
Executive Summary

The City of Richfield Surface Water Management Plan (SWMP or Plan) sets the course for the City's management of stormwater and water resources within the city. The SWMP provides data and other background information on resources, assesses city-wide and specific issues, sets goals and policies for the City and its resources, and lays out an implementation program to achieve the City's goals. The SWMP is organized into six major sections, summarized as follows:

Section 1 – Introduction

Section 1.0 of the SWMP summarizes the City of Richfield's location and history and describes the purpose of the SWMP. This surface water management plan (SWMP) replaces the *2008 City of Richfield Surface Water Management Plan (2008 SWMP)*. The SWMP will assist the City with policy decisions, water resource management, implementation priorities, regulatory program references, and capital improvement budgeting to address water resource issues.

The purpose of this SWMP includes those purposes given in Minnesota Statute 103B.201 for metropolitan water management programs, which include:

- Protect, preserve, and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge;
- Protect and maintain fish and wildlife habitat and water recreational facilities; and
- Secure the other benefits associated with proper management of surface and ground water.

This SWMP was developed consistent the requirements of Minnesota Statutes 103B.235, Minnesota Rules Chapter 8410, guidance from the Metropolitan Council, and the watershed management organizations (WMOs) with jurisdiction in the city. The SWMP was also developed with consideration of public input received through a water resource management survey.

Section 2 – Land and Water Resource Inventory

Section 2.0 of this Plan contains information on climate and precipitation, topography, watersheds and drainage patterns, land use, soils, geology and groundwater, surface waters, water quality, water quantity and flooding, stormwater infrastructure, natural, scenic, and recreational areas, and potential pollutant sources. This information describes the conditions in the city and affects decisions about infrastructure, development, and ecological preservation. Some of the most notable information in Section 3 includes:

Climate and precipitation: The climate of the Minneapolis-St. Paul area is a humid continental climate characterized by moderate precipitation, wide daily temperature variations, and large seasonal variations

in temperature, warm humid summers, and cold winters with moderate snowfall. Average weather imposes little strain on the typical drainage system, however extremes of precipitation and snowmelt are important for design of flood control systems. The National Oceanic and Atmospheric Administration (NOAA) published data on extreme precipitation events that can be used to aid in the design of flood control systems, now called Atlas 14. This data indicates increased precipitation depths for more extreme storm events relative to previously published values.

Topography, Watersheds, and Drainage Patterns: The City of Richfield is relatively flat, with generally mild slopes descending from a maximum elevation of approximately 900 feet in the northwest to a minimum elevation of approximately 810 feet in the southeast. Urbanization of the city over time has greatly altered the natural topography of the watershed. With these alterations, drainage patterns have become more defined. The City of Richfield is subdivided into three major watersheds, which fall under the respective jurisdictions of the following three watershed management organizations (WMOs):

- Minnehaha Creek Watershed District (MCWD)
- Nine Mile Creek Watershed District (NMCWD)
- Richfield-Bloomington Watershed Management Organization (RBWMO)

The City has subdivided its drainage area into 17 watersheds tributary to specific waterbodies (see Figure 2-2). These 17 watersheds are further divided for specific stormwater and surface water management and planning (e.g., water quality modeling).

Land Use: Almost all of the land in Richfield is now fully developed with just small parcels vacant for development in some areas. As a fully-developed community, changes in land use will come the result of redevelopment. Changes in land use are expected to be modest over the life of this Plan. However, redevelopment with or without land use changes may provide opportunities to implement a variety of stormwater best management practices (BMPs) that can improve water quality, reduce the risk of flooding, provide habitat, or achieve other benefits.

Soils: Soil composition, slope, and land management practices determine the impact of soils on water resource issues by affecting the rate and volume of stormwater runoff. Higher infiltration rates result in lower the potential for runoff from the land, while soils with low infiltration rates produce high runoff volumes and peak discharge rates. Because of urban development and land use, infiltration capacity of most of the soils in Richfield is not estimated. For proposed projects incorporating infiltration of stormwater runoff, soils should be evaluated for suitability on a site-by-site basis.

Geology and groundwater: Bedrock units under the City of Richfield include primarily Prairie du Chien dolomite with areas of St. Peter sandstone located in the north central and northeast part of the city. The bedrock is overlain by a layer of glacial drift which varies between 150 and 250 feet thick throughout most of the city. The region is underlain by four major bedrock aquifers: (1) St. Peter Sandstone, (2) Prairie du Chien-Jordan, (3) Wonewoc Sandstone (formerly Iron-ton-Galesville Sandstones), and (4) Mt. Simon-Hinckley Sandstones. In addition, there are numerous aquifers in the glacial drift. The City of

Richfield draws its drinking water from the Prairie du Chien-Jordan, Wonewoc, and Mt. Simon-Hinckley aquifers.

Surface waters: The Minnesota Department of Natural Resources (MDNR) designates certain water resources as public waters to indicate those lakes, wetlands, and watercourses over which the MDNR has regulatory jurisdiction. There are several designated and numbered public waters and wetlands within the city, including the following named lakes:

- Adams Hill Pond (27-1079P)
- Legion Lake (27-0024P)
- Milner Pond (27-0684W)
- Norby's Pond (27-0685W)
- Richfield Lake (27-0021P)
- Wood Lake (27-0026P)

In addition to MNDR public waters and public waters wetlands, the City manages several non-public water ponds as part of its stormwater infrastructure, including:

- Augsburg Pond
- Christian Park Pond
- Sheridan Pond
- Wilson Pond
- Washington Park Depression (dry under normal hydrologic conditions)

Wetlands within the city are identified in the National Wetland Inventory (NWI) as well as past City and WMO assessments. The City manages many of these ponds and wetlands for stormwater management purposes. Management of ponds (including public waters) that are wetland areas may be subject to additional regulatory considerations.

Water Quality: The City recognizes the need for good water quality in its waterbodies and has taken steps to protect and improve these resources. These steps include adopting water quality management policies, collecting water quality monitoring data, reviewing projects for conformance with water quality performance standards, and implementing water quality improvement projects. The City of Richfield adopts by reference the water quality standards of the Minnesota Pollution Control Agency (MPCA) (Minnesota Rules 7050). No waterbodies within the city are listed in the MPCA's impaired waters 303(d) list; however, stormwater runoff from the city is tributary to several impaired waters.

Water Quantity and Flooding: The City of Richfield uses its project review and permitting program, ordinances, studies, and capital projects to manage the quantity of water and reduce the risk of flooding within the city. Many of the activities performed by the City to manage stormwater runoff are incorporated into the City's Municipal Separate Storm Sewer System (MS4) Stormwater Pollution Prevention Program. The City continuously measures water levels of several lakes and ponds within the

City. Adams Hill Pond and Augsburg Pond have lift stations (i.e., pumped outlets) to discharge from the ponds when water levels reach pre-determined levels.

City Stormwater System: The City of Richfield's stormwater management system is comprised of a series of lateral and trunk storm sewers, stormwater ponds, and natural water bodies including ponds, lakes, and wetlands. In addition to stormwater treatment ponds, the City's stormwater management system includes a number of structural BMPs that improve water quality and manage flood risk. The City maintains a database of stormwater management BMPs to document ownership and maintenance responsibilities and to track inspection and maintenance activities consistent with the requirements of its MS4 permit. The City's stormwater system is connected to those of the surrounding communities, resulting in intercommunity flows into and out of the city. The City uses its project review and permitting program to prevent or limit increases in intercommunity flows and cooperates with adjacent cities and WMOs to address intercommunity flow issues.

Natural Communities and Habitat: While much of the natural landscape of the city has been altered by development, the City does include a number of natural areas, waterbodies, and city and regional parks. Areas of interest include the Wood Lake Nature Center, Veterans Park, Richfield Lake, and others. Wood Lake is a high quality natural area including natural communities of cattail marsh and lowland hardwood forest surrounding the lake. The City's natural and open space areas provide habitat suitable to urban wildlife. Nearly all the water resources within the city are surrounded by public open spaces. The City manages its open spaces to promote recreation and public access to water resources.

Pollutant sources: The sources of potential pollution in the city are varied. The location of these potentially contaminated or hazardous waste sites should be considered as sites are redeveloped and BMPs are implemented. While there are point sources of pollution that are regulated under State permits, the vast majority of pollution reaching surface waters comes from non-point source – those which cannot be traced back to a single source or pipe. Instead, pollutants are carried from land to water in stormwater or snowmelt runoff, in seepage through the soil, and in atmospheric transport. These pollutants include nutrients, bacteria, sediment, chlorides, pesticides, solvents, and chemicals.

Section 3 – Assessment of Issues and Opportunities

This section of the Plan presents and discusses the issues and opportunities facing the City, organized by various topics. Issue identification was an important task in development of this Plan, and included review of Metropolitan Council and watershed management organization (WMO) planning documents, review of available studies and modeling, discussion with City staff, and results of a public water resources management survey. The issues discussed in Section 3.0 are organized into the following topic areas:

- **Water quality:** including stormwater runoff water quality, MPCA impaired waters, total maximum daily load studies, waterbody classification and water quality goals, water quality BMP maintenance, and other water quality issues.
- **Water quantity and flood risk reduction:** including floodplain management, hydrologic and hydraulic modeling, and discussion of select local flooding issues.

- **Wetland management:** including wetland and shoreland buffers, aquatic invasive species, and wetland classification and inventory
- **Groundwater management**
- **Erosion and sediment control**

Major opportunities for the City to consider in addressing these issues are summarized at the end of this section, and include cooperative efforts with WMOs, partnerships with adjacent cities, redevelopment opportunities, and coordination with other City programs.

Section 4 – Goals, Strategies, and Policies

This section of the plan describes the City's goals, strategies, and policies for water resource management. The goals, strategies, and policies included in this SWMP are designed to continue to improve the quality and effectiveness of water resource planning and management in the City. These goals, strategies and policies have been developed to complement county, regional, and state goals, policies and management activities. While allowing for orderly development and redevelopment and providing its constituents with necessary services and infrastructure, the City has established the following goals:

1. Maintain and enhance surface water quality to meet applicable standards and preserve ecological functions.
2. Minimize the risk of flooding and associated negative impacts to public health, infrastructure, and the environment.
3. Protect and preserve the quantity and quality of groundwater resources.
4. Minimize erosion of soil into surface water systems and other negative environmental impacts of stormwater runoff.
5. Protect and preserve fish and wildlife habitat and shoreland integrity.
6. Preserve the quantity and quality of wetlands.
7. Minimize public expenditures related to surface water management through effective planning, education, cooperation, and implementation.

The City has developed policies and actions to achieve the City's goals for managing stormwater and surface water resources. These policies and actions are organized into four strategies. These strategies will assist the City in targeting its main audiences for the purposes of storm water management as follows:

- Operations
- Regulation and Permitting
- Education, Training, and Outreach
- Cooperation with other governmental entities

These strategies and policies that fall under the above strategies are described in greater detail in Section 4.0 of this SWMP.

Section 5 – Implementation Program

This section describes the significant components of the City’s Surface Water Management Plan (SWMP) implementation program, including implementation of the City’s NPDES MS4 Permit, operation and maintenance of the City’s stormwater system, education and public involvement, funding, ordinance implementation and official controls, and implementation priorities. The implementation program is presented in Table 5-1 through Table 5-3, organized as follows:

- Table 5-1 Implementation Program – Capital Improvements
- Table 5-2 Implementation Program – Programs
- Table 5-3 Implementation Program – Studies

Section 5.0 also describes the roles of the MCWD, NMCWD, and RBWMO with respect to water resource management within the city and activities performed in cooperation with the City.

Section 6 – References

This section lists the documents and other references used in the preparation of the SWMP.