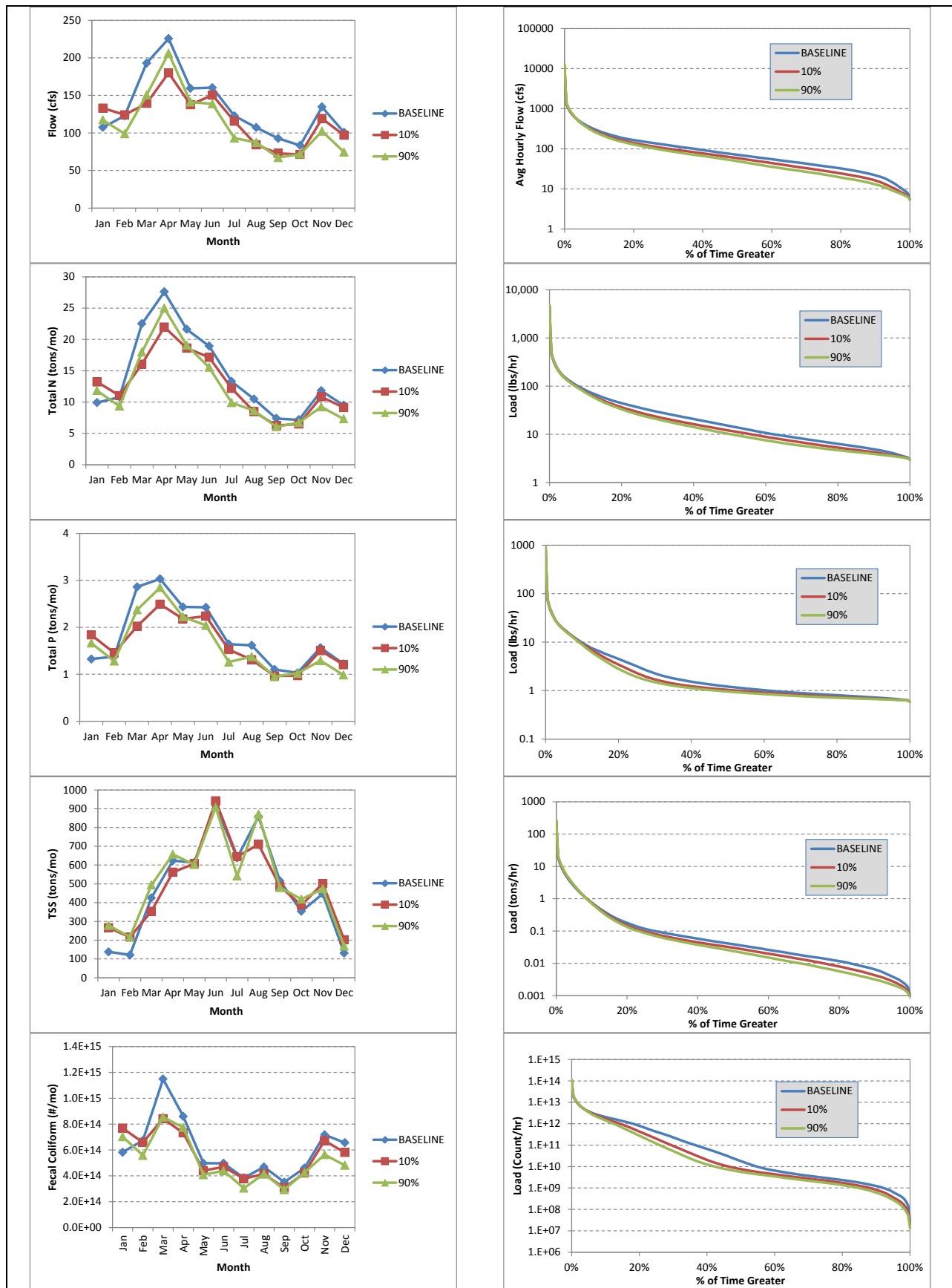
Figure 6.   Monthly Loading and Duration Curves for Menomonee River
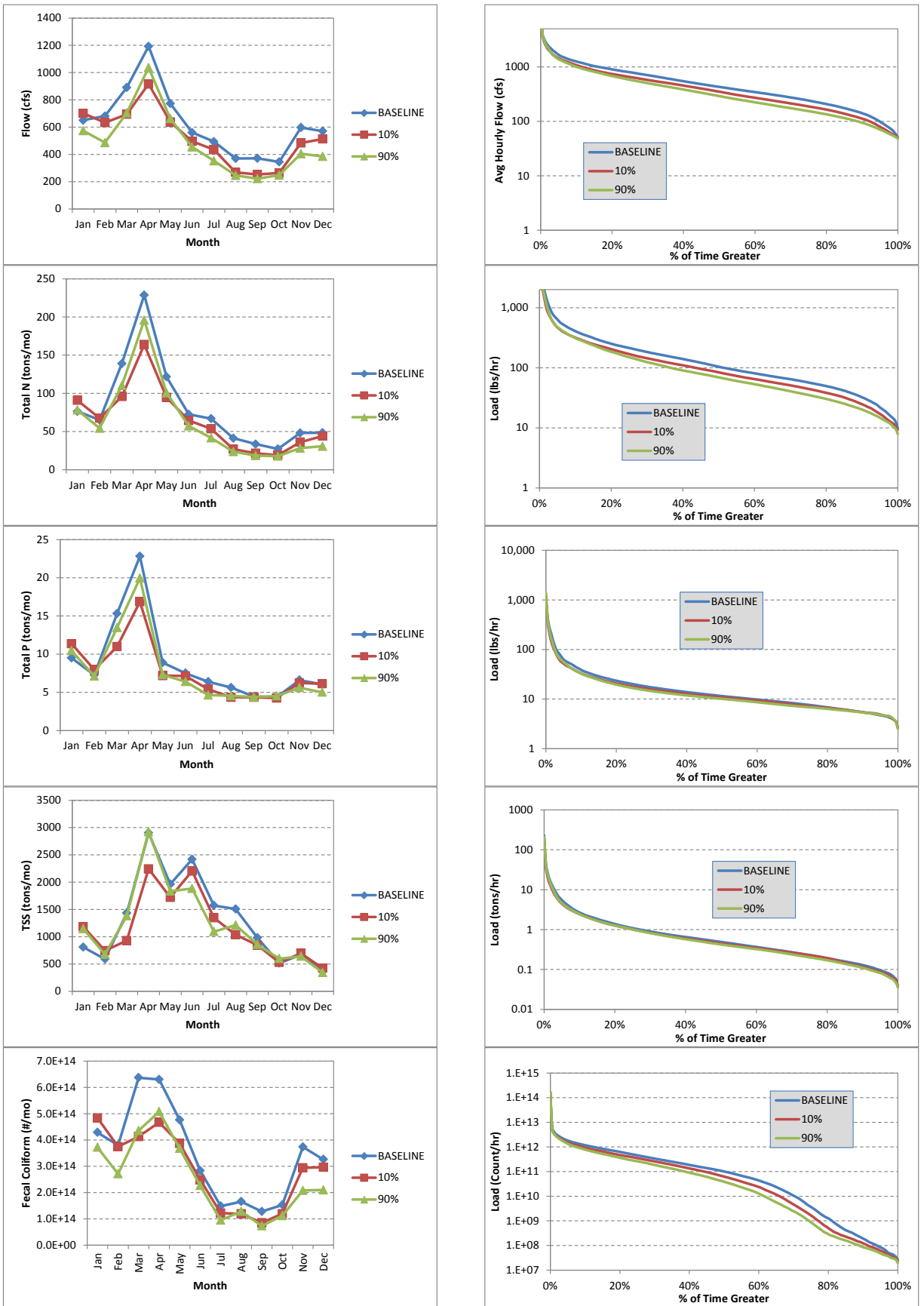
Figure 7.   Monthly Loading and Duration Curves for Milwaukee River
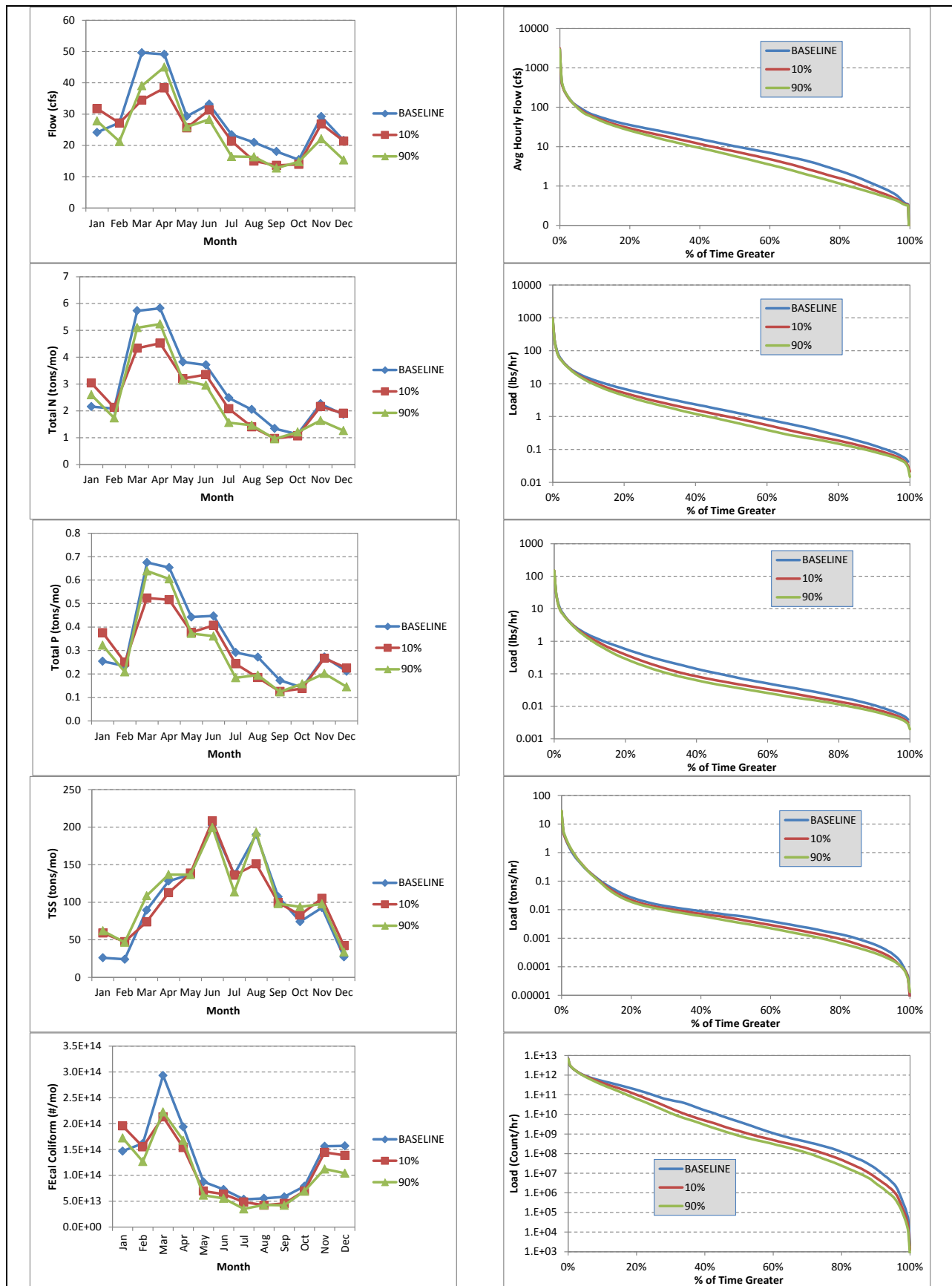
Figure 8.   Monthly Loading and Duration Curves for Oak Creek
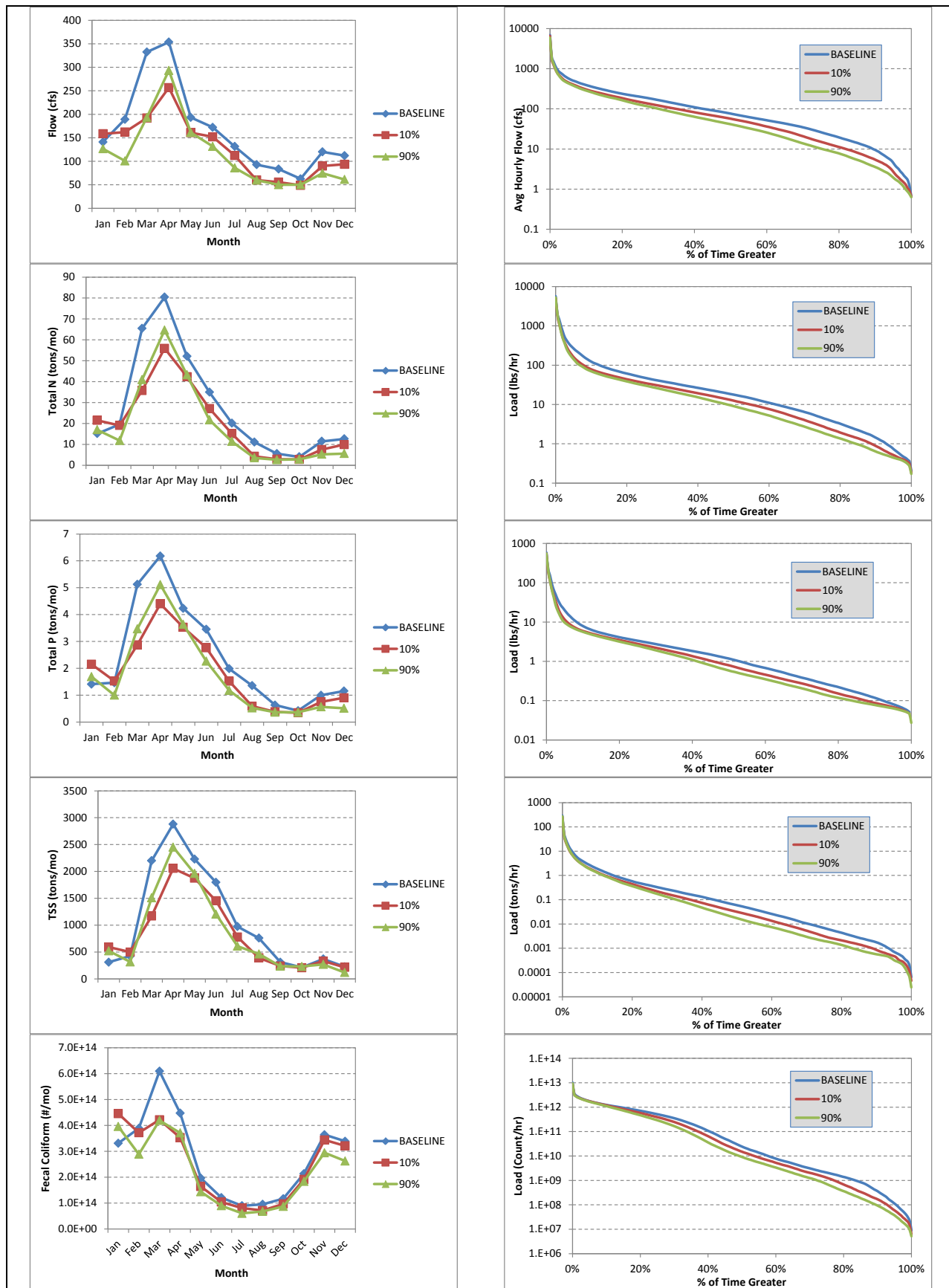
Figure 9.   Monthly Loading and Duration Curves for Root River

4 Electronic Deliverables

Electronic deliverables are contained on the accompanying DVD.

4.1 ESTUARY INPUT FILES

A major purpose of the watershed simulations was to provide hourly time series input of flow and fecal coliform bacteria loads to the Lake Michigan model to be run by UW-Milwaukee. The Lake model is specified to run for one year, to be selected as the year with the largest fecal coliform bacteria loading under current conditions. For each individual watershed and for the sum across all watersheds, the largest total load is predicted to have occurred in 1990 (Figure 10).
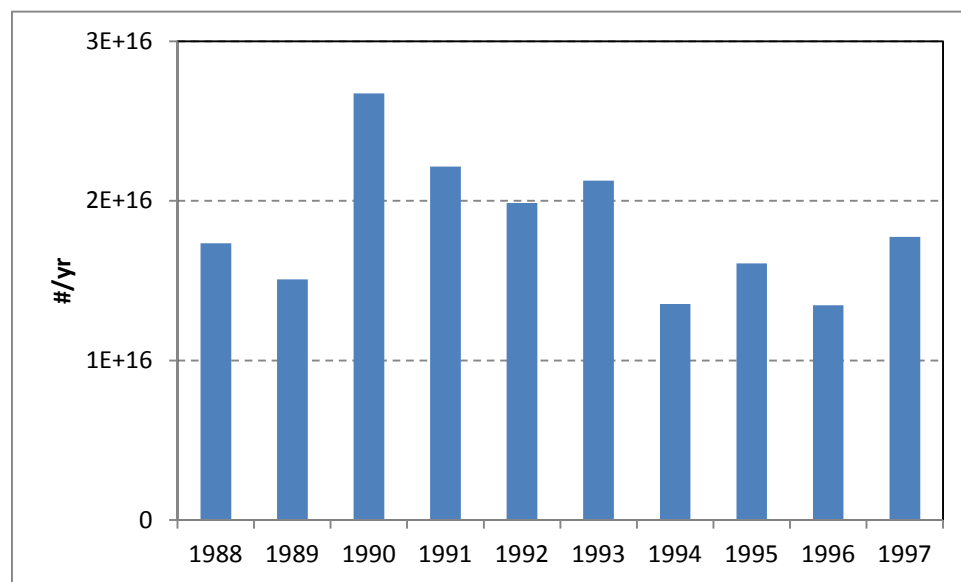
Figure 10. Total Fecal Coliform Load by Year (all Watersheds)

Time series for 1990 meteorology were created with the addition of a spin-up period consisting of the last three months of 1989. These files were transmitted electronically to SEWRPC for use in the Lake Michigan model.

4.2 MODEL FILES

Final model input files for each watershed are provided electronically.

Appendix A.　　Water Quality Summary Statistics

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Exhibit A

WATER QUALITY SUMMARY STATISTICS FOR THE KINNICKINNIC RIVER WATERSHED

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-1 Lyons Park Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3235	2787	2459
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	81	85	87
		Geometric mean (cells per 100 ml)	314	223	186
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	315	349	362
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1394	1521	1496
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	92	92	92
		Geometric mean (cells per 100 ml)	195	188	174
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	6.72	6.49	6.39
		Median (mg/l)	6.30	6.06	6.05
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0693	0.0594	0.0538
		Median (mg/l)	0.0355	0.031	0.0291
		Percent compliance with 0.1 mg/l standard	85	88	90
		Percent compliance with 0.075 mg/l standard	83	87	89
	Total Nitrogen	Mean (mg/l)	1.05	0.99	0.95
		Median (mg/l)	1.07	1.01	0.95
	Total Suspended Solids	Mean (mg/l)	6.72	6.71	6.66
		Median (mg/l)	3.96	3.96	3.96
	Copper	Mean (mg/l)	0.0030	0.0027	0.0024
		Median (mg/l)	0.0011	0.0011	0.0011

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-2 S. 43rd Street Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2338	1970	1683
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	82	86	89
		Geometric mean (cells per 100 ml)	154	95	70
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	335	357	365
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1120	1114	1023
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	92	92	93
		Geometric mean (cells per 100 ml)	86	70	59
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	9.83	9.26	8.86
		Median (mg/l)	9.78	9.15	8.42
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.3303	0.3506	0.3657
		Median (mg/l)	0.3179	0.3445	0.367
		Percent compliance with 0.1 mg/l standard	2	2	2
		Percent compliance with 0.075 mg/l standard	1	1	1
	Total Nitrogen	Mean (mg/l)	1.55	1.57	1.58
		Median (mg/l)	1.54	1.57	1.59
	Total Suspended Solids	Mean (mg/l)	8.01	8.06	8.05
		Median (mg/l)	3.42	3.34	3.28
	Copper	Mean (mg/l)	0.0027	0.0023	0.0020
		Median (mg/l)	0.0006	0.0005	0.0005

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-3 Kinnickinnic River Upstream of Confluence with Wilson Park Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3059	2626	2279
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	81	84	87
		Geometric mean (cells per 100 ml)	243	160	124
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	321	351	363
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1473	1475	1354
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	91	91	92
		Geometric mean (cells per 100 ml)	143	124	107
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	9.72	9.07	8.62
		Median (mg/l)	9.23	8.48	8.00
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.2096	0.2291	0.2467
		Median (mg/l)	0.1858	0.2047	0.2219
		Percent compliance with 0.1 mg/l standard	17	13	11
		Percent compliance with 0.075 mg/l standard	10	8	7
	Total Nitrogen	Mean (mg/l)	1.30	1.31	1.34
		Median (mg/l)	1.28	1.29	1.32
	Total Suspended Solids	Mean (mg/l)	8.70	8.83	8.85
		Median (mg/l)	3.51	3.48	3.42
	Copper	Mean (mg/l)	0.0031	0.0027	0.0023
		Median (mg/l)	0.0009	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-4 Wilson Creek Upstream of Holmes Avenue Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2091	1913	1729
		Percent compliance with single sample standard (<400 cells per 100 ml)	58	62	64
		Geometric mean (cells per 100 ml)	330	266	215
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	126	136	170
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1024	1014	926
		Percent compliance with single sample standard (<400 cells per 100 ml)	75	76	78
		Geometric mean (cells per 100 ml)	155	133	111
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	80	93	108
	Dissolved Oxygen	Mean (mg/l)	7.60	7.51	7.41
		Median (mg/l)	7.28	7.14	7.11
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.2162	0.2121	0.2284
		Median (mg/l)	0.1203	0.1251	0.1305
		Percent compliance with 0.1 mg/l standard	35	31	28
		Percent compliance with 0.075 mg/l standard	9	7	5
	Total Nitrogen	Mean (mg/l)	1.56	1.48	1.57
		Median (mg/l)	0.89	0.85	0.83
	Total Suspended Solids	Mean (mg/l)	15.81	16.91	17.43
		Median (mg/l)	5.49	5.63	5.38
	Copper	Mean (mg/l)	0.0035	0.0033	0.0030
		Median (mg/l)	0.0017	0.0015	0.0013

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-5 Holmes Avenue Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2824	2338	1970
		Percent compliance with single sample standard (<400 cells per 100 ml)	73	78	81
		Geometric mean (cells per 100 ml)	213	136	103
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	199	258	294
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1192	1181	1082
		Percent compliance with single sample standard (<400 cells per 100 ml)	85	86	87
		Geometric mean (cells per 100 ml)	120	102	88
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	111	125	137
	Dissolved Oxygen	Mean (mg/l)	9.86	9.14	8.68
		Median (mg/l)	9.80	7.86	7.47
		Percent compliance with dissolved oxygen standard (>5 mg/l)	92	94	94
	Total Phosphorus	Mean (mg/l)	0.4411	0.4849	0.5306
		Median (mg/l)	0.3888	0.4368	0.4775
		Percent compliance with 0.1 mg/l standard	2	1	1
		Percent compliance with 0.075 mg/l standard	1	1	1
	Total Nitrogen	Mean (mg/l)	2.26	2.34	2.49
		Median (mg/l)	1.93	2.08	2.19
	Total Suspended Solids	Mean (mg/l)	7.84	7.81	7.74
		Median (mg/l)	3.05	2.87	2.76
	Copper	Mean (mg/l)	0.0033	0.0027	0.0023
		Median (mg/l)	0.0008	0.0007	0.0007

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-6 Villa Mann Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3041	2587	2257
		Percent compliance with single sample standard (<400 cells per 100 ml)	73	78	81
		Geometric mean (cells per 100 ml)	309	221	184
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	122	164	199
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1294	1373	1327
		Percent compliance with single sample standard (<400 cells per 100 ml)	85	86	87
		Geometric mean (cells per 100 ml)	196	190	177
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	68	79	89
	Dissolved Oxygen	Mean (mg/l)	7.44	6.91	6.64
		Median (mg/l)	6.68	6.20	6.17
		Percent compliance with dissolved oxygen standard (>5 mg/l)	71	70	69
	Total Phosphorus	Mean (mg/l)	0.0746	0.0645	0.0584
		Median (mg/l)	0.037	0.0323	0.0294
		Percent compliance with 0.1 mg/l standard	83	86	89
		Percent compliance with 0.075 mg/l standard	79	84	86
	Total Nitrogen	Mean (mg/l)	1.05	1.00	0.96
		Median (mg/l)	1.07	1.03	0.97
	Total Suspended Solids	Mean (mg/l)	7.33	7.40	7.44
		Median (mg/l)	3.73	3.73	3.73
	Copper	Mean (mg/l)	0.0033	0.0029	0.0026
		Median (mg/l)	0.0010	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-7 Cherokee Park Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2691	2322	2047
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	79	82
		Geometric mean (cells per 100 ml)	299	216	181
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	124	170	205
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1183	1272	1237
		Percent compliance with single sample standard (<400 cells per 100 ml)	86	86	87
		Geometric mean (cells per 100 ml)	195	189	176
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	69	80	90
	Dissolved Oxygen	Mean (mg/l)	7.54	6.97	6.74
		Median (mg/l)	6.81	6.32	6.29
		Percent compliance with dissolved oxygen standard (>5 mg/l)	71	70	70
	Total Phosphorus	Mean (mg/l)	0.0706	0.0618	0.057
		Median (mg/l)	0.038	0.0328	0.0309
		Percent compliance with 0.1 mg/l standard	84	87	89
		Percent compliance with 0.075 mg/l standard	80	84	86
	Total Nitrogen	Mean (mg/l)	1.03	0.99	0.97
		Median (mg/l)	0.97	0.90	0.84
	Total Suspended Solids	Mean (mg/l)	6.86	6.86	6.91
		Median (mg/l)	4.01	4.00	4.00
	Copper	Mean (mg/l)	0.0031	0.0027	0.0025
		Median (mg/l)	0.0010	0.0010	0.0010

TETRA TECH

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-8 Wilson Park Creek, USGS Gauge	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2714	2385	2106
		Percent compliance with single sample standard (<400 cells per 100 ml)	65	68	70
		Geometric mean (cells per 100 ml)	353	274	224
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	116	130	167
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1262	1256	1151
		Percent compliance with single sample standard (<400 cells per 100 ml)	80	80	82
		Geometric mean (cells per 100 ml)	172	153	130
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	74	87	104
	Dissolved Oxygen	Mean (mg/l)	10.91	10.52	10.26
		Median (mg/l)	11.18	10.64	10.28
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1906	0.1948	0.2106
		Median (mg/l)	0.1359	0.1474	0.1584
		Percent compliance with 0.1 mg/l standard	34	30	26
		Percent compliance with 0.075 mg/l standard	22	18	17
	Total Nitrogen	Mean (mg/l)	1.37	1.33	1.39
		Median (mg/l)	1.06	1.03	1.03
	Total Suspended Solids	Mean (mg/l)	11.15	11.51	11.66
		Median (mg/l)	3.68	3.58	3.33
	Copper	Mean (mg/l)	0.0036	0.0033	0.0031
		Median (mg/l)	0.0015	0.0013	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-9 Kinnickinnic River Downstream of Wilson Park Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2903	2548	2245
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	79	83	85
		Geometric mean (cells per 100 ml)	328	247	200
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	301	341	349
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1441	1434	1313
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	90	90	91
		Geometric mean (cells per 100 ml)	163	143	122
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	11.26	10.83	10.57
		Median (mg/l)	11.40	10.84	10.51
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1928	0.2019	0.2162
		Median (mg/l)	0.1578	0.1726	0.1859
		Percent compliance with 0.1 mg/l standard	27	23	20
		Percent compliance with 0.075 mg/l standard	16	13	11
	Total Nitrogen	Mean (mg/l)	1.28	1.26	1.28
		Median (mg/l)	1.12	1.11	1.10
	Total Suspended Solids	Mean (mg/l)	11.20	11.44	11.50
		Median (mg/l)	3.76	3.62	3.42
	Copper	Mean (mg/l)	0.0039	0.0036	0.0034
		Median (mg/l)	0.0017	0.0016	0.0016

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
KK-10 Kinnickinnic River near Upstream Limit of Estuary	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2976	2617	2309
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	79	83	85
		Geometric mean (cells per 100 ml)	414	332	281
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	297	335	346
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1495	1495	1371
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	90	90	91
		Geometric mean (cells per 100 ml)	232	212	184
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	11.37	10.96	10.72
		Median (mg/l)	11.49	10.98	10.66
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1833	0.1919	0.2052
		Median (mg/l)	0.1517	0.1649	0.1780
		Percent compliance with 0.1 mg/l standard	30	26	23
		Percent compliance with 0.075 mg/l standard	18	16	14
	Total Nitrogen	Mean (mg/l)	1.25	1.22	1.24
		Median (mg/l)	1.11	1.09	1.09
	Total Suspended Solids	Mean (mg/l)	10.22	10.37	10.37
		Median (mg/l)	3.82	3.60	3.40
	Copper	Mean (mg/l)	0.0039	0.0037	0.0034
		Median (mg/l)	0.0016	0.0016	0.0016

Exhibit B

WATER QUALITY SUMMARY STATISTICS FOR THE MENOMONEE RIVER WATERSHED

Assessment Point	Water Quality Indicator	Statistic	Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-1 North Branch Menomonee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	602	654	686
		Percent compliance with single sample standard (<400 cells per 100 ml)	81	82	84
		Geometric mean (cells per 100 ml)	67	55	49
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	326	353	361
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	506	568	569
		Percent compliance with single sample standard (<400 cells per 100 ml)	89	88	88
		Geometric mean (cells per 100 ml)	42	41	38
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	9.93	9.49	9.14
		Median (mg/l)	10.14	9.67	9.19
		Percent compliance with dissolved oxygen standard (>5 mg/l)	93	90	88
	Total Phosphorus	Mean (mg/l)	0.0578	0.0575	0.0583
		Median (mg/l)	0.0437	0.0431	0.0429
		Percent compliance with 0.1 mg/l standard	92	92	93
		Percent compliance with 0.075 mg/l standard	89	90	90
	Total Nitrogen	Mean (mg/l)	1.59	1.63	1.67
		Median (mg/l)	1.42	1.46	1.51
	Total Suspended Solids	Mean (mg/l)	7.19	7.34	7.48
		Median (mg/l)	5.86	5.80	5.79
	Copper	Mean (mg/l)	0.0020	0.0021	0.0022
		Median (mg/l)	0.0012	0.0012	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-2 Upper Menomonee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	763	794	810
		Percent compliance with single sample standard (<400 cells per 100 ml)	73	76	77
		Geometric mean (cells per 100 ml)	115	103	92
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	258	283	293
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	414	432	411
		Percent compliance with single sample standard (<400 cells per 100 ml)	86	86	87
		Geometric mean (cells per 100 ml)	56	53	46
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	149	149	149
	Dissolved Oxygen	Mean (mg/l)	9.60	9.21	8.93
		Median (mg/l)	9.67	8.96	8.56
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	99	99
	Total Phosphorus	Mean (mg/l)	0.1172	0.1342	0.1512
		Median (mg/l)	0.0934	0.1073	0.1217
		Percent compliance with 0.1 mg/l standard	56	47	41
		Percent compliance with 0.075 mg/l standard	42	36	31
	Total Nitrogen	Mean (mg/l)	1.18	1.21	1.25
		Median (mg/l)	1.10	1.13	1.16
	Total Suspended Solids	Mean (mg/l)	7.61	7.93	8.09
		Median (mg/l)	5.46	5.31	5.26
	Copper	Mean (mg/l)	0.0024	0.0025	0.0025
		Median (mg/l)	0.0011	0.0011	0.0011

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-3 West Branch Menomonee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1074	1008	959
		Percent compliance with single sample standard (<400 cells per 100 ml)	76	80	82
		Geometric mean (cells per 100 ml)	130	103	89
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	263	307	325
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	513	557	543
		Percent compliance with single sample standard (<400 cells per 100 ml)	88	88	88
		Geometric mean (cells per 100 ml)	72	70	64
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	149	151	151
	Dissolved Oxygen	Mean (mg/l)	9.74	9.24	8.87
		Median (mg/l)	9.91	9.28	8.83
		Percent compliance with dissolved oxygen standard (>5 mg/l)	94	92	90
	Total Phosphorus	Mean (mg/l)	0.0507	0.0493	0.0485
		Median (mg/l)	0.0377	0.0362	0.0352
		Percent compliance with 0.1 mg/l standard	92	92	93
		Percent compliance with 0.075 mg/l standard	88	90	91
	Total Nitrogen	Mean (mg/l)	0.78	0.81	0.82
		Median (mg/l)	0.70	0.73	0.75
	Total Suspended Solids	Mean (mg/l)	10.30	10.51	10.62
		Median (mg/l)	7.30	7.10	7.06
	Copper	Mean (mg/l)	0.0034	0.0033	0.0032
		Median (mg/l)	0.0012	0.0012	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-4 Willow Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1098	1068	1041
		Percent compliance with single sample standard (<400 cells per 100 ml)	76	79	81
		Geometric mean (cells per 100 ml)	161	141	133
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	239	267	271
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	496	538	516
		Percent compliance with single sample standard (<400 cells per 100 ml)	87	86	86
		Geometric mean (cells per 100 ml)	94	100	97
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	141	141	137
	Dissolved Oxygen	Mean (mg/l)	8.86	8.66	8.50
		Median (mg/l)	8.93	8.80	8.52
		Percent compliance with dissolved oxygen standard (>5 mg/l)	96	94	92
	Total Phosphorus	Mean (mg/l)	0.0539	0.0521	0.0512
		Median (mg/l)	0.0312	0.0291	0.0281
		Percent compliance with 0.1 mg/l standard	89	90	91
		Percent compliance with 0.075 mg/l standard	86	88	89
	Total Nitrogen	Mean (mg/l)	1.03	1.04	1.05
		Median (mg/l)	0.94	0.91	0.92
	Total Suspended Solids	Mean (mg/l)	9.06	9.34	9.51
		Median (mg/l)	6.81	6.80	6.88
	Copper	Mean (mg/l)	0.0028	0.0028	0.0028
		Median (mg/l)	0.0012	0.0012	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-5 Menomonee River at Washington-Waukesha County Line	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1307	1295	1270
		Percent compliance with single sample standard (<400 cells per 100 ml)	66	69	72
		Geometric mean (cells per 100 ml)	206	184	159
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	187	186	203
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	578	583	535
		Percent compliance with single sample standard (<400 cells per 100 ml)	82	83	84
		Geometric mean (cells per 100 ml)	82	76	63
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	131	137	139
	Dissolved Oxygen	Mean (mg/l)	10.33	10.07	9.90
		Median (mg/l)	10.43	10.17	9.84
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	98	98
	Total Phosphorus	Mean (mg/l)	0.0882	0.0962	0.1048
		Median (mg/l)	0.0559	0.0602	0.0645
		Percent compliance with 0.1 mg/l standard	76	72	69
		Percent compliance with 0.075 mg/l standard	67	64	60
	Total Nitrogen	Mean (mg/l)	0.98	1.00	1.02
		Median (mg/l)	0.90	0.90	0.90
	Total Suspended Solids	Mean (mg/l)	10.47	11.09	11.39
		Median (mg/l)	5.98	5.85	5.87
	Copper	Mean (mg/l)	0.0041	0.0042	0.0043
		Median (mg/l)	0.0018	0.0017	0.0017

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-6 Nor-X-Way Channel	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1915	1794	1688
		Percent compliance with single sample standard (<400 cells per 100 ml)	70	74	77
		Geometric mean (cells per 100 ml)	149	111	90
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	236	265	292
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	807	839	790
		Percent compliance with single sample standard (<400 cells per 100 ml)	83	83	84
		Geometric mean (cells per 100 ml)	62	56	47
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	142	146	147
	Dissolved Oxygen	Mean (mg/l)	10.33	9.80	9.51
		Median (mg/l)	10.37	9.64	9.35
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1452	0.1667	0.1879
		Median (mg/l)	0.1084	0.1254	0.1404
		Percent compliance with 0.1 mg/l standard	49	43	38
		Percent compliance with 0.075 mg/l standard	33	29	26
	Total Nitrogen	Mean (mg/l)	0.86	0.86	0.86
		Median (mg/l)	0.77	0.75	0.74
	Total Suspended Solids	Mean (mg/l)	11.71	12.08	12.19
		Median (mg/l)	3.26	3.10	2.95
	Copper	Mean (mg/l)	0.0034	0.0032	0.0031
		Median (mg/l)	0.0008	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-7 Lilly Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1077	1020	967
		Percent compliance with single sample standard (<400 cells per 100 ml)	70	74	77
		Geometric mean (cells per 100 ml)	202	170	154
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	196	220	247
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	490	521	495
		Percent compliance with single sample standard (<400 cells per 100 ml)	84	84	85
		Geometric mean (cells per 100 ml)	131	132	126
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	111	114	120
	Dissolved Oxygen	Mean (mg/l)	9.54	9.13	8.82
		Median (mg/l)	9.69	9.19	8.84
		Percent compliance with dissolved oxygen standard (>5 mg/l)	95	93	91
	Total Phosphorus	Mean (mg/l)	0.0751	0.0736	0.0726
		Median (mg/l)	0.0436	0.0427	0.0423
		Percent compliance with 0.1 mg/l standard	82	84	85
		Percent compliance with 0.075 mg/l standard	78	80	82
	Total Nitrogen	Mean (mg/l)	0.94	0.94	0.94
		Median (mg/l)	0.87	0.85	0.83
	Total Suspended Solids	Mean (mg/l)	13.76	14.34	14.38
		Median (mg/l)	5.32	5.22	5.20
	Copper	Mean (mg/l)	0.0035	0.0034	0.0034
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-8 Butler Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1257	1109	1039
		Percent compliance with single sample standard (<400 cells per 100 ml)	67	73	76
		Geometric mean (cells per 100 ml)	247	182	160
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	170	205	235
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	613	615	596
		Percent compliance with single sample standard (<400 cells per 100 ml)	83	84	85
		Geometric mean (cells per 100 ml)	142	137	129
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	104	109	115
	Dissolved Oxygen	Mean (mg/l)	9.97	9.34	8.94
		Median (mg/l)	9.89	9.09	8.68
		Percent compliance with dissolved oxygen standard (>5 mg/l)	94	91	89
	Total Phosphorus	Mean (mg/l)	0.0805	0.0745	0.0721
		Median (mg/l)	0.0459	0.043	0.0425
		Percent compliance with 0.1 mg/l standard	80	84	86
		Percent compliance with 0.075 mg/l standard	75	80	82
	Total Nitrogen	Mean (mg/l)	1.01	0.99	0.99
		Median (mg/l)	0.97	0.92	0.89
	Total Suspended Solids	Mean (mg/l)	12.54	13.23	13.43
		Median (mg/l)	5.64	5.61	5.59
	Copper	Mean (mg/l)	0.0035	0.0032	0.0031
		Median (mg/l)	0.0011	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-9 Menomonee River Downstream of Butler Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1626	1567	1509
		Percent compliance with single sample standard (<400 cells per 100 ml)	64	67	70
		Geometric mean (cells per 100 ml)	275	240	216
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	160	156	172
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	679	682	625
		Percent compliance with single sample standard (<400 cells per 100 ml)	80	81	82
		Geometric mean (cells per 100 ml)	112	110	98
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	119	121	128
	Dissolved Oxygen	Mean (mg/l)	10.75	10.47	10.36
		Median (mg/l)	10.82	10.49	10.29
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	99
	Total Phosphorus	Mean (mg/l)	0.0861	0.0926	0.0998
		Median (mg/l)	0.0494	0.0522	0.0570
		Percent compliance with 0.1 mg/l standard	75	73	70
		Percent compliance with 0.075 mg/l standard	68	66	63
	Total Nitrogen	Mean (mg/l)	0.85	0.86	0.85
		Median (mg/l)	0.79	0.76	0.74
	Total Suspended Solids	Mean (mg/l)	13.31	13.91	14.03
		Median (mg/l)	5.24	5.04	4.90
	Copper	Mean (mg/l)	0.0043	0.0044	0.0044
		Median (mg/l)	0.0016	0.0015	0.0015

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-10 Little Menomonee Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3599	3737	3803
		Percent compliance with single sample standard (<400 cells per 100 ml)	59	63	66
		Geometric mean (cells per 100 ml)	265	210	181
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	156	162	189
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2643	2702	2548
		Percent compliance with single sample standard (<400 cells per 100 ml)	75	75	77
		Geometric mean (cells per 100 ml)	98	95	80
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	106	107	119
	Dissolved Oxygen	Mean (mg/l)	8.99	9.01	8.99
		Median (mg/l)	8.95	9.06	8.93
		Percent compliance with dissolved oxygen standard (>5 mg/l)	98	98	97
	Total Phosphorus	Mean (mg/l)	0.0716	0.0704	0.0715
		Median (mg/l)	0.0515	0.05	0.05
		Percent compliance with 0.1 mg/l standard	85	85	85
		Percent compliance with 0.075 mg/l standard	78	79	80
	Total Nitrogen	Mean (mg/l)	1.35	1.35	1.36
		Median (mg/l)	1.22	1.23	1.23
	Total Suspended Solids	Mean (mg/l)	19.92	19.55	19.87
		Median (mg/l)	10.05	8.85	8.24
	Copper	Mean (mg/l)	0.0024	0.0025	0.0026
		Median (mg/l)	0.0012	0.0012	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-11 Little Menomonee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	5453	5251	5100
		Percent compliance with single sample standard (<400 cells per 100 ml)	54	59	61
		Geometric mean (cells per 100 ml)	533	408	335
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	90	98	117
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2438	2512	2353
		Percent compliance with single sample standard (<400 cells per 100 ml)	72	72	75
		Geometric mean (cells per 100 ml)	168	154	123
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	68	72	85
	Dissolved Oxygen	Mean (mg/l)	10.49	9.99	9.65
		Median (mg/l)	10.72	10.03	9.65
		Percent compliance with dissolved oxygen standard (>5 mg/l)	98	97	96
	Total Phosphorus	Mean (mg/l)	0.0949	0.1036	0.1157
		Median (mg/l)	0.0623	0.0677	0.076
		Percent compliance with 0.1 mg/l standard	73	70	66
		Percent compliance with 0.075 mg/l standard	62	59	54
	Total Nitrogen	Mean (mg/l)	0.93	0.97	1.02
		Median (mg/l)	0.87	0.88	0.92
	Total Suspended Solids	Mean (mg/l)	10.67	11.00	11.15
		Median (mg/l)	3.48	3.34	3.35
	Copper	Mean (mg/l)	0.0038	0.0037	0.0037
		Median (mg/l)	0.0014	0.0012	0.0011

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-12 Menomonee River Downstream of Little Menomonee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2710	2536	2465
		Percent compliance with single sample standard (<400 cells per 100 ml)	57	62	65
		Geometric mean (cells per 100 ml)	447	371	329
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	94	94	115
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	999	1037	961
		Percent compliance with single sample standard (<400 cells per 100 ml)	75	76	78
		Geometric mean (cells per 100 ml)	166	159	137
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	74	76	92
	Dissolved Oxygen	Mean (mg/l)	10.67	10.33	10.18
		Median (mg/l)	10.80	10.39	10.16
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	98
	Total Phosphorus	Mean (mg/l)	0.0867	0.0942	0.1030
		Median (mg/l)	0.0505	0.0534	0.0593
		Percent compliance with 0.1 mg/l standard	74	72	69
		Percent compliance with 0.075 mg/l standard	67	65	62
	Total Nitrogen	Mean (mg/l)	0.83	0.84	0.85
		Median (mg/l)	0.77	0.76	0.78
	Total Suspended Solids	Mean (mg/l)	11.21	11.66	11.85
		Median (mg/l)	4.36	4.12	4.01
	Copper	Mean (mg/l)	0.0043	0.0044	0.0043
		Median (mg/l)	0.0016	0.0015	0.0014

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-13 Underwood Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4904	4254	3958
		Percent compliance with single sample standard (<400 cells per 100 ml)	61	70	73
		Geometric mean (cells per 100 ml)	477	317	265
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	105	133	147
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2045	1903	1780
		Percent compliance with single sample standard (<400 cells per 100 ml)	80	82	83
		Geometric mean (cells per 100 ml)	205	185	170
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	63	75	83
	Dissolved Oxygen	Mean (mg/l)	10.25	9.47	8.99
		Median (mg/l)	10.19	9.08	8.62
		Percent compliance with dissolved oxygen standard (>5 mg/l)	96	93	91
	Total Phosphorus	Mean (mg/l)	0.0834	0.0773	0.075
		Median (mg/l)	0.0566	0.0512	0.0503
		Percent compliance with 0.1 mg/l standard	79	82	84
		Percent compliance with 0.075 mg/l standard	70	75	78
	Total Nitrogen	Mean (mg/l)	1.02	1.00	1.00
		Median (mg/l)	0.99	0.94	0.91
	Total Suspended Solids	Mean (mg/l)	13.14	13.69	13.74
		Median (mg/l)	5.60	5.56	5.52
	Copper	Mean (mg/l)	0.0038	0.0035	0.0034
		Median (mg/l)	0.0010	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-14 Underwood Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4375	3555	3180
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	72	79	82
		Geometric mean (cells per 100 ml)	421	273	228
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	268	314	332
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1209	1111	1034
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	89	90	91
		Geometric mean (cells per 100 ml)	174	158	147
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	11.11	10.61	10.18
		Median (mg/l)	11.23	10.61	9.96
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.084	0.0782	0.0769
		Median (mg/l)	0.0567	0.0535	0.0528
		Percent compliance with 0.1 mg/l standard	79	83	84
		Percent compliance with 0.075 mg/l standard	70	75	76
	Total Nitrogen	Mean (mg/l)	1.00	0.98	0.97
		Median (mg/l)	0.98	0.92	0.87
	Total Suspended Solids	Mean (mg/l)	13.00	13.39	13.38
		Median (mg/l)	5.82	5.71	5.67
	Copper	Mean (mg/l)	0.0038	0.0034	0.0032
		Median (mg/l)	0.0010	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-15 Menomonee Mainstem	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3404	3098	2938
		Percent compliance with single sample standard (<400 cells per 100 ml)	54	61	65
		Geometric mean (cells per 100 ml)	557	436	381
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	76	82	99
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1250	1233	1140
		Percent compliance with single sample standard (<400 cells per 100 ml)	75	76	78
		Geometric mean (cells per 100 ml)	201	189	166
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	58	65	79
	Dissolved Oxygen	Mean (mg/l)	10.80	10.49	10.32
		Median (mg/l)	10.88	10.49	10.26
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	99
	Total Phosphorus	Mean (mg/l)	0.0907	0.0944	0.0995
		Median (mg/l)	0.0561	0.0573	0.0613
		Percent compliance with 0.1 mg/l standard	73	72	70
		Percent compliance with 0.075 mg/l standard	65	64	62
	Total Nitrogen	Mean (mg/l)	0.90	0.89	0.89
		Median (mg/l)	0.84	0.80	0.80
	Total Suspended Solids	Mean (mg/l)	12.07	12.57	12.66
		Median (mg/l)	4.57	4.30	4.13
	Copper	Mean (mg/l)	0.0046	0.0045	0.0045
		Median (mg/l)	0.0017	0.0015	0.0013

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-16 Honey Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	5033	4107	3627
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	73	79	82
		Geometric mean (cells per 100 ml)	403	244	195
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	270	322	339
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1743	1636	1524
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	89	89	90
		Geometric mean (cells per 100 ml)	170	149	132
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	11.09	10.62	10.38
		Median (mg/l)	10.92	10.28	10.03
		Percent compliance with dissolved oxygen standard (>2 mg/l)	98	96	94
	Total Phosphorus	Mean (mg/l)	0.1103	0.1083	0.1109
		Median (mg/l)	0.0818	0.0814	0.0875
		Percent compliance with 0.1 mg/l standard	65	65	61
		Percent compliance with 0.075 mg/l standard	50	48	45
	Total Nitrogen	Mean (mg/l)	1.19	1.16	1.16
		Median (mg/l)	1.14	1.09	1.09
	Total Suspended Solids	Mean (mg/l)	11.72	11.90	11.85
		Median (mg/l)	5.81	5.47	5.19
	Copper	Mean (mg/l)	0.0039	0.0035	0.0033
		Median (mg/l)	0.0015	0.0014	0.0015

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-17 Menomonee River Downstream of Honey Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3744	3382	3186
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	70	75	78
		Geometric mean (cells per 100 ml)	570	434	375
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	241	284	302
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1457	1422	1317
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	88	89	90
		Geometric mean (cells per 100 ml)	203	188	165
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	152	152	152
	Dissolved Oxygen	Mean (mg/l)	10.88	10.56	10.40
		Median (mg/l)	10.94	10.57	10.32
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0992	0.1038	0.1101
		Median (mg/l)	0.0656	0.0691	0.0742
		Percent compliance with 0.1 mg/l standard	69	68	66
		Percent compliance with 0.075 mg/l standard	60	58	54
	Total Nitrogen	Mean (mg/l)	0.92	0.92	0.92
		Median (mg/l)	0.86	0.83	0.83
	Total Suspended Solids	Mean (mg/l)	12.57	13.09	13.16
		Median (mg/l)	4.78	4.53	4.42
	Copper	Mean (mg/l)	0.0046	0.0045	0.0045
		Median (mg/l)	0.0017	0.0014	0.0013

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
MN-18 Menomonee River near Upstream Limit of Estuary	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3810	3436	3226
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	70	75	78
		Geometric mean (cells per 100 ml)	556	417	355
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	242	285	305
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1525	1471	1363
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	88	89	90
		Geometric mean (cells per 100 ml)	194	177	153
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	152	152	152
	Dissolved Oxygen	Mean (mg/l)	10.86	10.55	10.38
		Median (mg/l)	10.89	10.53	10.29
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1200	0.1292	0.1396
		Median (mg/l)	0.0898	0.0982	0.1073
		Percent compliance with 0.1 mg/l standard	59	54	49
		Percent compliance with 0.075 mg/l standard	41	37	33
	Total Nitrogen	Mean (mg/l)	1.04	1.07	1.10
		Median (mg/l)	0.99	1.01	1.05
	Total Suspended Solids	Mean (mg/l)	12.70	13.18	13.20
		Median (mg/l)	4.70	4.39	4.19
	Copper	Mean (mg/l)	0.0045	0.0044	0.0043
		Median (mg/l)	0.0017	0.0014	0.0013

Exhibit C

WATER QUALITY SUMMARY STATISTICS FOR THE MILWAUKEE RIVER WATERSHED

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-1 Kettle Moraine Lake	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	971	1,095	1,162
		Percent compliance with single sample standard (<400 cells per 100 ml)	69%	71%	72%
		Geometric mean (cells per 100 ml)	149	133	116
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	173	182	191
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	735	801	775
		Percent compliance with single sample standard (<400 cells per 100 ml)	86%	87%	87%
		Geometric mean (cells per 100 ml)	52	44	37
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	107	110	113
	Dissolved Oxygen	Mean (mg/l)	11.1	10.9	10.8
		Median (mg/l)	11.2	11.0	10.8
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.098	0.101	0.109
		Median (mg/l)	0.082	0.083	0.090
		Percent compliance with 0.1 mg/l standard	71%	66%	61%
		Percent compliance with 0.075 mg/l standard	40%	37%	24%
	Total Nitrogen	Mean (mg/l)	0.98	0.97	0.99
		Median (mg/l)	1.01	1.00	1.02
	Total Suspended Solids	Mean (mg/l)	32.3	27.0	29.3
		Median (mg/l)	20.1	16.6	18.0
	Copper	Mean (mg/l)	0.0024	0.0027	0.0029
		Median (mg/l)	0.0021	0.0023	0.0025

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-2 Auburn Lake Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3,079	3,493	3,747
		Percent compliance with single sample standard (<400 cells per 100 ml)	68%	70%	70%
		Geometric mean (cells per 100 ml)	290	281	282
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	190	197	201
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2,309	2,460	2,327
		Percent compliance with single sample standard (<400 cells per 100 ml)	81%	80%	82%
		Geometric mean (cells per 100 ml)	189	188	171
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	101	101	105
	Dissolved Oxygen	Mean (mg/l)	10.6	10.5	10.4
		Median (mg/l)	10.5	10.5	10.4
		Percent compliance with dissolved oxygen standard (>6 mg/l, >7 mg/l October-December)	99%	98%	97%
	Total Phosphorus	Mean (mg/l)	0.057	0.058	0.062
		Median (mg/l)	0.009	0.009	0.009
		Percent compliance with 0.1 mg/l standard	85%	84%	84%
		Percent compliance with 0.075 mg/l standard	82%	82%	81%
	Total Nitrogen	Mean (mg/l)	0.87	0.89	0.91
		Median (mg/l)	0.83	0.86	0.87
	Total Suspended Solids	Mean (mg/l)	12.6	9.5	8.9
		Median (mg/l)	6.3	5.7	5.4
	Copper	Mean (mg/l)	0.0023	0.0025	0.0026
		Median (mg/l)	0.0011	0.0011	0.0011

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-3 Lake Fifteen Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,563	1,758	1,871
		Percent compliance with single sample standard (<400 cells per 100 ml)	74%	76%	77%
		Geometric mean (cells per 100 ml)	228	216	205
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	197	205	212
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,164	1,249	1,191
		Percent compliance with single sample standard (<400 cells per 100 ml)	86%	86%	87%
		Geometric mean (cells per 100 ml)	129	127	115
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	108	109	113
	Dissolved Oxygen	Mean (mg/l)	10.8	10.6	10.5
		Median (mg/l)	10.8	10.7	10.5
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.112	0.114	0.124
		Median (mg/l)	0.087	0.087	0.096
		Percent compliance with 0.1 mg/l standard	68%	69%	57%
		Percent compliance with 0.075 mg/l standard	26%	21%	9%
	Total Nitrogen	Mean (mg/l)	1.35	1.37	1.42
		Median (mg/l)	1.32	1.32	1.37
	Total Suspended Solids	Mean (mg/l)	33.5	28.5	31.3
		Median (mg/l)	20.8	18.7	21.5
	Copper	Mean (mg/l)	0.0030	0.0034	0.0035
		Median (mg/l)	0.0024	0.0026	0.0027

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-4 West Branch of the Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,779	1,979	2,106
		Percent compliance with single sample standard (<400 cells per 100 ml)	61%	62%	62%
		Geometric mean (cells per 100 ml)	443	425	416
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	129	139	142
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,355	1,399	1,314
		Percent compliance with single sample standard (<400 cells per 100 ml)	77%	77%	79%
		Geometric mean (cells per 100 ml)	264	240	208
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	83	85	91
	Dissolved Oxygen	Mean (mg/l)	11.1	10.9	10.8
		Median (mg/l)	11.1	10.9	10.7
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.080	0.077	0.081
		Median (mg/l)	0.017	0.016	0.017
		Percent compliance with 0.1 mg/l standard	79%	79%	78%
		Percent compliance with 0.075 mg/l standard	74%	75%	74%
	Total Nitrogen	Mean (mg/l)	2.46	2.46	2.48
		Median (mg/l)	2.40	2.38	2.38
	Total Suspended Solids	Mean (mg/l)	73.2	50.4	47.5
		Median (mg/l)	7.6	7.5	7.2
	Copper	Mean (mg/l)	0.0025	0.0028	0.0031
		Median (mg/l)	0.0014	0.0014	0.0014

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-5 Kewaskum, USGS Sampling Location (4086149)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,065	1,147	1,185
		Percent compliance with single sample standard (<400 cells per 100 ml)	59%	60%	61%
		Geometric mean (cells per 100 ml)	309	289	269
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	148	153	158
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	681	679	625
		Percent compliance with single sample standard (<400 cells per 100 ml)	78%	79%	81%
		Geometric mean (cells per 100 ml)	137	117	98
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	95	98	103
	Dissolved Oxygen	Mean (mg/l)	10.9	10.7	10.5
		Median (mg/l)	11.0	10.8	10.6
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.086	0.085	0.091
		Median (mg/l)	0.052	0.055	0.060
		Percent compliance with 0.1 mg/l standard	77%	77%	73%
		Percent compliance with 0.075 mg/l standard	68%	65%	62%
	Total Nitrogen	Mean (mg/l)	1.87	1.87	1.89
		Median (mg/l)	1.85	1.84	1.86
	Total Suspended Solids	Mean (mg/l)	58.2	42.1	41.0
		Median (mg/l)	14.5	11.6	11.3
	Copper	Mean (mg/l)	0.0026	0.0029	0.0032
		Median (mg/l)	0.0021	0.0023	0.0025

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-7 Upper Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,747	1,910	2,019
		Percent compliance with single sample standard (<400 cells per 100 ml)	69%	71%	71%
		Geometric mean (cells per 100 ml)	337	308	292
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	175	189	197
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,273	1,324	1,242
		Percent compliance with single sample standard (<400 cells per 100 ml)	80%	80%	81%
		Geometric mean (cells per 100 ml)	232	210	184
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	88	93	98
	Dissolved Oxygen	Mean (mg/l)	10.9	10.6	10.4
		Median (mg/l)	11.0	10.8	10.6
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	99%	97%
	Total Phosphorus	Mean (mg/l)	0.075	0.072	0.074
		Median (mg/l)	0.010	0.010	0.010
		Percent compliance with 0.1 mg/l standard	81%	82%	82%
		Percent compliance with 0.075 mg/l standard	78%	79%	80%
	Total Nitrogen	Mean (mg/l)	2.23	2.23	2.24
		Median (mg/l)	2.18	2.15	2.15
	Total Suspended Solids	Mean (mg/l)	56.8	39.4	35.8
		Median (mg/l)	7.8	7.5	7.1
	Copper	Mean (mg/l)	0.0025	0.0027	0.0029
		Median (mg/l)	0.0013	0.0013	0.0013

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-8 Watercress Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	911	964	985
		Percent compliance with single sample standard (<400 cells per 100 ml)	59%	60%	61%
		Geometric mean (cells per 100 ml)	293	271	250
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	148	151	161
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	542	519	471
		Percent compliance with single sample standard (<400 cells per 100 ml)	78%	79%	81%
		Geometric mean (cells per 100 ml)	124	104	86
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	95	98	103
	Dissolved Oxygen	Mean (mg/l)	11.0	10.8	10.7
		Median (mg/l)	10.9	10.8	10.6
		Percent compliance with dissolved oxygen standard (>6 mg/l, >7 mg/l October-December)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.086	0.085	0.090
		Median (mg/l)	0.049	0.052	0.056
		Percent compliance with 0.1 mg/l standard	76%	75%	73%
		Percent compliance with 0.075 mg/l standard	67%	65%	63%
	Total Nitrogen	Mean (mg/l)	1.84	1.82	1.82
		Median (mg/l)	1.78	1.75	1.76
	Total Suspended Solids	Mean (mg/l)	58.3	42.1	40.8
		Median (mg/l)	13.5	10.8	10.2
	Copper	Mean (mg/l)	0.0030	0.0034	0.0038
		Median (mg/l)	0.0023	0.0027	0.0029

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-9 Watercress Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2,265	2,572	2,780
		Percent compliance with single sample standard (<400 cells per 100 ml)	58%	57%	55%
		Geometric mean (cells per 100 ml)	448	465	493
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	92	93	85
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,863	2,051	2,012
		Percent compliance with single sample standard (<400 cells per 100 ml)	70%	67%	65%
		Geometric mean (cells per 100 ml)	351	377	373
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	41	38	38
	Dissolved Oxygen	Mean (mg/l)	10.6	10.6	10.6
		Median (mg/l)	10.5	10.6	10.4
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99%	99%	98%
	Total Phosphorus	Mean (mg/l)	0.039	0.039	0.041
		Median (mg/l)	0.010	0.010	0.010
		Percent compliance with 0.1 mg/l standard	91%	91%	91%
		Percent compliance with 0.075 mg/l standard	89%	89%	89%
	Total Nitrogen	Mean (mg/l)	0.95	0.96	0.97
		Median (mg/l)	0.92	0.93	0.93
	Total Suspended Solids	Mean (mg/l)	16.7	11.5	10.4
		Median (mg/l)	5.3	5.0	4.7
	Copper	Mean (mg/l)	0.0018	0.0019	0.0020
		Median (mg/l)	0.0010	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-10 East Branch Milwaukee River, USGS Sampling Location (4086200)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	220	249	266
		Percent compliance with single sample standard (<400 cells per 100 ml)	93%	93%	94%
		Geometric mean (cells per 100 ml)	24	20	17
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	245	257	265
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	188	208	207
		Percent compliance with single sample standard (<400 cells per 100 ml)	96%	96%	96%
		Geometric mean (cells per 100 ml)	8	7	6
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	120	123	125
	Dissolved Oxygen	Mean (mg/l)	11.3	11.1	10.9
		Median (mg/l)	11.4	11.0	10.8
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.112	0.112	0.123
		Median (mg/l)	0.107	0.111	0.123
		Percent compliance with 0.1 mg/l standard	19%	18%	3%
		Percent compliance with 0.075 mg/l standard	%	%	%
	Total Nitrogen	Mean (mg/l)	1.04	1.01	1.07
		Median (mg/l)	1.02	1.00	1.05
	Total Suspended Solids	Mean (mg/l)	59.8	58.6	69.5
		Median (mg/l)	57.8	53.0	65.9
	Copper	Mean (mg/l)	0.0024	0.0026	0.0027
		Median (mg/l)	0.0024	0.0026	0.0026

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-11 East Branch of the Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	806	945	1,057
		Percent compliance with single sample standard (<400 cells per 100 ml)	58%	58%	58%
		Geometric mean (cells per 100 ml)	310	320	333
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	114	115	114
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	600	665	666
		Percent compliance with single sample standard (<400 cells per 100 ml)	83%	82%	82%
		Geometric mean (cells per 100 ml)	158	158	153
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	79	79	80
	Dissolved Oxygen	Mean (mg/l)	11.2	11.0	10.9
		Median (mg/l)	11.3	11.0	10.8
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.104	0.107	0.118
		Median (mg/l)	0.093	0.095	0.104
		Percent compliance with 0.1 mg/l standard	64%	59%	40%
		Percent compliance with 0.075 mg/l standard	16%	9%	5%
	Total Nitrogen	Mean (mg/l)	1.00	0.99	1.04
		Median (mg/l)	1.01	1.01	1.05
	Total Suspended Solids	Mean (mg/l)	41.9	39.7	46.5
		Median (mg/l)	36.1	34.3	41.0
	Copper	Mean (mg/l)	0.0025	0.0028	0.0030
		Median (mg/l)	0.0023	0.0025	0.0027

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-14 Middle Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	615	703	774
		Percent compliance with single sample standard (<400 cells per 100 ml)	62%	62%	62%
		Geometric mean (cells per 100 ml)	237	235	235
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	139	143	147
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	345	361	341
		Percent compliance with single sample standard (<400 cells per 100 ml)	84%	85%	86%
		Geometric mean (cells per 100 ml)	98	90	81
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	99	100	104
	Dissolved Oxygen	Mean (mg/l)	11.1	10.9	10.7
		Median (mg/l)	11.3	10.9	10.7
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.103	0.106	0.117
		Median (mg/l)	0.088	0.090	0.099
		Percent compliance with 0.1 mg/l standard	70%	64%	52%
		Percent compliance with 0.075 mg/l standard	24%	16%	8%
	Total Nitrogen	Mean (mg/l)	1.01	1.01	1.06
		Median (mg/l)	1.02	1.02	1.07
	Total Suspended Solids	Mean (mg/l)	41.0	38.4	44.7
		Median (mg/l)	34.0	32.1	38.1
	Copper	Mean (mg/l)	0.0026	0.0029	0.0031
		Median (mg/l)	0.0023	0.0025	0.0026

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-15 North Branch of the Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,169	1,131	1,067
		Percent compliance with single sample standard (<400 cells per 100 ml)	49%	52%	54%
		Geometric mean (cells per 100 ml)	215	172	135
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	133	139	151
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	502	457	409
		Percent compliance with single sample standard (<400 cells per 100 ml)	75%	78%	81%
		Geometric mean (cells per 100 ml)	41	28	19
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	92	96	101
	Dissolved Oxygen	Mean (mg/l)	9.5	9.0	8.6
		Median (mg/l)	10.4	10.1	9.9
		Percent compliance with dissolved oxygen standard (>6 mg/l, >7 mg/l October-December)	91%	87%	84%
	Total Phosphorus	Mean (mg/l)	0.150	0.166	0.180
		Median (mg/l)	0.121	0.133	0.145
		Percent compliance with 0.1 mg/l standard	41%	33%	28%
		Percent compliance with 0.075 mg/l standard	25%	20%	17%
	Total Nitrogen	Mean (mg/l)	0.99	1.01	1.03
		Median (mg/l)	1.01	1.03	1.04
	Total Suspended Solids	Mean (mg/l)	10.7	8.3	7.9
		Median (mg/l)	6.2	5.3	4.6
	Copper	Mean (mg/l)	0.0055	0.0062	0.0067
		Median (mg/l)	0.0045	0.0050	0.0054

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-16 Chambers Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	581	587	566
		Percent compliance with single sample standard (<400 cells per 100 ml)	59%	62%	63%
		Geometric mean (cells per 100 ml)	159	136	118
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	150	157	168
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	371	354	324
		Percent compliance with single sample standard (<400 cells per 100 ml)	81%	84%	86%
		Geometric mean (cells per 100 ml)	43	32	26
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	98	103	107
	Dissolved Oxygen	Mean (mg/l)	11.3	11.0	10.9
		Median (mg/l)	11.2	10.9	10.7
		Percent compliance with dissolved oxygen standard (>6 mg/l, >7 mg/l October-December)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.099	0.098	0.104
		Median (mg/l)	0.072	0.076	0.080
		Percent compliance with 0.1 mg/l standard	67%	64%	62%
		Percent compliance with 0.075 mg/l standard	52%	49%	46%
	Total Nitrogen	Mean (mg/l)	1.46	1.42	1.41
		Median (mg/l)	1.39	1.35	1.32
	Total Suspended Solids	Mean (mg/l)	51.4	39.1	39.8
		Median (mg/l)	18.9	14.7	14.5
	Copper	Mean (mg/l)	0.0049	0.0058	0.0065
		Median (mg/l)	0.0041	0.0047	0.0053

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Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-17 Melius Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	597	596	574
		Percent compliance with single sample standard (<400 cells per 100 ml)	57%	59%	61%
		Geometric mean (cells per 100 ml)	161	136	116
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	146	152	161
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	319	288	255
		Percent compliance with single sample standard (<400 cells per 100 ml)	80%	83%	85%
		Geometric mean (cells per 100 ml)	36	25	18
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	98	102	107
	Dissolved Oxygen	Mean (mg/l)	11.2	10.9	10.6
		Median (mg/l)	11.5	11.3	11.0
		Percent compliance with dissolved oxygen standard (>6 mg/l, >7 mg/l October-December)	100%	99%	99%
	Total Phosphorus	Mean (mg/l)	0.100	0.101	0.107
		Median (mg/l)	0.077	0.082	0.086
		Percent compliance with 0.1 mg/l standard	64%	61%	58%
		Percent compliance with 0.075 mg/l standard	49%	46%	42%
	Total Nitrogen	Mean (mg/l)	1.51	1.47	1.46
		Median (mg/l)	1.45	1.41	1.38
	Total Suspended Solids	Mean (mg/l)	54.5	41.4	42.1
		Median (mg/l)	19.3	14.8	14.5
	Copper	Mean (mg/l)	0.0048	0.0056	0.0062
		Median (mg/l)	0.0040	0.0046	0.0051

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-18 Batavia Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2,266	2,535	2,738
		Percent compliance with single sample standard (<400 cells per 100 ml)	59%	59%	57%
		Geometric mean (cells per 100 ml)	419	428	449
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	132	129	126
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,585	1,698	1,621
		Percent compliance with single sample standard (<400 cells per 100 ml)	82%	82%	83%
		Geometric mean (cells per 100 ml)	206	207	197
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	94	93	94
	Dissolved Oxygen	Mean (mg/l)	10.5	10.5	10.4
		Median (mg/l)	10.4	10.3	10.2
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	99%	99%
	Total Phosphorus	Mean (mg/l)	0.052	0.050	0.052
		Median (mg/l)	0.007	0.006	0.006
		Percent compliance with 0.1 mg/l standard	87%	87%	87%
		Percent compliance with 0.075 mg/l standard	84%	84%	85%
	Total Nitrogen	Mean (mg/l)	1.12	1.11	1.10
		Median (mg/l)	1.09	1.07	1.07
	Total Suspended Solids	Mean (mg/l)	27.3	18.3	16.8
		Median (mg/l)	4.5	4.1	3.7
	Copper	Mean (mg/l)	0.0026	0.0029	0.0032
		Median (mg/l)	0.0014	0.0016	0.0017

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-20 Silver Creek (Sheboygan County)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,694	1,928	2,073
		Percent compliance with single sample standard (<400 cells per 100 ml)	80%	83%	83%
		Geometric mean (cells per 100 ml)	208	199	197
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	201	212	211
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,450	1,679	1,686
		Percent compliance with single sample standard (<400 cells per 100 ml)	89%	89%	89%
		Geometric mean (cells per 100 ml)	198	211	214
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	95	90	86
	Dissolved Oxygen	Mean (mg/l)	10.9	10.5	10.2
		Median (mg/l)	11.2	10.8	10.4
		Percent compliance with dissolved oxygen standard (>3 mg/l)	93%	90%	87%
	Total Phosphorus	Mean (mg/l)	0.039	0.036	0.036
		Median (mg/l)	0.007	0.007	0.007
		Percent compliance with 0.1 mg/l standard	92%	93%	93%
		Percent compliance with 0.075 mg/l standard	90%	91%	92%
	Total Nitrogen	Mean (mg/l)	1.49	1.50	1.51
		Median (mg/l)	1.48	1.47	1.48
	Total Suspended Solids	Mean (mg/l)	35.1	23.7	20.8
		Median (mg/l)	5.3	5.0	4.7
	Copper	Mean (mg/l)	0.0016	0.0016	0.0017
		Median (mg/l)	0.0010	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-21 Silver Creek (Sheboygan County)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,964	2,151	2,265
		Percent compliance with single sample standard (<400 cells per 100 ml)	79%	82%	83%
		Geometric mean (cells per 100 ml)	203	187	180
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	218	234	239
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,534	1,681	1,632
		Percent compliance with single sample standard (<400 cells per 100 ml)	89%	89%	90%
		Geometric mean (cells per 100 ml)	176	177	169
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	113	114	116
	Dissolved Oxygen	Mean (mg/l)	10.7	10.6	10.6
		Median (mg/l)	10.6	10.6	10.5
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	99%	99%
	Total Phosphorus	Mean (mg/l)	0.040	0.038	0.038
		Median (mg/l)	0.007	0.007	0.007
		Percent compliance with 0.1 mg/l standard	91%	92%	92%
		Percent compliance with 0.075 mg/l standard	89%	90%	91%
	Total Nitrogen	Mean (mg/l)	1.24	1.25	1.26
		Median (mg/l)	1.21	1.21	1.22
	Total Suspended Solids	Mean (mg/l)	22.6	15.0	13.2
		Median (mg/l)	5.1	4.8	4.5
	Copper	Mean (mg/l)	0.0018	0.0018	0.0019
		Median (mg/l)	0.0010	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-22 Stony Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,844	2,081	2,229
		Percent compliance with single sample standard (<400 cells per 100 ml)	76%	79%	80%
		Geometric mean (cells per 100 ml)	236	219	210
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	211	224	231
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,574	1,731	1,687
		Percent compliance with single sample standard (<400 cells per 100 ml)	86%	86%	87%
		Geometric mean (cells per 100 ml)	199	195	184
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	109	110	113
	Dissolved Oxygen	Mean (mg/l)	10.6	10.5	10.5
		Median (mg/l)	10.5	10.5	10.4
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.045	0.042	0.043
		Median (mg/l)	0.007	0.007	0.007
		Percent compliance with 0.1 mg/l standard	90%	90%	90%
		Percent compliance with 0.075 mg/l standard	87%	88%	89%
	Total Nitrogen	Mean (mg/l)	1.46	1.45	1.45
		Median (mg/l)	1.43	1.42	1.42
	Total Suspended Solids	Mean (mg/l)	35.7	23.8	21.0
		Median (mg/l)	5.0	4.8	4.5
	Copper	Mean (mg/l)	0.0016	0.0017	0.0018
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-23 North Branch of the Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,979	2,230	2,392
		Percent compliance with single sample standard (<400 cells per 100 ml)	71%	73%	73%
		Geometric mean (cells per 100 ml)	242	222	212
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	197	206	211
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1,595	1,719	1,650
		Percent compliance with single sample standard (<400 cells per 100 ml)	82%	82%	83%
		Geometric mean (cells per 100 ml)	169	158	140
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	103	104	108
	Dissolved Oxygen	Mean (mg/l)	11.3	11.1	11.0
		Median (mg/l)	11.4	11.1	10.9
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.050	0.049	0.051
		Median (mg/l)	0.007	0.007	0.007
		Percent compliance with 0.1 mg/l standard	87%	87%	87%
		Percent compliance with 0.075 mg/l standard	84%	84%	84%
	Total Nitrogen	Mean (mg/l)	1.45	1.45	1.46
		Median (mg/l)	1.44	1.42	1.44
	Total Suspended Solids	Mean (mg/l)	34.5	23.1	21.2
		Median (mg/l)	5.1	4.9	4.5
	Copper	Mean (mg/l)	0.0018	0.0020	0.0021
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-24 Fredonia, USGS Sampling Location (4086360)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,181	1,240	1,261
		Percent compliance with single sample standard (<400 cells per 100 ml)	77%	80%	81%
		Geometric mean (cells per 100 ml)	301	280	267
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	152	171	182
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	938	956	901
		Percent compliance with single sample standard (<400 cells per 100 ml)	87%	88%	88%
		Geometric mean (cells per 100 ml)	267	259	243
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	52	59	66
	Dissolved Oxygen	Mean (mg/l)	11.0	10.8	10.7
		Median (mg/l)	10.9	10.8	10.6
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.109	0.105	0.109
		Median (mg/l)	0.074	0.073	0.077
		Percent compliance with 0.1 mg/l standard	76%	77%	73%
		Percent compliance with 0.075 mg/l standard	52%	54%	48%
	Total Nitrogen	Mean (mg/l)	1.84	1.76	1.74
		Median (mg/l)	1.79	1.68	1.67
	Total Suspended Solids	Mean (mg/l)	83.2	67.1	71.5
		Median (mg/l)	50.3	42.1	46.0
	Copper	Mean (mg/l)	0.0045	0.0050	0.0053
		Median (mg/l)	0.0036	0.0041	0.0044

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-25 Upper Lower Milwaukee River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,262	1,353	1,399
		Percent compliance with single sample standard (<400 cells per 100 ml)	73%	76%	77%
		Geometric mean (cells per 100 ml)	317	296	281
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	170	185	199
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	979	1,004	950
		Percent compliance with single sample standard (<400 cells per 100 ml)	84%	85%	86%
		Geometric mean (cells per 100 ml)	252	239	220
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	76	81	90
	Dissolved Oxygen	Mean (mg/l)	11.1	10.9	10.8
		Median (mg/l)	11.1	10.8	10.6
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.108	0.104	0.107
		Median (mg/l)	0.066	0.064	0.068
		Percent compliance with 0.1 mg/l standard	77%	78%	75%
		Percent compliance with 0.075 mg/l standard	62%	64%	59%
	Total Nitrogen	Mean (mg/l)	2.00	1.92	1.90
		Median (mg/l)	1.93	1.84	1.82
	Total Suspended Solids	Mean (mg/l)	87.5	68.9	72.1
		Median (mg/l)	44.7	37.3	40.7
	Copper	Mean (mg/l)	0.0042	0.0047	0.0051
		Median (mg/l)	0.0033	0.0038	0.0040

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-27 Cedar Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2,498	2,877	3,159
		Percent compliance with single sample standard (<400 cells per 100 ml)	50%	48%	45%
		Geometric mean (cells per 100 ml)	599	642	702
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	70	66	58
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2,114	2,345	2,333
		Percent compliance with single sample standard (<400 cells per 100 ml)	59%	54%	50%
		Geometric mean (cells per 100 ml)	492	553	576
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	27	20	20
	Dissolved Oxygen	Mean (mg/l)	11.1	10.9	10.8
		Median (mg/l)	11.1	11.0	10.8
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.057	0.056	0.059
		Median (mg/l)	0.013	0.013	0.014
		Percent compliance with 0.1 mg/l standard	87%	87%	86%
		Percent compliance with 0.075 mg/l standard	83%	84%	83%
	Total Nitrogen	Mean (mg/l)	1.61	1.63	1.65
		Median (mg/l)	1.58	1.58	1.61
	Total Suspended Solids	Mean (mg/l)	34.7	23.3	21.1
		Median (mg/l)	6.3	6.1	5.7
	Copper	Mean (mg/l)	0.0021	0.0023	0.0025
		Median (mg/l)	0.0012	0.0012	0.0012

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-29 Milwaukee River at the Milwaukee-Ozaukee County Line	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	1,430	1,597	1,700
		Percent compliance with single sample standard (<400 cells per 100 ml)	60%	61%	62%
		Geometric mean (cells per 100 ml)	367	360	352
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	152	156	156
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	865	883	819
		Percent compliance with single sample standard (<400 cells per 100 ml)	77%	78%	80%
		Geometric mean (cells per 100 ml)	183	169	150
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	92	95	99
	Dissolved Oxygen	Mean (mg/l)	11.4	11.2	11.0
		Median (mg/l)	11.4	11.2	11.1
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.089	0.086	0.091
		Median (mg/l)	0.034	0.033	0.035
		Percent compliance with 0.1 mg/l standard	76%	76%	76%
		Percent compliance with 0.075 mg/l standard	70%	70%	69%
	Total Nitrogen	Mean (mg/l)	1.77	1.74	1.74
		Median (mg/l)	1.70	1.66	1.65
	Total Suspended Solids	Mean (mg/l)	71.2	53.1	54.0
		Median (mg/l)	17.8	15.2	16.1
	Copper	Mean (mg/l)	0.0027	0.0031	0.0033
		Median (mg/l)	0.0018	0.0020	0.0021

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-30 Milwaukee River Downstream of Beaver Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	817	847	847
		Percent compliance with single sample standard (<400 cells per 100 ml)	57%	58%	60%
		Geometric mean (cells per 100 ml)	224	196	172
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	145	150	160
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	412	377	332
		Percent compliance with single sample standard (<400 cells per 100 ml)	78%	80%	82%
		Geometric mean (cells per 100 ml)	65	49	38
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	95	99	104
	Dissolved Oxygen	Mean (mg/l)	11.3	11.0	10.7
		Median (mg/l)	11.6	11.4	11.2
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99%	99%	97%
	Total Phosphorus	Mean (mg/l)	0.097	0.096	0.102
		Median (mg/l)	0.067	0.070	0.075
		Percent compliance with 0.1 mg/l standard	69%	67%	65%
		Percent compliance with 0.075 mg/l standard	55%	53%	50%
	Total Nitrogen	Mean (mg/l)	1.61	1.57	1.57
		Median (mg/l)	1.55	1.51	1.48
	Total Suspended Solids	Mean (mg/l)	60.4	45.5	46.2
		Median (mg/l)	19.9	15.8	15.8
	Copper	Mean (mg/l)	0.0041	0.0047	0.0052
		Median (mg/l)	0.0034	0.0039	0.0043

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-31 Indian Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	477	450	407
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	62%	65%	68%
		Geometric mean (cells per 100 ml)	108	83	65
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	161	172	185
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	199	165	144
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	83%	86%	88%
		Geometric mean (cells per 100 ml)	22	15	11
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	98	105	110
	Dissolved Oxygen	Mean (mg/l)	10.8	10.3	9.8
		Median (mg/l)	11.5	11.1	10.8
		Percent compliance with dissolved oxygen standard (>2 mg/l)	96%	94%	91%
	Total Phosphorus	Mean (mg/l)	0.099	0.099	0.105
		Median (mg/l)	0.075	0.080	0.085
		Percent compliance with 0.1 mg/l standard	66%	63%	60%
		Percent compliance with 0.075 mg/l standard	50%	46%	43%
	Total Nitrogen	Mean (mg/l)	1.59	1.54	1.54
		Median (mg/l)	1.54	1.49	1.46
	Total Suspended Solids	Mean (mg/l)	60.8	46.0	46.8
		Median (mg/l)	19.6	15.1	14.8
	Copper	Mean (mg/l)	0.0042	0.0049	0.0053
		Median (mg/l)	0.0037	0.0042	0.0045

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-32 Lincoln Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3	3	2
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	100%	100%	100%
		Geometric mean (cells per 100 ml)			
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	365	365	365
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	6	5	4
		Percent compliance with single sample standard (<2,000 cells per 100 ml)	100%	100%	100%
		Geometric mean (cells per 100 ml)			
		Days of compliance with geometric mean standard (<1,000 cells per 100 ml)	153	153	153
	Dissolved Oxygen	Mean (mg/l)	10.8	10.4	10.2
		Median (mg/l)	11.2	10.7	10.4
		Percent compliance with dissolved oxygen standard (>2 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.118	0.112	0.118
		Median (mg/l)	0.126	0.115	0.120
		Percent compliance with 0.1 mg/l standard	24%	32%	27%
		Percent compliance with 0.075 mg/l standard	15%	17%	14%
	Total Nitrogen	Mean (mg/l)	0.95	0.85	0.88
		Median (mg/l)	1.01	0.87	0.90
	Total Suspended Solids	Mean (mg/l)	80.0	70.6	83.3
		Median (mg/l)	83.8	68.8	84.0
	Copper	Mean (mg/l)	0.0028	0.0028	0.0028
		Median (mg/l)	0.0031	0.0031	0.0030

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-33 Milwaukee River at Lincoln/Estabrook Parks	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	779	802	802
		Percent compliance with single sample standard (<400 cells per 100 ml)	70%	72%	74%
		Geometric mean (cells per 100 ml)	198	179	162
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	176	186	196
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	509	504	465
		Percent compliance with single sample standard (<400 cells per 100 ml)	84%	85%	86%
		Geometric mean (cells per 100 ml)	93	82	72
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	103	106	110
	Dissolved Oxygen	Mean (mg/l)	10.7	10.5	10.3
		Median (mg/l)	10.6	10.4	10.3
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100%	100%	100%
	Total Phosphorus	Mean (mg/l)	0.103	0.101	0.104
		Median (mg/l)	0.073	0.071	0.074
		Percent compliance with 0.1 mg/l standard	75%	76%	74%
		Percent compliance with 0.075 mg/l standard	54%	55%	52%
	Total Nitrogen	Mean (mg/l)	1.25	1.18	1.18
		Median (mg/l)	1.20	1.14	1.12
	Total Suspended Solids	Mean (mg/l)	58.1	45.9	48.4
		Median (mg/l)	29.8	25.4	27.8
	Copper	Mean (mg/l)	0.0037	0.0042	0.0044
		Median (mg/l)	0.0031	0.0035	0.0037

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
ML-34 Milwaukee River at the Former North Avenue Dam	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	369	335	293
		Percent compliance with single sample standard (<400 cells per 100 ml)	65%	68%	72%
		Geometric mean (cells per 100 ml)	78	59	45
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	161	174	188
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	188	162	144
		Percent compliance with single sample standard (<400 cells per 100 ml)	86%	88%	89%
		Geometric mean (cells per 100 ml)	14	9	6
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	102	108	113
	Dissolved Oxygen	Mean (mg/l)	10.2	9.5	9.1
		Median (mg/l)	11.1	10.7	10.4
		Percent compliance with dissolved oxygen standard (>5 mg/l)	92%	88%	86%
	Total Phosphorus	Mean (mg/l)	0.113	0.114	0.119
		Median (mg/l)	0.099	0.103	0.107
		Percent compliance with 0.1 mg/l standard	52%	47%	44%
		Percent compliance with 0.075 mg/l standard	28%	25%	24%
	Total Nitrogen	Mean (mg/l)	1.18	1.13	1.12
		Median (mg/l)	1.13	1.07	1.06
	Total Suspended Solids	Mean (mg/l)	51.6	40.8	42.4
		Median (mg/l)	24.1	19.0	19.6
	Copper	Mean (mg/l)	0.0045	0.0051	0.0054
		Median (mg/l)	0.0042	0.0047	0.0051

Exhibit D

WATER QUALITY SUMMARY STATISTICS FOR THE OAK CREEK WATERSHED

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-1 Upper Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2603	2101	1830
		Percent compliance with single sample standard (<400 cells per 100 ml)	67	75	78
		Geometric mean (cells per 100 ml)	346	232	193
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	123	167	197
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1079	1061	1044
		Percent compliance with single sample standard (<400 cells per 100 ml)	84	84	85
		Geometric mean (cells per 100 ml)	181	178	173
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	82	92	93
	Dissolved Oxygen	Mean (mg/l)	8.17	7.49	7.07
		Median (mg/l)	8.59	7.78	7.47
		Percent compliance with dissolved oxygen standard (>5 mg/l)	73	67	65
	Total Phosphorus	Mean (mg/l)	0.0635	0.0545	0.0497
		Median (mg/l)	0.0248	0.0214	0.0206
		Percent compliance with 0.1 mg/l standard	83	87	89
		Percent compliance with 0.075 mg/l standard	80	85	87
	Total Nitrogen	Mean (mg/l)	0.88	0.83	0.81
		Median (mg/l)	0.82	0.75	0.69
	Total Suspended Solids	Mean (mg/l)	7.89	7.98	8.05
		Median (mg/l)	4.63	4.56	4.50
	Copper	Mean (mg/l)	0.0030	0.0025	0.0023
		Median (mg/l)	0.0008	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-2 North Branch of Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2722	2305	2097
		Percent compliance with single sample standard (<400 cells per 100 ml)	60	67	70
		Geometric mean (cells per 100 ml)	385	267	222
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	108	144	163
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1289	1216	1163
		Percent compliance with single sample standard (<400 cells per 100 ml)	76	77	78
		Geometric mean (cells per 100 ml)	192	177	164
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	71	87	91
	Dissolved Oxygen	Mean (mg/l)	8.58	7.95	7.57
		Median (mg/l)	8.30	7.53	7.30
		Percent compliance with dissolved oxygen standard (>5 mg/l)	80	76	74
	Total Phosphorus	Mean (mg/l)	0.0721	0.0639	0.0605
		Median (mg/l)	0.0298	0.0274	0.027
		Percent compliance with 0.1 mg/l standard	80	84	86
		Percent compliance with 0.075 mg/l standard	76	81	83
	Total Nitrogen	Mean (mg/l)	0.91	0.87	0.85
		Median (mg/l)	0.80	0.76	0.71
	Total Suspended Solids	Mean (mg/l)	15.66	16.26	16.45
		Median (mg/l)	6.40	6.11	5.99
	Copper	Mean (mg/l)	0.0040	0.0035	0.0033
		Median (mg/l)	0.0010	0.0008	0.0008

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Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-3 Oak Creek Downstream of North Branch of Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	5436	4462	3927
		Percent compliance with single sample standard (<400 cells per 100 ml)	58	67	70
		Geometric mean (cells per 100 ml)	729	484	400
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	36	49	63
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2382	2226	2099
		Percent compliance with single sample standard (<400 cells per 100 ml)	76	77	78
		Geometric mean (cells per 100 ml)	355	327	305
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	30	37	40
	Dissolved Oxygen	Mean (mg/l)	9.72	8.93	8.43
		Median (mg/l)	10.36	9.14	8.54
		Percent compliance with dissolved oxygen standard (>5 mg/l)	81	76	74
	Total Phosphorus	Mean (mg/l)	0.0736	0.0648	0.0606
		Median (mg/l)	0.0291	0.0261	0.0254
		Percent compliance with 0.1 mg/l standard	80	84	86
		Percent compliance with 0.075 mg/l standard	76	81	83
	Total Nitrogen	Mean (mg/l)	0.88	0.85	0.82
		Median (mg/l)	0.80	0.75	0.70
	Total Suspended Solids	Mean (mg/l)	13.74	14.27	14.49
		Median (mg/l)	5.90	5.68	5.58
	Copper	Mean (mg/l)	0.0037	0.0033	0.0031
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-4 Middle Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4447	3666	3265
		Percent compliance with single sample standard (<400 cells per 100 ml)	56	65	69
		Geometric mean (cells per 100 ml)	648	437	361
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	46	59	74
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1672	1512	1417
		Percent compliance with single sample standard (<400 cells per 100 ml)	75	76	77
		Geometric mean (cells per 100 ml)	308	279	260
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	35	43	46
	Dissolved Oxygen	Mean (mg/l)	9.24	8.57	8.14
		Median (mg/l)	9.46	8.60	8.23
		Percent compliance with dissolved oxygen standard (>5 mg/l)	82	77	74
	Total Phosphorus	Mean (mg/l)	0.0714	0.0643	0.0615
		Median (mg/l)	0.0294	0.0275	0.0272
		Percent compliance with 0.1 mg/l standard	81	84	86
		Percent compliance with 0.075 mg/l standard	76	81	83
	Total Nitrogen	Mean (mg/l)	0.86	0.84	0.83
		Median (mg/l)	0.76	0.72	0.68
	Total Suspended Solids	Mean (mg/l)	9.89	10.42	10.70
		Median (mg/l)	5.34	5.29	5.25
	Copper	Mean (mg/l)	0.0038	0.0035	0.0033
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-5 Middle Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4289	3546	3158
		Percent compliance with single sample standard (<400 cells per 100 ml)	55	64	67
		Geometric mean (cells per 100 ml)	664	460	386
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	40	52	63
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1595	1424	1319
		Percent compliance with single sample standard (<400 cells per 100 ml)	73	74	75
		Geometric mean (cells per 100 ml)	309	271	244
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	32	40	41
	Dissolved Oxygen	Mean (mg/l)	9.29	8.65	8.22
		Median (mg/l)	9.67	8.91	8.61
		Percent compliance with dissolved oxygen standard (>5 mg/l)	90	86	82
	Total Phosphorus	Mean (mg/l)	0.0761	0.0712	0.0706
		Median (mg/l)	0.0323	0.0305	0.0302
		Percent compliance with 0.1 mg/l standard	78	81	82
		Percent compliance with 0.075 mg/l standard	73	77	78
	Total Nitrogen	Mean (mg/l)	0.89	0.88	0.90
		Median (mg/l)	0.78	0.75	0.73
	Total Suspended Solids	Mean (mg/l)	9.36	9.69	9.80
		Median (mg/l)	4.69	4.54	4.39
	Copper	Mean (mg/l)	0.0039	0.0036	0.0034
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-6 Mitchell Field Drainage Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3966	3204	2839
		Percent compliance with single sample standard (<400 cells per 100 ml)	62	72	75
		Geometric mean (cells per 100 ml)	775	554	470
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	13	22	25
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1590	1541	1500
		Percent compliance with single sample standard (<400 cells per 100 ml)	80	82	84
		Geometric mean (cells per 100 ml)	411	371	354
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	5	11	11
	Dissolved Oxygen	Mean (mg/l)	8.81	8.15	7.74
		Median (mg/l)	8.44	7.56	7.20
		Percent compliance with dissolved oxygen standard (>5 mg/l)	78	75	73
	Total Phosphorus	Mean (mg/l)	0.0702	0.0628	0.0606
		Median (mg/l)	0.0464	0.0387	0.0367
		Percent compliance with 0.1 mg/l standard	82	85	86
		Percent compliance with 0.075 mg/l standard	75	80	82
	Total Nitrogen	Mean (mg/l)	1.00	0.94	0.91
		Median (mg/l)	0.94	0.86	0.79
	Total Suspended Solids	Mean (mg/l)	7.11	7.21	7.25
		Median (mg/l)	4.21	4.15	4.11
	Copper	Mean (mg/l)	0.0031	0.0027	0.0025
		Median (mg/l)	0.0008	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-7 Oak Creek Downstream of Mitchell Field Drainage Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4358	3611	3222
		Percent compliance with single sample standard (<400 cells per 100 ml)	56	65	68
		Geometric mean (cells per 100 ml)	696	482	403
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	35	46	58
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1657	1476	1355
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	76	77
		Geometric mean (cells per 100 ml)	320	277	249
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	28	37	40
	Dissolved Oxygen	Mean (mg/l)	9.13	8.35	7.87
		Median (mg/l)	9.27	8.48	8.12
		Percent compliance with dissolved oxygen standard (>5 mg/l)	80	75	72
	Total Phosphorus	Mean (mg/l)	0.0881	0.0832	0.0835
		Median (mg/l)	0.0583	0.0517	0.0511
		Percent compliance with 0.1 mg/l standard	75	77	78
		Percent compliance with 0.075 mg/l standard	65	69	70
	Total Nitrogen	Mean (mg/l)	0.98	0.97	0.99
		Median (mg/l)	0.92	0.86	0.83
	Total Suspended Solids	Mean (mg/l)	9.90	10.24	10.35
		Median (mg/l)	4.76	4.63	4.49
	Copper	Mean (mg/l)	0.0039	0.0035	0.0034
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-8 Lower Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	8662	7214	6471
		Percent compliance with single sample standard (<400 cells per 100 ml)	39	45	48
		Geometric mean (cells per 100 ml)	1550	1090	917
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	13	19	21
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	3218	2838	2573
		Percent compliance with single sample standard (<400 cells per 100 ml)	61	64	66
		Geometric mean (cells per 100 ml)	593	475	405
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	12	16	18
	Dissolved Oxygen	Mean (mg/l)	10.17	9.68	9.38
		Median (mg/l)	10.15	9.74	9.43
		Percent compliance with dissolved oxygen standard (>5 mg/l)	92	91	90
	Total Phosphorus	Mean (mg/l)	0.0883	0.0841	0.0845
		Median (mg/l)	0.0599	0.0534	0.0513
		Percent compliance with 0.1 mg/l standard	74	78	79
		Percent compliance with 0.075 mg/l standard	64	69	71
	Total Nitrogen	Mean (mg/l)	0.96	0.93	0.95
		Median (mg/l)	0.90	0.83	0.79
	Total Suspended Solids	Mean (mg/l)	10.69	11.06	11.15
		Median (mg/l)	4.79	4.59	4.42
	Copper	Mean (mg/l)	0.0040	0.0036	0.0035
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-9 Lower Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4091	3406	3042
		Percent compliance with single sample standard (<400 cells per 100 ml)	57	66	69
		Geometric mean (cells per 100 ml)	526	335	260
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	68	101	124
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1502	1301	1175
		Percent compliance with single sample standard (<400 cells per 100 ml)	76	78	80
		Geometric mean (cells per 100 ml)	189	141	112
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	50	71	86
	Dissolved Oxygen	Mean (mg/l)	10.54	10.15	9.91
		Median (mg/l)	10.35	9.97	9.74
		Percent compliance with dissolved oxygen standard (>5 mg/l)	96	96	96
	Total Phosphorus	Mean (mg/l)	0.0850	0.0796	0.0781
		Median (mg/l)	0.0633	0.0588	0.0568
		Percent compliance with 0.1 mg/l standard	76	80	82
		Percent compliance with 0.075 mg/l standard	64	68	71
	Total Nitrogen	Mean (mg/l)	0.95	0.92	0.91
		Median (mg/l)	0.91	0.88	0.85
	Total Suspended Solids	Mean (mg/l)	10.74	11.02	11.01
		Median (mg/l)	4.38	4.03	3.77
	Copper	Mean (mg/l)	0.0040	0.0036	0.0034
		Median (mg/l)	0.0010	0.0008	0.0008

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
OK-10 Lower Oak Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3696	3181	2918
		Percent compliance with single sample standard (<400 cells per 100 ml)	52	59	62
		Geometric mean (cells per 100 ml)	404	255	191
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	118	150	165
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1262	1023	907
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	77	79
		Geometric mean (cells per 100 ml)	89	56	40
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	93	112	120
	Dissolved Oxygen	Mean (mg/l)	11.22	10.91	10.74
		Median (mg/l)	11.21	10.84	10.58
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0698	0.0676	0.0677
		Median (mg/l)	0.0435	0.0390	0.0380
		Percent compliance with 0.1 mg/l standard	80	81	80
		Percent compliance with 0.075 mg/l standard	73	75	75
	Total Nitrogen	Mean (mg/l)	0.81	0.80	0.81
		Median (mg/l)	0.71	0.67	0.67
	Total Suspended Solids	Mean (mg/l)	13.19	14.29	14.94
		Median (mg/l)	5.12	5.10	5.15
	Copper	Mean (mg/l)	0.0047	0.0046	0.0048
		Median (mg/l)	0.0021	0.0018	0.0018

Exhibit E

WATER QUALITY SUMMARY STATISTICS FOR THE ROOT RIVER WATERSHED

Assessment Point	Water Quality Indicator	Statistic	Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
			Condition		
RT-1 Root River Upstream of Hale Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2861	2937	2828
		Percent compliance with single sample standard (<400 cells per 100 ml)	72	76	78
		Geometric mean (cells per 100 ml)	293	240	206
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	143	159	183
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1283	1509	1541
		Percent compliance with single sample standard (<400 cells per 100 ml)	86	85	85
		Geometric mean (cells per 100 ml)	170	171	158
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	87	91	100
	Dissolved Oxygen	Mean (mg/l)	10.68	10.23	9.81
		Median (mg/l)	10.77	10.35	9.98
		Percent compliance with dissolved oxygen standard (>5 mg/l)	95	92	88
	Total Phosphorus	Mean (mg/l)	0.0523	0.0501	0.0477
		Median (mg/l)	0.0211	0.0197	0.0188
		Percent compliance with 0.1 mg/l standard	88	89	90
		Percent compliance with 0.075 mg/l standard	86	87	89
	Total Nitrogen	Mean (mg/l)	0.84	0.82	0.79
		Median (mg/l)	0.86	0.82	0.76
	Total Suspended Solids	Mean (mg/l)	5.13	5.11	5.00
		Median (mg/l)	3.40	3.23	2.97
	Copper	Mean (mg/l)	0.0025	0.0025	0.0024
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-2 Root River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3619	3641	3456
		Percent compliance with single sample standard (<400 cells per 100 ml)	68	71	74
		Geometric mean (cells per 100 ml)	361	293	252
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	104	112	134
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1585	1917	1994
		Percent compliance with single sample standard (<400 cells per 100 ml)	81	80	81
		Geometric mean (cells per 100 ml)	208	214	200
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	60	63	71
	Dissolved Oxygen	Mean (mg/l)	8.38	8.15	7.95
		Median (mg/l)	8.42	8.17	8.00
		Percent compliance with dissolved oxygen standard (>5mg/l)	95	92	89
	Total Phosphorus	Mean (mg/l)	0.0654	0.0637	0.0607
		Median (mg/l)	0.0209	0.0195	0.0186
		Percent compliance with 0.1 mg/l standard	83	85	86
		Percent compliance with 0.075 mg/l standard	81	83	84
	Total Nitrogen	Mean (mg/l)	0.96	0.95	0.92
		Median (mg/l)	0.91	0.90	0.88
	Total Suspended Solids	Mean (mg/l)	4.90	5.02	5.07
		Median (mg/l)	3.42	3.36	3.22
	Copper	Mean (mg/l)	0.0035	0.0035	0.0033
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-3 Root River at Wildcat Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3665	3670	3446
		Percent compliance with single sample standard (<400 cells per 100 ml)	66	69	71
		Geometric mean (cells per 100 ml)	371	306	264
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	96	104	126
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1538	1716	1679
		Percent compliance with single sample standard (<400 cells per 100 ml)	79	78	79
		Geometric mean (cells per 100 ml)	215	219	204
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	55	61	69
	Dissolved Oxygen	Mean (mg/l)	9.28	8.61	8.13
		Median (mg/l)	9.07	8.27	7.96
		Percent compliance with dissolved oxygen standard (>5 mg/l)	88	86	84
	Total Phosphorus	Mean (mg/l)	0.0653	0.0635	0.0604
		Median (mg/l)	0.0184	0.0175	0.0171
		Percent compliance with 0.1 mg/l standard	82	84	85
		Percent compliance with 0.075 mg/l standard	79	81	83
	Total Nitrogen	Mean (mg/l)	0.92	0.92	0.90
		Median (mg/l)	0.84	0.84	0.82
	Total Suspended Solids	Mean (mg/l)	7.01	7.21	7.24
		Median (mg/l)	3.35	3.30	3.22
	Copper	Mean (mg/l)	0.0037	0.0037	0.0035
		Median (mg/l)	0.0009	0.0009	0.0009

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Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-4 Root River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3585	3696	3546
		Percent compliance with single sample standard (<400 cells per 100 ml)	60	63	65
		Geometric mean (cells per 100 ml)	486	438	376
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	62	62	76
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1444	1590	1522
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	74	75
		Geometric mean (cells per 100 ml)	267	266	245
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	40	44	48
	Dissolved Oxygen	Mean (mg/l)	9.90	9.22	8.71
		Median (mg/l)	9.78	8.89	8.55
		Percent compliance with dissolved oxygen standard (>5mg/l)	95	93	90
	Total Phosphorus	Mean (mg/l)	0.0677	0.0671	0.0650
		Median (mg/l)	0.0190	0.0183	0.0182
		Percent compliance with 0.1 mg/l standard	80	81	82
		Percent compliance with 0.075 mg/l standard	76	78	79
	Total Nitrogen	Mean (mg/l)	0.89	0.90	0.90
		Median (mg/l)	0.78	0.78	0.78
	Total Suspended Solids	Mean (mg/l)	7.47	7.96	8.24
		Median (mg/l)	3.28	3.33	3.33
	Copper	Mean (mg/l)	0.0041	0.0043	0.0042
		Median (mg/l)	0.0011	0.0010	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-5 Whitnall Park Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	4072	4291	4186
		Percent compliance with single sample standard (<400 cells per 100 ml)	59	61	63
		Geometric mean (cells per 100 ml)	486	447	395
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	65	60	75
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1858	2053	1961
		Percent compliance with single sample standard (<400 cells per 100 ml)	73	72	74
		Geometric mean (cells per 100 ml)	260	270	250
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	43	43	49
	Dissolved Oxygen	Mean (mg/l)	8.69	8.30	8.02
		Median (mg/l)	8.53	8.13	7.83
		Percent compliance with dissolved oxygen standard (>3 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0755	0.0756	0.0736
		Median (mg/l)	0.0243	0.0234	0.023
		Percent compliance with 0.1 mg/l standard	78	78	80
		Percent compliance with 0.075 mg/l standard	74	75	77
	Total Nitrogen	Mean (mg/l)	0.96	0.98	0.98
		Median (mg/l)	0.85	0.85	0.85
	Total Suspended Solids	Mean (mg/l)	11.44	12.72	13.19
		Median (mg/l)	3.53	3.51	3.50
	Copper	Mean (mg/l)	0.0043	0.0045	0.0045
		Median (mg/l)	0.0013	0.0011	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-6 Tess Corners Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2988	3150	3065
		Percent compliance with single sample standard (<400 cells per 100 ml)	65	68	70
		Geometric mean (cells per 100 ml)	336	293	260
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	111	113	130
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1405	1546	1487
		Percent compliance with single sample standard (<400 cells per 100 ml)	78	77	78
		Geometric mean (cells per 100 ml)	198	205	194
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	66	70	75
	Dissolved Oxygen	Mean (mg/l)	10.52	9.85	9.32
		Median (mg/l)	10.59	9.59	8.94
		Percent compliance with dissolved oxygen standard (>3 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0601	0.059	0.0574
		Median (mg/l)	0.0186	0.0182	0.0183
		Percent compliance with 0.1 mg/l standard	83	84	85
		Percent compliance with 0.075 mg/l standard	80	80	82
	Total Nitrogen	Mean (mg/l)	0.81	0.83	0.83
		Median (mg/l)	0.73	0.73	0.73
	Total Suspended Solids	Mean (mg/l)	10.16	10.64	10.85
		Median (mg/l)	3.56	3.51	3.47
	Copper	Mean (mg/l)	0.0033	0.0033	0.0033
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-7 Whitnall Park Creek Downstream of Tess Corners Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3455	3674	3602
		Percent compliance with single sample standard (<400 cells per 100 ml)	60	62	64
		Geometric mean (cells per 100 ml)	421	388	347
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	81	74	91
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1560	1725	1650
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	73	74
		Geometric mean (cells per 100 ml)	228	239	223
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	53	54	61
	Dissolved Oxygen	Mean (mg/l)	10.37	9.66	9.14
		Median (mg/l)	10.34	9.30	8.84
		Percent compliance with dissolved oxygen standard (>3 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0662	0.0662	0.0648
		Median (mg/l)	0.0208	0.0199	0.02
		Percent compliance with 0.1 mg/l standard	80	80	81
		Percent compliance with 0.075 mg/l standard	76	77	78
	Total Nitrogen	Mean (mg/l)	0.86	0.88	0.89
		Median (mg/l)	0.76	0.76	0.77
	Total Suspended Solids	Mean (mg/l)	10.23	10.99	11.29
		Median (mg/l)	3.47	3.48	3.47
	Copper	Mean (mg/l)	0.0039	0.0041	0.0041
		Median (mg/l)	0.0012	0.0011	0.0010

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-8 Middle Root River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3664	3904	3805
		Percent compliance with single sample standard (<400 cells per 100 ml)	57	59	61
		Geometric mean (cells per 100 ml)	582	553	485
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	44	44	57
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1550	1702	1607
		Percent compliance with single sample standard (<400 cells per 100 ml)	71	71	72
		Geometric mean (cells per 100 ml)	300	294	265
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	32	36	43
	Dissolved Oxygen	Mean (mg/l)	11.46	11.08	10.78
		Median (mg/l)	11.65	11.12	10.76
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	100	99
	Total Phosphorus	Mean (mg/l)	0.0775	0.0783	0.0781
		Median (mg/l)	0.0517	0.0497	0.0497
		Percent compliance with 0.1 mg/l standard	78	78	79
		Percent compliance with 0.075 mg/l standard	69	69	70
	Total Nitrogen	Mean (mg/l)	0.93	0.95	0.96
		Median (mg/l)	0.92	0.92	0.94
	Total Suspended Solids	Mean (mg/l)	9.70	9.75	9.87
		Median (mg/l)	3.32	3.26	3.28
	Copper	Mean (mg/l)	0.0005	0.0005	0.0005
		Median (mg/l)	0.0002	0.0001	0.0001

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-9 East Branch Root River	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3443	3468	3280
		Percent compliance with single sample standard (<400 cells per 100 ml)	67	70	72
		Geometric mean (cells per 100 ml)	349	287	248
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	104	116	138
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1590	1827	1813
		Percent compliance with single sample standard (<400 cells per 100 ml)	79	78	80
		Geometric mean (cells per 100 ml)	213	217	203
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	59	63	71
	Dissolved Oxygen	Mean (mg/l)	8.20	7.60	7.23
		Median (mg/l)	7.84	7.16	6.94
		Percent compliance with dissolved oxygen standard (>1 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.0629	0.0608	0.0578
		Median (mg/l)	0.0245	0.0221	0.0213
		Percent compliance with 0.1 mg/l standard	83	84	85
		Percent compliance with 0.075 mg/l standard	79	81	83
	Total Nitrogen	Mean (mg/l)	0.91	0.91	0.89
		Median (mg/l)	0.89	0.88	0.87
	Total Suspended Solids	Mean (mg/l)	6.93	7.13	7.14
		Median (mg/l)	3.29	3.23	3.14
	Copper	Mean (mg/l)	0.0033	0.0032	0.0031
		Median (mg/l)	0.0009	0.0009	0.0009

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-10 Root River Upstream of Ryan Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	3671	3843	3714
		Percent compliance with single sample standard (<400 cells per 100 ml)	58	60	62
		Geometric mean (cells per 100 ml)	573	530	458
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	47	46	60
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1503	1644	1545
		Percent compliance with single sample standard (<400 cells per 100 ml)	72	71	73
		Geometric mean (cells per 100 ml)	303	293	264
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	32	36	42
	Dissolved Oxygen	Mean (mg/l)	11.23	10.72	10.28
		Median (mg/l)	11.57	10.87	10.22
		Percent compliance with dissolved oxygen standard (>5 mg/l)	98	97	95
	Total Phosphorus	Mean (mg/l)	0.0747	0.0736	0.0716
		Median (mg/l)	0.0488	0.0451	0.0434
		Percent compliance with 0.1 mg/l standard	78	78	79
		Percent compliance with 0.075 mg/l standard	69	70	72
	Total Nitrogen	Mean (mg/l)	0.90	0.91	0.91
		Median (mg/l)	0.87	0.87	0.88
	Total Suspended Solids	Mean (mg/l)	8.59	9.09	9.29
		Median (mg/l)	3.26	3.28	3.31
	Copper	Mean (mg/l)	0.0015	0.0015	0.0015
		Median (mg/l)	0.0004	0.0003	0.0003

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-11 West Branch Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2165	2406	2420
		Percent compliance with single sample standard (<400 cells per 100 ml)	69	71	74
		Geometric mean (cells per 100 ml)	246	220	178
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	147	155	186
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1528	1631	1596
		Percent compliance with single sample standard (<400 cells per 100 ml)	81	80	81
		Geometric mean (cells per 100 ml)	141	133	112
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	82	94	104
	Dissolved Oxygen	Mean (mg/l)	12.25	12.09	12.13
		Median (mg/l)	12.96	12.58	12.42
		Percent compliance with dissolved oxygen standard (>1 mg/l)	95	92	91
	Total Phosphorus	Mean (mg/l)	0.2136	0.246	0.2818
		Median (mg/l)	0.1378	0.1729	0.2048
		Percent compliance with 0.1 mg/l standard	44	38	34
		Percent compliance with 0.075 mg/l standard	29	24	20
	Total Nitrogen	Mean (mg/l)	2.92	3.17	3.49
		Median (mg/l)	2.34	2.61	2.83
	Total Suspended Solids	Mean (mg/l)	20.43	15.83	15.11
		Median (mg/l)	3.42	3.07	2.97
	Copper	Mean (mg/l)	0.0052	0.0059	0.0065
		Median (mg/l)	0.0037	0.0046	0.0053

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-12 West Branch Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2243	2565	2641
		Percent compliance with single sample standard (<400 cells per 100 ml)	69	71	74
		Geometric mean (cells per 100 ml)	221	202	165
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	165	174	209
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1786	1931	1919
		Percent compliance with single sample standard (<400 cells per 100 ml)	81	80	81
		Geometric mean (cells per 100 ml)	132	129	111
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	92	102	111
	Dissolved Oxygen	Mean (mg/l)	12.07	12.02	12.22
		Median (mg/l)	12.56	12.46	12.44
		Percent compliance with dissolved oxygen standard (>3 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1923	0.2202	0.2527
		Median (mg/l)	0.1063	0.1371	0.1669
		Percent compliance with 0.1 mg/l standard	50	41	36
		Percent compliance with 0.075 mg/l standard	37	31	26
	Total Nitrogen	Mean (mg/l)	2.78	3.00	3.29
		Median (mg/l)	2.15	2.38	2.59
	Total Suspended Solids	Mean (mg/l)	26.05	20.26	19.54
		Median (mg/l)	3.83	3.59	3.46
	Copper	Mean (mg/l)	0.0047	0.0054	0.0060
		Median (mg/l)	0.0031	0.0038	0.0045

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-13 West Branch Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2118	2536	2687
		Percent compliance with single sample standard (<400 cells per 100 ml)	65	66	68
		Geometric mean (cells per 100 ml)	352	352	300
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	81	80	97
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1804	1982	2016
		Percent compliance with single sample standard (<400 cells per 100 ml)	77	77	77
		Geometric mean (cells per 100 ml)	209	199	172
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	53	58	68
	Dissolved Oxygen	Mean (mg/l)	11.62	11.44	11.37
		Median (mg/l)	12.01	11.81	11.62
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	99
	Total Phosphorus	Mean (mg/l)	0.1329	0.1452	0.166
		Median (mg/l)	0.0664	0.0726	0.0841
		Percent compliance with 0.1 mg/l standard	69	63	56
		Percent compliance with 0.075 mg/l standard	59	52	46
	Total Nitrogen	Mean (mg/l)	2.13	2.20	2.38
		Median (mg/l)	1.54	1.64	1.78
	Total Suspended Solids	Mean (mg/l)	19.89	15.83	15.29
		Median (mg/l)	3.66	3.37	3.27
	Copper	Mean (mg/l)	0.0006	0.0006	0.0006
		Median (mg/l)	0.0002	0.0002	0.0002

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-14 East Branch Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2290	2665	2763
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	75	77
		Geometric mean (cells per 100 ml)	155	144	125
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	244	255	274
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2289	2450	2510
		Percent compliance with single sample standard (<400 cells per 100 ml)	84	83	83
		Geometric mean (cells per 100 ml)	113	122	117
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	128	121	124
	Dissolved Oxygen	Mean (mg/l)	11.87	11.82	11.92
		Median (mg/l)	12.22	12.13	12.09
		Percent compliance with dissolved oxygen standard (>1 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1581	0.1706	0.1947
		Median (mg/l)	0.0677	0.0776	0.0854
		Percent compliance with 0.1 mg/l standard	69	63	58
		Percent compliance with 0.075 mg/l standard	58	53	49
	Total Nitrogen	Mean (mg/l)	2.50	2.51	2.65
		Median (mg/l)	1.92	1.98	2.09
	Total Suspended Solids	Mean (mg/l)	41.91	31.97	29.01
		Median (mg/l)	4.29	4.23	4.21
	Copper	Mean (mg/l)	0.0027	0.0029	0.0032
		Median (mg/l)	0.0013	0.0014	0.0014

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-15 East Branch Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2778	3133	3162
		Percent compliance with single sample standard (<400 cells per 100 ml)	69	71	74
		Geometric mean (cells per 100 ml)	216	200	174
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	187	199	216
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	2238	2336	2353
		Percent compliance with single sample standard (<400 cells per 100 ml)	81	80	81
		Geometric mean (cells per 100 ml)	143	152	145
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	105	106	108
	Dissolved Oxygen	Mean (mg/l)	11.28	10.94	10.78
		Median (mg/l)	11.45	10.98	10.81
		Percent compliance with dissolved oxygen standard (>3 mg/l)	100	100	100
	Total Phosphorus	Mean (mg/l)	0.1276	0.1287	0.1423
		Median (mg/l)	0.0619	0.0672	0.0714
		Percent compliance with 0.1 mg/l standard	75	71	67
		Percent compliance with 0.075 mg/l standard	64	59	56
	Total Nitrogen	Mean (mg/l)	2.11	2.06	2.14
		Median (mg/l)	1.64	1.69	1.77
	Total Suspended Solids	Mean (mg/l)	39.80	30.68	28.32
		Median (mg/l)	4.33	4.27	4.24
	Copper	Mean (mg/l)	0.0033	0.0036	0.0038
		Median (mg/l)	0.0013	0.0013	0.0013

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-16 Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2195	2656	2807
		Percent compliance with single sample standard (<400 cells per 100 ml)	62	63	66
		Geometric mean (cells per 100 ml)	370	378	328
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	79	80	94
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1845	1960	1974
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	75	76
		Geometric mean (cells per 100 ml)	213	201	175
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	56	61	71
	Dissolved Oxygen	Mean (mg/l)	11.64	11.39	11.25
		Median (mg/l)	12.01	11.66	11.43
		Percent compliance with dissolved oxygen standard (>5 mg/l)	98	97	96
	Total Phosphorus	Mean (mg/l)	0.1097	0.114	0.128
		Median (mg/l)	0.0618	0.0677	0.0755
		Percent compliance with 0.1 mg/l standard	75	72	67
		Percent compliance with 0.075 mg/l standard	64	60	55
	Total Nitrogen	Mean (mg/l)	1.83	1.80	1.90
		Median (mg/l)	1.40	1.45	1.54
	Total Suspended Solids	Mean (mg/l)	20.06	16.53	15.96
		Median (mg/l)	4.38	3.90	3.73
	Copper	Mean (mg/l)	0.0019	0.0021	0.0021
		Median (mg/l)	0.0006	0.0006	0.0006

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-17 Root River at Upstream Crossing of Milwaukee-Racine County Line and Downstream of Root River Canal	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2770	3136	3176
		Percent compliance with single sample standard (<400 cells per 100 ml)	58	59	61
		Geometric mean (cells per 100 ml)	554	548	486
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	41	45	52
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1434	1555	1499
		Percent compliance with single sample standard (<400 cells per 100 ml)	72	72	73
		Geometric mean (cells per 100 ml)	298	284	258
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	32	37	42
	Dissolved Oxygen	Mean (mg/l)	11.46	11.15	10.93
		Median (mg/l)	11.59	11.16	10.88
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	98
	Total Phosphorus	Mean (mg/l)	0.0881	0.0929	0.1019
		Median (mg/l)	0.0604	0.0628	0.0702
		Percent compliance with 0.1 mg/l standard	76	74	70
		Percent compliance with 0.075 mg/l standard	65	62	58
	Total Nitrogen	Mean (mg/l)	1.29	1.30	1.38
		Median (mg/l)	1.09	1.12	1.18
	Total Suspended Solids	Mean (mg/l)	12.43	10.88	10.71
		Median (mg/l)	3.42	3.01	2.95
	Copper	Mean (mg/l)	0.0005	0.0005	0.0005
		Median (mg/l)	0.0001	0.0001	0.0001

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-18 Root River Upstream of Hoods Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2899	3345	3426
		Percent compliance with single sample standard (<400 cells per 100 ml)	56	57	60
		Geometric mean (cells per 100 ml)	524	536	483
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	61	62	72
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1531	1650	1578
		Percent compliance with single sample standard (<400 cells per 100 ml)	71	72	73
		Geometric mean (cells per 100 ml)	244	235	210
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	50	53	62
	Dissolved Oxygen	Mean (mg/l)	11.36	11.11	10.94
		Median (mg/l)	11.49	11.12	10.83
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	99	99
	Total Phosphorus	Mean (mg/l)	0.0789	0.0908	0.0985
		Median (mg/l)	0.0573	0.0655	0.0718
		Percent compliance with 0.1 mg/l standard	80	74	70
		Percent compliance with 0.075 mg/l standard	67	60	55
	Total Nitrogen	Mean (mg/l)	1.01	1.24	1.29
		Median (mg/l)	0.82	1.05	1.09
	Total Suspended Solids	Mean (mg/l)	17.27	14.67	14.36
		Median (mg/l)	3.58	2.96	2.63
	Copper	Mean (mg/l)	0.0011	0.0013	0.0013
		Median (mg/l)	0.0002	0.0002	0.0002

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-19 Ives Grove Ditch	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2058	2200	2128
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	76	78
		Geometric mean (cells per 100 ml)	84	56	36
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	258	295	318
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	930	1031	1035
		Percent compliance with single sample standard (<400 cells per 100 ml)	86	85	85
		Geometric mean (cells per 100 ml)	28	22	15
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	147	150	151
	Dissolved Oxygen	Mean (mg/l)	9.57	8.88	8.39
		Median (mg/l)	8.37	7.37	7.12
		Percent compliance with dissolved oxygen standard (>1 mg/l)	97	98	98
	Total Phosphorus	Mean (mg/l)	0.7636	0.9992	1.2568
		Median (mg/l)	0.3125	0.4858	0.7396
		Percent compliance with 0.1 mg/l standard	21	15	12
		Percent compliance with 0.075 mg/l standard	15	11	9
	Total Nitrogen	Mean (mg/l)	4.41	5.26	6.16
		Median (mg/l)	3.11	3.81	4.63
	Total Suspended Solids	Mean (mg/l)	13.89	10.42	9.67
		Median (mg/l)	4.23	4.18	4.18
	Copper	Mean (mg/l)	0.0054	0.0064	0.0073
		Median (mg/l)	0.0035	0.0048	0.0059

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-20 Hoods Creek	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2439	2688	2649
		Percent compliance with single sample standard (<400 cells per 100 ml)	68	70	72
		Geometric mean (cells per 100 ml)	133	96	68
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	231	258	285
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1325	1473	1448
		Percent compliance with single sample standard (<400 cells per 100 ml)	80	79	79
		Geometric mean (cells per 100 ml)	53	44	31
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	137	141	146
	Dissolved Oxygen	Mean (mg/l)	10.83	10.18	9.72
		Median (mg/l)	11.52	10.27	9.35
		Percent compliance with dissolved oxygen standard (>3 mg/l)	98	98	98
	Total Phosphorus	Mean (mg/l)	0.4119	0.5356	0.717
		Median (mg/l)	0.125	0.1709	0.223
		Percent compliance with 0.1 mg/l standard	44	35	28
		Percent compliance with 0.075 mg/l standard	32	23	19
	Total Nitrogen	Mean (mg/l)	2.91	3.40	4.08
		Median (mg/l)	1.97	2.31	2.62
	Total Suspended Solids	Mean (mg/l)	18.31	14.41	13.65
		Median (mg/l)	4.14	4.10	4.10
	Copper	Mean (mg/l)	0.0046	0.0053	0.0059
		Median (mg/l)	0.0023	0.0030	0.0037

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-21 Root River at the City of Racine, USGS Sampling Location (4087240)	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2610	3031	3117
		Percent compliance with single sample standard (<400 cells per 100 ml)	57	59	61
		Geometric mean (cells per 100 ml)	424	424	372
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	91	92	104
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1311	1389	1320
		Percent compliance with single sample standard (<400 cells per 100 ml)	74	74	76
		Geometric mean (cells per 100 ml)	188	172	150
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	73	78	87
	Dissolved Oxygen	Mean (mg/l)	11.06	10.89	10.77
		Median (mg/l)	11.33	11.01	10.77
		Percent compliance with dissolved oxygen standard (>5 mg/l)	99	99	99
	Total Phosphorus	Mean (mg/l)	0.0945	0.0998	0.1096
		Median (mg/l)	0.0686	0.0745	0.0821
		Percent compliance with 0.1 mg/l standard	71	68	63
		Percent compliance with 0.075 mg/l standard	56	52	46
	Total Nitrogen	Mean (mg/l)	1.19	1.17	1.20
		Median (mg/l)	1.00	1.00	1.02
	Total Suspended Solids	Mean (mg/l)	19.59	17.09	16.86
		Median (mg/l)	4.40	3.41	2.84
	Copper	Mean (mg/l)	0.0006	0.0007	0.0008
		Median (mg/l)	0.0001	0.0001	0.0001

Assessment Point	Water Quality Indicator	Statistic	Condition		
			Recommended Plan Based on GMIA Weather Inputs	Recommended Plan under Best-Case Climate Change Scenario	Recommended Plan under Worst-Case Climate Change Scenario
RT-22 Mouth of Root River at Lake Michigan	Fecal Coliform Bacteria (annual)	Mean (cells per 100 ml)	2835	3279	3372
		Percent compliance with single sample standard (<400 cells per 100 ml)	55	57	60
		Geometric mean (cells per 100 ml)	435	433	373
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	95	98	111
	Fecal Coliform Bacteria (May-September: 153 days total)	Mean (cells per 100 ml)	1402	1472	1397
		Percent compliance with single sample standard (<400 cells per 100 ml)	72	73	75
		Geometric mean (cells per 100 ml)	171	153	128
		Days of compliance with geometric mean standard (<200 cells per 100 ml)	77	83	93
	Dissolved Oxygen	Mean (mg/l)	11.11	10.90	10.75
		Median (mg/l)	11.29	10.91	10.62
		Percent compliance with dissolved oxygen standard (>5 mg/l)	100	99	99
	Total Phosphorus	Mean (mg/l)	0.0998	0.1047	0.1135
		Median (mg/l)	0.0739	0.0783	0.0854
		Percent compliance with 0.1 mg/l standard	68	66	62
		Percent compliance with 0.075 mg/l standard	53	49	44
	Total Nitrogen	Mean (mg/l)	1.19	1.16	1.18
		Median (mg/l)	1.01	1.01	1.01
	Total Suspended Solids	Mean (mg/l)	22.08	19.69	19.37
		Median (mg/l)	6.71	4.97	3.83
	Copper	Mean (mg/l)	0.0012	0.0014	0.0014
		Median (mg/l)	0.0002	0.0001	0.0001