Chapter 12

Local Surface Water Management Plan

12.0 Introduction

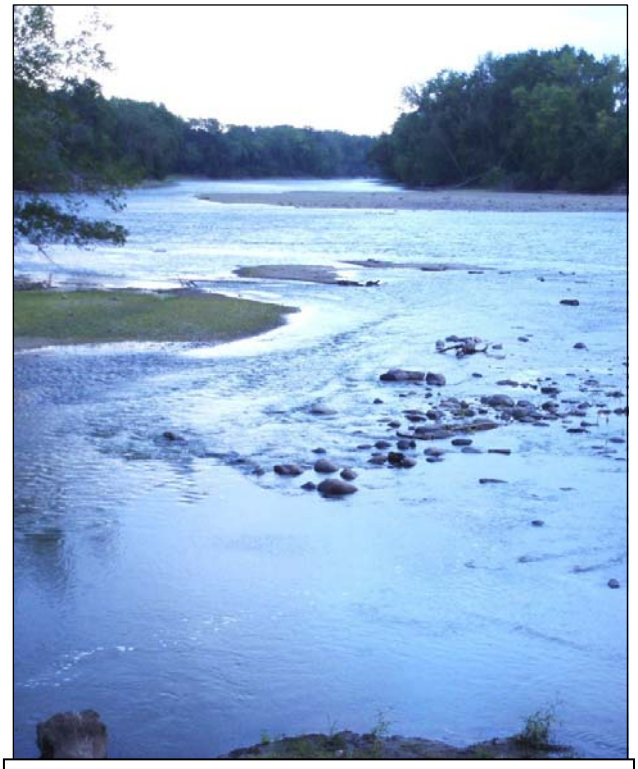
Purpose

This chapter serves as an addendum to the City of Fridley's approved 2001 Local Surface Water Management Plan (LSWMP) which is available for review at the Municipal Center. The City is aware of the need for watershed management organizations (WMO) within its jurisdiction, Rice Creek Watershed and Six Cities Watershed, to update their water management plans around 2010. Upon approval of updated WMO plans, the City will amend its LSWMP as needed.

This chapter focuses on both the quantity of water impacting Fridley's surface water resources and the quality of water in Fridley's lakes, rivers, streams, and wetlands. Water quantity is the volume of water flowing from various sources into a water resource. Some areas in the City are prone to flooding, or excessive volumes of water, after rain events. Water quality pertains to the cleanliness of the water in water resources. For example, chemical run-off from yards and streets can negatively impact water quality. This chapter examines the current status of these water resources and establishes a plan for improvement.

This section of the Comprehensive Plan contains the following elements:

- Inventory of land and water resources, including the physical environment and impaired waters
- Existing surface water management system and water resource agreements
- Assessment of existing and potential water-resource related problems
- Stormwater management
- Policies



Mouth of Rice Creek flowing into Mississippi River

For the purposes of this plan, surface water resources include the Mississippi River and other watercourses, wetlands, and lakes. Fridley is nearly fully developed and more than 70% of the parcels in the City have at least 26% impervious surface. According to the Regional Hydrogeologic Assessment of the Anoka Sand Plain, the sensitivity rating for the watertable system to pollution in the Fridley area ranges from very high in the central and eastern portions, to high in the northeastern, southwestern, and extreme western portions of the City. Sensitivity rating is a qualitative measure of the susceptibility of an aquifer to become contaminated from a release at the surface.

Community Setting

The City is located in southern Anoka County, on the east bank of the Mississippi River. The City is fully urbanized, with a completely built surface water system. It is located within two jurisdictional watersheds, the Rice Creek Watershed District (RCWD) and the Six Cities Watershed Management Organization (SCWMO). Both watersheds have completed watershed management plans.

12.1 Inventory of Physical Environment

Elevation

The topography of the community is varied and influenced by the waterways. Higher elevations exist in the eastern and southeastern portions of the community and the lowest associated with the Mississippi River floodplain (see **Figure 12.1**).

Surficial and Underlying Geology

The surficial deposits of the Fridley area are classified as part of the Anoka Sand Plain and were deposited primarily by glacial ice and meltwater during the most recent glaciation. However, the glacial landscape has been altered by soil formation and erosion during the postglacial periods. All of the glacial deposits were from the Grantsburg Sublobe and the overall thickness of the surficial deposits range from 50 to 100 feet.

There are five surficial deposits located in Fridley. Two of the deposits are of glacial origin: lake sand and outwash deposits. The other three deposits are of postglacial origin: alluvium, eolian sand, and terrace deposits.

The lake sand deposits are found along the eastern boundary of Fridley and consist of very fine to medium sand with minor silt, and include areas of fluvial sand at or near the surface. The outwash deposits located in the northern portion of the City generally consist of sand and gravel. Alluvium deposits have been identified along Rice Creek and the Mississippi River. These deposits consist of primarily silty sand overlaid in places by sandy loam or peat. Eolian deposits, dunes of very fine to medium sand, are found in the extreme southeastern corner of the City. The terrace deposits are mainly sand and gravel in nature and are found over most of the western two-thirds of the City. Bedrock geology is further described in Chapter 11 of this Plan.

Land Cover

By accurately describing an existing resource and applying appropriate management strategies, the City can continue to safeguard its current resources - even as these resources gradually change over time. For example, stream beds meander and emergent wetlands become boggier due to natural changes in the environmental landscape.

Management should not stall or interrupt these natural changes, rather ensure that quality is maintained. However, where appropriate the management plan may call for restoration of an ecosystem, or replacement of an existing ecosystem with one that is more conducive to site conditions.

Figure 12.2 shows the geographic distribution of land cover types, including impervious surface, marsh, native vegetation and woodland for all privately and publicly held land in Fridley. More than 70% of the parcels in the City have at least 26% impervious surface and 20% of the City's parcels are covered with 76-100% impervious surface.

Figure 12.1 Elevation

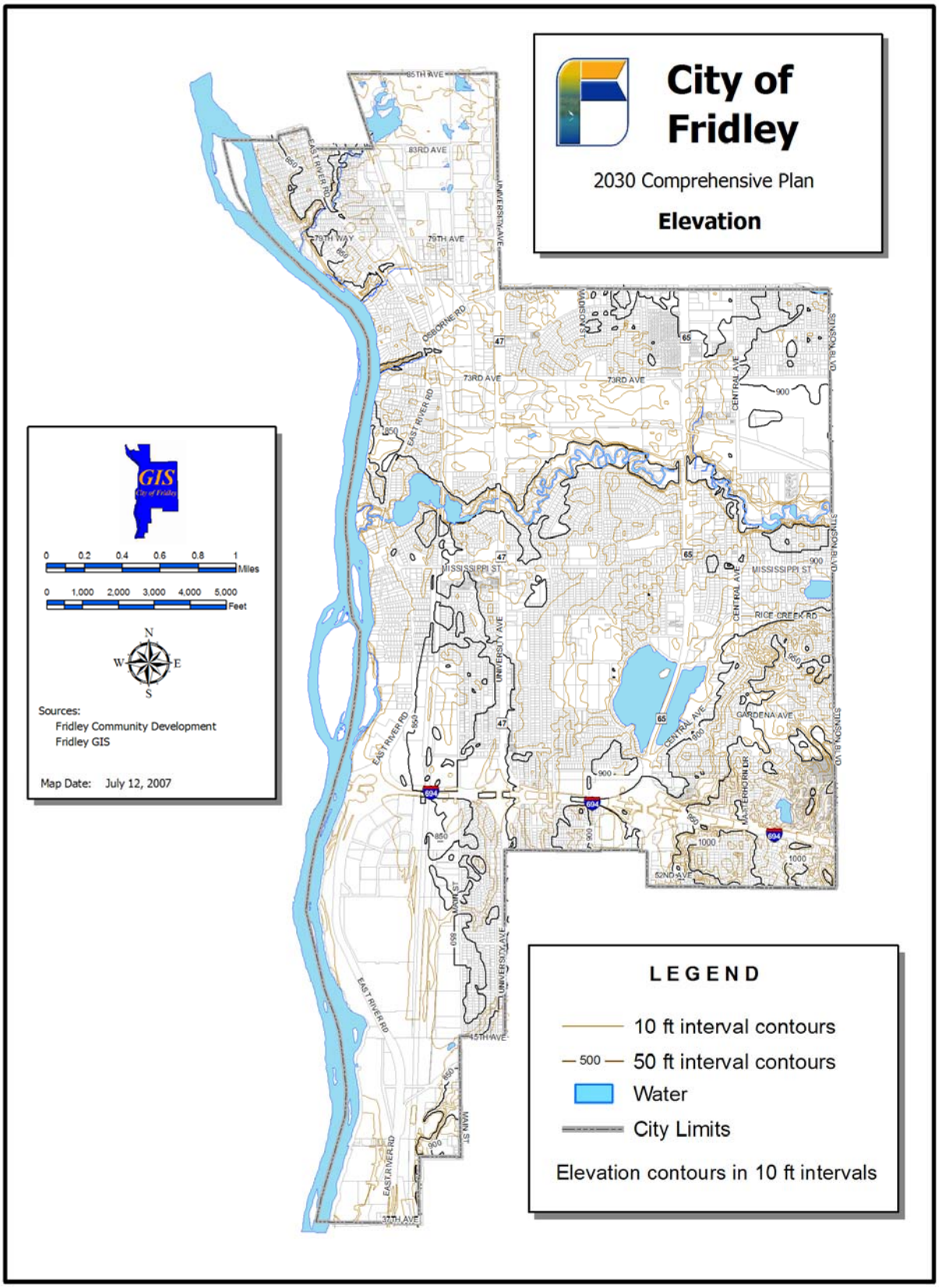
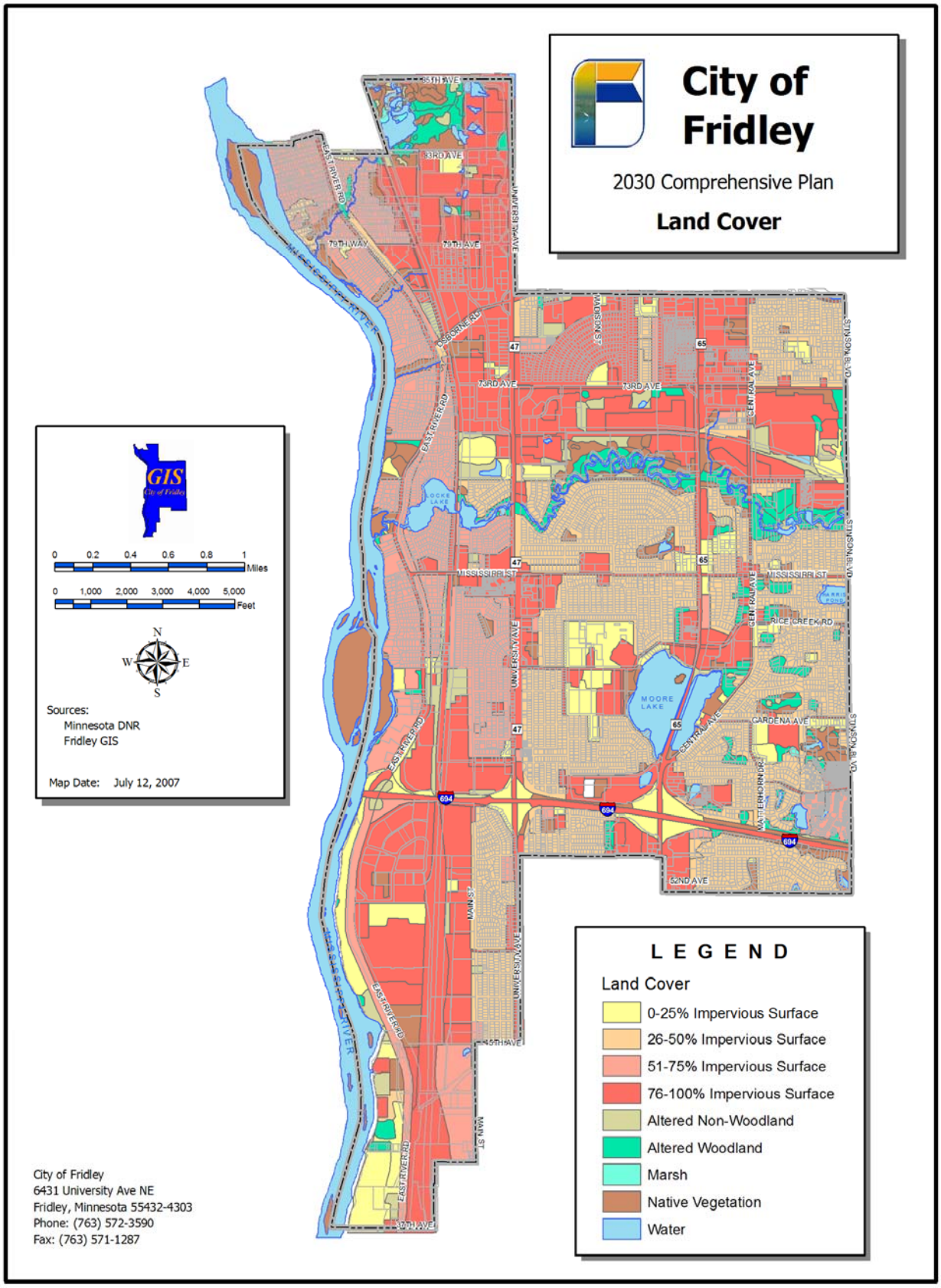


Figure 12.2 Land Cover



12.2 Inventory of Water Resources

Aquifers and Groundwater Conditions

Four aquifers are located in the Fridley area including the watertable system, Prairie du Chien-Jordan, Franconia-lronton-Galesville, and Mt. Simon-Hinckley.

The uppermost aquifer, the watertable system, exists in many different types of geologic materials. Some of these yield water to wells, such as sands and gravels; but others, such as till, do not allow the passage of water. Due to the heterogeneous nature of the glacial deposits, the watertable system is highly variable in velocity and groundwater flow direction is generally west or southwest toward the Mississippi River. The other three aquifers are bedrock aquifers are described in **Chapter 11** of this Plan.

According to the Regional Hydrogeologic Assessment of the Anoka Sand Plain, the sensitivity rating for the watertable system to pollution in the Fridley area ranges from very high in the central and eastern portions, to high in the northeastern, southwestern, and extreme western portions of the City. A sensitivity rating is a qualitative measure of the susceptibility of the aquifer to become contaminated from a release at the surface. The ratings correspond to an estimated travel time for waterborne contaminants at the land surface to reach the uppermost aquifer. A very high rating corresponds to a travel time of hours to months, while a high rating corresponds to a travel time of weeks to years. The wellhead protection plan being prepared by the County should provide more distinct data for aquifer ratings.

Lakes

There are four named lakes and one pond in Fridley, including East Moore Lake, Locke Lake, Farr Lake, West Moore Lake and Harris Pond.

Storm sewer output entering East Moore Lake

- *East Moore Lake* is located in the southeastern part of the City, and is bisected by TH 65 just north of I-694. The two parts of the lake are hydraulically connected by culverts underneath TH 65, and have emergent wetlands along their northern edges. East Moore Lake is maintained as a swimming and recreational basin. A fabric underlies the sandy bottom. The USGS quad map indicates depths of up to 20 ± feet.
- *Locke Lake* is a dredged, impounded basin along Rice Creek created by a dam near East River Road. It is situated just upstream from the Mississippi River and west of the Burlington Northern Railroad tracks.
- *Farr Lake* is a deep-water wetland situated between areas of single-family housing to the west and multi-family housing to the east. It is located just inside the eastern edge of the City and just north of I-694. This wetland is utilized for stormwater management and provides an aesthetic amenity for nearby residents.

- *West Moore Lake* is described as a large open water wetland. The USGS topographic map (New Brighton quad) does not indicate any depths equal to or greater than five feet in this part of the lake.
- *Harris Pond* is a small, excavated wetland midway along the eastern edge of the City and is utilized as a stormwater detention basin and for stormwater management. Harris Pond undergoes treatment for phosphorus reduction and control of algae. A portion of this pond extends into New Brighton and drains a small area of that City.

Mississippi River

The Mississippi River is the ultimate recipient of stormwater runoff from the City of Fridley. It is the largest river system in North America, draining about 40 percent of the continental United States. Fridley is located in the Middle Mississippi River Basin (upstream of Saint Anthony Falls) of the Upper Mississippi River (upstream of St. Louis, MO). This stretch of the Mississippi River can be characterized as a moderately flowing watercourse with a bottom consisting primarily of silts and sands.

According to the US Geological Survey, at gauging station Number 05288500 located at 95th Street in Coon Rapids (about 0.5 mile north of Fridley), the normal elevation of the river is approximately 804.5 feet. It is a DNR protected watercourse with a varying ordinary high water elevation that coincides with the top of the riverbank. Approximately 19,100 square miles drain to the station location. The DNR classifies the river as a warm water gamefish resource.

Protected Waters

There are nine Department of Natural Resources (DNR) protected waters in Fridley. **Table 12.1** lists the DNR protected waterways and water bodies in the City.

Table 12.1 DNR Protected Waters

Name of Feature	DNR Number	DNR Protected
Springbrook Wetland	02-0688P	Yes
Springbrook Creek	02009a	Yes, from 02-688P to Mississippi River
Rice Creek	02010b	Yes
Mississippi River	02001a	Yes
Farr Lake	02-0078P	Yes
Locke Lake	02-0077P	Yes
Harris Pond	02-0684W	Yes
West Moore Lake	02-0075-02P	Yes
East Moore Lake	02-0075-01P	Yes

Streams

The four named streams that flow through Fridley are Oak Glen, Rice, Springbrook, and Stonybrook.

- *Oak Glen Creek* is an intermittently flowing, steep sided ravine between East River Road and the Mississippi River. The remainder of this stream upstream from East River Road has been piped from outside the City.
- *Rice Creek* is a relatively large watercourse with a drainage area of approximately 200 square miles. Through Fridley, Rice Creek begins somewhat steeply sloped and flattens out as it approaches University Avenue. It enters the City at an elevation of 852.5 feet, drops 45 -50 feet and flows through Locke Lake before reaching the Mississippi River about 2.5 miles downstream.

Rice Creek leaving Locke Lake

- According to a recent survey by DNR Fisheries, Rice Creek has two types of fisheries within Fridley. From its confluence with the Mississippi River up to the Locke Lake dam, the gamefish species composition is similar to that found in the Mississippi River (catfish, smallmouth bass, walleye and northern). Above Locke Lake and to the City line, gamefish are limited to fingerling size walleye.
- *Springbrook Creek* flows out of a large wetland located at the City's northern border (with Coon Rapids). Within the City, Springbrook Creek is somewhat flat between the wetland and the Burlington Northern Railroad tracks and then cuts a steep sided ravine beginning around East River Road and extending to its confluence with the Mississippi River. Springbrook Creek is a DNR protected watercourse.
- *Stonybrook Creek* flows about 1,400 feet from an area near East River Road to the Mississippi River. The portion of this creek from East River Road to the River was piped in 1996 due to erosion problems.

Wetlands

The City completed a Wetland Inventory in 1993, including information on location, size and type of each wetland. This inventory describes vegetation, hydrology and a discussion of regulatory issues. (Refer to **Figure 12.3** for a map of wetland locations.) Data tables from the 1993 Wetland Inventory, showing a summary of information on each wetland basin/complex, are on file at the City. The Rice Creek Watershed District and the City share administration of the Minnesota Wetland Conservation Act (WCA) as a local government unit (LGU).

Impaired Waters

The federal Clean Water Act (CWA) requires states to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet designated uses, such as drinking water, fishing and swimming. The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity and mercury. A water body is “impaired” if it fails to meet one or more water quality standards.

Section 303(d) of the Clean Water Act requires states to publish and update a list of waters that are not meeting one or more water-quality standards. The list, known as the 303(d) Total Maximum Daily Load (TMDL) list, was updated on June 10, 2008, by the Minnesota Pollution Control Agency (MPCA). The data shows four of Fridley’s water bodies are impaired. The data is found in **Table 12.2 Surface Water**

Conditions. An impaired waters list was published in Fridley's 2001 Comprehensive Plan, since then, West Moore Lake and Springbrook Creek have been removed from the impaired waters list.

Figure 12.3 Water Resources and Watershed Districts

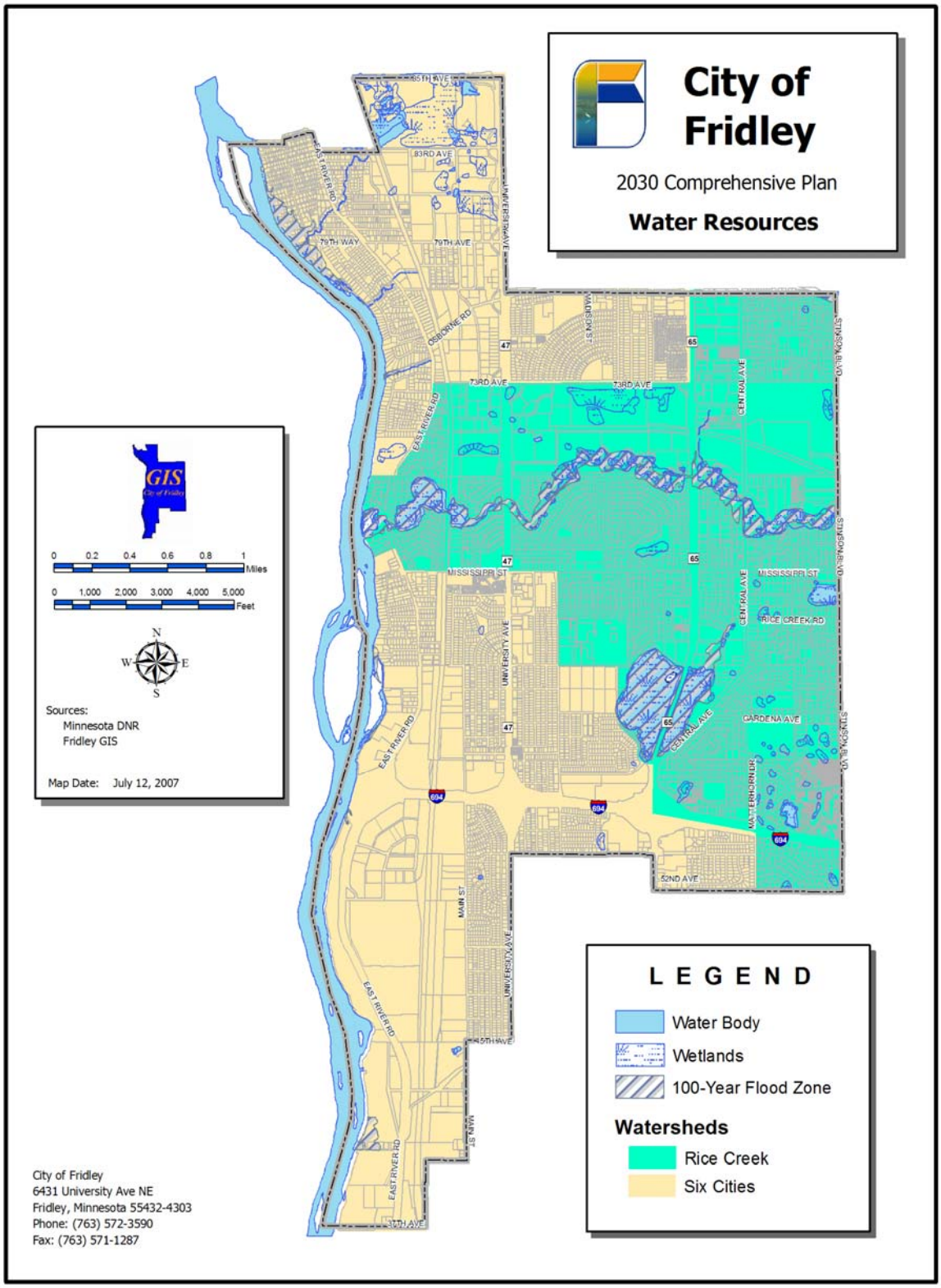


Table 12.2 Surface Water Conditions

Name of Feature	Description	Water Way ID	Affected Use	Pollutant or Stressor	TMDL Target Start	TMDL Target Completion
East Moore	Lake or Reservoir	02-0075-01	Aquatic Recreation	Nutrient/ Eutrophication Biological Indicators	2009	2013
Rice Creek	Headwaters to Maple R	07020011-531	Aquatic Life	Fish Bioassessments	2012	2017
Mississippi River	Coon Cr to Upper St Anthony Falls	07010206-509	Aquatic Recreation	Fecal Coliform	2008	2011
Mississippi River	Coon Cr to Upper St Anthony Falls	07010206-509	Aquatic Consumption	PCB in Fish Tissue	1998	2011
Mississippi River	Coon Cr to Upper St Anthony Falls	07010206-509	Aquatic Consumption	Mercury in Fish Tissue	Plan approved in 2008	

Numerous agencies, including Anoka Conservation District, Rice Creek Watershed District, MPCA, Friends of the Mississippi River and Six Cities Watershed District, collect data on Fridley's water bodies. Some data collection programs use staff as well as volunteers. By working cooperatively to gather data, more information can be collected in any given year, allowing the City to focus on management plans and mitigate the effects of stormwater runoff, including nonpoint source pollution.

12.3 Surface Water Management System

Water Resource Management Agreements

Surface water resources in the City of Fridley come under the jurisdiction of several entities. Each of the entities involved are described in **Table 12.3**.

Table 12.3 Surface Water Jurisdiction

Jurisdictional Entity	Jurisdictional Responsibility
US Army Corps of Engineers	Mississippi River: to the top-of-bank All wetlands: entire wetland
MN DNR	DNR protected wetlands and lakes: to the ordinary high water elevation DNR protected watercourses: to the top-of-bank
MPCA	Water quality protection through administration of 401 certification program and NPDES
Six Cities Watershed Management Organization	Review of any activities that affect surface waters within the SCWMO portion of the City
Rice Creek Watershed District	Wetlands: those under the jurisdiction of WCA and review of activities that affect surface waters, in the RCWD part of the City
City of Fridley	Review of any activities that affect surface water and wetlands per terms of the City's "Overlay District" authority (based on WCA requirements)

Rice Creek Watershed District (RCWD) requires a permit for many land-disturbing activities in the portion of RCWD situated within the City. Further, in this part of the City, RCWD is the LGU regarding administration of the Minnesota Wetland Conservation Act (WCA); and the City does not intend to assume LGU responsibilities for the WCA. See **Figure 12.3** for a map of watershed districts, wetlands and water bodies in Fridley.

Six Cities Watershed District (SCWD) covers the remaining portion of the City and also requires a permit for many land-disturbing activities. Within its municipal boundary, the City assumes LGU responsibilities in the SCWD. Additionally, the City administers the WCA within its municipal boundary.

National Pollution Discharge Elimination System

The Minnesota Pollution Control Agency (MPCA) administers the 401 certification of the National Pollutant Discharge Elimination System (NPDES) within Minnesota. According to the MPCA list updated in March 2007, Fridley is identified as a mandatory small municipal separate storm sewer system (MS4).

In general terms, MS4s are publicly owned or operated stormwater infrastructure used solely for stormwater, and are not part of a publicly owned wastewater treatment system. Examples of stormwater infrastructure include curbs, ditches, culverts, stormwater ponds and storm sewer pipes. Common owners or operators of MS4s include cities, townships and public institutions.

The MS4 general permit focuses on reducing the pollution that enters these public systems and discharges to wetlands, streams and lakes ("waters of the state"). Fridley is required to obtain a general permit according to federal rule, 40 CFR § 122.34 (a) and (b) (the Clean Water Act).

Requirements of the MS4 General Permit

All owners or operators of MS4s are mandated to satisfy the requirements of the MS4 general permit; Minneapolis and St. Paul are required to meet customized individual permits, which are similar but contain additional requirements.

The MS4 general permit requires the MS4 operator or owner to create a Stormwater Pollution Prevention Program with six important components:

- Public education and outreach, which includes teaching citizens about better stormwater management
- Public participation: Incorporate citizens in solving stormwater pollution problems. This includes a required public annual meeting and an annual report.
- A plan to detect and eliminate illicit discharges to the stormwater system (such as chemical dumping and wastewater connections)
- Construction-site runoff controls
- Post-construction runoff controls
- Pollution prevention and municipal "good housekeeping" measures, such as covering salt piles and street-sweeping.

The MS4 general permit is a requirement, but also a tool in the hands of City, township and county officials who want to improve the quality of lakes and rivers that receive stormwater discharges. MS4 administrators can improve the quality of life for their citizens by protecting and restoring local water quality.

Metropolitan Area Stormwater Runoff Infiltration Requirements

Much of the built-up inner cities and first- and second-ring suburbs developed without runoff management practices – causing harm to water resources. Redevelopment in these areas presents an excellent opportunity to expose runoff to infiltration, vegetative uptake, and settling through a number of successful "best management practices" (BMPs). Operators of "municipal separate storm sewers systems" (MS4) are required to apply for NPDES permit coverage and to implement best management practices for stormwater.

NPDES Phase II permit coverage began in 2003. The City of Fridley has since developed several stormwater/erosion control ordinance to meet NPDES Phase II requirements. These ordinances are available for review electronically on the City's website or on paper at the Municipal Center. A summary of the ordinances are found below in *Section 12.4 Assessment of Existing and Potential Water Resource-Related Problems, Reduction of Nonpoint Source Pollution, Resource Protection.*

Both the Local Surface Water Management Plan chapter of the Comprehensive Plan and the City's stormwater/erosion control ordinance are in place to meet the Metropolitan Council's Metropolitan Area Stormwater Runoff Infiltration Requirements.

12.4 Assessment of Existing and Potential Water Resource-Related Problems

Monitoring

Wetlands

At the time of the wetland inventory (1993), reviewing agencies did not require a function and value assessment. Therefore, such an assessment was not performed. Further, the currently accepted guidelines prepared by the Minnesota Stormwater Advisory Group regarding the susceptibility of wetlands to impact from stormwater runoff, was not available to wetland managers. Therefore, potential impacts caused by the quality and quantity of stormwater runoff are reviewed by the appropriate LGU.

In some cases of redevelopment and subsequent changes in site grades and impervious surfaces, it is the City's intention to protect all wetlands and the development planning process incorporates the following steps, which include a determination of stormwater susceptibility:

- The developer is required to submit a detailed delineation as part of a project's review process.
- The City's wetland consultant reviews delineation data including a determination of stormwater susceptibility and makes recommendations to City staff or advisory commissions.
- The City considers State and Local regulations, consultant and advisory commission recommendations, and coordinates with the developer to create an acceptable development plan.
- The developer submits the development plan to SCWMO or RCWD for review and approval, after which the City approves it.

Wetland Management

Fridley City Code Chapter 205.29, Wetland Overlay District, prevents development from occurring over wetland areas without mitigation. This section of code, however, does not set a standard regarding how close a development or land owner may build next to the edge of a wetland. While staff has effectively negotiated reasonable buffers around wetlands in any recent

development projects, it would be best to modify the code to establish uniform criteria for wetland setbacks.

Streams

Per National Pollutant Discharge Elimination System (NPDES) requirements, the City monitors outflow into streams, rivers, lakes, ponds and wetlands. Each year, in 10 – 12 percent of the City, Fridley performs an outflow assessment of stormwater flowing into open water bodies.

Lakes

The Minnesota Pollution Control Agency (MPCA) coordinates testing of lakes. Assessments of surface water conditions are required under the federal Clean Water Act. They are used to determine whether water bodies meet their intended uses, such as being suitable for fishing or swimming.

Lake Assessment Process and Methods

Minnesota lake assessments focus on the trophic state and its relationship to support of designated uses, specifically swimming and aesthetics. Carlson's Trophic State Index (TSI) was used to combine measures of summer Secchi Disk transparency and epilimnetic concentrations of chlorophyll-a and total phosphorous. The Secchi Disk process measures the lake's transparency depth. The amount of chlorophyll and/or phosphorus affects transparency depth.

Reduction of Nonpoint Source Pollution

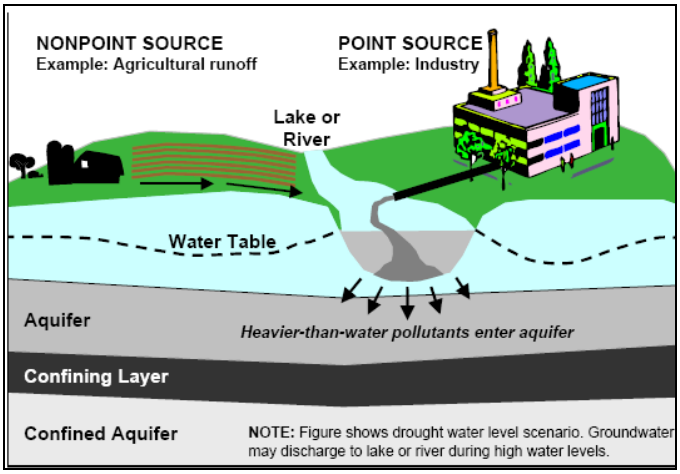
Fridley's surface water management program deals with broad land runoff ("nonpoint" source) and specific wastewater ("point" source) pollution. Point source pollution includes the discharge of treated wastewater effluent through a pipe. Nonpoint sources of pollution result from many of the everyday activities and actions of people (see **Figure 12.4**). These include applying fertilizer to lawns in an amount that exceeds what the grass can use, leaving exposed soils in areas that can drain into the street, blowing grass clippings into the street, washing a car on the driveway, or allowing a vehicle to leak oil on the ground or pavement. All these accumulate to become major nonpoint source pollution in our receiving waters.

Figure 12.4 Examples of Nonpoint Source Pollution

Source: Metropolitan Council, Surface Water Management, May 2005

Nonpoint source pollution begins with the alteration of the landscape caused by agricultural production and urban development (**Figure 12.5**). The natural vegetative and drainage systems provide a low-impact course for water to follow. Alteration of these systems increases both the volume and rate of water runoff, and introduces polluting materials that can be transported by the runoff into receiving water bodies. This makes it more difficult to clearly identify the pollution source and effectively manage it.

Figure 12.5 Point vs. Nonpoint Source Pollution



Source: Metropolitan Council, Surface Water Management, May 2005

According to the Metropolitan Council's document, Surface Water Management May 2005, "nonpoint sources of pollution far exceed point sources of pollution to the region's water resources and state's water resources".

As a fully developed community, little impervious surface will be added in upcoming years. Guidelines for managing stormwater runoff are already in place. Future projects, however, will be required to install stormwater treatment features that are engineered to ensure no new runoff will result from the new development.

Local Ordinances

The City uses regulation in the form of local ordinances, as a basic method for maintaining water quality. Development or redevelopment projects must be regulated to ensure the protection of surface and ground water resources, including shoreland buffers, wetland resources, and animal habitat.

New Development

Any new development in the City since 1978 has included construction of stormwater management improvements as part of any additional infrastructure required for that development. Treatment criteria have been based on RCWD standards and plans are reviewed by City staff to ensure compliance with Metropolitan Council's policies on nonpoint source pollution and RCWD requirements. Details on pretreatment requirements are found in the RCWD Water Resources Management Plan (August 1998).

Public Education

The City continues to enhance its deliverance of stormwater education. In 1999, the City began publishing an annual water quality report in its newsletter. Additionally, information is inserted with utility bills as funding has allowed. Staff provides public education to residents about the impacts of stormwater run-off at community events related to home improvement, yards, and gardens.

Resource Protection

Regulation is the act of adopting and enforcing ordinances and regulations that protect resources on privately owned land. Regulation has the possibility of meeting with public opposition and legal implications. Ordinances must be carefully written in order to protect the resource without resulting in a takings lawsuit.

Fridley has several ordinances that protect natural features on private land. The City's shoreland, floodplain, and wetland ordinances protect water resources from development, working in concert with state and federal regulations. They also establish a buffer around these ecosystems, protecting a transition area between wetland and upland resource types. Upland resources along the Mississippi River are also protected by the City's Critical Area Plan.

Much was done in the City of Fridley in 2005 to protect stormwater quality. Five separate text amendments were approved by the City Council and offer the following new protections:

- ZTA #05-02 Reduction of commercial parking space requirements
- ZTA #05-04 Approval of a shoreland overlay zoning district
- ZTA #05-05 Exception to six-inch raised curbing requirements to accommodate certain stormwater treatment features, like rain gardens
- ZTA #05-07 Made hazardous material dumping into the storm sewer system a public nuisance punishable as a misdemeanor
- ZTA #05-08 Amended landscaping requirements (Ch. 105) to allow for natural landscaped area growth over 10" tall, prohibit the deposit of leaves or grass in the street, prohibited the deposit of yard wastes within 25 feet of a waterway or bluffline, and require the sweeping of paved surfaces following lawn fertilizer applications
- ZTA #05-10 Creating a new and improved Chapter 208, Stormwater Management and Erosion Control Ordinance.

12.5 Stormwater Management

Description of Existing System

The bulk of Fridley's surface water management system was built between 1962 and 1973. During this time period, standard engineering practices called for efficient collection of storm and melt water runoff, and swift conveyance of that water to the receiving waterbody or watercourse. The City has taken advantage of opportunities, as they have become available, to retrofit the system.

Most of the existing collection and conveyance system in Fridley reflects this doctrine. In the case of Fridley, the ultimate receiving water is the Mississippi River. Where available, natural stream channels are utilized as conduits or have been modified using culverts and/or ditching of the channel.

Where streams were not available for sending runoff to the river, pipes were installed. Collection of water is accomplished through a series of catch basins. Location and spacing of catch basins, as well as pipe sizes, have generally been designed based on a five- or ten-year storm, depending on the particulars of the road and to some extent the catchment area that is the subject of the design.

Rain Gardens

Rain gardens are vegetated depressions that infiltrate runoff. Rain gardens are designed to encourage vegetation uptake of stormwater to reduce runoff and pollutant concentrations. An added benefit is the

recharging of the shallow aquifers. A well designed rain garden has engineered soil which maximizes infiltration pollutant removal while avoiding groundwater ponding longer than 24 hrs.

The National Pollutant Discharge Elimination System (NPDES) protocol recognizes that rain gardens play a very important role in stormwater pollutant removal. Rain gardens are also recognized as a Best Management Practice (BMP), which is a set of guidelines that are required for municipal operations in managing pollution control.

The publicly maintained rain garden is located at Jay Park. Owners of private property have built rain gardens in their front yards as a part of the 2006 and 2007 street reconstruction projects.

Basin Outflow Rates

No "basin outflow data" is available, with the exception of limited data that was collected from the outlet of the main Springbrook Nature Center wetland complex into Springbrook Creek.

This outflow data was collected as part of a Phase 1 Clean Water Partnership Resource Investigation grant in 1998 and 1999. The results of the Phase I Report, dated September 2000, are on file at the Municipal Center.

Retrofitting

The City has taken advantage of redevelopment or reconstruction situations to retrofit the existing system as opportunities have been presented. The following stormwater management features were accomplished by retrofitting the system.

- 2005 – 2006 Street Reconstruction Projects - The City collaborated with neighborhood residents, and Rice Creek Watershed District to establish a cost-sharing agreement for the installation of rain gardens to meet NPDES stormwater run-off requirements as part of the 2006 street reconstruction project.
- Memory Lane Rain Gardens - The City collaborated with neighborhood residents, Anoka Conservation District, and Rice Creek Watershed District to establish a cost-sharing agreement for the installation of five rain gardens along Memory Lane to meet NPDES stormwater run-off requirements as part of the 2007 street reconstruction project.

Proposed Improvement Projects

A complete list of proposed stormwater management-related improvement projects over the next five years is found in the stormwater section of **Attachment Ff, Capital Improvement Plan**.

Water Quality Monitoring

As part of the Phase 1 and Phase II Springbrook Watershed Clean Water Partnership grant, a wide range of data has been collected for parts of the Springbrook Creek drainage basin. This data was used to determine corrective actions and is on file at the City of Fridley in the final reports for each phase of the grant project.

The City began a program of water quality testing in East Moore Lake in the spring of 1999 to monitor possible impacts of the Medtronic World Headquarters development. Testing was completed by the Anoka Conservation District under a contract arrangement with the City of Fridley. This monitoring ended in 2004.

The Friends of the Mississippi River (FMR) began coordinating a Stream Health Evaluation Program (SHEP) for Rice Creek in the summer of 2006. The data collected from that year created a baseline on

which to assess future data. Each summer, volunteers will collect stream samples at the same two points along Fridley's portion of Rice Creek. The quantity and variety of macro-invertebrates found in the samples will determine the health of the stream when compared to the baseline data.

Progress toward achieving any water quality goal cannot be assessed without a baseline from which to judge data and a complete database that measures change. By accurately describing an existing water resource and by effectively applying appropriate management strategies, the City can continue to safeguard its current resources, even as these resources gradually change over time.

12.6 Policies

These policies are intended to amend, but not replace, those contained within the approved 2001 LSWMP.

1. The City will maintain the functional, habitat and aesthetic qualities of surface waters that serve as retention ponds through regular maintenance and in some cases on a cost-share basis with residents, in special situations and circumstances.
2. The City will ensure the effective function of detention ponds with regular maintenance of City owned facilities.
3. In addition to inspection during construction, the City will require that an "as-built" survey of a newly constructed stormwater pond and related structures be submitted for review to ensure adherence to design and specification.
4. Through annual inspection and response to citizen petition, the City will ensure that privately owned public stormwater facilities are properly maintained.
5. The City will continue to take an aggressive approach to routine sweeping of all City streets on an annual and seasonal basis to minimize and reduce impact to receiving waters from sand, salt, leaves, litter and other debris.
6. The City will continue to retrofit the existing system for water quality improvements as opportunities present themselves. Further, the City will specifically look for inexpensive, innovative retrofitting opportunities and seek cost-sharing arrangements to initiate economical, creative features and practices such as:
    a. Sump manholes and ditch checks
    b. Modified pond outlet structures
    c. Bio-active or vegetated ditches and swales
    d. Directing small flows away from impervious areas/conduits, and toward vegetated areas
    e. Other infiltration BMPs
7. The City will look for opportunities to improve or install desirable buffers (native plant species) along and around its surface water resources.
8. The City will continue all aspects of its comprehensive annual Operation & Maintenance Program.
9. The City will continue to participate in the National Flood Insurance Program, and continue to inform residents about flood protection related issues.
10. The City will be diligent in its attempts to stay up-to-date in implementing Federal "runoff management" requirements including, but not limited to, NPDES Phase II.

11. The City will work to reduce the economic impact of flood disasters to the City and its residents by implementing the Federal government's Project Impact Program.
12. The City will look for infiltration opportunities as is practicable and feasible.
13. The City will seek commitment from RCWD to reduce the rate and volume of water coming into Fridley via Rice Creek.

12.7 Goals and Objectives

Goals have been assembled related to local surface water management. The term goal is used throughout this plan to define the City's desired outcome relative to key community issues. As a result of the 2007 neighborhood planning meetings, four overriding goals emerged. Three of those four goals pertain to the purpose of this chapter and are listed below. The following objectives are listed in Chapter 1 of the Comprehensive Plan as action plans for this goal.

1. Maintain Fridley as a desirable place to live.
2. Maintain Fridley as a desirable place to work.
3. Protect Fridley's natural environment.

The following objectives were developed for the approved 2001 Local Surface Water Management Plan for Fridley and still pertain to the goals today.

- To protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of the City of Fridley and its residents regarding surface water issues.
- To maintain or enhance the water quality of Fridley's lakes, creeks, wetlands, and other resources.
- To preserve, maintain, and expand where possible the stormwater storage and detention systems to control excessive runoff volumes and rates, prevent flooding, protect public health and safety, and minimize public capital expenditures.
- To maintain and improve, where practical, the functions, values, and biological diversity of wetlands on City-owned property.
- To protect the capacity of the City's stormwater management system, prevent flooding, and maintain water quality by preventing erosion and sedimentation from occurring, and by correcting existing erosion and sedimentation problems.
- Protect the quality and quantity of groundwater resources.
- To improve the health of Springbrook Nature Center wetlands, including biotic communities, water quality, and the rate and volume of water traversing the Center.
- To increase public awareness, understanding, and involvement in water and natural resource management issues.

12.8 Conclusions and Action Steps

Several general statements can be drawn from the analysis of the existing local surface water management plan. The following statements were discussed and debated; and related action steps have been developed.

Action steps reflect the City's general intentions and will guide the community in the attainment of goals.

1. The City's wetland overlay code fails to establish a buffer minimum for construction adjacent to wetlands.

Action Step. Review wetland buffer standards in neighboring communities and revise existing code.

2. Several agencies collect water quality data for Fridley waterways. The data is not reported on an annual basis to Fridley public works staff. In order to establish mitigation strategies for waterways, Fridley needs to understand the condition of its waterways.

   Action Step: Accumulate the water quality data from multiple reporting agencies to establish current trends in water quality.

3. The NPDES Phase 2 (National Pollutant Discharge Elimination System) encourages and recognizes that rain gardens play a very important role in stormwater pollutant removal. They also recognize it as one of the BMP's (Best Management Practices) that is required by our municipal operations for pollution control.

   Action Step: The City should assess the effectiveness of rain gardens installed previously on Memory Lane and consider the construction of more rain gardens.

4. Rain gardens hold water during a rain event and filter the stormwater runoff throughout the next 24 hours. Rain gardens that do not filter properly become ponds and may lead to mosquito breeding grounds. The rain garden installed in Jay Park recently is not functioning as well as it should.

   Action Step: Reconstruct the Jay Park rain garden when time and funding permits.

5. Four of Fridley's water bodies are impaired. There are ecological benefits to restoring native flora on lake shores.

   Action Step: The City will continue to work with Anoka Conservation District and Rice Creek Watershed District to install more shoreland landscape restoration projects where most needed.

12.9 Summary

Much has been done in Fridley over the past ten years to protect surface water resources. A $700,000 wetland restoration project was completed at Springbrook Nature Center from 2002 to 2005. This project led to development of a wetland management plan for the Springbrook wetland complex that will help the wetland sustain the improvements completed. The Springbrook Watershed grant project also led to the development of many amendments to City Code, which have strengthened the City's ability to protect surface water resources. A Shoreland Ordinance was also approved and much public education has also been done.

In addition to efforts completed by the City, private business owners and homeowners have also completed low-impact stormwater management improvements such as under-pavement stormwater storage and rain gardens. While there is still much room for improvement, the City is on track to influence more positive changes in the years ahead.