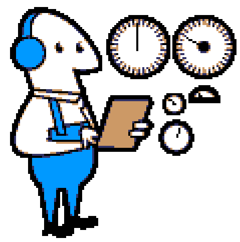
4 Program and Performance Monitoring, Evaluation and Reporting



The SMPP represents an organized approach to achieving compliance with the stormwater expectations of the NPDES Phase II program for both private and public activities. Land development, redevelopment and transportation improvement projects were required to comply with the provisions of the WDO prior acceptance of the SMPP. This SMPP documents and organizes previously existing procedures and incorporates the objectives of the WDO to create one cohesive program addressing pre-development, construction, post-development activities and municipal operations.

This chapter describes how the QLP and the Township will monitor and evaluate the proposed stormwater pollution prevention plan based on the above stated objective. As part of the stormwater management program, the Township:

- reviews its activities,
- inspects its facilities,
- oversees, guides, and trains its personnel, and
- evaluates the allocation of resources available to implement stormwater quality efforts.

4.1 Monitoring Program

There are extensive monitoring efforts already underway across the County including efforts by the LCHD to monitor numerous lakes, the Des Plaines River Watershed Workgroup and the Fox River Study Group. Refer to Figure 14.

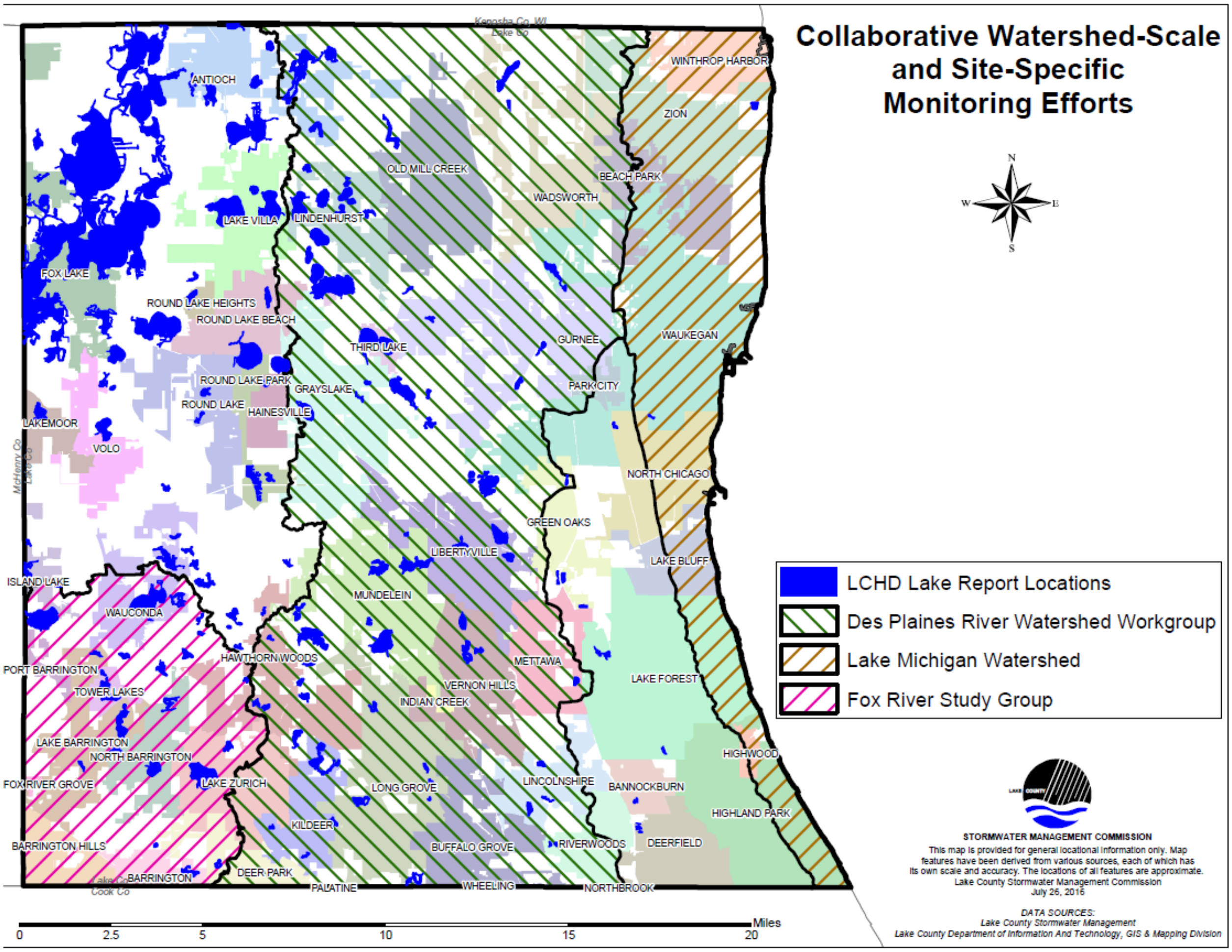


Figure 14: Countywide Monitoring Efforts

4.1.A Fox River Study Group

In accordance with ILR 40 V.A.2.b.x, the Fox River Study Group (FRSG), previously described in Chapter 2.4, satisfies the monitoring requirement for the portion of the community located within the Lower Fox River Watershed.

By agreement between the Illinois EPA and the FRSG, the Fox River Implementation Plan (FRIP) will take the place of a traditional TMDL for dissolved oxygen and nuisance algae in the Fox River. No written agreement has been implemented between the Illinois EPA and the FRSG regarding the FRIP, but the Illinois EPA has worked closely with the FRSG in developing the FRIP since 2001. Because the Illinois EPA's authority to implement and enforce the Clean Water Act comes from the federal government, the FRIP will need to be approved by the U.S. EPA before it officially replaces the TMDL process. The need for a TMDL will be revisited by IEPA after implementation of the FRIP, by evaluating whether the listed reaches are still impaired

The ISWS developed a calibrated QUAL2K water quality model application for the Fox River (Bartosova, 2013). This model was used to simulate future Fox River water quality in response to management actions considered in the FRIP. In 2016, the FRSG will develop a strategy for future data collection and prepare written plan(s) that may potentially include additional water quality monitoring and discussion with IEPA and IDNR of biological data to assess actual condition of aquatic community and potentially identify gaps in existing biological data.

The Township is committed to participating in the FRSG and supporting its efforts.

4.1.B Des Plaines River Watershed Workgroup

In accordance with ILR 40 V.A.2.b.x, participation in the Des Plaines River Watershed Workgroup (DRWW), previously described in Chapter 2.4, satisfies the monitoring requirement for the portion of the community located within the Des Plaines River Watershed.

POTWs and communities within the Des Plaines River watershed in Lake County have initiated efforts to form a workgroup: a voluntary, dues paying, membership organization that would monitor water quality and strategize to improve water quality based on scientific data, making decisions at the local level. Membership would consist of POTWs, municipal separate storm sewer permittees (MS4s), environmental groups, consultants, concerned citizens. The Workgroup, the Des Plaines River Watershed Workgroup (DRWW), would meet quarterly, be governed by a set of bylaws and an elected executive board, and provide many benefits to the general membership including:

- Water quality improvements
- Local decision making
- Cost savings
- NPDES permit compliance: shared monitoring effort, education and outreach materials
- Continuing education credits to maintain professional certifications

The Township is committed to participating in the DRWW and supporting its efforts.

4.1.C Lake County Health Department Lakes Management Unit

In accordance with ILR 40 V.A.2.b.ii and ILR 40 V.A.2.b.v, the monitoring efforts performed by the LCHD satisfies the monitoring requirement for the portions of the watershed tributary to an assessed Lake. Due to the length of monitoring efforts performed by the county, trends in water quality impairments and improvements can be best gauged by reviewing current and historic lakes reports.

The Lakes Management Unit has been collecting water quality data on Lake County lakes since the late 1960s. Since 2000, 176 different lakes each year have been studied and data collected on temperature, dissolved oxygen, phosphorus, nitrogen, solids, pH, alkalinity, chloride, conductivity, water clarity, the plant community and shoreline characteristics. The LMU collects baseline water quality information from at least 12-15 different lakes in the county each year. These lakes must be at least 6 acres in size. Water quality information is obtained through the collection of water samples once per month from May through September, usually at the deepest areas of the lakes.

ANALYSIS

This water is analyzed for nutrients, solids, temperature, dissolved oxygen and various other parameters. A plant survey to analyze the aquatic plant community for different species and their relative occurrence is also conducted once per month from May through September. Additionally, once per summer the shoreline of each lake is characterized for shoreline type, severity of erosion and shoreline plant species (including invasives).

SUMMARY REPORTS

Summary reports are written and presented to the management entity of the lake and other concerned citizens during the following spring. These reports include the analysis of data collected, a list of threats occurring in or around the lake, and recommendations on how to reduce or eliminate these problems. Lake summary reports can be found https://www.lakecountyil.gov/2400/Lake-Reports.

4.1.C.1 Inland Beaches

From May to September, bacteria concentrations are monitored bimonthly at inland beaches and recreational areas by Lake County's Lake Management Unit (LMU). The water samples are tested for E coli bacteria, which are found in the intestines of almost all warm-blooded animals. Note that not all strains of E coli are the same, and certain strains can make humans sick if ingested in high enough concentrations. If water samples come back high for E coli (235 E coli/100 ml), the management body for the bathing beach is notified and a sign is posted indicating the beach closure. Additionally, since rain events tend to lead to elevated bacteria levels in the water column, the LMU advises that persons avoid swimming for 48 hours after a large rain event.

The IEPA uses the number and duration of swim bans to assess whether or not the beaches support designated uses for primary contact recreation. Within Illinois, Lake Michigan Beaches are found to be "not supporting" of primary contact use when, on average over a three-year period: (1) one or more beach closures occurred per year lasting less than a 2 week; or (2) less than one beach closure occurred per year, but the average closure duration was one week or greater

4.1.D Community Monitoring

A portion of the Community is located outside of existing monitoring efforts. The Township has selected a total of *2 locations* to perform supplemental water quality monitoring in accordance with ILR 40 V.A.2.b.vii. Monitoring locations were selected to coincide with high priority outfalls which also require annual inspection per ILR40.B.3.h; refer to **Figure 16 Additional Community Monitoring Locations**.

Grab samples at these locations shall be collected once annually within 48 hours of a precipitation event greater than or equal to one quarter inch in a 24-hour period. At a minimum, analysis of storm water discharges or ambient water quality shall include the following parameters: total suspended solids, total nitrogen, total phosphorous. fecal coliform, chlorides, and oil and grease. In addition, monitoring shall be performed for any other pollutants associated with storm water runoff for which the receiving water is considered impaired pursuant to the most recently approved list under Section 303(d) of the Clean Water Act.

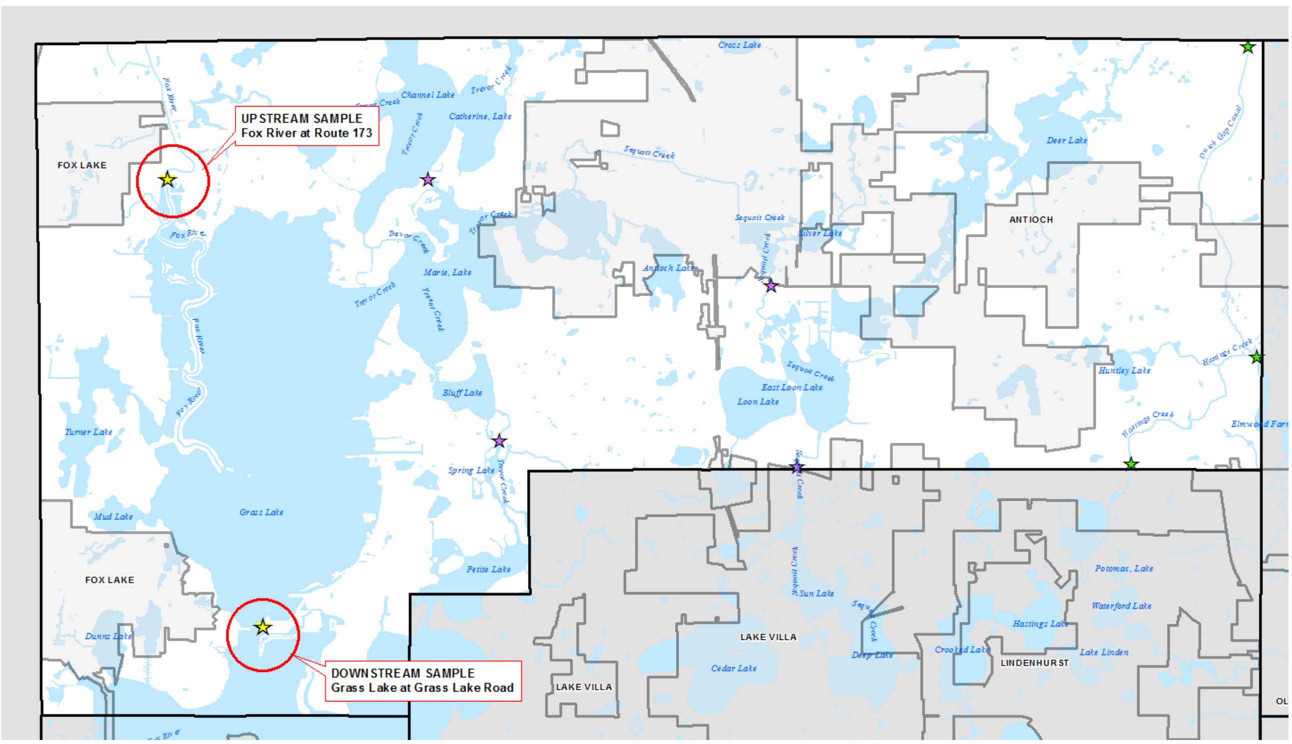


Figure 16: Additional Community Monitoring Locations

4.2 Program Evaluation (BMP C.6)

At the end of each year the BMPs implemented by the MS4 should be evaluated in order to determine the effectiveness of the program. Include a description of observed areas of program effectiveness, at the end of Part B **Stormwater Management Program Assessment** within each **Annual Report** submitted to IEPA. Program areas which do not appear to be improving should also be identified and described within this portion of the Annual Report. This information will be used to provide insight into how the program may need to evolve. The following are some indicators that the BMPs are appropriate.

- A reduced number of outfalls having positive indicators for potential pollutants.
- An improvement, or no change, in the annual monitoring results.
- Improved community awareness of water quality and other NPDES program aspects.
- Increased number of hits on website information related to the NPDES program.
- Increased quantities of Household Hazardous Wastes or Electronic collected by SWALCO.
- Reduced number of septic system failures.
- Increased stakeholder involvement.
- Reduced number of SE/SC violations.
- Increase in Streambank and Shoreline stabilization projects, or a decrease in the extent of projects necessary.
- Improved detention pond quality (including conversion of dry bottom or turf basins to naturalized basins; removal of excess sediment accumulation and a general increase in maintenance activity on detention ponds throughout the MS4).
- Reduced use of chloride and phosphorus by the MS4.
- Improved awareness of water quality and other NPDES program aspects by both Township staff and its contractors.

4.2.A Monitoring Program Evaluation

The results of the monitoring are used to further gage the effects of the SMPP on the physical/habitat-related aspects of the receiving waters and the effectiveness of BMPs. Possible causes of any documented degradation will be investigated and any appropriate corrective actions will be incorporated into future Stormwater Management Program Plan (SMPP).

- As part of the QLP section of the Annual Report, SMC provides a detailed discussion of the State of Lake County Waters including a summary of TMDLs, an assessment of the regional water quality monitoring and watershed group efforts and an estimate of the effectiveness of the regional efforts.
- The Township is responsible for providing a discussion of any additional local monitoring efforts within the MS4 portion of the **Annual Report Part C Annual Monitoring and Data Collection.**

4.2.B IDDE Program Evaluation

Experience gained from the USEPA NPDES program indicates a lower chance of observing polluted dry-weather flows in residential and newer development areas, while older and industrial land use areas having a higher incidence of observed dry-weather flows. Review the results of the screening program to examine whether any trends can be identified that relate the incidence of dry-weather flow observations to the age or land use of a developed area. If so, these conclusions may guide future outfall screening activities.

Indirect or subtle discharges such as flash dumping are difficult to trace to their sources and can only be remedied through public education and reporting. Therefore, it is expected that to some degree they will continue although at a reduced magnitude and frequency. Although the outfall screening program will be successful in identifying and eliminating most pollutants in dry-weather discharges, the continued existence of dry-weather flows and associated pollutants will require an ongoing commitment to continue the outfall screening program.

The first phase of the program was to complete the MS4 wide pre-screening effort, investigate those outfalls exhibiting dry-weather flow and then eliminate identified illicit direct connections. The ILR40 permit, issued in 2016 requires that all high-priority outfalls be evaluated annually. It is logical to assume that completion of the Phase 1 efforts and several years of annual screening, the majority of the dry-weather pollution sources will be eliminated. However, new sources may appear in the future as a result of mistaken cross connections from redevelopment, new-development or remodeling. These efforts will determine the effectiveness of the program on a long-term basis and show ongoing improvement through a reduced number of outfalls having positive indicators of potential pollutants. Include a description of the screening and dry-weather flow investigation, in **Annual Report Part C IDDE Monitoring and Data Collection** submitted to IEPA annually.

4.2.C SMPP Document Evaluation

Evaluation of the SMPP. The following types of questions/answers are discussed periodically between the QLP, Stormwater Coordinator, Managers and field staff. Suggested improvements are noted and incorporated into a revised SMPP document, approximately every 5-years.

- Are proper stormwater management practices integrated into planning, designing and construction of both public and private projects?
- Are efforts to incorporate stormwater practices into maintenance activities effective and efficient?
- Is the training program sufficient?
- Is the SMPP sufficient with respect to both the BMPs and measurable goals described for each of the six MCM?
- Are the procedures for implementing the SMPP adequate?
- Are there any TMDL Reports within the community and if yes, is there an action plan for compliance?
- Were there any issues of non-compliance and if yes, determine the plan for achieving compliance with a timeline of actions?