

**2021–2030**

# **Watershed Management Plan**

Formal 90-Day Review Plan

**Capitol Region Watershed District  
Saint Paul, MN**

September 8th, 2020



## ACKNOWLEDGEMENTS

In accordance with Minnesota Statutes, the draft Plan was submitted for formal review to the following. Additional reviewers are noted.

### District Cities

Falcon Heights  
Lauderdale  
Maplewood  
Roseville  
Saint Paul

### District Counties:

Ramsey County  
Ramsey County Parks and  
Recreation Department  
- Soil and Water  
Conservation Division

### Additional Reviewers:

District Citizens Advisory Committee  
Saint Paul Port Authority  
University of Minnesota

### Adjacent WMOs:

Ramsey Washington Metro Watershed District  
Lower Mississippi River Watershed  
Management Organization  
Mississippi Watershed Management  
Organization  
Minnehaha Creek Watershed District  
Rice Creek Watershed District

### State/Regional Agencies:

Metropolitan Council  
MN Board of Water and Soil Resources  
MN Department of Agriculture  
MN Department of Health  
MN Department of Natural Resources  
MN Pollution Control Agency  
MN Department of Transportation

**Consultant:** Barr Engineering

## CERTIFICATIONS

This Plan was created under the direct guidance of Capitol Region Watershed District's Board, Administrator and Planning, Projects and Grants Division Manager.

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**Date**

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**Mark Doneux**, Administrator

**Date**

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**Anna Eleria**, Planning, Projects and  
Grants Division Manager

**Date**



### CleanWater, Land and Legacy Amendment projects include:

- [Green Line Green Infrastructure Project](#)
- [Highland Ravine Stabilization Project](#)
- [Central High School Stormwater Improvement Project](#)
- Como Senior High School Stormwater Management Project
- [Upper Villa Stormwater Improvement Project](#)
- [Allianz Field/Snelling-Midway Rainwater Harvesting and Reuse Project](#)
- [Parkview Stormwater Improvement Project](#)
- Seminary Pond Improvement Project



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Watershed Issues & Goals cover page: Sara Rubinstein

Implementation Plan cover page: Sara Rubinstein

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## ABBREVIATIONS

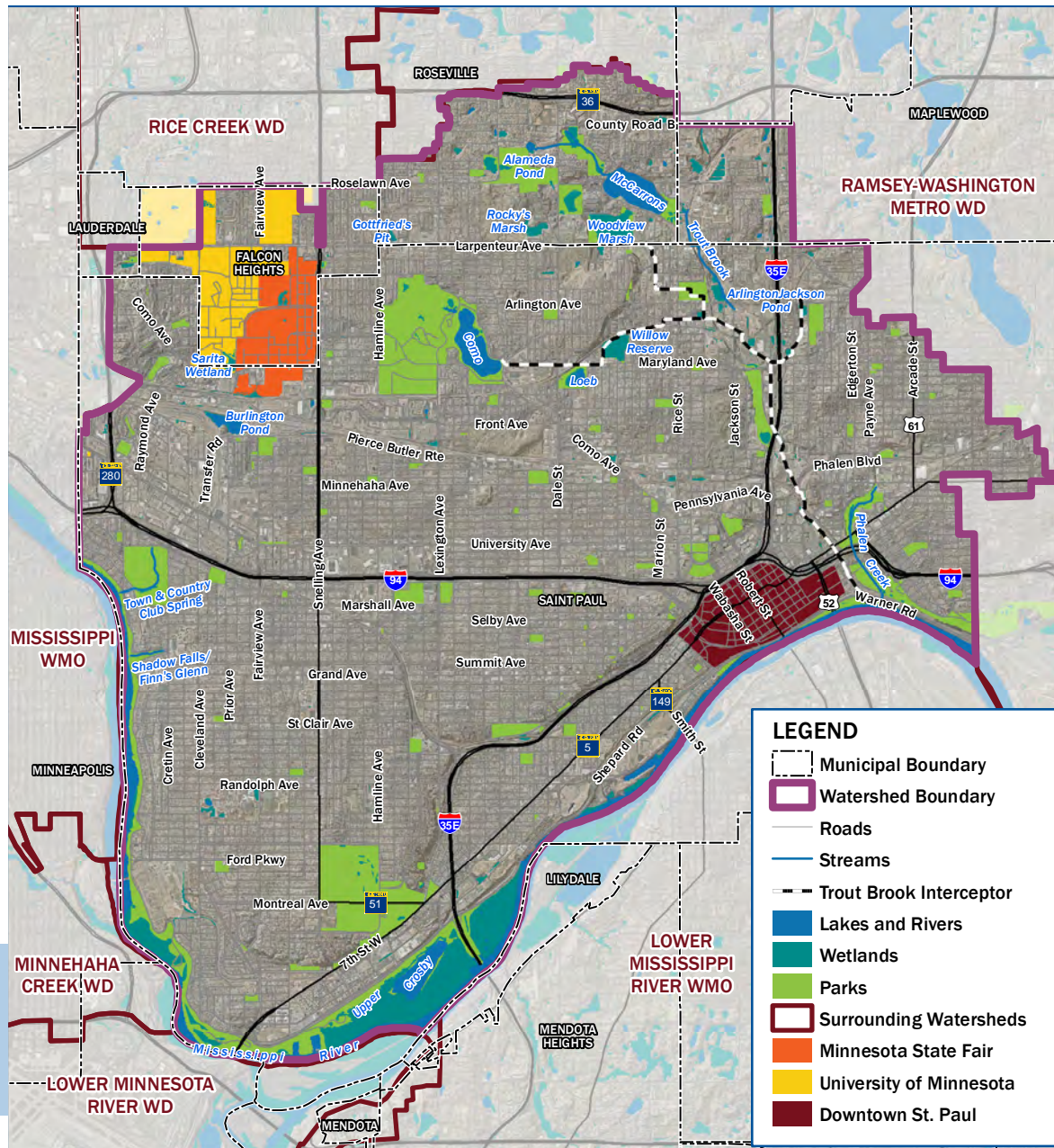
ACP	Areas of Concentrated Poverty	MDH	Minnesota Department of Health
ACP50	Areas of Racially Concentrated Poverty (ACP50 is defined by Metropolitan Council as areas where 40% or more of the residents have incomes below 185% of the federal poverty threshold and 50% or more are people of color)	MDNR	Minnesota Department of Natural Resources
		MNRRRA	Mississippi National River and Recreation Area
		MPCA	Minnesota Pollution Control Agency
		MS4	Municipal Separate Storm Sewer System
		MWMO	Mississippi Watershed Management Organization
AIS	Aquatic Invasive Species	NOAA	National Oceanic and Atmospheric Administration
BMP	Best Management Practices	NPDES	National Pollutant Discharge Elimination System
BWSR	Board of Water and Soil Resources	NRI	Natural Resource Inventory
CAC	Citizen Advisory Committee	PFAS	Perfluoroalkyl Substances
C&E	Communication and Engagement	PRAP	Performance Review and Assistance Program
CEZ	Creative Enterprise Zone	RCWD	Rice Creek Watershed District
CIP	Capital Improvement Project	RWMWD	Ramsey-Washington Metro Watershed District
CRWD	Capitol Region Watershed District (District)	SSGI	Shared, Stacked Green Infrastructure
CRWMO	Central Ramsey Watershed Management Organization	SWPPP	Stormwater Pollution Prevention Program
FEMA	Federal Emergency Management Agency	TAC	Technical Advisory Committee
IBI	Indices of Biological Integrity	TBI	Trout Brook Interceptor
IDDE	Illicit Discharge Detection and Elimination	TMDL	Total Maximum Daily Load
LGU	Local Government Unit	TP	Total Phosphorus
LID	Low-Impact Development	TSS	Total Suspended Solids
LWMP	Local Water Management Plan	WBIF	Watershed-Based Implementation Funding
LVMP	Lake Vegetation Management Plan	WMP	Water Management Plan





# EXECUTIVE SUMMARY





Capitol Region Watershed District (District) is a special purpose local government unit (LGU) that manages water resources within portions of Ramsey County per authorities given in [Minnesota Statutes 103B](#), [Minnesota Statutes 103D](#), and [Minnesota Rules 8410](#) (Figure ES-1). The District was established in 1998 by the Minnesota Board of Water and Soil Resources (BWSR) and is governed by a five-member Board of Managers. The District seeks to achieve its vision of:

**Cleaner waters through innovative, resilient, effective and equitable watershed management in collaboration with diverse partners.**

To achieve its vision, District staff implement a range of programs, projects, and capital improvements designed to protect, manage, and improve the resources within its jurisdiction, including creeks, wetlands, lakes, natural areas, and the Mississippi River.

The District has developed this Watershed Management Plan (Plan) to guide its actions in a coordinated, thoughtful, and effective manner over the period from 2021-2030. The District developed the plan in collaboration with stakeholders and partners who serve key roles in achieving District goals. This Plan carries forward many of the issues,

### Figure ES-1: Capitol Region Watershed District

The District covers 40.6 square miles of St. Paul, Falcon Heights, Lauderdale, Maplewood, and Roseville.



goals, and themes included in the [District's 2010 Plan](#). This document builds on a strong foundation of programs, projects, and partnerships to address the most immediate water resource management needs and increase the effectiveness of its efforts in the face of new and evolving challenges.

## Stakeholder Engagement and Plan Themes

The District crafted and implemented a comprehensive stakeholder engagement plan (CRWD, 2019) to involve residents, Technical Advisory Committee (TAC) members, Citizen Advisory Committee (CAC) members, the Board of Managers and staff in the identification, assessment, and prioritization of issues consistent with the process in [Minnesota Rules 8410.0045](#). Outreach activities included workshops with the Board of Managers, staff, TAC, and CAC, four “community conversations” events with District residents, face-to-face meetings with community organizations representing different cultural and ethnic groups, and in-person and online surveys. Results of the stakeholder engagement activities are detailed in [Appendix B](#) and were used by the Board of Managers to identify Plan priorities.

During Plan development, stakeholders identified

several recurring topics that affect a wide range of District operations, programs, and projects. These topics are included in this Plan as themes because it is anticipated that they will be considered in every aspect of District work over the next 10 years. They include:



**Bring water back**—The District's highly urbanized landscape and few waterbodies limit community connections to water. The District seeks to reconnect the community to its water resources, including the Mississippi River, through physical restoration of the resources as well as communication and engagement efforts to bring water back into the consciousness of the community.



Image credit: Adrian Danciu

**Rain as a resource**—Large areas of impervious surfaces (i.e., surfaces that water cannot pass through such as parking lots, roads, roofs and driveways) occupy the District's urban landscape and contribute to excessive stormwater runoff. By maximizing the natural water retention, storage, and infiltration capacity of the watershed, the District will keep precipitation on the landscape. This reduces stormwater runoff and the negative local and downstream impacts of flooding and poor water quality.



Image credit: Anita Jader

**Community equity and engaging underrepresented groups**—The District values diversity, equity, and inclusion and can achieve cleaner waters through engagement across communities. Historically, fewer structural and non-structural clean water projects have been implemented in some areas and communities within the watershed have been underserved. Engaging residents in the central and eastern portions of the District, people of color, immigrants, young adults, those who are poor, and youth will be a focus during the implementation of this plan.



Image credit: Caroline Yang

**Recreation**—Many residents identified recreation as one of the primary ways that the health and quality of water resources and natural areas affect them and their community. The District recognizes the important role of water resource management on recreation and supports partner efforts to improve water-based recreation access and opportunities.



**Quality of life**—Plan stakeholders noted the connection between the health of water and natural resources and the quality of life in the community. Healthy natural resources are often associated with cleaner neighborhoods, decreased urban heat island effects, and reduced flood risk. The District recognizes this connection and seeks to positively affect the quality of life of watershed residents beyond the measurable water quality and quantity benefits.



Image credit: Adrian Danciu

**Climate change and community resilience**—Changing climate patterns, including warmer winters and larger, more intense precipitation events pose significant water resource management challenges. Median estimates of the 100-year rain event expected in the mid 21st century have increased by more than 30% over current design values. Mitigating the impacts of climate change now and into the future is a high priority for the District, its partners, and stakeholders.



Image credit: Caroline Yang

**Partnerships**—The successful implementation of the [2010 Plan](#) was, in large part, due to the emphasis on partnerships. The District is well-positioned to convene stakeholders including cities, government agencies, institutions, neighborhood groups, residents, and others to address common goals. The District will continue to leverage such partnerships to more effectively and efficiently implement its programs and projects.



Image credit: Sara Rubinstein

**Innovation**—Technology and innovative water resource management methods have become mainstays in the District's work and are continually evolving. The District seeks to remain informed about advances in science, design, and engineering related to water resource management. The District will evaluate the practical application of such innovations in its operations, programs, and projects.



**Adaptive management**—Over the next 10 years, changing conditions may necessitate adjustments to the District's planned activities. The District recognizes this inevitability and will use an adaptive management approach to make decisions about District operations, programs, and projects.

Several of these themes are directly or indirectly reflected in the values and high level goals included in the District Strategic Plan (see [Section 1.2.1](#) and [Appendix C](#)). Throughout the execution of this Plan, the District will consider how each of the above themes is incorporated into District operations, programs, and projects.



## Land and Water Resources Inventory

[Appendix A](#) of the Plan summarizes the land and water resources located within the District. It contains information on location, topography and drainage, climate and precipitation, land use and demographics, soils, geology, groundwater resources, natural communities and rare species, fish and wildlife habitat, and potential pollutant sources. It also presents monitoring data, including stormwater monitoring results and water quality, aquatic vegetation, and fisheries data for key District resources including Como Lake, Lake McCarrons, Loeb Lake, Crosby Lake, and Little Crosby Lake.

Land and water resource information is important because it describes the condition of the watershed and how those conditions impact decisions about infrastructure, development, and resource management. This information helped to inform the watershed issues and goals.

## Watershed Issues and Goals

District staff reviewed stakeholder engagement results in the context of past District accomplishments (see [Section 1.1.2](#)), resource monitoring and assessment data, and current District programs. Staff interpretation, recommendations, and supporting information were presented at a Board workshop. Through discussion and consensus the Board of Managers identified priority issues to be addressed by the Plan and organized them into eight topics identified as either “resource issues” or “organization issues.” Issues presented in [Section 2](#) include an evolution of existing issues and new issues and reflect the unique challenges applicable to a diverse, highly urbanized watershed. Some notable issues include the following :

- The ability of the landscape to provide water quality benefits through infiltration, filtration, and other natural processes of stormwater runoff is minimized because of urban development within the watershed.

- Peak runoff rates and total runoff volumes are increasing due to current and projected future climate and precipitation trends.
- Some wetlands and other natural resources within the District have diminished in extent and quality due to development, hydrologic alterations, climate change, polluted stormwater runoff, and invasive species.
- Engagement in activities and actions that protect and improve water resources is not happening to the extent possible due to many factors including lack of community awareness, ability, interest and proximity to water.
- Water quality goals may not be achieved because current stormwater regulations do not adequately address all pollutants, emerging contaminants of concern, loading sources, and environmental pressures present in a highly urbanized watershed.
- Stormwater infrastructure that is reaching the end of its expected life will need to be replaced or rehabilitated at significant cost due to age and degradation.
- Areas and communities within the watershed have been underserved by District projects

The Plan establishes multiple goals to address the issues presented in [Section 2](#). Many of the District’s goals address multiple issues, reinforcing the interconnection of water, natural resource, and land-use management. District goals range in specificity; some are applicable District-wide, while others are specific to individual water resources. Where applicable, the District has established measurable goals that identify quantifiable changes in District lakes, streams, and stormwater discharges. For measurable goals, the District has identified indicators to assess progress towards goals (e.g., monitoring data). For goals that are not explicitly measurable, the District has identified outcomes that will indicate progress towards achieving the goal.

The Plan includes updated, measurable, resource goals for key District resources (e.g., Como Lake, Mississippi River). Some other notable Plan goals are presented or summarized by issue category in [Table ES-1](#).

**Table ES-1: Notable Plan Goals**

Resource Issues	<b>Built Environment</b>	Manage stormwater runoff from District owned, permitted and grant- funded projects with green infrastructure practices and other approaches that mimic natural hydrology by retaining a minimum volume equivalent of 1.1 inches over new, redeveloped, or existing impervious surfaces
		Explore private-public partnerships on redevelopment projects to implement shared, stacked green infrastructure (SSGI) projects with environmental, economic, and social benefits
	<b>Water Quality</b>	Manage District lakes to improve and sustain their ecological health and achieve the watershed and in-resource water quality goals identified in their lake management plans and defined in <a href="#">Section 2.3</a>
		Reduce sediment and pollutant loading to the Mississippi River as defined by its TMDLs and defined in <a href="#">Section 2.3</a>
		Quantify and reduce the amount of trash entering District lakes, wetlands, ponds, and the Mississippi River
		Establish a baseline and reduce chloride loading to Como Lake and make progress towards meeting the 2,233 pounds/day MS4 waste load allocation to Como Lake through actions identified in the <a href="#">Twin Cities Metro Area Chloride Implementation Plan</a>
	<b>Water Quantity and Flood Risk</b>	Adapt to changing climate by evaluating flood risk and designing all new applicable District projects under present and anticipated climate and precipitation trends
		Ensure that the Trout Brook storm sewer system, a District-owned and operated storm sewer system, adequately and safely conveys stormwater flows by inspecting at least once every five years and monitoring stormwater quality and quantity annually
	<b>Ecosystem Health</b>	Improve ecosystem health in the District's high priority subwatersheds of Trout Brook, Saint Anthony Hill, and Phalen Creek, by conducting at least one natural resource inventory and developing and implementing a management plan in each priority subwatershed
		Investigate and pursue opportunities to restore portions of historic streams in the Phalen Creek, Hidden Falls, and East Kittsondale subwatersheds, implementing two projects over 10 years
		Manage District lakes to achieve ecosystem health goals identified in their lake management plans and defined in <a href="#">Section 2.5</a>

**Table ES-1: Notable Plan Goals** (continued)

<b>Organization Issues</b>	<b>Communications and Engagement</b>	Increase the visibility of the District and its work to better engage a variety of stakeholders through a variety of actions defined in <a href="#">Section 2.6</a>
		Increase community understanding of, and connection to, natural resources, environmental issues, and public health through actions defined in <a href="#">Section 2.6</a>
		Enhance the District's public affairs and community relationships and increase community engagement through actions defined in <a href="#">Section 2.6</a>
	<b>Regulation</b>	Work with agency partners to evaluate and consider regulations for deicing practices
		Work with agency partners to evaluate and develop requirements for stormwater management on sites disturbing less than 1 acre of land
		Work with partners to improve coordination and processes on overlapping aspects of regulatory programs
	<b>Infrastructure Management</b>	Establish effective and efficient long-term management approach(es) for publicly owned stormwater management systems, including individual, shared, and/or regional systems
		Support our partners in the maintenance of stormwater infrastructure by developing and implementing a stormwater infrastructure maintenance service program
	<b>Organization</b>	Foster equitable implementation of all District programs and projects across the watershed by engaging traditionally underserved populations and expanding geographic reach into the Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds
		Maintain and enhance the capacity of the District to achieve water and natural resource management goals through the actions defined in <a href="#">Section 2.9</a>

## Implementation Plan

Individual District implementation activities are described in [Section 13](#). Estimated costs, year(s) of implementation, partners, priority level, and measurable outputs of each activity are presented in [Table 3-5](#). For assessment and reporting purposes, the District cross references all activities in the implementation plan to applicable District issues and goals ([Table 3-6](#)).

The District implementation plan includes the continuation of ongoing activities as well as new activities to address emerging issues and changing priorities. Notable activities in the District's implementation plan include:

- Further implementation of the District's diversity and inclusion program.
- Regulatory updates that consider a new land-disturbance threshold and target other pollutants.
- Continuation of robust stormwater, lake, wetland, and BMP performance monitoring programs.
- Grants focused on increasing participation from underrepresented community groups by expanding outreach and promotion of the Stewardship Grant Program in underserved areas.
- Expansion of the communications and engagement program to increase the visibility of the District and its resources, participation from diverse audiences, and the ease with which residents can communicate with the District.
- Development of a facility-management program for District-owned, shared ownership, and partner-owned facilities.
- Major planning efforts and projects
  - In-lake management activities for Como Lake and Lake McCarrons, including lake vegetation and aquatic invasive species (AIS) management, balanced fishery target development, and alum treatment
  - Updated lake management plans for Loeb Lake and Crosby Lake
  - Development and implementation of District-wide chloride source assessment and prevention plan
  - Development and implementation of trash management plan for areas adjacent to water resources
  - Subwatershed stormwater and natural resource planning and implementation in the District's high-priority subwatersheds, Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds.
- Capital improvements throughout the watershed, including many performed in coordination with large-scale redevelopment opportunities
  - Major repairs to the Trout Brook Interceptor
  - Improvements to Seminary Pond and nearby ravines to improve water quality and flood control of an existing regional stormwater system in Lauderdale.
  - Implementation of a central water feature and District stormwater system at the Ford Redevelopment Site
  - Restoration of Hidden Falls Creek utilizing captured and treated stormwater runoff from the Ford Redevelopment Site.
  - Support of the City of Saint Paul in the implementation of the Great River Passage Master Plan, including planning, construction, and outreach for the River Balcony and River Learning Center



The District plans to fund its administration, programs, projects, and capital improvements through the following four primary funding mechanisms:

- Property tax levy
- Local partner funding
- Bonds and loans
- Grants

The District also plans to explore new, alternative funding sources or mechanisms, such as environmental impact bonds, to broaden and diversify existing funding sources. The estimated cost of implementation is \$109M (assuming 3% annual inflation), or \$10.9M per year.

The District conducts sound and prudent fiscal management during its annual budgeting and working planning (see Section 3.6), which is based on the District's needs, priorities, and external economic factors. The District evaluates its annual tax levy and property tax impacts as a measure of fiscal responsibility. The District will continue to be sensitive to the economic climate of its partners, businesses, and residents as it sets the annual tax levy.

The District is responsible for evaluating progress towards achieving its goals and reporting annually to BWSR. Biennially, the District will perform a more detailed evaluation to assess the level of progress achieved on each of its stated goals (see [Section 2](#)). The format of this evaluation is based on the organization of District goals and cross-referenced to the most applicable implementation activities and associated measurable outputs. The assessment of District progress may include quantitative values and qualitative evaluation of progress towards each goal. This information will be used in annual work planning and determining future revisions and amendments to the Plan.



**Public Art Saint Paul, a partner Grant recipient, leads art-making at Western Sculpture Park.** Image credit: Caroline Yang



# INTRODUCTION





## SECTION 1: INTRODUCTION

The Capitol Region Watershed District (District) 2021-2030 Watershed Management Plan (Plan) establishes the priorities and framework for managing the water resources within the District over the next 10 years. This plan is the third-generation Plan for the District.

### 1.1. District Organization

Capitol Region Watershed District is a special purpose local government unit (LGU) that manages water resources within portions of Ramsey County per authorities given in [Minnesota Statutes 103B](#), [Minnesota Statutes 103D](#), and [Minnesota Rules 8410](#). The Metropolitan Surface Water Management Act (Minnesota Statutes 103B.201–103B.255) states the purposes of watershed management organizations such as the District are to:

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



**CRWD's new office in the Hamline-Midway neighborhood.**  
Image credit: Steve Silverman

Consistent with [Minnesota Rules 8410](#), the District must adopt a Watershed Management Plan (this document). The purpose of the Plan is to guide how the District will manage activities in the watershed between 2021 and 2030. The Plan details how the District meets requirements given in [Minnesota Statutes 103B](#) and [103D](#) and presents the District's priority issues, goals, and activities to be carried out during the life of this Plan.

The organizational structure of the District is presented in [Figure 1-1](#) and includes the Board of Managers, advisory committees and staff. The District is led by a five-person Board of Managers that guides implementation of the activities set forth in this Plan. Board Managers are appointed by the Ramsey County Board of Commissioners and serve a 3-year term.

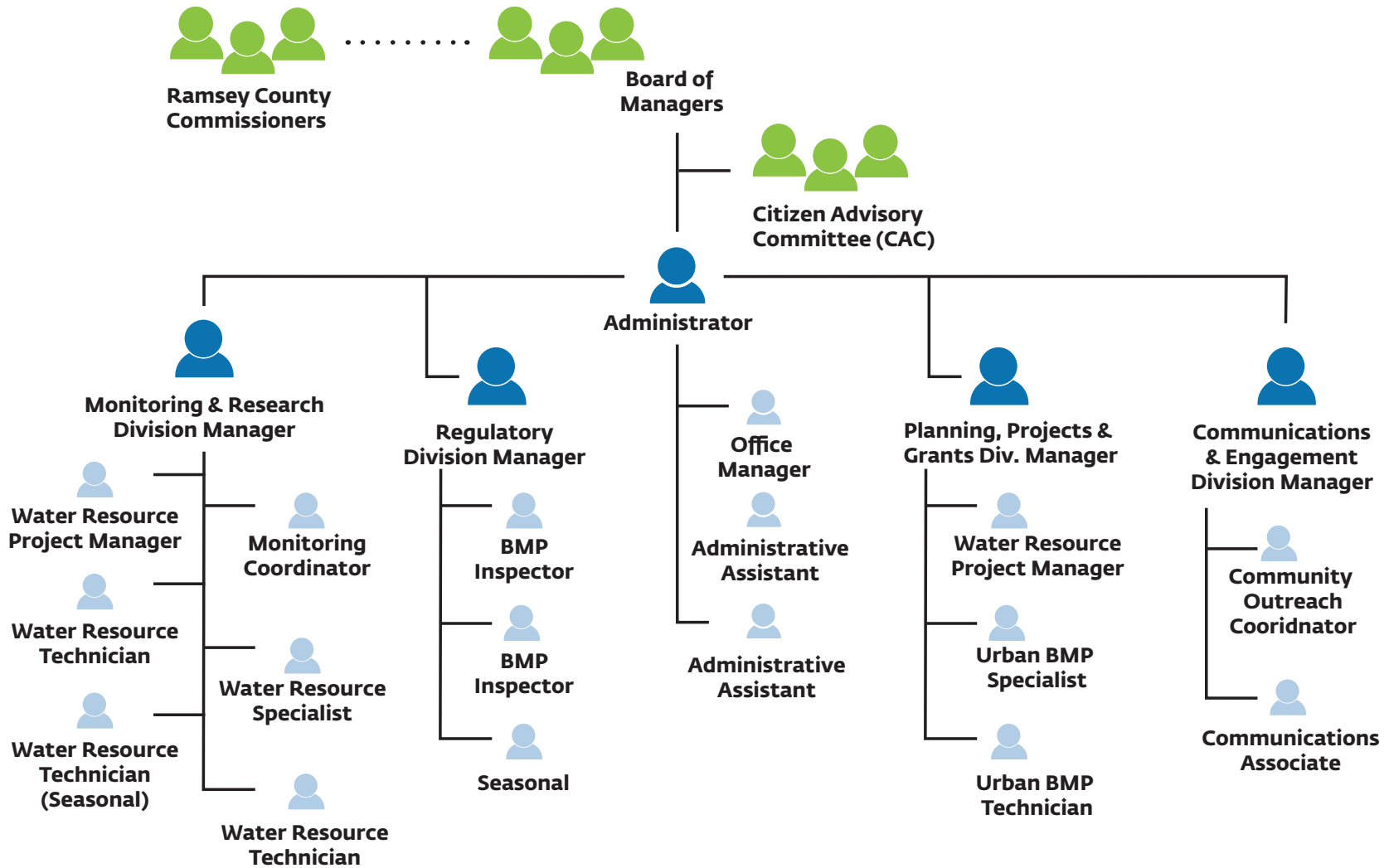
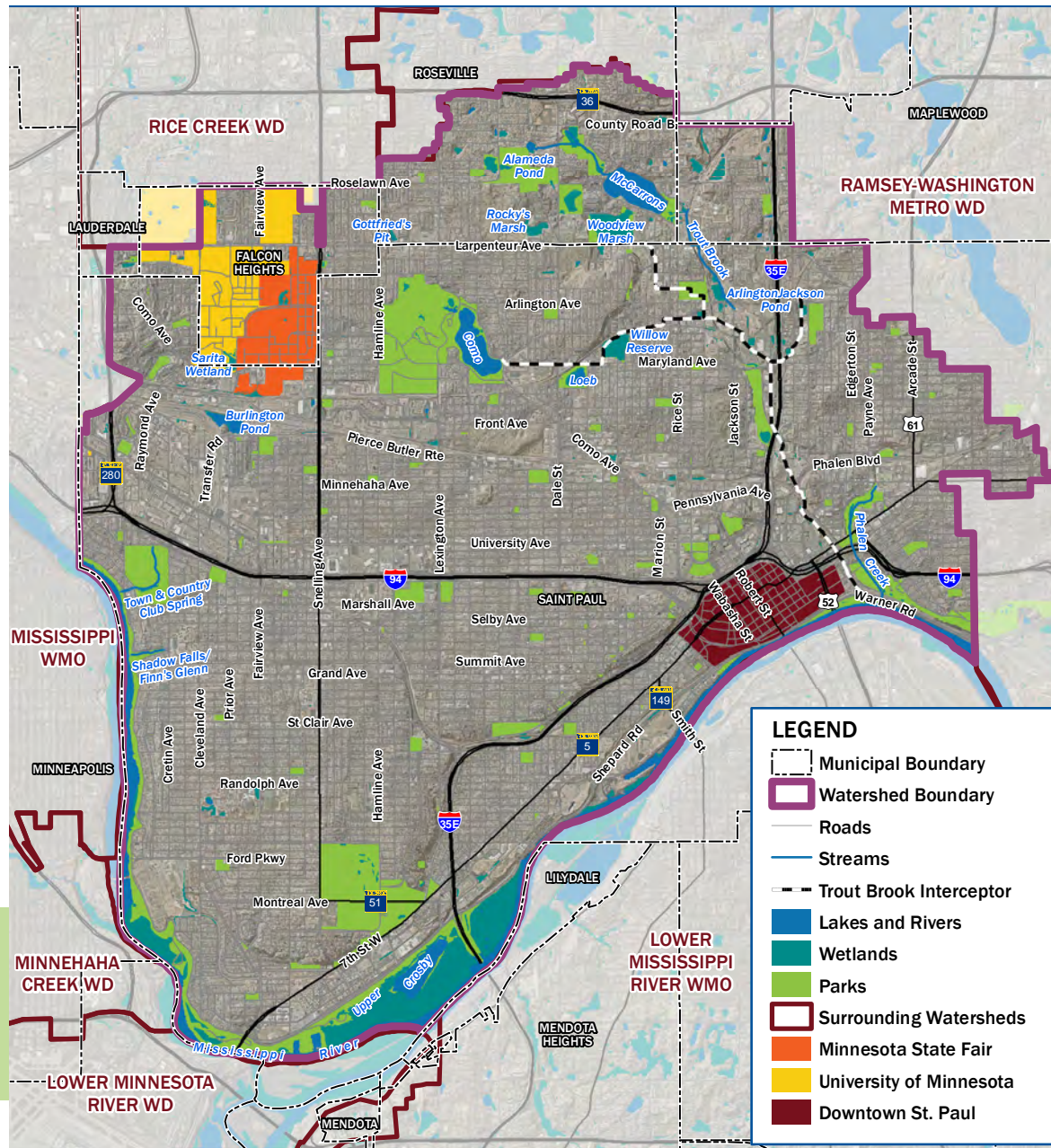


Figure 1-1: District Organizational Chart





### 1.1.1 District Location

The District is located in the southwestern portion of Ramsey County and consists almost entirely of developed urban landscape. The District covers 40.6 square miles and includes portions of the Cities of Falcon Heights, Lauderdale, Maplewood, Roseville, and Saint Paul (see [Figure 1-2](#) and [Figure 1-3](#)) that drain to a 12.7-mile stretch of the Mississippi River. Also located within the District are the State Fairgrounds and the Saint Paul Campus of the University of Minnesota (within the City of Falcon Heights). The District is bounded by the Mississippi Watershed Management Organization (MWMO) to the west, Rice Creek Watershed District (RCWD) to the north, and the Ramsey-Washington Metro Watershed District (RWMWD) to the north and east.

The District is located near the confluence of the Mississippi and Minnesota Rivers. This cultural and historically significant area is known as Bdote by the Dakota people. It is a place where the rivers and people have come together for at least 10,000 years. This area also serves many industrial, recreational, and ecological functions. The Mississippi River Valley has been a focal point

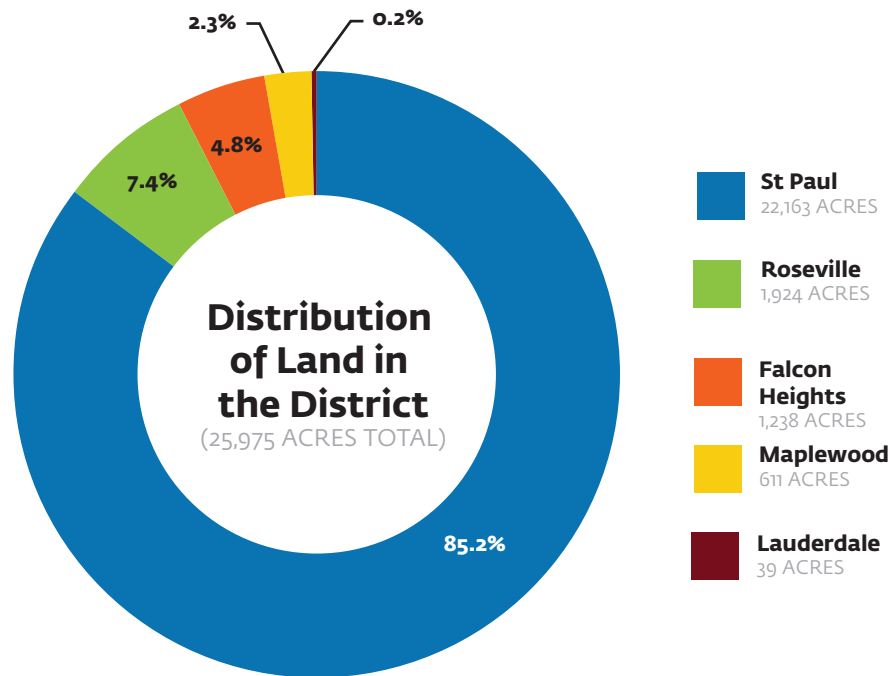
### Figure 1-2: Capitol Region Watershed District

The District covers 40.6 square miles of St. Paul, Falcon Heights, Lauderdale, Maplewood, and Roseville.



for settlement since the time of the earliest inhabitants of the area, including the Dakota people. European settlement of the area began in the mid 1800's and accelerated towards the end of the century. Population growth continued through the 20th century, as the region became home to people from diverse global origins.

Continued development of the watershed has resulted in significant changes to the natural landscape and hydrology of the District (historical water resources are described in [Appendix A](#)). Due to the District's highly urbanized nature and impervious land cover, water resources and natural areas are greatly impacted by stormwater runoff.



**Figure 1-3: Distribution of land in the district**

The majority of the 40.6 square mile area that makes up the CRWD is located in St. Paul

### 1.1.2 District History

The District began with a small group of dedicated residents who sought to improve Como Lake. In the summer of 1995, the District 10 Como Community Council invited neighbors to meet to explore what could be done about Como Lake's water quality and lakeshore. This led to the formation of an Environment Committee that met monthly, learning about water quality, collecting resources, and inviting speakers who could help them determine their next steps to improve the lake.

At that time, the area's watershed was overseen by the Central Ramsey Watershed Management Organization (CRWMO), a joint-power water management organization group that included the cities of Saint Paul, Maplewood, and others. In 1996, members of the District 10 Environment Committee began attending the meetings of the CRWMO, seeking action to improve water quality in Como Lake. Frustrated with the lack of progress by the CRWMO, the District 10 Environment Committee began to search for other ways to improve the local water resources.

As the committee explored its options, members kept coming back to the idea of a new watershed district. A watershed district provides a particularly valuable tool—taxing authority. The District 10 Environment Committee's effort to form a watershed district received support from District 10 Como Community Council, the State Board of Water and Soil Resources (BWSR), and the Metropolitan Council. Support also came from the Ramsey County Board of Commissioners, the former Ramsey Soil and Water Conservation District, now known as Soil and Water Conservation Division of Ramsey County Parks & Recreation Department, and the Minnesota Department of Natural Resources. Most importantly, the cities of Roseville, Falcon Heights, and Saint Paul supported it.

**On April 6, 1998**, there was a hearing to establish Capitol Region Watershed District. The new watershed district would cover 40.6 square miles and include portions of the cities of Falcon Heights, Lauderdale, Maplewood, Roseville, and Saint Paul. The watershed district was established with the mission to protect, manage, and improve the waters within its boundary. As a new and independent unit of government, it was given authority to levy taxes, establish rules, and conduct capital projects.

**On September 23, 1998**, BWSR approved the petition and ordered the establishment of Capitol Region Watershed District. The first Board of Managers was appointed by BWSR after consideration of 20 nominees, and consisted of Pat Byrne, Marylyn Deneen, Jim Leuthner, Jay Riggs, and Michael Thienes.

**For almost 3 years**, the District had no funds of its own and relied on RSWCD for financial as well as technical support. Despite limited resources, the Board turned to the important tasks of developing the foundational documents and structure for the organization. Among the first tasks for the Board was creating the first Watershed Management Plan. This Plan would become the basis for prioritizing projects and developing budgets. The Capitol Region Watershed District's first Watershed Management Plan was published on December 14, 2000.

**In 2003**, the Board of Managers initiated a new phase for the organization, hiring Mark Doneux as the District's first Administrator. Since that time, the Board of Managers has hired additional staff to support the District's expanding role and services.

**The District developed resource-specific management plans for Como Lake and Lake McCarrons in 2001 and 2003, respectively**, to address water quality concerns. In 2006, the District took over ownership of the Trout Brook Storm Sewer Interceptor (TBI) system from Metropolitan Council (see [Appendix A](#)) and adopted rules to regulate stormwater and other environmental impacts from new development and redevelopment activities that disturb an acre or more.

**In 2010**, the District adopted its second-generation Plan. [The 2010 Plan](#) continued to address water quality impacts from urban stormwater runoff with best management practices, while expanding the District's focus on monitoring, education and outreach, regulation, and managing TBI. The [2010 Plan](#) also laid out an ambitious 10-year project implementation plan. Highlights of major District and District-partner led projects completed since the 2010 Plan include:

- Four major structural repairs to the District's 6-mile long TBI system that have brought nearly 3 miles of pipe from poor condition to fair-to-good condition and ensured that the over 100 year-old system will safely convey runoff for years to come.
- Significant stormwater runoff treatment in the approximately 1,080 acre Lake McCarrons subwatershed. This included several major capital projects:
  - Roseville's Upper Villa Park stormwater reuse and infiltration system that captures and reuses or infiltrates 18.7 million gallons (2.5 million cubic feet) of runoff annually
  - The Parkview Center School underground system that filters 12.5 million gallons (1.7 million cubic feet) of runoff annually
  - The removal of over 17,000 cubic yards of sediment from the Villa Park wetland system, which is directly connected to the lake
- Creation of a new 3,000-foot stream to mimic the historic Trout Brook and provide treatment of neighborhood runoff in a series of ponds and wetlands in Saint Paul's 40-acre Trout Brook Nature Sanctuary.
- Installation of a 5-mile-long integrated tree trench system and nine boulevard rain gardens and stormwater planters along the Green Line Light Rail Transit system in Saint Paul that resulted in the planting of 1,000 trees and reduction of stormwater runoff from this corridor by more than 50%.

- Rainwater reuse at two Saint Paul sports facilities: CHS Field, home to the Saint Paul Saints baseball team, and Allianz Field, home to Minnesota United FC soccer team. Combined, these two systems are estimated to conserve over 2 million gallons (270,000 cubic feet) of water annually.
- Transformation of a concrete plaza at Minnesota's oldest high school, Central High School in Saint Paul, to a greener gathering space with tree trenches, permeable pavers, rain gardens, and an underground infiltration system. Over 1.4 million gallons (190,000 cubic feet) of stormwater runoff is treated each year at the high school.
- Nearly 500 boulevard rain gardens scattered throughout the District, planted as part of street reconstruction projects that capture and treat stormwater runoff and offer plant diversity, pollinator habitat, and beauty in residential neighborhoods.
- Implementation of the District's Watershed Rules through its Permitting Program that regulates stormwater management and erosion and sediment control on sites that disturb an acre or more of land. In 2019, 29 new permit applications were processed that involved 44 acres of impervious area. Runoff leaving those surfaces is accounted for and treated by stormwater BMPs that meet the standards specified in CRWD's Watershed Rules, resulting in 25 acre-ft of treated volume from 2015–2019.
- A New District office in Saint Paul's Hamline-Midway neighborhood showcasing sustainable water management practices including rainwater harvesting and reuse, tree trenches, rain gardens and permeable pavement. In addition, the site provides a neighborhood pocket park with a water feature, native plantings and an interactive educational exhibit.
- Implementation of the District's Communication and Engagement Program to reduce nonpoint source pollution and to increase clean water knowledge, participation and action among District residents and partners. In 2019, staff, partners and volunteers collaborated with nearly 11,000 residents as part of over 70 public events, trainings, presentations, resource

assistance, school visits, field trips and tours within the District.

- Creation of a Watershed Artist-in-Residence program that serves as a conduit to explore a variety of ways the arts can play a vital role in engaging audiences and be integrated into the work of the District. The program led to the development of a Watershed Art Plan and commissioning of water-related artworks for several major capital improvement projects (CIPs) including the Green Line, CHS Field, and the District's new office.

District performance and accomplishments, including progress made in relation to the [District's 2010 Plan](#), were evaluated through a mid-cycle Plan review (CRWD, 2015) and a Level II Performance Review and Assistance Program (PRAP) (BWSR, 2018). The mid-cycle Plan review identified focus areas for future action and has been considered in the identification of issues and implementation activities included in this Plan. The Level II PRAP recommendations included: (1) continue and expand the use of "prioritized," "targeted," and "measurable" as criteria for goals in the next Plan, as appropriate, and (2) structure website information to report progress and trends made in achieving resource goals.

The District's history through 2018 is more fully documented in Protecting, Managing, and Improving the Waters—History of the CRWD, 1998–2018 (CRWD, 2019). A full list and descriptions of District accomplishments since the 2010 Plan can also be found in District annual reports available from the District website at: <https://www.capitolregionwd.org/>

## 1.2. Focus for the Next 10 Years

Through past Plan development and execution, the District established a strong foundation of programs, projects, and partnerships to address the most immediate water resource management needs. With this Plan, the District seeks to increase the effectiveness of its efforts in the face of new and evolving challenges to resource management and increasing demands for District services from its partners and the community.

### 1.2.1 District Mission, Vision, and Values

The ongoing actions of the District, including the development and execution of this Plan, are intended to most effectively support the District's mission:

**To protect, manage and improve the water resources of Capitol Region Watershed District.**

In late 2018, the District began a strategic planning process to understand the District's situation as an organization and define its vision, values, and high-level organizational goals (CRWD, 2019). This process reaffirmed the District's mission and defined the District's vision as:

**Cleaner waters through innovative, resilient, effective, efficient and watershed management in collaboration with diverse partners.**

Paramount to the District's achievement of its mission and vision are the adoption of the following organizational values identified in its Strategic Plan:

- **Integrity:** The District will carry out its mission with transparency, accountability, and fiscal responsibility.
- **Diversity:** The District will promote equity, inclusion, and openness to engage all communities.
- **Collaboration:** The District will strengthen its impact through strategic partnerships and community engagement.
- **Innovation:** The District seeks to lead through bold actions supported by science.

These values are interwoven throughout the District's work and are the lens through which success shall be evaluated. The Strategic Plan also identifies high-level organizational goals for the desired future



**A macroinvertebrate and dragonfly monitoring event at Trout Brook Nature Sanctuary.** Image credit: Caroline Yang

state of the District, its communities, and its water resources. These serve as the basis for watershed management goals.

The development of the District Strategic Plan included its own intensive stakeholder input and data collection effort. The input and outcomes documented in the Strategic Plan have been considered in the creation of this Plan. This Plan applies the guiding concepts from the Strategic Plan to define measurable resource and organizational goals and implementation activities to address priority issues in the watershed.



### 1.2.2 Plan Development Process and Stakeholder Input

The District began developing this Plan in early 2019 by aggregating data from existing plans and studies and soliciting input from stakeholders. This process included the review of the following recent or concurrently developed District and partner planning documents including, but not limited to:

- The District Strategic Plan (2019)
- [The District Diversity and Inclusion Plan \(2020\)](#)
- [The Como Lake Management Plan \(2019\)](#)
- The District Communications and Engagement Plan (2020)
- [The Lake McCarrons Management Plan \(2020\)](#)
- The Trout Brook Storm Sewer Interceptor Capital Improvement Plan (2020)
- The District cities' 2040 Plans and Local Surface Water Management Plans (2019)



**CRWD hosts community conversations for the Plan.**

The District crafted and implemented a comprehensive stakeholder engagement plan (CRWD, 2019) to involve residents, technical advisory committee (TAC) members, citizen advisory committee (CAC) members, the Board of Managers, and staff in the identification, assessment, and prioritization of issues consistent with the process in [Minnesota Rules 8410.0045](#). Outreach activities included workshops with the Board of Managers, staff, TAC, and CAC; four “community conversations” events with District residents; face-to-face meetings with community organizations representing different cultural and ethnic groups; and in-person and online surveys. Activities implemented to solicit initial stakeholder input are summarized in [Appendix B](#).

Through stakeholder engagement activities, District staff sought to answer the following questions:

1. Which resources are important?
2. How does the health of those resources affect the stakeholders' quality of life?
3. What parts of the community or natural environment should be improved?

Supporting technical information appropriate to the audience was presented at stakeholder engagement events (for example, the TAC workshop included small group discussion of water quality impairments, local flooding issues, and other technical topics). Results of the stakeholder engagement activities are detailed in a technical memo and summarized in a 2 page handout ([Appendix B](#)). District staff reviewed the input received from stakeholder engagement activities in the context of past District accomplishments (see [1.1.2](#)), resource monitoring and assessment data (see [Appendix A](#)), and current District programs. Staff interpretation, recommendations, and supporting information were presented at a Board workshop; Board discussion and consensus resulted in the prioritization of the issues presented in this Plan (see [Section 2.1](#)).

## 1.2.3 Plan Themes

### Bring Water Back



### Rain as a Resource



Image credit: Adrian Danciu

### Climate change & resilience



Image credit: Adrian Danciu

### Community equity & engaging underrepresented groups



Image credit: Anita Jader

### Recreation



Image credit: Caroline Yang

### Quality of life



### Partnerships



Image credit: Caroline Yang

### Innovation



Image credit: Sara Rubinstein

### Adaptive Management



Throughout Plan development, stakeholders identified and emphasized topics that impact multiple issue categories and affect a wide range of District operations, programs, and projects. These topics are included in this Plan as themes because it is anticipated that they will be considered and pervade every aspect of District work over the next 10 years. These include: Bring water back, Rain as a resource (a slogan that comes from our partner, City of Saint Paul), Community equity and engaging underrepresented groups, Recreation, Quality of life, Climate change and resilience, Partnerships, Innovation, and Adaptive management.

Several of the themes are directly or indirectly reflected in the values and high-level goals included in the District Strategic Plan (see [1.2.1](#)). Throughout the execution of this Plan, the District will consider how each of the above themes is incorporated into District operations, programs, and projects.

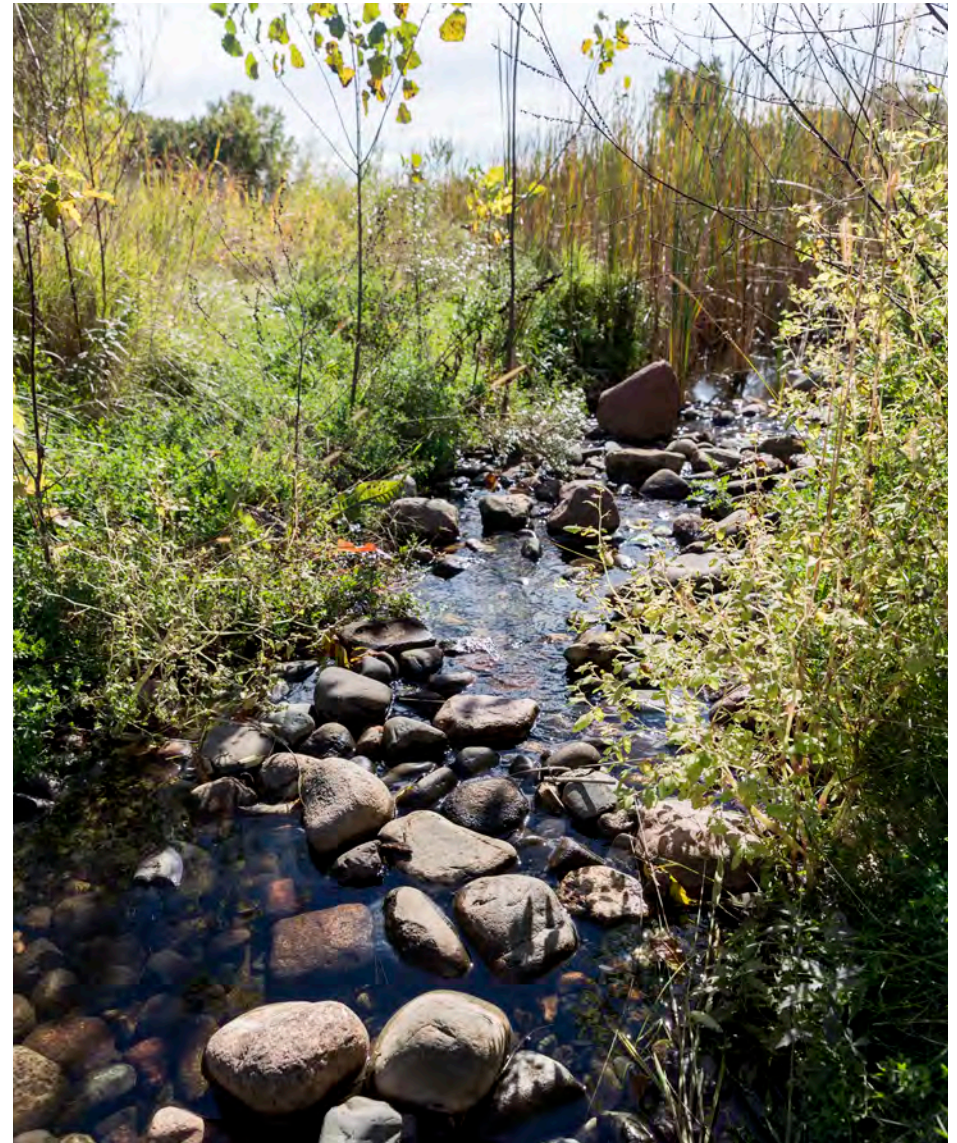


## Bring water back

The District occupies a highly urbanized landscape with few natural waterbodies. Over the course of urban development, wetlands have been drained and streams and drainage-ways have been buried in pipes. As a result, many residents have limited connections to the water and natural resources in the watershed. The District's stakeholder engagement process identified a link between exposure to water resources and community wellbeing (see [Appendix B](#)).

Dating back to the [2010 Plan](#), the District has sought to reconnect the community to its water resources, including the Mississippi River, through its “bring water back” campaign. This applies to both the physical restoration of water resources within the urban watershed as well as bringing water back into the consciousness of the community. The District recognizes that watershed residents and community groups serve important roles in water and natural resource stewardship, including pollution prevention, partnering with the District to implement BMPs, and effectively increasing District capacity to achieve its goals. Strengthening the community's understanding of and connection to the water resources in the District is key to promoting stewardship.

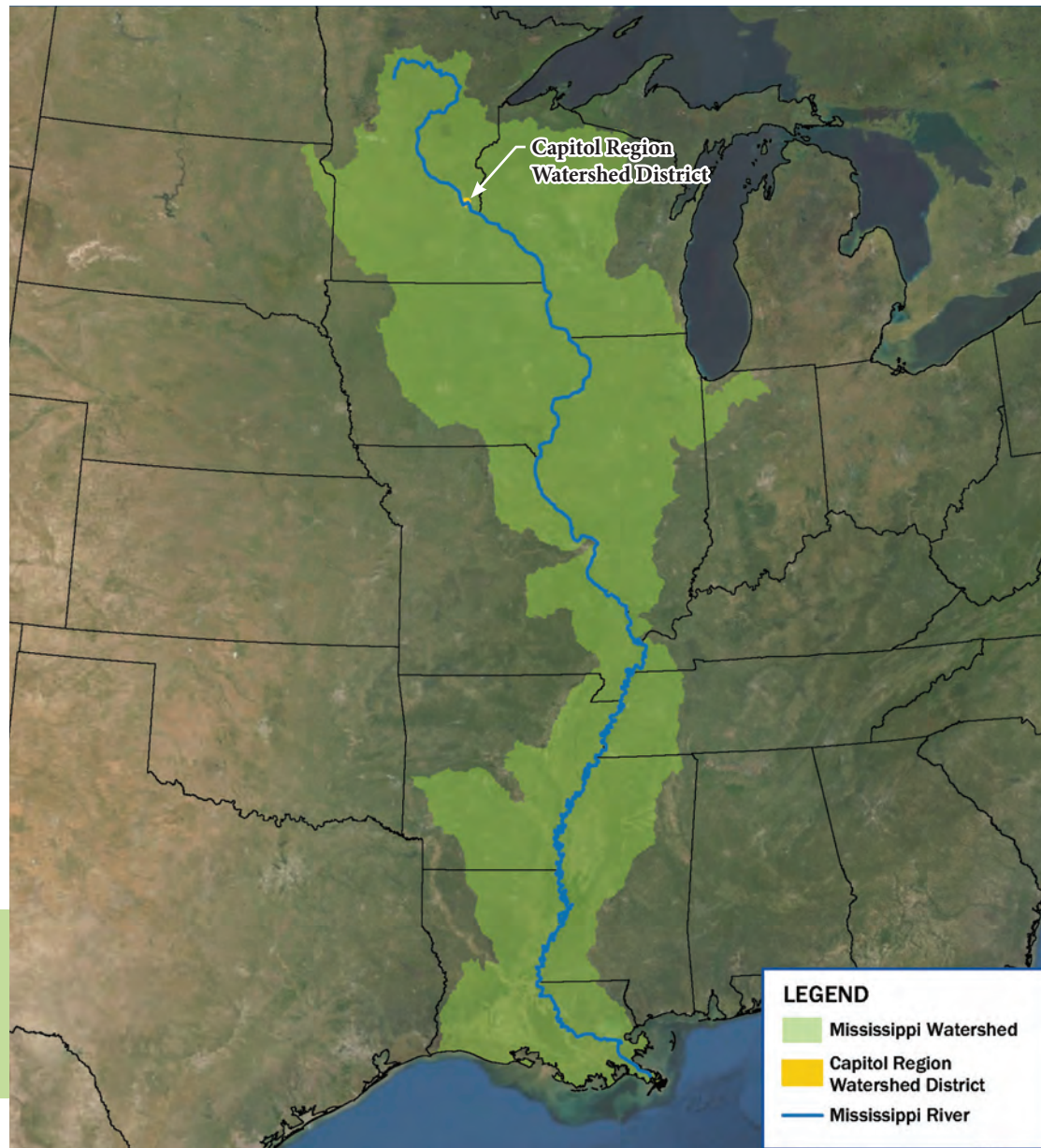
In addition to communication and engagement efforts, the District will work with its partners to promote the physical restoration of water resources through restoring of wetlands, daylighting of piped streams, and other opportunities. Restoration of specific resources were identified as priorities by residents and partners during stakeholder engagement. Several specific opportunities are identified in the District's Implementation and Capital Improvement Plan (see [Table 3-5](#)).



**Trout Brook Nature Sanctuary**



## Rain as a Resource



In a pre-developed condition, the natural landscape retains and infiltrates significant amounts of precipitation. In forested or rural areas, runoff can be as low as 10 percent of the water budget (FISRWG, 1998). Conversely, increased impervious surfaces and storm sewer networks can disrupt the natural water cycle and increase the volume and rate of water flowing directly to surface waters. The District is a highly urbanized environment with 50 percent impervious coverage. Much of the stormwater infrastructure in the District was constructed at a time when the primary goal of stormwater management was simply to convey water from developed areas as quickly and easily as possible. As a result, a high percentage of precipitation in the District reaches lakes and rivers as polluted stormwater runoff. District stormwater and precipitation monitoring data from 2010–2019 indicate that approximately 55 percent of precipitation becomes runoff in the area tributary to Trout Brook Interceptor, ultimately reaching the Mississippi River (see [Figure 1-5](#)).

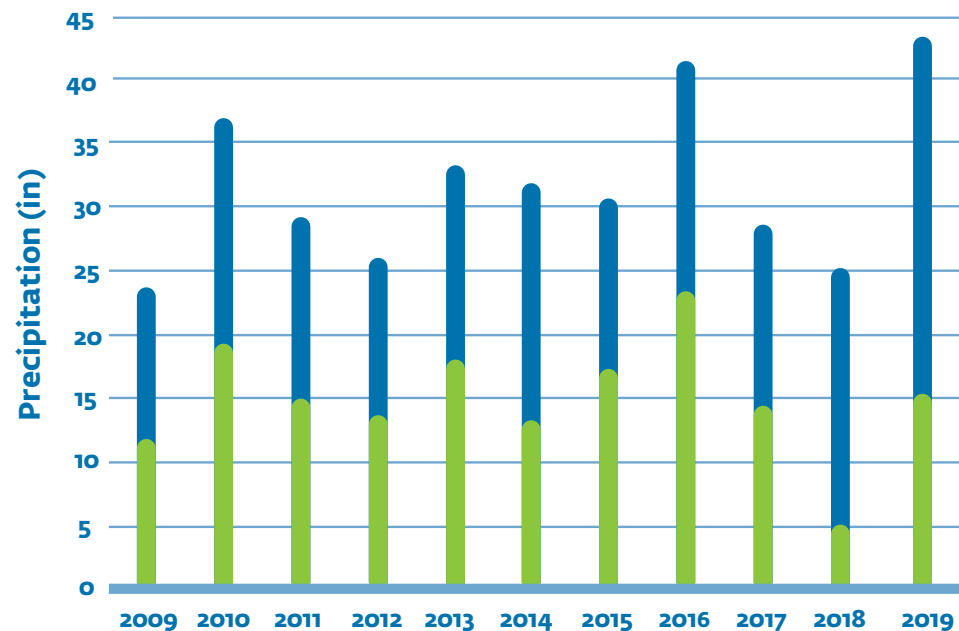
**Figure 1-4: District location within the Mississippi River watershed**

The rapid conveyance of stormwater from urban areas in underground pipe networks can overwhelm downstream stormwater infrastructure, causing localized flooding, increased flood risk to downstream communities, and impaired water quality locally and downstream. The regional impact of District stormwater runoff is magnified by its upstream location on the Mississippi River—located roughly 1,790 miles upstream from the Mississippi River delta in Louisiana. The total length of the river is approximately 2,350 miles. Excess local runoff from the District and other urban watersheds along the river has a cumulative effect on flood risk to cities in Iowa and further downstream.

The District seeks to offset the stormwater impacts of development by maximizing the natural water retention, storage, and infiltration capacity of the watershed. By keeping precipitation and stormwater runoff on the landscape, the District can minimize negative local and

downstream impacts that are a result of flooding and poor water quality. This theme is directly linked to the District Strategic Plan’s desired future condition of “stormwater managed to mimic natural hydrology.”

The District continues to mimic natural hydrology, in part, through rules that require stormwater volume retention of 1.1 inches of rainfall over the impervious surfaces of redevelopment projects 1 acre and larger. The District also provides grants and technical assistance to residents and partners to implement green infrastructure practices and other stormwater best management practices (e.g., rain gardens, permeable pavement, cisterns, and infiltration trenches). At the end of 2019, the District was directly involved in the implementation of over 1,700 clean water projects that treat nearly 300 million gallons (40 million cubic feet) of stormwater runoff annually.



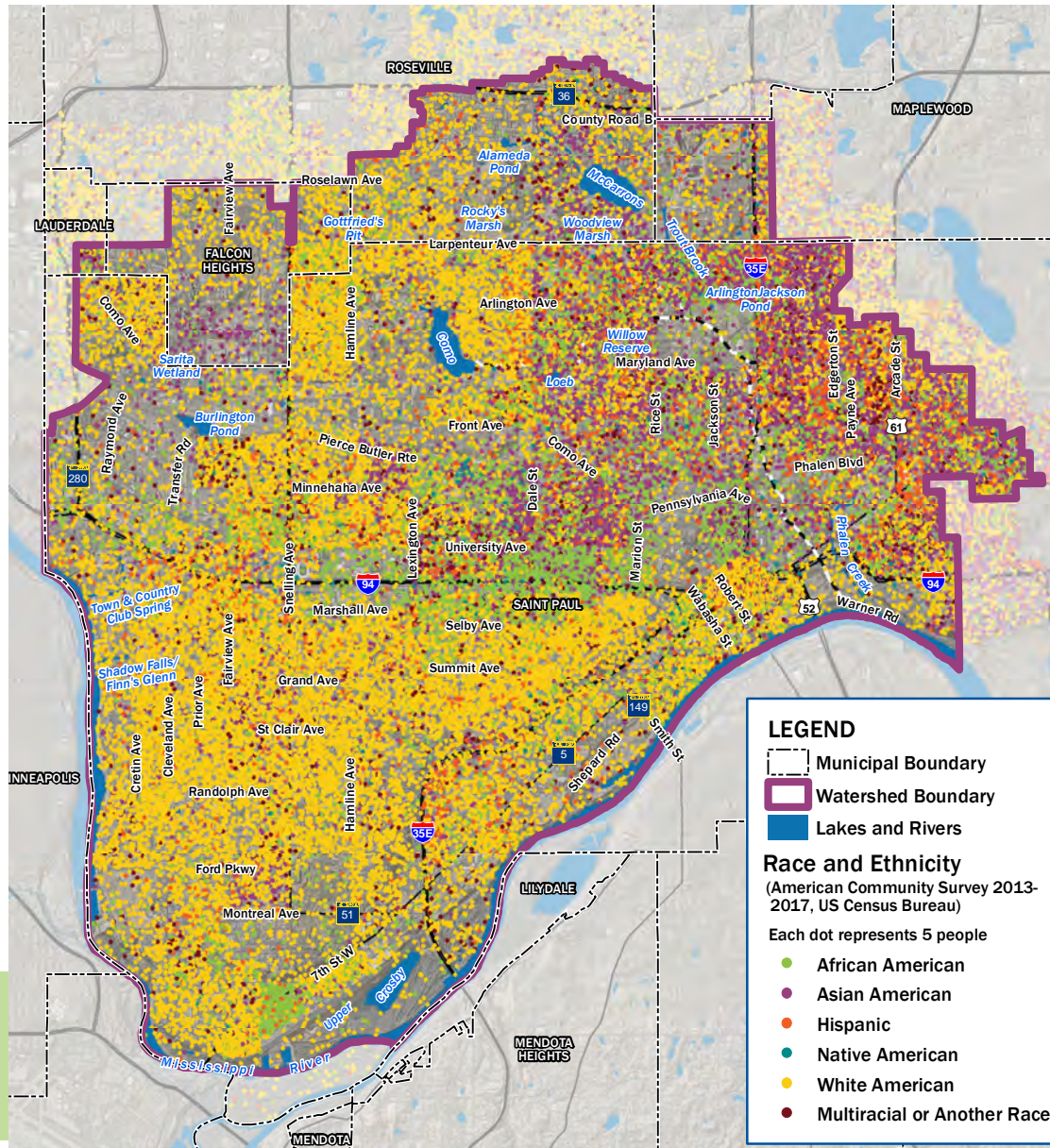
**Figure 1-5: Fate of Precipitation in the TBI**

Over 50% of precipitation falling within the watershed tributary to the TBI becomes stormwater runoff reaching the Mississippi River.

Runoff Retention



## Community equity and engaging underrepresented groups



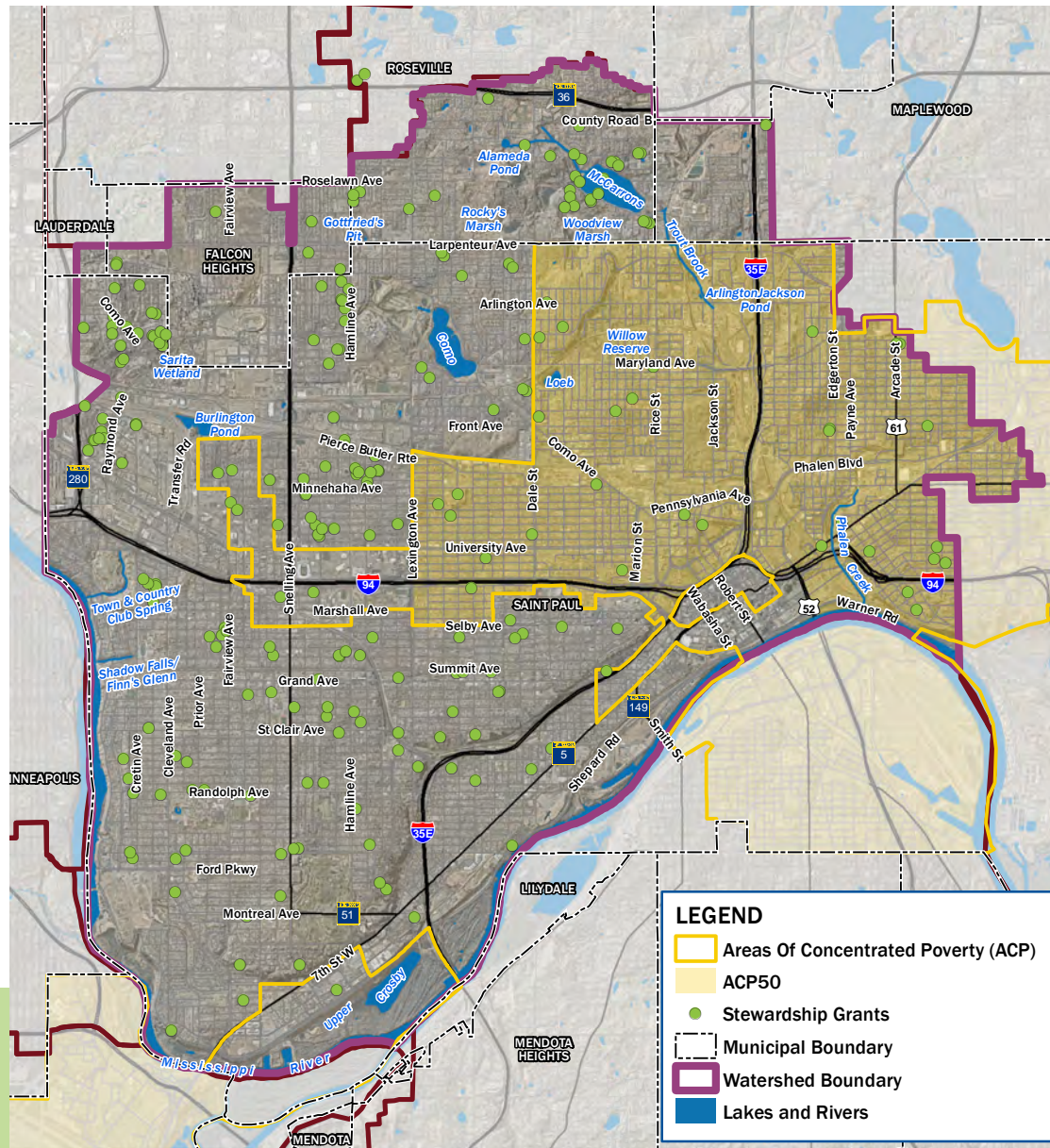
Watershed residents and community groups serve important roles in water and natural resource stewardship—effectively increasing the District’s capacity by preventing pollution and partnering with the District to implement BMPs. In 2019, staff, partners, and volunteers collaborated to provide resource assistance, 70 public events, trainings, presentations, school visits, field trips and tours to nearly 11,000 District residents.

The District values diversity and inclusion and can achieve cleaner waters through engagement across communities. Over time, the District’s population has grown to be more racially and ethnically diverse (Figure 1-6). Between 2000 and 2015, the percentage of people of color in Saint Paul increased from 36% to 46%. Across Ramsey County, this percentage increased from 13% in 2000 to 30% in 2014. These trends are expected to continue through 2040 (City of Saint Paul, 2019). In 2019, the District adopted a diversity and inclusion plan to increase organizational understanding of the communities it serves and expand its programs and services to historically underserved geographic areas and cultural/ethnic groups. One of the goals/priorities in the District’s Diversity Strategic Plan is to “deepen relationships with many communities in the District by increasing outreach.”

### Figure 1-6: Race and Ethnicity in the District

The racial and ethnic diversity in the District, illustrated by the various colors in the above figure, is anticipated to increase.





In 2018, the District analyzed hundreds of grant-funded projects and found far fewer residential/neighborhood-scale BMP projects constructed via our Stewardship Grant Program in the central and eastern portions of the District (Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds [Figure 1-7](#)). These subwatersheds also correspond to racially concentrated areas of poverty (ACP50) ([Figure 1-7](#) and [Appendix A](#)).

Income gaps can impact the community's ability to engage in water resources stewardship by limiting one's financial ability to implement practices, time available to become aware of and participate in stewardship practices or District programs, and property ownership that is often critical for siting BMPs. Engaging residents in the central and eastern portions of the District; Black, indigenous, and people of color (BIPOC); immigrants; young adults; and youth will be a focus of District operations, programs, and projects during the implementation of this Plan. The goal is to provide more projects and services in these central and eastern neighborhoods. In the end, District residents of all racial and ethnic backgrounds, ages, abilities, and incomes will be served.

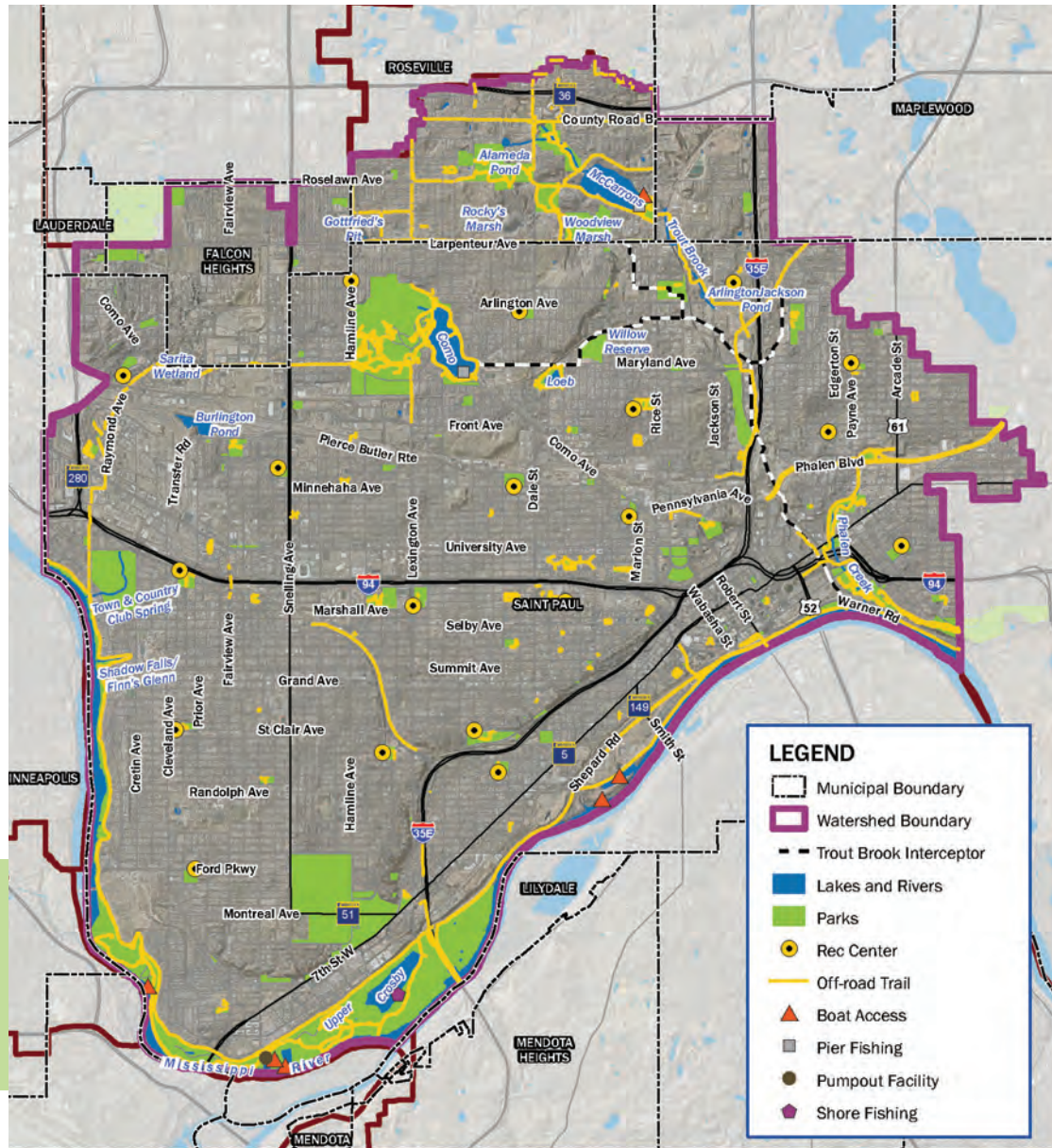
This theme is closely related to the District Strategic Plan's desired future condition of equity in the work of the District and value of diversity.

### Figure 1-7: Areas of Racially Concentrated Poverty (ACP50)

The District contains areas of concentrated poverty (red outline), including areas where 50% or more of the residents are people of color (yellow shading).



## Recreation



Despite the urban nature of the watershed, about 9% of the District is park, open space, or preserved land (Figure 1-8).

Regional and municipal parks located within the District preserve scenic views and allow access to the Mississippi River Valley and other water resources. These spaces provide opportunities for residents and visitors to appreciate and connect with the District's water and natural resources. Planned projects associated with Saint Paul's Great River Passage initiative will further connect District residents to the culture, history, and ecology of the Mississippi River.

Many residents identified recreation as one of the primary ways that the health and quality of water resources and natural areas affect them and their community. Recreational activities noted by stakeholders included fishing, swimming, boating, walking and biking on trails, and observing nature. Others noted a desire for improved access to water resources and natural areas for recreation. This theme is also reflected in the District Strategic Plan's desired future outcome of communities connected to water.

### Figure 1-8: Open Spaces and Recreational Areas

The District contains numerous city and county parks, community centers, trails, beaches, pier fishing, and boat access.



Popular public water access points within the District include the following:

- Boat access (Mississippi River and Lake McCarrons)
- Carry-in boat access (Como Lake)
- Fishing piers (Como Lake, Loeb Lake, Lake McCarrons)
- Onshore fishing access (Como Lake, Mississippi River)
- Swimming (Lake McCarrons)

In addition to water access, there is an extensive network of on- and off-road bike trails throughout the District including the Gateway Trail which extends from Saint Paul to Pine Point Regional Park just northwest of Stillwater. Also, the City of Saint Paul is revitalizing the historic Grand Round bike/walking trail system by creating new trail segments to link to improved existing segments.

The District recognizes the important role of water resource management in recreation. While the District generally does not pursue projects with goals that are primarily recreational, it supports partner efforts to improve water-based recreation access and opportunities as a way to connect District residents and visitors to water resources. District projects also directly benefit recreational opportunities (e.g., water quality improvements leading to healthy fisheries and swimmable lakes).

The District will consider impacts to recreation and opportunities for recreation in its operations, programs, and projects as it implements this Plan. Where opportunities are identified, the District will work with partners to promote recreational use of District resources.



**Paddle boarding and canoeing on Como Lake.**

Image credit: Caroline Yang

## Quality of life

The connection between the health of water and natural resources and quality of life in the community was often noted during stakeholder engagement. Some stakeholder comments linked healthy resources with specific activities such as community gatherings and outdoor recreation (see also [Recreation](#)). Also mentioned were benefits to physical and mental health and well-being stemming from healthy water and natural resources—noting the stress-reduction and relaxation benefits. Healthy natural resources are often associated with cleaner neighborhoods, decreased urban heat island effects, and reduced flood risk.

Quality of life and community well-being concepts are difficult to quantify, but their connection to healthy, accessible natural resources is clear (Keles, 2012). The District recognizes this connection and seeks to understand how its own activities, programs, and projects affect the quality of life of watershed residents—beyond the measurable water quality and quantity benefits.



**Residents enjoy shoreline restoration at Lake McCarrons.** Image credit: Sara Rubinstein



**Public Art Saint Paul, a partner grant recipient, art-making at Western Sculpture Park.** Image credit: Caroline Yang



## Climate change and community resiliency

Changing climate patterns, in particular precipitation, pose significant water resource management challenges. Changing climate trends in the Upper Midwest reported by the [National Oceanic and Atmospheric Administration \(NOAA\) in 2013](#) include:

- Warmer winters—decline in severity and frequency of severe cold periods and warming periods leading to mid-winter snowmelt.
- Changing precipitation patterns—the annual amount of precipitation is increasing as more rainfall is coming from heavy thunderstorm events and winters have increased snowfall.

Since that publication, precipitation amounts continue to increase. 2019 was the wettest year on record in Minnesota (1890–2019), with the Minneapolis-Saint Paul International Airport (MSP) station reporting 43.17 inches of precipitation. Since 2005, annual precipitation has exceeded the 1981–2010 climate normal average (30.61 inches) in the past 10 of 15 years, with an average deviation of +2.08 inches. Higher precipitation amounts, increased intensity, and more freeze-thaw cycles lead to increased stormwater runoff and may negatively impact water quality, flood risk, and ecosystem health. According to a study of long-term extreme weather trends (Moore et al., 2016) precipitation is predicted to increasingly exceed amounts historically used in floodplain assessments and infrastructure design.

Projects implemented by the District, cities, and developers have long design lives that must consider current as well as possible future climate scenarios. Median estimates of the 100 year rain event expected in the mid 21st century have increased by more than 30% over current design values, exceeding 10 inches in a 24 hour event. Understanding potential future conditions and designing resiliency into District and District-partner projects is necessary to achieve District goals into the future. The District's monitoring, research, and communications and engagement programs provide information and raise awareness about the impacts of a changing climate, while the District's permitting, grants, and capital-improvement projects



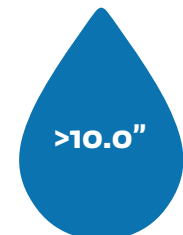
### 100-year rainfall depths (in 24 hours)



**Past\***  
1961



**Present\*\***  
2013



**Future\*\*\***  
2050

\* National Weather Service Technical Paper 40

\*\* NOAA Atlas 14 Volume 8

\*\*\* Stack et al, 2014

### Figure 1-9: 100-year Rainfall Depths are Increasing as our Climate Changes

Median estimates of the 100-year rain event expected in the mid 21<sup>st</sup> century have increased by more than 30% over current design values, exceeding 10 inches in a 24hour event.



mitigate the impact of climate change and build community resiliency through large- and small-scale BMPs.

Climate change and its associated challenges were cited by nearly all stakeholder groups during issue identification. Mitigating the impacts of climate change (on flooding, poor water quality, invasive species, and degradation of ecosystem health) now and into the future is a high priority for the District, its partners, and stakeholders. In response, the efforts cited in this Plan demonstrate increased consideration of climate change mitigation and adaptation in the design and execution of the District's operations,



**CRWD staff monitor water levels at Como Lake Golf Course pond.**

programs, and projects. This theme is directly linked to the District Strategic Plan's desired outcome of resilient watershed management strategies.

Partnerships will be an important part of climate change adaptation and community resiliency. The District is well-positioned to initiate conversations about climate change adaptation and community resiliency with its partners, to share information, support partners' efforts, and identify collaborative opportunities. Potential District climate change adaptation and community resiliency efforts span all eight issue categories identified in this Plan (see [Section 2](#)); examples include, but are not limited to:

- Demonstrating climate change adaptation through energy efficiency, water conservation, and green infrastructure at the District office/facilities and in District operations.
- Considering plants that are resilient to both flood and drought conditions in ecosystem restoration projects.
- Expanding flood modeling efforts that consider current and future precipitation patterns throughout the watershed.
- Implementing flood-mitigation projects that consider projected extreme rainfall events.
- Assessing the potential for large-scale reuse projects by identifying and assessing high-demand users.
- Monitoring changes in internal nutrient loading of Lake McCarrons and Como Lake as a result of increased temperatures.
- Providing cost-share opportunities that encourage native landscaping, pollinator habitat, and stormwater runoff reduction.
- Evaluating flood management strategies that consider (among other things) volume reduction, real-time monitoring, and adaptive control of outlet structures.

## Partnerships

The successful implementation of the [2010 Plan](#) was in large part due to the emphasis on partnerships. Partnerships were again prioritized among comments received from stakeholders during the development of this Plan. Similarly, collaboration is identified as a key value in the District Strategic Plan. The District will continue to seek opportunities to leverage partnerships to more effectively and efficiently implement its programs and projects.

The District recognizes that several entities have water and natural resource management responsibilities and authorities within the watershed. Working together allows sharing of knowledge and information about new technologies and innovative approaches. The District is well-positioned to convene stakeholders including cities, other government agencies, higher education institutions, neighborhood groups, and other large property owners to work together on shared or overlapping missions, goals, and responsibilities.

District partners provide opportunities and resources to coordinate with planned activities and implement programs and projects that would otherwise be infeasible. Examples include stormwater BMPs implemented in cooperation with city parks, street reconstruction efforts, and other infrastructure programs, as well as BMPs implemented in coordination with private developers.

The District also envisions an increased need for coordination and collaboration on the inspection, maintenance, and repair of shared, regional stormwater BMPs as well as those individually owned.

## Innovation

Technology and innovative water resource management methods have become mainstays in the District's work and are continually evolving (see list of major District accomplishments in [1.1.2](#)). The District seeks to remain informed about advances in science, design, and engineering related to water resource management. The District will evaluate the practical application of such innovations in its operations, programs, and projects. This includes the use of new information technology and communication methods, such as the use of weather forecasting, real-time monitoring, and adaptive controls to optimize BMP performance.

Innovation is identified as a key value in the District Strategic Plan. The District will seek opportunities to advance the field of water management through research and the application of innovative technologies and practices. The District will leverage the expertise of its partners (e.g., University of Minnesota) in the evaluation and application of innovative technologies.



**CHS Field cistern collects rainwater to irrigate the field.**

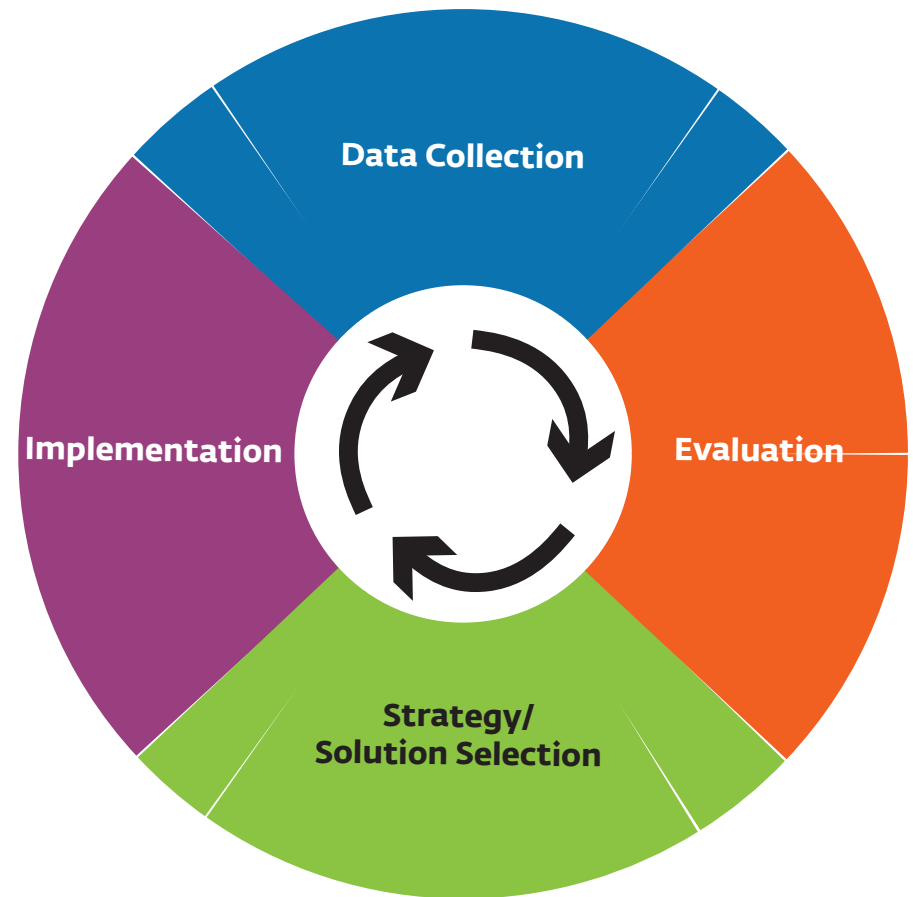
Image credit: Sara Rubinstein

## Adaptive Management

The District has developed this Plan with the best available data and careful forethought for the next 10 years. Still, it is anticipated that changing conditions may necessitate adjustments to the District's planned activities. The District recognizes this inevitability and will use an adaptive management approach to make decisions about District operations, programs, and projects.

Adaptive management is an ongoing, systematic approach for decision-making. It includes collecting data, evaluating information and possible outcomes, selecting a strategy or course of action, and implementing the action (Figure 1-10). The District monitors the outcome of its actions (i.e., data collection) and incorporates what is learned into ongoing or future management decisions.

The District takes an adaptive management approach to water and natural resource management. Resource management plans (e.g., [Como Lake Management Plan](#)) identify multiple possible projects that may be prioritized and implemented depending on the results of prior activities, as demonstrated by monitoring. Adaptive management is also incorporated into District programs. For example, the District will evaluate the impact of communication and engagement strategies and build on the most successful strategies. The District Strategic Plan identifies adaptive management as an element of resilient watershed management strategies. The biennial reviews of the District's work and accomplishments against the Plan goals and implementation activities provide ample opportunities for evaluating, adapting, and amending the District's Plan as needed.



**Figure 1-10: Adaptive Management Approach**





# **WATERSHED ISSUES & GOALS**



## SECTION 2: WATERSHED ISSUES AND GOALS

This section of the Plan discusses the priority issues recognized by the District and identifies goals to address those issues.

### 2.1. Issue Identification

As part of Plan development, District staff executed multi-element stakeholder engagement to gather input from District Board of Managers, staff and CAC members, residents, community and neighborhood groups, city staff, state agency technical staff, and other partners (see [Section 1.2](#)). Supporting technical information appropriate to the audience was presented at stakeholder engagement events. This effort identified issues and concerns, which were classified into categories and summarized in a memorandum (see [Appendix B](#)).

District staff reviewed the input received from stakeholder engagement activities in the context of past District accomplishments (see [Section 1.1.2](#)), resource monitoring and assessment data (see [Appendix A](#)), and current District programs. Staff interpretation, recommendations, and supporting information

were presented at a Board workshop. Priority issues and concerns from the 2010 Plan, outcomes of the Level II PRAP (see [Section 1.1.2](#)), and the [District's 2010 Plan](#) Mid-Term Review (CRWD, 2015) were also considered in this process and incorporated into the updated priority issues, as applicable. Through discussion and consensus the Board of Managers identified priority issue categories to be addressed by the Plan (shown below).

The top four issue categories may generally be grouped into “resource” issues (i.e., issues closely linked to resources such as lakes, streams, wetlands, and developed areas) while the bottom four categories generally address “organizational” issues (i.e., those related to District programs, operations, and administration).

Within each of these categories, District staff formulated priority issue statements that clarify the specific issues facing the District. These issue statements inform the goals and implementation activities included in the Plan. The following sections provide a narrative discussion of each issue, using relevant District land and water resource data and information. A full land and water resource inventory can be found in [Appendix A](#). The goals to address all priority issues are also included in the following sections.





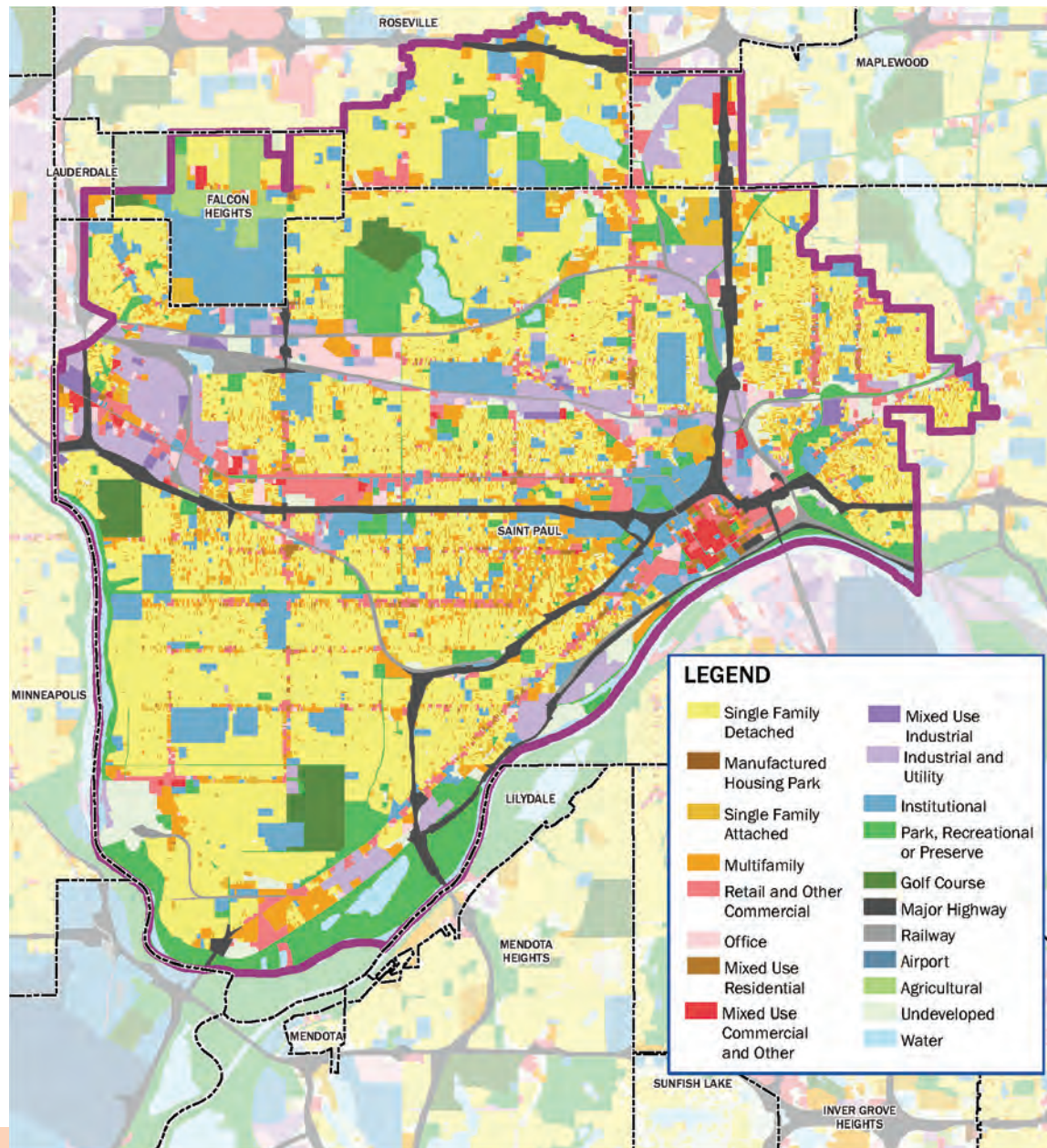


## 2.2. Built Environment Issues and Goals

Over time, the District landscape has changed from a naturally vegetated, wetland-rich area to a fully developed, urban environment. The District contains areas of dense urban development, including the central business district of Saint Paul (Figure 2-1). Single-family residential is the most common land use, covering approximately 46% of the District. Commercial (5%) and industrial (6%) land uses are generally located along major roadways or rail corridors.

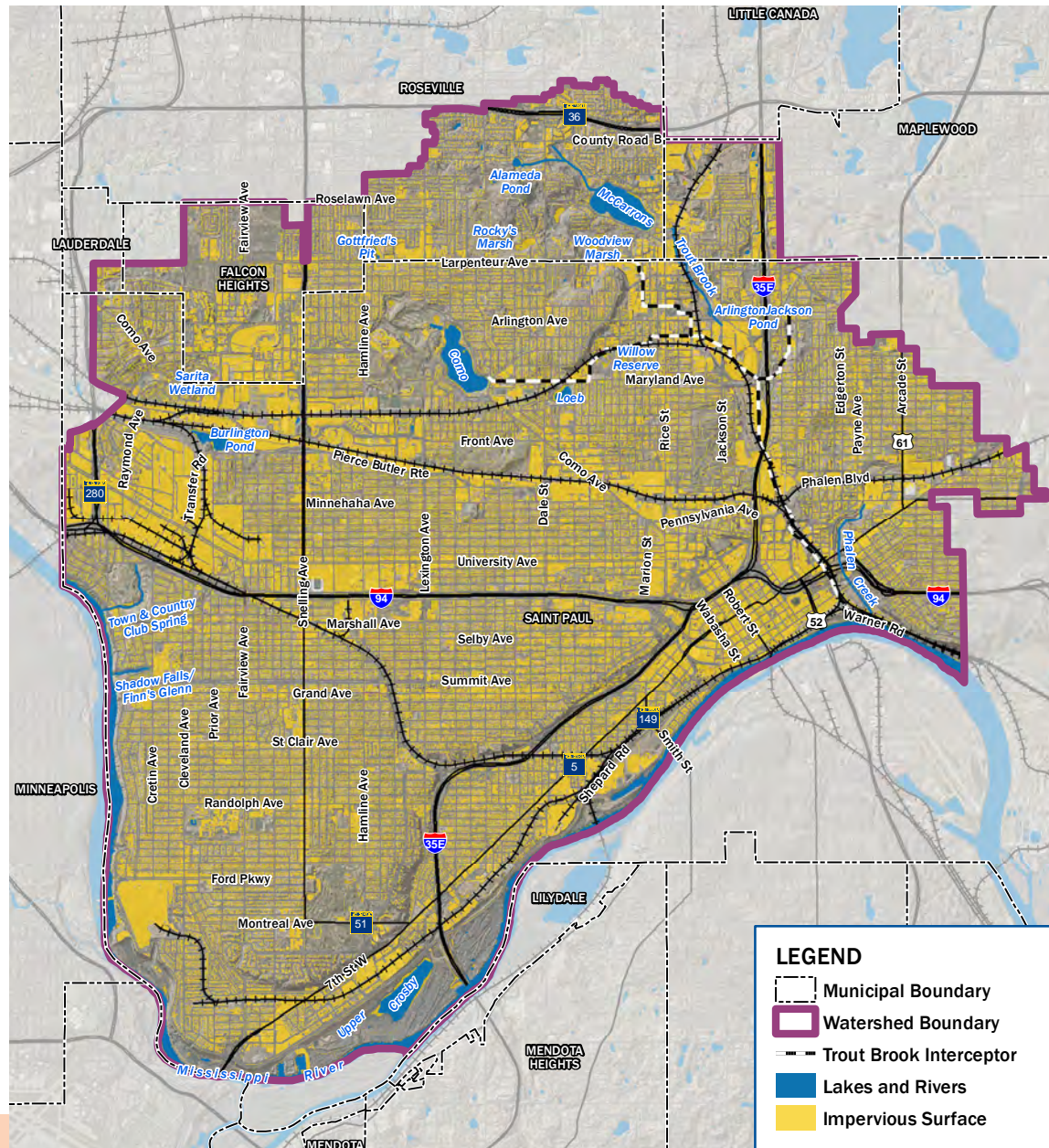
Urbanization and the associated increase in impervious surface (i.e., surfaces through which water cannot infiltrate) results in increased stormwater runoff rates and volumes. Impervious areas cover approximately 50% of the District. Areas of concentrated imperviousness (exceeding 80%) are in downtown Saint Paul, along the Burlington Northern Santa Fe (BNSF) railroad, and in commercial and industrial areas adjacent to University Avenue and other major roads (Figure 2-2). Increased stormwater runoff from impervious areas contributes to water quantity issues (see Section 2.3) and water quality issues (see Section 2.4).

High imperviousness and land disturbance (e.g., construction) result in increased amounts of nutrients, chloride, sediment, and other pollutants carried in District stormwater runoff (i.e., loading).



**Figure 2-1: Current (2018) Land Use**





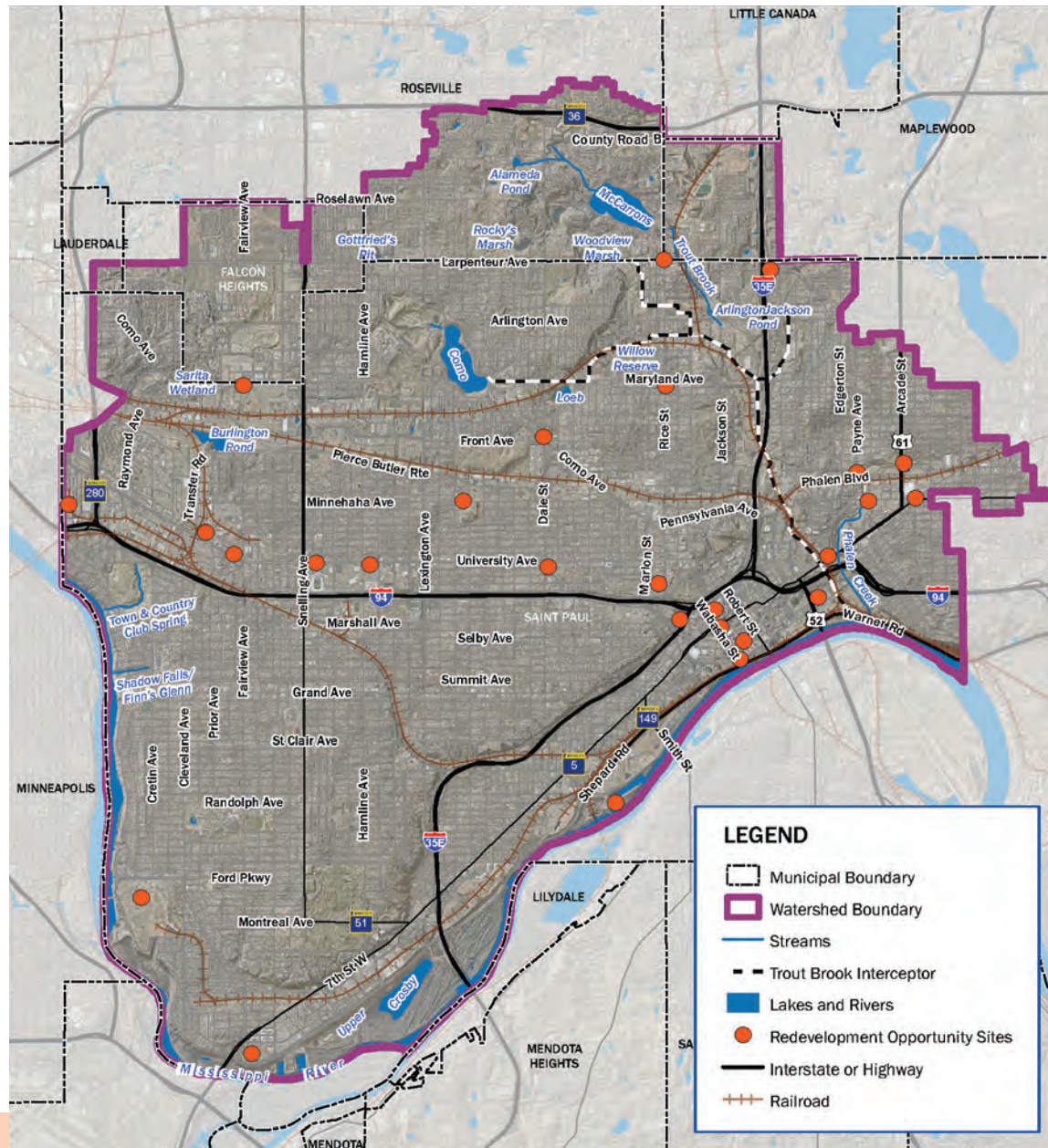
Increased stormwater runoff rates and volumes resulting from impervious area also contribute to erosion, threaten existing infrastructure and increase flood risk.

Urbanization and development also limit the natural ability of the District landscape to mitigate the negative environmental impacts of stormwater runoff by reducing infiltration and retention. Infiltration or retention of stormwater runoff is the most effective means of limiting the impacts of urbanization, as these methods reduce the total volume of runoff to the downstream receiving waterbodies. However, historic wetland complexes and natural areas within the District (see [Appendix A](#)) have been replaced with impervious surfaces and soils compacted from development, limiting infiltration and retention potential. Existing structures, utilities, and land ownership further restrict the opportunities for the District and its partners to implement cost-effective stormwater best management practices (BMPs).

Due to the District's fully developed condition, significant changes in land use are not expected, although increases in mixed use (e.g., commercial-residential) land use and higher density residential land use are expected in Saint Paul ([City of Saint Paul, 2019](#)). The use of green infrastructure and low impact development (LID) practices are strategies using plants, soil systems, and natural processes to minimize stormwater impacts in areas of

**Figure 2-2: District Impervious Area**





increasing density. Redevelopment provides opportunities to integrate otherwise infeasible or challenging stormwater management improvements in collaboration with developers and other District partners. The District is tracking several large-scale redevelopment opportunities, including the following:

- Ford Redevelopment Site
- Sears Redevelopment Site
- Great River Passage Projects
- Towerside Innovation District
- Creative Enterprise Zone

Many of these redevelopment opportunities are located in highly impervious areas of Saint Paul (Figure 2-3). Additional information about District land use, imperviousness, and redevelopment opportunities is included in [Appendix A](#).

During the initial engagement process, stakeholders identified several issues, concerns, and opportunities directly and indirectly related to the built environment. The influence of the built environment on the District's challenges, goals, and actions led to its identification as a top-priority issue category by District staff and the Board of Managers.

**Figure 2-3: Potential Redevelopment Opportunities**



## Built Environment Issue Statements

1. The ability of the landscape to provide water quality benefits through infiltration, filtration, and other natural processes of stormwater runoff is minimized because of urban development within the watershed.
2. High imperviousness in the District increases stormwater runoff rates and volumes, exacerbates erosion, and leads to increased flood risk and stress on stormwater infrastructure.

## Built Environment Goals

- BE-1** Manage stormwater runoff from District-owned, permitted, and grant funded projects with green infrastructure practices and other approaches that mimic natural hydrology by retaining a minimum volume equivalent to 1.1 inches over new, redeveloped, or existing impervious surfaces
- BE-2** Work with partners to identify, evaluate, and carryout opportunities for regional stormwater management systems on at least one large-scale redevelopment project (e.g., Ford Site, Towerside, Creative Enterprise Zone) over 10 years
- BE-3** Explore private-public partnerships on redevelopment projects to implement shared, stacked green infrastructure (SSGI) projects with environmental, economic, and social benefits
- BE-4** Identify and prioritize improvement projects in each of the District's high-priority subwatersheds (Trout Brook, Saint Anthony Hill, and Phalen Creek) (see Section 3.2) through development of at least one subwatershed study in each subwatershed
- BE-5** Support the voluntary implementation of green infrastructure practices with a target of 15 BMPs installed per year by continuing to offer grant programs and considering other types of incentives
- BE-6** Annually monitor and report effectiveness of at least five District green infrastructure practices and other stormwater BMPs in reducing stormwater runoff volumes and pollutant loads
- BE-7** Identify and address top 5 sediment or phosphorus pollutant loading hot spot areas for targeted source control (e.g., street sweeping)

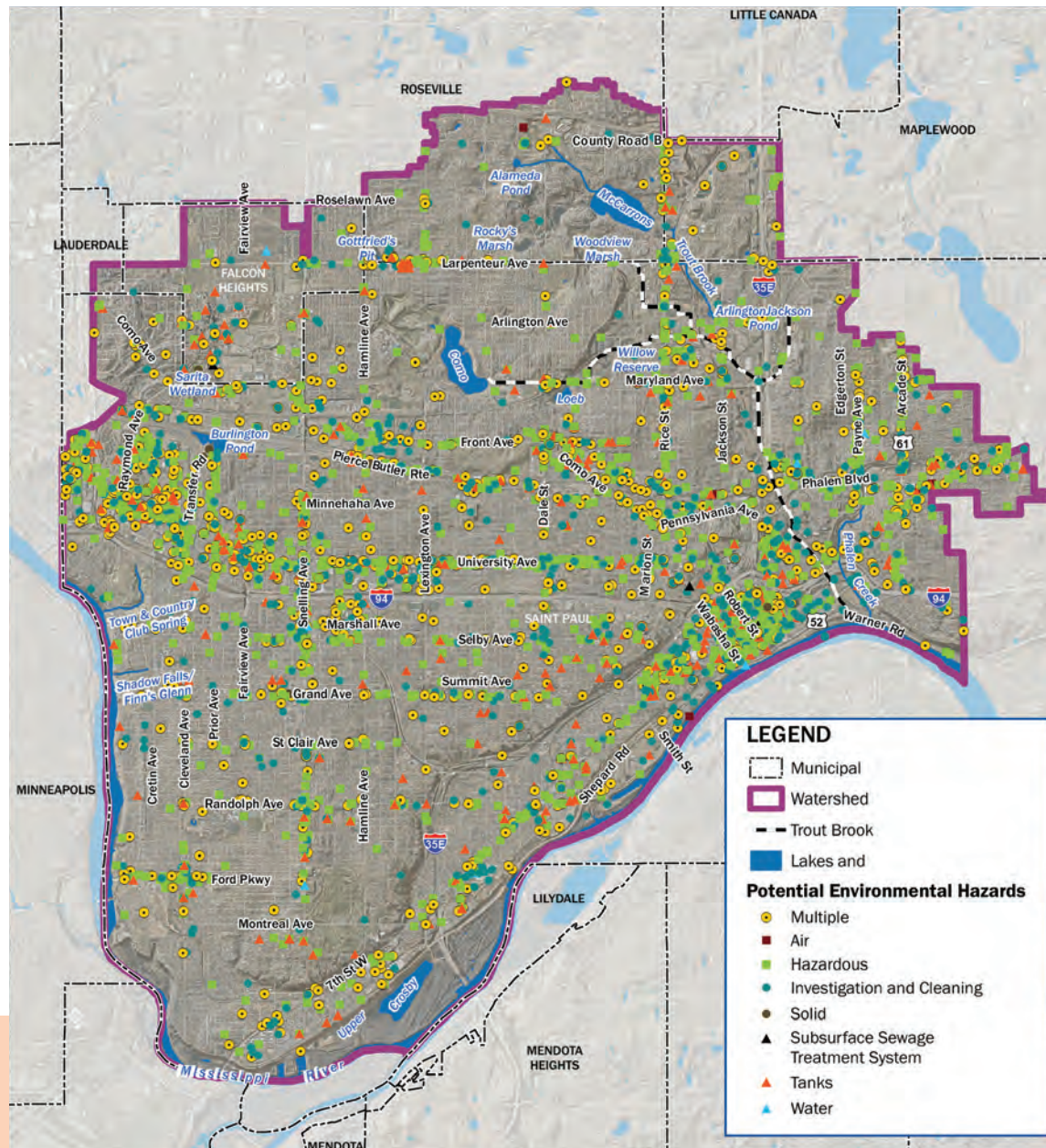




## 2.3. Water Quality Issues and Goals

Pollutants are discharged to surface waters as either point sources or non-point sources. Point source pollutants discharge to receiving surface waters at a specific point from a specific identifiable source (e.g., discharge from a wastewater treatment plant). Unlike point sources, non-point source pollution cannot be traced 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.

The sources of water pollution in the District are many and varied. Potential pollutant sources in the District include permitted sources, potentially contaminated sites, leaking above- and below-ground storage tanks, unsealed wells, and non-point sources such as stormwater runoff (Figure 2-4). This map and associated information are useful for determining the suitability of a site for infiltration or filtration of stormwater runoff and shall be consulted during the site investigation and feasibility phase of potential water quality improvement projects. For many District waterbodies, stormwater runoff is a major contributor of pollutants. Pollutants in stormwater runoff include phosphorus and other nutrients, sediment, chlorides, oil, grease, chemicals (including hydrocarbons), metals, litter (e.g., plastics,



**Figure 2-4: Potential Pollutant Sources**

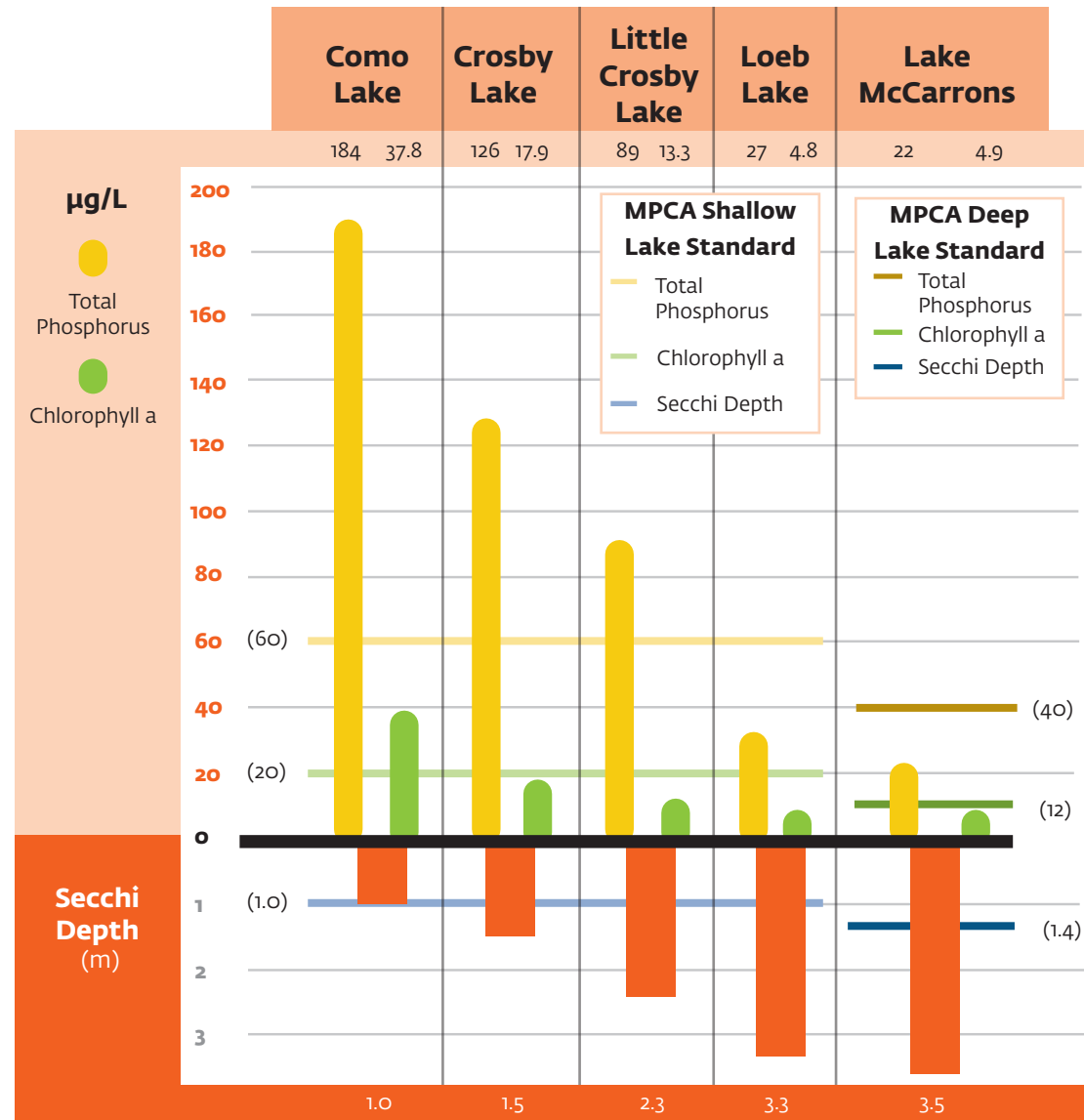
The MPCA maintains a database of potential pollutant sources including storage tanks, solid waste producers, hazardous waste sites, and others.



Styrofoam), and pathogens, which can severely reduce water quality. Within the District, nutrient and sediment loading to waterbodies from stormwater runoff can far exceed what would be expected from an undeveloped watershed. Chloride loading from runoff carrying road salt applied to roadways, parking lots, sidewalks, and other developed areas throughout the winter months is also a significant pollutant source.

In District lakes and wetlands, phosphorous is the pollutant of most concern. As total phosphorus (TP) loads increase, it is likely that water quality degradation will accelerate, resulting in unpleasant consequences such as profuse algae growth or algal blooms (reflected in high chlorophyll a concentrations). Algal blooms, overabundant aquatic plants, and nuisance/exotic species, such as Eurasian watermilfoil, purple loosestrife, and curly-leaf pondweed, will flourish and interfere with ecological function as well as recreational use and the aesthetics of waterbodies. Sediment is also a pollutant of concern. Sediment contributes to poor water clarity that affects vegetation growth and deposits onto stream and lake beds, impacting aquatic habitat. It is also a substrate to which phosphorus and other pollutants bind.

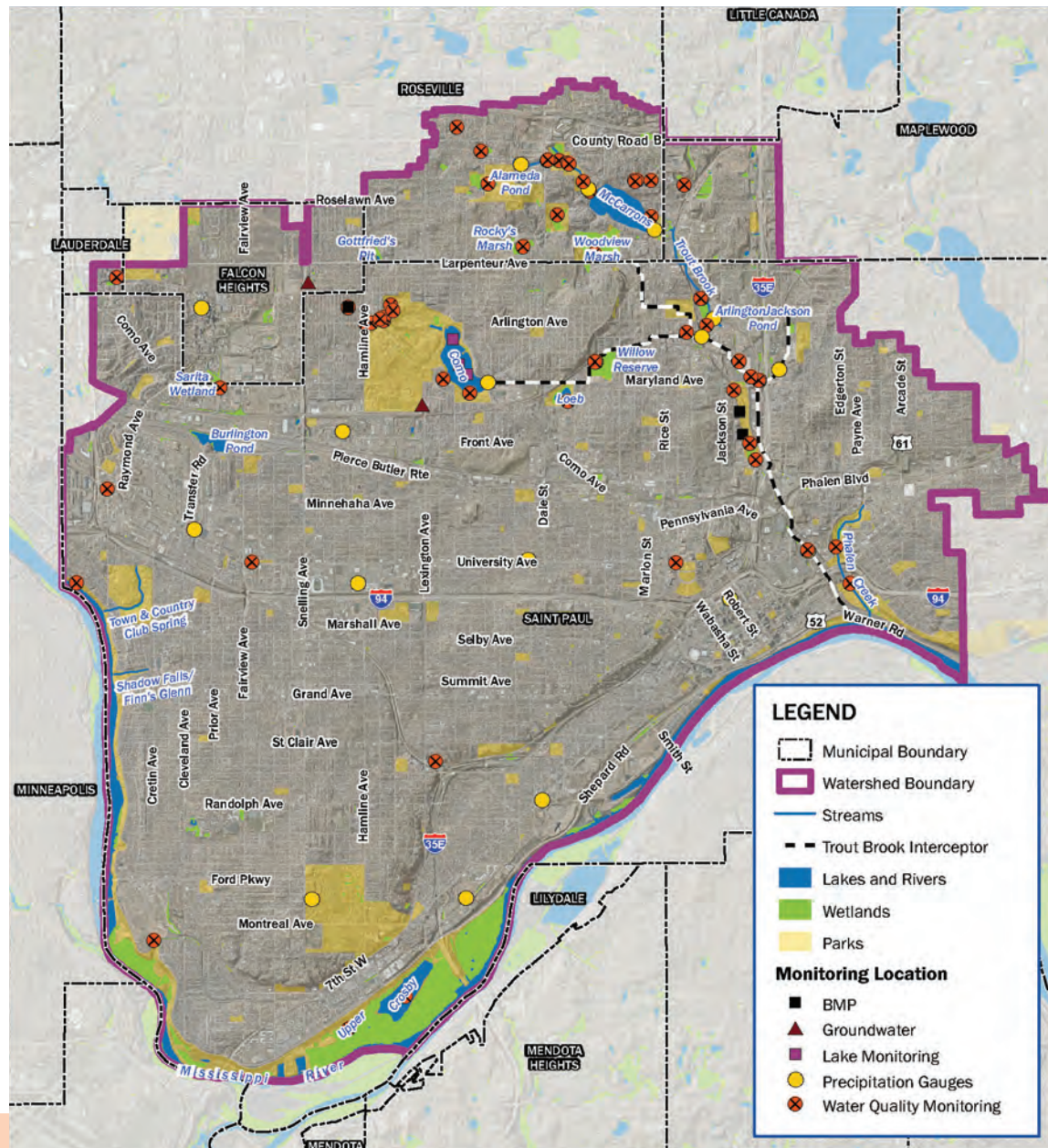
The District collects data from stormwater, lakes, and wetlands to identify water quality issues (see [Figure 2-5](#), [Table 2-2](#), and [Appendix A](#)). Monitoring locations are shown in [Figure 2-6](#), Loeb Lake and Lake



**Figure 2-5: District Lake Water Quality Data (2009-2019)**

Note: summer average (May-September) total phosphorus exceeds applicable MPCA shallow lake standards in Crosby Lake and Little Crosby Lake. Como Lake exceeds applicable MPCA shallow lake standards for both total phosphorus and chlorophyll-a.





McCarrons have excellent water quality that the District and its partners seek to maintain through ongoing pollution prevention actions, capital improvements, and monitoring. Water quality in Como Lake, Crosby Lake, and Little Crosby Lake is degraded due to high phosphorus concentrations in excess of the applicable MPCA standard (Figure 2-5). The District implementation plan includes prioritized actions to address water quality issues in these lakes (see Table 3-5). Water quality issues and management actions specific to individual District lakes are discussed in greater detail in individual resource management plans (e.g., [Como Lake Management Plan](#)).

The Minnesota Pollution Control Agency (MPCA) has classified Como Lake, Lake McCarrons, and the portion of the Mississippi River adjacent to the District as impaired by specific pollutants relative to their intended use(s) (Table 2-1). For impaired waterbodies, the MPCA completes a total maximum daily load (TMDL) analysis; a TMDL is a threshold calculation of the amount of a pollutant that a waterbody can receive and still meet water quality standards and its intended use(s). Pollutant loading from tributary watersheds must often be reduced to control or reverse water quality degradation in downstream water bodies. Approved and final draft TMDLs and associated implementation plans may contain actionable steps for the District. The District and its partners have completed some actions recommended in the [Como Lake TMDL](#) (CRWD,

**Figure 2-6: District Monitoring Locations**



2010), while others are incorporated into the more recent [Como Lake Management Plan](#) (CRWD, 2019) and this Plan. The District will continue to review completed TMDLs and TMDL implementation plans and incorporate recommended actions into the District's implementation plan, where appropriate.

Stormwater monitoring data from storm sewers in the District (see [Table 2-2](#)) indicate concentrations of Escherichia coli (E.coli), total phosphorus, and total suspended sediment generally exceed

applicable MPCA water quality standards. In addition, pollutant concentrations in District stormwater discharges exceed those in the Mississippi River receiving water for all monitored parameters except chloride. The elevated pollutant concentrations in stormwater relative to the Mississippi River reflect the high imperviousness of the District, which is a source of sediment, metals, and other pollutants. Based on 2010–2019 stormwater monitoring data, the average TP and TSS from the

**Table 2-1: Impaired Waters within or Adjacent to the District**

Waterbody	Impaired Use	Pollutant or Stressor	Year Listed	TMDL Study Approved	TMDL Study Target Completion
<b>Como Lake</b>	Aquatic Consumption	Mercury in fish tissue	2008	2008 <sup>1</sup>	
	Aquatic Life	Chloride	2014	2016 <sup>2</sup>	
	Aquatic Recreation	Nutrients/Eutrophication	2002	2010 <sup>3</sup>	
<b>Lake McCarrons</b>	Aquatic Life	Mercury in fish tissue	2006	2010 <sup>1</sup>	
<b>Mississippi River</b>	Aquatic Consumption	Mercury in fish tissue	1998	2007 <sup>1</sup>	
		Mercury in water	1998	2007 <sup>1</sup>	
		PCB in fish tissue	1998	--	2020
		PFOS in fish tissue	2008	--	2025
		PFOS in water	2014	--	2025
	Aquatic Life	Total suspended solids	2014	2015 <sup>4</sup>	
		Aluminum	2020 (draft)		2033
	Aquatic Recreation	Nutrients/Eutrophication	2016	--	2029
		Fecal coliform	1994	2016 <sup>5</sup>	2022

Source: 2020 MPCA Impaired Waters 303(d) List (draft).

PFOS = Perfluorooctane Sulfonate; PCB = Polychlorinated Biphenyl

(1) Addressed by the [Minnesota Statewide Mercury Total Maximum Daily Load](#) (MPCA, 2007, as revised)

(2) Addressed by the [Twin Cities Metro Area Chloride Total Maximum Daily Load](#) (MPCA, 2016)

(3) Addressed by the [Como Lake TMDL](#) (CRWD, 2010)

(4) Addressed by the [South Metro Mississippi River Total Suspended Solids Total Maximum Daily Load](#) (MPCA, 2015, as revised)

(5) Addressed by the [Upper Mississippi River Bacteria Total Maximum Daily Load](#) (MPCA, 2016)



watershed is approximate 0.5 pounds/acre/year and 200 pounds/acre/year. Average chloride concentrations in District stormwater discharges are generally around or below the 230 mg/L standards applicable to Class 2B rivers and lakes (see [Minnesota Rules 7050](#)) but are less than the average chloride concentration in the Mississippi River.

The Mississippi River data included in [Table 2-2](#) also demonstrate the impact of the Minnesota River, which enters the Mississippi

River between mile 847.9 (Lock and Dam #1) and mile 839.1 (Downtown Saint Paul), as a significant source of total suspended sediment and total phosphorus.

See the Land and Water Resource Inventory ([Appendix A](#)) for more information about District surface water quality, impaired waters, and monitoring programs. During the initial engagement process, all stakeholders identified issues, concerns, and opportunities related to water quality.



**Table 2-2: District Stormwater Quality Monitoring Results (2010-2019)**

Location	Average Concentration						
	Chloride (mg/L)	Copper (µg/L)	E. coli <sup>1</sup> (cfu/100 mL)	Lead (µg/L)	TP (µg/L)	TSS (mg/L)	Zinc (µg/L)
<b>Stormwater Outlets</b>							
East Kittsondale	234	19.6	4,123	16.6	229	123	84.6
Hidden Falls	84	12.6	3,125	16.3	205	122	61.3
Phalen Creek	178	13.3	3,242	19.2	272	165	71.6
Saint Anthony Park	141	12.5	3,755	8.6	190	110	62.6
Trout Brook - East Branch	243	10.2	3,842	6.5	295	103	44.9
Trout Brook - West Branch	90	11.0	3,446	8.9	268	365	46.6
Trout Brook Outlet	121	11.7	3,312	10.3	260	131	44.5
<b>Mississippi River Locations and Standards</b>							
Mississippi River Mile 839.1 (Downtown St Paul)	24	1.8	130.9	0.7	134	46	5.8
Mississippi River Mile 847.7 (Lock and Dam #1)	18	2.4	130.6	0.5	68	11	5.2
Mississippi River Standard (in Mississippi River)	230 <sup>2</sup>	-- <sup>5</sup>	1260 <sup>3</sup>	-- <sup>5</sup>	100 <sup>2</sup>	32 <sup>4</sup>	-- <sup>5</sup>

Notes: values highlighted exceed water quality standard applicable in the Mississippi River; note that Mississippi River water quality standards are presented for comparison and do not directly apply to the District's stormwater discharges.

- (1) Units for Escherichia coli (E. coli) are colony forming units (cfu) per 100 mL of water and are presented as geometric mean
- (2) Based on [Minnesota Rules 7050](#)
- (3) To meet the 1260 cfu/mL standard, no more than 10% of all E. coli samples should exceed this value in a given month. Although CRWD rarely collects more than one sample per month, it may be concluded that the 1260 cfs/mL standard is exceeded
- (4) Site-specific standard based in the [South Metro Mississippi River Turbidity TMDL](#) (MPCA, 2015)
- (5) MN Rules 7050 applicable standards for copper, lead, and zinc are a function of total hardness



## Water Quality Issue Statements

1. Polluted stormwater runoff is increasing and impairing the water quality of District Lakes, wetlands, and the Mississippi River in part due to higher precipitation frequencies and volumes driven by climate change and other human impacts.
2. Recreation and other designated uses of the District's lakes, the Mississippi River, and surrounding natural areas are limited by poor water quality.

## Water Quality Goals

- WQ-1** Establish Como Lake as an ecologically healthy shallow lake and achieve the following long-term water quality goals identified in the [Como Lake Management Plan](#):

  - a. Achieve and maintain an in-lake summer-average total phosphorus (TP) concentration of less than 60 µg/L
  - b. Reduce watershed phosphorus loading by 60% relative to year 2000 baseline; reduce internal phosphorus loading by 95%
  - c. Reduce other non-point source pollutants (e.g., bacteria, chloride, trash, sediment)

**WQ-3** Establish Crosby Lake as an ecologically healthy shallow lake appropriate for its proximity to the Mississippi River and achieve the following long-term water quality goals identified in the [Crosby Lake Management Plan](#):

  - a. Achieve an in-lake summer-average TP concentration of less than 60 µg/L
  - b. Reduce watershed phosphorus loading by 47% relative to 2000-2009 baseline of 92 pounds/year

**WQ-2** Manage Lake McCarrons to improve and sustain its ecological health as a deep lake and achieve the following water quality goals identified in the [Lake McCarrons Management Plan](#):

  - a. Maintain an in-lake summer average TP concentration less than 33 µg/L
  - b. Maintain watershed phosphorus loading of 0.25 pounds/acre/year (no increase from 2008-2018 baseline)
  - c. Maintain hypolimnetic TP concentrations below 300 µg/L
  - d. Work with partners to ensure in-lake chloride concentrations do not exceed 230 mg/L more than once every 3 years
  - e. Reduce other non-point source pollutants (e.g., bacteria, chloride, trash, sediment)

**WQ-4** Manage Loeb Lake to improve and sustain its ecological health as a shallow lake and maintain or improve water quality of Loeb Lake that meets the following shallow lake water quality standards:

  - a. Maintain an in-lake summer average TP concentration of less than 60 µg/L
  - b. Maintain clarity of 1 meter
  - c. Maintain chlorophyll a concentration of less than 20 µg/L

**WQ-5** Reduce sediment loading from the District to the Mississippi River to less than 154 pounds/acre/year ([South Metro Mississippi River Turbidity HTML](#)) through ongoing practices (e.g., regulation) and capital improvements through ongoing practices (e.g., regulation) and capital improvements (e.g., assessment, prioritization, and stabilization of eroded ravines)





- WQ-6** Reduce total phosphorus loading to the Mississippi River to 0.35 lb/acre/year and achieve total phosphorus concentrations of 125 µg/L and 100 µg/L in the Mississippi River and Lake Pepin, respectively ([Draft Lake Pepin TMDL](#))
- WQ-7** Quantify and reduce the amount of trash entering District lakes, wetlands, ponds, and the Mississippi River
- WQ-8** Achieve bacterial water quality standards (126 CFU/mL monthly geometric mean, April–October) in the Mississippi River ([Upper Mississippi River Bacteria TMDL](#))
- WQ-9** Establish a baseline and reduce chloride loading to Como Lake and make progress towards meeting the 2,233 pounds/day MS4 waste load allocation to Como Lake through actions identified in the [Twin Cities Metro Area Chloride Management Plan](#).
- WQ-10** Reduce loading of chloride, metals, pesticides, organic contaminants, and other pollutants to District lakes, wetlands, ponds, and the Mississippi River.
- WQ-11** Research the prevalence, extent and impacts of at least two emerging water quality issues (e.g., microplastics, pharmaceuticals, PFAS compounds, and other anthropogenic contaminants)
- WQ-12** Document baseline conditions, identify trends, and target areas for reducing pollutant loading and evaluate progress towards achieving water quality goals by monitoring quality and quantity of District water resources annually (five lakes, seven subwatershed stormwater outfalls) and periodically (nine wetlands)

- WQ-13** Support and collaborate with Ramsey County, the Minnesota Department of Natural Resources (MDNR), Saint Paul Regional Water Services, community suppliers, and other appropriate partners on groundwater quality monitoring and protection efforts



**Collecting sediment cores on Como Lake**



## 2.4. Water Quantity and Flood Risk Issues and Goals

In a natural, undeveloped setting, pervious ground cover allows water, including stormwater runoff, to infiltrate the soil. Impervious areas, which cover 50% of the District, alter natural drainage patterns and increase the rate and volume of stormwater runoff. The additional volume of runoff can increase water levels in ponds, lakes, streams, and wetlands, which increases the potential for erosion and flooding. It also causes large, flashy flows in storm sewers, which increases the potential for flooding and property damage. Increased precipitation also results in high water tables and increased groundwater flow to springs, potentially threatening the stability and capacity of downstream structures.

Managing the risk of flooding is a primary focus of the District and its partners due to the potential threat to public health and safety, infrastructure, and the environment. In addition to property damage, flooding may cause other impacts that are harder to quantify, including the following:

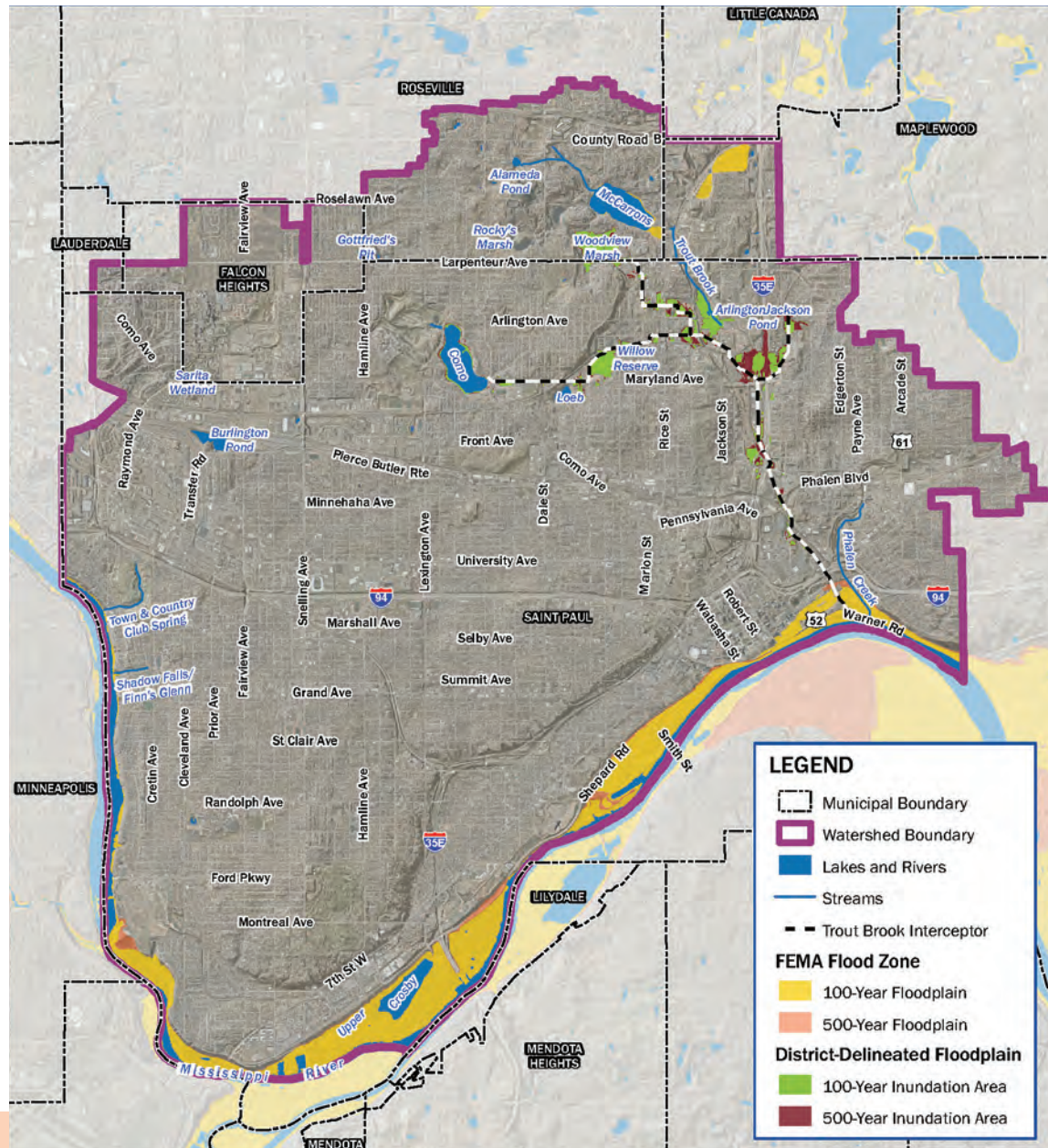
- Flooding of roads making them impassable to emergency vehicles and residents
- Shoreline erosion
- Destruction or alteration of riparian habitats
- Restricted recreational use of waterbodies, trails, and adjacent lands
- More strain on budgets and personnel for repairing flood-damaged facilities and controlling public use of facilities during flooding events

The Federal Emergency Management Agency (FEMA) has identified areas prone to flooding during 100-year flood events to assist cities and residents in managing flood risk. FEMA-delineated floodplains are limited to the areas adjacent to the Mississippi River, Lake McCarrons, and wetlands in Maplewood. The District has also mapped the 100-year and 500-year flood



**Water flows into the underground stormwater system**





inundation areas adjacent to the Trout Brook Interceptor (TBI) stormwater system (Figure 2-7). The District has used this information to identify and prioritize further investigations of these flood-prone areas adjacent to the TBI system and to inform its permit program.

During plan development, District staff and partners identified and prioritized known flooding issues within the District. The highest priority issues are addressed in the implementation plan (see Table 3-5) and include:

- Priority areas adjacent to Trout Brook Interceptor:
  - Maryland Ave. W./Norton St. N.
  - Maryland Ave. W./Grotto St. N.
  - Arlington Ave. E/railroad
- Gottfried's Pit
- Seminary Pond
- Como Golf Course (Hole 8)

The fully developed nature of the District limits available physical space for capital improvements to address flooding issues. Appropriate rate and volume controls dispersed throughout the landscape are necessary to minimize future flooding issues. The District's regulatory program includes criteria intended to limit adverse impacts to floodplains and minimize flooding. The negative impacts of flooding may be further minimized

**Figure 2-7: District and FEMA Floodplains**



by thoughtful management of the floodplain achieved through education and other activities. The District will continue to work with its partners to consider and evaluate all possible means to reduce flood risk, including structural and non-structural options.

Precipitation patterns trending towards larger, more intense storms (see [Section 1.2.3, Climate change and community resiliency](#) and [Appendix A](#)) will exacerbate existing water quantity issues or create new problems. [NOAA's 2013 assessment of climate trends for the Midwest](#) found that precipitation amounts are predicted to increase

significantly over what is historically used in floodplain assessments and infrastructure design. Median estimates of mid-21<sup>st</sup> century 24-hour precipitation events with a 1% chance of occurring in a given year (i.e., 100-year event) exceed 10 inches, a significant increase over current design values (7.44" 100-year Atlas 14 event, see Appendix A). Understanding the hydrologic response of the watershed to large precipitation events is critical to identifying areas of flood risk and evaluating strategies to reduce flood risk or damages.

### Water Quantity and Flood Risk Issue Statements

1. Flooding, stress to infrastructure, and erosion are the result of excessive runoff from a highly urbanized watershed.
2. Peak runoff rates and total runoff volumes are increasing due to current and projected future climate and precipitation trends.
3. Groundwater seepage or springs are occurring more frequently, in more locations, and over longer durations.

### Water Quantity and Flood Risk Goals

- FL-1** Maintain critical event (i.e., 10 or 100 year) flood control for all District-sponsored CIPs and permitted redevelopment projects .
- FL-2** Ensure that the Trout Brook storm sewer system, a District-owned and operated storm sewer system, adequately and safely conveys stormwater flows by inspecting at least once every five years and conducting two major repairs over the 10-year plan.
- FL-3** Minimize flood risk and reduce impacts to stormwater infrastructure and property in three high priority flood-prone areas in the Trout Brook subwatershed by investigating the issues and implementing flood-mitigation solutions
- FL-4** Reduce the likelihood and/or consequences of flooding consistent with partner objectives by working with partners to identify, prioritize, and address existing and potential infrastructure capacity and other contributing issues throughout the District
- FL-5** Maintain existing floodplain capacity (i.e., no net loss) through implementation of the District's Rules and identify opportunities to increase floodplain capacity and functionality along Crosby Lake and other areas along the Mississippi River
- FL-6** Adapt to changing climate by evaluating flood risk and designing all new applicable District projects under present and anticipated climate and precipitation trends
- FL-7** Identify and address groundwater quantity issues by supporting and collaborating with appropriate agencies and coordinating with partners at least annually



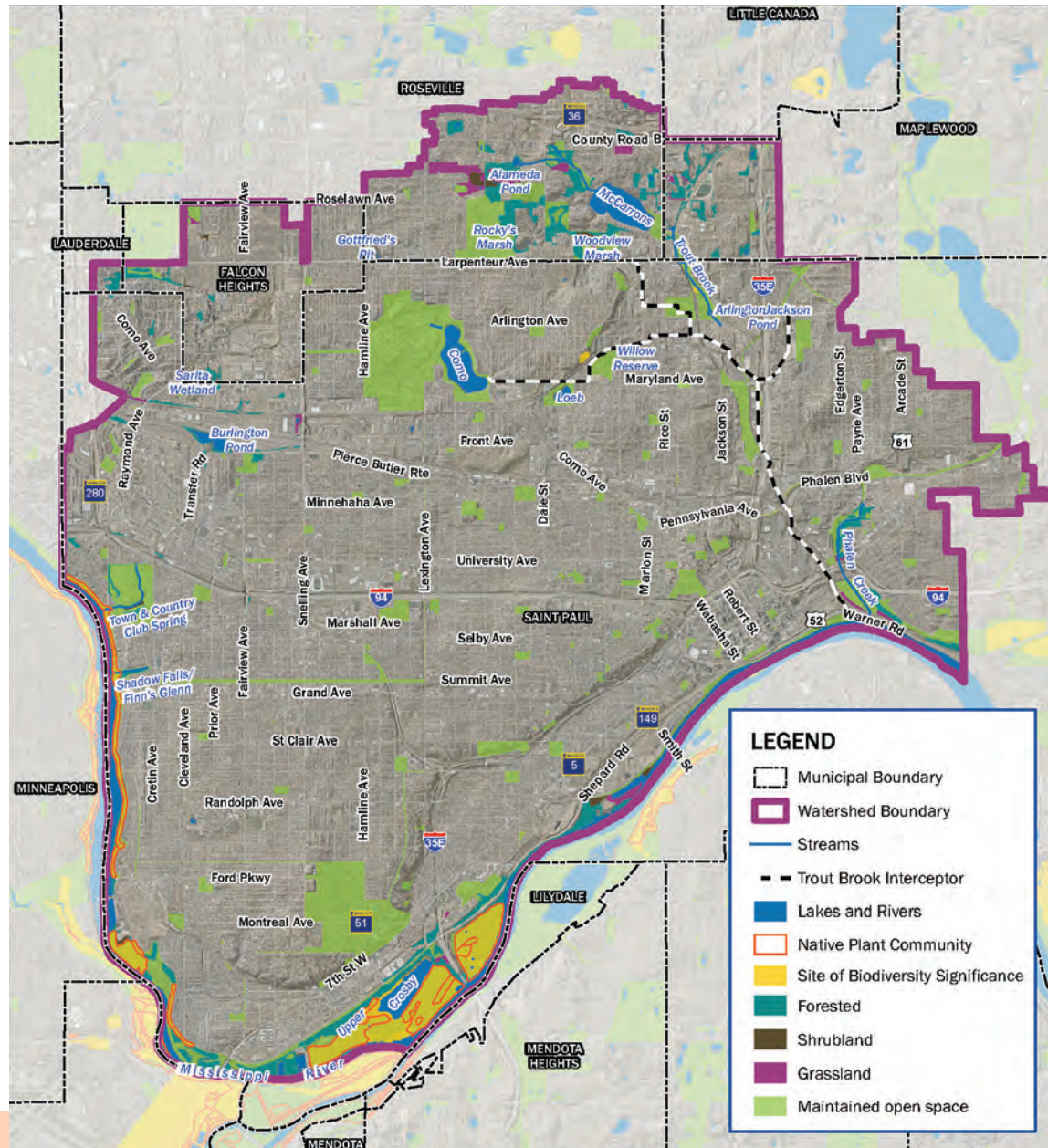


## 2.5. Ecosystem Health Issues and Goals

Healthy wetland systems, shoreland areas, riparian areas, and natural spaces are critical components of the hydrologic system and positively affect soil health, groundwater, surface water quality and quantity, wildlife, fisheries, aesthetics, and recreation. Wetlands, shoreland, riparian zones, and natural areas provide valuable habitat for many types of wildlife including waterfowl, songbirds, raptors, mammals, fish, and amphibians. Healthy urban vegetation and tree canopy mitigate urban heat island effects, reduce runoff, and have aesthetic and recreational benefits.

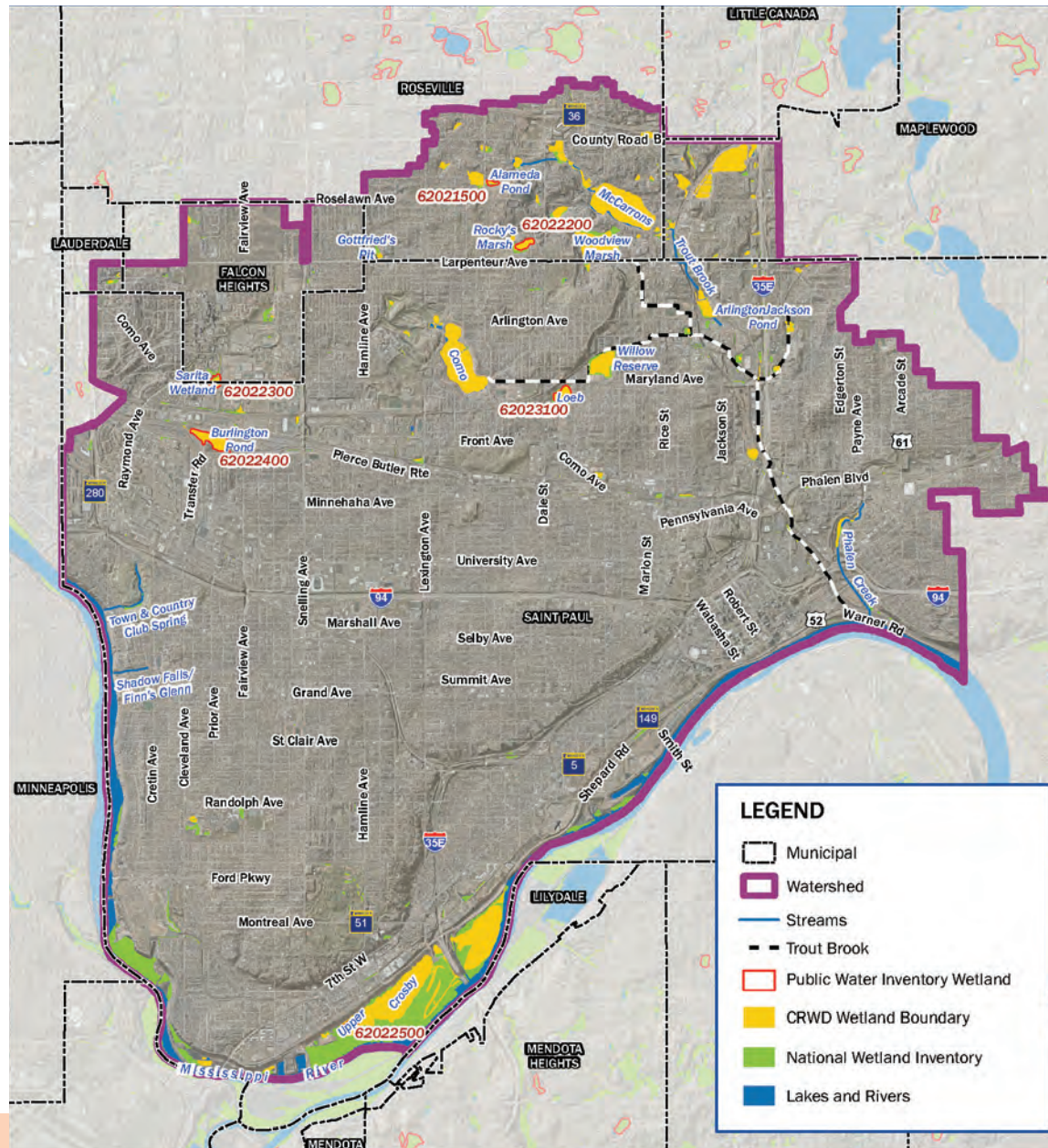
Most of the District has been developed for residential, commercial, and other urban land uses (see [Appendix A](#)), resulting in the loss of natural vegetation. Some areas of natural and semi-natural vegetation remain ([Figure 2-8](#)), concentrated along the Mississippi River and in the north end of the District near Lake McCarrons. Most natural and semi-natural areas are located within existing regional parks (e.g., Hidden Falls Regional Park, Crosby Farm Regional Park, and Mississippi Gorge Regional Park) and are thus protected from future development.

In addition to development, impacts from habitat fragmentation, hydrologic alteration, and pollutant loading may promote non-native or invasive species, reduce habitat, and diminish filtration, infiltration,



**Figure 2-8: Remaining Vegetation and Sites of Biological Significance**



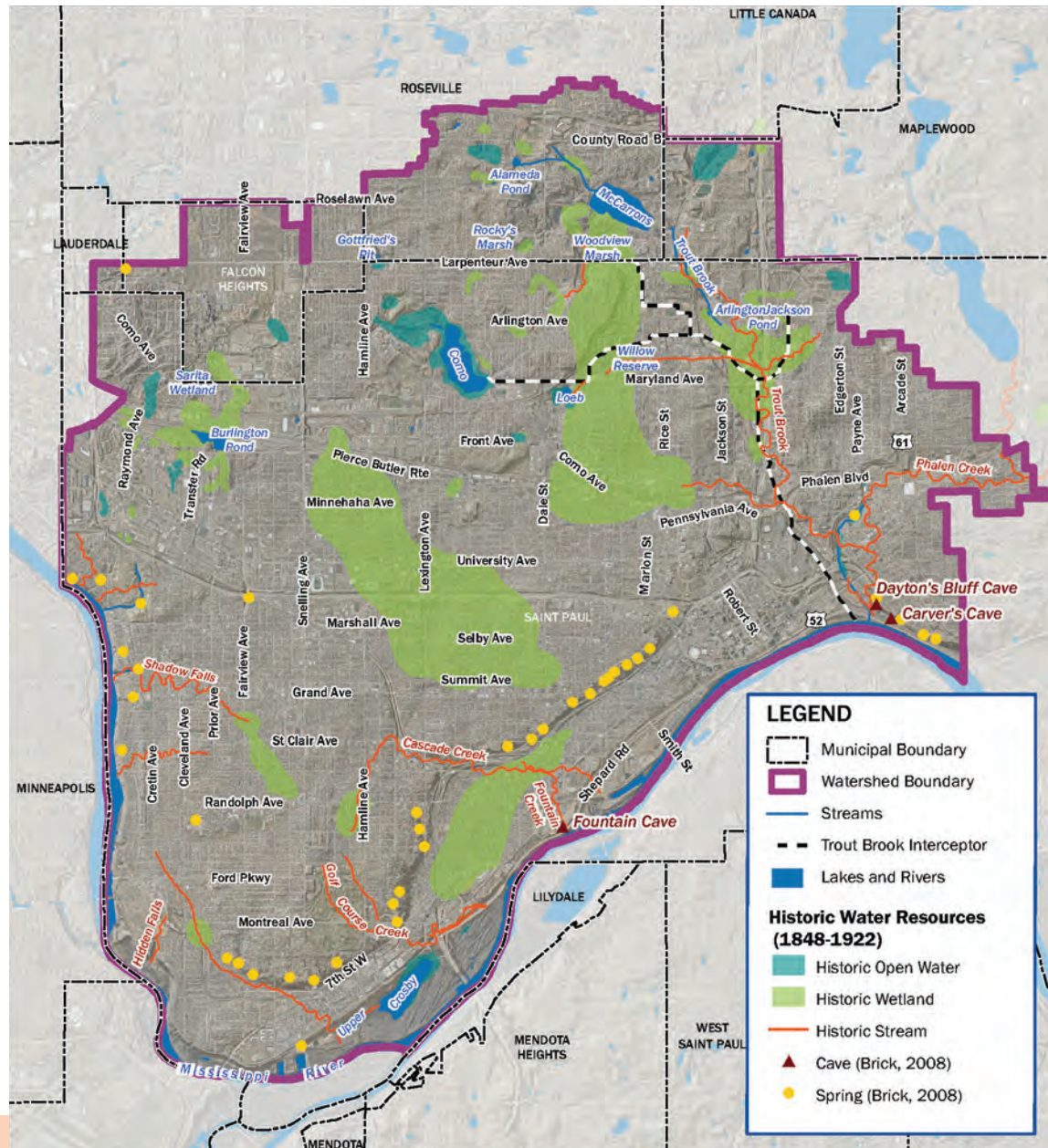


and water retention benefits that these natural areas provide. The District has inventoried and continues to monitor wetlands within its jurisdiction (see [Figure 2-9](#) and [Appendix A](#)). Results from wetland monitoring performed from 2007-2014 generally indicate that the District contains wetlands of “poor” to “moderate” quality based on indices of biological integrity (IBIs) of the macroinvertebrate and plant communities ([CRWD, 2016](#)). None of the wetlands surveyed in the District scored in the “excellent” category for either IBI assessment. The low levels of species diversity and robustness observed in District wetlands are likely due to watershed stressors introduced by the surrounding land uses, stormwater inputs, and the lack of habitat connectivity ([CRWD, 2016](#)). Arlington-Jackson wetland and Woodview Marsh were the only wetlands that scored in the “moderate” condition category for both plant and macroinvertebrate IBIs historical average scores ([CRWD, 2016](#)). The District’s 2010 Wetland Management Strategy (see [Appendix F](#)) includes the identification, evaluation, and prioritization of potential wetland restoration and enhancement projects. That analysis will be used in combination with wetland monitoring data and natural resource inventories to plan District actions during the life of this Plan.

The District has also inventoried and mapped historic water resources (see [Figure 2-10](#)). The location of historic resources is useful

**Figure 2-9: District Wetlands**





for understanding soil and groundwater conditions, drainage issues, and potential restoration opportunities. Potential restoration areas are identified in the District implementation plan (see [Table 3-5](#)) including:

- Phalen Creek
- Hidden Falls Creek
- Swede Hollow
- Cascade Creek/Fountain Creek

Maintaining the ecological health and integrity of natural areas is key to achieving the direct and indirect environmental benefits these areas provide. This requires that both positive and negative impacts on ecological health and environmental functions be considered with water resource and land management activities.

The map of historic wetlands is useful in (1) understanding underlying soil and groundwater conditions, (2) helping explain drainage issues, and (3) indicating potential opportunities for re-creating wetlands.

Historically, the District's efforts to protect and improve ecological health have accompanied projects with primary goals related to water quality or water quantity. During the development of this plan, stakeholders frequently identified ecosystem health issues and concerns and generally expressed a desire for an expanded District role in addressing ecosystem health, including restoration of altered historical creeks and wetlands. Stakeholders also identified

**Figure 2-10: Historic Resources**



potential opportunities for the District to address ecosystem health concerns in partnership with residents, cities, and other cooperators. This Plan also prioritizes lake ecology by including goals that address macrophyte communities in Como Lake and Lake McCarrons.

### Ecosystem Health Issue Statements

1. Wetlands and other natural resources within the District have diminished in extent and quality due to development, hydrologic alterations, climate change, polluted stormwater runoff, and invasive species.
2. Terrestrial and aquatic wildlife habitat is degraded, recreational opportunities are reduced, and public health is affected by the loss of ecological health and function.
3. The health and population of fish and other aquatic species are negatively impacted by stormwater runoff.

### Ecosystem Health Goals

- EH-1** Establish Como Lake as an ecologically healthy shallow lake and achieve the following long-term ecosystem health goals identified in [Como Lake Management Plan](#):

  - a. Reduce the occurrence of curly-leaf pondweed to <10% during period of peak abundance
  - b. Establish and maintain native aquatic vegetation with species richness greater than eight and at least three species with greater than 20% frequency of occurrence
  - c. Establish and maintain a fishery with balanced populations of piscivorous, planktivorous, and benthivorous fish
  - d. Maintain existing areas of native vegetation along the shoreline to capture surface runoff, minimize shoreline erosion, and promote wildlife habitat

**EH-2** Manage Lake McCarrons to improve and sustain its ecological health as a deep lake and maintain the following ecosystem health goals identified in the [Lake McCarrons Management Plan](#):

  - a. Prevent introduction of new aquatic invasive species and control existing invasive species populations
  - b. Maintain or increase abundance and distribution of native submersed aquatic plants throughout the growing season
  - c. Create and maintain stable shoreline buffers around Lake McCarrons
  - d. Maintain a healthy, balanced fishery

**EH-3** Establish Crosby Lake as an ecologically healthy shallow lake appropriate for its proximity to the Mississippi River and achieve the following ecosystem health goal identified in the [Crosby Lake Management Plan](#):

  - a. Develop and work towards achieving long term targets for fish and aquatic plant diversity





### Willow Reserve restoration project in Saint Paul

- EH-4** Manage reestablished native plant communities and control invasive species in Willow Reserve, Highland Ravine, Trout Brook Nature Sanctuary, and other District-sponsored natural areas
- EH-5** Improve ecosystem health in the District's high priority-watersheds of, Trout Brook, Saint Anthony Hill, and Phalen Creek by conducting at least one natural resource inventory and developing and implementing a management plan in each priority subwatershed
- EH-6** Investigate and pursue opportunities to restore portions of historic streams in the Phalen Creek, Hidden Falls, and East Kittsondale subwatersheds, targeting two projects implemented over 10 years
- EH-7** Pursue wetland restoration and local banking opportunities in the top three priority areas identified in the District's future Wetland Management Plan
- EH-8** Promote native vegetated buffers around all water resources beyond the minimum requirements of CRWD and other applicable rules through grant opportunities and communication and engagement efforts
- EH-9** Foster the expansion of native plant communities in the District through conversion of turf grass by promoting District and partner grant opportunities and highlighting native plant benefits



## 2.6. Communications and Engagement Issues and Goals

Communications and public engagement are important avenues to protecting natural and water resources. Pollution prevention and other behaviors practiced by residents can cumulatively mitigate negative impacts to resources, limiting the need for expensive restoration action. Through communication and engagement, the District can empower local advocates for watershed stewardship who are examples in their neighborhoods and, in turn, may increase the District's capacity. Effective communication and engagement are necessary to establish and develop relationships between the District and the communities in which the District and its partners serve.

The input received throughout the issue-identification process highlighted continued priorities of education, communication, and engagement to achieve District goals. Challenges include engaging a population of residents with diverse uses of water, diverse values and ideas about water, and varying capacity for action. Lower incomes like those found in ACP50 census tracts (see Figure 1-5) can impact a community's ability to be a steward of water resources. Residents may lack the time or resources to become aware of and engage in stewardship practices or participate in District programs. Homeownership, often critical for siting BMPs, may also be an impediment.

Over time, the District's population has grown more racially and ethnically diverse (see Figure 1 4). Multiple languages are spoken throughout the District, which can impact communication between the District and the communities it serves. Between 2000 and 2015, the percentage of people of color in Saint Paul increased from 36% to 46%. Across Ramsey County, this percentage increased from 13% in 2000 to 30% in 2014. These trends are expected to continue through 2040 ([City of Saint Paul, 2019](#)). In comments, stakeholders often cited the need to engage groups that have not previously participated, increase awareness of the District and its role, and increase the accessibility of District communications. The District values diversity and inclusion and can achieve cleaner waters through engagement across communities. One of the goals/priorities in the

[District's Diversity Strategic Plan \(CRWD, 2019\)](#) is to "deepen relationships with many communities in the District by increasing outreach." More information about District demographics is included in [Appendix A](#). The District will use local demographic information to learn more about the populations it serves and promote the equitable distribution of services so that District residents of all racial and ethnic backgrounds, ages, abilities, and incomes will be served.

The District has adopted a Communications and Engagement Plan (CRWD, 2020). It outlines the communications and engagement goals and key audiences to reach over the next 10 years. The plan also includes strategies and tactics for identifying, tracking, and leveraging community partnerships, which will be essential for gathering diverse community input and incorporating ideas into the District's work. It has been considered in the development of issues, goals, and actions included in this Plan.



**A macroinvertebrate and dragonfly monitoring event at Trout Brook Nature Sanctuary** Image credit: Caroline Yang





## Communications and Engagement Issue Statements

1. Engagement in activities and actions that protect and improve water resources is not happening to the extent possible due to many factors including lack of community awareness, ability, interest and proximity to water.
2. The work of the District is not fully visible to our stakeholders.
3. The District is not effectively engaging residents in the central and eastern portions of the District, people of color, recent immigrants, young adults and youth.
4. The District needs to establish ways to acknowledge Dakota land and promote connections with the historical and cultural connections to place.
5. Relationships with community groups serving diverse audiences, media, and elected officials—necessary to achieve water quality goals—are lacking.
6. The District's public-facing communications are not accessible to many audiences in the District.
7. District communication is focused primarily on stormwater and should create more connections to other natural resources, environmental issues, and public health.

## Communications and Engagement Goals

- CE-1** Increase the visibility of the District and its work to better engage a variety of stakeholders through the following actions:
- a. Create standard branding and messaging
  - b. Create and implement individual communications and engagement plans, including three pieces of digital content per year for District keystone projects and programs
  - c. Proactively engage at least one member of the media each month to amplify the District's work

- CE-2** Increase community understanding of, and connection to, natural resources, environmental issues, and public health through the following actions:
- a. Develop and share at least two pieces of accessible and engaging District-owned content each month that ties District goals to the interests of stakeholders
  - b. Create and share information that promotes actions to improve water quality and ecosystem health
  - c. Host or support events to further understanding and encourage clean water actions , targeting 25 events per year



- CE-3** Enhance the District's public affairs and community relationships and increase community engagement through the following actions:
- Build community engagement infrastructure and tools, including long-term program opportunities (e.g., K12 curriculum, regular volunteer opportunities, citizen science, etc.)
  - Expand outreach to neighborhood groups, environmental organizations, local businesses, K12 schools, colleges and universities, and other District audiences through five outreach meetings per month
  - Gather information from audiences where engagement is lacking to identify barriers to adoption of clean water behaviors and develop strategies to overcome those barriers
  - Increase recruitment and support of volunteers who will promote programs and activities that align with District goals and actively participate in improving our water resources, targeting 300 adopted storm drains, 200 new participants, and 300 volunteer hours per year
- CE-4** Connect with members of Dakota, Ojibwe, and other indigenous communities to build relationships and develop materials that acknowledge their history and ongoing engagement in the stewardship of the land and water in the District.

- CE-5** Support the continued integration of the arts, technology and storytelling as a vibrant means to communicate, educate, and enliven the experiences of District residents.
- CE-6** Support the creation of recreational access points and programming to better connect people with Willow Reserve and other water and natural resources of the District
- CE-7** Increase communication and engagement efforts to help address chloride and trash pollution.



**COMPAS, a partner grant recipient, leads a nature hike at Fort Snelling State Park** Image credit: Caroline Yang





## 2.7. Regulation Issues and Goals

The District is one of several government entities with water resource management responsibilities and regulatory authority within the watershed. In accordance with [Minnesota Statutes section 103D.341](#), the District first adopted rules in 2006 to ensure that development and redevelopment activities achieve performance standards designed to protect District water resources [District rules](#) were last revised in 2019 and are summarized in [Section 3.4.1](#).

Overlapping permitting and stormwater management authorities may allow for specialization of resources and expertise but can also create the potential for redundant and less efficient processes. Consistent enforcement, periodic evaluation, and updates of District rules are necessary to balance the protection of District resources against the costs and other impacts to developers, residents, and cities. Communication between the District and its partners, especially cities, is necessary to identify areas where efficiency may be increased as well as areas where additional effort is needed to realize the full benefits of District rules. The District reviews its rules and permitting program regularly with the District's (TAC) to increase the effectiveness and efficiency of the District regulatory program.

The stakeholder engagement process identified several priority issues related to the District's regulatory program, many of which were identified by the TAC. A potential gap in the District's regulatory program is the regulation of sites disturbing less than 1 acre of land. As the District is fully developed, many opportunities to implement stormwater management improvements and environmental protections will occur as redevelopment occurs on small sites (i.e., less than 1 acre), which do not currently trigger District rules. The fully developed nature of the District also calls attention to the potential need for the regulation of chloride application. Como Lake is impaired due to chloride, and the 50 percent impervious coverage of the District creates the potential for significant chloride loading elsewhere.

### Regulation Issue Statements

1. Stormwater regulation can be confusing to permittees and inefficient at times because it is not consistent across jurisdictions.
2. Water quality goals may not be achieved because current stormwater regulations do not adequately address all pollutants, emerging contaminants of concern, loading sources, and environmental pressures present in a highly urbanized watershed.
3. Water quality issues are exacerbated by inconsistent maintenance of stormwater and erosion and sediment-control practices.



**Water collection and reuse system at Allianz Field**



## Regulation Goals

- R-1** Achieve the District's 1.1 inch volume retention standard and other performance standards on 100% of redevelopment projects disturbing 1 acre or more of land
- R-2** Work with agency partners to provide consistent and efficient stormwater regulations and controls across jurisdictions
- R-3** Meet with agency partners every 2 years to ensure that stormwater regulations reflect the most pressing water quality issues, current research, and science to make progress in protecting and improving water and natural resources
- R-4** Work with agency partners to evaluate and consider regulations for deicing practices
- R-5** Work with agency partners to evaluate and develop requirements for stormwater management on sites disturbing less than 1 acre of land
- R-6** Support the state's efforts to develop comprehensive water reuse policy and guidance and updates to the state plumbing code
- R-8** Work with partners to improve coordination and processes on overlapping aspects of regulatory programs:
  - a. Review of permit applications early in the project design phase
  - b. Detection and elimination of at least 20 illicit discharges over 10 years
  - c. Inspection and enforcement during and after construction
- R-9** Identify and implement ways to improve engagement with developers, engineers, and applicants
- R-10** Identify and leverage opportunities that combine incentives for green infrastructure with regulations to address District and partner goals



**CRWD coordinates with permittees during inspections**

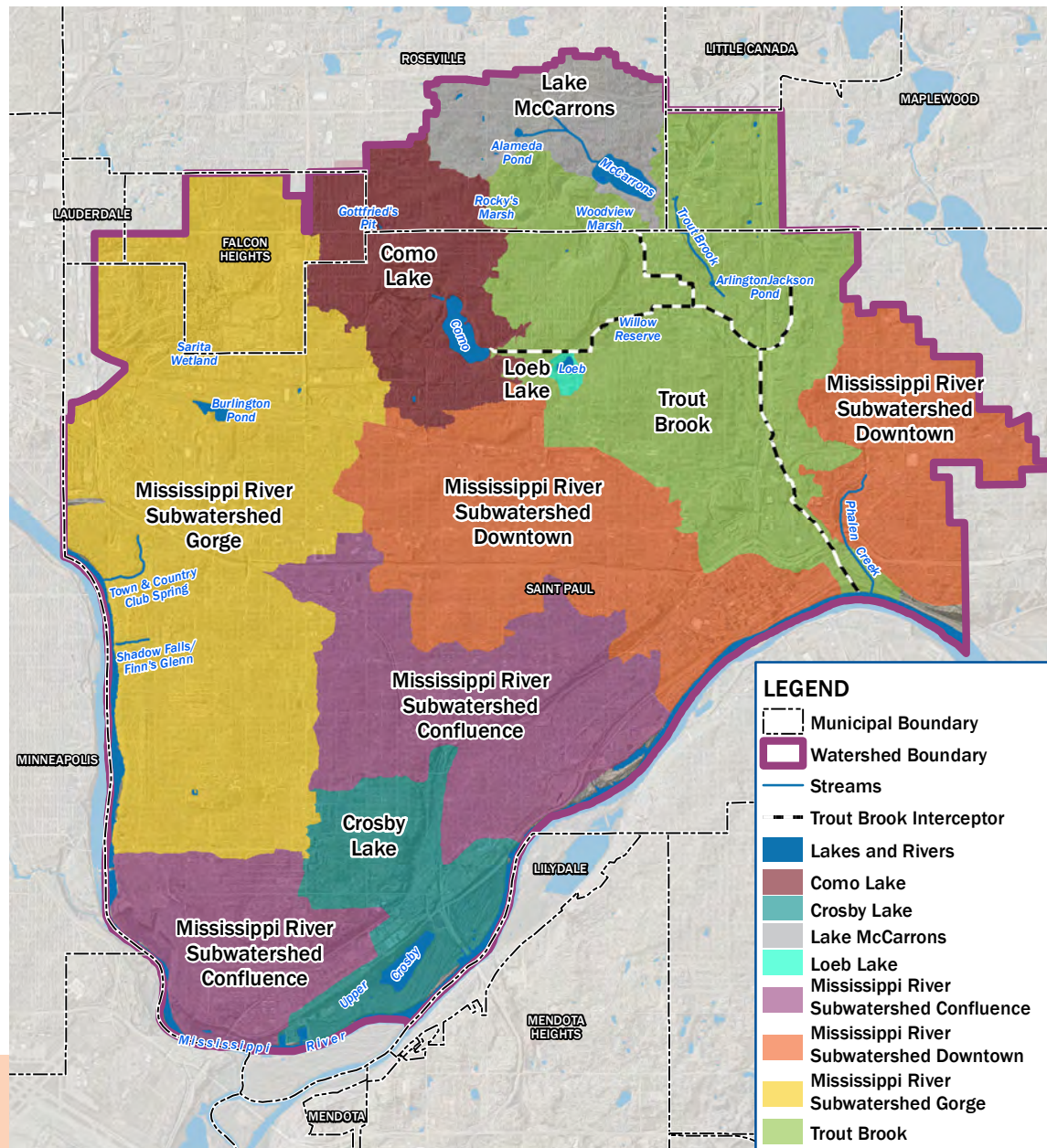




## 2.8. Infrastructure Management Issues and Goals

Stormwater management infrastructure must be properly maintained to achieve its intended performance. Cities and other municipal separate storm sewer (MS4) permit holders, including the District, are generally responsible for maintaining their own stormwater management systems in accordance with system maintenance plans detailed in each entity's Stormwater Pollution Prevention Program (SWPPP) and local water management plan, if applicable.

The District operates and is responsible for maintaining the 6 mile long TBI, a large storm sewer system draining the Trout Brook watershed (Figure 2-11). The system includes tunnels ranging in size from less than 3 feet to 13 feet in diameter (or height) and consisting primarily of reinforced concrete with some sections of brick and limestone block. The TBI was owned by the Metropolitan Council until 2006 when ownership was transferred to the District. The City of Saint Paul owns and operates the last half-mile section of the TBI. As the owner and operator of the TBI, the District is required to maintain a National Pollutant Discharge Elimination System (NPDES) MS4 permit. The District's MS4 permit includes specific requirements related to the maintenance of District-owned stormwater



**Figure 2-11: Trout Brook Interceptor (TBI)**

The TBI storm sewer carries runoff from the Trout Brook, Como Lake, and Lake McCarrons watersheds.





**Green Line light-rail transit rain garden** Image credit: Adrian Danciu

infrastructure. Due to its age, size, and drainage area, the inspection and maintenance of the TBI is a critical responsibility of the District.

Maintenance responsibilities for shared BMPs are typically defined for each project in a cooperative agreement between the District and its partner(s). In some cases, the District has assumed ownership and/or maintenance responsibilities for BMPs initially constructed by its partners. Private entities are generally responsible for maintenance of privately owned infrastructure through maintenance agreements with the permitting entity (the city or the District).

As existing infrastructure ages and new BMPs are constructed by the District and its partners, management and maintenance of infrastructure becomes an increasingly complex and expensive task. As of 2020, the District is responsible for maintaining over 30 individual stormwater management BMPs in addition to the TBI. This number will continue to grow with the implementation of this Plan. Some entities may lack the resources and capacity to perform maintenance activities. In addition, maintenance of shared, stacked green infrastructure may require coordination of several entities managing different elements of the practices. The District will explore opportunities to coordinate inspection and maintenance of BMPs to ensure continued functionality and performance over their life spans. Coordinated efforts will improve efficiency and reduce costs of inspecting and maintaining BMPs.



**Trout Brook Interceptor repair project**





## Infrastructure Management Issue Statements

1. Stormwater infrastructure does not achieve desired performance if consistent and adequate inspection, maintenance, and management is lacking.
2. Stormwater infrastructure that is reaching the end of its expected life will need to be replaced or rehabilitated at significant cost due to age and degradation.
3. Regular, necessary inspection and maintenance of stormwater infrastructure may not occur because grantees, permittees, and other partners do not have adequate knowledge, capacity, and/or resources to perform these actions.

## Infrastructure Management Goals

- IM-1** Achieve desired performance of District-owned and funded stormwater infrastructure through regular inspection of all District-owned and funded infrastructure, consistent routine and non-routine maintenance, and replacement according to individual infrastructure operation and maintenance plans
- IM-2** Establish effective and efficient long-term management approach(es) for publicly owned stormwater management systems, including individual, shared, and/or regional systems
- IM-3** Support our public and private partners in the maintenance of stormwater infrastructure by developing and implementing a stormwater infrastructure maintenance service program
- IM-4** Offer BMP inspection and maintenance support to District grantees to ensure at least 90% of District grant-funded projects meet their design goals annually
- IM-5** Develop and implement program(s) for inspection of District-permitted and other privately owned stormwater infrastructure
- IM-5** Work with partners to assess inspection and maintenance needs and costs for regional stormwater management systems, identify partner roles, and develop an approach/program for regional stormwater systems
- IM-6** Increase public and private sector knowledge of stormwater BMP inspection and maintenance by offering or promoting annual education and training programs by others

## 2.9. Organization Issues and Goals

The District performs many functions consistent with its statutory duties and is one of many entities with water management authority within the watershed. Clear roles and responsibilities, administrative processes, and funding sources are necessary for the District to accomplish its many goals efficiently. Coordination with cities and other partners is also necessary to limit redundancies, leverage strengths and resources, and take advantage of opportunities to pursue shared goals. Regular evaluation of District programs and accomplishments will allow the District to assess progress and make informed planning decisions following an adaptive management approach.

The District recognizes that making meaningful progress on issues within and beyond its jurisdictional boundary (e.g., Mississippi River water quality, climate resiliency) is a shared responsibility of all stakeholders. The District seeks to inspire residents, cities, and other water management authorities through innovation, research, and organizational leadership.

The extent to which the District may implement programs, projects, and capital improvements is limited by the availability of both financial and human resources. The District must target and prioritize its planned activities to maximize water quality, flood-risk reduction, ecosystem health, and other benefits while efficiently using its limited resources in a manner that is both fiscally and scientifically sound.

The District levies taxes through its authority under [MN Stat. 103D](#) and [Minnesota Statutes 103B](#) to fund programs, projects, and capital improvements. Local funding sources are insufficient to implement all of the District's planned activities. The District recognizes the economic impact on its residents and pursues cost-share partnership opportunities and grant funding to offset costs to the District and its tax base.

The District seeks to equitably implement its projects and services consistent with the goals of its Strategic Plan. Historically, District projects have been concentrated in the Como Lake watershed, Lake McCarrons watershed, and other limited areas. In 2018, the District analyzed hundreds of grant-funded projects and found significantly less program participation in the central and eastern portions of the District (Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds). These subwatersheds also correspond to areas of racially concentrated poverty (ACP50; see [Introduction, Figure 1-7](#)). The overlapping gaps in project distribution and ACP50 geography offer a lens to help the District achieve diversity, inclusion, and equity goals through targeted implementation of District grant programs, community engagement activities, planning efforts, and others.



**Native plants help soak up polluted runoff** Image credit: Sara Rubinstein





## Organization Issue Statements

1. Assessment of all District projects and programs has not been conducted on a regular and/or formal basis to determine progress and success in accomplishing goals in a cost-effective manner.
2. Potential for gaps, conflicts, and redundancies in stormwater management roles exist due to multiple entities involved in managing stormwater runoff with different requirements, interests, and needs.
3. All District goals cannot fully be achieved due to insufficient funding.
4. Implementation of District projects and programs across all District communities is limited by the District's capacity to engage the many evolving, diverse communities and stakeholder priorities present within the District.
5. Areas and communities within the watershed have been underserved due primarily to prior District projects.

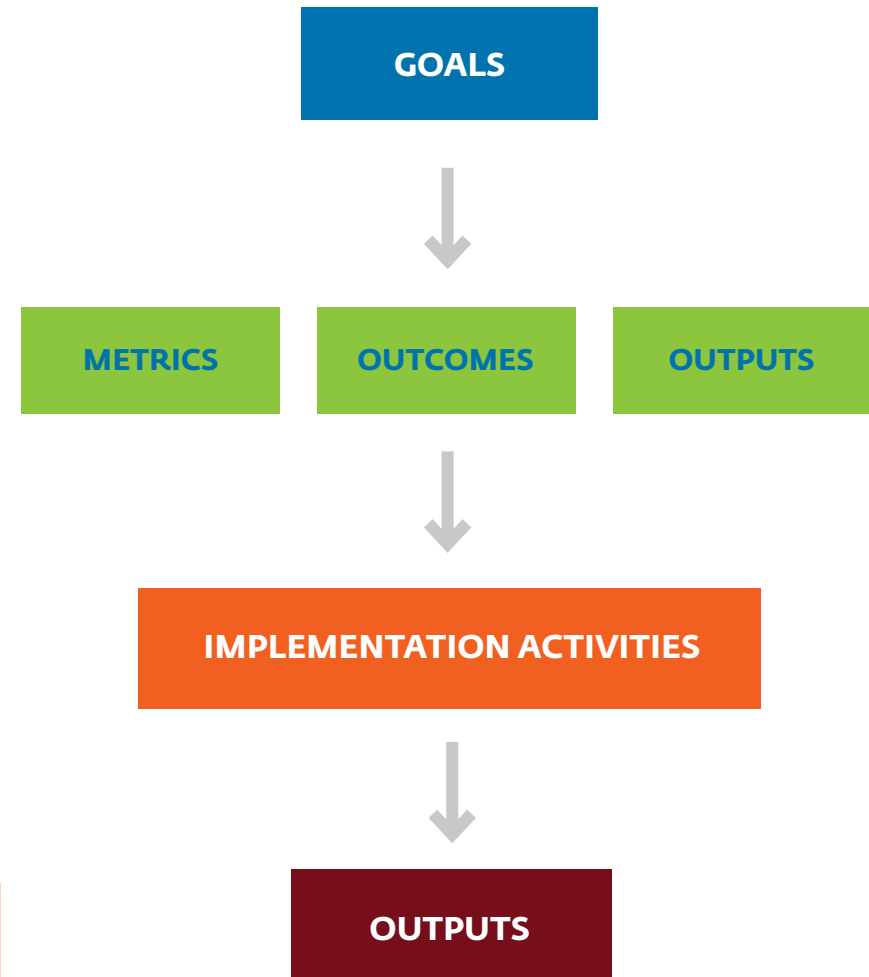
## Organization Goals

- 0-1 Foster equitable implementation of all District programs and projects across the watershed by engaging traditionally underserved populations and expanding geographic reach into the Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds
- 0-2 Assess District programs, activities, and water governance within and adjacent to the District through an equity lens and make recommendations for consistent, equitable, and efficient water resource management
- 0-3 Ensure that high value and multiple benefits are derived from funds spent on District projects and programs through planning, adaptive management and biannual evaluation of progress
- 0-4 Advance the field of water management through demonstration, research, and monitoring of innovative technologies and practices with partners
- 0-5 Maintain and enhance the capacity of the District to achieve water and natural resource management goals by:
  - a. Expanding existing and creating new partnerships with government agencies, institutions, and non-profits to improve water resource management.
  - b. Identifying and expanding public-private partnership opportunities for incorporating water and natural resource improvements into redevelopment projects (i.e., local chambers of commerce and business councils, Saint Paul Port Authority, redevelopment companies).
  - c. Pursuing non-traditional state grant funding and exploring other funding mechanisms to support District and partner activities.
  - d. Expanding the District's role as a thought leader and advocate for sustainable water resource management.
  - e. Recruiting and retaining high-quality staff and volunteers including CAC members and resident volunteers.

## 2.10. Goal Measurability

District goals presented in this section range in specificity; some are applicable District-wide, while others are specific to individual water resources. Where applicable, District goals contain measurable metrics or outcomes that may be used to evaluate success (e.g.,  $\mu\text{g/L}$  of phosphorus or % pollutant reduction). Some goals contain interval-based outputs (e.g., five lakes monitored annually, 15 BMPs installed per year); where an interval or timeline is not explicitly established within the goal language, the 10-year planning period may be considered as the default timeline for achieving the goal. Some District goals do not have obvious measurable indicators, or the baseline by which progress will be assessed is not yet known. To assess progress towards these goals, the District will evaluate the output of implementation activities associated with each goal.

The District has correlated each goal with one or more of the planned implementation activities ([Appendix G](#)). Each of the implementation activities includes quantified, measurable outputs. The outputs correlated with each goal will be tracked biannually by the District to assess progress towards each goal. The achievement of the measurable outputs are highly dependent on complementary partner projects, interest, funding, schedule and capacity. The District will use this information in its assessment and reporting see [Section 3.8](#)).



**Figure 2-12:**  
**Measurability of qualitative and quantitative goals**





# IMPLEMENTATION PLAN



## SECTION 3: IMPLEMENTATION PLAN

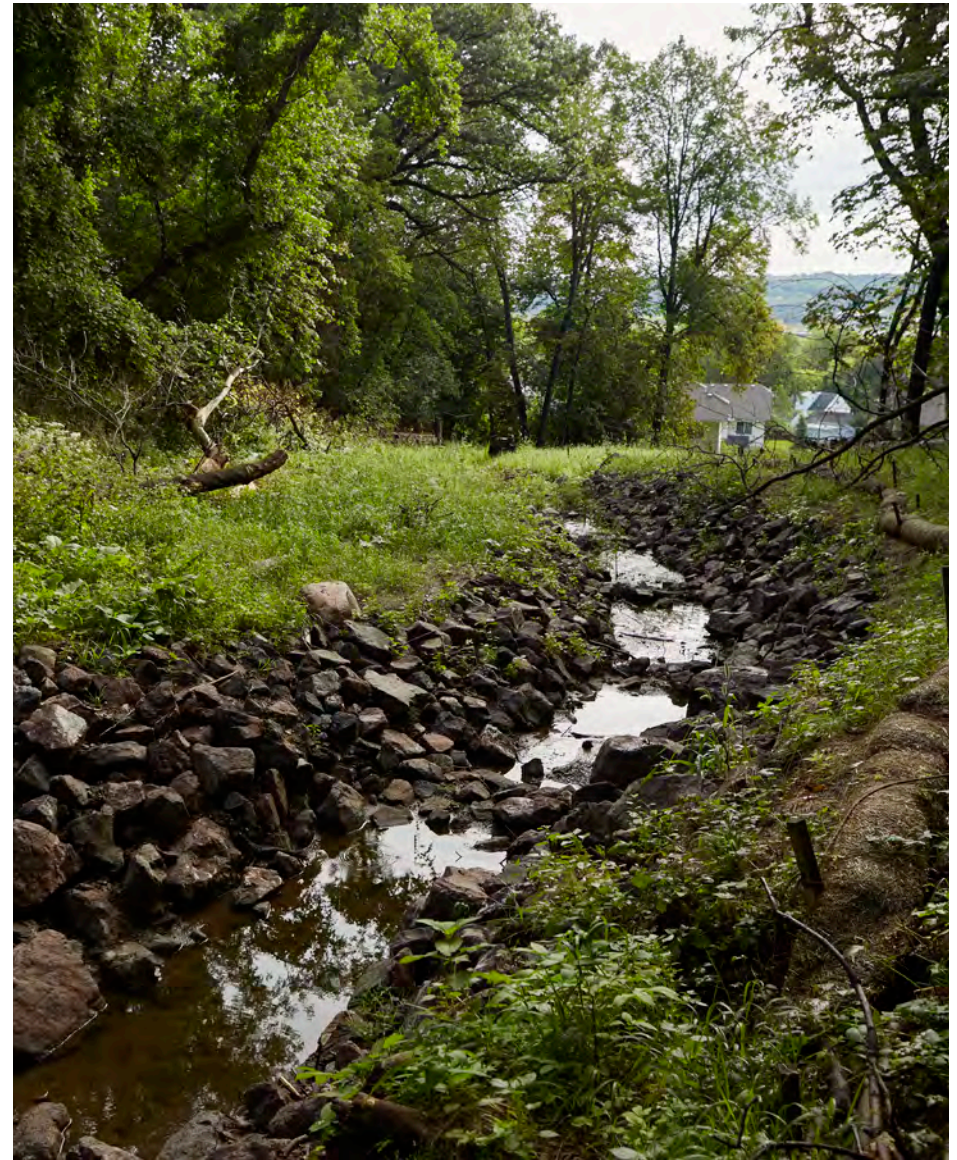
The implementation plan summarizes the activities the District seeks to accomplish during the 10-year life of this Plan to achieve the District's goals and its overall mission. The implementation plan includes specific program areas, projects, and capital improvements. Methods for prioritizing and funding programs, projects, and capital improvements are also discussed in this section.

### 3.1. Implementation Plan Structure

The District's implementation plan is organized into the following major categories:

1. Administration – 100 series
2. Programs – 200 series
3. Projects– 300 and 400 series

The Administration and Program categories generally include ongoing activities performed primarily by District staff including monitoring, assessment and research, communications and engagement, grants, facility/infrastructure management and regulations. The Projects category includes two subcategories: the 300 series is typically for feasibility studies, modeling efforts, planning, and operational work while the 400 series is for CIPs including engineering/design and construction activities. The organization of the implementation plan mirrors the District's annual budgeting to promote consistency and funding availability. The program and project categories included in the District's implementation plan are listed in [Table 3-1](#) and summarized in this section. For assessment and reporting purposes, the District cross-references all activities in the implementation plan to applicable District issues and goals ([Table 3-6](#)).



**Highland Ravine stabilization project** Image credit: Adrian Danciu



**Table 3-1 : District 2021-2030 Implementation Categories**

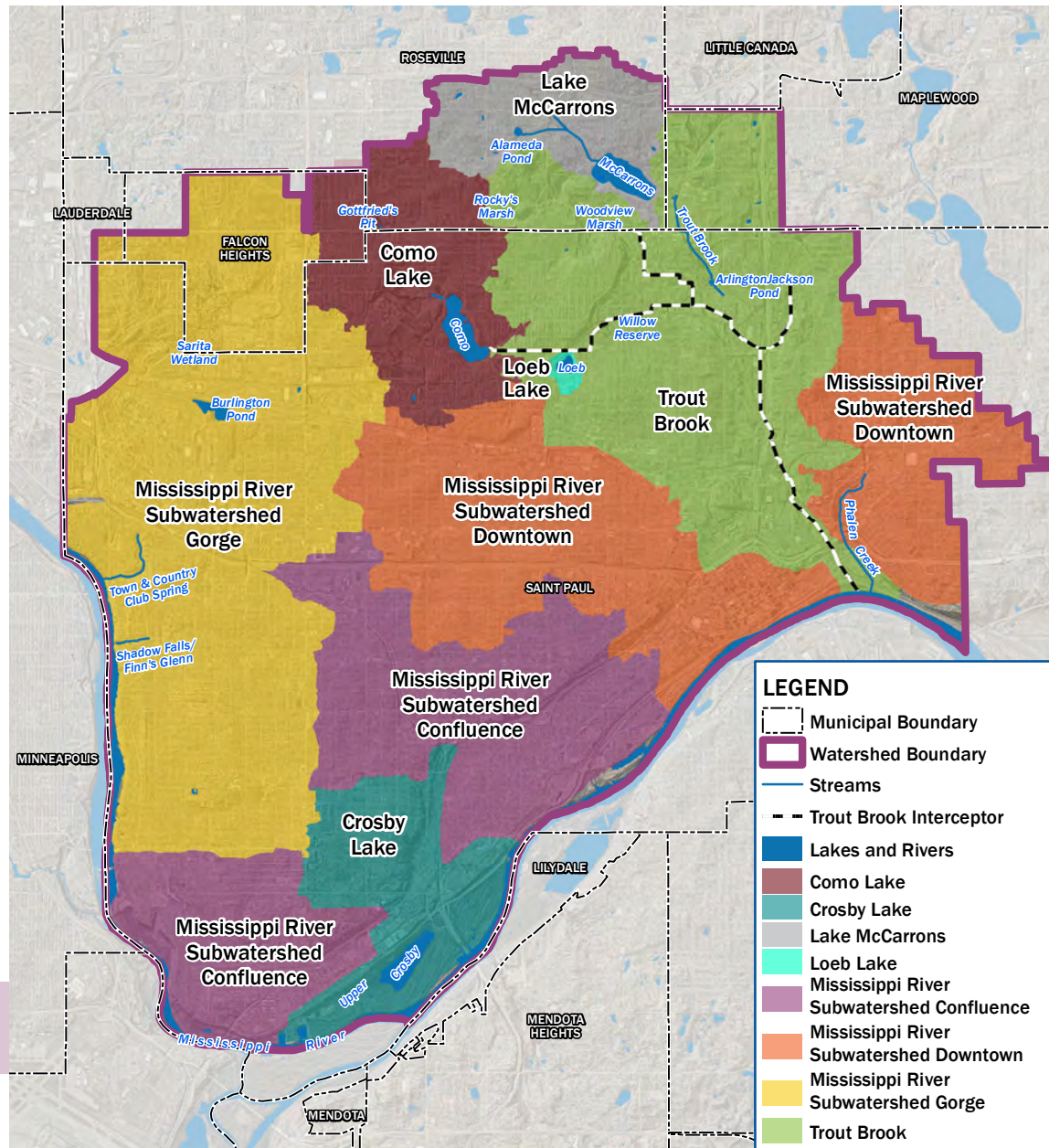
Type	Code	Category
<b>Admin</b>	101	Administration
<b>Programs</b>	208	Regulatory Program
	210	Grants Program
	211	Monitoring, Data Assessment, and Research Program
	220	Communications and Engagement Program
	222	Facility (Infrastructure) Management Program
<b>Projects Planning, Design, and Capital Improvements</b>	302/402	Groundwater
	305/405	Como Lake Subwatershed
	310/410	Lake McCarrons Subwatershed
	313/413	Loeb Lake Subwatershed
	315/415	Trout Brook Subwatershed
	317/417	Crosby Lake Subwatershed
	325/425	Wetland, Stream, and Ecosystem Restoration
	331/431	Mississippi River Gorge
	332/432	Mississippi River Confluence
	333/433	Mississippi River Downtown
	375/475	Watershed-Wide Planning and Assessment

Many planning/study projects (300 series) and CIPs (400 series) are organized into eight subwatershed planning and implementation geographies ([Table 3-1](#)). Subwatershed assessments and plans already completed (e.g., [Como Lake Management Plan in 2019](#)) or planned (e.g., Trout Brook subwatershed assessment starting in 2021) support the activities planned in each geography. Subwatershed management areas are presented in [Table 3-1](#) and include the following:

- Como Lake – 305/405 series
- Lake McCarrons – 310/410 series
- Loeb Lake – 313/413 series
- Trout Brook – 315/415 series
- Crosby Lake – 317/417 series
- Mississippi River gorge (Saint Anthony Park and Mississippi River Boulevard subwatersheds) – 331/431 series
- Mississippi River confluence (Hidden Falls, Davern, Crosby, West Kittsondale, East Kittsondale, West Seventh, and Goodrich-Western subwatersheds) – 332/432 series
- Mississippi River downtown (Saint Anthony Hill, downtown, Phalen Creek and urban subwatersheds) – 333/433 series

Subwatersheds within in each geographic management areas are presented in greater detail in Figure A-2 of [Appendix A](#). There are three categories of the District's project work that are applicable watershed-wide and are not based on subwatershed areas: :

- Groundwater—302/402 series
- Wetland, stream, and ecosystem restoration—325/425 series
- Watershed-wide planning and assessment—375/475 series



Specific planned activities within each program/project category are detailed in [Table 3-5](#). Table 3-5 also includes a summary of information for each activity, including the following:

- Activity ID number (e.g., 208A)
- Activity title
- Priority level (see Section 3.2)
- Target geography/resource (if applicable)
- Measurable outputs of the activity
- Role of the District as a leader (L) or partner (P)
- Potential partners
- Estimated total District cost over the 10-year Plan life (planning-level)
- Proposed year(s) of implementation
- Estimated annual cost

All costs are intended for planning purposes only and are presented in 2020 dollars with an assumed 3% annual escalator to account for inflation. Costs summed by program/project category are summarized in [Table 3-2](#).

**Figure 3-1: Watershed Planning Area**



**Table 3-2: District 2021-2030 Implementation Categories**

Program											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
<b>100 Admin</b>	\$968,000	\$1,003,000	\$1,027,000	\$1,064,000	\$1,090,000	\$1,128,000	\$1,156,000	\$1,197,000	\$1,226,000	\$1,263,000	<b>\$11,123,000</b>
<b>200 Programs</b>	\$3,198,000	\$3,396,000	\$3,868,000	\$4,010,000	\$4,254,000	\$4,532,000	\$4,646,000	\$4,832,000	\$5,132,000	\$5,347,000	<b>\$43,215,000</b>
<b>300 Projects</b>	\$1,452,000	\$1,301,000	\$1,182,000	\$1,265,000	\$1,007,000	\$1,008,000	\$1,020,000	\$958,000	\$1,131,000	\$1,023,000	<b>\$11,348,000</b>
<b>400 CIP</b>	\$6,391,000	\$3,405,000	\$2,874,000	\$3,241,000	\$4,556,000	\$3,499,000	\$4,649,000	\$4,155,000	\$4,410,000	\$6,424,000	<b>\$43,604,000</b>
<b>Total</b>	<b>\$12,009,000</b>	<b>\$9,105,000</b>	<b>\$8,951,000</b>	<b>\$9,580,000</b>	<b>10,907,000</b>	<b>\$10,167,000</b>	<b>\$11,471,000</b>	<b>\$11,142,000</b>	<b>\$11,899,000</b>	<b>\$14,057,000</b>	<b>\$109,290,000</b>

Note: Estimated costs are presented for planning purposes only and include inflation at an assumed 3% annual rate.

**Flowers at Trout Brook Nature Sanctuary**

Image credit: Caroline Yang

**Willow Reserve restoration project**

Image credit: Adrian Danciu

## 3.2. Prioritization and Targeting

The District prioritizes programs, projects, and activities to promote efficient use of finite staff and financial resources. As part of Plan development, each activity included in [Table 3-5](#) has been assigned one of the following three priority levels:

**Critical** – activities necessary to perform the core functions and statutory duties of the District, as required by law, rule, or statute.

**Important** – activities led by the District in support of its goals and objectives but not required by law, rule, or statute, do not rise to the level of “critical.”

**Beneficial** – activities aligned with District goals and objectives but likely to be deferred to a future date, performed only if an opportunity arises, or to be led by District partners, with the District supporting the activity through limited funding, technical assistance, and/or other cooperative efforts.

This classification system is qualitative and intended to serve as a guide for annual work planning and budgeting (see [Section 3.6](#)). Classification of an activity as critical, important, or beneficial does not, by itself, determine implementation of an activity relative to other activities or its planned schedule in [Table 3-5](#).

Activities in the annual work plan may be accelerated, delayed, delegated, or abandoned relative to the 10-year implementation plan. For example, activities led by partners may be implemented earlier or later than planned due to changing partner priorities, funding, and schedules.

Factors considered in the development of the annual work plan may include the following:

- Annual budget commitments from previous years (i.e., ongoing responsibilities)
- Available tax revenues, grants, and cost-share funding (e.g., from cities or agencies)

- Activity priority (see [Section 3.5.1](#))
- Feasibility
- Risk (of performing or not performing the activity)
- Results of monitoring or studies
- Input from TAC, CAC, and partners
- Consideration of balance with other proposed projects and programs

If planned implementation actions must be deferred due to a recession or significant economic downturn, prioritization will be given to activities on their classification as critical, important, or beneficial and the applicable factors listed above.

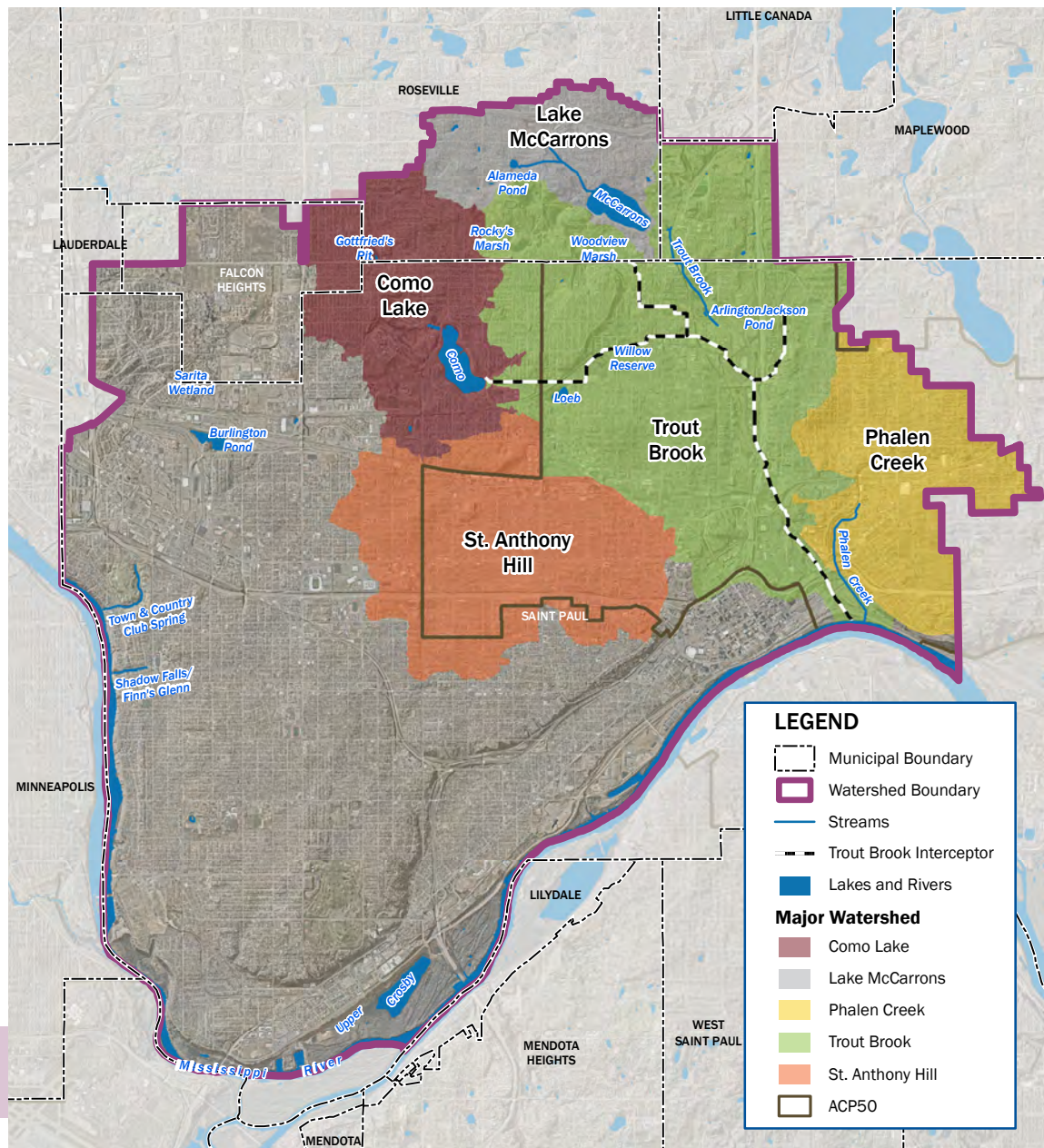
Ultimately, the implementation plan ([Table 3-5](#)) is a statement of intent by the District. Final decisions on implementation activities rest with the District’s Board of Managers to budget for and authorize via the annual work plan.

The programs and projects identified in [Table 3-5](#) are also targeted, where applicable, to specific geographies within the District. As part of Plan development, the District established the following overall priority geographic areas (of equal importance) with consideration of District natural resources, water quality goals, stakeholder input, and/or geographic distribution of water quality improvement projects:

- Trout Brook subwatershed
- Phalen Creek subwatershed
- Saint Anthony Hill subwatershed
- Como Lake subwatershed
- Lake McCarrons subwatershed

The Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds were selected as priority geographic areas because fewer water quality improvement projects funded through the





District's Stewardship Grant Program have been implemented in these areas compared to other areas of the District. These subwatersheds also correspond to areas of racially concentrated poverty (ACP50) (Section 1.2). These areas are presented in Figure 3-2. The District is using the overlapping gaps in project distribution and ACP50 geography as a lens to help us achieve diversity, inclusion, and equity goals and to focus implementation activities including District grant programs, public engagement activities, planning efforts, and others.

Como Lake and Lake McCarrons subwatersheds were also selected as priority geographic areas to continue to make progress towards achieving their water quality and ecosystem health goals and build off significant investments made by the District and its partners over the past 10 years.

Selection of high-priority areas for targeting District work does not preclude work in other areas of the watershed. The District will continue to pursue opportunities to implement water and natural resource programs and projects throughout the watershed, especially where and when partners anticipate activities complementary to District goals.

**Figure 3-2: District Plan Implementation Priority Areas**

### 3.3. Administration (100 level)



**Left to right: Joe Collins, President; Rick Sanders, Treasurer; Mary Texer, Vice President; Seitu Jones, Secretary; Mark Doneux, Administrator; Not pictured: Shawn Murphy, Manager** Image credit: Becca Dilley

#### General Administration – 101A

The District administration work includes ongoing activities that recur annually to satisfy Minnesota Rules for watershed districts and those that pertain to the organization, administration, and coordination of programs, services, and facilities provided by the District. It includes supporting the District's Board of Managers, preparing for Board workshops and meetings, development of the annual budget and levy, the annual audit, and preparation of an annual report of the previous year's activities and accomplishments.

#### Citizen Advisory Committee – 101B

The District's work is supported by a CAC comprised of District residents. In 2020, there were 15 members. The CAC provides input to the Board of Managers on organizational development, planning processes, and program implementation. CAC meetings are held once a month. CAC administration costs are reflected in general administration #101A.

#### External Funding Opportunities – 101C

The major sources of CRWD funding are local tax revenue, partner funds and state Clean Water Fund grants. CRWD will identify and pursue other funding sources (e.g., other grants, special tax districts, environmental improvement bonds) to augment traditional sources.

#### Program Effectiveness Assessment – 101D

The District will evaluate its progress towards meeting the Plan goals and objectives on a biannual basis. The procedure for this review is described in [Section 3.8](#). Based on the findings of the biannual review, the District may conduct a Plan amendment as described in [Section 3.9](#).

#### Office Operations – 101E

The District owns its office building and site at 595 Aldine Street in Saint Paul, Minnesota and the adjacent parcel at 1736 Thomas Avenue. The District is responsible for facility and site management, maintenance, and repairs of both parcels. The District will evaluate the need and potential uses for the 1736 Thomas building and site within the 10year Plan implementation period.

#### Minnesota Association of Watershed Districts (MAWD) Support – 101F

The District provides office space and administrative and programmatic support to the Minnesota Association of Watershed Districts.





**CRWD's new office in the Hamline-Midway neighborhood** Image credit: Steve Silverman

### **Safety Program – 101G**

The District's comprehensive safety program outlines the policies, procedures, and best practices to ensure the safety of staff and others in the workplace and minimize the frequency and severity of accidents. The District conducts annual safety training, provides monthly safety reminders and updates to staff, updates procedures and operations as needed, and audits the safety program every 3 years.

### **Diversity and Inclusion Program – 101H**

The District values diversity and inclusion and can achieve cleaner waters through engagement across communities. The District is working to achieve the goals and actions of its Diversity Strategic Plan. The goals include (1) expanding the District's internal awareness of the opportunities and challenges related to creating a more diverse and inclusive environment, (2) deepening relationships with many communities by increasing outreach, (3) increasing organizational diversity and inclusion efforts, and (4) being a leader in diversity and inclusion initiatives.

### 3.4. Programs (200 level)

#### 3.4.1 Regulatory Program – 208

[State statute 103D](#) provides for and requires watershed districts to adopt Rules. In 2006, the District adopted water quality and stormwater management rules, as well as a permitting program to implement these rules. The [District Rules](#) apply to stormwater management, flood control, wetlands, erosion and sediment control, and connection to the TBI. These rules require stormwater management permits for construction projects disturbing 1 acre or more of land. As redevelopment occurs, it is important to incorporate stormwater management facilities into site designs that capture 1.1 inch of rainfall over all newly constructed impervious surfaces. As new science identifies more efficient and/or necessary volume control, water quality treatment, or erosion and sediment control approaches, District rules are reviewed and updated. The last District Rule update occurred in 2019.



**District staff inspecting the Smith Bridge Project**

Image credit: Sara Rubinstein

#### General Permitting Implementation – 208A

The District implements a permit application and review program per the authority granted in [Minnesota Statutes 103D](#) to ensure compliance with the standards outlined in the [District Rules](#). Issuing permits provides a mechanism to enforce the Rules and require proper erosion and sediment control and stormwater management. It also provides the District the authority to require BMP maintenance. District staff enforce permit requirements during and post-construction.

Current District rules are available from the District website at:

<https://www.capitolregionwd.org/permits/watershed-rules/>

#### Coordinated Erosion and Sediment Control Inspections – 208B

During construction, sites are inspected for compliance with local and state erosion and sediment control regulations. Multiple jurisdictions and layers of regulation can result in duplicative efforts or inconsistent messaging regarding on-site inspection and enforcement. A process to streamline and coordinate efforts across jurisdictions will be developed to benefit both the regulated entities and the regulators.

#### Permittee Post-Construction BMP Inspections – 208C

Stormwater BMPs have been implemented on permitted projects for over 10 years. The District will work with partners to ensure BMPs are inspected, maintained, and repaired to ensure function and compliance with District Rules.

#### Engagement Activities with Permittees, Developers, Engineers, and Applicants – 208D

Ensuring that the regulated community understands District stormwater requirements is important to creating an efficient permit review and approval process. The District will offer the



private development community an opportunity to provide input on their experiences with regulation. Their input will inform District efforts in engagement and technical support in the Regulatory Program.

### **Rules Evaluation and Update – 208E**

The District currently implements Rules that address water quality and quantity, erosion control, wetland protection, illicit discharges in the TBI, and floodplain management. The District will periodically evaluate its regulations to ensure adequate progress towards meeting water quality goals and standards and addressing other pollutants. The District will focus on keeping these Rules clear and up-to-date with revisions as needed, improving compliance and inspections, and coordinating District Rules with other local, state, and federal regulatory requirements. The District may also consider a general permit for routine activities such as maintenance and repairs of dock walls and other shipping operations. In addition, the District will evaluate the cost cap for linear projects and the stormwater impact fund approximately every 2 years. Rules evaluation and updates may be triggered by updates to state or partner standards (e.g., MS4 permits), in response to monitoring and/or study results (e.g., climate and precipitation trends), or at the request of partners.

### **Deicing Practices Rule – 208F**

Source control is the only effective method to reduce impacts from road salt. The District will work with partner agencies to evaluate and implement strategies to regulate chlorides in years 4 and 5 of Plan implementation after development of a District chloride assessment and reduction plan.

### **Stormwater Rule Requirements on Sites Less than 1 Acre – 208G**

Water quality and volume reduction practices are not consistently implemented throughout the watershed on sites less than

1 acre. The District will work with partners in years 2 and 3 of Plan implementation to determine appropriate stormwater regulation and implementation strategies for sites less than 1 acre.

### **District Illicit Discharge Detection and Elimination (IDDE) Plan Implementation – 208H**

Working with public partners, the District will seek to improve regulations on the identification and elimination of illicit discharges to the stormwater system. In addition, the District will offer technical assistance to District cities, businesses, institutions, and other property owners in the elimination of illicit discharges. An Illicit Discharge Detection and Elimination (IDDE) Plan outlining action steps was completed in 2019 (CRWD, 2019).

### **Green Infrastructure Incentives in District Rules – 208I**

Implementation of green infrastructure practices is not a current District Rule requirement for stormwater management. The District will explore methods, such as regulatory incentives, to increase implementation of green infrastructure on permitted projects in years 2 and 3 of Plan implementation.

### **Industrial Stormwater Permittee Coordination – 208J**

Industrial Sector Stormwater NPDES Permit sites may have high pollutant loads and increased potential for illicit discharges. The District will work with partners to assess compliance on industrial permit sites and provide assistance with inspection, enforcement, and technical information to improve compliance rates.

### **Water Reuse Policy Support – 208K**

Water reuse in Minnesota and within the District is an increasingly viable approach to conserving water resources and managing stormwater runoff (MDH, 2018). Statewide comprehensive policy or guidance on water reuse does not currently exist. The District will support the state's efforts to develop a comprehensive water reuse policy and guidance and updates to the state plumbing code.

### 3.4.2 Grants Program – 210

The District implements several grant programs targeting different audiences that provide financial and technical assistance to implement practices that protect local lakes and the Mississippi River. Much of the land in the District is already developed and privately owned, so working with residents, schools, faith organizations, and businesses to build clean water projects supported by grant funding is essential for improving water quality.

The District grant programs are described in the following sections and are summarized in [Table 3-3](#). Correlation between each grant program and the goals established in this Plan are presented in [Table 3-6](#). Estimated expenditures related to each grant program are included in [Table 3-5](#).

**Table 3-3: District Grant and Cost Share Program Summary**

Program Number	Program Name	Purpose	Eligible Recipients	Range of Award	Application Timeline
210A	Stewardship Grants	Provide design and financial assistance to homeowners, business, schools, and community organizations to build projects to reduce stormwater pollution	District cities, homeowners, businesses, schools, and community organizations	Up to \$150K	All year
220L	Partner Grants	Provide financial assistance to community, arts, and environmental organizations; schools; and faith-based groups to promote clean water actions	Community organizations, schools, faith-based institutions, and others who will work in the District	\$2K-\$20K	Once/year, Fall
210G	Well Sealing Grants	Provide financial assistance to landowners to seal abandoned wells to reduce groundwater contamination potential	District landowners with abandoned wells	50% of cost up to \$750	All year
210H	Planning Grants	Provide financial assistance to public, private, and non-profit organizations for feasibility and design of large-scale, cost-effective and/or innovative projects to improve water resources	District public, private, and non-profit organizations	Up to \$50K	All year



Criteria for grant applications and awards vary according to grant program. Grant applicants are encouraged to contact the appropriate District staff for individual program information. Criteria may include, but are not limited to:

- Will the project improve water quality and/or reduce stormwater runoff?
- Are project results measurable?
- Does the proposal include a reasonable budget, work plan, and timeline?
- Is the site highly visible, or does it have a potentially high educational value?
- Is the project located in a high-priority subwatershed?
- Does the project have an educational component?
- Are local citizens involved in planning and implementing the project?
- Does the project involve partners with other organizations or groups?

Current grant program information is available from the District at: <https://www.capitolregionwd.org/grants/>

### Stewardship Grants – 210A

The District will continue to encourage District residents, businesses, schools, non-profits, and others to adopt clean water practices by offering technical assistance and cost-share grants. The Stewardship Grant Program includes communication and coordination with interested property owners, site visits, plan designs, grant administration, and project implementation assistance. Projects generally focus on water quality improvement with consideration for other natural resource benefits (e.g., native vegetation and pollinator habitat)

### Stewardship Grant Outreach – 210B

For nearly 15 years, hundreds of property owners in the District have implemented clean water projects through the District's grant program. However, a majority of the grant-funded projects have been concentrated in the western half of the District. The District wants to expand outreach and promotion of the Stewardship Grant Program in underserved areas to increase diversity of project participants and provide equitable access to the grant program. The District will consider targeting promotion to sites with underutilized parking lots and other areas of high imperviousness.



**Stewardship Grantee Bang Brewing's rain gardens**

Image credit: Sara Rubinstein

### Stewardship Grant Project Inspection and Maintenance Assistance – 210C

The District will ensure grant project success by conducting annual inspections of previously constructed BMPs and identifying areas of improvement for the first 5 years. BMP maintenance workshops, maintenance guides, individual assistance, and other types of technical support will be offered to grantees.

### Target Site Identification – 210D

The District grants program will target recreational centers, libraries, ice rinks (Saint Paul Frogtown and Oscar Johnson), and other community gathering places for site investigations because of their high potential for water quality treatment, visibility to broad and diverse audiences, and other community benefits. The District will conduct field investigations and desktop analyses in three phases (Plan implementation years 2, 5 and 9) to identify suitable sites and initiate property owner outreach.



**Family cares for their Stewardship Grant rain garden**

Image credit: Sara Rubinstein

### Right-of-Way (ROW) Projects – Boulevard Rain Gardens – 210E

The District will continue to leverage municipal street reconstruction projects for implementation of rain gardens in boulevards, medians, or other ROW spaces to reduce stormwater volumes and pollution, increase native, pollinator-friendly vegetation, and enhance aesthetics in neighborhoods. As part of District cities' projects, the District will investigate the potential for constructing boulevard rain gardens and, where feasible, provide designs and financial assistance for construction. The District will review and evaluate the District cities' street reconstruction schedules for potential opportunities.

### Well-Sealing Grants– 210F

Abandoned, unsealed wells provide a direct pathway for contaminants to enter groundwater. The District will continue to provide well sealing grants to protect local groundwater resources.

### Large-Scale Site Planning Grants – 210G

The District will continue to offer planning grants for studying the feasibility and developing concept designs for cost-effective and/or innovative projects that retain water and protect and improve the water quality of waterbodies within the District.

### Chloride Reduction Grants – 210H

After development of the District Chloride Reduction Plan in years 1 and 2, the District will develop and implement an incentive-based program for chloride reduction strategies (e.g., alternative deicing agents, equipment upgrades) for public and private winter maintenance organizations. The available funding, time period, and eligibility criteria will be determined.

### District "Watercorps" Position – 210I

The District will provide practical watershed management experience to high school students or older to expose them to this career field. In Plan year 2, the District will prepare a "Watercorps" job description and work plan that outlines the knowledge and practical experience to be gained in this position. This position will first be offered in year 3 of Plan implementation.



### 3.4.3 Monitoring, Assessment, and Research Program – 211

The District implements an ongoing monitoring, data assessment, and research program. The program includes monitoring and assessment of District lakes, wetlands, and stormwater to accurately assess resource conditions and identify hot spots and trends. The District also performs monitoring to assess the performance of stormwater BMPs. The District also uses this information to determine progress being made toward District goals at least biennially. The District reports monitoring data to public and technical audiences through District and state agency online data portals, monitoring reports, and other media.

The location of sampling, frequency of sampling, parameters measured, and other details are described in the District's Land and Water Resource Inventory (see [Appendix A](#)).



**CRWD staff install a buoy to monitor water quality in Como Lake**

#### **Stormwater Monitoring and Data Collection – 211A**

The District will continue to monitor the quality and quantity of stormwater runoff to identify water quality problem areas, quantify subwatershed runoff pollutant loadings, provide data for the calibration of hydrologic, hydraulic, and water quality models, and promote understanding of District water resources and water quality. Currently the District operates 15 stormwater monitoring sites.

#### **Lake Monitoring and Data Collection – 211B**

The District and its partners will continue to monitor water quality, biological health (vegetation and fish surveys) and hydrologic characteristics of the District lakes including Como Lake, Lake McCarrons, Loeb Lake, Crosby Lake, and Little Crosby Lake.

#### **BMP Performance Monitoring – 211C**

The District will continue to monitor the effectiveness of stormwater BMPs in reducing stormwater runoff volumes and pollutant loads. BMP monitoring sites include Green Line green infrastructure practices, the Upper Villa stormwater reuse and infiltration system, Trout Brook Nature Sanctuary, William Street Pond, and other sites.

#### **Monitoring Database and Reporting Tool – 211D**

The District utilizes a monitoring database system to organize, view, and query all years of data more efficiently; edit, analyze, and review data; improve data sharing and access to data; and provide a consistent method for saving data to prevent data loss. In addition, an online, interactive, map-based tool allows water resource professionals, researchers, residents, and other interested individuals to access and download District monitoring data.

### Wetland Biological Integrity Monitoring – 211E

The District assesses the health of wetlands in the watershed by monitoring plants and macroinvertebrates as surrogates for wetland health. District wetlands are monitored regularly to track wetland health over time and assess performance of stormwater improvement or wetland restoration projects.

### Monitoring Data Trend Analysis and Reporting for Public – 211F

In years 1 and 2 of the Plan, the District will analyze 15 years of stormwater quality/quantity, lake, and wetland data to determine trends and other findings. The trend analysis will be presented in engaging, visually appealing formats to share with District staff, the Board, partner agencies, and the public.



**CRWD staff monitor gross solids**

### Citizen Science Monitoring Program – 211G

Beginning in year 3 of the Plan, the District will identify opportunities for citizen monitoring by interested citizens. These opportunities may be based on existing, established citizen-based programs. The District will provide participants with training and equipment to collect basic water quality or biological measurements. This would both expand the District's data collection and allow residents to engage with the mission and work of the District (see also item 220F).

### Research Program – 211H

The District will support and collaborate with partners, including the Minnesota Stormwater Research Council, on pilot testing of innovative BMPs, assessing effectiveness of traditional and innovative BMPs, researching fate and transport of stormwater pollutants, benefits of non-structural BMPs, and other topics as they emerge.

### Emerging Contaminants and Water Quality Issues – 211I

The District will periodically review available data and research regarding emerging contaminants to determine if programmatic changes are needed, including development and implementation of a monitoring plan. Emerging contaminants to consider investigating include microplastics, perfluoroalkyl substances (PFAS), pharmaceuticals, and other human-made contaminants.

### Non-structural BMPs Effectiveness – 211J

Midway through Plan implementation, the District will work with partners to study the effectiveness of potential non-structural practices, such as enhanced street sweeping, storm drain clearing, leaf clean-up, and proper disposal of pet waste in reducing sediment, phosphorus, and other pollutants to the District lakes, wetlands, and streams.



### 3.4.4 Communication and Engagement Program (220)

Communication and engagement are critical elements in the District's pursuit of its many and varied goals. The District implements an intensive communication and engagement (C&E) program that is intended to:

- Increase community participation in activities that improve the quality of water in the District.
- Promote general District-wide awareness of the District, including in traditionally underserved areas.
- Develop advocates for the District who will actively participate in improving the watershed and advocate for programs and activities that improve District water quality.

The District's C&E program is informed by the strategies and tactics outlined in the District's Communication and Engagement Plan (CRWD, 2020). Specific communications and engagement activities are described in the following sections.

#### General Communications and Engagement – 220A

The District will research demographics throughout the District to better understand the communities we serve. The District will develop brand standards and common language for all clean water practices and translate scientific content to better engage and inform residents about the District monitoring and research program. The District's communication tools will expand to include more videos, graphics, iconography, photos, virtual/augmented reality, and translated materials. The District will expand and strengthen media relationships. In addition, a database of all District contacts will be created to streamline and better manage communication and engagement. The District will evaluate C&E programs to determine effectiveness.

#### Project Communication – 220B

The District will develop individual communication plans for key projects. Communication tools may include signage, fact sheets, news releases, videos, graphics, and more to convey project benefits to key audiences.

#### Clean Streets – 220C

The District will expand the Adopt-a-Drain program and financially and/or administratively support initiatives such as the Como Curb Clean-up to engage residents in preventing leaves from entering storm drains and nearby waterbodies. In addition, new programs that promote smart salting practices and alternatives to chlorides will be developed for residents and businesses. The District will consider how these programs may be coordinated with trash management planning and implementation (see item 370G).



**Looking for dragonflies at Trout Brook Nature Sanctuary**

Image credit: Caroline Yang

### Maintenance Workshops for Water Quality – 220D

The District will provide annual workshops for city staff and transportation agency staff that promote best practices for managing winter roads/sidewalks and turfgrass. The District will also continue to identify new training opportunities to encourage other good housekeeping practices that prevent pollution from reaching nearby waterbodies.

### Digital Communications – 220E

The District will expand and enhance engagement via digital platforms including social media, the District website, and a monthly newsletter. The District will showcase seasonal best practices for managing water quality at home, upcoming community events, grant programs and projects, and more.

### Volunteer Programs – 220F

The District will continue to offer the Master Water Stewards Program. In addition, the District will expand volunteer opportunities to promote environmental stewardship at a community level and explore opportunities to conduct citizen science that informs the District's programs and projects. See Fund 211G.

### Sponsorships – 220G

The District will sponsor lectures, workshops, festivals, and more to inform and engage residents and young people in water resource protection, as well as identify opportunities to sponsor activities led by partner organizations in communities underserved by the District.

### Partnerships – 220H

The District will foster relationships with existing partners and expand them to include organizations working with audiences that have been underserved by the District. The budget for partnerships is included in the general communications and engagement fund (220A).



**Como Lake residents participate in the curb clean-up**



**Urban Roots, a partner grant recipient, plants a rain garden** Image credit: Caroline Yang



### Events – 220I

The District will attend, present, and exhibit at community events with an emphasis on opportunities in communities or with residents that have been underserved by the District. New engagement strategies and tools will be developed to meaningfully engage residents and partners.

### Award Program – 220J

The District bestows annual Watershed Stewards Awards to honor individuals and organizations that exemplify watershed stewardship through activities or projects that demonstrate a commitment to help protect, manage, and improve our lakes, ponds, wetlands, and the Mississippi River.

### Youth Programs – 220K

The District will expand program offerings in traditional and non-traditional settings to engage youth in learning about and protecting CRWD's water resources.

### Partner Grant Program – 220L

The District will expand grant opportunities for community, arts, and environmental organizations; schools; and faith-based groups to raise awareness about local water resources and promote clean water actions by residents.

### Public Art Program – 220M

The District will continue coordinating the Watershed Artist-in-Residence program and develop events and workshops centered around the arts to engage residents in water resource learning and protection. A field guide for the District's engagement with the arts will be developed to help foster future creative opportunities that combine the disciplines of art, science, and community engagement.

### 595 Aldine Communications and Engagement – 220N

The District will conduct office tours and develop BMP interpretive signage, hands-on learning opportunities, and exhibits to engage visitors in water resource learning and protection at the District's office.

### 3.4.5 Facility (Infrastructure) Management Program – 222

As part of the implementation of this Plan, the District will develop a comprehensive facility management program beginning in 2021. This program will establish effective and efficient management approaches for publicly owned individual, shared, and/or regional stormwater management systems. The program will promote regular inspection, consistent routine and non-routine maintenance, and replacement of stormwater infrastructure to ensure intended performance. The program will address District-owned infrastructure, infrastructure jointly maintained by the District and its partners, as well as partner-owned infrastructure. Specific initiatives and activities are described in the following sections.



**CRWD Trout Brook Interceptor inspections**

### **District Owned Facility Management – 222A**

The District owns stormwater infrastructure including TBI, a 6 mile-long regional stormwater conveyance system, and stormwater BMPs including Green Line BMPs, Como Subwatershed BMPs, Highland Ravine practices, Parkview School BMP, and its office BMPs. The District will regularly inspect, maintain, and repair all District-owned systems to ensure proper function and performance over their intended lifespans.

### **Shared Ownership (District/Partner) Facility Management – 222B**

There are some District projects in which ownership and maintenance responsibilities are split up or shared between the District and project partners. Examples include Curtiss Pond and Upper Villa BMPs. The District anticipates it will assume maintenance responsibility for more shared BMPs as they come online in the next 10 years (e.g., Seminary Pond, Como Park/Golf Course BMPs). The District will take the lead in regularly inspecting, maintaining, and repairing these systems to ensure proper function and performance over their intended lifespans.

### **Partner-Owned Facility Management and Ownership Evaluation – 222C**

At the request of city and county partners, the District provides inspection, maintenance, and repair services for projects owned by partners including the Snelling Midway Rainwater Harvesting and Reuse System and William Street Pond. These projects typically serve multiple parcels and/or are demonstrating new innovations and technology in stormwater management. During this 10 year time frame, the District will discuss, evaluate, and consider assuming ownership of the last ½ mile of TBI, appurtenant facilities to TBI including Willow Reserve and Arlington Jackson stormwater ponds, the Como Lake outlet, and the Lake McCarrons outlet.

### **Cooperative BMP Maintenance Service Program – 222D**

As the number and age of stormwater best management practices rises, the capacity and financial resources of both public and private entities to inspect and maintain BMPs becomes limited. The District will develop and implement a fee-based BMP maintenance service program that can be offered to our public partners and potentially others.

### **BMP Database – 222E**

The District established a web-based BMP database to track and manage projects constructed as part of the District's permit, grant, and/or CIP programs. The District will continue to update and improve the functionality of the database and expand its usage as the maintenance of more BMPs falls under the responsibility of the District.



**Rainwater collection and reuse system at Allianz Field**



## 3.5. Projects and Capital Improvements (300, 400)

### 3.5.1 Groundwater Projects and Capital Improvements – 302/402

The District has identified several groundwater-related projects in support of District goals. Collaboration with local, regional, and state agencies to complete these projects will be a priority of the District. Groundwater projects are described in the following sections.

#### Groundwater Seepage and Springs Study – 302A

Springs in the District tend to be found along spring lines at discrete elevations, depending on bedrock contacts, where there are perched water tables. In 2008, as part of the development of the [2010 Plan](#), the spring lines and springs in the District were identified. Dozens of springs can be found along the most coherent spring-line, looping Saint Paul like a “necklace” and roughly following the Mississippi River. With increasing rainfall volumes and frequencies due to climate change, some springs are flowing year-round, year after year. Partners, with technical support of the District, will investigate groundwater springs and seeps along this “necklace” and other known areas.

#### Beneficial Infiltration Study and Demonstration Projects – 302B

The District will work with public and private partners to formalize a process to review, approve, and implement stormwater infiltration projects to help remediate groundwater contamination. Infiltration may only be considered on brownfield sites that have low levels of contamination. This work will commence mid-term of the Plan to allow for collection and analysis of beneficial infiltration data from the District's office site.

#### Infiltration-Groundwater Quality Study – 302C

Hundreds of infiltration BMPs have been installed in the watershed by the public and private sectors. The District, in partnership with others, will conduct a study to evaluate the impact/benefit of infiltration projects on local surficial groundwater quality. The timing of a 2-year project is flexible but is defined for years 3 and 4 of the Plan.

#### Groundwater Monitoring Well Network in the District – 302D

The District will technically support partners including cities and the Minnesota Department of Health in developing a more thorough well inventory beyond the State Well Index. The existing monitoring well network contains large gaps within the District. District partners also plan to expand groundwater monitoring to include chloride monitoring and establishment of additional wells. A timeline for this work has not been defined.

#### Karst Area Study – 302E

The District will technically support partners in their study to better understand the location and extent of active karst features where infiltration is prohibited. Infiltration BMPs in karst settings have the potential of creating sinkholes as a result of the additional weight of water in a structural BMP (termed hydraulic head) and/or water infiltrated from the BMP that can dissolve the carbonate rock (e.g., limestone). These conditions can lead to the erosion of bedrock underneath or adjacent to a BMP. In addition, the pollutants being carried by the stormwater runoff can pass rapidly through the subsurface into the groundwater, creating a greater risk of groundwater contamination than is found in other soil types.

#### Ramsey County Groundwater Study – 302F

It is anticipated that Ramsey County will review and update the draft County groundwater plan. The District will support the County's efforts. A timeline for this work has not been defined.

#### Future Groundwater Projects – 401A

The District will technically and/or financially support future groundwater management projects that are identified in District- and partner led groundwater studies and assessments.

### 3.5.2 Como Lake Subwatershed Projects and Capital Improvements – 305/405

The District's Implementation Plan includes several projects and capital improvements planned within the Como Lake watershed (see [Figure 3-1](#)), including in-lake and watershed activities. Many of these activities are based on specific actions recommended in the [Como Lake Management Plan](#) (CRWD, 2019). The implementation plan also includes general activities for BMPs not yet identified.

#### Como Lake Water Quality Model – 305A

The Como Lake water quality model will be updated with the revised subwatershed loads developed in 2018, direct sediment core P flux measurements collected in 2016, and recent observed monitoring data to better estimate water quality conditions from proposed improvements.

#### AIS Management (Including Herbicide Treatment of Curly-Leaf Pondweed) – 305B

The aquatic vegetation community in Como Lake is dominated by curly-leaf pondweed with low diversity of other native macrophytes. The District and its partners will work to control curly-leaf pondweed with herbicide treatments. An aggressive management strategy in the first 3 years starting in 2020 will be applied. Once curly-leaf pondweed is under control, management efforts can focus on establishment of a diverse, native aquatic plant community.

#### Lake Vegetation Management Plan and Implementation – 305C

The District will collaborate with MDNR to develop and implement a long-term lake vegetation management plan to establish and maintain a healthy and diverse native aquatic plant community. The plan should also consider strategies to keep curly-leaf pondweed under control following initial herbicide treatments, which may also require periodic, small-scale herbicide treatments. Mechanical harvesting of native vegetation may also be required to prevent nuisance growth conditions following curly-leaf pondweed control.



**A beautiful day at Como Lake** Image credit: Caroline Yang

#### Balanced Fishery Target Development – 305D

The District will collaborate with MDNR to develop and implement a Como Lake Fisheries Management Plan that defines long-term targets for a diverse, ecologically balanced fishery that can also support and sustain recreational fishing for the community.

#### Shoreline Management Plan – 305E

Following an initial shoreline assessment, the District and the City of Saint Paul will develop and implement a Como Lake Shoreline Management Plan that emphasizes native plant diversity, wildlife habitat, shoreline stabilization, and capture of surface runoff. Local partners and volunteers shall assist with shoreline vegetation management projects.





**Como Park Senior High School captures and cleans runoff below their athletic field**

### **Street Sweeping Enhancement – 305F**

In the first 2 years of the Plan, the District will coordinate efforts with municipal partners to develop and implement a Como Watershed Street Sweeping Plan that prioritizes streets for sweeping based on subwatershed load reduction potential, tree species type (leaf phosphorus content, typical leaf drop timing), source potential, and logistics.

The District will collaborate with public and private partners in implementation of clean water projects identified in previous feasibility studies that are outlined in the [Como Lake Management Plan](#) (CRWD, 2019) and studies that occur during the life of the 10 year Plan.

### **Innovative Treatment Facility Feasibility study – 305G**

The feasibility study will explore the effectiveness of spent lime and other innovative technologies to treat watershed runoff flowing to Como Lake. This potential future action depends upon progress to reduce external/watershed loads and the response of the lake to in-lake management actions. It will occur in years 9 and 10 of Plan implementation.

### **Water-Based Recreational Activities Support – 305H**

Recreation is the most significant way people interact with Como Lake. The District will technically support the work of its partners on water-based recreational activities at Como Lake and may

include maintenance and improvement of existing fishing areas, identification of additional fishing areas, an annual community fishing event, maintenance of non-motorized boating channels, and on-the-water educational opportunities.

### **Como Park Area Drainage Infrastructure Analysis and Planning – 305I**

The City of Saint Paul and Ramsey County are interested in better understanding the drainage and flooding issues at Como Golf Course (Hole 8 and Lexington Parkway ponds) and Gottfried's Pit, identifying solutions to address them, and determining the most efficient and effective approach to operating and maintaining drainage infrastructure.

### **Como Golf Course BMPs – 405J**

The District will construct regional BMPs on the Como Golf Course in Plan years 1 and 2. This includes installing infiltration systems adjacent to the Como Zoo and retrofitting the northwest Como Golf Course Pond with an iron-enhanced filtration bench. Combined, the projects are expected to remove an estimated 55 pounds of total phosphorus each year.

### **Como Pavilion BMPs – 405K**

The District will technically and/or financially support the City of Saint Paul Parks & Recreation in the design and construction of regional and small-scale BMPs in coordination with parking lot improvements for the Como Lake Pavilion. An exact timeline for this project is unknown.

### **McMurray Field – 405L**

In coordination with the Saint Paul Parks & Recreation department's planned improvements to the broomball and softball fields, the District will construct a regional infiltration and stormwater reuse system to irrigate the McMurray Athletic Fields and remove an estimated 33 pounds of TP/year. The timeline for this project is unknown.

### **Como Lake Alum Treatment – 405M**

Diffusive flux of phosphorus from Como Lake sediments is a significant source of phosphorus and a primary driver of water quality problems in Como Lake. Alum treatment was recommended in the [Como Lake Management Plan](#) (CRWD, 2019) to address in-lake phosphorus loading from the bottom sediments. Alum (aluminum sulfate) is applied to lakes to reduce the phosphorus being recycled inside of the lake. The treatment is expected to dramatically reduce algae growth and improve water clarity and quality. Alum is commonly used in drinking water treatment and has been a safe lake management tool for decades. The District, in collaboration with the City of Saint Paul, will apply alum to limit mobilization of sediment phosphorus and mitigate internal phosphorus loading in year 1.

### **East Como Boulevard BMPs – 405N**

The reconstruction of East Como Lake Drive may offer an opportunity to implement highly visible, green infrastructure practices along this lake parkway. The District will technically and/or financially support the design and construction of green infrastructure practices by the City of Saint Paul.

### **Gottfried's Pit Improvements – 405O**

The District will technically and/or financially support its government partners in the design and construction of improvements at Gottfried's Pit to alleviate flooding and improve water quality.

### **Future Stormwater Management Planning and Implementation – 305P/405P**

The District will collaborate with partners to identify and study potential opportunities for implementation of stormwater BMPs as part of public and private redevelopment projects in the Como Lake subwatershed. An example is construction of boulevard curb-cut raingardens during street reconstruction projects. See Appendix C of the [Como Lake Management Plan](#) (CRWD, 2019).



### 3.5.3 Lake McCarrons Subwatershed Projects and Capital Improvements – 310/410



**Canoeing on Lake McCarrons** Image credit: Sara Rubinstein

The District's Plan includes several projects and capital improvements within the Lake McCarrons watershed (see [Table 3-1](#)), including in-lake and watershed activities. Many of these activities are based on specific actions recommended in the [Lake McCarrons Management Plan](#) (CRWD, 2020). The implementation plan also includes general activities for the future implementation of BMPs not yet identified.

#### **Alum Treatment Evaluation and Implementation – 310A/410A**

Alum applied in Lake McCarrons in 2004 has successfully controlled internal phosphorus loading. Alum (aluminum sulfate) is applied to lakes to reduce the phosphorus being recycled inside of the lake. The treatment is expected to dramatically reduce algae growth

and improve water clarity and quality. The District and its partners will reevaluate the need for another alum treatment on an annual basis by reviewing the hypolimnetic phosphorus concentrations and comparing them to the hypolimnetic TP concentration threshold. Exceedances of the threshold may trigger the need for another alum treatment. Phosphorus concentrations in lake sediment cores will be evaluated every 5 years.

Based on findings of the alum evaluation, the District and partners will apply alum to inactivate mobile sediment phosphorus and mitigate internal phosphorus loading.

### **Villa Park Wetland System Evaluation and Performance Enhancements – 310B/410B**

The District and partners shall evaluate the performance of the Villa Park wetland system and investigate options for improving its functionality in year 1 of Plan implementation.

Based on findings of the Villa Park performance improvement evaluation, the District and partners will implement measures to improve the functionality of the wetland system.

### **Watershed Hydraulic/Hydrologic Modeling – 310C**

The District and its partners will perform watershed hydrologic and hydraulic modeling to assess the risk of floods to structures and infrastructure including a known flooding issue at the intersection of Cohansey Boulevard and Bossard Avenue.

### **Lake Vegetation Management Plan and AIS Response Plan – 310D**

The Lake McCarrons Aquatic Invasive Species (AIS) Response Plan, completed in 2018, defines the process and criteria by which AIS will be managed in Lake McCarrons (CRWD, 2018). In addition, the Lake Vegetation Management Plan defines the thresholds of AIS that necessitate active management and goals for aquatic plants, which serve beneficial ecological and biological functions on Lake McCarrons.

### **Balanced Fishery Target Development – 310E**

Targets for a balanced fishery will be developed in year 2 to provide angling opportunities, ensure a diversity of game fish, and provide ecological and water quality benefits in Lake McCarrons. MDNR, with technical support from the District, will continue to implement its Fisheries Management Plan for Lake McCarrons.

### **Shoreline Management Plan and Implementation – 310F**

Ramsey County and the District conducted a shoreline survey of Lake McCarrons in 2008 and 12 residential properties have restored their shoreline. The county and the District will conduct a follow-up shoreline inventory to assess current lakeshore conditions of both



**Parkview Center School captures and cleans 12.5 million gallons of runoff annually** Image credit: Sara Rubinstein

restored and unrestored areas to determine the amount of shoreline suitable for “lakescaping” and the amount of shoreline subject to erosion. Working with property owners, the county and District will create and maintain stable shoreline buffers around Lake McCarrons and assist the City of Roseville in determining where and when no-wake zones should be established by sharing lake level and bathymetric information and current science regarding the effect of boating on shoreline erosion.

### **Future Stormwater Planning and Implementation – 310G/410G**

A feasibility study will be developed to explore the effectiveness of potential BMPs to reduce external/watershed loads, retain water in the watershed, and help achieve water quality goals outlined in the [Lake McCarrons Management Plan](#). The feasibility of existing practices and/or new innovative treatments will also be considered.

The District will collaborate with public and private partners to implement CIPs that arise from future stormwater planning or redevelopment opportunities in the Lake McCarrons subwatershed. Potential projects may include enhancements at Victoria Park wetland and improvements at Alameda Pond.



### 3.5.4 Loeb Lake Subwatershed Projects and Capital Improvements – 313/413

The District's Implementation Plan includes several projects and capital improvements planned for Loeb Lake and its tributary watershed, located within the Trout Brook subwatershed (see [Table 3-1](#)). Among the planned projects is an update to the District's [2009 Loeb Lake and Willow Reserve Management Plan](#) (CRWD, 2009). The updated lake management plan may include additional recommendations for projects and capital improvements.

#### Update Loeb Lake Management Plan – 313A

The District will update the Loeb Lake Management Plan based on recent chemical, biological, and hydrologic monitoring data and water quality improvement projects conducted within the subwatershed. High priority issues will be identified, and goals and implementation activities will be adapted accordingly.

#### AIS Management – 313B

The District will continue to monitor the presence of invasive plant species in Loeb Lake, identify and implement strategies to prevent the introduction of new invasive species, and limit, as much as possible, the spread of invasive species already present.

#### Shoreline Management Plan and Implementation – 313C

Working with the City of Saint Paul Parks & Recreation, the District will evaluate the condition of the Loeb Lake shoreline and implement shoreline restoration and stabilization measures. The District will also technically support the Parks & Recreation Department in implementing best turf-management practices in the area surrounding Loeb Lake, known as Marydale Park.

#### Loeb Lake Sedimentation Pond Investigation – 313D

The District and its partners will investigate options to improve pollutant reduction and flood control of the sedimentation pond connected to Loeb Lake in the southeast corner of Marydale Park

#### Future Stormwater Planning and Implementation – 313E/413A

The District will conduct future water retention and stormwater management studies and projects based on the recommendations from an updated Loeb Lake Management Plan and as opportunities arise.

The District will design and construct future CIPs that arise out of redevelopment opportunities or are identified in the updated Loeb Lake Management Plan and future studies.



**Loeb Lake in Saint Paul** Image credit: Sara Rubinstein

### 3.5.5 Trout Brook Subwatershed Projects and Capital Improvements – 315/415

The District's implementation plan includes several projects and capital improvements planned for the TBI stormwater management system and its tributary watershed (see Figure 3 1). Many of these activities are based on recommendations in the TBI CIP (CRWD, 2020). TBI is a regulated MS4, requiring that the District maintain and implement a SWPPP. The District has identified projects and capital improvements to improve water quality and reduce flood risk in the subwatershed adjacent to TBI.

#### TBI 5-year Inspection and CIP Development – 315A

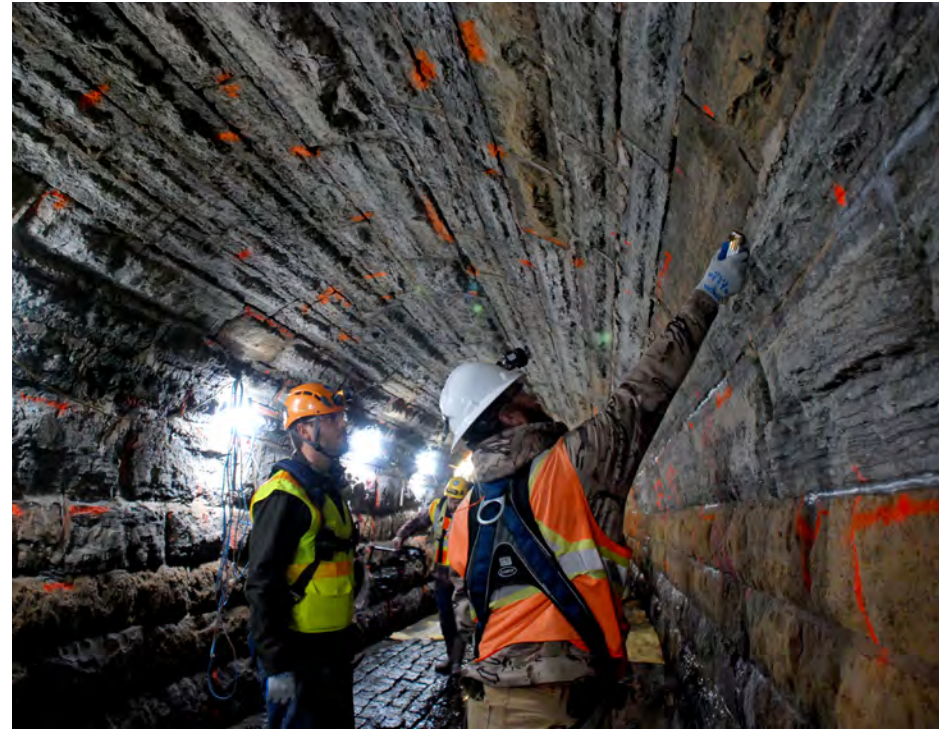
The District will inspect the entire length of the TBI every 5 years. The purpose of the inspections is to assess the structural conditions of TBI by identifying defects such as cracks, holes, and infiltration and to recommend sections for repair. The inspection findings will serve as the basis for updating the TBI CIP. The last TBI inspection was conducted in 2019 and is scheduled to occur in years 4 and 9 of the Plan.

#### NPDES Stormwater Program – 315B

TBI is an MS4. The District operates TBI under a state MS4 permit and an approved SWPPP to minimize stormwater volumes and pollution to local waters. The SWPPP outlines activities for stormwater education and outreach, public involvement, illicit discharge detection and elimination, construction erosion and sediment control, post-construction stormwater management, and pollution prevention/good housekeeping. The District evaluates its previous year SWPPP activities and accomplishments and updates its SWPPP as needed on an annual basis.

#### TBI Hydrologic and Hydraulic Model Update and Expansion – 315C

In 2018, the District updated and calibrated a hydrologic/hydraulic model of the TBI. The model determined the 2-, 10-, and 100 year flood flows for the TBI using Atlas 14 (current) precipitation depths.



**Inspections of CRWD's Trout Brook Interceptor**

In addition, the model projects flood flows for the 500 year storm event, which correlates to a moderate projection for the 100 year storm event in 2050. Because the model uses very coarse hydrology (over 50-acre watersheds on average) and primarily models only the hydraulics of the TBI, the District and the City of Saint Paul will increase hydrologic and hydraulic resolution to the model by adding in more detail from the tributary watersheds and municipal and Minnesota Department of Transportation storm sewers in 2020 and 2021 (year 1 of Plan implementation).



### **TBI Flood Mitigation and Water Quality Improvement Studies – 315D**

The District will conduct flood mitigation and water quality improvement studies in the top-three priority flooding areas identified in the TBI Hydrologic and Hydraulic Model Update Report (CRWD, 2018). The three priority areas located in Saint Paul are Maryland Ave. W./Norton St. N., Maryland Ave. W./Grotto St. N., and Arlington Ave. E./Railroad. A study will be conducted every 3 years starting in year 1 of Plan implementation.

The District will design and construct flood mitigation and/or water quality improvement projects identified in the TBI flood mitigation and water quality improvement studies.

### **TBI Easement Verification, Acquisition, and Documentation – 315E**

There are a number of areas where the District does not own a permanent easement for TBI or the District easement is insufficient for performing maintenance and repair work. The District will continue to work with the Ramsey County attorney and its consultants in negotiating and acquiring adequate easements for TBI.

### **TBI Repairs Station 28+65 to 50+72 – 415F**

Starting in the fall of 2020 and extending through the winter of 2021 (year 1 of Plan implementation), the District will repair TBI from St. 28+65 to 50+72, which is generally in fair-to-poor condition. Recommended repairs from the 2019 CIP include sealing of surface reinforcement, crack and fracture sealing, minor surface repair, and removal of sediments.

### **TBI Repairs Station 135+06 to 180+29 – 415G**

The District will repair TBI from St. 135+06 to 180+29, which is in generally fair-to-poor condition, from year 5 to year 6 of Plan implementation. Recommended repairs from the 2019 CIP include sealing of surface reinforcement, crack and fracture sealing, minor surface repair, and removal of sediments.

### **Major Sediment Removal – 415H**

Several sections of TBI require removal of accumulated sediment to improve tunnel conveyance and minimize deposition of sediments to the Mississippi River. The segments include TBI Mainline St. 100+60 to 101+60, TBI East Branch St. 29+08 to 30+20, and TBI West Branch St. 130+45 and St. 3+35. Removal of sediment is planned for years 3 and 10.

### **Future Stormwater Planning and Implementation– 315I/415I**

The District will technically and financially support BMP feasibility studies as redevelopment opportunities arise in the Trout Brook subwatershed.

The District will technically and financially support the design and construction of CIPs identified in feasibility studies or as opportunities arise..



**Trout Brook Nature Sanctuary**

### 3.5.6 Crosby Lake Subwatershed Projects and Capital Improvements – 317/417

The District's implementation plan includes several projects and capital improvements planned for Crosby Lake and its tributary watershed (see Figure 3 1). Some of these activities are based on recommendations in the District's [2012 Crosby Lake Management Plan](#) (CRWD, 2012). An update to the Crosby Lake Management Plan is planned as part of the implementation of this Plan. The updated lake management plan may include additional recommendations for projects and capital improvements.

#### **Crosby Farm Bluff Stabilization Plan and Bluff Stabilization Projects – 317A/417A**

A bluff erosion assessment was conducted over 10 years ago by District partners (Ramsey County Soil and Water Conservation, 2007). The District will technically support partners in reassessing erosion of the bluffs and developing a plan to address the high-priority eroded areas.

The District will technically and/or financially support partners in their implementation of bluff stabilization projects identified in an updated bluff stabilization plan.

#### **Hidden Falls/Crosby Farm Trail Reconstruction Planning – 317B**

The City of Saint Paul, with technical and financial support from the District, will plan for access and trail reconstruction within Hidden Falls and Crosby Farm Regional Park to reduce impacts from increasingly frequent large flood events in the Mississippi River (City of Saint Paul, 2019).

#### **Update Crosby Lakes Management Plan – 317C**

The District will update the Crosby Lake Management Plan in years 3 and 4 to provide a framework for the protection and improvement of Crosby Lake. The plan update will include assessment of the current conditions of Crosby Lake and Little Crosby, estimates of watershed loading to the lakes, and identification of opportunities for improving lake water quality and ecological, aesthetic, and recreational conditions.

#### **Interstate 35E Regional Stormwater BMP Feasibility Study – 317D**

The [2012 Crosby Lake Management Plan](#) recommended a feasibility study to determine if it is possible to build a stormwater detention pond with an approximate surface area of 1.75 acres and an average depth of 4 feet on a site adjacent to the 35E ditch. This study will be conducted after the update to the Crosby Lake Management Plan.

#### **Shoreline Management Plan and Implementation – 317E**

Crosby and Little Crosby Lake are located in the Mississippi National River and Recreational Area, a national park system, and the shorelines of the lakes are largely undeveloped other than trails. The District and its partners will conduct an assessment of shoreline conditions and develop a Shoreline Restoration and Management Plan for Crosby and Little Crosby lakes in years 5 and 6.

#### **Terrestrial and Aquatic Invasive Species Management – 317F**

The District will continue to monitor the presence of invasive plant and animal species in Crosby Lake, Crosby Farm Regional Park, Hidden Falls Park, and other areas in the subwatershed and prevent the introduction of additional invasive species and limit, as much as possible, the spread of invasive species already present.

#### **Floodplain and Wetland Restoration Opportunities around Crosby Lake – 317F/417G**

The District will technically support its partners in developing a plan to re-create the native floodplain forest around Crosby Lake to substantially improve the quality and quantity of the park's habitat for forest wildlife. Recommended strategies are outlined in the Crosby Farm Regional Park Ecological Inventory and Restoration Management Plan (City of Saint Paul, 2005).

The District will technically and/or financially support partners in their implementation of wetland and floodplain restoration projects to improve the quality and quantity of wildlife habitat, provide water quality benefits for Crosby Lake, and expand native vegetation.





**Little Crosby Lake in Saint Paul** Image credit: Sara Rubinstein

### **Future Stormwater Planning and Implementation – 317H/415H**

The District will conduct future stormwater management studies and projects based on the recommendations in an updated Crosby Lakes Management Plan or as redevelopment opportunities arise.

The District will technically and/or financially support the design and construction of future CIPs that are identified in the updated lake management plan, future studies, or as redevelopment opportunities arise.



### 3.5.7 Wetland, Stream, and Ecosystem Restoration Projects and Capital Improvements – 325/425

Many of the pre-settlement hydrologic and natural features within the District have been lost, diminished, or degraded because of development (see [Section 1](#) and [Appendix A](#)). The District has identified several projects and capital improvements, including the development of area-specific natural resource inventories and management plans, to further identify, evaluate, and prioritize resource management activities. These activities are informed by the District's 2010 Wetland Management Strategy and the identification and prioritization of potential wetland restoration sites contained therein (see [Appendix F](#)).

#### Phalen Creek Daylighting – 325A/425A

Based on the findings of the Phalen Creek Daylighting Feasibility Study, completed in 2018, the District will develop detailed concepts for daylighting options adjacent to the Rush Line Bus Rapid Transit project. Design development started in 2020 and may continue into year 1, prior to full BRT design work. In the District's Stream Corridor Restoration Plan, which was developed as part of the 2010 Plan, Phalen Creek was given high ratings for opportunity, constructability, and alignment with District goals.

The District will support partners in daylighting Phalen Creek based on the preferred concept design and preliminary engineering work.

#### Hidden Falls Creek Restoration Planning – 325B/425B

A feasibility study was completed in 2014 to evaluate the restoration potential of Hidden Falls Creek (City of Saint Paul, 2014). The City of Saint Paul and the District will conduct preliminary engineering work including cost estimating for restoring Hidden Falls Creek. The exact timing for this work will be based on the schedule for the Ford Redevelopment Site. This project was identified in the city's Hidden Falls-Crosby Farm Regional Park Master Plan (City of Saint Paul, 2019) as well as the District's Stream Corridor Restoration Plan, developed as part of the [2010 Plan](#). The District identified this site



**Willow Reserve restoration project in Saint Paul**

with high ratings for opportunity, constructability, and alignment with District goals.

The District will technically and/or financially support partners in the Hidden Falls Creek restoration project based on results of preliminary engineering work.

#### Swede Hollow Water Resource and Natural Resources Plan – 325C/425C

The City of Saint Paul, with technical support from the District, will develop a water resource and natural resources plan for Swede Hollow, located near the downstream end of Phalen Creek. As part of plan development, the city will assess the feasibility of water recirculation in Phalen Creek, inventory natural resources, and identify opportunities for restoration. This project was identified in



the Swede Hollow Master Plan, but no timeline was provided (City of Saint Paul, 2019).

The District will technically and/or financially support partners in stream and natural resource restoration efforts based on recommendations from Swede Hollow water recirculation and natural resource studies.

### **Cascade Creek/Fountain Creek - Ayd Mill Road Feasibility Study – 325D/425D**

The City of Saint Paul is investigating the feasibility of improving Ayd Mill Road, which offers an opportunity for the District and the city to explore daylighting of Cascade and Fountain Creeks, which historically flowed through this area. The District will consider conducting a feasibility study to evaluate daylighting and restoration of the two creeks based on city and community interest. In the District's Stream Corridor Restoration Plan, which was developed as part of the 2010 Plan, Cascade and Fountain Creeks were rated "medium" for opportunity, constructability, and alignment with District goals.

The District will technically and/or financially support partners in the restoration of segment(s) of Cascade Creek/Fountain Creek based on results of a feasibility study and preliminary engineering work.

### **Willow Reserve Signage and Access – 325E**

The completion of vegetation restoration in Willow Reserve in 2020 provides an opportunity to improve accessibility and conduct outreach in the Reserve (CRWD, 2016). The City of Saint Paul is seeking grant funds for the design and construction of access points, trails, boardwalks, and scenic outlooks in the Reserve. Interpretive signage is also planned for the Reserve. The District will technically and financially support the Saint Paul Parks & Recreation Department and the North End Neighborhood Association in these water-related engagement and access projects between years 1 and 3.

### **District 6 Natural Resource Management Plan – 325F**

In 2015, the District, the City of Saint Paul, and North End Neighborhood Organization completed a natural resource inventory (NRI) for District 6 in Saint Paul (CRWD, 2015). The purpose of the NRI is to help the partners understand, prioritize, protect, and restore the area's natural resources and open spaces. The District and partners will revisit the NRI goals, strategies, opportunities, and recommendations and select NRI recommendations to further investigate from years 3 to 5 of Plan implementation (2023 to 2025).

### **Wetland Restoration Planning – 325G**

The City of Saint Paul, with technical support from the District and other partners, will develop a wetland management plan that includes an inventory of existing wetlands, identification of priority sites for protection/restoration, and a process to minimize the loss of wetland area and function. The District will work with BWSR to ensure that opportunities to restore or create wetlands within the District are not in conflict with the Wetland Conservation Act banking requirements. The District will extend wetland work and planning beyond the City of Saint Paul boundaries to include the remaining areas in the District.

### **Natural Resource Inventories and/or Management Plans and Implementation – 325H/425H**

The District will conduct NRIs and identify natural resource management goals, strategies, and opportunities in the Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds. Inventories and plans in other subwatersheds will be conducted if there is strong partner interest and opportunities arise to leverage other projects.

The District will technically and/or financially support partner initiatives on natural resource, wetland, stream, and ecosystem projects and implement recommendations from District natural resource management plans with an emphasis on projects in the Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds.

### 3.5.8 Mississippi River Gorge Subwatershed Projects and Capital Improvements – 331/431

The District's implementation plan includes several projects and capital improvements planned for the area tributary to the Mississippi River upstream of the Ford dam (Mississippi River Gorge subwatershed, see Figure 3 1). Many of these activities are associated with planned or possible redevelopment opportunities and will require intensive coordination and partnership with cities, developers, and other District partners.



**Tree trenches located by Green Line light-rail transit**

Image credit: Adrian Danciu

#### **Towerside Regional Stormwater Planning – 331A/431A**

The Towerside Innovation District encompasses 370 acres on the eastern edge of Minneapolis and western edge of Saint Paul and Capitol Region Watershed District. Towerside is pursuing a district systems approach for heating, cooling and energy, parking, green public realm, and stormwater management. The District will technically support Towerside stormwater management planning within District boundaries. The basis for future stormwater planning will come from a Towerside and Creative Enterprise Zone (CEZ) "Green" and "Blue" Infrastructure framework being developed in partnership with Mississippi Watershed Management Organization. Its completion is anticipated in 2020.

The District will technically and/or financially support the design and construction of future stormwater CIPs in the Towerside Innovation District based on the findings and recommendations from Towerside stormwater management planning efforts.

#### **Creative Enterprise Zone Regional Stormwater Planning – 331B/431B**

The CEZ is a livable, mixed-use neighborhood in Saint Paul that is recognized and sustained as a center of enterprise and creativity. The zone is bounded to the west by Westgate Drive and Berry Street, to the east by Prior Avenue, to the north by the railroad tracks south of Energy Park Drive, and to the south by I-94. The District will technically support stormwater management planning in the Zone that comes from the Towerside and CEZ Green and Blue Infrastructure framework.

The District will technically and/or financially support the design and construction of future stormwater CIPs in the CEZ based on the findings and recommendations from CEZ stormwater management planning efforts.



### **University of Minnesota/Minnesota State Fair Cooperative Projects – 331C/431C**

The District began the Gortner Avenue feasibility study in 2019 to identify potential stormwater BMPs that may be shared among partners at the University of Minnesota, the Minnesota State Fairgrounds, Ramsey County, and the City of Falcon Heights. The project initiated from the stormwater treatment requirement for the upcoming Cleveland Avenue reconstruction. It has since expanded to include possible regional practices with the potential to provide multiple benefits in the vicinity of Larpenteur between Cleveland and Snelling Avenues. Other practices may also be pursued as partner challenges and project benefits are clarified. In addition, there is an opportunity for restoring Sarita Wetland, depending on interest and involvement of the State Fair and University of Minnesota.

The District will technically and/or financially support government and institutional partners in the design and construction of future CIPs based on recommendations of cooperative stormwater studies.

### **Seminary Pond and Ravines Stormwater Improvements – 431D**

The District, the City of Lauderdale, and other partners will construct flood mitigation and water quality improvements for Seminary Pond and adjoining ravine areas. Construction is slated to begin in fall of 2020 and extend through spring of 2021 (year 1 of the Plan). The improvements include converting Seminary Pond from a dry pond to a wet pond by deepening the pond and raising the berm, installation of an iron-enhanced sand filter along the pond edge to remove dissolved phosphorus, and stabilizing several steep ravine slopes upstream of Seminary Pond. The project is estimated to control stormwater volumes up to the 10 year, 24 hour storm event and reduce sediment and phosphorus loads by approximately 40%.

### **Future Stormwater Management Planning and Implementation – 331E/431E**

The District will technically support stormwater management planning on future redevelopment sites and enterprise zones within the Saint Anthony and Mississippi River Boulevard subwatersheds.

The District will technically and/or financially support the design and construction of future CIPs based on the findings and recommendations from stormwater management planning efforts.



**Seminary Pond in Lauderdale**

### 3.5.9 Mississippi River Confluence Subwatershed Projects and Capital Improvements – 332/432

The District's implementation plan includes several projects and capital improvements planned for areas tributary to the Mississippi River between the Ford dam and downtown Saint Paul (Mississippi River Confluence subwatershed, see [Figure 3-1](#)). Many of these activities are associated with planned or possible redevelopment opportunities and will require intensive coordination and partnership with cities, developers, and other District partners.

#### East Kittsondale Subwatershed Project Prioritization and Implementation – 332A/432A

The District will reevaluate and update the East Kittsondale Subwatershed Study using more recent subwatershed information and considering completed water quality improvement projects and future redevelopment opportunities (CRWD, 2014). The study updates may include revised cost estimates and new project priorities.

The District will support the design and construction of future water quality CIPs based on recommendations from the East Kittsondale study update.

#### Ford Redevelopment Site Comprehensive Stormwater Planning – 332B/432B

The District has supported stormwater management planning efforts at the 135 acre Ford Redevelopment Site for over 10 years (CRWD, 2016). The District will continue to provide technical and financial assistance to the City of Saint Paul on a District stormwater management approach and a central water feature at the Ford Site. The central water feature will feed a future restored Hidden Falls Creek.

#### Area C Ford Site Planning – 332C

The District will continue to advocate and technically support comprehensive environmental investigation of Ford's Area C, a former waste disposal area located below the Ford Redevelopment Site.

#### Snelling-Midway Phase II Redevelopment Planning – 332D

The City of Saint Paul and Minnesota United FC, with technical and financial support from the District, constructed a district rainwater reuse system for the 35 acre Snelling Midway Redevelopment site in 2018. The system currently provides water for trees, landscaping, and green spaces surrounding Allianz Field; a total of 17 acres are served by the reuse system. The District will technically and financially support the integration of future sites into the rainwater reuse system and exploration of BMPs in the future public realm as the balance of the site is redeveloped. Upon full buildout, an estimated 2 million gallons of water will be conserved by using rainwater instead of potable water.



**Great River School clean water projects and natural play area**

Image credit: Adrian Danciu





**Victoria Park clean water project rendering**

### **Victoria Park Stormwater Improvements – 432E**

In 2018, the City of Saint Paul, with technical and financial support from the District, completed a stormwater feature feasibility study in Victoria Park, located on the Mississippi River bluff (City of Saint Paul, 2018). The study included preliminary concepts and a project cost estimate. The District will provide technical and/or financial support to the city in the design and construction of the stormwater feature and water quality improvements in Victoria Park.

### **Future Stormwater Management Planning and Implementation – 332F/442F**

The District will technically support stormwater management planning on future redevelopment sites within the Hidden Falls, Davern, West and East Kittsondale, West 7th, and Goodrich subwatersheds.

The District will technically and/or financially support the design and construction of future CIPs based on findings and recommendations from stormwater management planning efforts.

### 3.5.10 Mississippi River Downtown Subwatershed Projects and Capital Improvements – 333/433

The District's implementation plan includes several projects and capital improvements planned for areas tributary to Phalen Creek and the section of the Mississippi River adjacent to downtown Saint Paul (Mississippi River Downtown subwatershed, see Figure 3 1). Many of these activities are associated with planned or possible redevelopment opportunities and will require intensive coordination and partnership with cities, developers, and other District partners.



**CHS Field water collection and reuse system**

Image credit: Adrian Danciu

#### **Sears Redevelopment Site Stormwater Planning and Implementation – 333A/433A**

The Sears redevelopment site encompasses 17 acres and sits immediately west of the State Capitol. The site offers another opportunity along the Green Line corridor to explore for shared, stacked green infrastructure (SSGI) and a site-wide stormwater management system. The timeline for site master planning and preliminary stormwater management planning has not been defined yet.

Based on the findings from stormwater management planning at the Sears redevelopment site, the District may provide technical and financial assistance for site-wide SSGI system.

#### **Swede Hollow BMP Feasibility Study and Implementation – 333B/433B**

The District will conduct a feasibility study to explore stormwater management opportunities within and adjacent to Swede Hollow.

Based on the findings from the Swede Hollow stormwater feasibility study, the District will technically and/or financially support the city in the design and construction of stormwater BMPs.

#### **Phalen Creek Subwatershed Water Quality and Quantity Study – 333C**

Besides the Trout Brook and Saint Anthony Hill subwatersheds, the District will focus water quality and flood-mitigation studies in Phalen Creek subwatershed. The District will work with partners to identify two to three study areas within this subwatershed.



### **Saint Anthony Hill Water Quality and Quantity Study – 333D**

Besides the Trout Brook and Phalen Creek subwatersheds, the District will focus water quality and flood-mitigation studies in Saint Anthony Hill subwatershed. The District will work with partners to identify two to three study areas within this subwatershed.

### **Science Museum of Minnesota – 433E**

In 2020, the Science Museum of Minnesota, with support from the District, conducted a campus wide feasibility study for improving stormwater management. The District will continue its support of the Science Museum by providing financial and technical assistance for the design and construction of innovative and highly visible, education-focused stormwater BMPs. .

### **Future Stormwater Management Planning and Implementation – 333F/433F**

The District will leverage redevelopment opportunities within the Saint Anthony Hill, Downtown, Phalen Creek, and Urban subwatersheds to study the potential of innovative, cost-effective, highly visible, and educational stormwater BMPs. Opportunities include the Wakan Tipi Center at Bruce Vento Nature Sanctuary.

The District will support the design and construction of future CIPs based on the findings and recommendations from stormwater management planning efforts.



**Zero Abuse Project in Downtown St Paul installs a birooft with Stewardship Grant dollars**

### 3.5.11 Watershed Wide Planning and Assessment Projects and Capital Improvements – 375/475

In addition to the projects and capital improvements planned for specific planning subwatersheds (see Figure 3 1), the District has identified several watershed-wide activities planned over the next 10 years.

#### **Transportation Redevelopment Projects - Stormwater Feasibility Studies/Preliminary Engineering, and Implementation – 375A/475A**

Future transportation projects, such as Riverview transit corridor, Gold Line BRT, Rush Line BRT, and I 94, offer opportunities to explore improved stormwater management in those corridors. The District shall technically support transit partners in integrating stormwater management feasibility studies with the planning and design of future transportation projects.

Based on the findings of transit stormwater feasibility studies, the District will technically and/or financially support transit partners in the design and construction of stormwater BMPs.

#### **Great River Passage Project Stormwater Feasibility Studies, Preliminary Engineering, and Implementation – 375B/475B**

In 2013, the City of Saint Paul adopted the Great River Passage Master Plan, a comprehensive framework for creating vibrancy within the city's 3,500 acres of parkland along a 17 mile stretch of the Mississippi River. Key capital initiatives of the plan include the River Learning Center/National Park Service Mississippi National River and Recreation Area (MNRRA) Headquarters and River Balcony. Both projects are located within the District. The District will technically support the City of Saint Paul and non-profit partners in stormwater planning and outreach at these sites and others identified in the Master Plan.

The District will technically and/or financially support the City of Saint Paul and non-profit partners in the design and construction of highly visible and educational stormwater BMPs.

#### **Watershed Management Plan Update – 375C**

The District will commence a 1½ to 2 year long process of updating its 10-year Plan starting in year 8. The update will include identification and prioritization of watershed issues, assessment of current land and water conditions, development of measurable watershed goals, and determination and prioritization of targeted implementation activities.

#### **Partner Agency Plan Review and Comment – 375D**

The District will review and comment on federal, state, and local water-related regulations, plans, policies, and studies that are pertinent to the work of the District.

#### **GIS Program – 375E**

The District will manage and update its GIS data, resources, and software needs.

#### **Saint Paul Watershed Governance Exploration – 375F**

City of Saint Paul staff and its Interagency Work Group have discussed how to implement stormwater management requirements consistently across the city and how watershed district rules and services do not apply to the West Side neighborhood. The city, with support from the District, expects to continue exploring the merits and considerations of this topic and work with all agencies involved to further assess possible scenarios. The city's Joint Powers Agreement for water governance relating to the West Side runs through 2023.



### Public Private Partnership Opportunities – 375G

The District will identify and cultivate new public-private partnerships to make progress towards achieving its Plan goals. New private partners to consider include business organizations, developers, institutions, and others.

### District Flooding Prioritization and Solution Identification – 375H

The District will work with cities to prioritize known localized flooding areas including 35E and County Rd. B, Sarita wetland area, Fairview trunk system, Como Golf Course (Hole 8), Curtiss Field, Bridal Veil Creek, Lowertown, and low lying area along University Avenue near Transfer Road. Flood-mitigation solutions will also be identified as part of planning storm sewer projects including Ramsey County Rice Street Improvement Project.

### Trash Management Planning and Implementation near Water Resources – 375I

Trash was identified by the community as well as other District stakeholder groups as a high priority water quality issue. In cooperation with partners, the District will develop and implement a trash management plan within the immediate vicinity of District infrastructure and water and natural resources.

### Municipal Source Control/Good Housekeeping Planning and Implementation Assistance – 375J

The District will assist its city partners in implementation and assessment of effectiveness of source control measures and good housekeeping strategies.

### District Chloride Source Assessment and Prevention Plan – 375K

The state developed a metro-wide Chloride Reduction Plan (MPCA, 2016). The District will work within its partners to develop a watershed specific chloride management plan that encompasses existing activities (winter training, FB posts, monitoring) and new strategies (updated rules, incentives, expanded outreach) to reduce chloride usage and chloride loading to District lakes, ponds, wetlands, and the Mississippi River.

### District Boundary Corrections – 375L

The District will periodically evaluate its existing legal boundaries against storm sewer maps, topography and other defining measures and make boundary corrections as needed.



**Mississippi River in downtown Saint Paul** Image credit: Adrian Danciu

### Mixed Use Neighborhood Node Drainage and Water Quality Study – 375M

The District will technically support the City of Saint Paul in a study to investigate water quantity and quality issues in mixed use neighborhoods that generate large volumes of runoff and cause nuisance conditions.

### Tools for Quantification of Non-stormwater Benefits of Green Infrastructure – 375N

Green infrastructure practices are natural and engineered systems that mimic the natural water cycle by capturing, filtering, and/or infiltrating stormwater runoff to reduce polluted stormwater discharges to local waterbodies. Green infrastructure also provides other environmental, social, and economic benefits. The District will explore and compare various tools available for quantification of the non-stormwater benefits of green infrastructure and identify and utilize the preferred tools in stormwater management planning.

### Climate Science and Community Resiliency – 375O

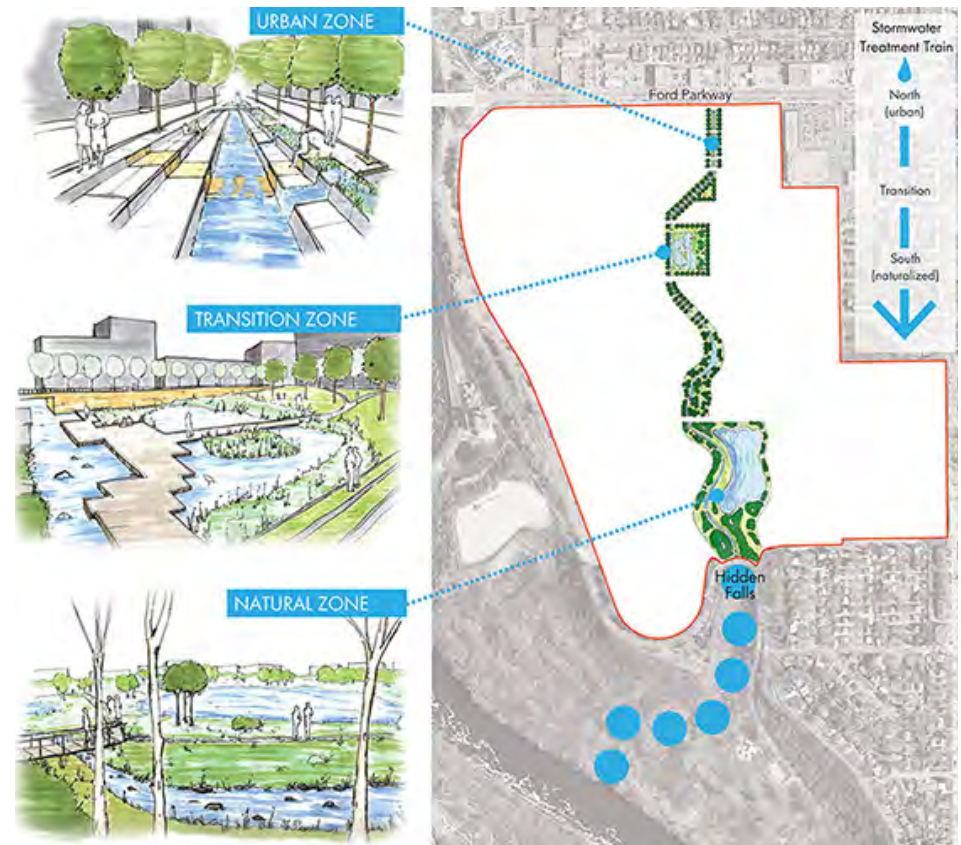
The District will incorporate current and future understanding of climate change and precipitation trends as they pertain to the quality and quantity of District water resources, flood risk, and stormwater best management practice design and maintenance. The District's climate change and community resiliency work may entail research, planning, communications and engagement, and reporting.

### Stormwater Impact Fund Implementation – 475P

To the maximum extent practicable, the District requires developers to meet volume reduction requirements on-site. If that is not practicable, there are a series of alternative sequencing steps in order of preference. As a final alternative, the District collects stormwater impact funds from developers who cannot meet District Rules through on-site or off-site BMP projects. The District will utilize these funds for design and construction of other watershed BMPs.

### Debt and Loan Service – 475Q

The District will make annual payments towards its existing CIP bonds and loan.



**Ford Plant sustainable stormwater management conceptual plan**



### 3.6. Work Planning and Adaptive Management

Table 3-5 includes activities planned over the 10-year life of this Plan. During the 10-year period, new information becomes available, opportunities arise, priorities may evolve, new concerns may emerge, or new technical approaches are developed. In addition, available District and partner funding resources may be impacted by broader economic downturns. The District will adapt its implementation plan to address these challenges or seize these opportunities, performing formal Plan amendments as needed (see Section 3.9).

Annually, the Board (with guidance from District staff) will develop and approve a work plan that outlines the planned actions and expenditures over the next year with consideration for District priorities and financial resources. The District intends to engage the Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC) in review of its proposed annual work plan.



**Adaptive Management Approach**

The 10-year implementation plan (Table 3-5) will serve as a guide for development of the annual work plan. The identified priority and schedule implementation of an activity in Table 3-5 does not guarantee or prohibit the implementation of that activity at a given year. The District's annual work plan may accelerate, delay, delegate, or defer activities relative to the 10-year implementation plan. For example, activities led by partners may be implemented earlier or later than planned due to changing partner priorities, funding, and schedules.

Factors considered in the development of the annual work plan may include:

- Annual budget commitments from previous years (i.e., ongoing responsibilities)
- Available tax revenues, grants, and cost share funding (e.g., from cities or agencies)
- Activity priority (see Section 3.5.1)
- Feasibility
- Risk (of performing or not performing the activity)
- Results of monitoring or studies
- Input from TAC, CAC, and partners
- Consideration of balance with other proposed projects and programs
- Partner priority and funding changes

If planned implementation actions must be deferred due to a recession or significant economic downturn, prioritization will be given to activities on their classification as critical, important, or beneficial (see Section 3.2) and the applicable factors listed above.

Ultimately, the implementation plan ([Table 3-5](#)) is a statement of intent by the District. Final decisions on implementation activities rest with the District's Board of Managers to budget for and authorize via the annual work plan.

### 3.7. Funding

The District plans to fund its administration, programs, projects, and capital improvements through the following four primary funding mechanisms:

- Property tax levy
- Local partner funding
- Bonds and Loans
- Grants

The District also plans to explore new, alternative funding sources or mechanisms, such as environmental impact bonds, to broaden and diversify existing funding sources (Implementation Activity #101C).

#### 3.7.1 Property Tax Levy

The District has the authority to collect funds through a property tax levy under [Minnesota Statutes 103B](#) and [103D](#). This tax is an ad valorem tax (a tax on all taxable parcels in the District that is based on property value). The District legal boundary defines the area of land that comes under the District's jurisdiction, and the area upon which the ad valorem tax is applied. The legal boundary follows the hydrological boundary generally but must follow property boundaries or other legally definable boundaries (e.g., roads), and a single property cannot be in more than one watershed district.

From 2011- 2020, the District funded approximately 60% of its work (administration, programs, projects, and capital improvement projects) through the property tax levy. On the District operations side (administration, programs, and projects), 96% of funding originated from property taxes. In contrast, 33% of capital improvement funding was from property taxes and the remaining

67% of capital improvement costs was funded by partner cost share funds, grants and bonds. The major, non-tax levy funding included state funding of a TBI repair project in 2012/2013, Clean Water Fund grants for the Green Line, Upper Villa and Allianz Field projects, and bonds in 2013 for capital projects and in 2018 for the new office.

During the next 10 years, the District anticipates that it will need to increase its annual levy. The current tax levy is \$8.3M in 2020 and the average levy over the next decade is \$10.5M. The increase in the District's tax levy is the direct result of the District's expanded role in watershed management, specifically facility management and capital improvement projects, and will support the implementation of the activities included in this Plan. The District conducts sound and prudent fiscal management during its annual budgeting and working planning (see Section 3.6), which is based on the District's needs, priorities and external economic factors. The District evaluates its annual tax levy and property tax impacts as a measure of fiscal responsibility. The District will continue to be sensitive to the economic climate of its partners, businesses, and residents as it sets the annual tax levy.

The District will continue to fund nearly all of its administration work, programs, and non-capital projects through its annual tax levy; some additional funding will be raised through permit fees, interest income, and local cost-share funding. Based on estimates of future revenue, capital improvement projects will be funded with approximately 90% annual levy funding and 10% through other revenue including grants, loans, partnership cost-share, and bond proceeds. Small capital improvement projects (less than \$250,000) will be financed through the annual levy. If other revenue is less than 10% for capital projects, the District will reduce project expenditures and/or increase the annual tax levy. If other revenue is greater than 10%, the District will consider increasing its fund balance for future projects and/or reducing its levy. The projected average annual capital tax levy is \$4.2M, which is 90% of the projected average annual capital expenditure of \$4.5M.



### 3.7.2 Grant Funds

Over the past decade the District has successfully leveraged State Clean Water Fund grants to offset the cost of large capital improvement projects. Approximately \$4 million has been received from the state. The District anticipates that competitive grant funding will decrease and become a smaller portion of the District's overall funding, an assumption necessary, in part, to developing a feasible implementation plan. The District will continue to apply for grants and loans to offset project costs whenever possible and cost effective. However, grant and loan programs change frequently as funding sources and priorities change, new grant and loans become available, and existing programs are terminated.

In addition to competitive grants, BWSR's Watershed Based Implementation Funding (WBIF) is expected to become the primary mechanism through which BWSR distributes Clean Water Fund grants. The WBIF program will supply a steady but small source of grant funding allocated every 2 years. WBIF will be allocated within the metro by watershed, with the District located within the "Mississippi East" watershed. For the initial, pilot funding biennium (FY2018-2019), the funding allocation for the District was approximately \$95,000. Local units of government within the Mississippi East watershed shall determine the distribution of WBIF within its boundary. Coordination between the District, its partners, and other organizations within the Mississippi East watershed is critical to promote effective and equitable use of WBIF grant funds. Additional information is available from BWSR at: <https://bwsr.state.mn.us/watershed-based-implementation-funding-program>

### 3.7.3 Partner Cost-Share

The District has relied on partnerships with its cities, regional and state agencies, educational institutions, the private sector, and community groups to successfully complete water and natural resources improvement activities that benefit multiple partners and the broader community but would otherwise be cost-prohibitive.

Noteworthy examples of effective cost-share partnerships include rainwater harvesting at professional sport stadiums in Saint Paul, improved stormwater management at Saint Paul's Central and Como Park High Schools, and hundreds of boulevard raingardens installed as part of street reconstruction projects in Saint Paul and Roseville. The District may lead implementation of such projects or contribute financially to projects led by partners including public or private entities. As the District is fully developed and the District does not own land except for its office site, the District seeks to leverage public-private partnerships with developers and others to achieve District and partner goals. [Table 3-5](#) identifies potential partners for planned implementation activities, where appropriate.

### 3.7.4 Bonds and Loans

The District also has the authority to finance large capital projects



**Saint Paul Natural Resources coordinates Bug Bonanza with Partner Grant dollars** Image credit: Caroline Yang

by selling bonds or securing loans. The District is currently paying off bonds issued for previous large capital improvement projects including water quality improvements in the Como subwatershed, repairs for TBI, and construction of the District's new office. In 2020, the annual payment for bonds and loan is approximately \$1.0 million. The District intends to issue bonds or secure loans for future large capital improvement projects.

## 3.8. Plan Reporting and Assessment

### 3.8.1 Annual Reporting

The District is responsible for evaluating progress towards achieving its goals and reporting annually to BWSR, per [Minnesota Rules 8410.0150](#). Within the first 120 days of the calendar year, the District must submit to BWSR an activity report for the previous calendar year. Reporting requirements specified in [Minnesota Rules 8410](#) will be followed. Generally, the District's annual report includes:

- An assessment of the previous year's annual work plan that indicates whether the planned activities were performed, including the expenditures of each activity with respect to the approved budget (unless included in the audit report)
- A work plan and budget for the current year specifying which activities will be undertaken
- At a minimum of every 2 years, an evaluation of progress on goals and the implementation actions, including the capital improvement program, to determine if amendments to the implementation actions are necessary (see Section 3.8.2)
- A summary of significant trends of lake, stormwater, and climate monitoring data
- The BWSR Level 1 Performance Review and Assistance Program (PRAP) review

The District's annual report may be supplemented by additional, program-specific progress reports (e.g., District Monitoring Report). Within 180 days of the calendar year, the District must submit an audit report of the preceding year's activities.

### 3.8.2 Progress Assessment

Biennially, the District will perform a more detailed evaluation to assess the level of progress achieved on each of the District's stated goals (see Section 2). The format of this evaluation is based on the organization of District goals, cross referenced to the most applicable implementation activities and the associated measurable outputs ([Appendix G](#)). Several of the District's resource goals (e.g., summer average total phosphorus in Como Lake) have a clear, quantifiable metric to assess achievement or progress. In some cases, however, the scope of District goals and the complexity of the affected systems limit the applicability of a singular, quantitative metric.

Thus, the assessment of District progress may include quantitative values and/or qualitative (narrative) discussion of progress towards each goal. It is also important to consider the level of effort performed to achieve these results. Therefore, the measurable outputs of the implementation activities most directly correlated with each goal will also be reported. This information will be useful in annual work planning and determining future revisions to the implementation plan and amendments to the Plan. This evaluation may help focus District efforts on goals that are lagging as well as prioritize or de-emphasize individual implementation activities.

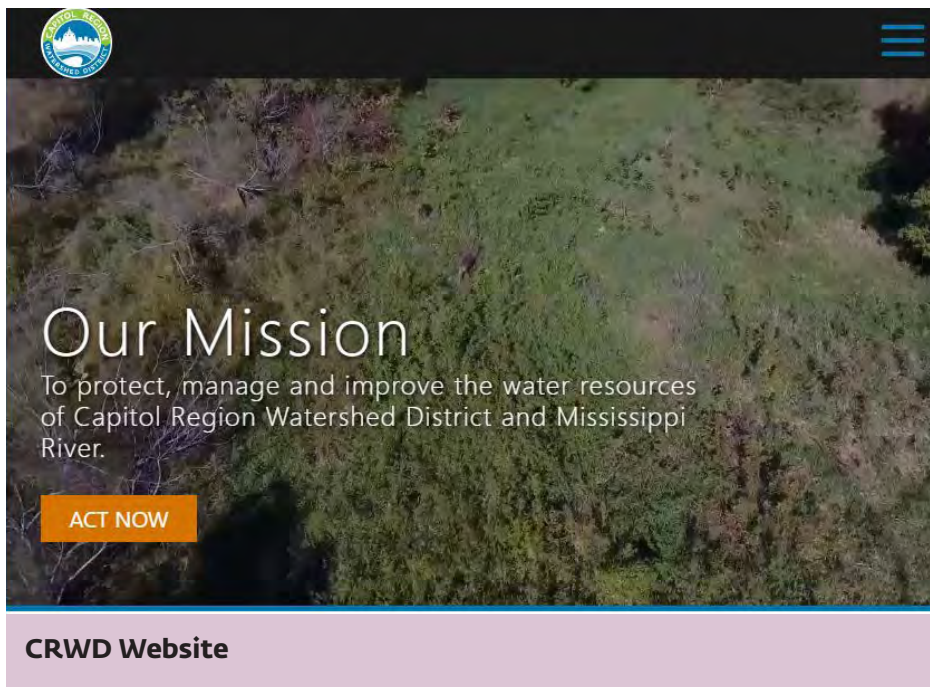
The District will use the biennial progress evaluation input for annual work planning and to determine if amendments to the District implementation plan are needed.

In addition to regular biennial reviews, the District will perform a more extensive mid-term review approximately 5 years into the implementation of this Plan (as was done in 2015 for the 2010 Plan). The mid-term review will assess District goals, issues, activities, and finances and make recommendations for Plan implementation through 2030. The District also anticipates that BWSR will perform a Level II PRAP review during the life of this Plan. The District will incorporate the results of the Level II PRAP in the remaining implementation of this Plan and future Plan updates.



### 3.8.3 District Website

The District will continue to maintain its website. The website will contain the information required in [Minnesota Rules 8410.0150](#), including the location, time, agenda, and minutes for organization meetings; contact information for District staff; the current Plan; annual activity reports; rules and requirements; a list of District board members; and a list of employees including postal and electronic mailing addresses and telephone numbers. The website will be kept current. The District website is located at: [www.capitolregionwd.org](http://www.capitolregionwd.org).



### 3.9. Plan Amendments and Updates

This Plan will guide District activities through 2030, or until superseded by adoption of a subsequent Plan. During this time, the District may revise its Plan through an amendment procedure, as needed. Amendments to this Plan will follow the procedures described in this section and will proceed in accordance with the process provided in [Minnesota Rules 8410.0140](#) and [Minnesota Statutes 103B.231](#). Plan amendments may be proposed by any person to the Board of Managers, but only the Board of Managers may initiate the amendment process. All recommended Plan amendments must be submitted to the District in writing, along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost. Amendments identified by District division manager or administrator will similarly be presented to the Board of Managers for approval.

The District anticipates that only significant changes or additions to goals, issues, administrative procedures, or implementation (i.e., programs, projects, and capital improvements) will prompt the District to amend the Plan, although final discretion resides with the Board of Managers. Minnesota Rules 8410.0140 subp. 1a defines changes that do not require an amendment (e.g. reformatting/reorganization of the Plan, clarification of existing Plan goals or policies, and adjustment to how the District will carry out program activities within its discretion). Timing of Plan amendments will generally coincide with the District's work plan, budget development, and adoption process. Each year, a preliminary work plan and budget for the following year is developed in late spring to mid-summer. The draft preliminary work plan and budget is adopted for public comment in late summer with adoption of the final preliminary work plan and budget in early fall. In December, the final annual work plan and budget is adopted by the District's Board of Managers. The District intends to post this updated information on the District website e ([www.capitolregionwd.org](http://www.capitolregionwd.org)).

Amendments to this Plan are subject to the review process provided in Minnesota Statutes [Minnesota Statutes 103B.231 subd. 11](#), except when the proposed amendments are determined to be minor-amendments by satisfying all of the following criteria:

- A. BWSR has either agreed that the amendments are minor or failed to act within five working days of the end of the 30-day comment period specified in item B (unless an extension has been mutually agreed upon);
- B. The District has sent copies of the amendments to the Plan review authorities for review and comment allowing at least 30 days for receipt of comments, has identified that the minor amendment procedure is being followed, and has directed that comments be sent to the District board;
- C. No county board has filed an objection to the amendments with the District and BSWR within the comment period specified in item B (unless an extension is mutually agreed upon);
- D. The District has held a public meeting to explain the amendments and published a legal notice of the meeting twice, at least seven days and 14 days before the date of the meeting; or
- E. The amendments are not necessary to make the Plan consistent with an approved and adopted Ramsey County groundwater plan.

Draft and final amendments will be formatted and distributed consistent with the requirements of [Minnesota Rules 8410.0140](#), subparts 4 and 5, respectively.

Approximately 2 years prior to the expiration date of this Plan, the District will begin the process of updating its Plan (unless a revised schedule is developed by BWSR in accordance with [Minnesota Statutes section 103B.231, subdivision 3a](#)).

### 3.10. Local Controls and Water Management Plans

Cities within the District manage the impacts of development and redevelopment on water resources through their official controls (e.g., city code, ordinances), local water management plan (LWMP), and Municipal Separate Storm Sewer System (MS4) permit.

Each city within the District is a regulated MS4 under the Clean Water Act and is required to be in compliance with the MS4 General Permit, issued by the state of Minnesota. The MS4 General Permit requires each regulated MS4 to develop a Storm Water Pollution Prevention Program (SWPPP) that addresses how the MS4 will reduce the amount of sediment and other pollutants entering waters from stormwater systems. Information regarding municipal stormwater responsibilities and the MS4 program is available from the MPCA at: <https://www.pca.state.mn.us/water/municipal-stormwater-ms4>

Cities maintain local ordinances regulating stormwater management within their jurisdiction consistent with the District Plan and Rules. Future updates to city ordinances and official controls must be consistent with, or adopt by reference, this Plan and the District Rules. If necessary due to future amendments to this Plan, cities shall amend their official controls to be consistent with this Plan within 2 years of adoption of future amendments.

Cities are encouraged to develop and implement permit programs for projects that fall below the threshold for District permits. If cities assume permitting responsibility from the District (see [Section 3.10.1](#)), those cities are responsible for implementing a permit program consistent with the District. Cities should inform permit applicants of the need for District approval and a District permit for projects meeting specific criteria and direct them to District staff or to the District website for more information: [www.capitolregionwd.org](http://www.capitolregionwd.org).



### 3.10.1 District Rules and Permitting

The District has adopted Rules and implements a project review and permitting program per the authority granted in [Minnesota Statutes 103D](#). The [District Rules](#) require permits for projects meeting certain criteria. As of 2020, the District issues permits for the following rules:

- Stormwater Management (Rule C)
- Flood Control (Rule D)
- Wetland Management (Rule E)
- Erosion and Sediment Control (Rule F)
- Illicit Discharge and Connection (Rule G)

District enforcement actions and procedures for Rule violations are defined in the District's Rules document. The complete and most current District rules are available at the District office and from the District website at: <https://www.capitolregionwd.org/permits/watershed-rules/>

If a city wishes to reestablish its permitting authority for all land alteration activities (i.e., take over permitting authority from the District) it must first prepare a LWMP, obtain District approval of the local plan, and then adopt and enforce applicable ordinances. These ordinances must conform to the District Plan and the District rules.

### 3.10.2 Local Water Management Plans

Each city within the District is required to complete a LWMP that conforms to [Minnesota Statutes 103B.235](#), [Minnesota Rules 8410.1060](#), and is consistent with the District Plan (this document). [Minnesota Rules 8410.1060](#) and [Minnesota Statutes 103B.235](#) Subd. 2 include specific requirements for LWMP content, review, approval, and adoption. LWMPs must be adopted no more than two years prior to the adoption of a local comprehensive plan and extensions of local comprehensive plans due dates do

not alter the LWMP schedule. The current status of city LWMPs is presented in [Table 3-4](#).

The policies and goals established in each city's LWMP must be consistent with the District Plan. The section of the LWMP covering assessment of problems must include those problems identified in the District Plan that affect the city. The corrective action proposed must consider the individual and collaborative roles of the city and the District and must be consistent with the District Plan.

In general, the District expects the cities to take the lead in addressing problem areas that are primarily local in nature (e.g., local nuisance flooding). LWMPs should identify problems and corrective actions that affect District concerns stated in this Plan or require District collaboration to address. Cities are responsible for maintaining stormwater infrastructure; the District requires that LWMPs assess the need for periodic maintenance of public works, facilities, and natural conveyance systems.

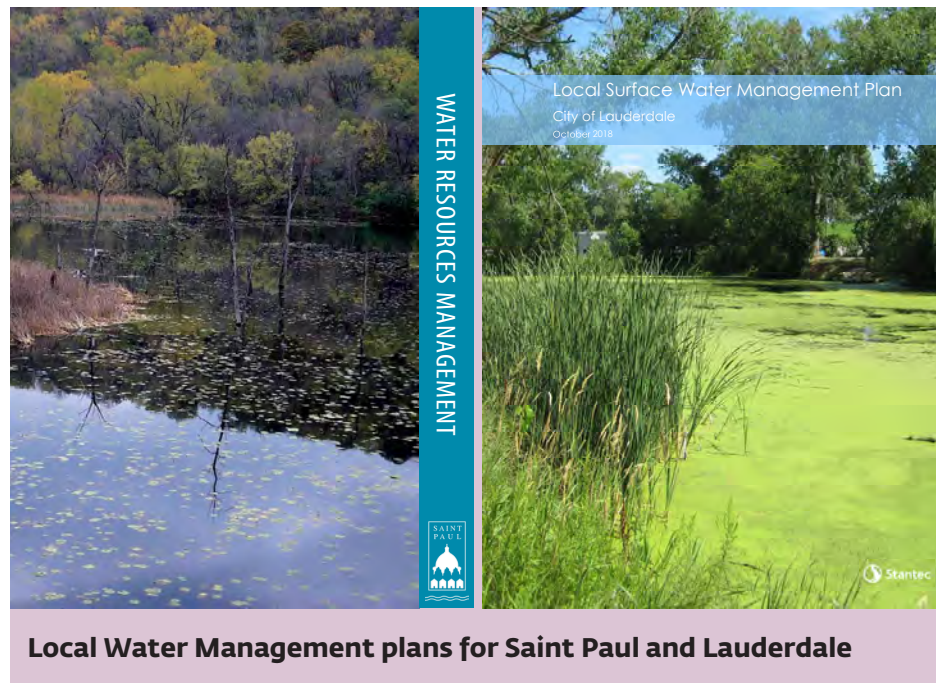
**Table 3-4: Local Water Plan Status**

City	Date of District Approval	Date of City Adoption
<b>Falcon Heights</b>	May 30, 2018	June 27, 2018
<b>Lauderdale</b>	October 3, 2018	November 12, 2019
<b>Maplewood</b>	October 3, 2018	November 26, 2018
<b>Roseville</b>	May 30, 2018	July 9, 2018
<b>Saint Paul</b>	June 19, 2019	June 19, 2019

LWMPs must be submitted to the District for review and approval per the requirements of Minnesota Statutes 103B .235. The District will review the LWMP following the process and schedule described in Minnesota Statutes 103B .235. Upon District approval of the local plan, the city must adopt and implement its plan within 120 days and amend its official controls within 180 days of plan approval. The city must notify the District within 30 days of plan adoption and implementation and adoption of necessary official controls. If a municipality later wishes to amend its plan, it must submit the

proposed amendment to the District for review of consistency with the District Plan following the procedure described in [Minnesota Rules 8410.0160](#).

Cities are encouraged to consult with District staff early on in their planning process. The District will work closely with cities as needed in local plan preparation, review, and implementation. Cities are urged to review District data, maps, and other information available to assist in local plan preparation. District staff will work with city staff, as requested, regarding financial considerations, implementation priorities, and programs for plan elements of mutual concern.



In addition to the LWMP content requirements specified in [Minnesota Rules 8410.1060](#) and [Minnesota Statutes 103B.235](#), the District has established the following local plan content requirements:

1. For cities subject to NPDES MS4 permit requirements, the LWMP must include or reference policies, goals, and actions based on their SWPPP in accordance with MPCA requirements and schedules. Non-degradation requirements, policies, goals, and actions, must also be included in the local water management plan, if applicable.
2. The LWMP must include a listing of any impaired waters (as included on the MPCA's 303(d) list) within the city's jurisdiction. The local plan must describe the city's role/level of participation in preparing and implementing TMDL studies. The local plan must also address issues identified in the District LWMPs prepared for water bodies within the jurisdiction of the city and implementation recommendations that involve local implementation or coordination with the District.
3. The LWMP must describe the city's responsibilities for maintenance, repair, etc. of "non-District-managed" public and private stormwater management systems. The local plan must address maintenance issues and identify the situations where the city needs to coordinate with District on maintenance activities. The LWMP must address, at a minimum, the following maintenance issues included in [Minnesota Rules \(8410.0100, Subp.6.\)](#)
4. The LWMP must describe the city's role in wetland management and include or reference applicable wetland management standards. If the city is already the LGU or wishes to accept responsibility as the LGU, the city must adopt a wetland management ordinance that incorporates the District wetland management classification system and standards.



Table 3-5: CRWD 2021-2030 Plan Implementation Table and Capital Improvement Program

NOTES:

- In the **Partners** column, "**L**"=Lead, "**P**"=Partners
- **Overall Budget Notes** : This budget reflects 3% inflation each year from 2020 cost estimates. The cost estimates reflect only CRWD portion of costs. Costs of some project/CIPs will be shared with partners.

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits												
ADMINISTRATION																								
101	Administration													Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
101A	General administration	Critical	Watershed-wide	Annual budget, audit and report	L								\$8,855,847	\$772,500	\$795,675	\$819,545	\$844,132	\$869,456	\$895,539	\$922,405	\$950,078	\$978,580	\$1,007,937	
101B	Citizen Advisory Committee	Critical	Watershed-wide	12 CAC members and monthly meetings	L								\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
101C	External funding opportunities	Critical	Watershed-wide	1 external funding opportunities study	L								\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720	
101D	Program effectiveness assessment	Critical	Watershed-wide	Bi-annual assessment report	L			P					\$23,236	\$-	\$5,305	\$-	\$5,628	\$-	\$5,970	\$-	\$6,334	\$-	\$-	
101E	Office operations	Critical	Watershed-wide	Annual office operations	L								\$1,535,013	\$133,900	\$137,917	\$142,055	\$146,316	\$150,706	\$155,227	\$159,884	\$164,680	\$169,621	\$174,709	
101F	MAWD support	Important	Watershed-wide	Annual MAWD support	L								\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720	
101G	Safety Program	Critical	Watershed-wide	Annual training and monthly staff meeting safety reminders	L								\$472,312	\$41,200	\$42,436	\$43,709	\$45,020	\$46,371	\$47,762	\$49,195	\$50,671	\$52,191	\$53,757	

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
101H	Diversity and inclusion program	Critical	Watershed-wide	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/ schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	L	P	P	P	P	P	P	P	\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
													\$968,200	\$1,002,551	\$1,027,163	\$1,063,606	\$1,089,718	\$1,128,379	\$1,156,081	\$1,197,098	\$1,226,487	\$1,263,281	
PROGRAMS																							
208	Regulatory Program												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
208A	General permitting implementation	Critical	Watershed-wide	30 permits approved and 7 acre-feet retained annually	L								\$3,333,249	\$206,000	\$212,180	\$327,818	\$337,653	\$347,782	\$358,216	\$368,962	\$380,031	\$391,432	\$403,175
208B	Coordinated erosion and sediment control inspections	Important	Watershed-wide	(% compliance) Active Sites Visited once per week during construction	L	P	P	P					\$3,333,249	\$206,000	\$212,180	\$327,818	\$337,653	\$347,782	\$358,216	\$368,962	\$380,031	\$391,432	\$403,175



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
208C	Permittee post construction BMP inspections	Important	Watershed-wide	20 inspected BMPs and BMP conditions status reports per year	L	P	P			P	P		\$177,117	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
208D	Engagement activities with permittees, developers, engineers, and applicants	Important	Watershed-wide	5 meetings with private developers during the plan period	L						P		\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720
208E	Rules evaluation and update	Critical	Watershed-wide	5 Rules TAC meetings; # updates to District Rules	L	P	P	P	L				\$177,117	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
208F	Deicing practices rule	Important	Watershed-wide	1 chloride reduction rule or ordinance assistance package	L	P	P	P	L				\$25,156	\$-	\$-	\$-	\$-	\$-	\$-	\$12,299	\$6,334	\$6,524	\$-
208G	Stormwater rule requirements on sites less than one acre	Critical	Watershed-wide	1 Rule Revision for Small Sites	L	P	P	P	L				\$44,365	\$-	\$-	\$21,855	\$22,510	\$-	\$-	\$-	\$-	\$-	\$-
208H	Illicit Discharge Detection and Elimination (IDDE) plan implementation	Important	Watershed-wide	20 illicit discharges removed over 10 years	L	P	P	P					\$229,389	\$41,200	\$42,436	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
208I	Green infrastructure incentives in District rules	Important	Watershed-wide	1 adopted green infrastructure incentive rule	L	P	P	P	P				\$23,533	\$-	\$-	\$-	\$-	\$11,593	\$11,941	\$-	\$-	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
208J	Industrial stormwater permittee coordination	Important	Watershed-wide	10 industrial stormwater site meetings	P	P	P	L					\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720
208K	Water reuse policy support	Critical	Watershed-wide	Adopted water reuse guidance document	P	P	P	L	P	P			\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720
													\$7,520,292	\$499,550	\$514,537	\$743,054	\$765,346	\$776,714	\$800,015	\$824,015	\$842,402	\$867,674	\$886,985
210	Grants Program												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
210A	Stewardship grants	Critical	Watershed-wide	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	L		P						\$5,903,898	\$515,000	\$530,450	\$546,364	\$562,754	\$579,637	\$597,026	\$614,937	\$633,385	\$652,387	\$671,958
210B	Stewardship grant outreach	Critical	Watershed-wide	12 community events with translated Stewardship Grant outreach materials; engage with 3 organizations that serve BIPOC residents	L							P	\$59,039	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796	\$5,970	\$6,149	\$6,334	\$6,524	\$6,720
210C	Stewardship grant project inspection and maintenance assistance	Important	Watershed-wide	90% BMPs rated fair or better for functionality	L		P						\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
210D	Targeted site identification	Important	Watershed-wide	12 suitable sites identified over the 10-year plan	L	P	P						\$88,124	\$-	\$26,523	\$-	\$-	\$28,982	\$-	\$-	\$-	\$32,619	\$-
210E	ROW projects - boulevard raingardens	Important	Watershed-wide	5 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	L	P	P		P			P	\$295,195	\$25,750	\$26,523	\$27,318	\$28,138	\$28,982	\$29,851	\$30,747	\$31,669	\$32,619	\$33,598
210F	Well-sealing Grants	Beneficial	Watershed-wide	12 wells sealed annually	L		P						\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
210G	Large-scale site planning grants	Important	Watershed-wide	3 planning grants annually	L								\$1,180,780	\$103,000	\$106,090	\$109,273	\$112,551	\$115,927	\$119,405	\$122,987	\$126,677	\$130,477	\$134,392
210H	Chloride reduction grants	Important	Watershed-wide	5 chloride reduction grants annually	L								\$485,845	\$-	\$-	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
210I	District "watercorps" position	Important	Watershed-wide	1 position offered annually	L	P				P			\$431,112	\$-	\$42,436	\$43,709	\$45,020	\$46,371	\$47,762	\$49,195	\$50,671	\$52,191	\$53,757
													\$8,798,225	\$679,800	\$769,153	\$819,545	\$844,132	\$898,437	\$895,539	\$922,405	\$950,078	\$1,011,199	\$1,007,937
211	Monitoring, Assessment and Research Program												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
211A	Stormwater monitoring and data collection	Critical	Watershed-wide	10 monitoring sites; stormwater quality and quantity data	L	P							\$4,132,728	\$360,500	\$371,315	\$382,454	\$393,928	\$405,746	\$417,918	\$430,456	\$443,370	\$456,671	\$470,371
211B	Lake monitoring and data collection	Critical	Watershed-wide	5 lakes monitored; lake quality, and quantity data, and biological data	L		L						\$1,298,858	\$113,300	\$116,699	\$120,200	\$123,806	\$127,520	\$131,346	\$135,286	\$139,345	\$143,525	\$147,831

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
211C	BMP performance monitoring	Critical	Watershed-wide	8 BMPs monitored; volume and pollutant reductions	L	P	P	P					\$1,771,169	\$154,500	\$159,135	\$163,909	\$168,826	\$173,891	\$179,108	\$184,481	\$190,016	\$195,716	\$201,587
211D	Monitoring database and reporting tool	Important	Watershed-wide	Stormwater and lake data available on monitoring database and reporting tool	L								\$708,468	\$61,800	\$63,654	\$65,564	\$67,531	\$69,556	\$71,643	\$73,792	\$76,006	\$78,286	\$80,635
211E	Wetland biological integrity monitoring	Important	Watershed-wide	18 wetlands monitored; wetland health grades	L	P	P	P					\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
211F	Monitoring data trend analysis and reporting for public	Important	Watershed-wide	Monitoring trend analysis report	L					P			\$41,818	\$20,600	\$21,218	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
211G	Citizen Science Monitoring Program	Important	Watershed-wide	Citizen science monitoring program	L			P		P		P	\$119,023	\$-	\$-	\$32,782	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
211H	Research program	Important	Watershed-wide	Stormwater research reports	L	P	P	P	P	L			\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
211I	Emerging contaminants and water quality issues	Important	Watershed-wide	New monitoring parameters and results	L	P	P	P	P	P			\$177,117	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
211J	Non-structural BMPs effectiveness	Beneficial	Watershed-wide	Technical memo	L	P	P	P	P	L		P	\$71,664	\$-	\$-	\$-	\$-	\$23,185	\$23,881	\$24,597	\$-	\$-	\$-
\$9,147,391														\$798,250	\$822,198	\$857,791	\$861,014	\$910,030	\$937,331	\$965,451	\$969,079	\$998,151	\$1,028,096



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
220	Communications and Engagement Program												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
220A	General communications and engagement	Critical	Watershed-wide	Brand standards and common language; 5 outreach meetings per month; contact database	L	P	P	P	P	P	P	P	\$3,070,027	\$267,800	\$275,834	\$284,109	\$292,632	\$301,411	\$310,454	\$319,767	\$329,360	\$339,241	\$349,418
220B	Project Communication	Critical	Watershed-wide	Project specific communication plans and tools; 3 pieces of digital content per project per year	L	P	P	P	P	P	P	P	\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
220C	Clean Streets	Important	Watershed-wide	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	L	P	P			P	P	P	\$472,312	\$41,200	\$42,436	\$43,709	\$45,020	\$46,371	\$47,762	\$49,195	\$50,671	\$52,191	\$53,757
220D	Maintenance workshops for water quality	Critical	Watershed-wide	2-4 workshops with 20-45 attendees per year	L	P	P			P	P		\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
220E	Digital communications	Critical	Watershed-wide	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	L	P	P	P	P	P	P	P	\$827,873	\$61,800	\$63,654	\$65,564	\$67,531	\$69,556	\$191,048	\$73,792	\$76,006	\$78,286	\$80,635

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
220F	Volunteer programs	Important	Watershed-wide	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	L			P				L	\$472,312	\$41,200	\$42,436	\$43,709	\$45,020	\$46,371	\$47,762	\$49,195	\$50,671	\$52,191	\$53,757
220G	Sponsorships	Important	Watershed-wide	5-10 District sponsored events/ activities; 1,000-5,000 people served per year	P	L			L			L	\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
220H	Partnerships	Critical	Watershed-wide	50 hours spent collaborating with 10 key community partners per year	L	P	P	P	P	P	P	P	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
220I	Events	Important	Watershed-wide	25 community events attended by the District; 2,000 people reached per year	L	P	P	P	P	P	P	P	\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
220J	Awards program	Beneficial	Watershed-wide	Annual awards program to recognize up to six individuals or organizations.	L	P	P	P		P	P	P	\$177,117	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
220K	Youth programs	Important	Watershed-wide	500 youth engaged; types of youth programs; 5 schools worked with per year	L	P	P	P		P		P	\$295,195	\$25,750	\$26,523	\$27,318	\$28,138	\$28,982	\$29,851	\$30,747	\$31,669	\$32,619	\$33,598



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
220L	Partner grant program	Important	Watershed-wide	10 Partner Grant projects; 5,000-10,000 participants served; types of products created; pollution reduction; acres of greenspace restored per year	L	P	P			P		P	\$2,691,604	\$180,250	\$185,658	\$218,545	\$225,102	\$260,837	\$268,662	\$307,468	\$316,693	\$358,813	\$369,577
220M	Public art program	Important	Watershed-wide	1-2 arts related projects, activities, events per year; demographics of audiences when available	L					P		P	\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
220N	595 Aldine communications and engagement	Important	Watershed-wide	4-5 BMP and interactive exhibit signs; 1-2 exhibits, and activities at District office per year	L								\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
													\$10,722,232	\$870,350	\$896,461	\$950,672	\$979,193	\$1,037,550	\$1,188,082	\$1,131,484	\$1,165,428	\$1,233,011	\$1,270,001
222	Facility (Infrastructure) Management Program												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
222A	District-owned facility management	Critical	Watershed-wide	6 BMPs inspected and maintained	L							P	\$3,850,145	\$206,000	\$233,398	\$264,440	\$299,610	\$339,459	\$384,607	\$435,759	\$493,715	\$559,379	\$633,777
222B	Shared ownership (District/ partner) facility management	Critical	Watershed-wide	4 BMPs inspected and maintained	L	P	P						\$962,536	\$51,500	\$58,350	\$66,110	\$74,903	\$84,865	\$96,152	\$108,940	\$123,429	\$139,845	\$158,444

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
222C	Partner owned facility management and ownership evaluation	Critical	Watershed-wide	Evaluation report	L	P	P						\$1,155,043	\$61,800	\$70,019	\$79,332	\$89,883	\$101,838	\$115,382	\$130,728	\$148,115	\$167,814	\$190,133
222D	Cooperative BMP maintenance service program	Important	Watershed-wide	6 BMPs inspected and maintained	L	P	P			P	P	P	\$704,700	\$-	\$-	\$54,636	\$61,903	\$70,136	\$79,464	\$90,033	\$102,007	\$115,574	\$130,946
222E	BMP database	Critical	Watershed-wide	BMP database	L								\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
\$7,026,658													\$350,200	\$393,594	\$497,300	\$560,064	\$631,075	\$711,426	\$802,356	\$905,269	\$1,021,756	\$1,153,617	
PROJECTS - Planning, Design and CIPs																							
302	Groundwater Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
302A	Groundwater seepage and springs study	Beneficial	Watershed-wide	Seepage and springs study report	P	L	L	P					\$51,431	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$25,335	\$26,095	\$-
302B	Beneficial infiltration study and demonstration projects	Beneficial	Watershed-wide	Beneficial infiltration study report	L	P	P	P	P				\$58,833	\$-	\$-	\$-	\$-	\$28,982	\$29,851	\$-	\$-	\$-	\$-
302C	Infiltration and groundwater quality study	Important	Watershed-wide	Infiltration-groundwater quality study report	L	P	P	P	P				\$82,774	\$-	\$-	\$54,636	\$28,138	\$-	\$-	\$-	\$-	\$-	\$-
302D	Groundwater monitoring well network in the District	Beneficial	Watershed-wide	Groundwater monitoring well network map	P	P	P	L	P				\$13,439	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$13,439
302E	Karst area study	Beneficial	Saint Paul	Karst study report	P	L	P	P	P				\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
302F	Ramsey County groundwater study	Important	Watershed-wide	Updated County groundwater plan	P	P	L	P	P				\$26,878	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$26,878	
													\$233,356	\$-	\$-	\$54,636	\$28,138	\$28,982	\$29,851	\$-	\$25,335	\$26,095	\$40,317
402	Groundwater Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
402G	Future groundwater projects	Important	Watershed-wide	1 groundwater projects	P	L	L	L	P				\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
													\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
305/405 Como Lake Subwatershed																							
305	Como Lake Subwatershed Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
305A	Como Lake water quality model	Critical	Como subwatershed	Como Lake water quality model	L	P							\$20,600	\$20,600	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
305B	AIS management (including herbicide treatment of curlyleaf pondweed)	Critical	Como subwatershed	< 10% FOC of curlyleaf pondweed	L	L	P	L					\$177,117	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572	\$20,159
305C	Lake vegetation management plan and implementation	Critical	Como subwatershed	Plan is done, implementation: species richness >8; 3 species having FOC >20%	P	P	P	L					\$78,923	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$-	\$-	\$-
305D	Balanced fishery target development	Important	Como subwatershed	Fishery targets from Como Lake Management Plan	P			L					\$59,193	\$7,725	\$7,957	\$8,195	\$8,441	\$8,695	\$8,955	\$9,224	\$-	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
305E	Shoreline management plan and implementation	Important	Como subwatershed	Shoreline management plan and all of lakeshore maintained in a restored state	L	L	P					P	\$47,306	\$25,750	\$2,122	\$2,185	\$2,251	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610	\$2,688
305F	Street sweeping enhancement	Important	Como subwatershed	Street sweeping plan and sediment and phosphorus reduction	P	L						P	\$104,545	\$51,500	\$53,045	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
305G	Innovative treatment facility feasibility study (i.e. spent lime)	Beneficial	Como subwatershed	Study report	L			P					\$132,434	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$65,239	\$67,196
305H	Water-based recreational activities support	Beneficial	Como subwatershed	Support of partner water-based recreational activities	P	L		L					\$265,675	\$23,175	\$23,870	\$24,586	\$25,324	\$26,084	\$26,866	\$27,672	\$28,502	\$29,357	\$30,238
305I	Como Park area drainage infrastructure analysis and planning	Important	Como subwatershed	Como Park area drainage infrastructure study	L	P	P						\$78,023	\$51,500	\$26,523	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
305P	Future stormwater management planning	Important	Como subwatershed	1 future stormwater management studies	L	P	P						\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
\$1,199,972													\$226,600	\$161,257	\$84,140	\$86,664	\$89,264	\$91,942	\$94,700	\$75,373	\$142,873	\$147,159	

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
405	Como Lake Subwatershed Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
405J	Como Golf Course BMPs	Critical	Como subwatershed	"Infiltration and iron-enhanced pond 55 lbs/year TP reduction 34 acre-ft/year volume reduction"	L	P							\$1,167,917	\$1,030,000	\$137,917	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
405K	Como Pavilion BMPs	Critical	Como subwatershed	1 water quality CIPs	P	L							\$2,284,783	\$-	\$-	\$-	\$1,125,509	\$1,159,274	\$-	\$-	\$-	\$-	
405L	McMurray Field	Critical	Como subwatershed	1 water quality CIPs	L	P							\$1,957,730	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$633,385	\$652,387	\$671,958
405M	Como Lake Alum Treatment	Critical	Como subwatershed	24,000 gallons of Alum applied to Como Lake	L	P		P					\$360,500	\$360,500	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
405N	East Como Blvd. BMPs	Critical	Como subwatershed	1 water quality CIPs	P	L							\$662,172	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$326,193	\$335,979
405O	Gottfried's Pit Improvements	Important	Como subwatershed	1 water quality CIPs	P	P	L						\$104,545	\$51,500	\$53,045	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
405P	Future capital improvement projects (CIPs)	Important	Como subwatershed	1 future water quality CIPs	L	P	P	P					\$940,978	\$103,000	\$212,180	\$-	\$-	\$289,819	\$-	\$-	\$-	\$-	\$335,979
\$7,4780														\$1,545,000	\$403,142	\$-	\$1,125,509	\$1,449,093	\$-	\$-	\$633,385	\$978,580	\$1,343,916
310/410 Lake McCarrons Subwatershed Projects																							
310	Lake McCarrons Subwatershed Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
310A	Alum treatment evaluation	Important	Lake McCarrons subwatershed	Alum treatment evaluation report	L	P	P	P					\$17,911	\$-	\$-	\$-	\$-	\$-	\$17,911	\$-	\$-	\$-	\$-



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
310B	Villa Park wetland system evaluation	Important	Lake McCarrons subwatershed	VPWS evaluation report with existing phosphorus reductions	L	P	P						\$45,020	\$-	\$-	\$-	\$45,020	\$-	\$-	\$-	\$-	\$-	\$-
310C	Watershed Hydraulic/ Hydrologic Modeling	Important	Lake McCarrons subwatershed	Updated model	L	P	P						\$78,332	\$41,200	\$37,132	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
310D	Lake vegetation management plan and AIS response plan	Important	Lake McCarrons subwatershed	Lake vegetation management plan; type and abundance of aquatic plants	P	P	L	L					\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
310E	Balanced fishery targets	Important	Lake McCarrons subwatershed	Fishery targets	P	P	P	L					\$15,914	\$-	\$15,914	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
310F	Shoreline management plan and implementation	Important	Lake McCarrons subwatershed	Shoreline management plan	L	P	L	P				P	\$33,639	\$-	\$-	\$16,391	\$2,251	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610	\$2,688
310G	Future stormwater management planning	Important	Lake McCarrons subwatershed	1 future BMP studies	L	P	P			P	P	P	\$47,067	\$-	\$-	\$-	\$-	\$23,185	\$23,881	\$-	\$-	\$-	\$-
													\$474,038	\$61,800	\$74,263	\$38,245	\$69,782	\$48,690	\$68,061	\$27,057	\$27,869	\$28,705	\$29,566
410	Lake McCarrons Subwatershed Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
410A	Alum treatment	Critical	Lake McCarrons subwatershed	1 alum treatment	L	P	P	P					\$614,937	\$-	\$-	\$-	\$-	\$-	\$-	\$614,937	\$-	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
410B	Villa Park performance improvements	Important	Lake McCarrons subwatershed	1 Villa Park CIP project	L	P	P						\$579,637	\$-	\$-	\$-	\$-	\$579,637	\$-	\$-	\$-	\$-	
410G	Future CIPs	Important	Lake McCarrons subwatershed	1 future CIP	L	P	P	P		P	P	P	\$190,016	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$190,016	\$-	
\$1,384,589														\$-	\$-	\$-	\$-	\$579,637	\$-	\$614,937	\$190,016	\$-	\$-
313/413 Loeb Lake Subwatershed																							
313	Loeb Lake Subwatershed Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
313A	Update Loeb Lake Management Plan	Important	Loeb Lake subwatershed	Updated Loeb Lake Management Plan	L	P	P	P				P	\$41,664	\$25,750	\$15,914	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
313B	AIS management	Important	Loeb Lake subwatershed	AIS managment plan included in Loeb Lake management plan	L	L	P	P					\$16,073	\$-	\$10,609	\$5,464	\$-	\$-	\$-	\$-	\$-	\$-	
313C	Shoreline management plan and implementation	Important	Loeb Lake subwatershed	Shoreline management plan	L	L	P						\$16,555	\$-	\$-	\$10,927	\$5,628	\$-	\$-	\$-	\$-	\$-	
313D	Loeb Lake sedimentation pond investigation	Important	Loeb Lake subwatershed	Study completed	L	P							\$41,200	\$20,600	\$20,600	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
313E	Future stormwater planning	Important	Loeb Lake subwatershed	1 feasibility study	L	P	P						\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	
													\$233,569	\$56,650	\$57,732	\$27,318	\$16,883	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
413	Loeb Lake Subwatershed Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
413E	Future CIPs	Important	Loeb Lake subwatershed	1 CIP	L	P	P	P					\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
													\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
315/415 Trout Brook Subwatershed																							
315	Trout Brook Subwatershed Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
315A	TBI 5-year inspection and CIP development	Critical	Trout Brook subwatershed	Inspection and CIP reports every five years	L								\$252,491	\$-	\$-	\$-	\$135,061	\$-	\$-	\$-	\$-	\$117,430	\$-
315B	NPDES stormwater program	Important	Trout Brook subwatershed	Annual MS4 report and updated SWPPP	L	P	P	P				P	\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
315C	TBI hydrologic and hydraulic model update and expansion	Important	Trout Brook subwatershed	Expanded, updated TBI H/H model	L	P	P	P					\$103,000	\$103,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
315D	TBI flood mitigation and water quality improvement studies	Critical	Trout Brook subwatershed	3 flood mitigation and water quality improvement studies	L	P	P	P					\$354,697	\$77,250	\$-	\$-	\$84,413	\$-	\$-	\$92,241	\$-	\$-	\$100,794
315E	TBI easement verification, acquisition, and documentation	Important	Trout Brook subwatershed	8 acres of additional TBI easement	L	P	P						\$546,841	\$103,000	\$106,090	\$109,273	\$112,551	\$115,927	\$-	\$-	\$-	\$-	\$-



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
315I	Future stormwater management planning	Important	Trout Brook subwatershed	2 BMP feasibility studies	L	P	P	P		P	P	P	\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
													\$1,729,341	\$324,450	\$148,526	\$152,982	\$377,045	\$162,298	\$47,762	\$141,435	\$50,671	\$169,621	\$154,550
420	Trout Brook Subwatershed Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
415F	TBI Repairs Station 28+65 - 50+72	Critical	Trout Brook subwatershed	2200 feet of TBI repaired	L								\$952,750	\$952,750	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
415G	TBI Repairs Station 135+06 - 180+29	Critical	Trout Brook subwatershed	4500 feet of TBI repaired	L								\$2,534,585	\$-	\$-	\$-	\$-	\$231,855	\$1,134,350	\$1,168,380	\$-	\$-	\$-
415H	Major sediment removal	Important	Trout Brook subwatershed	1700 cubic feet of sediment removed	L								\$121,832	\$-	\$-	\$54,636	\$-	\$-	\$-	\$-	\$-	\$-	\$67,196
415D	Future flood mitigation and/or water quality improvement projects	Critical	Trout Brook subwatershed	3 flood mitigation/ water quality improvement projects	L	P	P	P					\$2,123,549	\$-	\$318,270	\$327,818	\$-	\$347,782	\$358,216	\$-	\$380,031	\$391,432	\$-
415I	Future CIPs	Critical	Trout Brook subwatershed	2 CIPs	L	P	P	P		P	P	P	\$1,180,780	\$103,000	\$106,090	\$109,273	\$112,551	\$115,927	\$119,405	\$122,987	\$126,677	\$130,477	\$134,392
													\$6,913,495	\$1,055,750	\$424,360	\$491,727	\$112,551	\$695,564	\$1,611,971	\$1,291,368	\$506,708	\$521,909	\$201,587
317/417 Crosby Lake Subwatershed																							
317	Crosby Lake Subwatershed Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
317A	Crosby Farm bluff stabilization plan	Important	Crosby Lake subwatershed	Bluff erosion study update	P	L	P	P					\$18,633	\$-	\$-	\$-	\$-	\$-	\$-	\$12,299	\$6,334	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
317B	Hidden Falls/ Crosby Farm trail reconstruction planning	Beneficial	Crosby Lake subwatershed	Trail reconstruction plan	P	L	P	P				P	\$117,666	\$-	\$-	\$-	\$-	\$57,964	\$59,703	\$-	\$-	\$-	\$-
317C	Update Crosby Lake Management Plan	Important	Crosby Lake subwatershed	Updated Crosby Lake Management Plan	L	P	P	P					\$55,456	\$-	\$-	\$27,318	\$28,138	\$-	\$-	\$-	\$-	\$-	\$-
317D	35E Regional stormwater BMP feasibility study	Important	Crosby Lake subwatershed	Stormwater feasibility study	L	P	P	P					\$58,833	\$-	\$-	\$-	\$-	\$28,982	\$29,851	\$-	\$-	\$-	\$-
317E	Shoreline management plan and implementation	Important	Crosby Lake subwatershed	Shoreline management plan and # feet of restored shoreline	L	P	P	P					\$74,987	\$-	\$-	\$-	\$-	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
317F	Terrestrial and aquatic invasive species management	Important	Crosby Lake subwatershed	Type and abundance of invasive species	L	P	P	P					\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
317G	Floodplain and wetland restoration opportunities around Crosby Lake	Beneficial	Crosby Lake subwatershed	Floodplain and wetland restoration plan	P	L	P	P				P	\$60,598	\$-	\$-	\$-	\$-	\$-	\$29,851	\$30,747	\$-	\$-	\$-
317H	Future stormwater management planning	Important	Crosby Lake subwatershed	1 feasibility study	L	P	P	P			P		\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
\$740,407														\$30,900	\$31,827	\$60,100	\$61,903	\$133,317	\$167,167	\$92,241	\$57,005	\$52,191	\$53,757

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
417	Crosby Lake Subwatershed Projects Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
417A	Crosby Farm Park bluff stabilization projects	Beneficial	Crosby Lake subwatershed	1 bluff stabilization project	P	L	P	P					\$264,869	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$130,477	\$134,392
417G	Floodplain and wetland restoration projects	Beneficial	Crosby Lake subwatershed	1 floodplain and wetland restoration project	P	L	P	P				P	\$132,434	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$65,239	\$67,196
417H	Future CIPs	Important	Crosby Lake subwatershed	1 future water quality CIPs	L	P	P	P			P		\$885,585	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
\$1,282,888														\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$293,574	\$302,381
325/425 Wetland, Stream, and Ecosystem Restoration																							
325	Wetland, Stream, and Ecosystem Restoration Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
325A	Phalen Creek Daylighting	Critical	Phalen Creek subwatershed	Concept design report for daylighted Phalen Creek	L	P		P				P	\$103,000	\$103,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325B	Hidden Falls Creek Restoration Planning	Critical	Hidden Falls subwatershed	Planning and design report for restored Hidden Falls Creek	L	L							\$121,196	\$-	\$-	\$-	\$-	\$-	\$59,703	\$61,494	\$-	\$-	\$-
325C	Swede Hollow Water Resource and Natural Resources Plan	Important	Phalen Creek subwatershed	Swdede Hollow water and natural resources plan	P	L						P	\$94,133	\$-	\$-	\$-	\$-	\$46,371	\$47,762	\$-	\$-	\$-	\$-
325D	Cascade Creek/ Fountain Creek daylighting feasibility study	Beneficial	East Kittsondale subwatershed	Cascade Creek/ Fountain Creek daylighting feasibility study report	L	P							\$78,023	\$51,500	\$26,523	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
325E	Willow Reserve signage and access	Important	Trout Brook subwatershed	Willow Reserve interpretive signage and access	P	L						P	\$159,158	\$25,750	\$106,090	\$27,318	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325F	District 6 Natural Resource Management Plan	Important	Trout Brook subwatershed	1 NRI recommendation investigated and feasibility report created	L	P						P	\$55,957	\$-	\$-	\$21,855	\$22,510	\$11,593	\$-	\$-	\$-	\$-	\$-
325G	Wetland Restoration Planning	Important	Watershed Wide	Saint Paul wetland restoration plan	L	L	P	P	P				\$106,909	\$25,750	\$26,523	\$54,636	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325H	Natural resource inventories and/or management plans	Important	Trout Brook and Phalen Creek subwatersheds	2 natural resource inventories and plans	L	P	P					P	\$295,195	\$25,750	\$26,523	\$27,318	\$28,138	\$28,982	\$29,851	\$30,747	\$31,669	\$32,619	\$33,598
													\$1,013,571	\$231,750	\$185,658	\$131,127	\$50,648	\$86,946	\$137,316	\$92,241	\$31,669	\$32,619	\$33,598
425	Wetland, Stream, and Ecosystem Restoration Capital Improvements												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
425A	Phalen Creek daylighting	Critical	Phalen Creek subwatershed	1 Phalen Creek daylighting project	L	P		L				P	\$549,737	\$-	\$106,090	\$218,545	\$225,102	\$-	\$-	\$-	\$-	\$-	\$-
425B	Hidden Falls Creek restoration	Critical	Hidden Falls subwatershed	1 Hidden Falls Creek restoration project	P	L							\$1,248,322	\$-	\$-	\$-	\$-	\$-	\$-	\$614,937	\$633,385	\$-	\$-
425C	Swede Hollow restoration	Important	Phalen Creek subwatershed	1 Swede Hollow restoration project	P	L							\$993,259	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$489,290	\$503,969
425D	Cascade Creek/ Fountain Creek restoration	Beneficial	East Kittsondale subwatershed	1 Cascade Creek/ Fountain Creek restoration project	P	L							\$671,958	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$671,958

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
425H	Future wetland/ stream/natural resource restoration projects	Important	Watershed- wide	2 Acres of restored wetland and other natural resource areas	P	L	L	P	P	P	P	P	\$944,624	\$82,400	\$84,872	\$87,418	\$90,041	\$92,742	\$95,524	\$98,390	\$101,342	\$104,382	\$107,513
\$4,407,900														\$82,400	\$190,962	\$305,964	\$315,142	\$92,742	\$95,524	\$713,327	\$734,727	\$593,672	\$1,283,440
331/431 Mississippi River Gorge Subwatersheds																							
331	Mississippi River Gorge Subwatersheds Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
331A	Towerside Innovation District stormwater management planning	Important	Saint Anthony Park subwatershed	Towerside stormwater planning study	L	P			L	P	P	P	\$112,797	\$25,750	\$-	\$27,318	\$-	\$28,982	\$-	\$30,747	\$-	\$-	\$-
331B	Creative Enterprise Zone stormwater management planning	Important	Saint Anthony Park and West Kittsondale subwatersheds	CEZ stormwater planning study	L	P				P	P	P	\$116,181	\$-	\$26,523	\$-	\$28,138	\$-	\$29,851	\$-	\$31,669	\$-	\$-
331C	UM/MN State Fair Cooperative Projects	Important	Saint Anthony Park subwatershed	1 stormwater planning study	L	P	P	P		P	P	P	\$118,232	\$25,750	\$-	\$-	\$28,138	\$-	\$-	\$30,747	\$-	\$-	\$33,598
331E	Future stormwater management planning	Important	Saint Anthony and Mississippi River Blvd subwatersheds	1 stormwater management planning study	L	P	P	P	P	P	P	P	\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
\$583,366														\$72,100	\$47,741	\$49,173	\$78,786	\$52,167	\$53,732	\$86,091	\$57,005	\$26,095	\$60,476
431	Mississippi River Gorge Subwatersheds Capital Improvement Projects																						
431A	Towerside CIP	Beneficial	Saint Anthony Park subwatershed	1 water quality CIP in Towerside Innovation District	L	P			L	P	P		\$268,783	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$268,783

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
431B	Creative Enterprise Zone CIP	Beneficial	Saint Anthony Park and West Kittsondale subwatersheds	1 water quality CIPs in Creative Enterprise Zone	L	P				P	P		\$671,958	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$671,958
431C	UM/MN State Fair Cooperative Projects	Beneficial	Saint Anthony Park subwatershed	1 water quality CIP with UMN/MN State Fair	P	P	P	L		L	P		\$474,783	\$206,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$268,783
431D	Seminary Pond and ravine stormwater improvements	Critical	Saint Anthony Park subwatershed	2 tons of sediment removed and 17 pounds of phosphorus removed annually	L	P	P			P	P		\$621,090	\$515,000	\$106,090	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
431E	Future CIPs	Important	Saint Anthony, Miss. River Blvd and Hidden Falls subwatersheds	1 future water quality CIP	L	P	P		P	P	P		\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
\$2,627,005													\$772,500	\$159,135	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$1,276,721	
332/432 Mississippi River Confluence Subwatersheds																							
332	Mississippi River Confluence Subwatersheds Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
332A	East Kittsondale Subwatershed Project Prioritization	Beneficial	East Kittsondale subwatershed	1 East Kittsondale study and water quality CIP	L	P	P			P		P	\$28,138	\$-	\$-	\$-	\$28,138	\$-	\$-	\$-	\$-	\$-	\$-
332B	Ford Redevelopment Site comprehensive stormwater planning	Critical	Hidden Falls subwatershed	Advance stormwater designs at Ford Redevelopment Site	P	L					L		\$104,545	\$51,500	\$53,045	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
332C	Area C Ford Site planning	Important	Hidden Falls subwatershed	Environmental investigation studies	P	P		L			P	P	\$215,457	\$51,500	\$53,045	\$54,636	\$56,275	\$-	\$-	\$-	\$-	\$-	\$-



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
332D	Snelling- Midway Phase II Redevelopment Planning	Critical	West and East Kittsondale subwatersheds	Properties connected to District rainwater reuse system	P	L					L	P	\$174,347	\$-	\$53,045	\$-	\$-	\$57,964	\$-	\$-	\$63,339	\$-	\$-
332F	Future stormwater management planning	Important	Davern, West and East Kittsondale, West 7th, and Goodrich subwatersheds	1 stormwater planning study	L	P	P	P		P	P	P	\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
													\$758,643	\$123,600	\$180,353	\$76,491	\$106,923	\$81,149	\$23,881	\$24,597	\$88,674	\$26,095	\$26,878
432	Mississippi River Confluence Subwatersheds Capital Improvement Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
432A	East Kittsondale stormwater BMPs	Beneficial	East Kittsondale subwatershed	1 East Kittsondale water quality CIP	L	P						P	\$129,556	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$63,339	\$32,619	\$33,598
432B	Ford Redevelopment District stormwater system and central water feature	Critical	Hidden Falls subwatershed	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	P	L					L		\$1,030,000	\$1,030,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
432E	Victoria Park stormwater improvements	Critical	West 7th subwatershed	Stormwater runoff retained and sediment and phosphorus reductions; stormwater featured constructed	P	L						P	\$856,769	\$103,000	\$371,315	\$382,454	\$-	\$-	\$-	\$-	\$-	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
432F	Future CIPs	Important	Davern, West and East Kittsondale, West 7th, and Goodrich subwatersheds	1 future water quality CIP	L	P	P	P		P	P	P	\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
\$2,606,715														\$1,184,500	\$424,360	\$437,091	\$56,275	\$57,964	\$59,703	\$61,494	\$126,677	\$97,858	\$100,794
333/433 Mississippi River Downtown Subwatersheds																							
333	Mississippi River Downtown Subwatersheds Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
333A	Sears Redevelopment Site stormwater planning	Important	Saint Anthony Hill subwatershed	Sears redevelopment site stormwater planning study	L	P		L			L		\$107,681	\$-	\$53,045	\$54,636	\$-	\$-	\$-	\$-	\$-	\$-	\$-
333B	Swede Hollow BMP feasibility study	Important	Phalen Creek subwatershed	Swede Hollow BMP feasibility study	L	P							\$179,943	\$-	\$53,045	\$-	\$-	\$-	\$59,703	\$-	\$-	\$-	\$67,196
333C	Phalen Creek subwatershed water quality and quantity study	Critical	Phalen Creek subwatershed	1 Phalen Creek subwatershed water quality and quantity study	L	P	P						\$235,744	\$-	\$-	\$54,636	\$56,275	\$-	\$-	\$61,494	\$63,339	\$-	\$-
333D	Saint Anthony Hill subwatershed water quality and quantity study	Critical	Saint Anthony Hill subwatershed	1 Saint Anthony Hill subwatershed water quality and quantity study	L	P	P						\$235,744	\$-	\$-	\$54,636	\$56,275	\$-	\$-	\$61,494	\$63,339	\$-	\$-
333F	Future stormwater management planning	Important	Saint Anthony Hill, Downtown, Phalen Creek, and Urban Subwatersheds	1 future stormwater planning study	L	P	P	P			P	P	\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
\$1,113,347														\$30,900	\$137,917	\$196,691	\$146,316	\$34,778	\$95,524	\$159,884	\$164,680	\$39,143	\$107,513

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
433	Mississippi River Downtown Subwatersheds Capital Improvement Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
433A	Sears Redevelopment Site	Important	Saint Anthony Hill subwatershed	1 Sears site water quality CIP	P	P		L			L		\$374,497	\$-	\$-	\$-	\$-	\$-	\$-	\$184,481	\$190,016	\$-	\$-
433B	Swede Hollow CIP	Important	Phalen Creek subwatershed	1 Swede Hollow water quality CIP	P	L							\$788,849	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$126,677	\$326,193	\$335,979
433E	Science Museum of Minnesota	Critical	Downtown subwatershed	1 Science Museum of Minnesota water quality CIP	P							L	\$522,725	\$257,500	\$265,225	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
433F	Future CIPs	Important	Saint Anthony Hill, Downtown, Phalen Creek, and Urban Subwatersheds	3 future water quality CIPs	L	P	P	P			P	L	\$1,771,169	\$154,500	\$159,135	\$163,909	\$168,826	\$173,891	\$179,108	\$184,481	\$190,016	\$195,716	\$201,587
\$3,457,240														\$412,000	\$424,360	\$163,909	\$168,826	\$173,891	\$179,108	\$368,962	\$506,708	\$521,909	\$537,567
375/475 Watershed Wide Planning, Assessment and Implementation																							
375	Watershed Wide Planning and Assessment Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
375A	Transportation Redevelopment Projects - Stormwater Feasibility Studies/ Preliminary Engineering	Important	Watershed- wide	1 Transportation- oriented stormwater feasibility study	P	P	L	L					\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317
375B	Great River Passage Project - Feasibility Studies/ Preliminary Engineering	Important	Watershed- wide	1 Great River Passage stormwater feasibility study	P	L	P	P				L	\$354,234	\$30,900	\$31,827	\$32,782	\$33,765	\$34,778	\$35,822	\$36,896	\$38,003	\$39,143	\$40,317



FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
375C	Watershed Management Plan update	Critical	Watershed- wide	Updated Plan	L	P	P	P	P	P	P	P	\$389,560	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$95,008	\$260,955	\$33,598
375D	Partner agency plan review and comment	Important	Watershed- wide	5 comment letters on draft updates to District cities' local surface water management plans comment letters	P	L	L	L	P				\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
375E	GIS Program	Important	Watershed- wide	Updated GIS information and data	L	P	P	P					\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
375F	Saint Paul watershed governance exploration	Important	Watershed- wide	Technical memorandum evaluating water governance in Saint Paul	P	L	P	P	P				\$63,673	\$20,600	\$21,218	\$21,855	\$-	\$-	\$-	\$-	\$-	\$-	\$-
375G	Public private partnership opportunities	Important	Watershed- wide	2 meetings per year	L	P				P	P	P	\$118,078	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439
375H	District Flooding Prioritization and Solution Identification	Important	Watershed- wide	List of priority flood mitigation sites and potential solutions	L	P	P	P					\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University /College/ Schools	Business /Developers	Comm. Groups/ Non-Profits											
375I	Trash management planning and implementation for areas surrounding District infrastructure and water and natural resources	Important	Watershed-wide	Trash management plan	L	P	P	P		P	P	P	\$297,559	\$-	\$-	\$81,955	\$28,138	\$28,982	\$29,851	\$30,747	\$31,669	\$32,619	\$33,598
375J	Municipal source control/good housekeeping planning and implementation assistance	Important	Watershed-wide	Municipal source control and good housekeeping plan	P	L	P	P		P			\$48,479	\$-	\$-	\$-	\$-	\$-	\$23,881	\$24,597	\$-	\$-	\$-
375K	District Chloride Source Assessment and Prevention Plan	Important	Watershed-wide	Chloride reduction plan	L	P	P	P					\$78,023	\$51,500	\$26,523	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
375L	District boundary corrections	Important	Watershed-wide	Corrected District boundaries	L				P				\$28,982	\$-	\$-	\$-	\$-	\$28,982	\$-	\$-	\$-	\$-	\$-
375M	Mixed use neighborhood node drainage and water quality study	Beneficial	Watershed-wide	Mixed use neighborhood study	P	L							\$66,217	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$32,619	\$33,598
375N	Tools for quantification of non-SW benefits of green infrastructure	Important	Watershed-wide	Technical memorandum of green infrastructure cost-benefit tools	L					P			\$52,273	\$25,750	\$26,523	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-

FUND	PROGRAM/ PROJECT TITLE	PRIORITY LEVEL (Critical, Important, Beneficial)	TARGET LOCATION	MEASURABLE OUTPUTS	PARTNERS								Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
					District	Cities	County	State/ Regional Agencies	Other WDs/ WMOs	University / College/ Schools	Business /Developers	Comm. Groups / Non-Profits											
375O	Climate science and community resiliency	Critical	Watershed-wide	Local climate change and adaption study report	L	P	P	P	P	P	P	P	\$236,156	\$20,600	\$21,218	\$21,855	\$22,510	\$23,185	\$23,881	\$24,597	\$25,335	\$26,095	\$26,878
													\$3,504,401	\$314,150	\$297,052	\$333,282	\$264,495	\$301,411	\$304,483	\$313,618	\$392,699	\$600,196	\$383,016
475	Watershed Wide Capital Improvement Projects												Total Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
475A	Transit Redevelopment Stormwater CIPs	Important	Watershed-wide	1 transporation-related water quality CIP	P	P	L	L					\$590,390	\$51,500	\$53,045	\$54,636	\$56,275	\$57,964	\$59,703	\$61,494	\$63,339	\$65,239	\$67,196
475B	Great River Passage CIPs	Important	Watershed-wide	1 Great River Passage water quality CIPs	P	L	P	P			P	L	\$885,585	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
475P	Stormwater Impact Fund Implementation	Important	Watershed-wide	1 stormwater impact fund CIP	L								\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
475Q	Debt and Loan Service	Critical	Watershed-wide	Semi-annual debt service payments	L								\$11,379,658	\$1,081,500	\$1,113,945	\$1,147,363	\$1,125,509	\$1,159,274	\$1,194,052	\$1,229,874	\$1,076,755	\$1,109,057	\$1,142,329
													12,855,633	\$1,210,250	\$1,246,558	\$1,283,954	\$1,266,197	\$1,304,183	\$1,343,309	\$1,383,608	\$1,235,101	\$1,272,154	\$1,310,318



**Table 3-6: CRWD 2021-2030 Plan Implementation Table and Capital Improvement Program**

**Notes:** BE = built environment  
 WQ = water quality  
 FL = water quantity and flood risk  
 EH = ecosystem health  
 CE = communications and engagement  
 R = regulation  
 IM = infrastructure management  
 O = organization

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
ADMINISTRATION											
101	Administration										
101A	General administration	O-1	O-2	O-3			O-3	O-5			
101B	Citizen Advisory Committee	O-1	O-4				O-5	O-2			
101C	External funding opportunities	O-3					O-3	O-5			
101D	Program effectiveness assessment	O-1	O-2				O-3	O-5	O-2		
101E	Office operations	O-1					O-3	O-5			
101F	MAWD support	O-2					O-4				
101G	Safety Program	O-1					O-5				
101H	Diversity and inclusion program	CE-3	CE-4	O-4	O-5		O-1	O-2	CE-3	CE-4	
PROGRAMS											
208	Regulatory Program										
208A	General permitting implementation	R-1	R-2				R-1	R-2	R-9	BE-1	FL-1
208B	Coordinated erosion and sediment control inspections	R-1	R-3				R-7				
208C	Permittee post construction BMP inspections	R-3					R-7				
208D	Engagement activities with permittees, developers, engineers, and applicants	R-1					R-8	R-7	R-2		
208E	Rules evaluation and update	R-1	R-2				R-3	R-7	R-2		
208F	Deicing practices rule	R-2					R-4	R-3	R-2		

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
208G	Stormwater rule requirements on sites less than one acre	R-2	R-1				R-5	R-3	R-2		
208H	Illicit Discharge Detection and Elimination (IDDE) plan implementation	R-1					R-7				
208I	Green infrastructure incentives in District rules	R-2	R-1				R-9	R-3	R-2		
208J	Industrial stormwater permittee coordination	R-1					R-2				
208K	Water reuse policy support	R-2	R-1				R-6	R-2			
<b>210</b>	<b>Grants Program</b>										
210A	Stewardship grants	WQ-1	BE-1	O-5			BE-5	WQ-5	WQ-6		
210B	Stewardship grant outreach	WQ-1	BE-1	O-5	O-4		O-1	O-2			
210C	Stewardship grant project inspection and maintenance assistance	IM-1	IM-3				BE-6				
210D	Targeted site identification	WQ-1	BE-1	O-5			BE-7				
210E	ROW projects - boulevard raingardens	WQ-1	BE-1				BE-5	WQ-5	WQ-6		
210F	Well-sealing Grants	WQ-1					WQ-10	WQ-13			
210G	Large-scale site planning grants	WQ-1	BE-1				BE-3				
210H	Chloride reduction grants	WQ-1					WQ-9	WQ-10			
210I	District "watercorps" position	CE-1	CE-2	O-4			CE-3				
<b>211</b>	<b>Monitoring, Assessment and Research Program</b>										
211A	Stormwater monitoring and data collection	O-1					WQ-12				
211B	Lake monitoring and data collection	O-1					WQ-12				
211C	BMP performance monitoring	O-1					BE-6				
211D	Monitoring database and reporting tool	O-1					WQ-12				
211E	Wetland biological integrity monitoring	O-1					WQ-12				
211F	Monitoring data trend analysis and reporting for public	O-1					BE-6				
211G	Citizen Science Monitoring Program	O-1					CE-3				
211H	Research program	O-1	O-2				O-4	FL-6			
211I	Emerging contaminants and water quality issues	O-2	WQ-1	R-2			WQ-11				
211J	Non-structural BMPs effectiveness	WQ-1	O-1				BE-6				
<b>220</b>	<b>Communications and Engagement Program</b>										
220A	General communications and engagement	CE-1	CE-2	CE-5	CE-7		CE-1	CE-2	CE-3	CE-7	EH-8
220B	Project Communication	CE-2	CE-5	CE-6			CE-1	CE-2	CE-6		
220C	Clean Streets	CE-1					CE-2	CE-7			
220D	Maintenance workshops for water quality	R-3	IM-1	IM-3			IM-3	R-3			
220E	Digital communications	CE-2	CE-5	CE-6	CE-7		CE-5	CE-1	CE-2		
220F	Volunteer programs	CE-1	CE-3	O-5			CE-3				

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
220G	Sponsorships	CE-1	CE-3	CE-2			CE-3				
220H	Partnerships	CE-1	CE-4	CE-3			CE-3				
220I	Events	CE-2	CE-1				CE-2	CE-3			
220J	Awards program	CE-2					CE-3				
220K	Youth programs	CE-1	CE-2	CE-3			CE-3				
220L	Partner grant program	CE-5	WQ-1				WQ-1	WQ-8	CE-3	EH-9	
220M	Public art program	CE-2					CE-5				
220N	595 Aldine communications and engagement	CE-2					CE-2				
<b>222</b>	<b>Facility (Infrastructure) Management Program</b>										
222A	District-owned facility management	IM-1	IM-2				IM-1	FL-2			
222B	Shared ownership (District/partner) facility management	IM-1	IM-3	IM-2			IM-2	IM-5			
222C	Partner owned facility management and ownership evaluation	IM-1	IM-3	IM-2			IM-2	IM-3	IM-5	IM-6	
222D	Cooperative BMP maintenance service program	IM-3	IM-1				IM-3	IM-4	IM-7		
222E	BMP database	IM-1	IM-2				IM-1				
<b>PROJECTS - Planning, Design and CIPs</b>											
<b>302</b>	<b>Groundwater Projects</b>										
302A	Groundwater seepage and springs study	FL-3					FL-7				
302B	Beneficial infiltration study and demonstration projects	BE-1	WQ-1				FL-7	BE-6	O-4		
302C	Infiltration and groundwater quality study	BE-1	WQ-1				FL-7	BE-6			
302D	Groundwater monitoring well network in the District	BE-1					FL-7				
302E	Karst area study	FL-3	BE-1				FL-7				
302F	Ramsey County groundwater study	FL-3	BE-1				WQ-13	FL-7			
<b>402</b>	<b>Groundwater Capital Improvements</b>										
402G	Future groundwater projects	BE-1	FL-3				WQ-13	FL-7			
<b>305/405</b>	<b>Como Lake Subwatershed</b>										
<b>305</b>	<b>Como Lake Subwatershed Projects</b>										
305A	Como Lake water quality model	WQ-2					WQ-1				
305B	AIS management (including herbicide treatment of curlyleaf pondweed)	WQ-2	EH-2				WQ-1				
305C	Lake vegetation management plan and implementation	WQ-2	EH-2				EH-1	WQ-1			
305D	Balanced fishery target development	WQ-2	EH-3				EH-1	WQ-1			
305E	Shoreline management plan and implementation	WQ-2	EH-2				WQ-1	EH-1	WQ-7		



Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
305F	Street sweeping enhancement	WQ-2	WQ-1				WQ-1	WQ-9			
305G	Innovative treatment facility feasibility study (i.e. spent lime)	WQ-2	WQ-1				WQ-1				
305H	Water-based recreational activities support	WQ-2					WQ-1				
305I	Como Park area drainage infrastructure analysis and planning	WQ-2	WQ-1				WQ-1				
305P	Future stormwater management planning	BE-1	WQ-1	FL-1	EH-1		WQ-1	WQ-5	WQ-6	WQ-10	FL-1
<b>405</b>	<b>Como Lake Subwatershed Capital Improvements</b>										
405J	Como Golf Course BMPs	WQ-1	WQ-2				WQ-1				
405K	Como Pavilion BMPs	WQ-1	WQ-2				WQ-1				
405L	McMurray Field	WQ-1	WQ-2				WQ-1				
405M	Como Lake Alum Treatment	WQ-2					WQ-1				
405N	East Como Blvd. BMPs	WQ-1	WQ-2				WQ-1				
405O	Gottfried's Pit Improvements	WQ-1	WQ-2	FL-1			WQ-1	FL-4			
405P	Future capital improvement projects (CIPs)	WQ-1	WQ-2	FL-1	EH-1		WQ-1	WQ-5	WQ-6	WQ-10	FL-1
<b>310/410</b>	<b>Lake McCarrons Subwatershed Projects</b>										
<b>310</b>	<b>Lake McCarrons Subwatershed Projects</b>										
310A	Alum treatment evaluation	WQ-2					WQ-2				
310B	Villa Park wetland system evaluation	EH-1	WQ-1	BE-1			WQ-2				
310C	Watershed Hydraulic/Hydrologic Modeling	FL-1	FL-2	WQ-2			FL-4				
310D	Lake vegetation management plan and AIS response plan	EH-2	WQ-2				EH-2	WQ-2			
310E	Balanced fishery targets	EH-2	WQ-2				EH-2				
310F	Shoreline management plan and implementation	EH-1	EH-2	WQ-2			WQ-2	EH-2			
310G	Future stormwater management planning	WQ-1	WQ-2	BE-1			WQ-2	WQ-5	WQ-6	WQ-10	
<b>410</b>	<b>Lake McCarrons Subwatershed Capital Improvements</b>										
410A	Alum treatment	WQ-2					WQ-2				
410B	Villa Park performance improvements	EH-1	WQ-1	BE-1			WQ-2				
410G	Future CIPs	BE-1	WQ-1	FL-1	EH-1		WQ-2	WQ-5	WQ-6	WQ-10	FL-1
<b>313/413</b>	<b>Loeb Lake Subwatershed</b>										
<b>313</b>	<b>Loeb Lake Subwatershed Projects</b>										
313A	Update Loeb Lake Management Plan	BE-1	WQ-1	FL-1	EH-1		WQ-3				
313B	AIS management	EH-2	WQ-2				WQ-3	EH-4			
313C	Shoreline management plan and implementation	EH-1	EH-2	WQ-2			WQ-3	EH-4			
313D	Loeb Lake sedimentation pond investigation	WQ-2	EH-2				WQ-3				

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
313E	Future stormwater planning	BE-1	WQ-1	FL-1	EH-1		WQ-3	WQ-5	WQ-6	WQ-10	FL-1
413	Loeb Lake Subwatershed Capital Improvements										
413E	Future CIPs	BE-1	WQ-1	FL-1	EH-1		WQ-3	WQ-5	WQ-6	WQ-10	FL-1
315/415	Trout Brook Subwatershed										
315	Trout Brook Subwatershed Projects										
315A	TBI 5-year inspection and CIP development	IM-1	IM-2				FL-2				
315B	NPDES stormwater program	IM-1	IM-2	WQ-1			FL-2				
315C	TBI hydrologic and hydraulic model update and expansion	IM-1	IM-2	FL-1			FL-2	FL-3			
315D	TBI flood mitigation and water quality improvement studies	IM-1	WQ-1	FL-1			BE-4	WQ-5	WQ-6	WQ-10	FL-3
315E	TBI easement verification, acquisition, and documentation	IM-1					FL-2				
315I	Future stormwater management planning	IM-1	IM-2				WQ-5	WQ-6	WQ-10	FL-1	
415	Trout Brook Subwatershed Capital Improvements										
415F	TBI Repairs Station 28+65 - 50+72	IM-1	IM-2				FL-2				
415G	TBI Repairs Station 135+06 - 180+29	IM-1	IM-2				FL-2				
415H	Major sediment removal	IM-1	IM-2	WQ-1			WQ-5	WQ-6	FL-2		
415D	Future flood mitigation and/or water quality improvement projects	IM-1	WQ-1	FL-1			WQ-5	WQ-6	FL-2		
415I	Future CIPs	IM-1	IM-2	WQ-1	FL-1		WQ-5	WQ-6	FL-2		
317/417	Crosby Lake Subwatershed										
317	Crosby Lake Subwatershed Projects										
317A	Crosby Farm bluff stabilization plan	BE-2	WQ-2	FL-1			WQ-4	WQ-5			
317B	Hidden Falls/Crosby Farm trail reconstruction planning	EH-1	CE-1				WQ-5				
317C	Update Crosby Lake Management Plan	BE-1	WQ-1	FL-1	EH-1		WQ-4	WQ-5	EH-3		
317D	35E Regional stormwater BMP feasibility study	WQ-1					WQ-4				
317E	Shoreline management plan and implementation	EH-1	EH-2	WQ-2			WQ-4	EH-3			
317F	Terrestrial and aquatic invasive species management	EH-2					WQ-4	EH-3			
317G	Floodplain and wetland restoration opportunities around Crosby Lake	EH-1	FL-1				EH-7	FL-5			
317H	Future stormwater management planning	BE-1	WQ-1	FL-1	EH-1		WQ-4	WQ-5	WQ-6	WQ-10	FL-1
417	Crosby Lake Subwatershed Projects Capital Improvements										
417A	Crosby Farm Park bluff stabilization projects	BE-2	WQ-2	FL-1			WQ-4	WQ-5			
417G	Floodplain and wetland restoration projects	EH-1	FL-1				EH-7	FL-5			
417H	Future CIPs	BE-1	WQ-1	FL-1	EH-1		WQ-4	WQ-5	WQ-6	WQ-10	FL-1
325/425	Wetland, Stream, and Ecosystem Restoration										

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
325	Wetland, Stream, and Ecosystem Restoration Projects										
325A	Phalen Creek Daylighting	EH-1	EH-2	CE-1			EH-6				
325B	Hidden Falls Creek Restoration Planning	EH-1	EH-2	CE-1			EH-6				
325C	Swede Hollow Water Resource and Natural Resources Plan	EH-1	EH-2	CE-1			EH-5				
325D	Cascade Creek/Fountain Creek daylighting feasibility study	EH-1	EH-2	CE-1			EH-6				
325E	Willow Reserve signage and access	EH-1	EH-2	CE-1			EH-4	CE-6			
325F	District 6 Natural Resource Management Plan	EH-1	EH-2	CE-1			EH-5				
325G	Wetland Restoration Planning	EH-1	EH-2	CE-1			EH-7				
325H	Natural resource inventories and/or management plans	EH-1	EH-2	CE-1			EH-5	CE-6	EH-7		
425	Wetland, Stream, and Ecosystem Restoration Capital Improvements										
425A	Phalen Creek daylighting	EH-1	EH-2	CE-1			EH-6				
425B	Hidden Falls Creek restoration	EH-1	EH-2	CE-1			EH-5				
425C	Swede Hollow restoration	EH-1	EH-2	CE-1			EH-6				
425D	Cascade Creek/Fountain Creek restoration	EH-1	EH-2	CE-1			EH-5				
425H	Future wetland/stream/natural resource restoration projects	EH-1	EH-2	CE-1			EH-6	CE-6	EH-7		
331/431	Mississippi River Gorge Subwatersheds										
331	Mississippi River Gorge Subwatersheds Projects										
331A	Towerside Innovation District stormwater management planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
331B	Creative Enterprise Zone stormwater management planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
331C	UM/MN State Fair Cooperative Projects	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
331E	Future stormwater management planning	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
431	Mississippi River Gorge Subwatersheds Capital Improvement Projects										
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431B	Creative Enterprise Zone CIP	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
431C	UM/MN State Fair Cooperative Projects	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
431D	Seminary Pond and ravine stormwater improvements	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
431E	Future CIPs	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
332/432	Mississippi River Confluence Subwatersheds										
332	Mississippi River Confluence Subwatersheds Projects										
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332B	Ford Redevelopment Site comprehensive stormwater planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10



Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
332C	Area C Ford Site planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
332D	Snelling-Midway Phase II Redevelopment Planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
332F	Future stormwater management planning	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
<b>432</b>	<b>Mississippi River Confluence Subwatersheds Capital Improvement Projects</b>										
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432B	Ford Redevelopment District stormwater system and central water feature	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
432E	Victoria Park stormwater improvements	BE-1	BE-2	WQ-1			WQ-5	WQ-6	WQ-10		
432F	Future CIPs	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
<b>333/433</b>	<b>Mississippi River Downtown Subwatersheds</b>										
<b>333</b>	<b>Mississippi River Downtown Subwatersheds Projects</b>										
333A	Sears Redevelopment Site stormwater planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
333B	Swede Hollow BMP feasibility study	BE-1	BE-2	WQ-1			WQ-5	WQ-6	WQ-10		
333C	Phalen Creek subwatershed water quality and quantity study	BE-1	BE-2	WQ-1	FL-1		BE-4	WQ-5	WQ-6	WQ-10	
333D	Saint Anthony Hill subwatershed water quality and quantity study	BE-1	BE-2	WQ-1	FL-1		BE-4	WQ-5	WQ-6	WQ-10	
333F	Future stormwater management planning	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
<b>433</b>	<b>Mississippi River Downtown Subwatersheds Capital Improvement Projects</b>										
433A	Sears Redevelopment Site	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
433B	Swede Hollow CIP	BE-1	BE-2	WQ-1			WQ-5	WQ-6	WQ-10		
433E	Science Museum of Minnesota	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
433F	Future CIPs	BE-1	BE-2	WQ-1	FL-1		WQ-5	WQ-6	WQ-10	FL-1	
<b>375/475</b>	<b>Watershed Wide Planning, Assessment and Implementation</b>										
<b>375</b>	<b>Watershed Wide Planning and Assessment Projects</b>										
375A	Transportation Redevelopment Projects - Stormwater Feasibility Studies/ Preliminary Engineering	BE-1	BE-2	WQ-1	FL-1		BE-2	BE-3	WQ-5	WQ-6	WQ-10
375B	Great River Passage Project - Feasibility Studies/Preliminary Engineering	BE-1	BE-2	WQ-1	FL-1		BE-2	BE-3	WQ-5	WQ-6	WQ-10
375C	Watershed Management Plan update	O-1	O-2	O-3			O-3	O-2	O-5		
375D	Partner agency plan review and comment	O-2					O-2	O-5			
375E	GIS Program	O-1					O-3				
375F	Saint Paul watershed governance exploration	O-2					O-2	O-3			
375G	Public private partnership opportunities	O-2	O-3				BE-2	BE-3			

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
375H	District Flooding Prioritization and Solution Identification	FL-1	FL-2				FL-4				
375I	Trash management planning and implementation for areas surrounding District infrastructure and water and natural resources	WQ-2	EH-1				CE-7				
375J	Municipal source control/good housekeeping planning and implementation assistance	WQ-1	O-2	IM-3	R-3		WQ-5	WQ-6	WQ-10	IM-3	R-3
375K	District Chloride Source Assessment and Prevention Plan	WQ-1	WQ-2				WQ-9	WQ-10	CE-7		
375L	District boundary corrections	O-2					O-2				
375M	Mixed use neighborhood node drainage and water quality study	WQ-1	BE-1				BE-6				
375N	Tools for quantification of non-SW benefits of green infrastructure	O-1	O-2				O-5				
375O	Climate science and community resiliency	FL-2	WQ-1								
<b>470</b>	<b>Watershed Wide Capital Improvement Projects</b>										
475A	Transit Redevelopment Stormwater CIPs	BE-1	BE-2	WQ-1	FL-1		BE-2	BE-3	WQ-5	WQ-6	WQ-10
475B	Great River Passage CIPs	BE-1	BE-2	WQ-1	FL-1		BE-2	BE-3	WQ-5	WQ-6	WQ-10
475P	Stormwater Impact Fund Implementation	O-3					O-3				
475Q	Debt and Loan Service	O-3					O-3				

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# 2021 – 2030 Watershed Management Plan

## Appendices

Formal 90-Day Review Plan

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- Appendix B:** 2021-2030 Plan Stakeholder Engagement Summary
- Appendix C:** Strategic Plan
- Appendix D:** Diversity Strategic Plan
- Appendix E:** Communications and Engagement Plan
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- Appendix G:** Plan Goals and Implementation Activity Outputs Correlation Table





## Appendix A

### Land and Water Resource Inventory

## Appendix A

### Land and Water Resource Inventory

~~April~~September 2020

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## A. Land and Water Resources Inventory

This Appendix of the Capitol Region Watershed District (District) Watershed Management Plan (Plan) summarizes the land and water resources located within the District. It contains information on location, topography and drainage, climate and precipitation, land use and demographics, soils, geology, groundwater resources, natural communities and rare species, fish and wildlife habitat, and potential pollutant sources. It also presents information about District surface water resources, including resource-specific water quality and flooding information.

Land and water resource information is important because it describes the condition of the watershed and how those conditions impact decisions about infrastructure, development, and resource management.

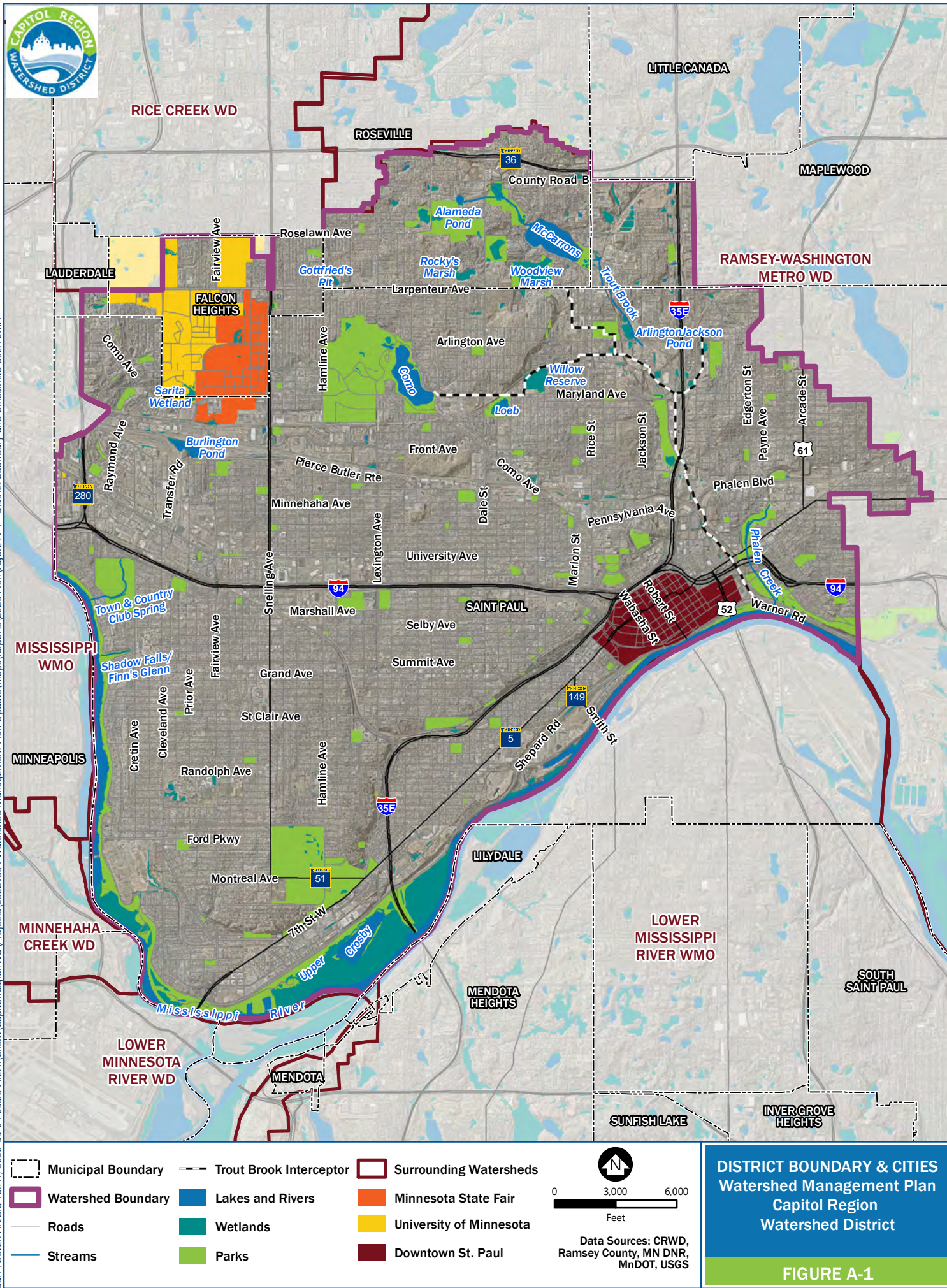
### A.1 Location

The District is 40.6 square miles in size and includes portions of the Cities of Falcon Heights, Lauderdale, Saint Paul, Maplewood, and Roseville (see Figure A-1). The District also includes the Minnesota State Fairgrounds and University of Minnesota Saint Paul Campus, which operate as autonomous entities outside the jurisdiction of local or state government. The District is bounded to the east by the Ramsey-Washington Metro Watershed District (RWMWD), and to the north by the Rice Creek Watershed District (RCWD) and the Grass Lake Watershed Management Organization (GLWMO). Table A-1 presents the contributing area of each city within the District.

**Table A-1 District Cities and Areas**

Entity	Acres	Square Miles	Percentage (%)
Saint Paul	22,116	34.6	85.1%
Roseville	1,921	3.0	7.4%
Falcon Heights <sup>1</sup>	516	0.8	2.0%
Maplewood	609	1.0	2.3%
Lauderdale	40	0.1	0.2%
State Fairgrounds	350	0.5	1.3%
University of MN	437	0.7	1.7%
<b>Total</b>	<b>25,989</b>	<b>40.6</b>	<b>100%</b>
(1) Area of Falcon Heights does not include State Fairgrounds or University of Minnesota Campus			







---

## A.2 Topography and Drainage Patterns

Topography within the District is characterized by a large, relatively flat outwash plain in the uplands above terrace deposits located along the Mississippi River. The outwash plain, referred to as the Saint Paul Sand Flats, was formed by meltwater associated with the most recent glacial events and includes incised tributary channels (Patterson, 1992). The historic Trout Brook and Phalen Creek created a large river valley that runs north/south through the District. Local areas of higher topography exist within the Saint Paul Flats, including Ramsey Hill and the Highland Park neighborhood.

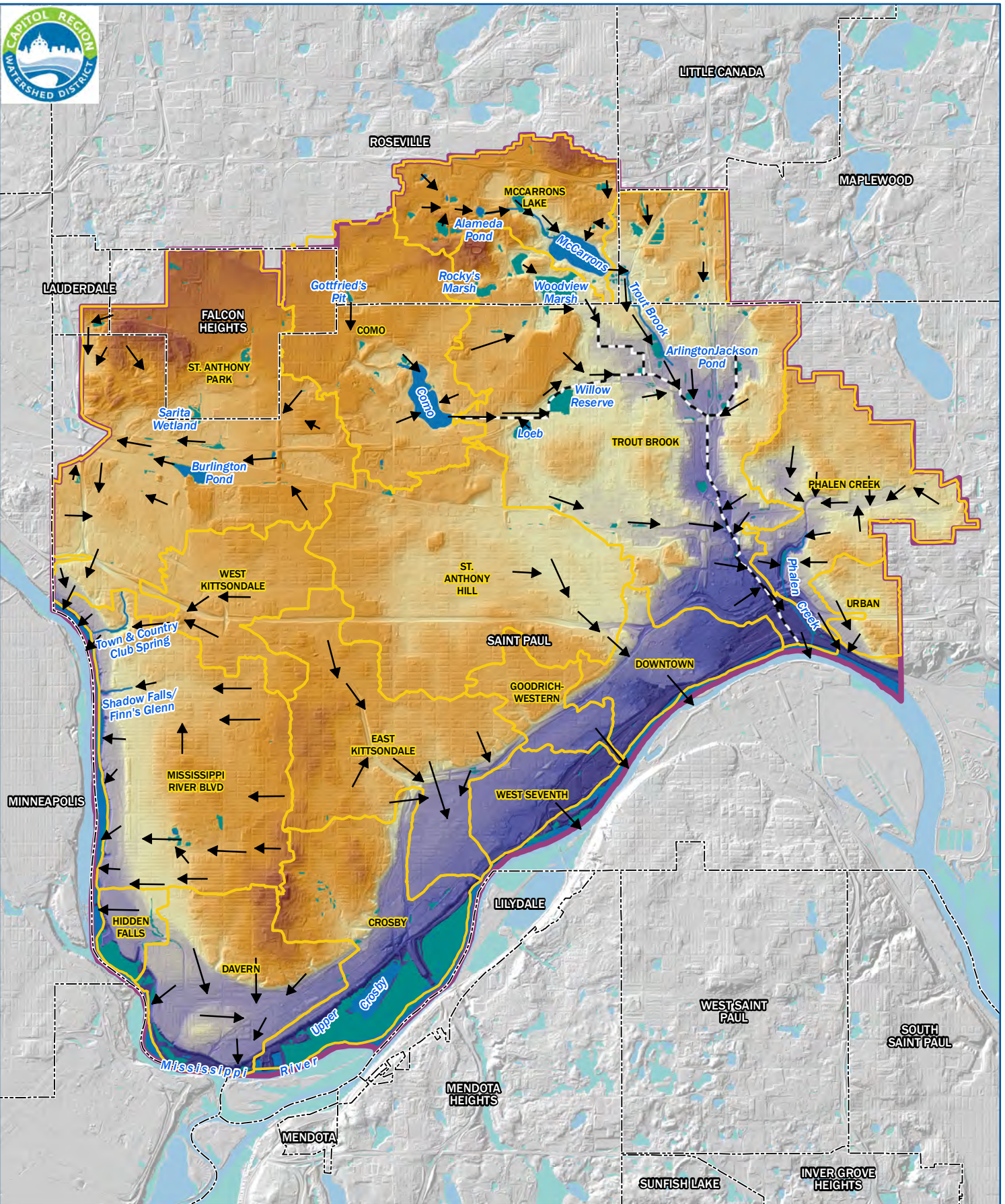
The terrace deposits along the Mississippi River are part of the Mississippi Bottomlands (Patterson, 1992). Terrace deposits are characterized by flat topography between steep bluff lines. The terrace deposits were formed by the migration of the Mississippi River during glacial and post-glacial melting events, with each terrace representing a historic floodplain.

Local topography determines drainage patterns in the District. The east side of the District generally drains from north to south along the historic Trout Brook and Phalen Creek. The west side of the District drains west and south towards the Mississippi River. Elevations within the District range from over 1000 feet above mean sea level (MSL, NAVD88 vertical datum) in areas of Falcon Heights, Roseville, and Highland Park (Saint Paul) to a minimum of about 690 feet MSL along the Mississippi River.



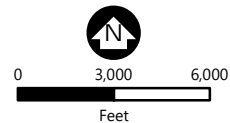


Barr Footer: ArcGIS 10.7.1, 2019-1A-08 13:34 File: I:\Client\CapitolRegion\Watershed Management Plan Update\Maps\Reports\2020 Plan\Figure A-2 - Topography and Drainage Patterns.mxd User: EMA



- |                    |                         |
|--------------------|-------------------------|
| Municipal Boundary | Trout Brook Interceptor |
| Watershed Boundary | Lakes and Rivers        |
| Subwatershed       | Wetlands                |
| Streams            | Flow Direction          |

Elevation  
  
1026 ft  
686 ft



Data Sources: CRWD,  
MN DNR, USGS

**TOPOGRAPHY &  
DRAINAGE PATTERNS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-2**



---

## A.3 Climate and Precipitation

The climate of the Minneapolis-Saint Paul metropolitan area is a humid continental climate, characterized by moderate precipitation (normally sufficient for crops), wide daily temperature variations, large seasonal variations in temperature, warm humid summers, and cold winters with moderate snowfall. Climate data is often presented according to 30-year “climate normal” periods, the most recent spanning the period from 1981-2010. Several of the wettest years on record have been observed since 2010. Deviation from climate normal and data since 2010 are discussed in Section A.3.2. Climate data presented in this section is based on the 10-year period from 2010 through 2019, unless otherwise noted.

The mean annual temperature in the District is 45.0°F, as measured at the University of Minnesota-Saint Paul station (2010-2019). Mean monthly temperatures vary from 13.8°F in January to 73.6°F in July (2010-2019). For the 1981-2010 climate normal period, the average date for latest occurrence of freezing temperatures was April 25, while the average date for the first autumn frost was October 9. The average frost-free period (growing season) is approximately 166 days. Additional climatic data is available from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) (<http://www.ncdc.noaa.gov/>).

Table A-2 summarizes precipitation data for the University of Minnesota-Saint Paul station for the 2010-2019 period. Average total annual precipitation at the University of Minnesota-Saint Paul station is 35.2 inches. The mean monthly precipitation varies from 5.2 inches in July to 0.7 inches in January (2010-2019). From May to September, the growing season months, the average rainfall (2010-2019) is 20.8 inches, or about 65% of the average annual precipitation. Snowfall averages 54.4 inches annually at the Minneapolis-Saint Paul International Airport (MSP) station from 2010-2019; this is similar to the 1981-2010 climate normal average of 54.0 inches annually.

Additional information about local and regional climate is available from the Minnesota Department of Natural Resources (MDNR) State Climatology office and NOAA at:

- Minnesota State Climatology Office: <https://www.dnr.state.mn.us/climate/index.html>
- NOAA: <http://www.nws.noaa.gov/climate/index.php?wfo=mpx>

**Table A-2 Climate and Precipitation Data (St. Paul, 2010-2019)**

Month	Precipitation (inches)	Minimum Temperature (°F)	Average Temperature (°F)	Maximum Temperature (°F)
January	0.72	6.4	13.8	21.4
February	1.02	8.8	16.1	24.8
March	1.36	23.1	31.1	39.9
April	3.70	36.1	44.2	53.1
May	4.94	48.5	57.9	67.2
June	5.10	59.2	68.5	77.3
July	5.16	64.2	73.6	82.6
August	5.01	61.2	70.5	79.6
September	2.50	52.7	63.0	72.4
October	2.57	39.9	48.4	57.5
November	1.52	25.9	32.6	40.3
December	1.63	13.6	20.5	27.0
<b>Total</b>	<b>35.24</b>	--	--	--
Source: University of Minnesota-St. Paul station, 2010-2019 period				

### A.3.1 Precipitation-Frequency Data (Atlas 14)

The amount, rate, and type of precipitation are important in determining flood levels and stormwater runoff rates. While average weather poses little risk to human health and property, extreme precipitation events may result in flooding that threatens infrastructure and public safety. NOAA published Atlas 14, Volume 8, in 2013. Atlas 14 is the primary source of information regarding rainfall amounts and frequency in Minnesota. Atlas 14 provides estimates of precipitation depth (i.e., total rainfall in inches) and intensity (i.e., depth of rainfall over a specified period) for durations from 5 minutes up to 60 days. Atlas 14 supersedes publications Technical Paper 40 (TP-40) and Technical Paper 49 (TP-49) issued by the National Weather Bureau (now the National Weather Service) in 1961 and 1964, respectively. Atlas 14 improvements in precipitation estimates include denser data networks, longer (and more recent) periods of record, application of regional frequency analysis, and new techniques in spatial interpolation and mapping. Comparison of precipitation depths between TP-40 and Atlas 14 indicates increased precipitation depths for more extreme (i.e., less frequent) events. Table A-3 lists selected rainfall events for the District.

Runoff from spring snowmelt is not provided in Atlas 14 and current regional snowmelt runoff data is not available (Minnesota Stormwater Manual, 2019). However, snowmelt and rainstorms occurring during snowmelt in early spring are significant in this region. The volumes of runoff generated, although they occur over a long period, can have significant impacts where the contributing drainage area to a lake or pond is large and the outlet is small.

**Table A-3      Selected Rainfall Events Used for Design Purposes**

Type	Frequency	Duration	Depth (in)
Rainfall	2-year	24 hour	2.80
	5-year	24 hour	3.49
	10-year	24 hour	4.18
	25-year	24 hour	5.29
	50-year	24 hour	6.29
	100-year	24 hour	7.40
	10-year	10 day	6.62
	100-year	10 day	9.95

Source: NOAA Atlas 14 – Volume 8. Station: Saint Paul – Station 21-7377. These depths reflect the 50% exceedance limit.

### **A.3.2    Climate Trends and Future Precipitation**

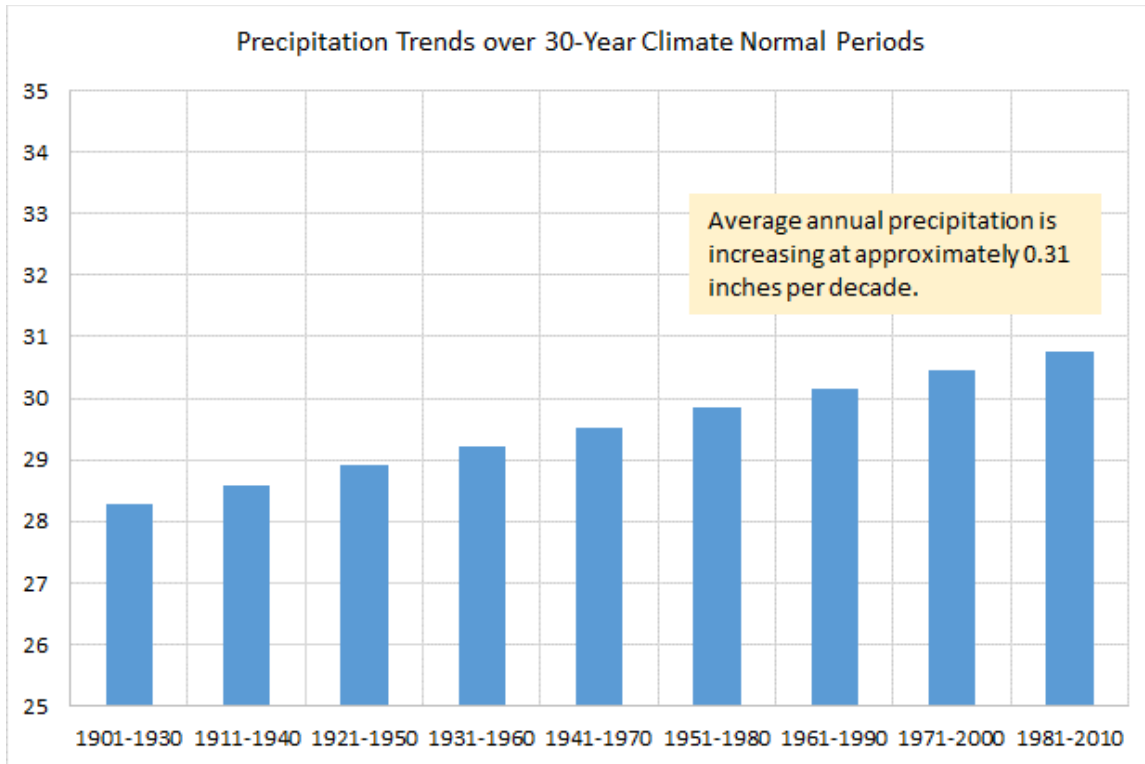
There are typically wide variations in climate conditions in the District. However, climatologists have found four significant recent climate trends in the Upper Midwest (NOAA, 2013):

- Warmer winters—decline in severity and frequency of severe cold; warming periods leading to mid-winter snowmelt
- Higher minimum temperatures
- Higher dew points
- Changes in precipitation trends – more rainfall is coming from heavy thunderstorm events and increased snowfall

According to NOAA's 2013 assessment of climate trends for the Midwest, annual and summer precipitation amounts in the Midwest are trending upward, as is the frequency of high intensity storms. Annual precipitation at the University of Minnesota-Saint Paul averaged 35.9 inches from 2010-2019, a 3.7 inch increase over the 1981-2010 climate normal. Annual precipitation exceeded the 1981-2010 climate normal average (32.2 inches) in 7 of 8 years since 2010.

Higher intensity precipitation events typically produce more runoff than lower intensity events with similar total precipitation amounts; higher rainfall intensities are more likely to overwhelm the capacity of the land surface to infiltrate and attenuate runoff. Climate normal data available from the Minnesota Department of Natural Resources indicates annual precipitation is increasing within the Minneapolis-Saint Paul metropolitan area by approximately 0.31 inches per decade (see Figure A-3).





**Figure A-3 Trends in Average Annual Precipitation (Twin Cities Region)**

The study of long-term extreme weather trends found that precipitation amounts are predicted to increase significantly over what is historically used in floodplain assessments and infrastructure design. Recent work completed by the University of Minnesota (Moore et al., 2016) provides information useful to consider long-term extreme weather trends in the region. A range of estimates for the mid-21st century 100-year 24-hour rainfall event were identified. The lower estimate for the mid-21st century 100-year, 24-hour rainfall estimate was approximately 7.3 inches, which is similar to the current mean 100-year rainfall depth published in Atlas 14 (7.8 inches). The middle estimate is 10.2 inches, which is similar to the upper limits of the Atlas 14 90-percent confidence limits for the 100-year rainfall depth (10.4 inches). Upper estimates of mid-21st century 100-year 24-hour rainfall exceed the 90-percent confidence limits of Atlas 14.

Additional information about climate change is available from the Minnesota Department of Natural Resources (MDNR) at: [https://www.dnr.state.mn.us/climate/climate\\_change\\_info/index.html](https://www.dnr.state.mn.us/climate/climate_change_info/index.html)

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## A.4 Land Use and Imperviousness

The District is entirely developed, although some lands that cannot be developed for various reasons (e.g., proximity to wetlands) may retain an “undeveloped” land use designation. Figure A-4 presents current (2016-2018) land use within the District.

The District contains areas of dense urban development, including the central business district of Saint Paul. Single family residential is the most common land use, covering approximately 46% of the District. Commercial (5%) and industrial (6%) land uses are generally located along major roadways or rail corridors. Both small, neighborhood-size parks and large regional parks are distributed throughout the District, including several located along the Mississippi River. Table A-4 summarizes current land use within the District.

Planned future land use (year 2040) is presented in Figure A-5 based on Metropolitan Council data. Knowledge of estimated future land use is useful to identify areas where redevelopment might offer opportunities for additional stormwater treatment or retrofits of existing stormwater infrastructure. Due to the District’s fully developed condition, significant changes in land use are not expected, although increases in mixed use (e.g., commercial-residential) land use and higher density residential land use are expected in Saint Paul (City of Saint Paul, 2019).

Land use can be a significant factor in stormwater management and planning, as urban land use is often correlated with impervious area that results in increased rate and volume of stormwater runoff from precipitation. In contrast, vegetated areas provide opportunities for stormwater retention and infiltration. Consistent with the District’s urban environment, impervious areas cover approximately 50% of the District. Areas of concentrated imperviousness exceeding 80% occur in downtown Saint Paul, along the Burlington Northern Santa Fe (BNSF) railroad, and in commercial and industrial areas adjacent to University Avenue and other major roads. Impervious area within the District is presented in Figure A-6.

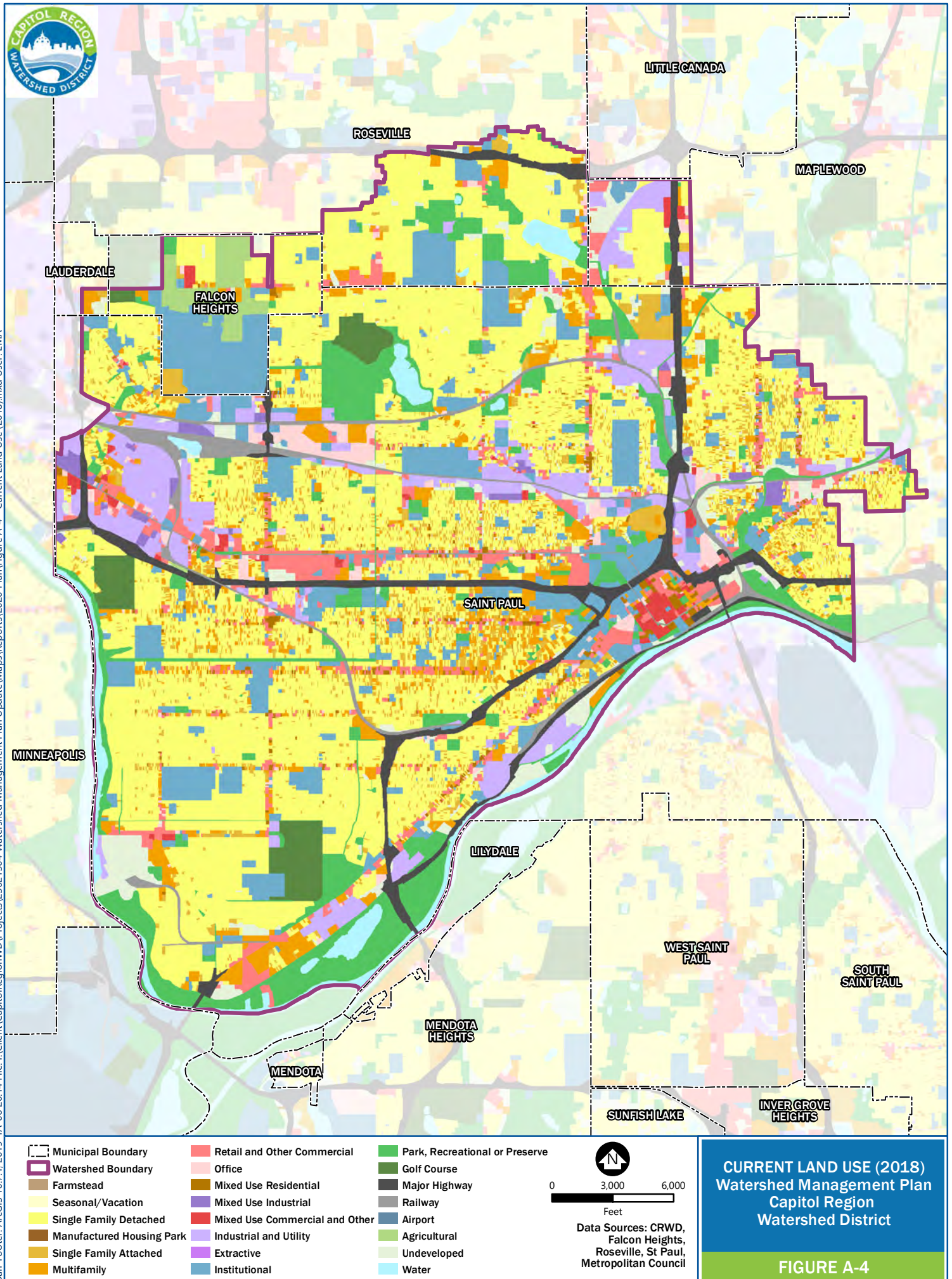
**Table A-4      Current Land Use (2018)**

Land Use	Acres	Percent of District
Agricultural	286.4	1.1%
Commercial	1213.7	4.7%
Golf Course	438.4	1.7%
Highway	1068.5	4.1%
Industrial and Utility	1483.6	5.7%
Institutional <sup>1</sup>	2878.2	11.1%
Mixed Use	542.8	2.1%
Multifamily	1379	5.3%
Office	383.8	1.5%
Park, Recreational, or Preserve	2331.9	9.0%
Railway	593.7	2.3%
Single Family Attached	1501.9	5.8%
Single Family Detached	10176.8	39.2%
Undeveloped	980.6	3.8%
Water	729.9	2.8%
<b>Total</b>	<b>25,989.2</b>	<b>100%</b>

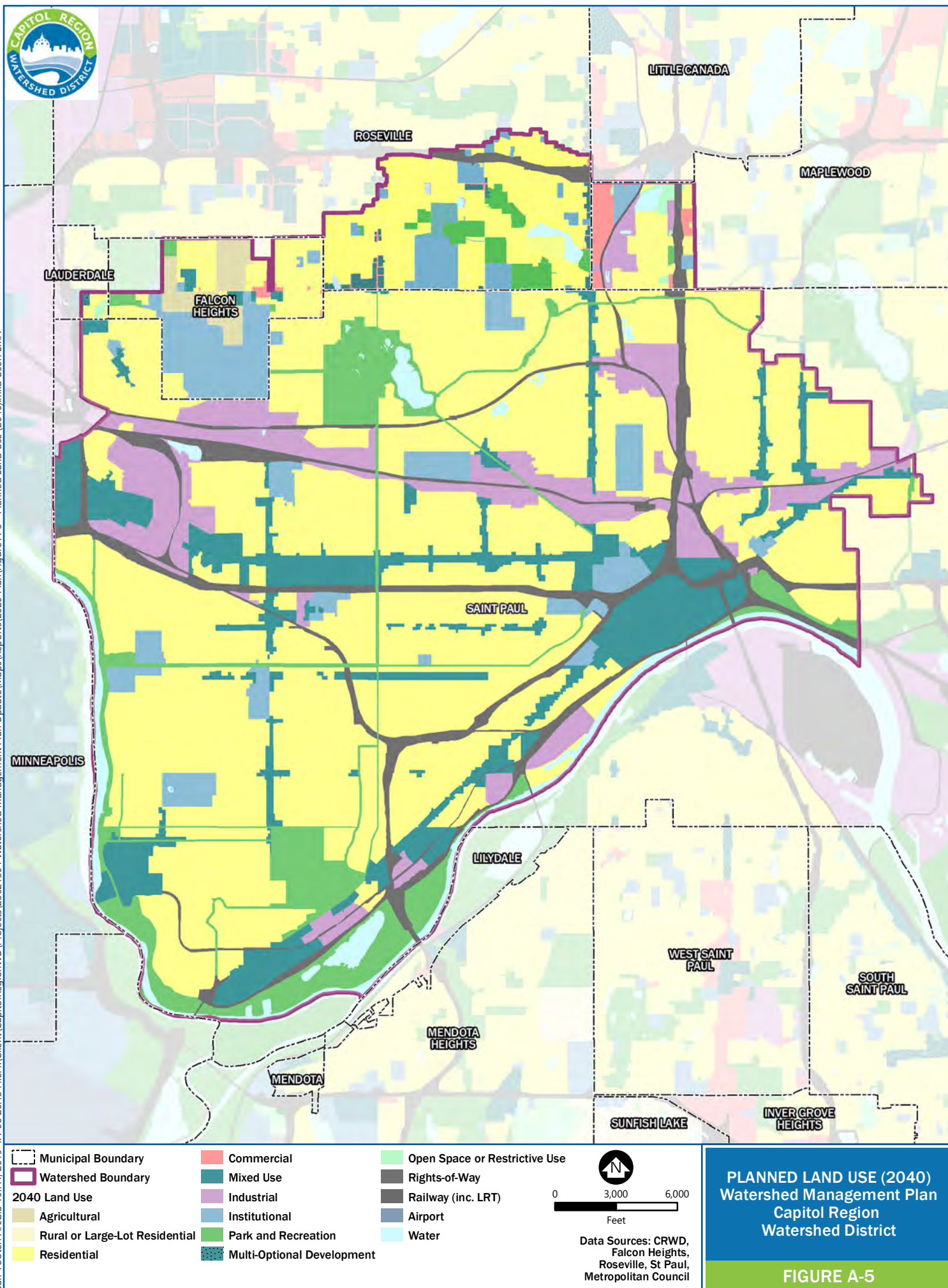
Source: Comprehensive Plans of Falcon Heights, Lauderdale, Roseville, Maplewood, and Saint Paul; Metropolitan Council

- (1) Includes institutional land uses and parks and open space associated with institutional land use (e.g. University of Minnesota, Minnesota State Fair Grounds, school playing fields).

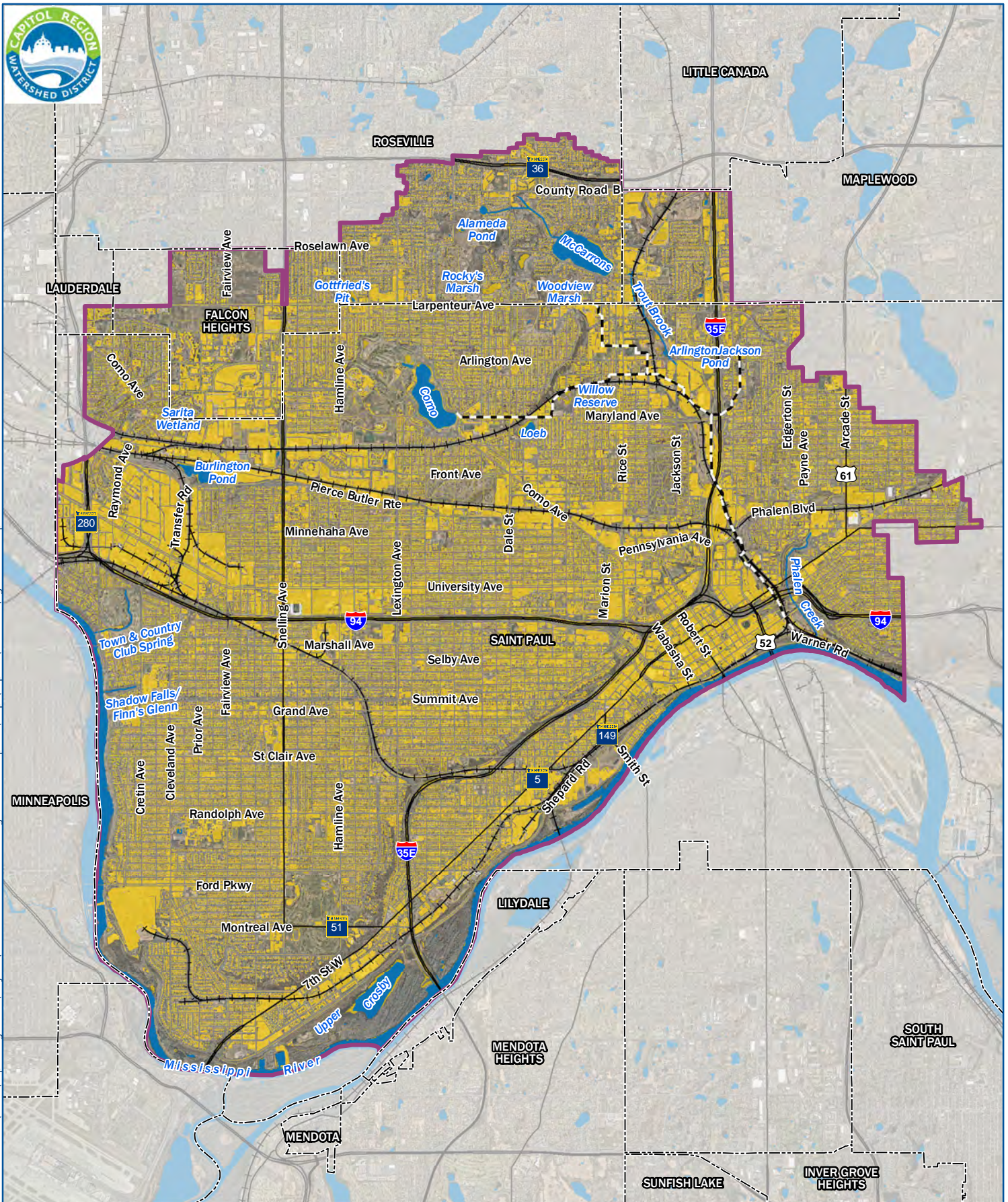




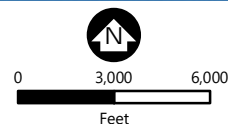








- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor
- Impervious Surface



Data Sources: CRWD,  
Ramsey County,  
MN DNR, USGS

IMPERVIOUS AREA  
Watershed Management Plan  
Capitol Region  
Watershed District

FIGURE A-6



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### A.4.1 Redevelopment

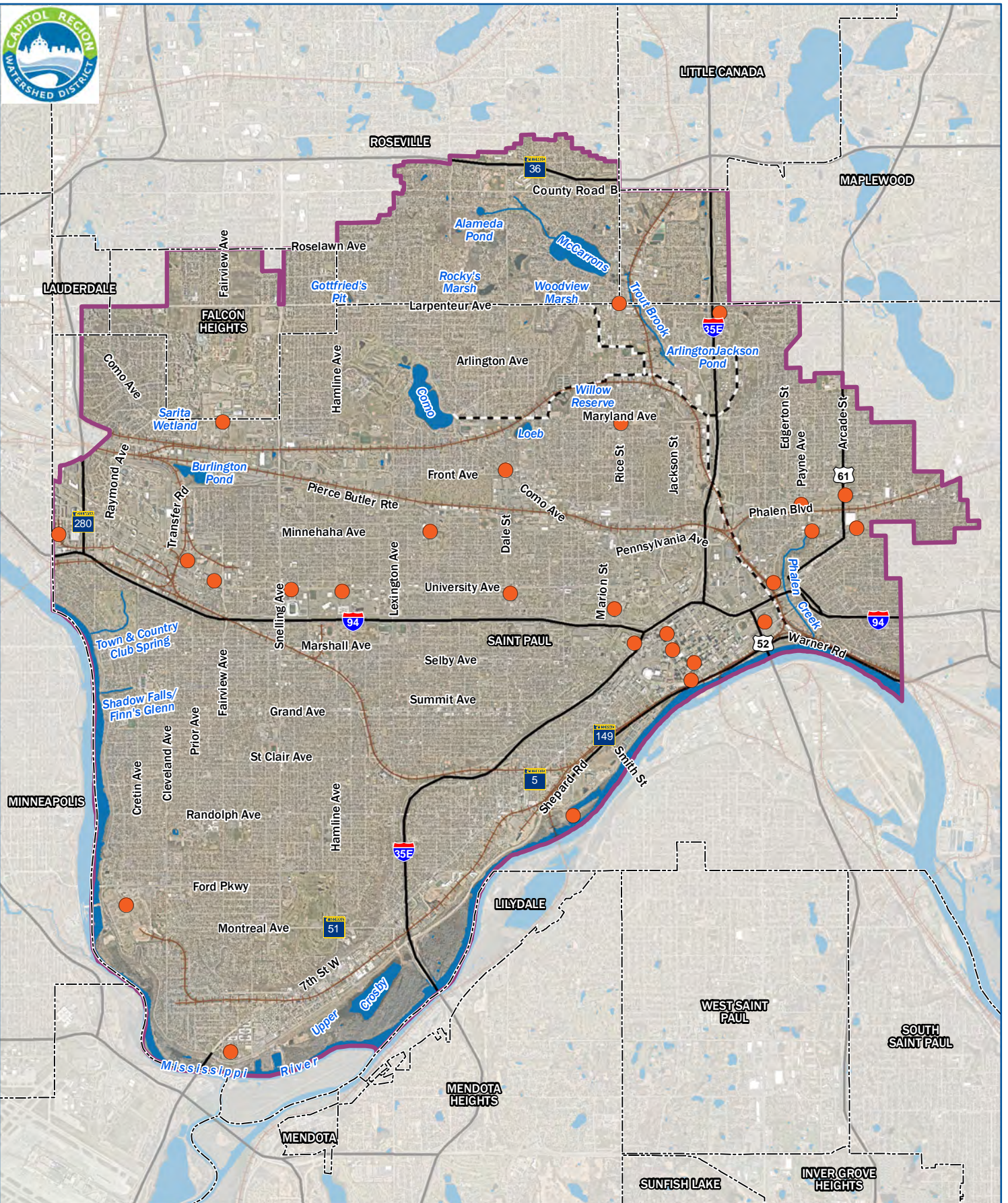
The District is entirely developed. Thus, the majority of the expected overall change in land use will be from redevelopment. Redevelopment activity presents an opportunity to incorporate additional stormwater best management practices (BMPs) where implementation of such BMPs would be otherwise infeasible, both through the District's permit program and partnerships. The District's implementation plan (Section 3.0 of the Plan) describes the process by which the District works with partners to identify redevelopment opportunities and leverage those opportunities to incorporate BMPs to achieve the District's goals.

Potential redevelopment areas occur throughout the watershed, with many located in Saint Paul. The comprehensive plans for cities within the District contain more information about specific future redevelopment areas. Other future redevelopment opportunities are as yet unknown. Currently, the District is tracking several large-scale redevelopment opportunities, including:

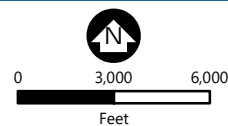
- Former Sears site (Saint Paul)
- Ford site (Saint Paul)
- Towerside Innovation District (Saint Paul)
- Creative Enterprise Zone (CEZ, Saint Paul)
- Snelling-Midway Phase II (Saint Paul)
- Sites associated with the City of Saint Paul River Balcony Project

Figure A-7 presents the approximate location of potential redevelopment opportunities within the District.





- |                         |                                 |
|-------------------------|---------------------------------|
| Municipal Boundary      | Redevelopment Opportunity Sites |
| Watershed Boundary      | Railroad                        |
| Lakes and Rivers        | Interstate or Highway           |
| Streams                 |                                 |
| Trout Brook Interceptor |                                 |



Data Sources: CRWD,  
City of Saint Paul (2018),  
MN DNR, USGS

**POTENTIAL REDEVELOPMENT  
OPPORTUNITIES**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-7**



## A.5 Population and Demography

Census data and City Comprehensive Plans identify observed and anticipated population and demographic changes in District Cities. The population of the District in 2018 was approximately 212,000 (estimated by interpolating individual City populations according to the percentage of each City within the District). Based on Metropolitan Council's *Thrive MSP 2040* forecasts, it is projected that the overall population within the District will increase by approximately 23,000 (11% relative to 2018 values). Estimated population growth is anticipated to result in higher density redevelopment within the already urbanized watershed (Saint Paul, 2019).

**Table A-5 Estimated population within the District (adjusted by land area)**

City	Percent in District	2010 Census Population <sup>1</sup>	2018 Census Population <sup>1</sup>	2030 Forecasted Population <sup>1</sup>	2040 Forecasted Population <sup>1</sup>
Falcon Heights	87%	4,628	4,887	4,611	4,611
Lauderdale	6%	143	152	150	151
Maplewood	15%	5,702	6,151	6,840	7,290
Roseville	22%	7,405	8,015	7,480	7,590
Saint Paul	62%	176,742	190,771	204,104	213,342
<b>Total</b>		<b>196,630</b>	<b>211,993</b>	<b>225,215</b>	<b>235,024</b>

Source: US Census data; Metropolitan Council *Thrive MSP 2040* (updated December 2018)

(1) Population within the District is estimated as the total City population multiplied by the percentage in the District.

Over time, the District's population has grown more racially and ethnically diverse. Between 2000 and 2015, the percentage of people of color in Saint Paul increased from 36% to 46%. Across Ramsey County, this percentage increased from 13% in 2000 to 30% in 2014. These trends are expected to continue through 2040 (Saint Paul, 2019). Figure A-8 presents race and ethnicity information available from 2010 census data. Figure A-9 presents limited data regarding non-English languages spoken in homes within the District.

The District's residents are also aging. Ramsey County is projected to experience a nearly 50% increase in residents 65 and older between 2015 and 2030, and another 10% increase in this age cohort from 2030 and 2040 (Metropolitan Council, 2016). Figure A-10 presents age information available from census data.

Within the District there are significant gaps in income and other avenues to prosperity (Saint Paul, 2019). Education levels vary widely across the District (see Figure A-11). The Metropolitan Council has identified Areas of Concentrated Poverty (ACP50)—census tracts where greater than 50% of the residents are people of color and at least 40% of the residents live below 185% of the federal poverty line. Figure A-12 presents the ACP50 within the District. Within Saint Paul, the ACP50 also exhibits the lowest high school graduation (Saint Paul, 2019).

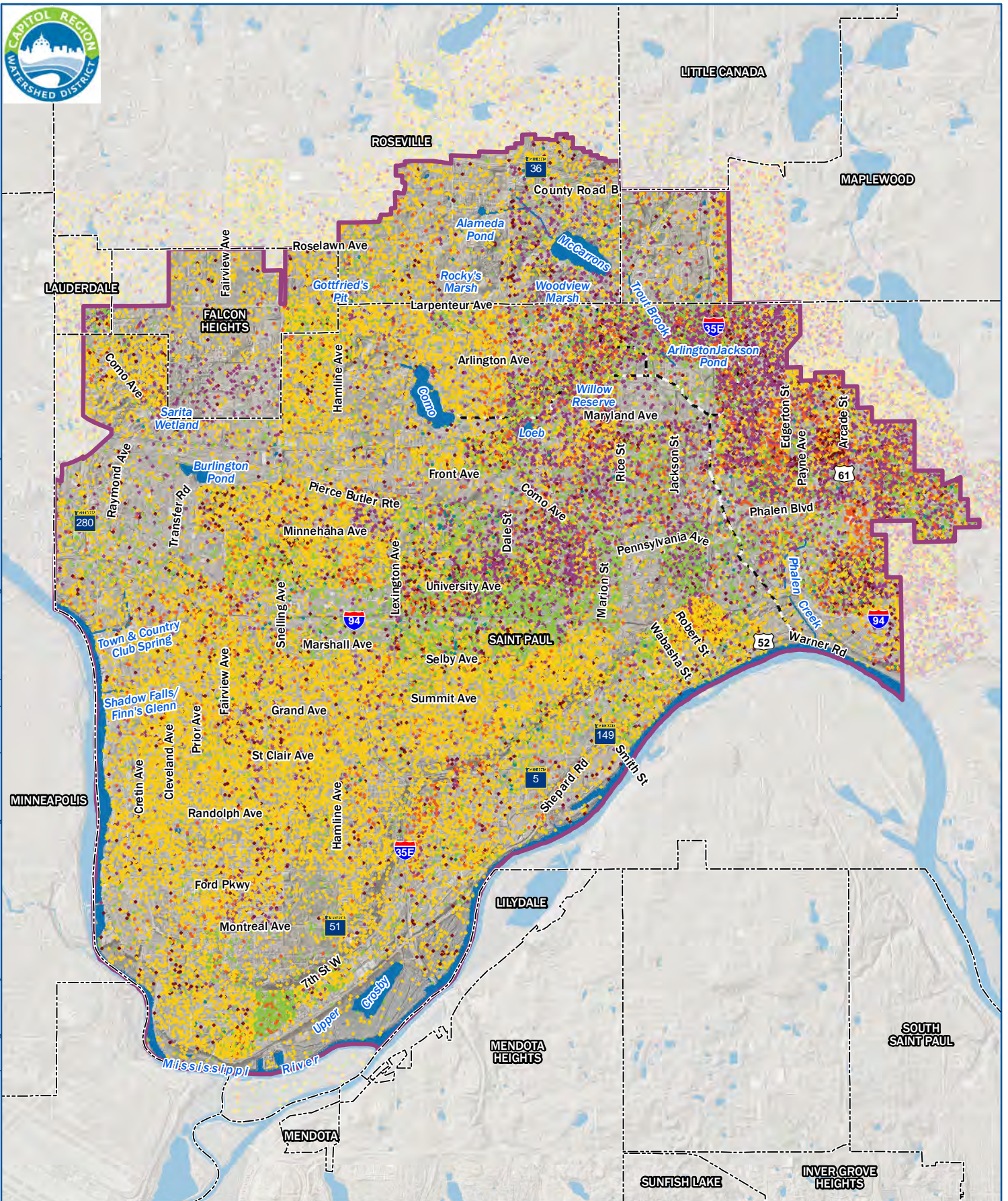
The District values diversity and inclusion and can achieve cleaner waters through engagement across communities. One of the goals/priorities in the District's 2018-2020 Strategic Diversity Plan is to "deepen



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relationships with many communities in the District by increasing outreach.” The District uses local demographic information (including the data presented herein) to learn more about the population it serves and better tailor its activities to serve those populations. This practice promotes inclusion of traditionally underserved communities in the watershed, equitable distribution of services, and will help achieve the goals of the District’s 2018-2020 Diversity Plan.





- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor

- Race and Ethnicity**  
Each dot represents 5 people
- African American
  - Asian American
  - Hispanic
  - Native American
  - White American
  - Multiracial or Another Race

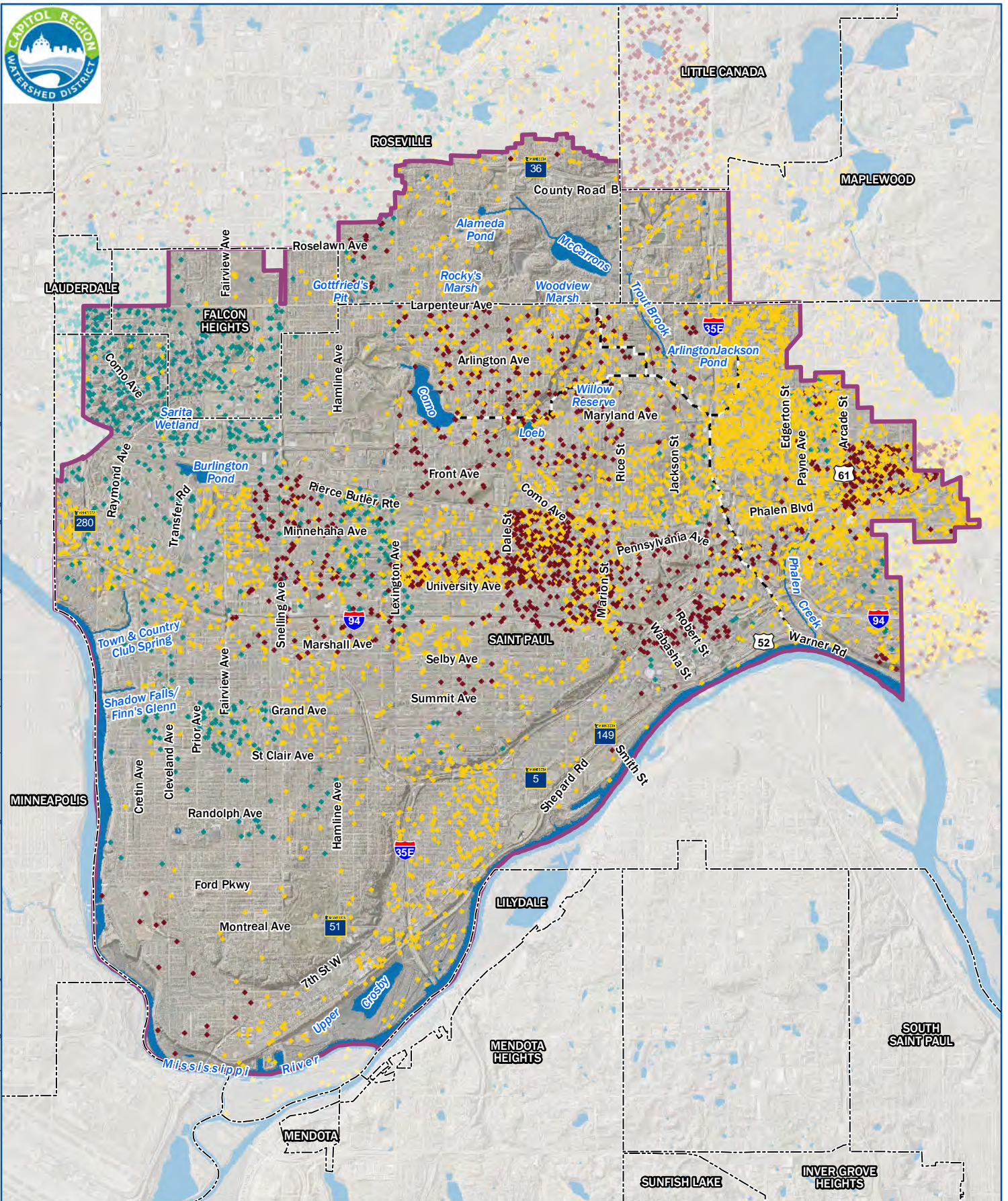
0 3,000 6,000  
Feet

Data Sources: CRWD,  
US Census Bureau (American  
Community Survey, 2013-2017)  
Metropolitan Council,  
MN DNR, USGS

**RACE AND ETHNICITY  
WITHIN THE DISTRICT**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-8**





- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor

**Predominant Language other than English**  
Each dot represents 1 person

- Spanish
- Chinese
- Vietnamese

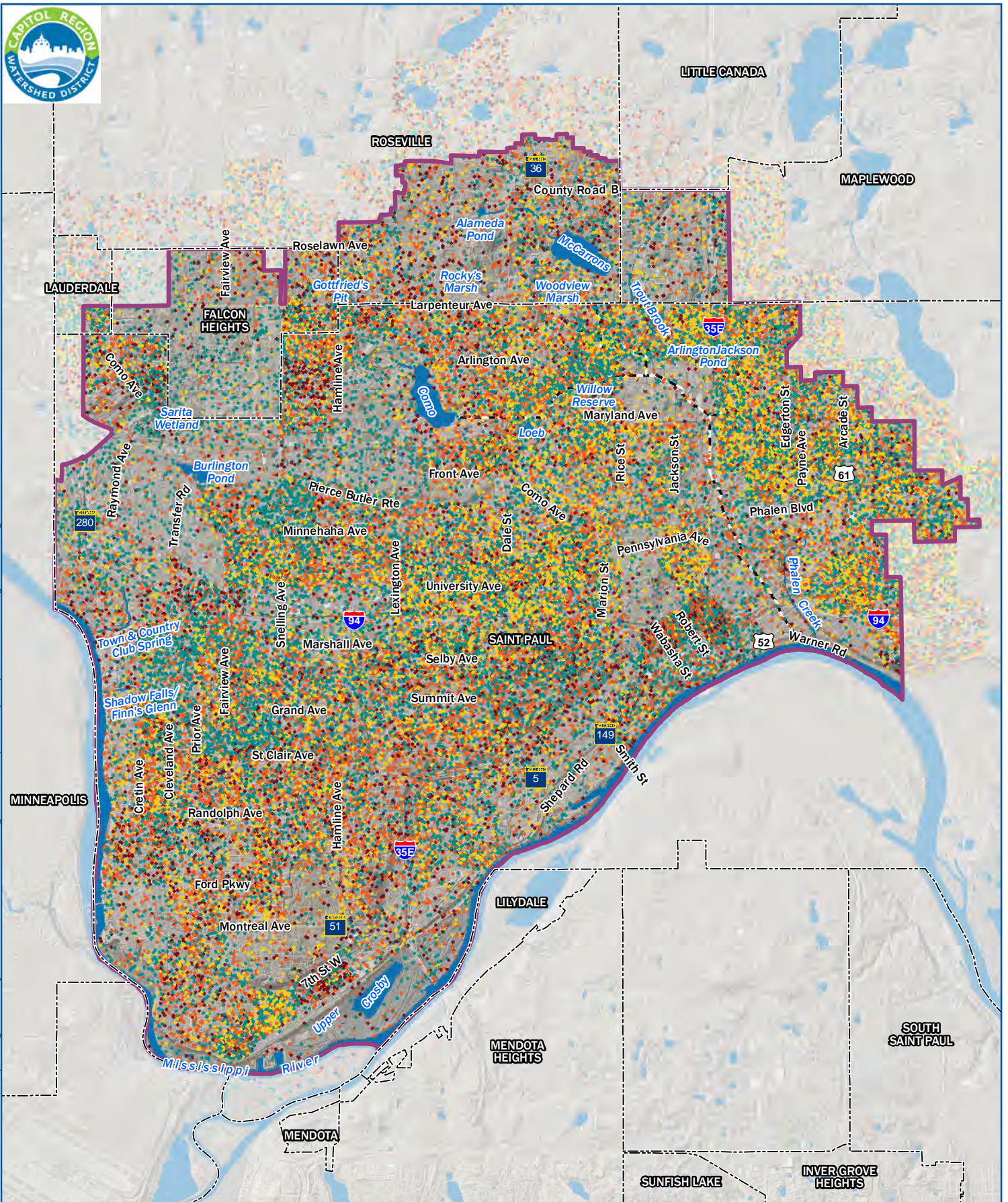
0 3,000 6,000  
Feet

Data Sources: CRWD,  
US Census Bureau (American  
Community Survey, 2013-2017)  
Metropolitan Council,  
MN DNR, USGS

**LANGUAGE OTHER THAN  
ENGLISH SPOKEN AT HOME  
WITHIN THE DISTRICT**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-9**





- Municipal
- Watershed
- Lakes and
- Trout Brook

- Age of Individuals**  
Each dot represents 5 people
- Under 18 Years Old
  - 18 to 39 Years Old
  - 40 to 64 Years Old
  - 65 Years Old and Older

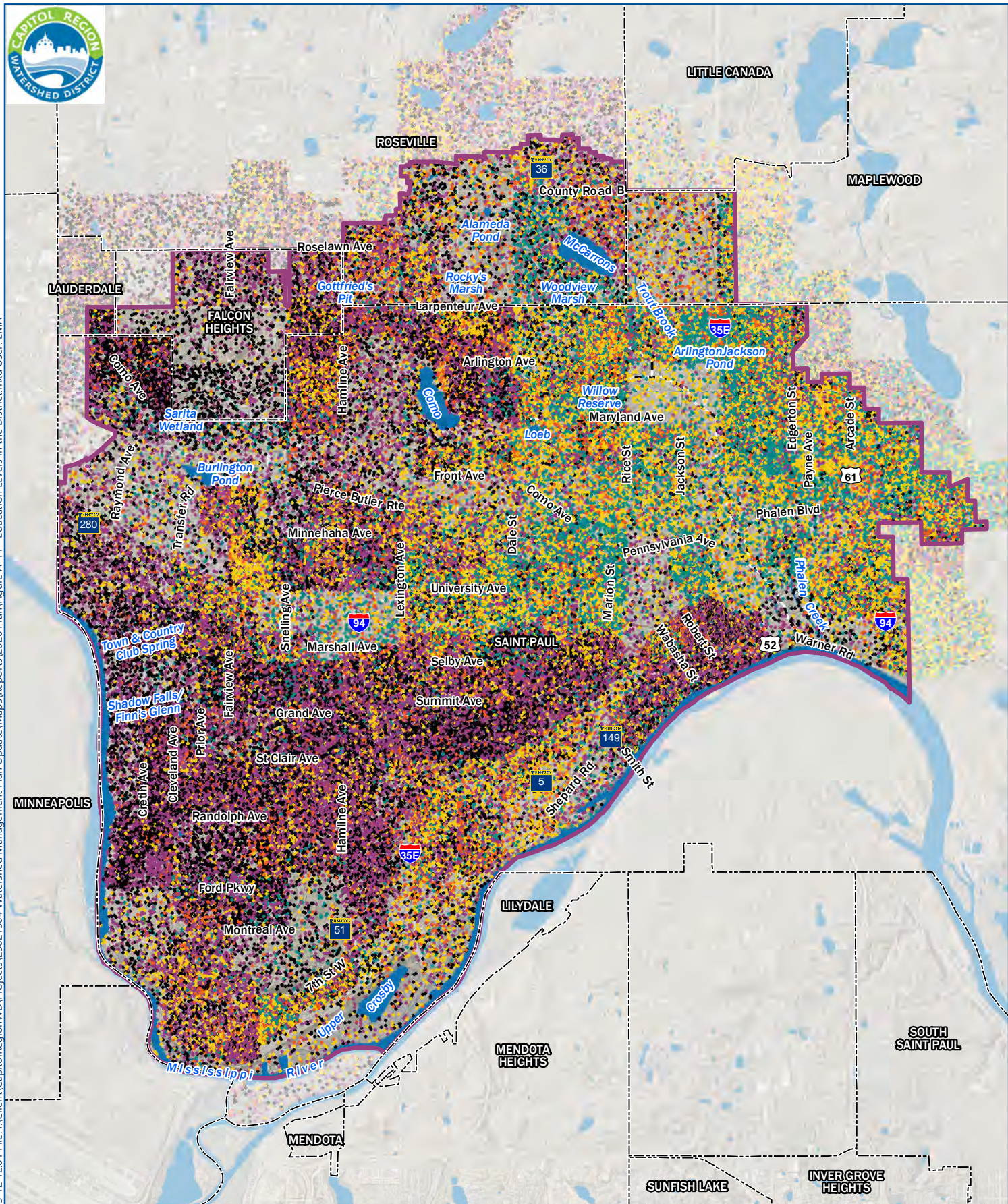
0 3,000 6,000  
Feet

Data Sources: CRWD,  
US Census Bureau (American  
Community Survey, 2013-2017)  
Metropolitan Council,  
MN DNR, USGS

**AGE IN THE DISTRICT**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-10**





- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor

- Highest Level of Education Attained**  
Each dot represents 1 person
- Did not Graduate High School
  - High School Graduate
  - Two-Year Degree
  - Bachelor's Degree
  - Graduate Degree or Higher

0 3,000 6,000  
Feet

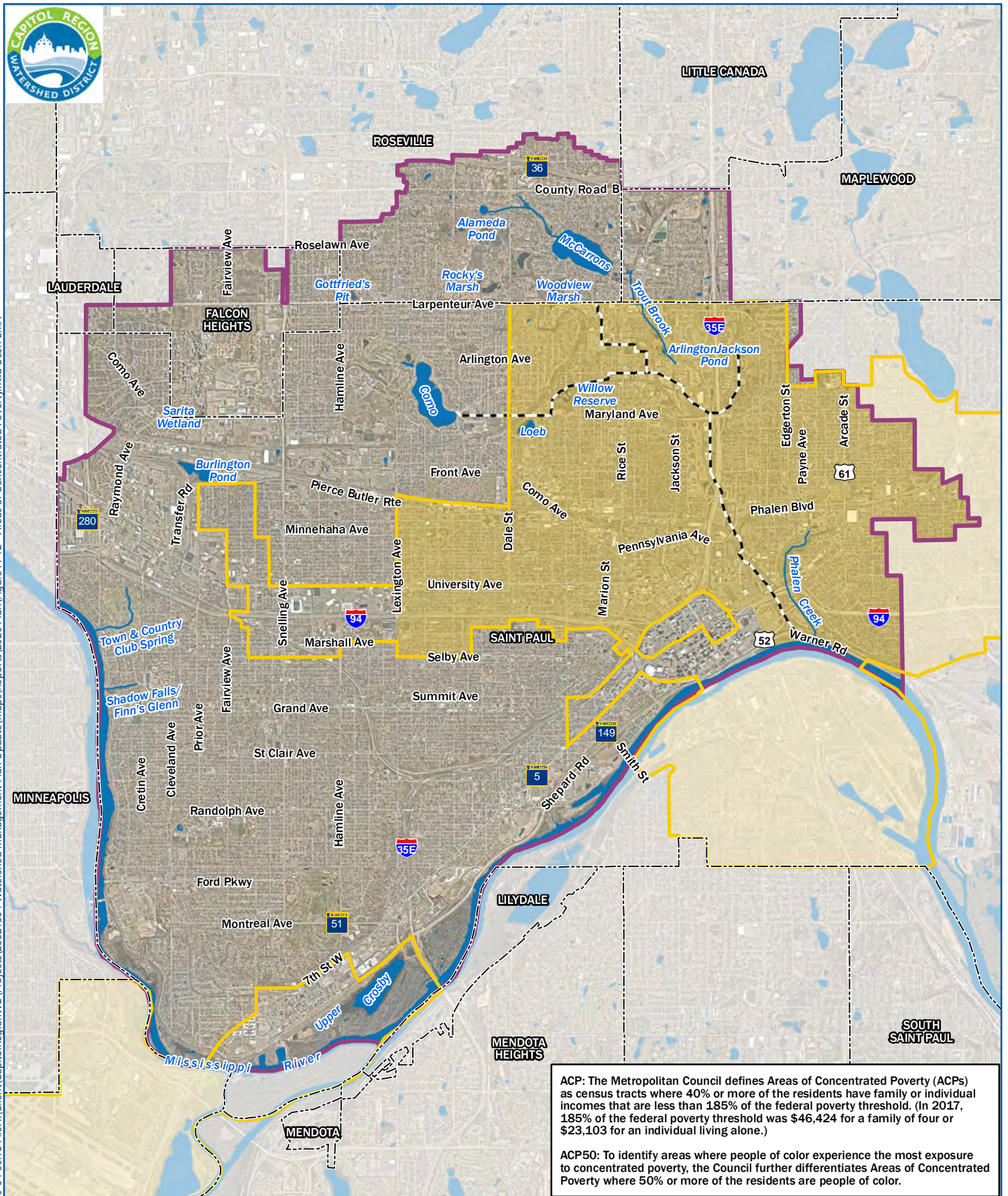
Data Sources: CRWD,  
US Census Bureau (American  
Community Survey, 2013-2017)  
Metropolitan Council,  
MN DNR, USGS

**EDUCATION LEVELS  
IN THE DISTRICT**

Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-11**

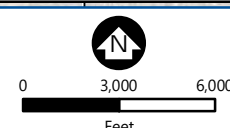




ACP: The Metropolitan Council defines Areas of Concentrated Poverty (ACPs) as census tracts where 40% or more of the residents have family or individual incomes that are less than 185% of the federal poverty threshold. (In 2017, 185% of the federal poverty threshold was \$46,424 for a family of four or \$23,103 for an individual living alone.)

ACP50: To identify areas where people of color experience the most exposure to concentrated poverty, the Council further differentiates Areas of Concentrated Poverty where 50% or more of the residents are people of color.

- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor
- Areas Of Concentrated Poverty (ACP)
- ACP50



Data Sources: CRWD,  
Metropolitan Council  
MN DNR, USGS

AREAS OF  
CONCENTRATED POVERTY  
Watershed Management Plan  
Capitol Region  
Watershed District

FIGURE A-12



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## A.6 Geology

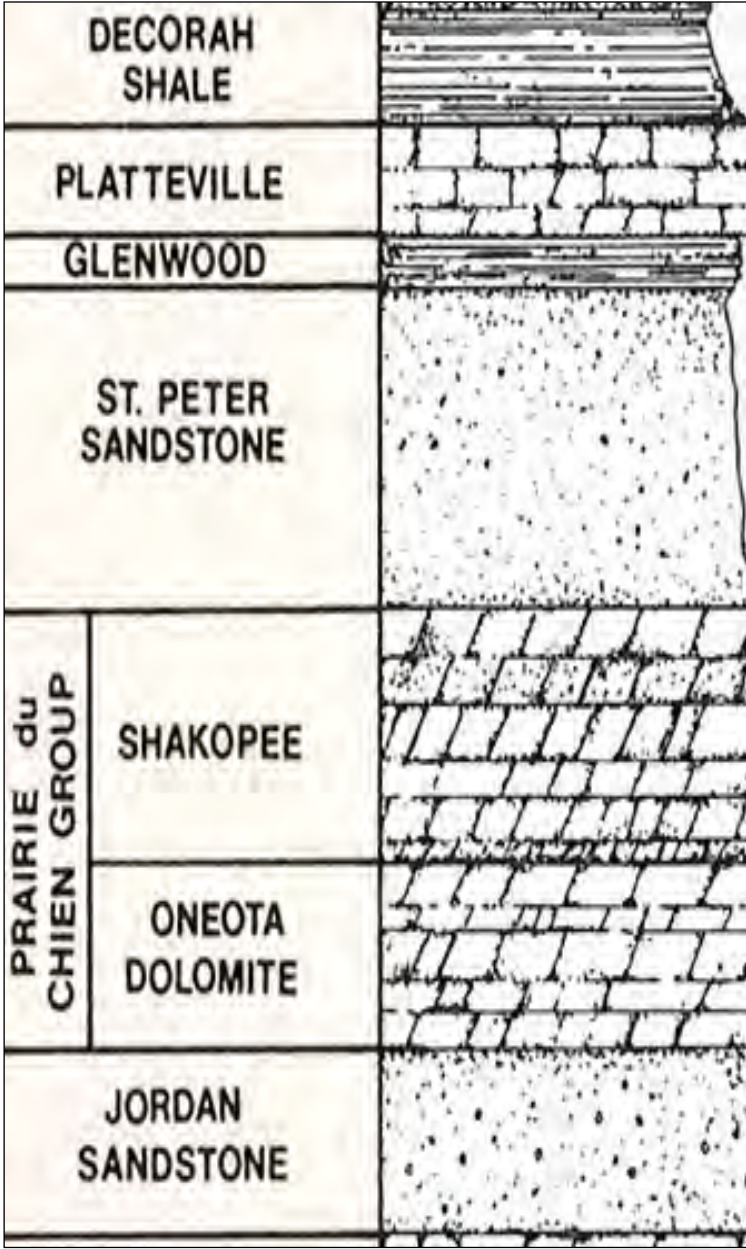
The geology of the District includes consolidated bedrock formations overlain by unconsolidated glacial sediments (also known as quaternary deposits). Unconsolidated glacial sediments are from glacial deposits left from the quaternary geologic period and modified by post-glacial erosion and soil formation processes. Most of the quaternary deposits in the District were deposited approximately 12,000 to 20,000 years ago by the Des Moines lobe (Grantsburg sublobe) and Superior lobe of the Wisconsin Glaciation (the most recent local glacial episode) (Meyer and Swanson, 1992).

The glacial (quaternary) deposits found in Ramsey County are primarily in the form of outwash, till, and stream and lake sediments, which are composed of varying percentages of sand, silt, clay, and gravel. The overall thickness of glacial deposits ranges from less than 10 to over 300 feet within the District. Deposits are thickest where pre-glacial and interglacial stream valleys, incised into underlying bedrock, have been filled with glacial sediment (e.g., Phalen Creek). Thinner deposits are found along the bluffs of the Mississippi River and in the southwest portion of the District (Meyer and Swanson, 1992). More recent quaternary deposits include floodplain alluvium along the Mississippi River, alluvial fan deposits, and peat deposits representative of historical wetlands (Meyer, 2007).

Consolidated bedrock formations (bedrock deposits) are much older and lie beneath the mantle of glacial sediments. They include a thick overlapping sequence of sandstones, limestones, dolostones, and shales. Most bedrock units in the District were deposited during the Paleozoic era marine environments about 450 to 530 million years ago. Some older undifferentiated Proterozoic-era rocks have been identified in the deep bedrock substrate (Meyer and Swanson, 1992).

The bedrock deposits in the District are part of a regional geologic setting called the Hollandale embayment. The embayment sequence of sandstone, carbonate and shale bedrock layers and acts as a huge groundwater basin. Table A-6 lists the bedrock deposits that outcrop (are exposed directly at the surface) or subcrop (are exposed in the subsurface directly below surficial sediments) within the District.

Table A-6 Upper-most bedrock deposits and local characteristics

Sample Bedrock Unit Cross Section		Bedrock Formations (descending order)	Local Characteristics
	DECORAH SHALE	Decorah shale	<ul style="list-style-type: none"> <li>Occurs in west &amp; center of the District</li> <li>Acts as a confining layer</li> </ul>
	PLATTEVILLE	Platteville limestone & Glenwood Shale	<ul style="list-style-type: none"> <li>Discontinuous in the District</li> <li>Outcrops present along Mississippi River bluffs</li> </ul>
	GLENWOOD		
	ST. PETER SANDSTONE	St. Peter sandstone	<ul style="list-style-type: none"> <li>Continuous except for buried bedrock valley near historic Trout Brook</li> <li>Lowest portion acts as confining layer</li> <li>Exposed along Mississippi River bluffs</li> </ul>
	PRAIRIE du CHIEN GROUP SHAKOPEE	Prairie du Chien group (dolostone)	<ul style="list-style-type: none"> <li>Continuous in the District</li> <li>Outcrops adjacent to the Mississippi River in downtown Saint Paul</li> <li>Can exhibit high conductivity</li> </ul>
	ONEOTA DOLOMITE		
	JORDAN SANDSTONE	Jordan sandstone	<ul style="list-style-type: none"> <li>Outcrops only extreme eastern portion of the District</li> </ul>

Source: Ramsey County Geologic Atlas (Meyer and Swanson, 1992)

Note: Other bedrock layers occurring below Jordan sandstone that do not outcrop in the District include: St. Lawrence formation, Franconia formation, Ironston sandstone, Galeville sandstone, Eau Claire formation (shale), and Mt. Simon sandstone

Additional geologic information, including descriptions of specific quaternary and bedrock deposits located within the District, are presented in the *Ramsey County Geologic Atlas* (Meyer and Swanson, 1992), available at: <https://conservancy.umn.edu/handle/11299/58233>

## A.7 Groundwater

### A.7.1 Hydrogeology and Aquifers

The glacial and bedrock deposits discussed in Section A.6 form a layered sequence of aquifers and confining units that make up the hydrogeologic setting of the District. An aquifer is a geologic formation capable of supplying sufficient quantities of water to a well. A confining unit is a geologic deposit that impedes the flow of water between aquifers (see also the *Ramsey County Geologic Atlas* (Meyer and Swanson, 1992)).

The uppermost aquifers in the District are glacial deposits. Glacial aquifers (also known as surficial aquifers) include the water table and buried glacial aquifers, which are primarily used for domestic purposes. Glacial aquifers are variable in location and yield. Groundwater quality in glacial aquifers is often correlated to the quality of the water that is infiltrating at the surface. Groundwater flow in the water table aquifer is toward local discharge zones (wetlands, lakes, and streams) and, both locally and regionally, toward the Mississippi River.

Most high-capacity wells draw water from bedrock aquifers. The bedrock aquifers within the District include the following:

- **Platteville Formation** – The Platteville Formation is composed of limestone and dolostone and is generally between 25 and 30 feet thick. In some areas, the aquifer is fully confined and saturated; in others, the Platteville is either part of the water-table system or is unsaturated and incapable of providing water to wells. Use of the Platteville aquifer is prohibited in many areas due to its proximity to the surface and associated potential for contamination.
- **St. Peter Aquifer** – The St. Peter sandstone aquifer is generally 150-160 feet thick and is composed mainly of poorly cemented, uniform sand grains that form a porous and permeable aquifer medium. The basal portion of the St. Peter contains layers of mudstone, siltstone, and shale that form a confining layer. The St. Peter is used primarily for domestic and other low-volume uses.
- **Prairie du Chien-Jordan Aquifer** – The Prairie du Chien Group (a series of dolomite deposits) and Jordan Sandstone are hydrologically connected due to the absence of a confining unit between them. This aquifer has high yield rates and is the most heavily used aquifer in the District. Many large-diameter and high-capacity wells draw from this aquifer for industrial, commercial, and municipal water supplies. Most of the Prairie du Chien-Jordan aquifer is more than 200 feet thick. Groundwater flows through it from the northeast toward the discharge zone of the Mississippi River. Recharge to the aquifer occurs from overlying non-con materials, lateral groundwater flow and buried bedrock valleys.



- **Tunnel City-Wonewoc Aquifer** (formerly Franconia-Ironton-Galeville Aquifer) – This aquifer includes three hydrogeologically connected layers. Groundwater flow in this aquifer is generally from the north of Ramsey County towards the Mississippi River. Locally, this aquifer is rarely utilized due its moderate to low yield.
- **Mt. Simon-Hinckley Aquifer** – This aquifer underlies all of Ramsey County and is composed of fine- and coarse-grained sandstone. Groundwater flow is generally east to west towards a cone of depression formed by pumping in Hennepin County. The aquifer has moderate to high yield and low vulnerability to contamination. Its use is unrestricted by Minnesota Law.

Additional information about the aquifers within the District is available from the following sources:

- *Ramsey County Geologic Atlas* (Meyer and Swanson, 1992), available at: <https://conservancy.umn.edu/handle/11299/58233>
- *Ramsey County Groundwater Protection Plan* (Ramsey Conservation District, 2010)
- Metropolitan Council Water Supply Planning at: <https://metro council.org/Wastewater-Water/Planning/Water-Supply-Planning.aspx>

## A.7.2 Groundwater Recharge

Recharge to the groundwater system occurs throughout the District. The characteristics of local geologic deposits at the land surface significantly affect the rate, volume, and distribution of recharge (see Section A.8). Water infiltrates most rapidly into sandy deposits and flows easily through sandy materials; clay deposits tend to slow and impede infiltration and subsurface flows. Relative to natural conditions, urban development and impervious surfaces (e.g., buildings, streets, parking lots) have reduced the amount of open space and decreased the amount of land available to infiltrate runoff and recharge groundwater.

Groundwater recharge reaches the water table (i.e., quaternary or surficial aquifer) at a fast rate through sandy geologic deposits. Surficial aquifers usually have higher static water levels than deeper aquifers, indicating that water flows downward into the aquifer system and that surficial aquifers help recharge deeper aquifer systems. Deeper bedrock aquifers are recharged through bedrock valleys, leakage through confining layers, fractures in tills and confining layers, improperly constructed wells, and other areas where good hydraulic connections and unforeseen flowpaths exist with upper aquifer units.

## A.7.3 Drinking Water Supply, Wellhead Protection, and Pollution Prevention

The majority of residents within the District obtain their drinking water from the Saint Paul Regional Water Service (SPRWS). The SPRWS operates an intake from the Mississippi River, located in Fridley. Although most of the SPRWS water supply comes from surface water, the SPRWS may use groundwater as an alternate water supply when there are taste and odor problems, during drought conditions, or in other special situations (e.g., security reasons). Approximately 10% of the SPRWS water supply consists of groundwater annually (Ramsey Conservation District, 2009). As of 2015, the SPRWS maintains 10 groundwater wells located in the Prairie du Chien-Jordan aquifer (SPRWS, 2015). ~~The~~ A portion of the

SPRWS drinking water supply system and management areas are ~~all~~ located in the northeast portion outside of the District.

Groundwater is also used to privately supply drinking water to organizations and businesses. There are 105 wells identified in the County Well Index (CWI) as providing domestic consumption (i.e., drinking water) within the District (see Figure A-13). Most of these wells are located in Roseville, Falcon Heights, and Maplewood.

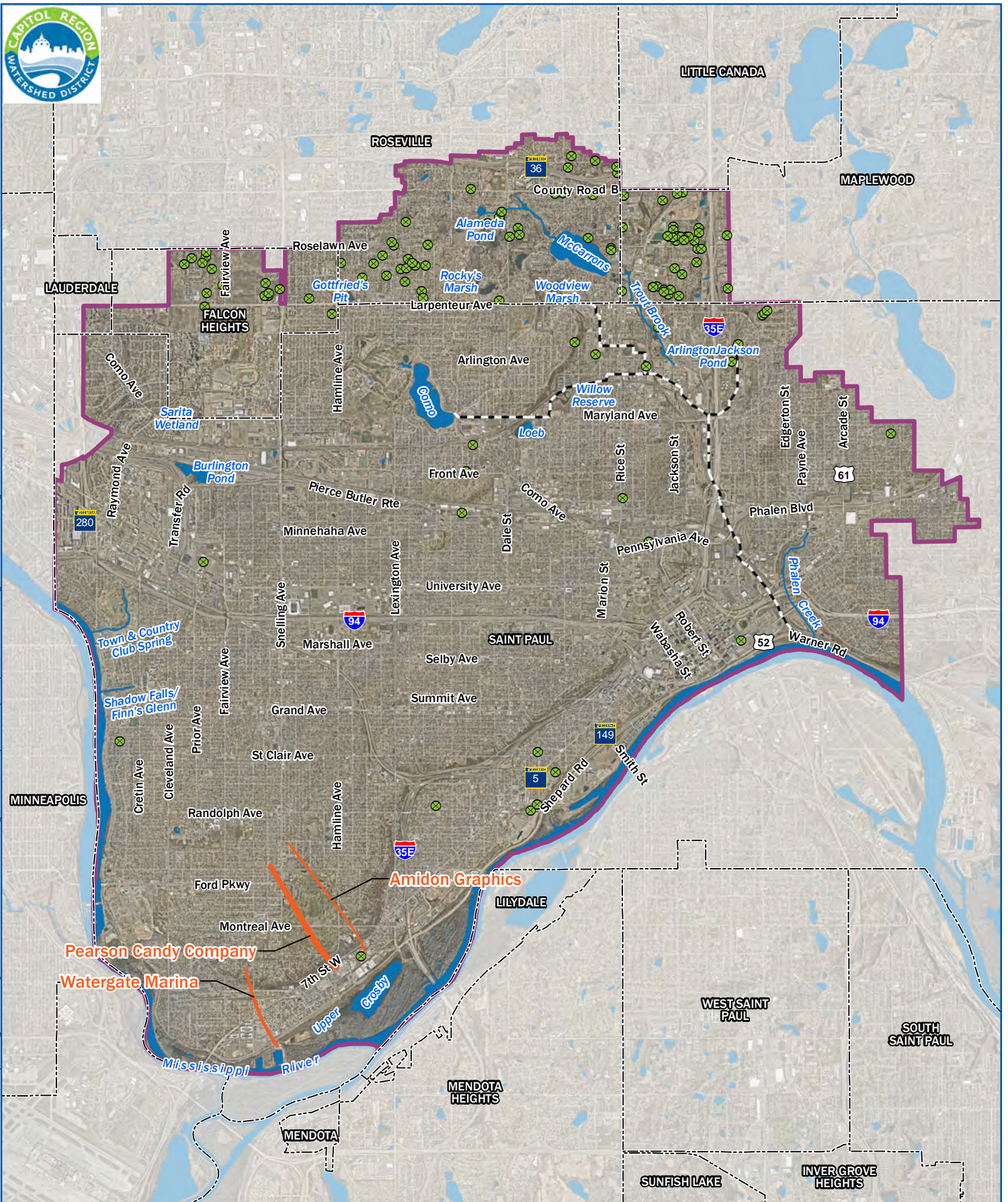
In 1989 the state of Minnesota instituted the Minnesota Groundwater Protection Act, which identified the Minnesota Department of Health (MDH) as responsible for the protection of groundwater quality. Through its wellhead protection program, the MDH administers and enforces the Minnesota Water Well Code, which regulates activities such as well abandonment and installation of new wells. The MDH also administers the Wellhead Protection Program, which is aimed at preventing contaminants from entering the recharge zones of public well supplies. In 1997, the Wellhead Protection Program rules (Minnesota Rules 4720.5100 to 4720.5590) went into effect.

The MDH prepares source water assessments for all Minnesota public water systems, including those using groundwater sources. Source water assessments consider data such as water sampling results, water system surveys, and well records to assess a water supply's susceptibility to contamination. In some cases, a source water assessment area is mapped to show the land area over which wellhead protection measures should be implemented. The MDH has mapped three source water assessment areas within the District (see Figure A-13).

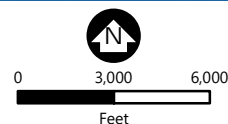
Some public water suppliers are required to prepare wellhead protection plans (WHPPs). Through these wellhead protection plans, public water suppliers delineate drinking water supply management areas (DWSMA) for groundwater wells, assess the water supply's susceptibility to contamination from activities on the land surface, and establish management programs, such as identification and sealing of abandoned wells and education/public awareness programs. The DWSMA represents the boundaries of the recharge area to the well and is the area to be protected and managed by the wellhead protection plan. ~~There are no~~ A portion of the SPRWS DWSMA ~~s~~ is located within the northern portion of the District.

As the District and its partners rely more heavily on infiltration practices to improve water quality and reduce stormwater volumes, the District will continue to consider the possible impacts of infiltrated stormwater on groundwater quality. The MDH and MPCA also provide guidance for evaluating infiltration projects in areas with vulnerable groundwater supplies; the guidance considers the presence of wellhead protection areas, aquifer characteristics, land use, and other factors. This guidance is available from the MPCA website: [https://stormwater.pca.state.mn.us/index.php/Stormwater\\_and\\_wellhead\\_protection](https://stormwater.pca.state.mn.us/index.php/Stormwater_and_wellhead_protection)





- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor
- Source Water Assessment Areas
- Domestic Well



Data Sources: CRWD, MDH, MN DNR, USGS

**DRINKING WATER WELLS  
& SOURCE WATER  
ASSESSMENT AREAS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-13**



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#### A.7.4 Groundwater Modeling

The Metropolitan Council developed and maintains a regional groundwater flow model for the entire Metropolitan Area (Twin Cities Metropolitan Groundwater Flow Model Version 3, as updated). The objective of this modeling effort is to maintain a groundwater-flow model that allows the Metropolitan Council, land use planners, and water utility planners across the metropolitan area to consider both groundwater availability and land use during the planning processes (Metropolitan Council, 2014).

The model was developed and calibrated for the primary purpose of predicting the effects of current and future groundwater withdrawals and land use on groundwater levels and the base flows of streams at a regional scale. These types of model predictions are useful for interpreting hydrogeologic data, informing future data collection, and for evaluating alternatives to enhance sustainable use of water resources in the metropolitan area.

The model is periodically updated; version 3 of the model (updated in 2014) is available from the Metropolitan Council at: <https://metro council.org/Wastewater-Water/Planning/Water-Supply-Planning/Metro-Model-3.aspx>

#### A.7.5 Groundwater Monitoring

Much of the groundwater monitoring performed by the District is completed as part of contaminated site management plans. These data are available from the Minnesota Pollution Control Agency (MPCA). The MPCA also implements a groundwater quality monitoring program; the program focuses on quaternary aquifers located throughout the state and the Prairie du Chien, Jordan, and Galena aquifers located in the Twins Cities Metro area and southeastern Minnesota.

The MPCA also monitors a network of shallow monitoring wells to augment the domestic well network. The monitoring well network is an early warning system designed to detect contamination as it enters the groundwater system. Groundwater quality monitoring information and data is available online from the MPCA at: <https://www.pca.state.mn.us/water/groundwater-monitoring>

The MDNR also coordinates an observation well network and collects static groundwater-level data to assess groundwater resources, determine long term trends, interpret impacts of pumping and climate, plan for water conservation, and evaluate water conflicts. The observation well network includes several sites in the District. More information is available from the MDNR at: <https://www.dnr.state.mn.us/waters/cgm/program.html>

#### A.7.6 Groundwater Quality

Long-term data for analyzing groundwater quality trends in the District are lacking. MDH tests water quality of several municipal drinking supply wells in Ramsey County, but often only after treatment. Only small-scale water quality studies and analyses have been performed in select areas for particular needs. A brief summary of some of these studies is presented in the 1996 *Ramsey County Ground Water Quality Protection Plan* (Ramsey Conservation District, 1996) and the 2009 draft *Ramsey County Groundwater Protection Plan* (Ramsey Conservation District, 2009).

Potential sources of groundwater contamination in the District include: commercial and industrial waste disposal, landfills, leaking petroleum tanks, unsealed wells, non-compliant septic systems, fertilizer/pesticide applications, animal waste, and road salt application (see also Section A.13). Emerging contaminants include pharmaceuticals, industrial effluents, personal care products, fire retardants, and other items that are washed down drains and not able to be processed by municipal wastewater treatment plants or septic systems.

Wastewater collection is available throughout the District, the entirety of which is included within the Metropolitan Urban Services Area (MUSA). Few subsurface sewage treatment systems (SSTS) remain in the District; failing or non-compliant SSTS pose a potential risk to groundwater quality.

## A.8 Soils

Soil composition and slope are important factors affecting the rate and volume of stormwater runoff. The shape and stability of aggregates of soil particles—expressed as soil structure—influence the permeability, infiltration rate, and erodibility (i.e., potential for erosion) of soils. Slope is important in determining stormwater runoff rates and susceptibility to erosion.

Soil infiltration capacity affects the amount of direct runoff resulting from rainfall. Higher infiltration rates result in lower potential for runoff, as more precipitation is able to enter the soil. Conversely, soils with low infiltration rates produce high runoff volumes and high peak discharge rates, as most or all of the rainfall moves as overland flow. The Natural Resources Conservation Service (NRCS – formerly the Soil Conservation Service) has established four general hydrologic soil groups (HSGs). These groups are:

**Hydrologic Soil Group A**—(Low runoff potential): Group A soils have a high infiltration rate and are typically composed of more than 90% sand and gravel.

**Hydrologic Soil Group B**—(Moderately low runoff potential): Group B soils have a moderate infiltration rate and are typically composed of 50-90% sand.

**Hydrologic Soil Group C**—(Moderately high runoff potential): Group C soils have a slow infiltration rate and are composed of less than 50% sand.

**Hydrologic Soil Group D**—(High runoff potential): Group D soils have a very slow infiltration rate and are composed of more than 40% clay. These soils have a combination of high swelling potential, a permanently high water table, and a clay layer at or near the surface.

Dual HSGs (types A/D, B/D, and C/D) are soils that are considered D soils primarily because of a high water table. However, if the soil were drained it would be classified into a different group. The second group listed for dual HSG soils is for an undrained condition. For the purpose of evaluating infiltration capacity, dual HSGs are usually considered as D soils. The most current soils data for the District are based on the Soil Survey Geographic dataset (SSURGO) from the NRCS and are presented in Figure A-14.

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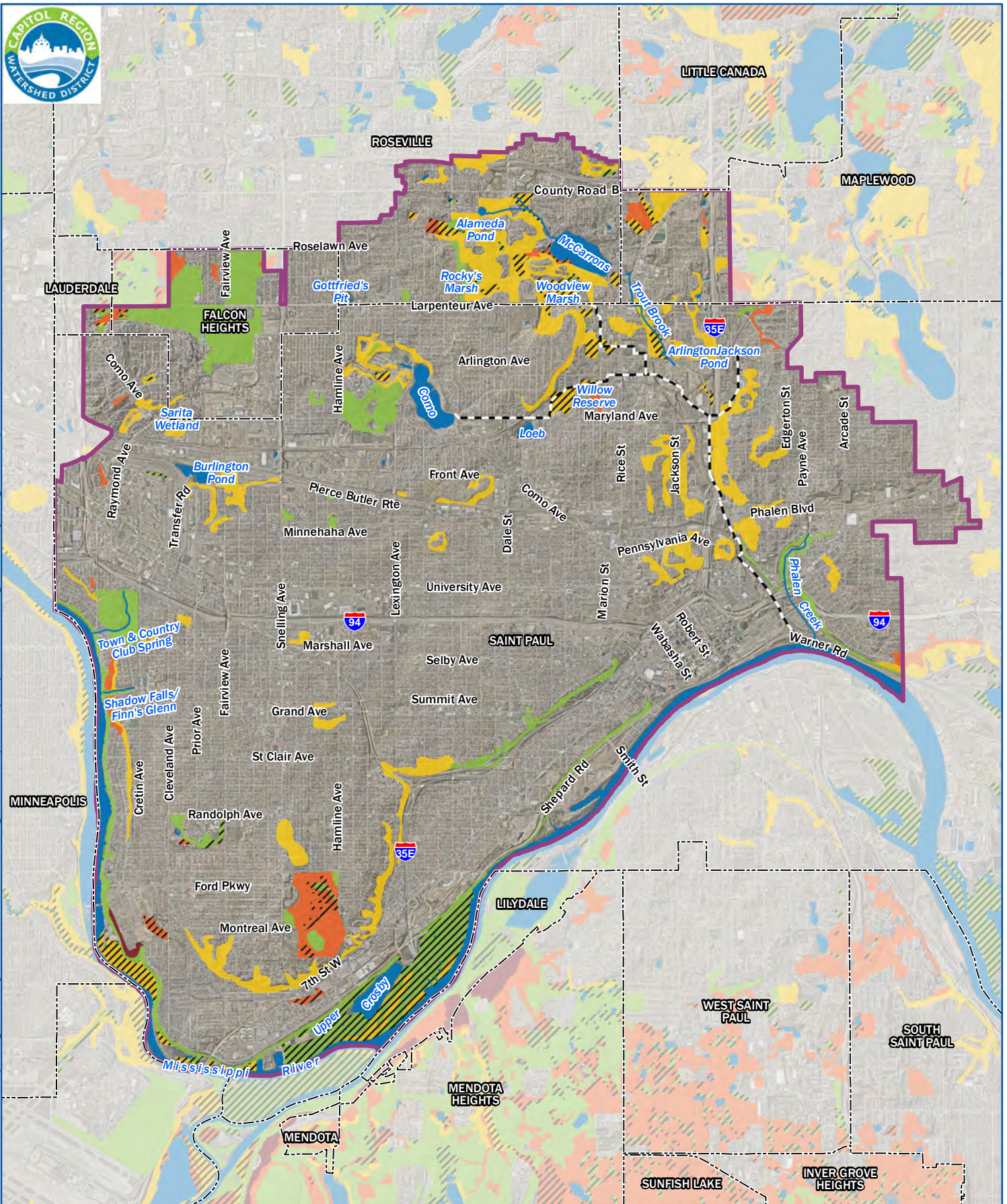
Most of the District is not rated with respect to HSG. The “Not Rated/Not Available” classification is typically assigned to areas where development has altered the existing soil, or data were unavailable prior to development. Generally, areas of defined HSGs in the District are limited to parks and open spaces. In these areas, HSGs A and B are most common.

In areas of limited data, quaternary geology may be used as an indication of the types of soils present and the associated drainage characteristics. The SSURGO dataset from the NRCS includes the texture of the parent material. Soils in the District are classified as having well drained, moderately well drained, and poorly drained characteristics, based on the texture of the parent material. Very sandy geologic materials are classified as well drained (similar to HSG A and B soils). Clayey geologic materials are classified as poorly drained (similar to HSG C and D soils). Drainage characteristics based on surficial geology are presented in Figure A-15.

Development is another factor that may increase the potential for high volumes of runoff. As land is developed for urban use, much of the soil is covered with impervious surfaces, and soils in the remaining areas are significantly disturbed and altered. Development often results in consolidation of the soil and tends to reduce infiltration capacity of otherwise permeable soils, resulting in significantly greater amounts of runoff. Grading, plantings, and tended lawns tend to dominate the pervious landscape in urbanized areas and may become more important factors in runoff generation than the original soil type.

Figure A-14 and Figure A-15 provide general guidance about the infiltration capacity of soils. Site specific data such as geologic borings, piezometers, and other engineering studies are necessary to evaluate soil infiltration capacity for individual project sites.





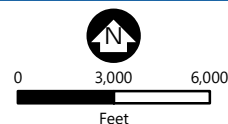
- Municipal Boundary
- Watershed Boundary
- Lakes and Rivers
- Streams
- Trout Brook Interceptor

- Soil Hydrologic Group\*
- A
  - A/D
  - B
  - B/D
  - C

C/D

D

\*Areas with missing soil data are due to the presence of urban soils.

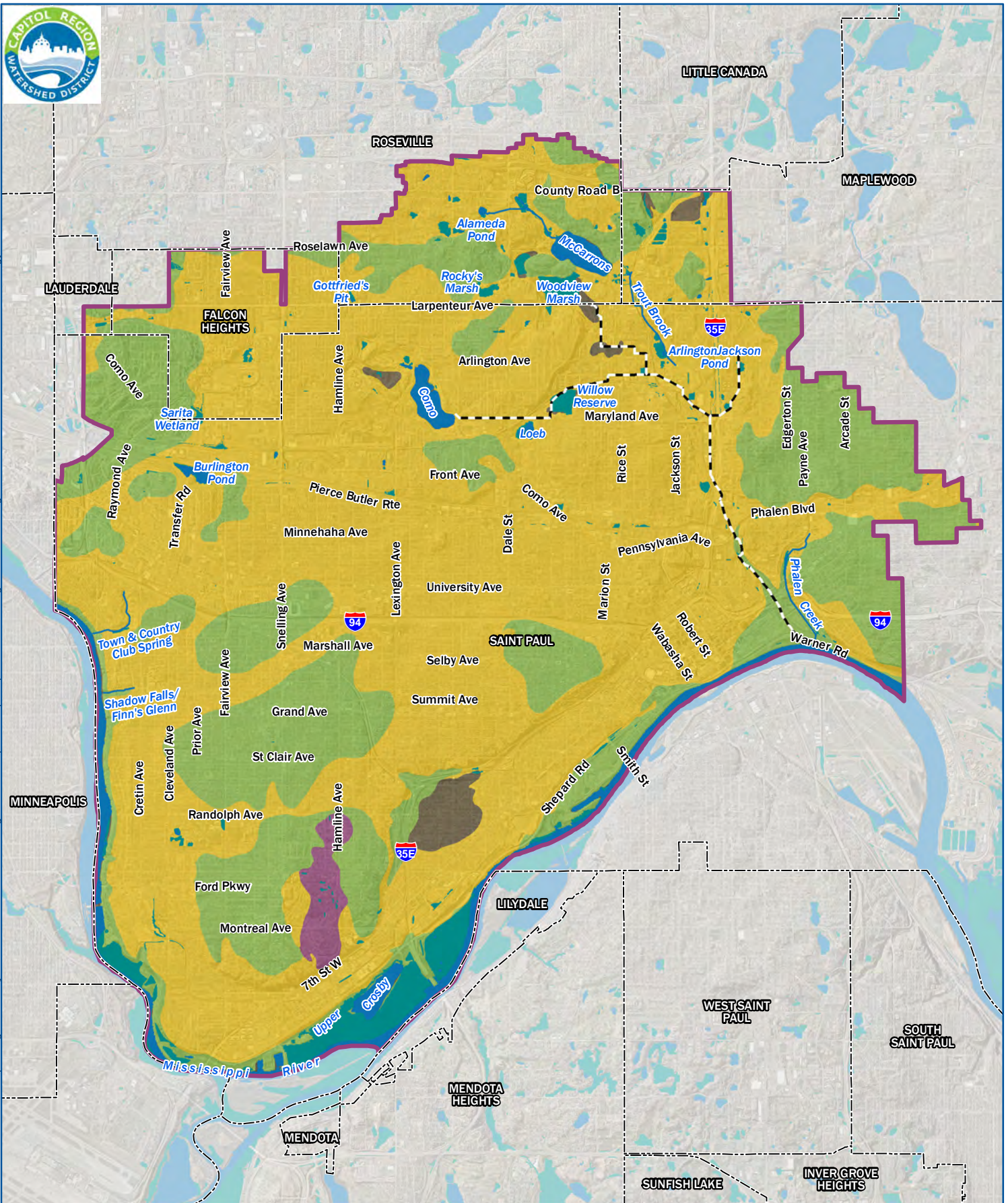


Data Sources: CRWD, MN DNR, NRCS, USGS

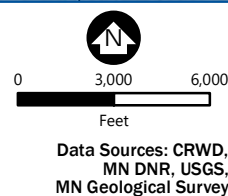
**HYDROLOGIC SOIL GROUPS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-14**





- |                         |                         |
|-------------------------|-------------------------|
| Municipal Boundary      | Well drained            |
| Watershed Boundary      | Moderately well drained |
| Lakes and Rivers        | Poorly drained          |
| Wetlands                | Peat and muck           |
| Streams                 |                         |
| Trout Brook Interceptor |                         |



**DRAINAGE CHARACTERISTICS  
OF SOILS BASED ON  
SURFICIAL GEOLIGIC DEPOSITS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-15**

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## A.9 Surface Water System

The District is located near the confluence of the Mississippi and Minnesota Rivers. The Mississippi River forms the western and southern border of the District and is a major regional resource serving power generation, recreation, navigation, and ecological functions. All areas in the District ultimately drain to the Mississippi River, either directly or through a network of stormwater and surface water features.

The development of Saint Paul and the surrounding communities has resulted in alterations to the natural hydrologic system: streams were filled or buried in underground pipes, wetlands were drained or filled, and stormwater infrastructure was constructed to convey water off the land. Historic water resources in the District are described in Section A.9.1.

For resource management purposes, the District has subdivided the watershed into six major planning areas:

- Como Lake subwatershed
- Lake McCarrons subwatershed
- Loeb Lake subwatershed
- Crosby Lake subwatershed
- Trout Brook subwatershed
- Mississippi River Gorge subwatershed
- Mississippi River Confluence subwatershed
- Mississippi River Downtown subwatershed

Figure A-16 presents the major subwatersheds in the District. Information specific to individual priority waterbodies is presented in this section as well as surface water resource information presented at a District-wide scale.

### A.9.1 Historic Water Resources

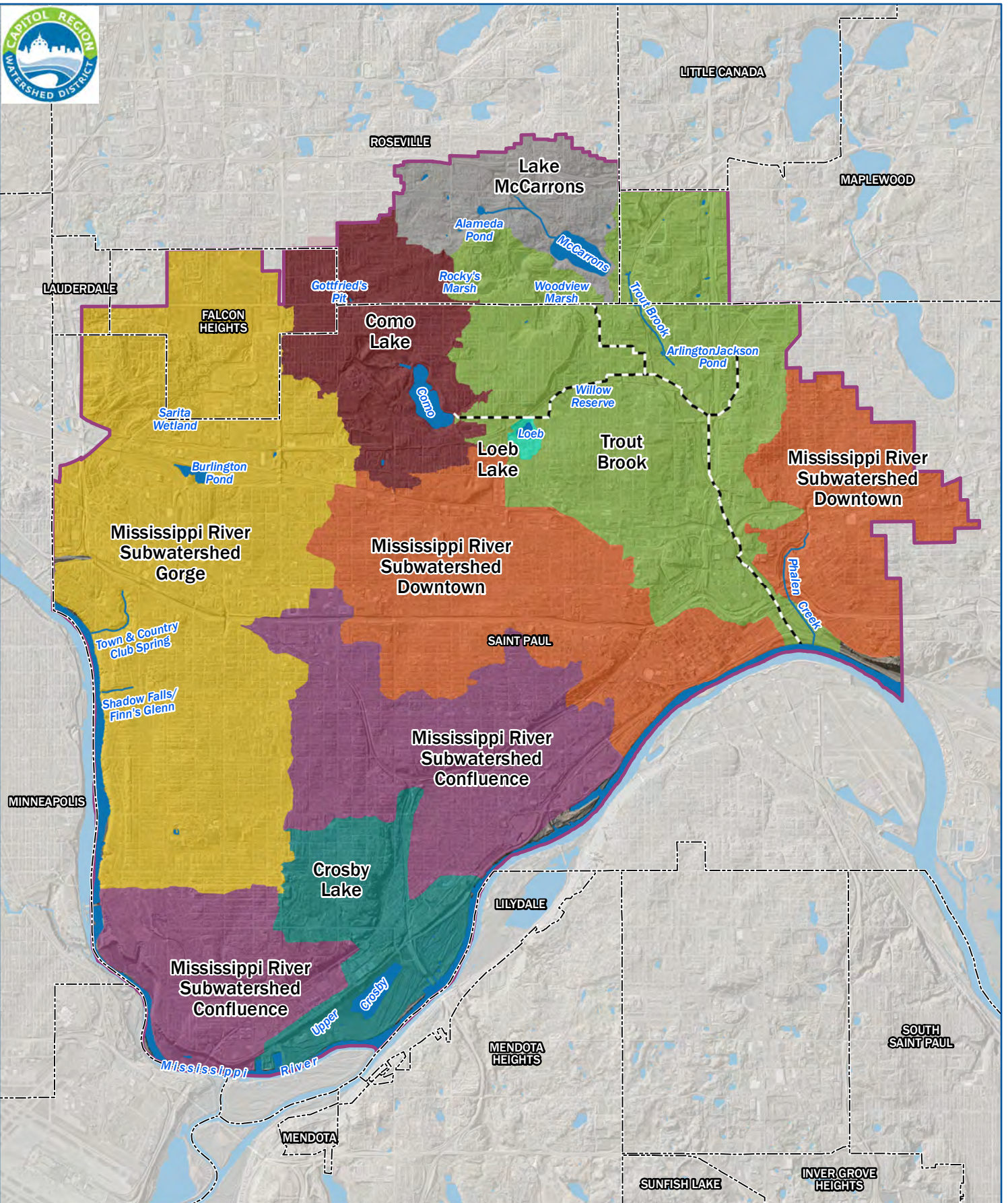
Prior to urban development, the District contained many significant natural and water resources including lakes, wetlands, streams, and springs, and unique aquatic, riparian, and upland habitats associated with these resources. As the land in the District was developed, many of these water and natural resources were lost or altered. Wetlands were filled or drained to create more land suitable for development while streams and springs were buried in pipes.

The District has inventoried and mapped historic water resources to evaluate the potential for future restoration efforts (see Figure A-17). The inventory considered historic maps of the City of Saint Paul and Ramsey County (published between 1867 and 1922) and information from historian and geologist Greg Brick. The location of some historic resources is approximate owing to the natural variability of hydrologic features (e.g., expansion of wetland areas during wet cycles, stream channel migration). The extent of features presented on Figure A-17 generally represent the largest areal extent of the resource.





Barr Footer: ArcGIS 10.7.1, 2020-08-31 10:12 File: I:\Client\CapitolRegion\WDP\Projects\23621304 Watershed Management Plan Update\Map\Reports\2020 Plan\Updates 90 Day Draft\Figure A-16 - Watershed Planning Areas.mxd User: EMA



- Municipal Boundary
- Watershed Boundary
- Streams
- Trout Brook Interceptor
- Lakes and Rivers

- Major Watershed
- Como Lake
- Crosby Lake
- Lake McCarrons
- Loeb Lake

- Mississippi River Subwatershed Confluence
- Mississippi River Subwatershed Downtown
- Mississippi River Subwatershed Gorge
- Trout Brook



0 3,000 6,000  
Feet

Data Sources: CRWD, MN DNR, USGS

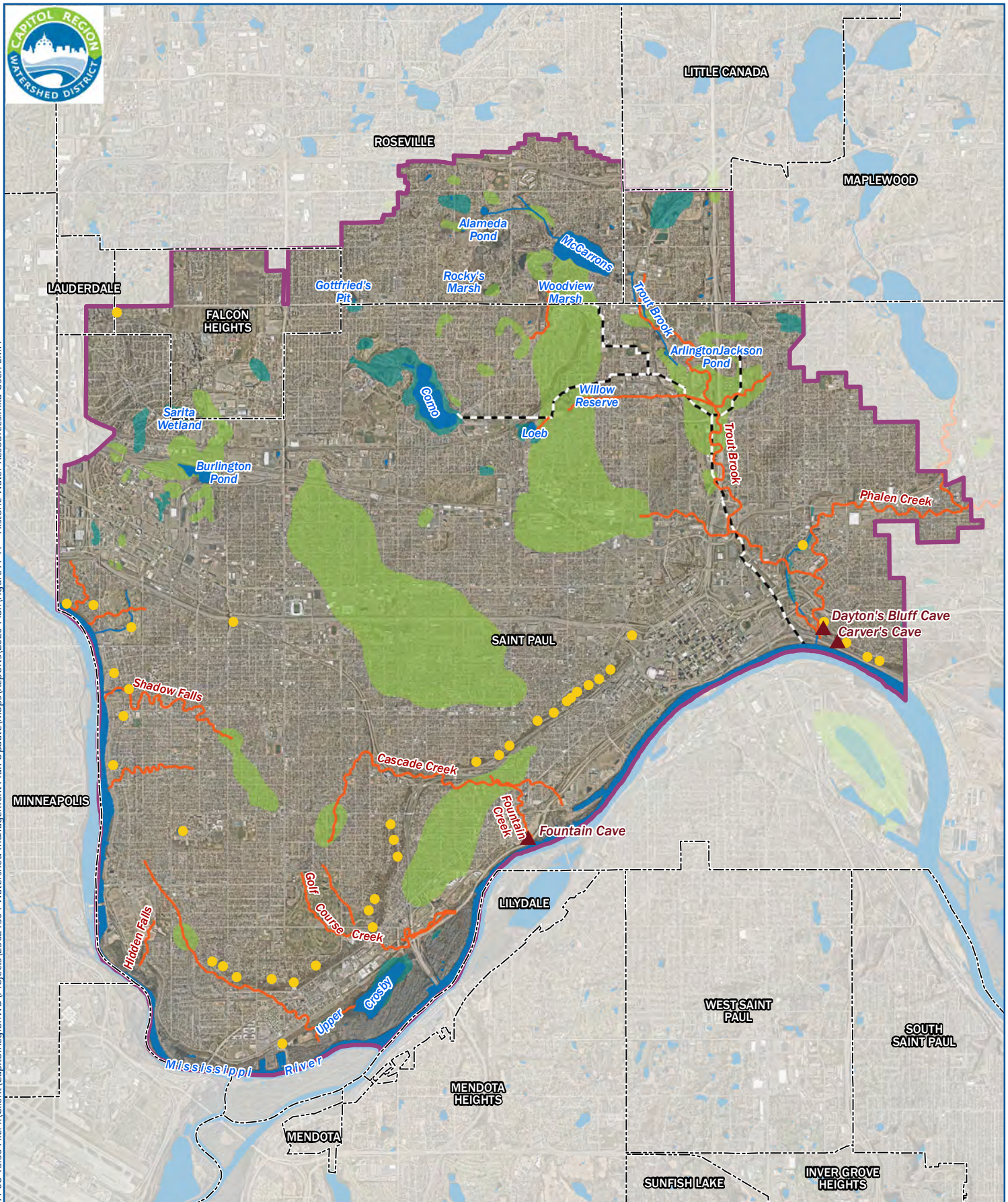
**WATERSHED PLANNING AREAS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-16**





Barr Footer: ArcGIS 10.7.1, 2019-1A-08 13:56 File: I:\Client\CapitolRegion\Watershed Management Plan Update\Maps\Reports\2020 Plan\Figure A-17 - Historic Water Resources.mxd User: EMA



- |                         |   |
|-------------------------|---|
| Municipal Boundary      | <b>Historic Water Resources (1848-1922)</b> |
| Watershed Boundary      | Historic Open Water                         |
| Lakes and Rivers        | Historic Wetland                            |
| Streams                 | Historic Stream                             |
| Trout Brook Interceptor | Cave (Brick, 2008)                          |
|                         | Spring (Brick, 2008)                        |

0 3,000 6,000  
Feet

Data Sources: MN DNR, Brick (2008), MGS  
CRWD, MNDOT, Metro GIS, EOR,  
David Rumsey Collection 1874, ES Norton 1886,  
George Franklin 1889, AT Andreas 1874,  
DL Curtice 1886, HM Smith 1912,  
US Land Office 1848, City of St Paul 1922,  
Rice 1874 & 1867

**HISTORIC WATER RESOURCES**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-17**



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#### **A.9.1.1 Lakes**

The larger historic lakes in the District remain today (i.e., Lake McCarrons, Como Lake, Loeb Lake, and Crosby Lake). Relative to its historic extent, Como Lake has become smaller. Mapping errors or inconsistencies may account for the shifting extents of some other lakes. In addition to these larger lakes, there were a number of smaller lake systems throughout the District that are no longer in existence.

#### **A.9.1.2 Wetlands**

Figure A-17 shows four large wetland complexes located in the center of District. Local topography suggests the two largest wetland complexes mapped on early surveys of the area are located on sloping terrain. Thus, portions of the wetland area shown on Figure A-17 may represent upland that drained to historic wetlands. Several historic wetlands were connected to other water resources such as streams, springs, marshes, and lakes. While the wetlands themselves have been filled for development, some of the connected resources can still be found today (i.e., Woodview Marsh, Willow Reserve, and Trout Brook). In addition to the large wetland complexes, several smaller wetland systems existed throughout the District.

#### **A.9.1.3 Springs**

A number of historic springs are presented in Figure A-17, many were tributaries to streams that discharged to the Mississippi River. Springs in the District tend to be found along spring lines at discrete elevations, depending on bedrock contacts, where there are perched water tables. Not all of the springs are perennial; some of them will only be found during wet years. Coverage for the City of Saint Paul is more complete than for the northern part of the District, away from the Mississippi River, where scattered, depression-type springs in glacial drift may exist and are as yet unmapped; this latter area remains to be thoroughly researched (Brick, 2008). Some of the historic spring systems are non-existent today while others exist in an altered state underneath the City of Saint Paul.

#### **A.9.1.4 Caves**

Cave systems are located at the downstream ends of the following historic streams: Phalen Creek, Trout Brook, and Cascade Creek. Notable natural caves within the boundary of the District include Carver's Cave, Dayton's Bluff Cave, and Fountain Cave (Brick, 2008). Carver's Cave is a short cave located downriver from downtown Saint Paul. Fountain Cave is longer than Carver's Cave and is located upstream of downtown Saint Paul. Stratigraphically, both Carver's Cave and Fountain Cave are located within St. Peter Sandstone (Carver's Cave near the middle of the formation, and Fountain Cave near the top). Dayton's Bluff Cave is similar in size and formation to Carver's Cave and is located a short distance upriver (Brick, 2009).

#### **A.9.1.5 Streams and Creeks**

Trout Brook and Phalen Creek originally flowed through the eastern part of the District to the Mississippi River. Trout Brook flowed from origins near Lake McCarrons and Loeb Lake south to the Mississippi River (see Figure A-17). Phalen Creek flowed south and west to the Mississippi River from Lake Phalen, through a deep ravine along Dayton's Bluff. Both streams were partially filled in the late 1800s by railroad companies using the stream valleys as track beds for railroad lines servicing downtown Saint Paul. Today,



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these streams remain buried underground for the majority of their lengths. Lake Phalen is no longer drained by Phalen Creek, and is located in the Ramsey-Washington Metro Watershed District.

Cascade Creek, originating near Randolph St. and Hamline Ave in Saint Paul, once flowed south and east to the Mississippi River. In 1854, John Ayd, a German immigrant, bought 160 acres of land bounded by present-day Lexington, Victoria, St. Clair, and Randolph Avenues and built a grist mill and mill house on Cascade Creek. The mill operated until 1878. In 1880, the Short Line, a commuter rail line built to connect Minneapolis and Saint Paul, was completed, and at least a portion of the stream bed was filled in at that time. Today, Ayd Mill Road follows a portion of the original route of Cascade Creek.

Hidden Falls Creek, located on the west side of the District, originally flowed southwest from what is now the Highland Park neighborhood of Saint Paul towards the Mississippi River. Hidden Falls Creek was buried during development. Redevelopment of the Ford site in Saint Paul may include opportunities to daylight portions of Hidden Falls Creek.

### **A.9.2 Existing Lakes, Ponds, and Streams**

Major surface waters in the District are presented in Figure A-18. Several of the surface water resources present in the District are classified by the MDNR as public waters. The MDNR designates certain water resources as public waters to indicate those lakes, wetlands, and watercourses over which the MDNR has regulatory jurisdiction. By statute the definition of public waters includes both “public waters” and “public waters wetlands.” The collection of public waters and public waters wetlands designated by the MDNR is generally referred to as the public waters inventory, or PWI.

Public waters are all waterbasins (i.e., lakes, ponds, wetlands) and watercourses (i.e., streams, rivers) that meet the criteria set forth in Minnesota Statutes, Section 103G.005, Subd. 15 that are identified on public water inventory maps and lists authorized by Minnesota Statutes, Section 103G.201. The regulatory boundary of public waters and public water wetlands is called the ordinary high water level (OHWL). A MDNR permit is required for work within designated public waters. Table A-7 summarizes the public waters located within the District. PWI maps and lists are available on the MDNR’s website:

[http://www.dnr.state.mn.us/waters/watermgmt\\_section/pwi/maps.html](http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html).

**Table A-7      Public Waters**

Waterbody Name	City	District Subwatershed <sup>1</sup>	Public Water ID Number	Lake (P) or Wetland (W) Designation	Approx. Area (acres)	Maximum Depth (ft)
Alameda Pond	Roseville	McCarrons	62-0215	W	2.0	--
Burlington Pond	Saint Paul	Mississippi	62-0224	W	18.2	--
Como Lake	Saint Paul	Como	62-0055	P	68.4	15.5
Crosby Lake	Saint Paul	Crosby	62-0047	P	48.0	19
Loeb Lake	Saint Paul	Loeb	62-0231	W	8.0	28
Lake McCarrons	Roseville	McCarrons	62-0054	P	68.1	57
Sarita Wetland <sup>2</sup>	Falcon Heights	Mississippi	62-0223	W	4.9	--
Rocky Marsh	Roseville	Trout Brook	62-0222	W	5.4	--
Upper Lake	Saint Paul	Crosby	62-0225	W	8.2	--
Mississippi River	Saint Paul	Mississippi	27-3	--	--	--

Source: US Census data; Metropolitan Council *Thrive MSP 2040* (updated December 2018)

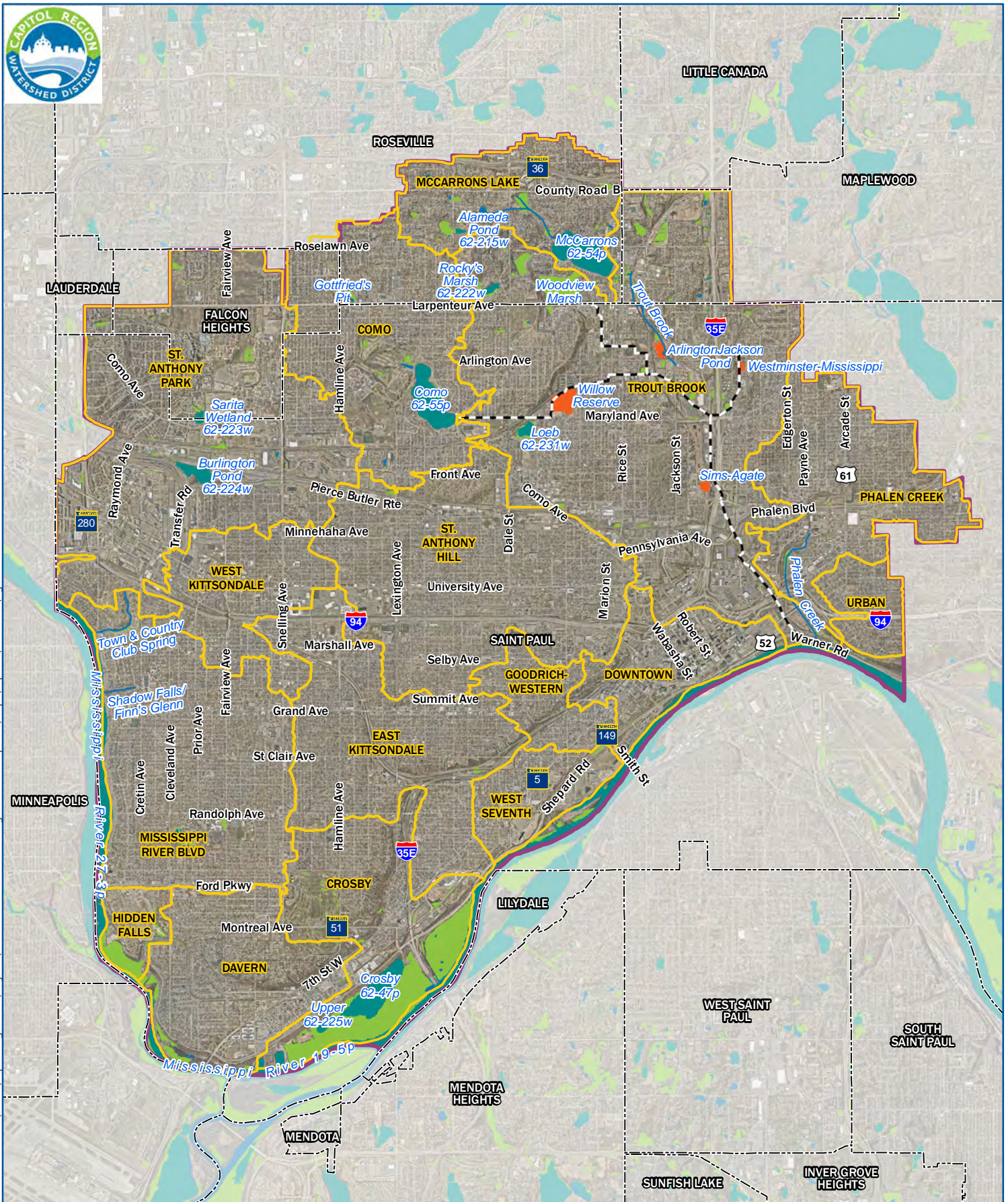
(1) See Section A.2 and Figure A-16.

(2) Identified as Moo-U Slough on PWI maps and inventory

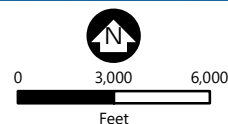
There are several waterbodies of significance located in the District that are not classified as public waters by the MDNR. These waterbodies are presented in Figure A-18 and include:

- Woodview Marsh (Roseville – Trout Brook watershed)
- Gottfried's Pit (Roseville – Como Lake watershed)
- Willow Reserve Pond (Saint Paul – Trout Brook watershed)
- Arlington-Jackson Pond (Saint Paul – Trout Brook watershed)
- Villa Park wetland system (Roseville – Lake McCarrons watershed)
- Westminster-Mississippi stormwater pond (Saint Paul – Trout Brook watershed)
- Hidden Falls Creek (Saint Paul – Mississippi River Gorge watershed)
- Town and Country Club Spring creek (Saint Paul – Mississippi River Gorge watershed)
- Shadow Falls/Finns Glenn creek (Saint Paul – Mississippi River Gorge watershed)





- Municipal Boundary
- Watershed Boundary
- Subwatershed
- Streams
- Trout Brook Interceptor
- Lakes and Rivers
- Wetlands
- PWI Lakes and Rivers
- Wetland Used for Stormwater



Data Sources: CRWD, MN DNR, MnDOT, USGS

**SURFACE WATER RESOURCES**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-18**



### A.9.2.1 Como Lake

Como Lake is a 70 acre shallow urban lake located in Saint Paul's Como Regional Park. Como Lake is a popular regional recreation area; the lake is used for non-motorized boating, fishing, aesthetic viewing, and is surrounded by walking and biking paths. Como Lake supports a variety of wildlife and serves as a habitat sanctuary amidst a densely urbanized area. Throughout the year, several species of mammals, reptiles, birds, and pollinators can be observed at Como Lake.

Como Lake has a maximum depth of 15.5 feet, an average depth of 6.5 feet, and is classified as a shallow lake by the MPCA for water quality management purposes. The littoral zone (the area where light can penetrate to the lake bottom which allows for vegetation growth) exceeds 95% of the lake area. Approximately 1,700 acres of watershed drains to Como Lake. Water exiting Como Lake drains to the Mississippi River via the Trout Brook Interceptor (TBI) stormsewer system.

The size and depth of Como Lake has varied since surveys performed in the mid-1800s. Como Lake has been altered from its original shape and depth. Sediment borings indicate that Como Lake may have been shallower and could have historically been a wetland (CRWD, 2002). Alterations to the lake include dredging, draining, construction of the lake outlet, and continued development of the stormsewer network draining to the lake.

#### *Como Lake Water Quality*

Como Lake has experienced water quality problems associated with frequent algal blooms and occasional fish kills for decades. Excessive nutrient loading, particularly phosphorus, is the primary cause of Como Lake's water quality problems (CRWD, 2019). Consequently, the MPCA placed Como Lake on the State's 303(d) list of impaired waters for nutrients in 2002 (see Section A.9.6). Como Lake is also listed as impaired due to chloride and mercury in fish tissue (see Section A.9.6). Other pollutants of concern include sediment and trash.

Water quality samples have been collected in Como Lake by Ramsey County Public Works (RCPW) dating back to 1984. RCPW monitoring includes nutrients, transparency (i.e., Secchi depth), and physical parameters (e.g., temperature, pH). Phytoplankton and zooplankton samples are collected from the lake surface waters. Chloride is measured bi-weekly during the winter ice-covered period at the deepest point in the lake. In 2017, CRWD began measuring continuous DO with sensors at three monitoring locations to measure anoxia near the sediment surface. Quantification of the spatial extent and temporal extent of anoxia in the lake facilitates estimation of the diffusive flux of phosphorus from the sediments.

Como Lake water quality data are presented in Table A-8 and Figure A-19. Water quality in Como Lake is stable, despite significant variability from year to year, and exceeds applicable water quality standards in most years. The Water Quality Drivers Analysis Study completed in 2017 (CRWD, 2017) considered long-

term chemical, biological, and physical data and identified the primary sources of phosphorus loading to Como Lake. These sources include:

- Diffusive flux of sediment phosphorus
- Die-off and decay of curly-leaf pondweed (CLP)
- Phosphorus loading from watershed runoff

Understanding the sources and mechanisms of phosphorus loading to, and within, Como Lake is a critical element in prioritizing management strategies that will be most effective for reducing phosphorus loading and improving water quality. More information about the historical water quality of Como Lake and its contributing factors is included in the District's 2019 *Como Lake Management Plan* (Como LMP). The Como LMP also includes recommended strategies to improve Como Lake water quality; these strategies have been incorporated into the Plan (see Section 3.0) as appropriate.

**Table A-8      Como Lake Water Quality Data (1984-2019)**

Period	Total Phosphorus (µg/L)	Chlorophyll <i>a</i> (µg/L)	Secchi Depth (m)
1984-2019 (May-Sept)	173	34.2	1.4
10 year (2010-2019) (May-Sept)	184	37.8	1.0
MPCA Shallow Lake Standard	≤60	≤20	≥1.0

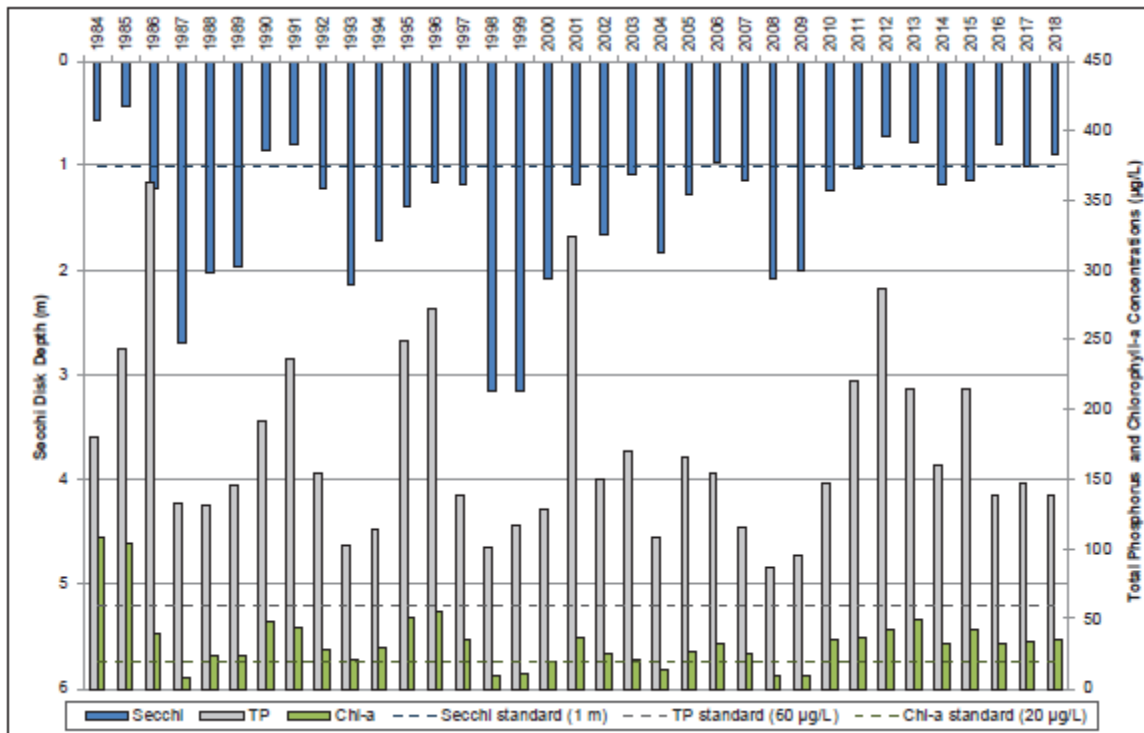


Figure A-19 Como Lake Water Quality Trends

### Como Lake Macrophytes

The District and others have performed aquatic plant surveys in Como Lake during the ice off period since 2005, including multiple surveys per summer since 2013. Aquatic plant density in Como Lake is high (see Figure A-20). Recent surveys identify curlyleaf pondweed (CLP) as the dominant, abundant plant observed in late spring/early summer. CLP (*Potamogeton crispus*) is an invasive aquatic plant that disrupts macrophyte ecology, degrades water quality, and is nearly impossible to eradicate once established. CLP often outcompetes native vegetation to become the dominant aquatic plant species in a lake. In this region, it tends to die off and decay in mid- to late-June, releasing phosphorus into the water column and contributing to summer algal blooms. CLP was first observed in Como Lake in the early 1990s and now dominates the aquatic plant community.

Other native aquatic plant species present in Como Lake in moderate density include:

- Canadian waterweed (*Elodea canadensis*; a.k.a. American waterweed or pondweed),
- sago pondweed (*Potamogeton pectinatus*),
- leafy pondweed (*Potamogeton foliosus*),
- coontail (*Ceratophyllum demersum*),
- flatstem pondweed (*Potamogeton zosteriformis*), and
- filamentous algae (*Spirogyra/Cladophora* species).

Muskgrass (*Chara spp.*), greater duckweed (*Spirodela polyrriza*), lesser duckweed (*Lemna minor*) and wild celery (*Valisneria americana*) have also been observed in low density. In general, the density of the native



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pondweeds, duckweeds, coontail, and filamentous algae tends to increase following CLP die-off in mid- to late-June.

Aquatic plants, including CLP, have historically been mechanically harvested in Como Lake for recreational purposes to maintain paddling lanes or clear areas near the fishing piers. Additional management actions such as herbicide treatments may be necessary to reduce CLP density in Como Lake.

Aquatic plants serve important functions in shallow lakes which includes habitat for fish and zooplankton, nutrient uptake, and stabilization of sediments. The District seeks to improve the native aquatic vegetation community in Como Lake and will continue to perform monitoring and management of the aquatic plant community in Como Lake following an adaptive management approach.

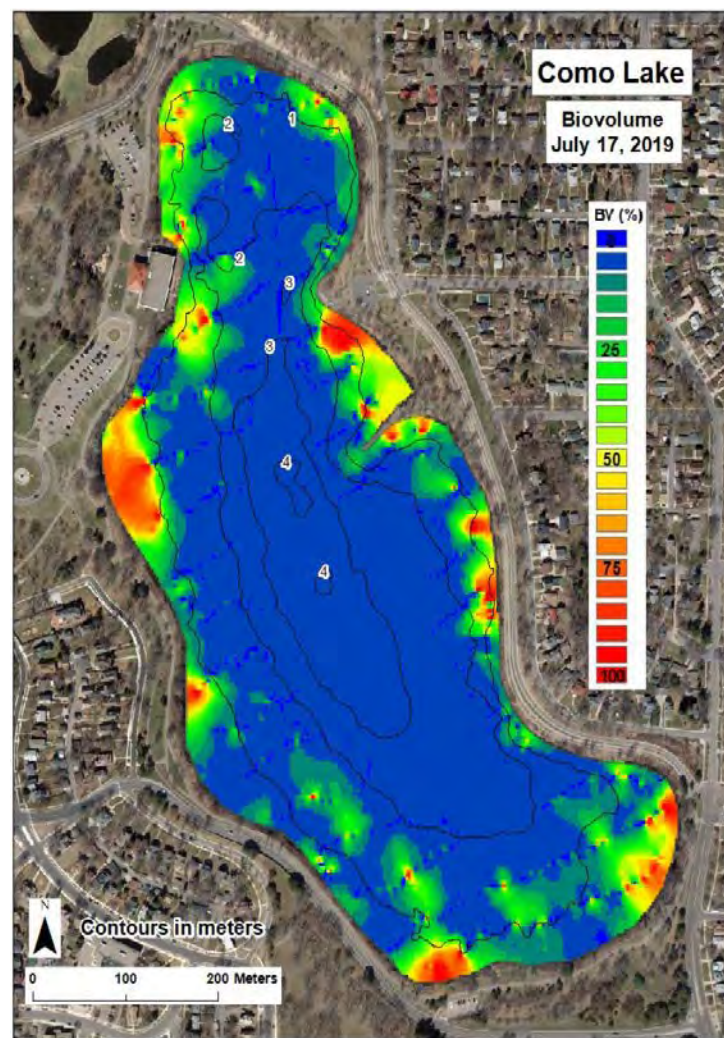
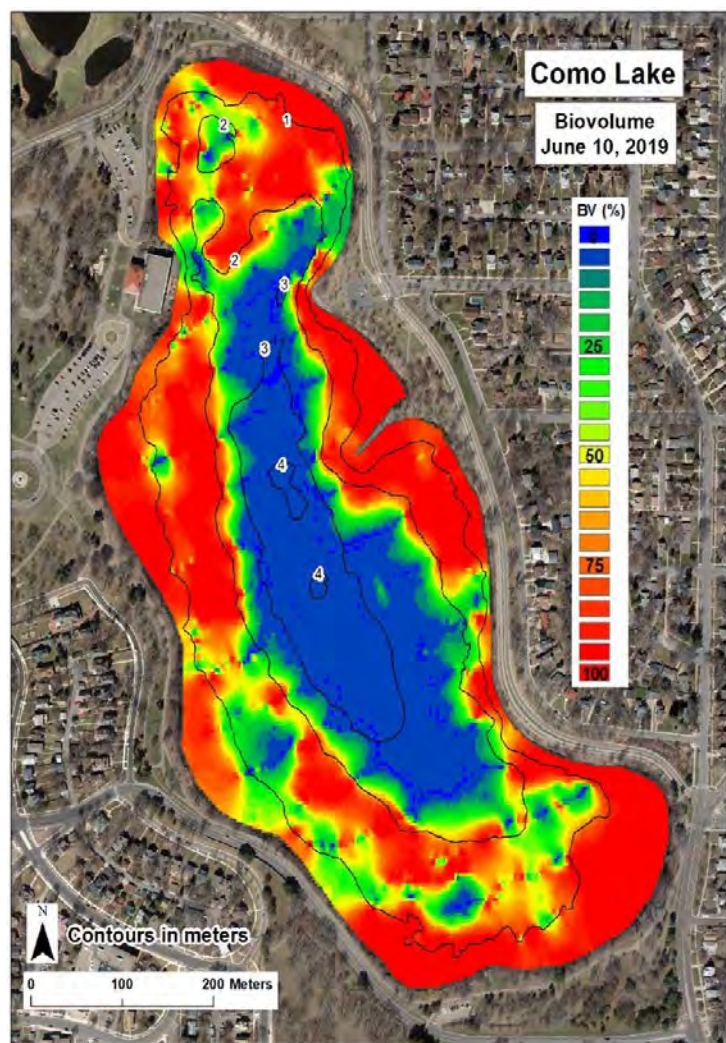


Figure A-20 Como Lake Aquatic Plant Biovolume (% occurrence)

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## Como Lake Fisheries

The MDNR has periodically performed fish surveys in Como Lake since 1976. The District has also sponsored supplemental surveys in recent years and. Frequent winter fish kills prompted the installation of an aeration device in October 1985. Following aerator installation, the MDNR implemented a biomanipulation strategy to improve water quality by shifting the rough fish population towards bluegill, walleye, and largemouth bass (Noonan 1998). Rough fish (e.g. goldfish, black bullhead, common carp) can negatively impact water quality by disturbing sediment and releasing dissolved phosphorus through feeding behavior. Biomanipulation initially resulted in improved water clarity, but the improvement was not sustained (Noonan, 1998).

Currently, Como Lake is stocked by the MDNR through their Fishing in the Neighborhood (FIN) Program (MDNR, 2019), which aims to increase angling opportunities in urban lakes. The species stocked historically by the MDNR include bluegill, channel catfish, largemouth bass, walleye, and yellow perch. In 2018, the MDNR stocked Como Lake with walleye in an effort to increase the population of top predators. Prior to recent walleye stocking, the fish community had been dominated by black crappie followed by black bullheads or bluegill sunfish since 2006.

The fish community in Como Lake has few top predators (e.g. walleye, northern pike), and is dominated by planktivorous forage fish (e.g. sunfish, black crappie) due to a combination of low predation pressure, historical stocking practices, and likely recreational fishing pressure (LimnoTech 2017). These fish preferentially consume large-bodied zooplankton like *Daphnia*, which graze on algae. Predation of *Daphnia* limits the ability of the zooplankton community in Como Lake to reduce algae growth levels, contributing to water quality issues. In addition, black bullheads have been prolific in Como Lake (black bullheads comprised more than 37 percent of the catch in 2015). This species will be tracked in future survey efforts as they can contribute to turbidity, nutrient and water clarity issues in lakes.

### A.9.2.2 Lake McCarrons

Lake McCarrons is a small urban lake located in the southeast corner of Roseville. The Lake McCarrons subwatershed is approximately 1,080 acres (see Figure A-16) and consists primarily of residential land use. Lake McCarrons drains to the Mississippi River via the TBI stormsewer system. A Ramsey County park is located along the southeast shore of the lake and includes a boat launch, beach, and fishing pier. Lake McCarrons is a popular recreational feature within the District.

Lake McCarrons has a surface area of approximately 75 acres and a maximum depth of 54 feet. The average lake depth is 25 feet. The MPCA classifies Lake McCarrons as a deep lake for water quality purposes. The lake typically has a distinct thermocline at 14 to 16 feet, which separates an upper, warmer, mixed layer of water from a lower, colder, stagnant layer during the summer months. The lake is so strongly stratified that that it does not always turn over in the fall.

The District completed an updated Lake McCarrons Management Plan in 2020 (McCarrons LMP). The McCarrons LMP includes a detailed assessment of lake conditions, establishes water quality targets, and identifies management activities. Relevant management activities are included in this Plan's implementation plan (Section 3.0).



## Lake McCarrons Water Quality

Like many other urban lakes, Lake McCarrons has previously experienced significant water quality problems, as documented in the 2003 Lake McCarrons Management Plan (The Osgood Group and Barr Engineering Co., 2003). The Villa Park Ponds and Wetland System were constructed in the mid-1980s to reduce watershed pollutant loading to the lake. Since then, several BMPs have been implemented within the watershed to improve lake water quality (see the 2020 Lake McCarrons Management Plan).

The District performed an alum treatment in Lake McCarrons in 2004 to reduce internal phosphorus loading from lake sediment. Since the alum treatment, water quality has improved significantly (CRWD, 2020). Recent water quality data indicate that Lake McCarrons is stable and is meeting applicable state eutrophication water quality standards (see Table A-9 and Figure A-21). The 2020 Lake McCarrons Management Plan includes targets for external (i.e., watershed) and internal phosphorus loading to maintain the lake's water quality in terms of TP and chlorophyll a concentrations and Secchi disk transparency.

Despite meeting eutrophication water quality goals, chloride concentrations observed in Lake McCarrons have increased from 1988-2018. If the current trend continues, it is likely that Lake McCarrons will be listed as impaired for chloride within the next 10 years (CRWD, 2020). The 2020 Lake McCarrons Management Plan includes activities to limit chloride loading from the watershed.

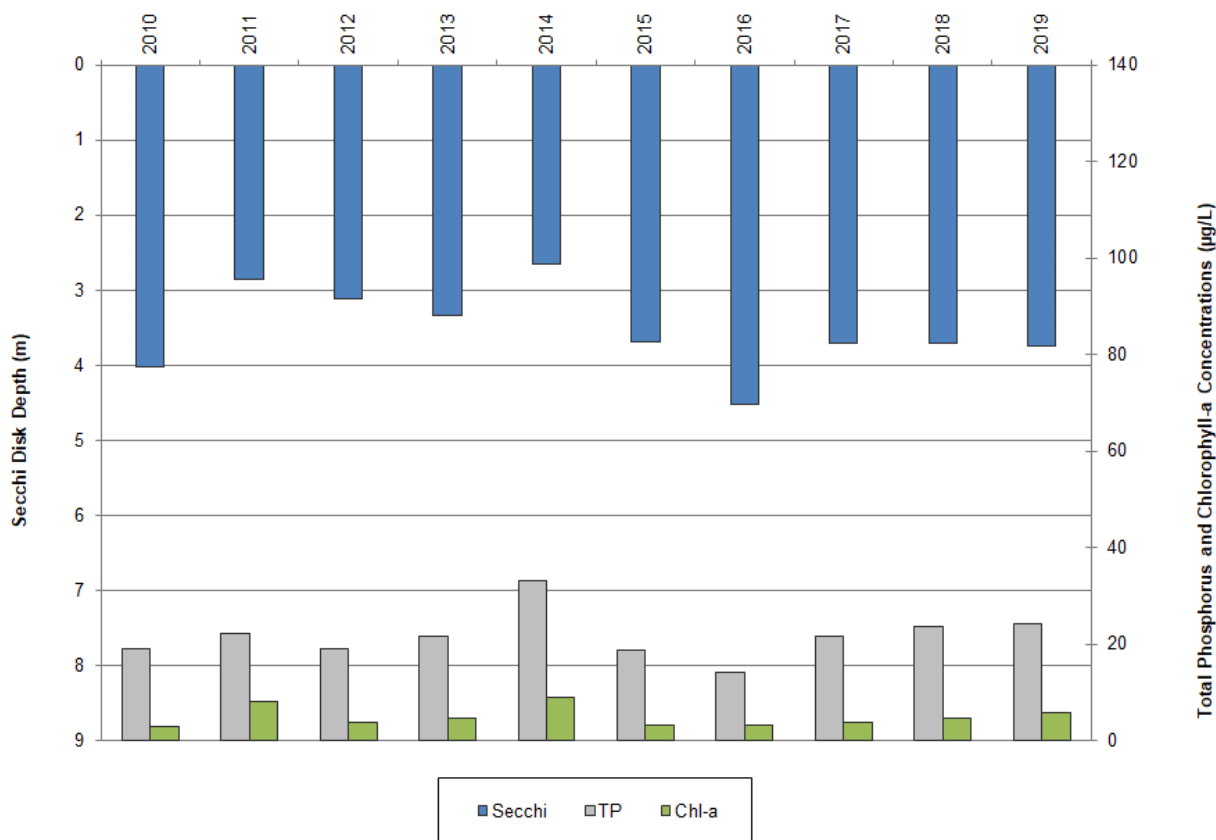


Figure A-21 Lake McCarrons Summer Average Water Quality (2010-2019)

Table A-9 Lake McCarrons Water Quality Data (2010-2019)

Period	Total Phosphorus (µg/L)	Chlorophyll <i>a</i> (µg/L)	Secchi Depth (m)
10 year (2010-2019) (May-Sept)	22	4.9	3.5
MPCA Deep Lake Standard	≤40	≤12	≥1.4

### *Lake McCarrons Macrophytes and Invasive Species*

The 2003 Lake McCarrons Management Plan noted that Eurasian watermilfoil (EWM) had recently become established in the lake. Since then, this macrophyte species has been present to varying degrees year to year. Curly-leaf pondweed (CLP) has also been present in Lake McCarrons since 1996. CLP is of concern because its mid-summer dieback releases phosphorus into the water column at a time when algae are able to take it up.

The District has performed point intercept aquatic vegetation surveys during the ice-off period from 2014-2019. During each year, between 11-14 species of submerged and floating leaf species were observed within Lake McCarrons. The majority of the vegetation growth has been observed within the western littoral area of the lake (Figure A-22) and this area has high occurrences of coontail and EWM. Based on this data, the vegetation community did not meet the MDNR's Floristic Quality Index (FQI) thresholds, suggesting impairment in aquatic life for vegetation within the lake (CRWD, 2018).

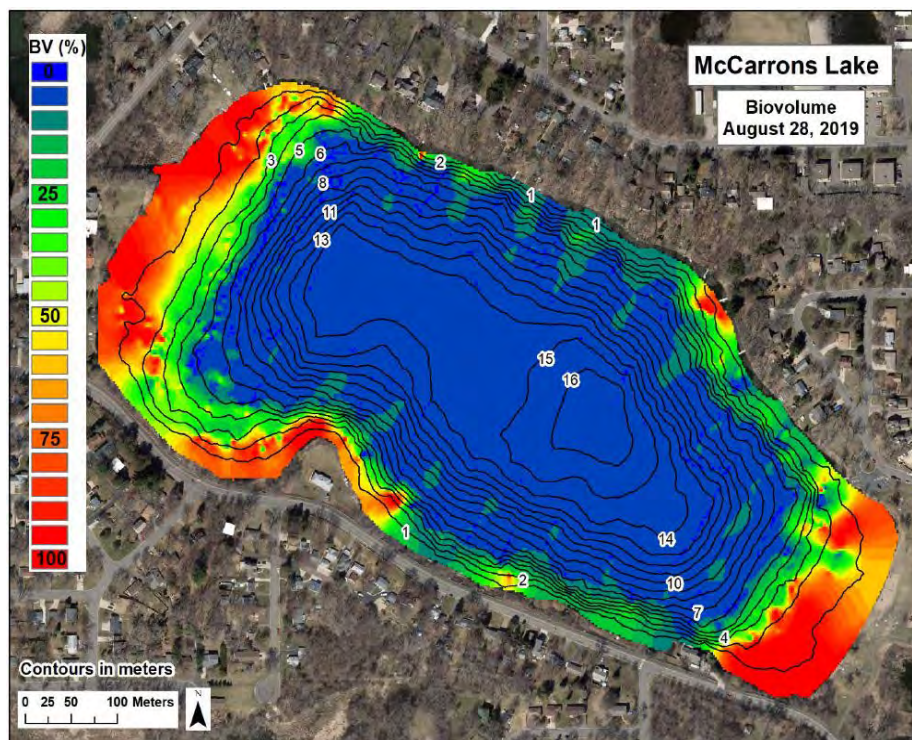
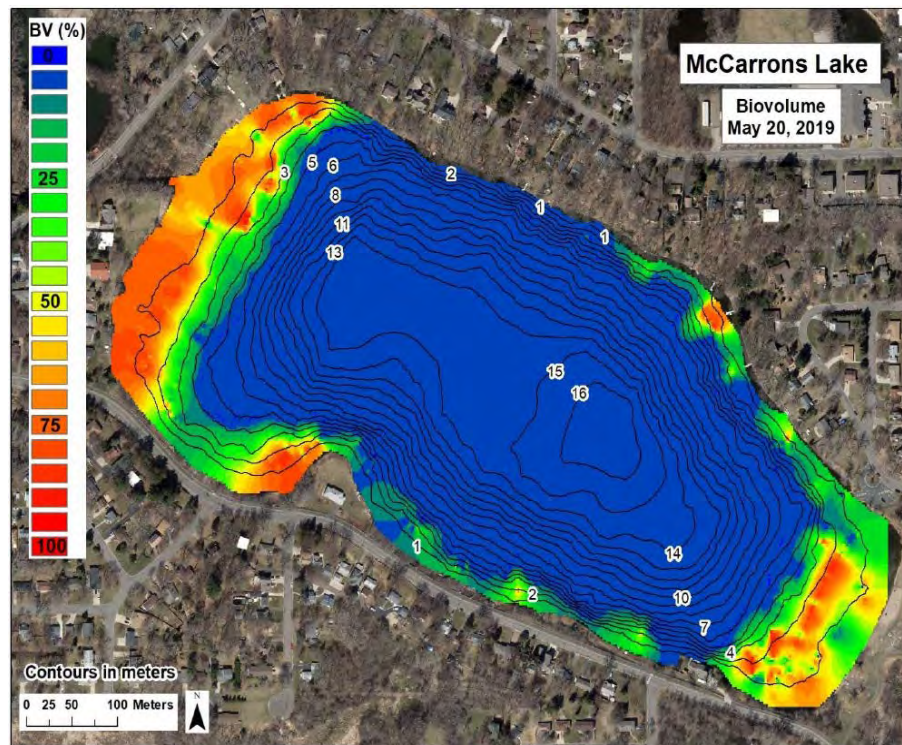


Figure A-22 Lake McCarrons Aquatic Plant Biovolume (% occurrence)



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The 2020 McCarrons Lake Management Plan includes goals to increase the abundance and distribution of native submersed aquatic vegetation through the development and implementation of a lake vegetation management plan (LVMP). An LVMP is a document the MDNR develops with public input to address aquatic plant issues on a lake. The LVMP is intended to balance riparian property owners' interest in the use of shoreland and access to the lake with preservation of aquatic plants, which is important to the lake's ecological health. MDNR (2012) previously developed a LVMP for Lake McCarrons to prescribe the permitted aquatic plant management actions (mechanical and/or herbicides) for a five-year period, including controls for invasive plants and restoration of lake shore habitat.

In August 2019 the MDNR confirmed the presence of zebra mussels in Lake McCarrons. Ramsey County staff conducted a targeted search and confirmed a lakewide zebra mussel presence. The Lake McCarrons Aquatic Invasive Species (AIS) Plan (CRWD, 2018) defines the process and criteria by which AIS will be managed on Lake McCarrons. The LVMP will consider AIS threshold criteria for both legacy and newly discovered invasive species in the lake.

### ***Lake McCarrons Fisheries***

The MDNR has periodically performed fish surveys in Lake McCarrons dating back to 1958. With the maximum depth over 50 feet and a high abundance of aquatic vegetation, Lake McCarrons has a variety of habitat for various species of fish.

A 1958 survey identified a healthy panfish population consisting mostly of bluegills, with 30 percent measuring over 7 inches. Smallmouth bass were found to be present. Northern pike and black crappies were found to be low in numbers, while yellow perch were observed in high abundance. The lack of young northern pike and the few adults present substantiate a lack of natural spawning facilities for this fish. Fish surveys between 1958 and 2014 found generally similar results. The 2014 survey again identified northern pike as the primary management species in the lake. Northern pike captured averaged 24.8 inches in length and 3.1 pounds. Bluegills ranged from 3.4 to 8.4 inches in length and 17 percent of bluegills captured were 7 inches in length or larger.

Periodic partial winterkills tend to reduce the number of small bluegills back to levels of abundance that the lake can support. Although limited winter lake water quality monitoring data is available for Lake McCarrons, five years of data between 2005 and 2018 indicate that dissolved oxygen (DO) concentrations in the top 4 feet of Lake McCarrons were at least 8.8 mg/L. The recent data suggests that winterkill is not a serious concern for the lake presently.

### **A.9.2.3 Crosby Lake**

Crosby Lake is located in the City of Saint Paul just north of the Mississippi River and collectively refers to two individual basins separated by a bog: Crosby Lake and Little Crosby Lake. Crosby Lake and Little Crosby Lake have surface areas of approximately 45 acres and 7 acres, respectively. Both lakes are classified as shallow lakes by the MPCA, with average depths of 3 feet and 7 feet, respectively. Crosby Lake is located within the Mississippi River floodplain. Mississippi River waters exchange with Crosby Lake at an estimated elevation of 697 feet. This flood elevation corresponds to a flow of 49,000 cubic feet per second in the Mississippi River and has a 33 percent chance of occurring annually (CRWD, 2010).

Although located in the District's Crosby Lake planning area (see Figure A-16), the drainage area to Crosby Lake is only 234 acres. Drainage from most of the planning area bypasses Crosby Lake before discharging to the Mississippi River. The area tributary to Crosby Lake includes industrial land, park space, and natural area. Crosby Lake is located within Crosby Farm Regional Park. Crosby Farm Park is a City of Saint Paul park and a part of the National Park Service's Mississippi National River and Recreation Area (Mississippi NRR). The Park provides opportunities for fishing, canoeing, walking, hiking, and cross country skiing.

The watershed around Crosby Lake is one of a few extensive areas of continuous vegetation remaining in the District (see Figure A-33) and is classified by the MDNR as an area of biological significance. The watershed includes diverse wetland and forest habitats that support many native wildlife species. Vegetation includes areas of intact sedge meadow, black ash seepage swamps, Kentucky coffee trees, and large tracts of intact floodplain forest.

The District developed a Crosby Lake Management Plan in 2010 (CRWD, 2010). Relevant management activities from the Crosby Lake Management Plan have been included in the implementation activities of this Plan (see Section 3.0).

### *Crosby Lake Water Quality*

Water quality data for Crosby Lake and Little Crosby Lake have been collected since 1999 and 2011, respectively. Water quality data for the most recent 10-year period (2009-2018) are presented in Figure A-23, Figure A-24, and Table A-10 and demonstrate stable water quality trends. Summer average total phosphorus concentrations in both Crosby Lake and Little Crosby Lake exceed the 60 µg/L state water quality standard. Despite high total phosphorus concentrations, Crosby Lake is not included on the MPCA's 303(d) impaired waters list (see Section A.9.6) in part due to the influence of the Mississippi River. Although not yet listed as impaired, the MPCA identifies Crosby Lake as a waterbody that is at "high risk" for future chloride impairment.

Water samples collected near the lake bottom demonstrate very high concentrations of total phosphorus, suggesting that release from lake sediments may be a significance source of phosphorus (CRWD, 2010). Periodic flooding from the Mississippi River is also a source of phosphorus loading. For example, the lake was inundated by the river for 103 days in 2011, and for 50 days in 2014 (CRWD, 2017). Water quality data observed in the years following these inundation periods showed average TP concentrations above the normal historical values. In 2015, however, there were no documented days of river flooding, followed by only a single day of inundation in 2016. Water quality showed drastic improvements in TP and Chl-*a* during these years (see Figure A-23). The source of these high nutrient concentrations could be from high flow periods of the Mississippi River where large sediment loads enter the lake. Management efforts need to take into account the dynamic relationship between the lake and the river.

Despite periodic high TP concentrations, observed Chl-*a* concentrations and Secchi depth transparencies meet standards in both basins, suggesting the presence of feedback mechanisms that offset the lake's response to excess nutrients. These mechanisms include zooplankton grazing and a robust submerged aquatic vegetation community that stabilizes the sediments and prevents wind resuspension (CRWD,

2010). Consequently, Crosby Lake's water is relatively clear despite some signs of eutrophication (see Figure A-23, Figure A-24, and Table A-10).

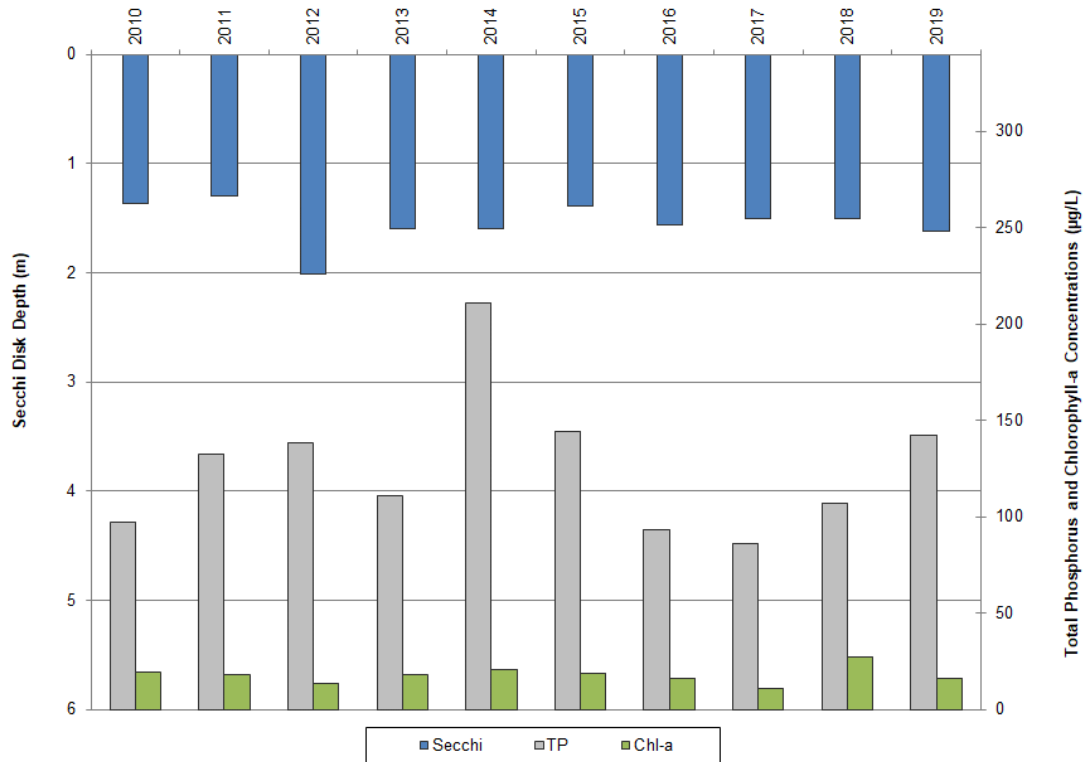


Figure A-23 Crosby Lake Summer Average Water Quality (2010-2019)



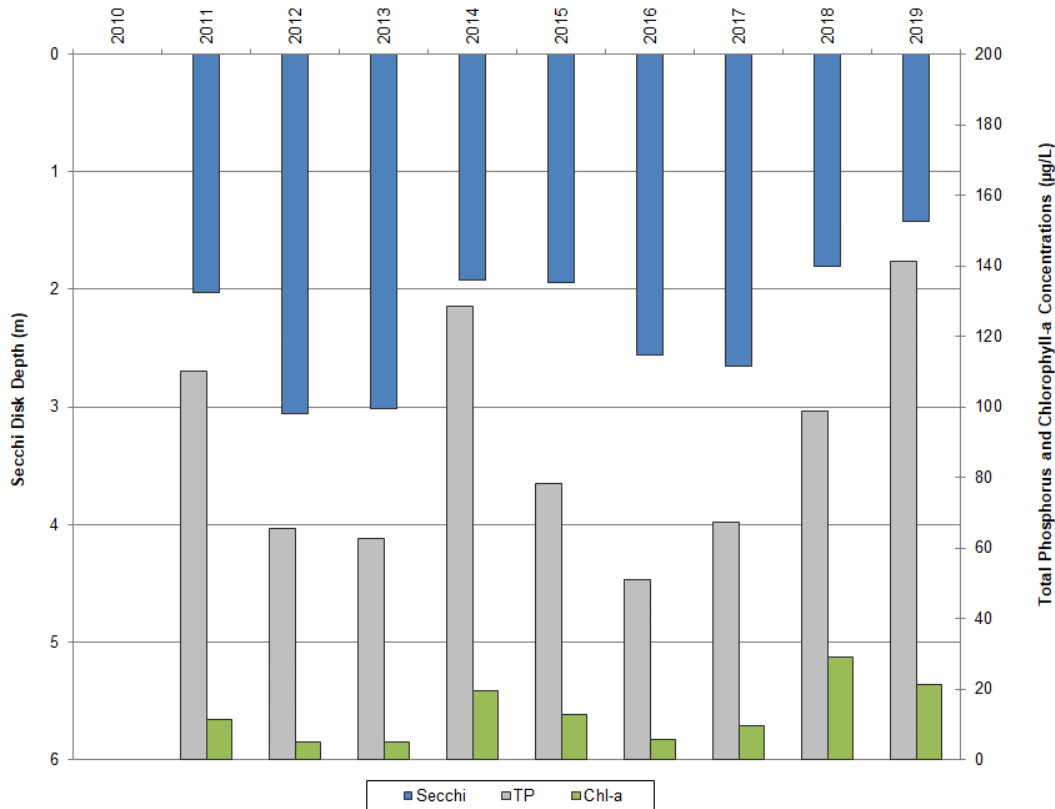


Figure A-24 Little Crosby Lake Summer Average Water Quality (2011-2019)

Table A-10 Crosby Lake and Little Crosby Lake Water Quality Data (2010-2019)

Period	Total Phosphorus (µg/L)	Chlorophyll a (µg/L)	Secchi Depth (m)
Crosby Lake (2010-2019) (May-Sept)	126	17.9	1.5
Little Crosby Lake (2011-2019) (May-Sept)	89	13.3	2.3
MPCA Shallow Lake Standard	≤60	≤20	≥1.0

### Crosby Lake Macrophytes

The District has performed point intercept aquatic vegetation surveys in Crosby Lake during the ice-off period from 2014-2019. In 2018, 16 species of submerged and floating leaf species were observed within Crosby Lake. Aquatic plant density in Crosby Lake is high (Figure A-25). In general, in 2018, submerged aquatic vegetation has been dominated by white water lily, star duckweed, coontail and greater and lesser duckweed. Curly-leaf pondweed (CLP) has also been present in Crosby Lake. CLP is of concern because its

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mid-summer dieback releases phosphorus into the water column at a time when algae are able to take it up.

Prior to 2014, submerged aquatic vegetation data was compiled from MDNR fish surveys and Ramsey County monitoring data to develop a general history of vegetative conditions in Crosby Lake. MDNR surveys were conducted as far back as 1968 and then in 1978, 1988, and 1999. Two plant surveys of Little Crosby Lake was performed in 2009. Plant indices of biological integrity of 16 and 20 were calculated from the 2009 surveys and fall into the "poor" category ( $<23$ ). The poor plant IBI scores are due to a limited number of species presence and the relative dominance of a single species (coontail) (CRWD, 2016).

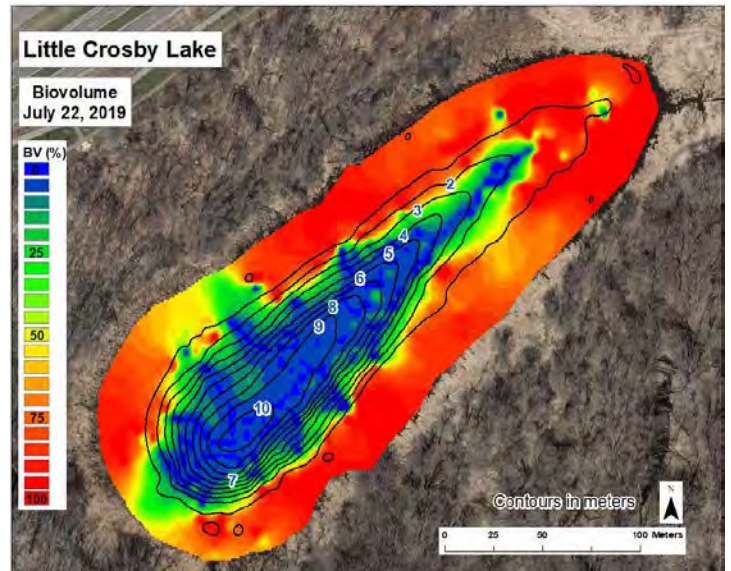
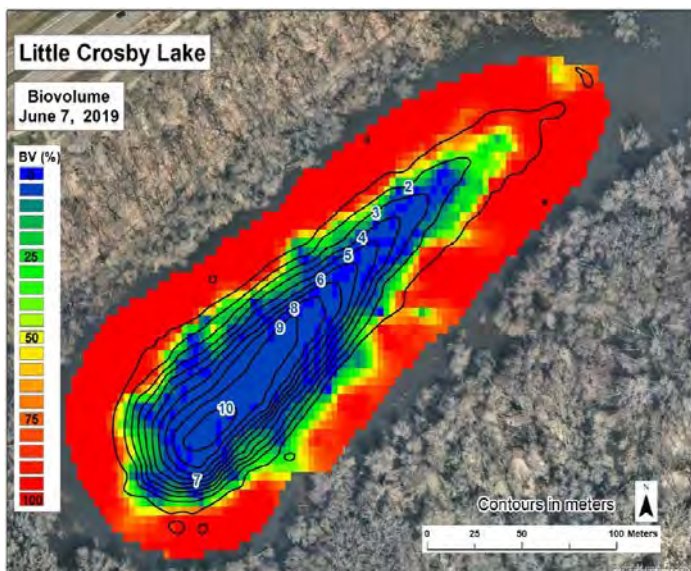
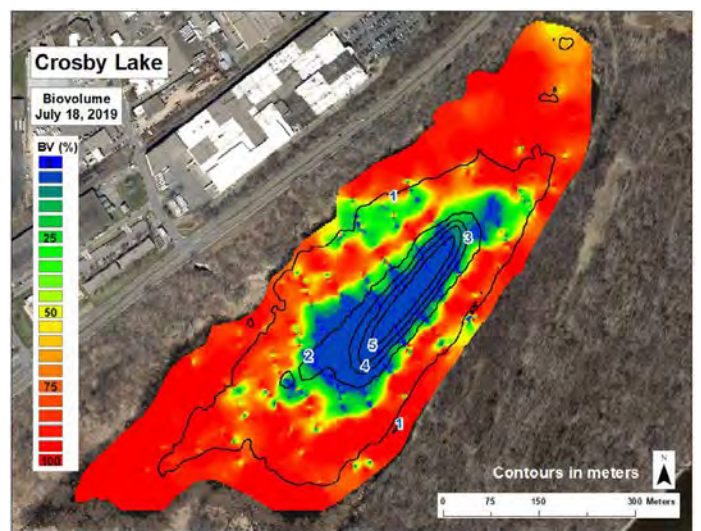
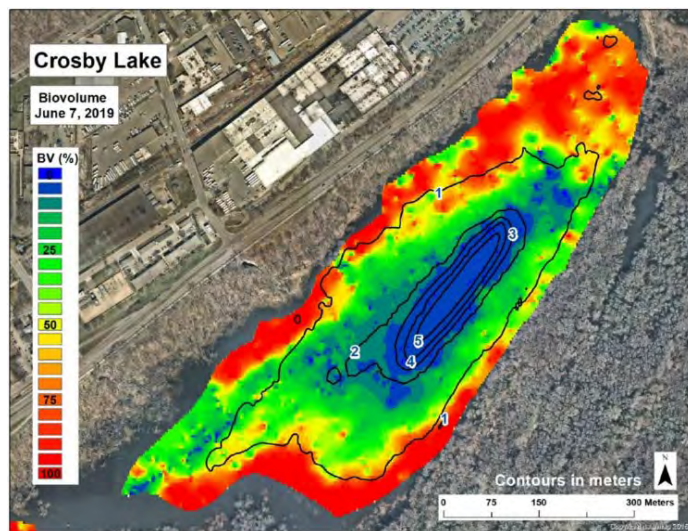


Figure A-25 Crosby Lake Aquatic Plant Biovolume (% occurrence)



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### **Crosby Lake Fisheries**

Fisheries surveys have been periodically conducted in Crosby Lake by the MDNR since 1968 and last performed by CRWD and Wenck in 2015. Prior to 1983, the Crosby Lake fish community was dominated by rough fish – bottom foragers such as common carp, yellow and black bullhead, and buffalo. Rough fish tend to have a destructive feeding pattern, rooting through sediment and submerged vegetation to find food. Top predators included northern pike of substantial size and numbers.

Since the 1983 survey, the rough fish community has diminished in size and abundance. Crosby Lake now demonstrates a much more balanced fishery with a healthy panfish population including bluegills, pumpkinseed sunfish. Panfish tend to eat zooplankton early in their life cycle and then macroinvertebrates later in their life cycle. Small numbers of rough fish remain present. Northern pike and bowfin remain the top predator species, although their abundance and size during the 2014 survey was lower than average for lakes similar to Crosby Lake. The bullhead population in Crosby Lake changes from year to year (as seen in differences between the 2014 and 2015 surveys) and may be a function of seasonal flooding.

#### **A.9.2.4 Loeb Lake**

Loeb Lake is a small, land-locked lake located in the north-central portion of Saint Paul, within the Trout Brook watershed (Figure A-16). The lake is located within Marydale Park, which includes a walking path around the lake. Loeb Lake has a surface area of 9.7 acres, an average depth of 9 feet, and a maximum depth of 28 feet. The MPCA classifies Loeb Lake as a shallow lake for water quality purposes because the lake's littoral area (the area less than 15 feet deep) of 81 percent exceeds the MPCA's criterion of 80 percent.

The watershed tributary to Loeb Lake is approximately 44 acres and is fully developed. Marydale Park occupies a significant portion (16 acres) of the watershed. Other land uses primarily include residential and industrial land uses, with a small amount of commercial land use. Although located in the Trout Brook watershed, Loeb Lake is landlocked and does not have a surface outlet. Water loss from the lake occurs via evaporation and groundwater outflow.

The District completed a Loeb Lake and Willow Reserve Management Plan in February 2009 (CRWD, 2009). The management plan includes more detailed information about the Loeb Lake watershed and water budget. Relevant management activities from that plan, as updated, have been included in the implementation activities of this Plan (see Section 3.0).

#### **Loeb Lake Water Quality**

Regular water quality monitoring data has been collected from Loeb Lake since 2004 (CRWD, 2009). Dissolved oxygen (DO) and temperature profiles suggest the lake becomes stratified during the summer with anoxic conditions (DO <2 mg/L) below a depth of approximately 4 meters. Although anoxic conditions can accelerate phosphorus release from lake sediment, water quality modeling of Loeb Lake suggests that internal loading of phosphorus from lake sediment is a small contributor of phosphorus relative to runoff from the watershed, which is also minimal (CRWD, 2009).

Water quality in Loeb Lake is good. Summer average total phosphorus concentrations in Loeb Lake are stable and remain well below the 60 µg/L MPCA water quality standard (Table A-11 and Figure A-26). Similarly, summer average Secchi Depth and chlorophyll-*a* data demonstrate good water quality and are well within applicable state standards (Table A-11 and Figure A-26). The high ratio of lake area to watershed area and percentage of the watershed occupied by park and natural area (approximately 40 percent) contribute to the good observed water quality in Loeb Lake.

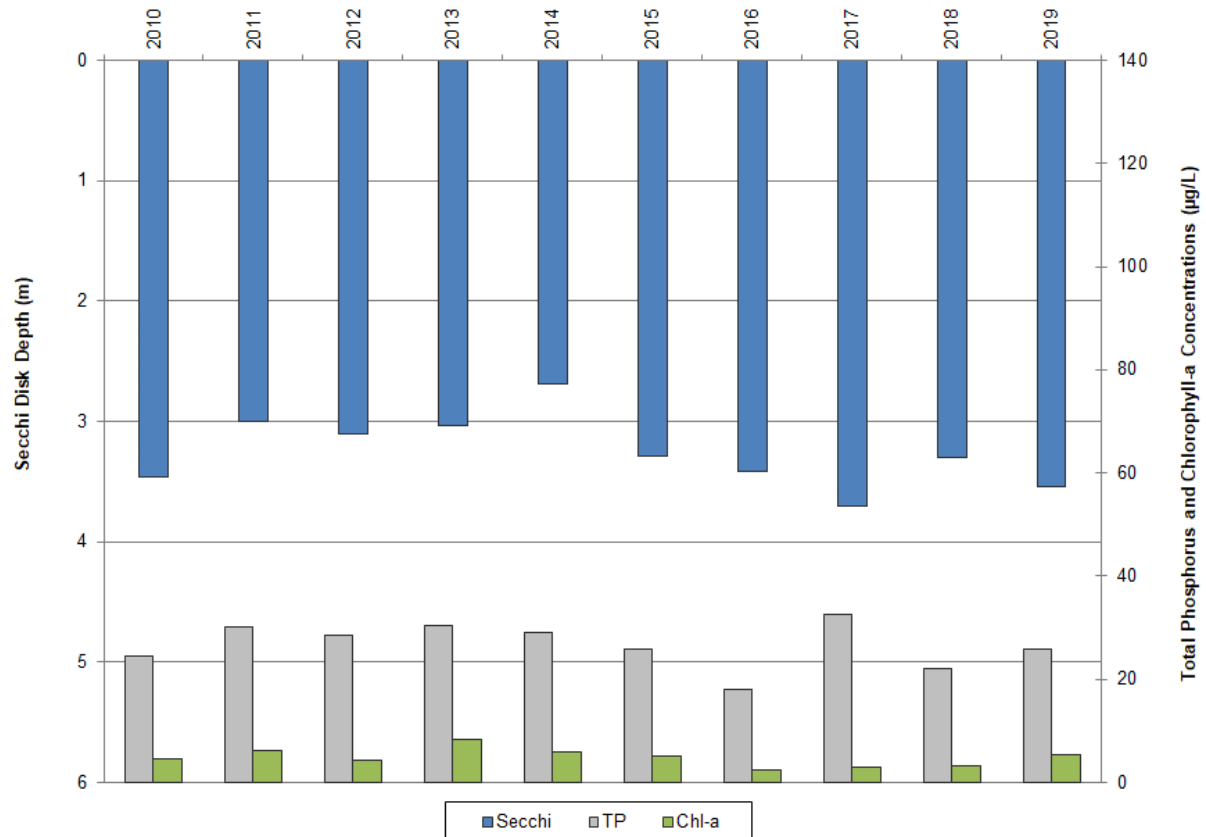


Figure A-26 Loeb Lake Summer Average Water Quality (2010-2019)

Table A-11 Loeb Lake Water Quality Data (2010-2019)

Period	Total Phosphorus (µg/L)	Chlorophyll a (µg/L)	Secchi Depth (m)
Loeb Lake (2010-2019) (May-Sept)	27	4.8	3.3
MPCA Shallow Lake Standard	≤60	≤20	≥1.0

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### *Loeb Lake Macrophytes*

The District has performed point intercept aquatic vegetation surveys in Loeb Lake during the ice-off period from 2014-2019. In 2019, 13 species of submerged and floating leaf species were observed within Loeb Lake. Aquatic plant density in Loeb Lake is high (see Figure A-27). In general, in 2019, submerged aquatic vegetation was dominated by coontail, slender leaf naiad, filamentous green algae, star duckweed, flatstem pondweed and greater duckweed.

Curly-leaf pondweed (CLP) is also present in Loeb Lake. CLP is of concern because its mid-summer dieback releases phosphorus into the water column at a time when algae are able to take it up. Eurasian watermilfoil, another invasive species, was identified by the MDNR in 2003 and 2005, as well as by CRWD and Ramsey Conservation District in the 2019 survey.

Prior to 2014, submerged aquatic vegetation data was compiled from MDNR fish surveys (1981 and 2000) and Ramsey County (2005) monitoring data to develop a general history of vegetative conditions in Loeb Lake.

The following trends- were observed between 1981 and 2005:

- Between 1981 and 2000, there was a decline in the number of desirable native submerged species (sago pondweed, narrowleaf pondweed, and flatstem pondweed). Species such as sago pondweed are known to be important components of fish and waterfowl habitats.
- The abundance of narrowleaf pondweed declined significantly between 1981 and 2000, and was observed with a less than 5 percent relative abundance rating in 2005.
- Coontail was present in 1981, 2000, and 2005 in declining abundance. This species is known to be the last native to survive in vulnerable ecosystems.



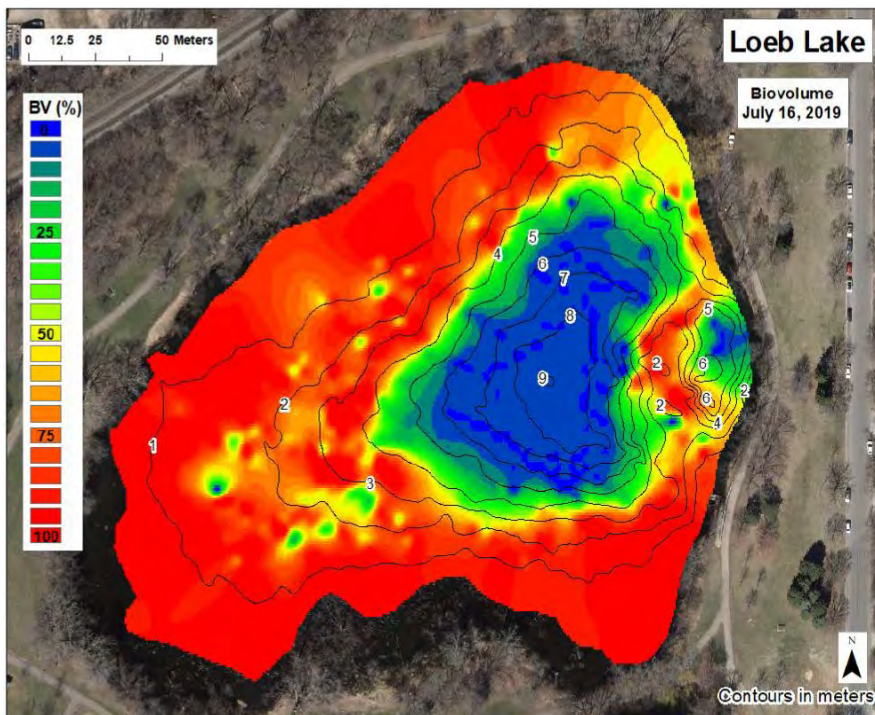
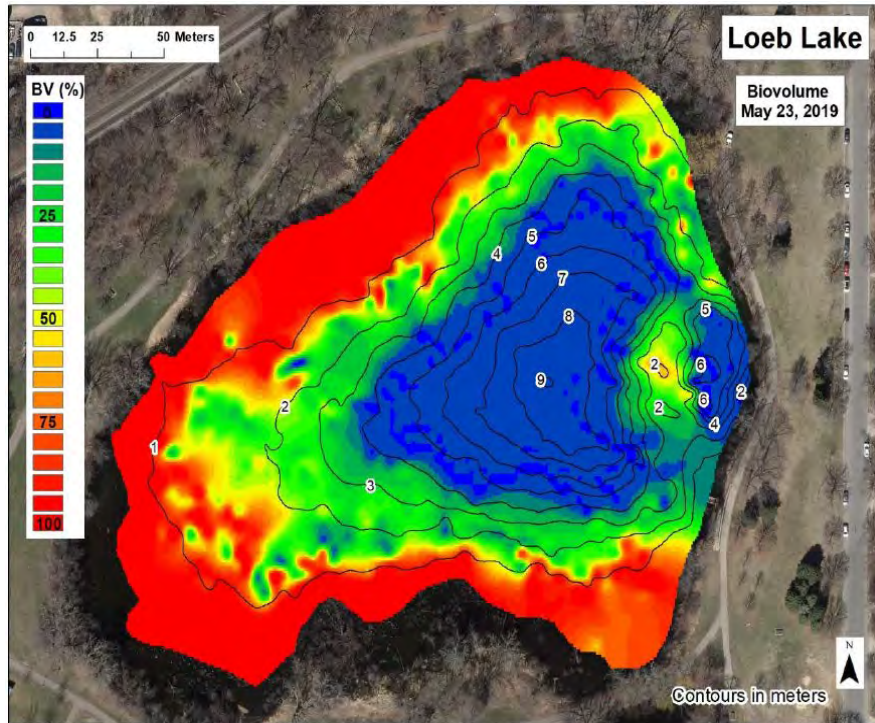


Figure A-27 Loeb Lake Aquatic Plant Biovolume (% occurrence)

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### *Loeb Lake Fisheries*

Fisheries surveys have been periodically conducted in Loeb Lake by the MDNR since 1974 and last performed in 2014. Panfish and rough fish groups comprise the majority of the catch during most surveys; black bullhead and bluegill have been the most numerous species collected. Predator species in Loeb Lake observed in 2014 include walleye and largemouth bass.

MDNR records indicate that Loeb Lake has periodically experienced winter kills due to low oxygen levels in the lake (as recently as the winter of 2006/2007). An aeration system installed in 2000 operates after ice formation to minimize winter kill of fish. Dissolved oxygen concentrations are also a concern in the summer. Dissolved oxygen profiles indicate that may limit fish to areas of the lake that are 7 feet deep and less due to lake stratification and anoxia below the thermocline.

Loeb Lake is part of the MDNR's Fishing in the Neighborhood (FiN) program. The MDNR has stocked Loeb Lake at various times since 1974 with adult bluegill, walleye, channel catfish, black crappie, northern pike, and largemouth bass. Until 2016, Loeb Lake was stocked annually, usually with bluegill and walleye. Shore-fishing access is good along the east shore where there is a fishing pier and a quick drop-off. The rest of the lake is difficult for angling due to shoreline vegetation and shallow water near shore.

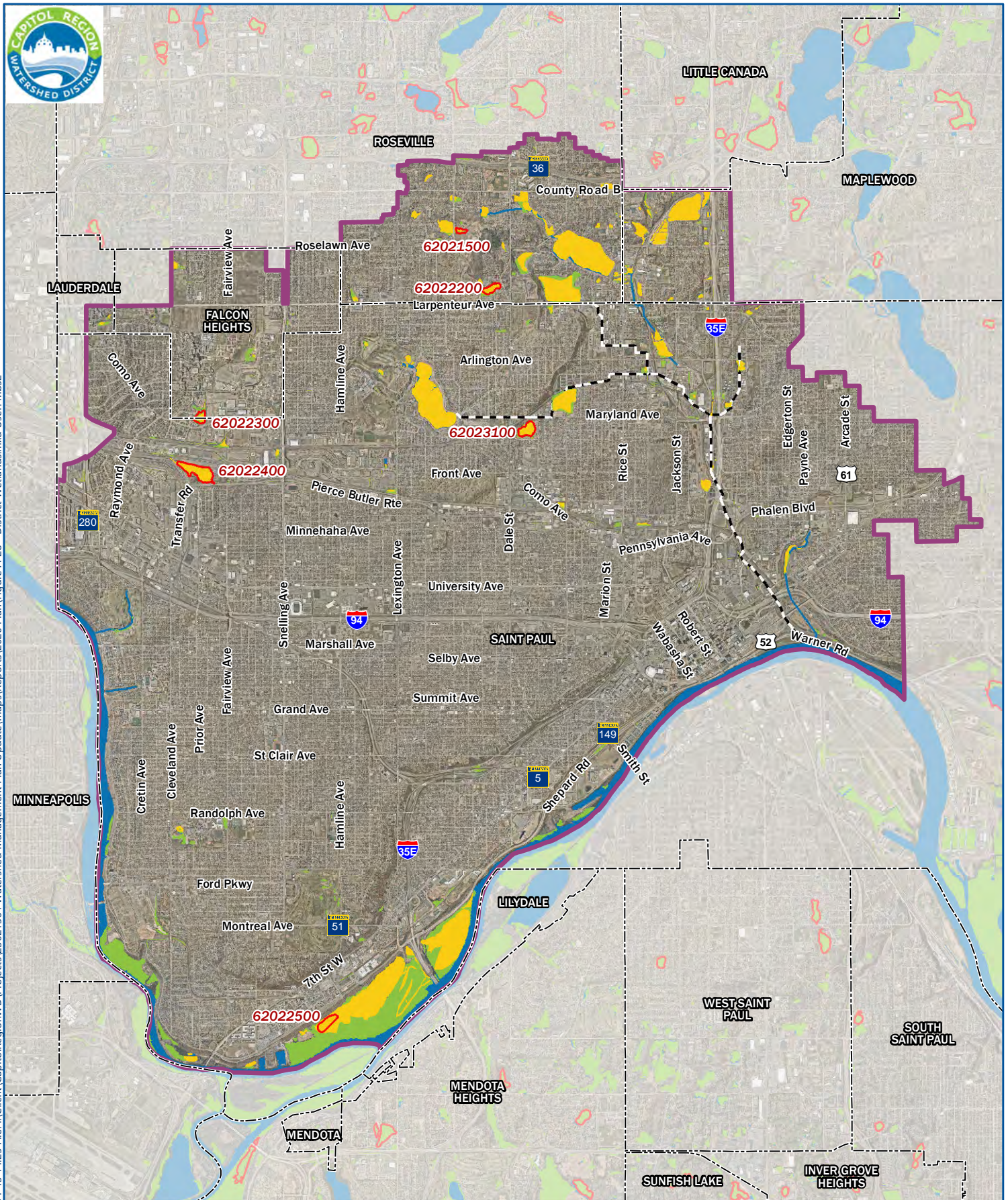
### **A.9.3 Wetlands**

Wetland areas are important community and ecological assets. Wetlands provide significant wildlife habitat and refuge, while also supplying aesthetic, recreational, and water quality treatment benefits. Many of the historical wetland areas within the District (see Section A.9.1.2 and Figure A-17) were drained or filled for development prior to the establishment of wetland regulations. The largest remaining wetland tracts include: Woodview Marsh located near Larpenteur Avenue in Roseville, the Villa Park wetland located northwest of Lake McCarrons in Roseville, and Willow Reserve located near Maryland Avenue in Saint Paul.

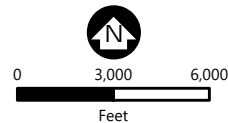
To protect these valuable resources, the District continues to manage wetlands to achieve no net loss of acreage, functions, and value. The District serves as the Local Government Unit (LGU) responsible for administration of the Wetland Conservation Act (WCA) for projects within the District's boundaries in the Cities of Lauderdale, Falcon Heights, Maplewood, and Roseville (except for on Minnesota Department of Transportation projects).

The District seeks opportunities to restore and enhance existing and historic wetland resources (see Section 2.5 of the Plan). Potential wetland restoration opportunities are documented in the District's Wetland Management Strategy (see Appendix F), as amended. The District also implements a wetland monitoring program described in Section A.10.2.





- Municipal Boundary
- Watershed Boundary
- Streams
- Trout Brook Interceptor
- Capital Region WD Wetland Boundary
- Public Water Inventory Wetland
- National Wetland Inventory
- Lakes and Rivers



Data Sources: CRWD, MN DNR, MnDOT, USGS

**DISTRICT WETLANDS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-28**



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#### **A.9.3.1 Wetland Conservation Act (WCA)**

The purpose of the WCA (Minnesota Rules 8420) is to maintain and protect Minnesota's wetlands and the benefits they provide. To retain the benefits of wetlands and reach the legislation's goal of no-net-loss of wetlands, WCA requires anyone proposing to drain, fill, or excavate a wetland to first try to avoid disturbing the wetland; second, to try to minimize any impact on the wetland; and, finally, to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation.

The WCA rules require that drained and filled wetlands be replaced at replacement ratios of between 1:1 and 2.5:1 (depending upon the location of impact, location of replacement, and timing of replacement). LGUs (i.e., the District in all Cities except Saint Paul) may have more restrictive wetland regulations. The Minnesota Legislature has amended the WCA several times since its inception. More information about WCA guidance is provided at the BWSR website: <https://bwsr.state.mn.us/wetlands-regulation-minnesota>

As part of administering the WCA rules, the District is responsible for making determinations on the accuracy of wetland delineations, wetland functions and values assessments, and wetland replacement plans, often with review and input by a Technical Evaluation Panel (TEP). For all projects proposing to impact more than 10,000 square feet of wetland, the District must send a copy of the application to the TEP, MDNR, and any persons who have requested notification. The parties notified are invited to submit comments during a review period that must be at least 15 days long (per Minnesota Statute 103G).

#### **A.9.3.2 Wetland Inventory and Assessment**

It is important to understand the extent, function, and value of existing wetlands to provide a basis for wetland protection, management, and restoration efforts. Nationally, the U.S. Fish and Wildlife Service (USFWS) is responsible for mapping wetlands across the country, including those in Minnesota. Using the National Aerial Photography Program (NAPP) in conjunction with limited field verification, the USFWS identifies and delineates wetlands, produces detailed maps on the characteristics and extent of wetlands, and maintains a national wetlands database as part of the National Wetland Inventory (NWI). The NWI is periodically updated based on available imagery.

Locally, the District has inventoried wetlands within its jurisdiction and continues to implement a wetland monitoring program (see Section A.10.2). In general, baseline wetland index of biological integrity (IBI) data and water quality data showed that wetlands within the District are highly impacted with lower species diversity and robustness. These impacts are likely due to watershed stressors introduced by intense urbanization, including the effects of surrounding land uses, stormwater inputs, and the lack of habitat connectivity (CRWD, 2016). Wetlands located within the District are presented in Figure A-28.

Results from wetland monitoring performed from 2007-2014 generally indicate that the District contains wetlands of "poor" to "moderate" quality based on the biological health of the macroinvertebrate and plant communities (CRWD, 2016). None of the wetlands surveyed in the District scored in the excellent category for either IBI assessment. Arlington-Jackson wetland and Woodview Marsh were the only two wetlands that scored in the "moderate" condition category for both plant and macroinvertebrate IBIs for their historical average scores, thus exhibiting the most stable condition and highest quality of all monitored District wetlands (CRWD, 2016).

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### A.9.4 Stormwater System

The District is completely developed and highly urbanized (see Section A.4). Pre-settlement drainage patterns and historic water resources have been significantly altered as part of land development (see Section A.9.2). Over time, Cities and land developers have constructed an extensive network of stormwater management infrastructure to collect stormwater and convey it downstream. The stormwater system includes pipes, ponds, lakes, wetlands, ditches, streams, swales, and other drainageways. Ultimately, all stormwater in the District is routed to the Mississippi River through a total of 55 outlets (owned by the City of Saint Paul).

Various units of government and private entities have jurisdiction over different parts of the stormwater system within the District. The Minnesota Department of Transportation (MNDOT) is responsible for maintaining the stormwater systems within their rights-of-way, such as interstate highways (i.e., I--35E and I-94), U.S. highways (i.e., Highway 10, and Highway 61), and state highways (i.e., Highway 5, Highway 36, and Highway 120). Ramsey County is responsible for maintaining at least part of the stormwater systems within their rights-of-way, such as county roads and county state aid highways.

The cities within the District have jurisdiction and maintenance responsibility over their own stormwater management systems. These systems include lateral (also called primary) stormwater systems (i.e., street gutters, pipes, and ditches) and outflow (also called main, trunk, or secondary) conveyors, which collect flows from city lateral systems and move the water downstream. Cities generally design lateral stormwater systems with capacity to convey runoff from 5- or 10-year frequency storms without significant flooding and protecting public health and safety for storms up to the 100-year frequency interval (these design levels are sometimes referred to as "level of service" and "level of protection"). City stormwater management systems are described in greater detail in each City's local water management plan. Owners of private stormwater systems are responsible for maintaining their facilities.

The District operates and is responsible for maintaining the Trout Brook Interceptor (TBI). The TBI was constructed as a combined sanitary sewer and stormwater system from the late 1800's to early 1900's. The combined sewer system was separated in 1988. The system includes tunnels ranging in size from six to thirteen feet in diameter (or height). The tunnel sections typically consist of reinforced concrete but include portions of brick and limestone block. The TBI drains the Trout Brook watershed (see Figure A-16) and includes three primary branches:

- TBI Mainline (approximately 23,200 feet)
- West TBI Extension (approximately 5,100 feet)
- East TBI Extension (approximately 3,000 feet)

The TBI was owned by the Metropolitan Council until 2006 when ownership was transferred to the District. The District owns the majority of the TBI and is responsible for operation, inspection, maintenance, and repair of the TBI. The City of Saint Paul owns and operates the furthestmost downstream approximately one-half mile of the TBI.

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As the owner and operator of the TBI, the District is required to maintain a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permit. The District's MS4 permit includes specific requirements related to the maintenance of District-owned stormwater infrastructure.

The District monitors select stormwater infrastructure, including best management practices (BMPs) constructed by the District. Stormwater monitoring is described in in Section A.9.7.

### **A.9.5 Mississippi River**

Stormwater runoff within the District ultimately discharges to the Mississippi River. Approximately 13 miles of the Mississippi River form the west and south boundary of the District (see Figure A-18). The confluence of the Minnesota River and Mississippi River occurs near the far south end of the District. The drainage area tributary to the Mississippi River downtown of the confluence with the Minnesota River is approximately 37,000 square miles; the District makes up approximately one one-thousandth (0.1%) of the Mississippi River drainage area at this location.

The United States Geological Survey (USGS) collects continuous streamflow data on the Mississippi River in Saint Paul dating back to 1892. Average annual flow at this location is approximately 12,500 cubic feet per second (cfs). Peak flows often occur in late spring and early summer and can exceed 100,000 cfs and raise the river level by over 20 feet (most recently reaching 116,000 cfs and 20.1 feet gage height on April 1, 2019).

Gage data is available from the USGS at: [https://waterdata.usgs.gov/nwis/inventory/?site\\_no=05331000](https://waterdata.usgs.gov/nwis/inventory/?site_no=05331000)

The Mississippi River has been managed for navigation since 1930 and contains a series of locks and dams and an uninterrupted navigation channel. The Upper Mississippi River has a maintained navigation channel depth of at least 9 feet. The Saint Paul District of the United States Army Corps of Engineers (USACE) operates and maintains 12 locks and dams beginning at Lower St. Anthony Falls in downtown Minneapolis and ending at lock and dam 10 in Guttenberg, Iowa. Lock and dam 1, also known as the Ford Dam located adjacent to Ford Parkway, is the only lock and dam present within the District.

The Mississippi River corridor within the District is part of the Mississippi River Corridor Critical Area (MRCCA), a designation given under the Critical Areas Act of 1973 (Minnesota Statutes 116G). The designation was intended to allow management of the corridor as a multi-purpose resource while preserving and enhancing the area's natural, aesthetic, cultural, and historic value for public use, and protecting the corridor's environmentally sensitive areas. Land development within the MRCCA is subject to requirements of Minnesota Rules 6106, which are implemented through local plans and ordinances.

Additional information is available from the MDNR at:

[https://www.dnr.state.mn.us/waters/watermgmt\\_section/critical\\_area/faqs.html](https://www.dnr.state.mn.us/waters/watermgmt_section/critical_area/faqs.html)

### **A.9.6 Impaired Waters**

The federal Clean Water Act (CWA) requires states to adopt water quality standards to protect the nation's waters. Water quality standards designate beneficial uses for each waterbody and establish criteria that must be met to support its designated use(s). The criteria differ depending on the waterbody's classification as a wetland,



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shallow lake, or deep lake. Section 303(d) of the CWA requires each state to identify and establish priority rankings for impaired waters that do not meet the water quality standards. The list of impaired waters, sometimes called the 303(d) list, is maintained by the MPCA and updated every 2 years.

For impaired waterbodies, the CWA requires an assessment that addresses the causes and sources of the impairment. This process is known as a total maximum daily load (TMDL) analysis. A TMDL is a threshold calculation of the amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL establishes the pollutant loading capacity for a waterbody and develops an allocation scheme amongst the various contributors, which include point sources, nonpoint sources and natural background, as well as a margin of safety. As a part of the allocation scheme, a waste load allocation (WLA) is developed to determine allowable pollutant loadings from individual point sources (including loads from storm sewer networks in MS4 communities), and a load allocation (LA) establishes allowable pollutant loadings from nonpoint sources and natural background levels in a waterbody.

Within the District, Como Lake, Lake McCarrons, and the Mississippi River are listed on the 2018 MPCA impaired waters 303(d) list for a variety of impairments. Crosby Lake is also identified as high risk for chloride impairment. Table A-12 summarizes these impairments and the status of applicable TMDLs. Completed TMDLs and associated implementation plans may contain actionable steps for the District. The District and its partners have completed some actions recommended in the Como Lake TMDL (CRWD, 2010), while others are incorporated into the more recent Como Lake Management Plan (CRWD, 2019) and this Plan. The District will continue to review completed TMDLs and TMDL implementation plans and incorporate recommended actions into the District's implementation plan, where appropriate.

Current impaired waters listings are available from the MPCA website:

<https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list>

Applicable water quality standards for CRWD lakes are presented in Table A-13. Water quality standards vary according to lake depth and location (the District is located in the North Central Hardwood Forest, or NCHF, ecoregion).

**Table A-12      Impaired Waters within CRWD**

Waterbody	Impaired Use	Pollutant or Stressor	Year Listed	TMDL Study Target Completion	TMDL Study Approved
Como Lake	Aquatic Consumption	Mercury in fish tissue	2008	--	2008 <sup>1</sup>
	Aquatic Life	Chloride	2014	--	2016 <sup>2</sup>
	Aquatic Recreation	Nutrients/ Eutrophication	2002	--	2010 <sup>3</sup>
Lake McCarrons	Aquatic Life	Mercury in fish tissue	2006	--	2010 <sup>1</sup>
Mississippi River	Aquatic Consumption	Mercury in fish tissue	1998	--	2007 <sup>1</sup>
		Mercury in water	1998	--	2007 <sup>1</sup>
		PCB in fish tissue	1998	2020	--
		PFOS in fish tissue	2008	2025	--
		PFOS in water	2014	2025	--
	Aquatic Life	Total suspended solids	2014	--	2015 <sup>4</sup>
	Aquatic Life Aquatic Recreation	Nutrients/ Eutrophication	2016	2018	--
		Fecal coliform	1994	2022	2016 <sup>5</sup>

Source: 2020 (draft) MPCA Impaired Waters 303(d) List.

PFOS = Perfluorooctane Sulfonate; PCB = Polychlorinated Biphenyl

- (1) Addressed by the *Minnesota Statewide Mercury Total Maximum Daily Load* (MPCA, 2007, as revised)
- (2) Addressed by the *Twin Cities Metro Area Chloride Total Maximum Daily Load* (MPCA, 2016)
- (3) Addressed by the *Como Lake TMDL* (CRWD, 2010)
- (4) Addressed by the *South Metro Mississippi River Total Suspended Solids Total Maximum Daily Load* (MPCA, 2015, as revised)
- (5) Addressed by the *Upper Mississippi River Bacteria Total Maximum Daily Load* (MPCA, 2016)

**Table A-13 Water Quality Standards Applicable to District Lakes**

MPCA Lake Classification	Select Water Quality Standards <sup>1</sup>			
	Total Phosphorus (µg/L)	Chlorophyll-a (µg/L)	Secchi Disk Depth (m)	Chloride (mg/l) <sup>2</sup>
Shallow Lake (Como, Crosby, Loeb, Little Crosby)	< 60	< 20	> 1.0	230
Deep Lake (McCarrons)	< 40	< 14	> 1.4	230

Source: [Minnesota Rules 7050](#) for NCHF eco-region; note that water quality standards for additional parameters are also applicable to District water resources

- (1) Standards for total phosphorus, chlorophyll-a, and Secchi Disk Depth are summer average (June – September)
- (2) The 230 mg/L chloride standard is the chronic standard, where two or more exceedances within a three year period are considered an impairment (as opposed to the acute standard which deems one exceedance over 860 an impairment).

## A.9.7 Floodplains

Floodplains are lowland areas adjacent to lakes, wetlands, and rivers that are susceptible to inundation of water during a flood. For regulatory purposes, the term “floodplain” refers to the area inundated during a flood or storm event with a 1 percent chance of occurring in any year (i.e., a 100-year event).

The Federal Emergency Management Agency (FEMA) performs flood insurance studies (FIS) and develops Flood Insurance Rate Maps (FIRMs) to identify areas prone to flooding during 100-year storm events. The water level corresponding to the 100-year flood event is referred to as the Base Flood Elevation (or BFE) and is the basis for the mapped floodplain extent. Figure A-29 presents floodplains delineated by FEMA; within the District, FEMA-delineated floodplains are limited to those areas adjacent to the Mississippi River, Lake McCarrons, and wetlands in Maplewood.

Each of the cities within the District has a FIS. The FIS, together with a city’s floodplain ordinance, allow the city to take part in the national flood insurance program (NFIP). Homeowners within FEMA-designated floodplains are required to purchase flood insurance. NFIP is implemented independently of the District and are described herein for informational purposes. FEMA-established floodplains and 100-year flood levels are available from FEMA at: <https://msc.fema.gov/portal/home>

The District has also mapped the 100-and 500-year floodplains adjacent to the Trout Brook Storm Sewer Interceptor (TBI) (see Section A.10.4). The District will use this information to identify and prioritize improvements to the TBI system and to inform its permit program.

The Cities within the District have prepared local water management plans containing more detailed information regarding localized flooding issues. Some of the more significant local flooding issues are identified for potential future action in the District’s implementation plan (see Section 3.0). The District’s permit program includes a flood control rule (Rule D) and requires a District permit for activities located within the 100-year floodplain. The



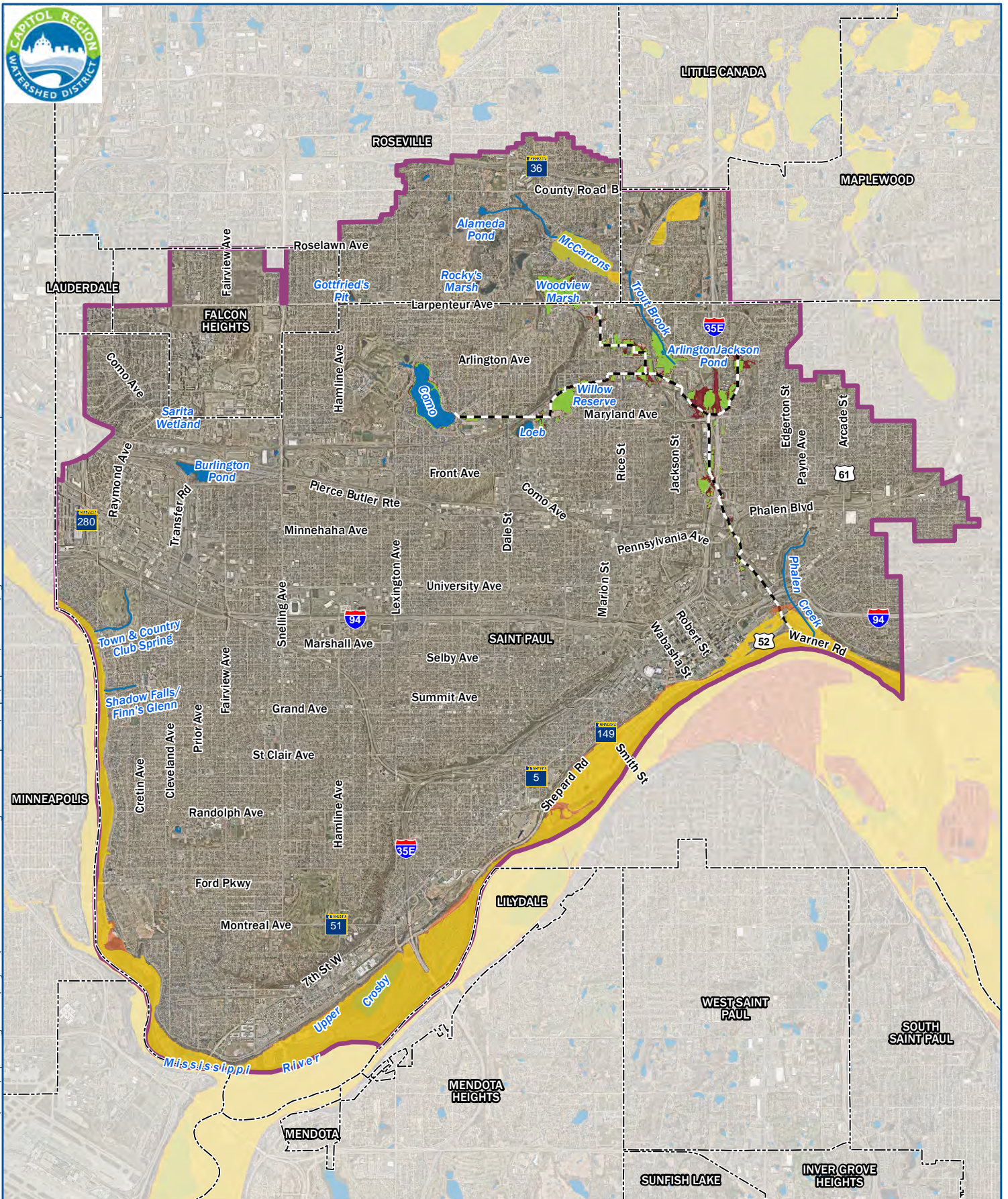
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rule is intended to limit adverse impacts to floodplains and minimize flood risk. The rule includes criteria for minimum building elevations relative to the 100-year flood levels and compensatory storage for filling of the floodplain. In areas where FEMA-mapped floodplains and District-delineated floodplains differ, the most restrictive elevations and/or floodplain extent shall govern.

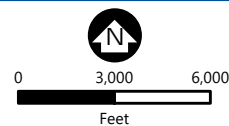




Barr Footer: ArcGIS 10.7.1, 2019-1A-08 13:56 File: I:\Client\CapitolRegionWD\Projects\23621304 Watershed Management Plan Update\Maps\Reports\2020 Plan\Figure A-19 - FEMA and District Floodplains.mxd User: EMA



- |                         |                                       |
|-------------------------|---------------------------------------|
| Municipal Boundary      | <b>FEMA Flood Zone</b>                |
| Watershed Boundary      | 100-Year Flood Zone                   |
| Lakes and Rivers        | 500-Year Flood Zone                   |
| Streams                 | <b>District-Delineated Floodplain</b> |
| Trout Brook Interceptor | 100-Year Inundation Area              |
|                         | 500-Year Inundation Area              |



Data Sources: CRWD,  
MN DNR, MnDOT,  
USGS, FEMA

**FEMA & DISTRICT  
FLOODPLAINS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-29**



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## A.10 Surface Water Monitoring

The District monitors the water quality of lakes, wetlands, and stormwater throughout the District. The District's monitoring program collects data for various purposes, including to:

- establish baseline conditions
- identify water quality problem areas
- quantify runoff pollutant loadings
- evaluate water quality trends
- evaluate the effectiveness of BMPs
- provide data for the calibration of hydrologic, hydraulic, and water quality models
- promote informed, science-based decisions

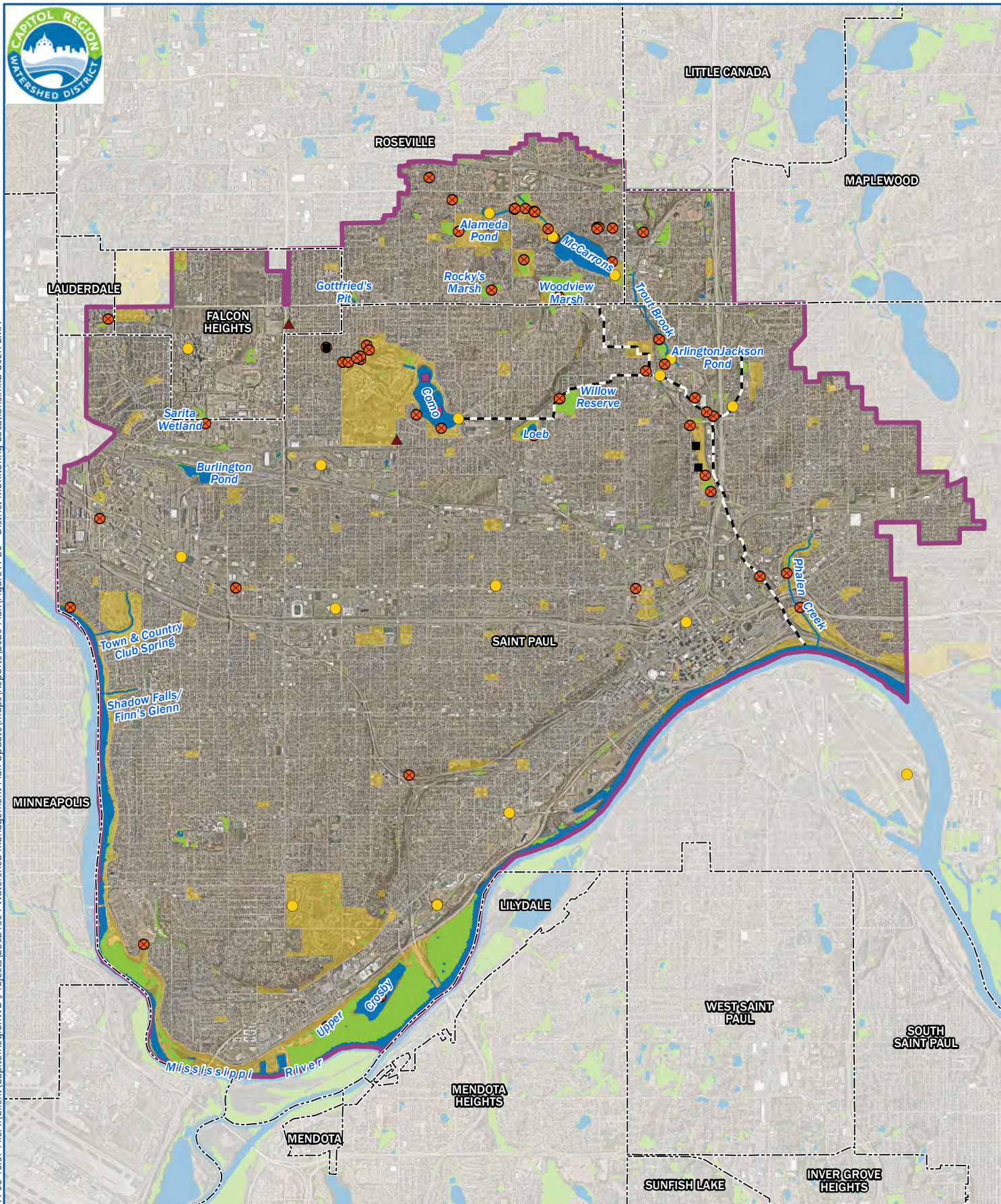
District monitoring locations are presented in Figure A-30. The District's monitoring program focuses primarily on stormwater due to the highly urbanized setting as well as the presence of other monitoring programs focusing on natural resources (e.g., lakes).

In addition to District monitoring activities, several other entities monitor water quantity and water quality of the Mississippi River including the USGS, Metropolitan Council, MPCA, and the Mississippi Watershed Management Organization (MWMO). Data collected for the Mississippi River in the Twin Cities Metro Area has been summarized by the MPCA and is available at: <https://www.pca.state.mn.us/water/watersheds/mississippi-river-twin-cities>

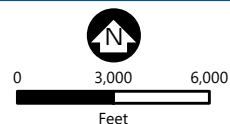




Barr Footer: ArcGIS 10.7.1, 2019-1A-08 13:57 File: I:\Client\CapitolRegion\WD Projects\23621304 Watershed Management Plan Update\Maps\Reports\2020 Plan\Figure A-20 - District Monitoring Locations.mxd User: EMA



- |                         |                     |                          |
|-------------------------|---------------------|--------------------------|
| Municipal Boundary      | Wetlands            | Lake Monitoring          |
| Watershed Boundary      | Parks               | Precipitation Gauges     |
| Lakes and Rivers        | Monitoring Location | Water Quality Monitoring |
| Streams                 | BMP                 |                          |
| Trout Brook Interceptor | Groundwater         |                          |



Data Sources: CRWD,  
MN DNR, USGS

**DISTRICT MONITORING  
LOCATIONS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-30**



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## A.10.1 Lake Monitoring

The District and its partners routinely monitor five lakes, including:

- Como Lake
- Crosby Lake
- Little Crosby Lake
- Loeb Lake
- Lake McCarrons

Monitoring is performed by the Ramsey County Public Works (RCPW), Ramsey County Parks, MDNR, and/or District staff. Lake monitoring includes:

- Water levels
- Water chemistry and physical parameters
- Phytoplankton and zooplankton
- Aquatic vegetation
- Fish surveys

Monitoring methods are summarized in the following section. Detailed information about the District's lake monitoring methods and monitoring results are available in the 2016 CRWD Lakes Monitoring Report (CRWD, 2017) and subsequent monitoring reports published during the life of this Plan.

### *Lake Levels*

Historical lake level data is available for Como Lake, Loeb Lake, and Lake McCarrons from the MDNR's Lakefinder website at: <https://www.dnr.state.mn.us/lakefind/index.html>

MDNR lake level data is typically recorded twice per month based on manual readings of staff gauges. The District has installed level loggers on Como Lake, Loeb Lake, Lake McCarrons, and Crosby Lake (lake levels in Little Crosby Lake are similar to Crosby Lake due to hydrologic connection). The District level loggers record continuous water level data from early spring (typically April) to late fall (November).

### *Chemistry and Physical Data*

The RCPW generally collects between eight and ten water quality grab samples between April and October. Grab samples are generally collected at the deepest part of the lake. The physical and chemical parameters of depth, temperature, dissolved oxygen, conductivity, and pH are measured at 1-meter sampling intervals for the full depth profile of the lake using a multi-probe. Water transparency, or water clarity, is determined with the use of a Secchi disk. Water chemistry samples are collected from the epilimnion (the mixed layer near the surface) and at multiple depths along the profile of the lake. Water samples are analyzed for:

- Turbidity
- Chlorophyll-a
- Total phosphorus (TP)
- Soluble reactive phosphorous (SRP) or ortho-phosphorus (ortho-P)
- Total Kjeldahl nitrogen (TKN)

- Nitrate (NO<sub>3</sub>)
- Ammonia (NH<sub>3</sub>)
- Chloride (Cl)

Lake chemistry monitoring results are compared to applicable water quality standards presented in Table A-13.

### *Phytoplankton and Zooplankton Data*

Phytoplankton and zooplankton data are collected concurrently with water chemistry sampling by RCPW. For phytoplankton analysis, a composite sample is collected using a plastic tube inserted vertically 2 m into the upper layer of the water column. This sample is thoroughly mixed and a sub-sample collected and preserved for laboratory analysis. To collect a zooplankton sample, a net tow is lowered to the observed thermocline to collect samples from the oxygenated layer of the lake. The net tow is allowed to settle and then pulled up to the water surface at a rate of 1 m/sec. The net and capture bucket are drained down to a volume of 100 mL and preserved for laboratory analysis also conducted by RCPW.

### *Aquatic Vegetation Surveys*

Ramsey Conservation District (RCD) performs point-intercept aquatic vegetation surveys of District lakes three times per year (spring, summer, and fall). This method consists of using GPS to pre-select specific, evenly spaced monitoring points throughout the full area of the lake. At each point, plant species are identified and given an abundance ranking (CRWD, 2016). RCD also performs biovolume surveys to collect submerged aquatic vegetation data. The biovolume survey uses a GPS-enabled depth finder to assess evenly spaced transects; the collected data is analyzed by CI BioBase software to determine the depth of the lake and the extent of aquatic vegetation along each transect.

### *Fish Stocking and Surveys*

The MDNR performs fish stocking to improve fishing conditions on selected Minnesota lakes, including Como Lake (stocked annually), Loeb Lake (last completed in 2016), and Lake McCarrons (last completed in 2009). Fish are stocked at different life stages depending on the desired effect in the lake. The MDNR performs fish surveys approximately every 5-10 years; the MDNR last performed standard fish surveys on District lakes in 2014. The District also contracts with consultants to perform targeted fish surveys in support of lake management activities (e.g., Como lake improvements).

## **A.10.2 Wetland Monitoring**

As one of many efforts to assess impacted water resources, the District began a wetland biological monitoring program in 2007 as part of the District's larger water resource monitoring program. The District monitors 20 wetlands through this program. The goal of the wetland monitoring program is to establish baseline quality conditions of major wetlands to better inform management decisions and understand their value. The data collected through wetland monitoring is used to understand the services provided by wetlands, including:



- Biological function:
  - Ecological diversity
  - Urban wildlife habitat and connectivity
- Environmental services:
  - Water quality improvements
  - Flood control
  - Carbon sink
- Community and human health value:
  - Green space/aesthetics
  - Recreation

Biological monitoring data are used to assess wetland conditions using an Index of Biological Integrity (IBI), consisting of aquatic invertebrate and plant indices. Monitoring consists of a collection of aquatic macroinvertebrates and a survey of aquatic plants, along with collection of water quality and land-use data. These data are then evaluated through macroinvertebrate and plant metrics that provide an overall rating within the IBI. The assessment process is described in greater detail in the 2007-2014 Wetland Monitoring Report (CRWD, 2016).

### A.10.3 Stormwater Monitoring

The District regularly collects stormwater quality and flow data at seven locations dating back to 2005, including:

- St. Anthony Park subwatershed outlet
- East Kittsondale subwatershed outlet
- Phalen Creek subwatershed outlet
- Hidden Falls
- East Branch of Trout Brook Storm Sewer System
- West Branch of Trout Brook Storm Sewer System
- Outlet of the Trout Brook Storm Sewer System

These monitoring locations are presented in Figure A-30. Routinely monitored water quality parameters include: Total phosphorus (TP), ortho-phosphorus, nitrate/nitrite, total suspended solids (TSS), chloride, *Escherichia coli* (*E. coli*) and metals.

Pollutant concentration data collected from these locations is summarized in Table A-14. The District also monitors flow at these stormwater outlets which allows the District to calculate pollutant loads.

The MPCA and the U.S. Environmental Protection Agency (EPA) have established surface water standards for several water quality parameters (Minnesota Rules 7050). While these standards apply to receiving waters (i.e., lakes, streams) and are not directly applicable to stormwater discharge, it is useful to compare District stormwater quality to these standards and the observed water quality in the Mississippi River, an impaired water (see Section A.9.6)

Data presented in Table A-14 indicate that pollutant concentrations in District stormwater discharges exceed those in the Mississippi River receiving water for all monitored parameters. The elevated pollutant concentrations

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in stormwater relative to the Mississippi River reflect the high imperviousness of the District, which facilitates the transport of metals and other pollutants. Average chloride concentrations in District stormwater discharges are generally at or below the 230 mg/L chronic standard applicable to Class 2B rivers and lakes (see Minnesota Rules 7050) but are greater than the average chloride concentration in the Mississippi River. While the stormwater pollutant concentrations presented in Table A-14 are generally greater than those in the receiving water, the pollutant load from District stormwater discharges is a small percentage of cumulative pollutant loading to the Mississippi River (the District is approximately 1/1000<sup>th</sup> of the drainage area to the Mississippi River below the Minnesota River).

The Mississippi River data included in Table A-14 also demonstrate the impact of the Minnesota River, which enters the Mississippi River between mile 847.1 (Ford Dam) and mile 839.1, as a significant source of total suspended sediment and total phosphorus.

Figure A-31 and Figure A-32 present annual phosphorus loading and annual total suspended solids loading, respectively, for the monitored stormwater outlets from 2009 through 2018. Comparison of the average loading from stormwater outlets allows the District to prioritize areas for implementation of structural and non-structural best management practices to reduce pollutant loading.

**Table A-14 District Stormwater Quality Monitoring Results (2010-2019)**

Location	Average Concentration						
	Chloride (mg/L)	Copper (µg/L)	E. coli <sup>1,3</sup> (cfu/100 mL)	Lead (µg/L)	TP (µg/L)	TSS (mg/L)	Zinc (µg/L)
<b>Stormwater Outlets</b>							
East Kittsondale	234	19.6	4,123	16.6	229	123	84.6
Hidden Falls	84	12.6	3,125	16.3	205	122	61.3
Phalen Creek	178	13.3	3,242	19.2	272	165	71.6
Saint Anthony Park	141	12.5	3,755	8.6	190	110	62.6
Trout Brook - East Branch	243	10.2	3,842	6.5	295	103	44.9
Trout Brook - West Branch	90	11.0	3,446	8.9	268	365	46.6
Trout Brook Outlet	121	11.7	3,312	10.3	260	131	44.5
<b>Mississippi River Locations and Standards</b>							
Mississippi River Mile 839.1 (Ford Dam)	24	1.8	130.9	0.7	134	46	5.8
Mississippi River Mile 847.7 (Downtown St. Paul)	18	2.4	130.6	0.5	68	11	5.2
Water Quality Standard (in Mississippi River)	230 <sup>2</sup>	-- <sup>5</sup>	-- <sup>3</sup>	-- <sup>5</sup>	100 <sup>2</sup>	32 <sup>4</sup>	-- <sup>5</sup>
<p>Notes: Mississippi River water quality standards are not applicable to District stormwater discharges and are presented as additional information.</p> <p>(1) Units for <i>Escherichia coli</i> are colony forming units (cfu) per 100 mL of water and are presented as geometric means</p> <p>(2) Based on <a href="#">Minnesota Rules 7050</a>;</p> <p>(3) District E. coli samples are not collected with frequency sufficient to determine exceedances of applicable water quality standards</p> <p>(4) Site-specific standard based in the <a href="#">South Metro Mississippi River Turbidity TMDL</a> (MPCA, 2015)</p> <p>(5) MN Rules 7050 applicable standards for copper, lead, and zinc are a function of total hardness</p>							



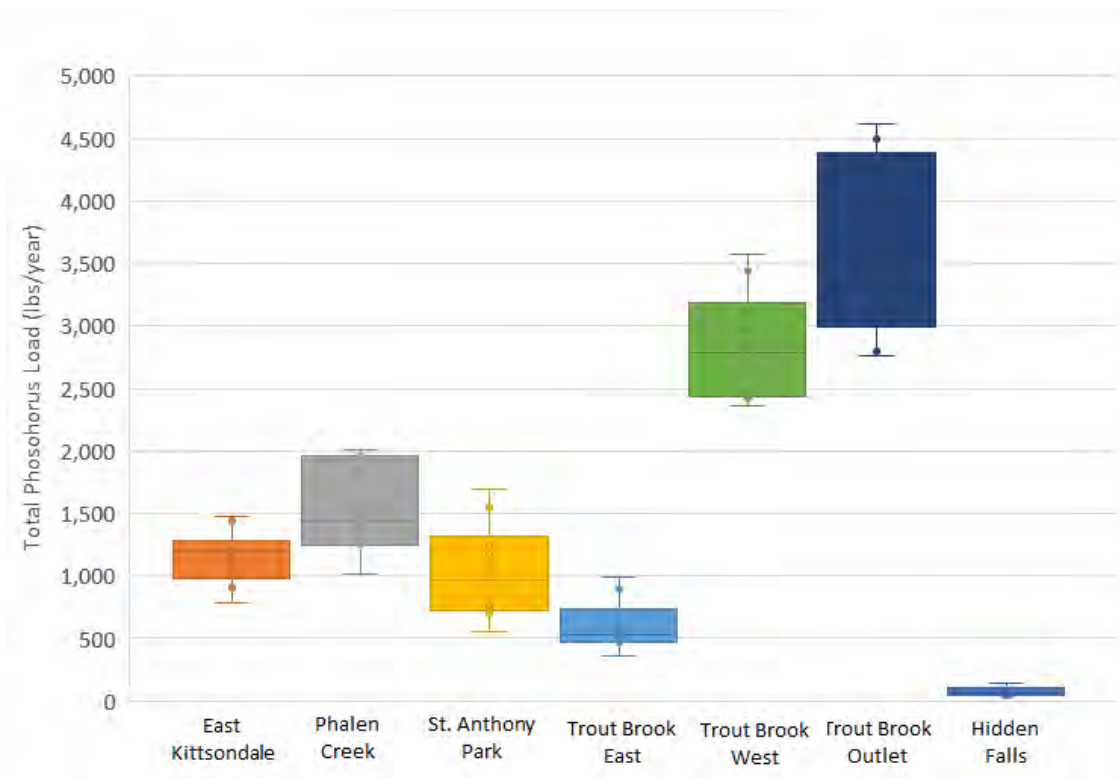


Figure A-31 District Stormwater Total Phosphorus Loading (2010-2019)

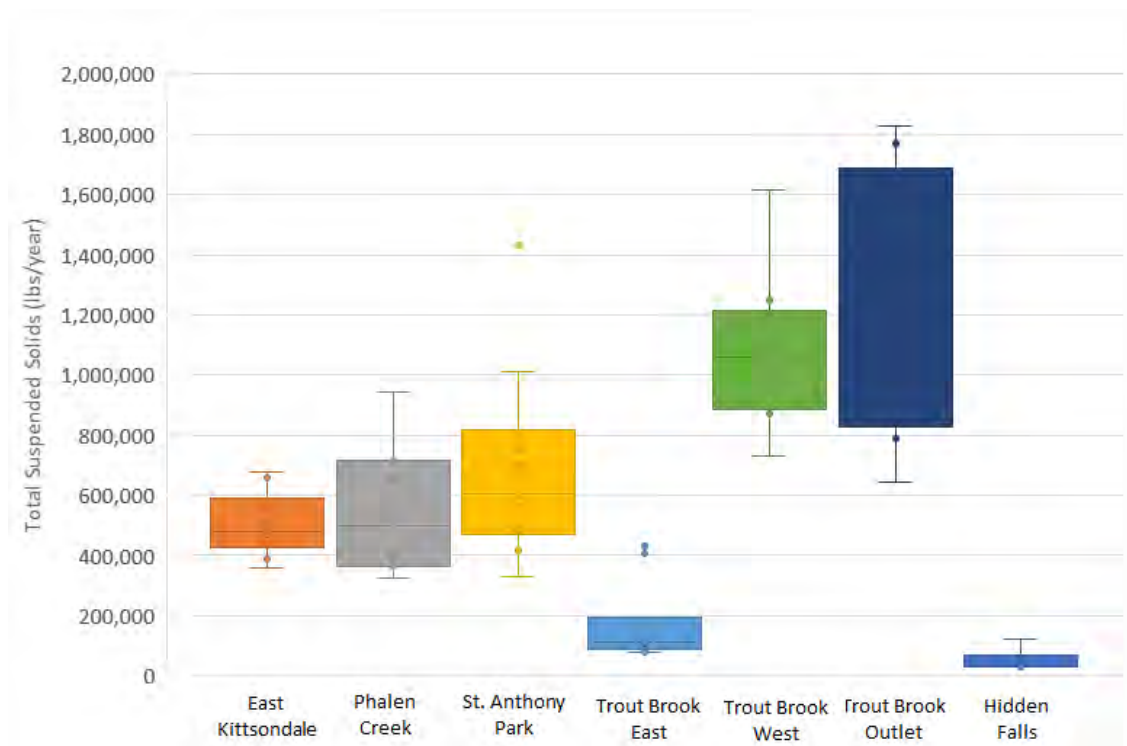


Figure A-32 District Stormwater Total Suspended Solids Loading (2010-2019)

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#### **A.10.3.1 Best Management Practice (BMP) Monitoring**

In addition to stormwater outlet monitoring, all structural best management practices constructed by the District are also monitored for water quantity and water quality to assess the amount of stormwater and pollutant reductions achieved by the BMP. The District also assesses BMP performance data in aggregate to evaluate the feasibility of classes of BMPs (e.g., underground infiltration) and inform future design decisions.

Significant BMP monitoring locations are presented in Figure A-30. Individual BMP performance data is available from the District on request.

#### **A.10.4 Surface Water Modeling**

Portions of the District have been modeled as part of the development of subwatershed analyses and resource management plans (e.g., Como Lake Management Plan – CRWD, 2019). Modeling efforts include hydrologic, hydraulic, and/or water quality modeling as needed to address the specific analytical goals. Modeling results are summarized in the applicable resource management plans.

The District maintains a hydrologic and hydraulic model of the Trout Brook Storm Sewer Interceptor (TBI) system. The District updates this model as needed to incorporate land use changes and evaluate potential stormwater infrastructure improvements. The District has used the TBI model to evaluate flood risk along the TBI system and prioritize areas for future improvements (see Section 3.0). Figure A-29 presents the approximate floodplain adjacent to the TBI system.

### **A.11 Natural Areas, Habitat, and Rare Features**

Through its Natural Heritage and Nongame Research Program (NHNRP), the MDNR collects, manages, and interprets information about rare natural features, native plants and plant communities, and nongame animals, including endangered, threatened, and special concern species. As part of the NHNRP, the MDNR maintains the Natural Heritage Information System (NHIS) as a statewide database of these resources. The MDNR limits publication of spatial attributes and locations of these items to protect rare features or species from damage or collection.

Additional information about rare, threatened, and endangered species is available from the NHNRP at: <https://www.dnr.state.mn.us/nhnrp/index.html>

As described in Section A.9.2, the MDNR and CRWD perform periodic fish surveys on Como Lake, Crosby Lake, Loeb Lake, and Lake McCarrons. Fish stocking and survey information for individual lakes is available from the MDNR's Lakefinder website at: <https://www.dnr.state.mn.us/lakefind/index.html>.

The MDNR's Minnesota County Biological Survey for Ramsey County (1994, with Anoka County) identified pre-settlement vegetation. Prior to settlement, the District was covered primarily by oak forest interrupted by tall grass prairie. River bottom forests occurred along the Mississippi River below the bluff. Portions of dense deciduous forest known as the "Big Woods" covered portions of the east side of the District, Falcon Heights, and the Highland neighborhood of Saint Paul. Elm, sugar maple, and basswood are representative Big Woods tree species.

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Most of the District has been developed for residential, commercial, and other urban land uses (see Section A.4). However, some areas of natural and semi-natural vegetation remain. These areas provide ecological benefits, such as wildlife habitat, in addition to water quality and recreational value. Areas of remaining natural and semi-natural vegetation are presented in Figure A-33 and are concentrated along the Mississippi River and in the north end of the District near Lake McCarrons. Most natural and semi-natural areas are located within existing regional parks (e.g. Hidden Falls-Crosby Farm Regional Park, and Mississippi Gorge Regional Park) and are thus protected from future development.

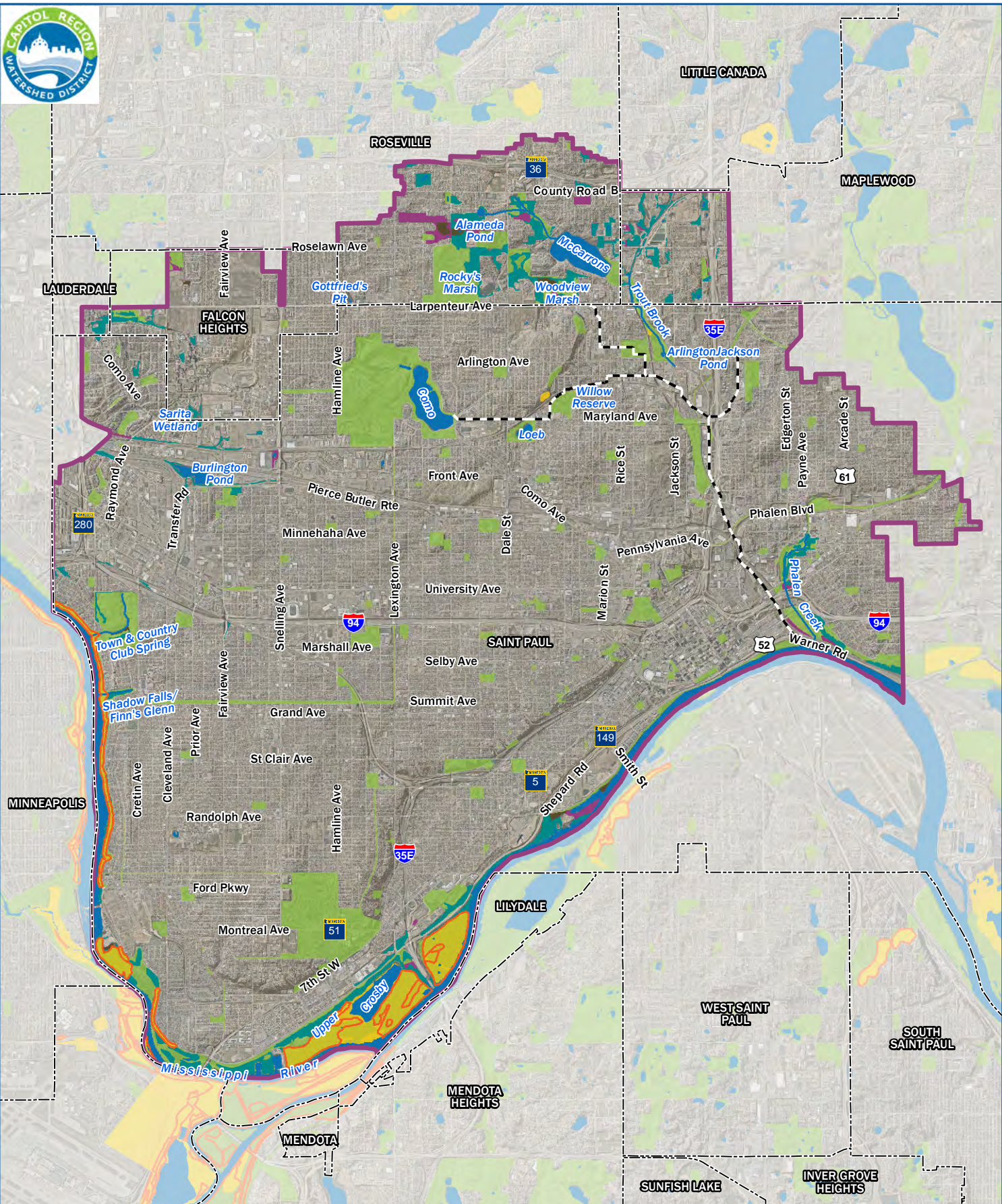
Minnesota County Biological Survey also identifies sites of biodiversity significance. Sites of biodiversity significance within the District are located along the Mississippi River corridor (see Figure A-33). These sites include:

- Crosby Lake Park (high biodiversity significance)
- Portions of the Mississippi River Floodplain (moderate biodiversity significance)
- Mississippi River bluffs (moderate biodiversity significance)

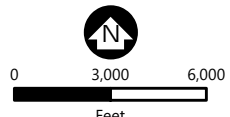
Additional information is available from the Minnesota Biological Survey at:

<https://www.dnr.state.mn.us/mbs/index.html>





- |                         |                                   |
|-------------------------|-----------------------------------|
| Municipal Boundary      | Native Plant Community            |
| Watershed Boundary      | Site of Biodiversity Significance |
| Lakes and Rivers        | Maintained open space             |
| Streams                 | Forested                          |
| Trout Brook Interceptor | Shrubland                         |
|                         | Grassland                         |



Data Sources: CRWD,  
MN Biological Survey,  
Metropolitan Council,  
MN DNR, USGS

**REMAINING VEGETATION  
& SITES OF  
BIOLOGICAL SIGNIFICANCE**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-33**



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## A.12 Open Space and Recreation

Despite the urban nature of the watershed, about 9% of the District is occupied by park, open space, or preserve land uses. Additionally, the District includes the State Fair Grounds. Open space and recreational areas are presented in Figure A-34. The regional and municipal parks located within the District have preserved scenic views and allow access to the Mississippi River Valley and other water resources. These spaces provide opportunities for residents and people who recreate in the District to appreciate and connect with the District's resources.

Popular recreational opportunities within the District include activities like boating, fishing, hiking, walking, biking, and others. There are several public water access points within the District, including:

- boat access (Mississippi River and Lake McCarrons)
- carry-in boat access (Como Lake)
- fishing piers (Como Lake, Loeb Lake, Lake McCarrons)
- on-shore fishing access (Como Lake, Mississippi River)

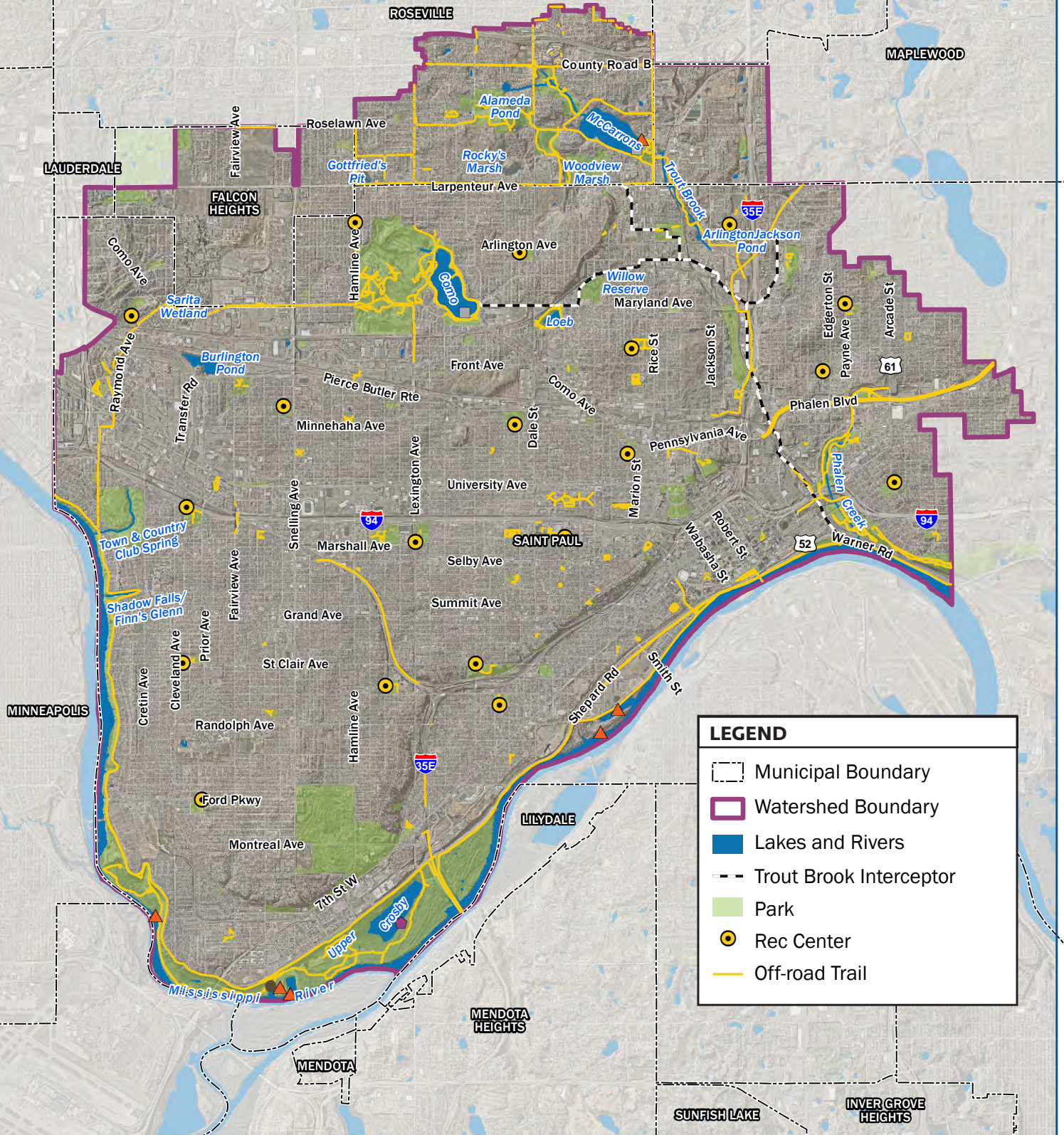
In addition, there is an extensive network of on- and off-road bike trails throughout the District including the Gateway Trail which extends from Saint Paul to Pine Point Regional Park just northwest of Stillwater.

Parks and other open spaces may also provide stormwater management opportunities for the District and its partners. In addition to providing physical space for BMPs, these spaces are often in an ideal location situated between the non-point pollutant source (e.g., urban development) and the receiving water (e.g., lakes, ponds, wetlands). Implementing BMPs in parks and other areas frequented by the public can further enhance demonstration and education benefits.





Barr Footer: ArcGIS 10.7.1, 2019-1A-08 13:58 File: I:\Client\CapitolRegionWD\Projects\23621304 Watershed Management Plan Update\Maps\Reports\2020 Plan\Figure A-24 - Open Spaces and Recreational Areas.mxd User: EMA



**LEGEND**

Municipal Boundary

Watershed Boundary

Lakes and Rivers

Trout Brook Interceptor

Park

Rec Center

Off-road Trail

Boat Access

Pier Fishing

Pumpout Facility

Shore Fishing

Municipal Boundary

Watershed Boundary

Lakes and Rivers

Trout Brook Interceptor

Park

Rec Center

Off-road Trail

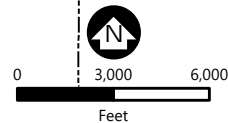
Water Access

Boat Access

Pier Fishing

Pumpout Facility

Shore Fishing



Data Sources: CRWD,  
Metropolitan Council,  
MN DNR

**OPEN SPACES &  
RECREATIONAL AREAS**  
Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-34**



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## A.13 Potential Pollutant Sources

The sources of water pollution in the District are many and varied. Potential pollutant sources in the District include permitted pollutant sources, potentially contaminated sites, leaking above- and below-ground storage tanks, unsealed wells, and non-point sources.

The MPCA maintains a database of potential environmental hazards, which includes permitted sites (air, industrial stormwater, construction stormwater, wastewater discharge), hazardous waste generating sites, leak sites, petroleum brownfields, tank sites, unpermitted dump sites, and sites enrolled in the Voluntary Investigation and Cleanup (VIC) program. This information is available online through the MPCA's What's In My Neighborhood program. Sites identified in this database are presented in Figure A-35.

The presence of potentially contaminated or hazardous waste sites should be considered as sites are redeveloped and BMPs are implemented. The presence of soil contamination at many of these sites, if not removed, may limit or prevent infiltration as a stormwater management option.

More information about potential pollutant sources is available from the MPCA website:

<http://www.pca.state.mn.us/index.php/data/wimn-whats-in-my-neighborhood/whats-in-my-neighborhood.html>

### A.13.1 Permitted Pollutant Sources

#### A.13.1.1 Municipal Separate Storm Sewer System (MS4) Stormwater

Public entities that manage stormwater and meet certain criteria are required by the MPCA to obtain a Municipal Separate Storm Sewer System (MS4) permit. Entities required to obtain a permit are known as "MS4s." The MS4 Stormwater Program is designed to reduce the amount of sediment and pollution that enters surface water and groundwater from storm sewer systems. The MS4 stormwater discharges are regulated by National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permits administered by the MPCA.

Within the District, there are several MS4s, including:

- Capitol Region Watershed District
- City of Falcon Heights
- City of Maplewood
- City of Lauderdale
- City of Roseville
- City of Saint Paul
- Metropolitan State University
- Minnesota Department of Transportation
- Ramsey County
- Saint Paul Community and Technical College
- University of Minnesota – Twin Cities

Discharge from stormwater pipes is considered a non-point source discharge as the pollutants coming from the pipe are generated across the watershed contributing to the pipe, not at a single location. For most waterbodies,

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stormwater runoff is a major source of pollutants. Table A-15 summarizes the principal pollutants found in stormwater runoff and provides example sources and possible impacts of each pollutant.

As a requirement of the permit, MS4s must develop and maintain a stormwater pollution prevention program (SWPPP) which outlines programs and practices to minimize pollutant loading and water quality impacts resulting from stormwater management. The SWPPP contains six areas of focus, known as minimum control measures, including:

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management
- Pollution Prevention/Good Housekeeping For Municipal Operations

Each MS4 submits a report to the MPCA annually documenting the implementation of its SWPPP. The District is required to obtain an MS4 permit and maintain a SWPPP based on its ownership of the Trout Brook Interceptor stormwater system (see Section A.9.4).

The MPCA periodically updates the MS4 General Permit. More information is available from the MPCA at: <https://www.pca.state.mn.us/water/municipal-stormwater-ms4>

**Table A-15 Pollutants Commonly Found in Stormwater**

Stormwater Pollutant	Examples of Sources	Related Impacts
<b>Nutrients:</b> Nitrogen, Phosphorus	Decomposing grass clippings, leaves and other organics, animal waste, fertilizers, failing septic systems, atmospheric deposition	Algal growth, reduced clarity, other problems associated with eutrophication (oxygen deficit, release of nutrients and metals from sediments)
<b>Sediments:</b> Suspended and Deposited	Construction sites, other disturbed and/or non-vegetated lands, eroding streambanks and shorelines, road sanding	Increased turbidity, reduced clarity, lower dissolved oxygen, deposition of sediments, smothering of aquatic habitat including spawning sites, and benthic toxicity
<b>Organic Materials</b>	Leaves, grass clippings	Algal growth, reduced clarity, other problems associated with eutrophication (oxygen deficit, release of nutrients and metals from sediments)
<b>Pathogens:</b> Bacteria, Viruses	Domestic and wild animal waste, failing septic systems	Human health risks via drinking water supplies, contaminated swimming beaches
<b>Hydrocarbons:</b> Oil and Grease, PAHs (Naphthalenes, Pyrenes)	Tar-based pavement sealant, industrial processes, automobile wear, emissions and fluid leaks, waste oil.	Toxicity of water column and sediment, bioaccumulation in aquatic species and throughout food chain
<b>Metals:</b> Lead, Copper, Cadmium, Zinc, Mercury, Chromium, Aluminum, others	Industrial processes, normal wear of auto brake linings and tires, automobile emissions & fluid leaks, metal roofs	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
<b>Pesticides:</b> PCBs, Synthetic Chemicals	Pesticides (herbicides, insecticides, fungicides, rodenticides, etc.), industrial processes	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
<b>Chlorides</b>	Road salting and uncovered salt storage	Toxicity of water column and sediment
<b>Polycyclic Aromatic Hydrocarbons (PAH's)</b>	Tar based pavement sealant	Carcinogenic to humans
<b>Trash and Debris</b>	Litter washed through storm drain networks	Degradation of the beauty of surface waters, threat to wildlife

Based on *Minnesota Urban Small Sites BMP Manual* (Barr Engineering Co, 2001).

### A.13.1.2 Construction Stormwater

Construction sites can contribute substantial amounts of sediment to stormwater runoff. The NPDES/SDS Construction Stormwater Permit administered by the MPCA requires that all construction activity disturbing an area of one acre or more must obtain a permit and create a Stormwater Pollution Prevention Plan (SWPPP) that



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outlines how pollutant loading from the construction site will be minimized during and after construction. Construction stormwater permits are required throughout construction activities through final stabilization of the site. In addition to the NPDES Construction Stormwater Permit, the District and each of its Cities implement permit programs (independently or through the District) to regulate pollutant loading from construction activity.

The MPCA periodically updates the Construction Stormwater Permit. More information is available from the MPCA at: <https://www.pca.state.mn.us/water/construction-stormwater>

#### **A.13.1.3 Industrial Stormwater**

The NPDES/SDS Industrial Stormwater Permit applies to specific industrial operations with the potential to contaminate stormwater runoff. The permit requires that the industrial facility create a Stormwater Pollution Prevention Plan (SWPPP) documenting structural and/or non-structural BMPs used to manage stormwater and a spill prevention, control, and countermeasure (SPCC) plan.

The MPCA periodically updates the Industrial Stormwater General Permit. More information is available from the MPCA at: <https://www.pca.state.mn.us/water/industrial-stormwater>

#### **A.13.1.4 Feedlots**

Two registered feedlots are located within the District: the University of Minnesota Feedlot and the State Fairgrounds. Feedlot operations capable of holding 1,000 or more animal units or more are classified as a large concentrated animal feeding operation (CAFO) and are required to obtain a NPDES/SDS permit for livestock production from the MPCA. Neither feedlot in the District is required to have an NPDES/SDS permit based on its size.

#### **A.13.1.5 Municipal and Industrial Wastewater**

Several facilities within the District are permitted by the MPCA to discharge wastewater such as industrial process wastewater and non-contact cooling water discharge. Municipal wastewater is sanitary waste from residential and commercial sources. Industrial wastewater is a waste generated by an industrial process. For any wastewater discharge an NPDES/SDS permit is required from the MPCA. Figure A-35 includes permitted wastewater discharges within the District.

### **A.13.2 Potentially Contaminated Sites**

Sites identified by the MPCA as potentially contaminated are included in Figure A-35. The MPCA database includes properties that have already been investigated and cleaned up, properties currently enrolled in MPCA cleanup programs, and suspected contaminated properties determined to be clean upon investigation. Sites included in the database may include operational and abandoned landfills, dumps, solid waste sites, and others. Discharges at these sites may contain pollutants with the potential to contaminate both groundwater and surface water.

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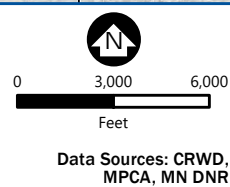
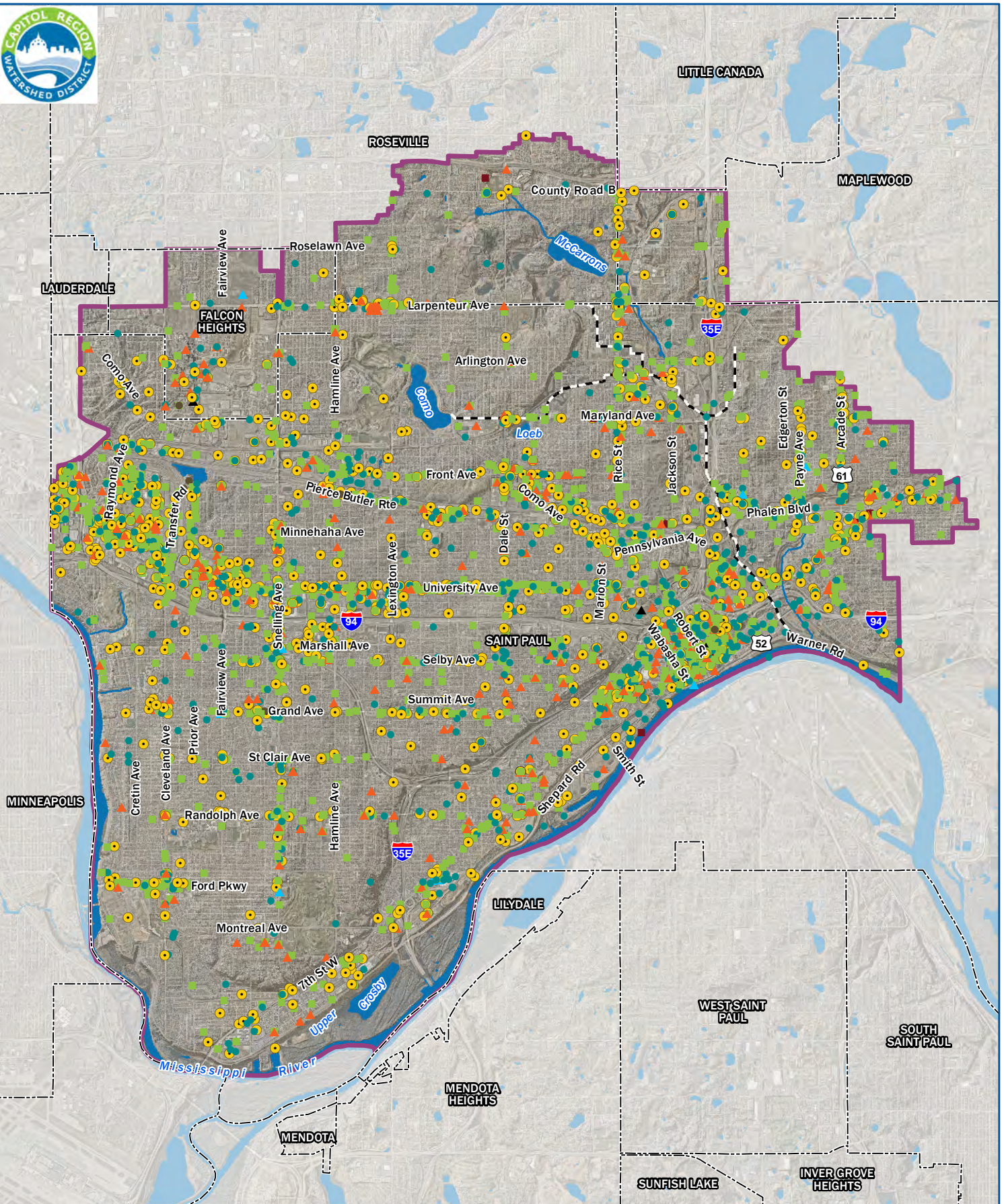
### **A.13.3 Leaking Above- & Below-ground Storage Tanks**

Leaking above- and below-ground storage tanks may leach pollutants into groundwater and surface water. The MPCA investigates and cleans up releases from petroleum tanks. Locations of storage tanks within the District are shown in Figure A-35.

### **A.13.4 Wells**

There are many wells within the District. When not properly constructed or maintained, wells can function as an unintended pathway for flow between aquifers or from surface water to groundwater. When wells are abandoned, appropriate well sealing is necessary to limit potential for groundwater contamination.





**POTENTIAL POLLUTANT SOURCES**

Watershed Management Plan  
Capitol Region  
Watershed District

**FIGURE A-35**



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## Appendix B

### 2021 Plan Stakeholder Engagement Summary Memorandum and Fact Sheet



## Memorandum

**To:** Anna Eleria, Capitol Region Watershed District  
**From:** Greg Williams  
**Subject:** Summary of Results from the Capitol Region Watershed District 2020 Plan Update Stakeholder Outreach  
**Date:** July 29, 2019  
**Project:** 23621304  
**C:**

In developing its 2020 Watershed Management Plan (WMP, Plan), Capitol Region Watershed District (CRWD) created a Stakeholder Outreach Plan (February 2019). The Stakeholder Outreach Plan outlined several activities to engage and receive input from a broad, diverse group of stakeholders that reflect the demographics of CRWD. This memorandum summarizes the results of the stakeholder outreach activities completed through June 30, 2019 and provides a recommendation to CRWD's Board of Managers regarding issue prioritization that considers the results of CRWD outreach efforts.

In addition to this summary memo, Barr Engineering Company (Barr) and CRWD staff will prepare an infographic to summarize the stakeholder outreach process and results. This infographic will be shared with stakeholder outreach activity participants and the public. As Plan goals and implementation items are developed in future tasks, CRWD staff will track the connection between stakeholder comments and applicable goals and implementation items. This process will document the link between stakeholder input and Plan outcomes.

### 1.0 Stakeholder Outreach Activities

Activities to solicit stakeholder input conducted by CRWD between February 2019 and June 2019 include the following:

- Plan update notification to State and local government agencies (as required by MN Rules 8410.0045)
- Technical Advisory Committee (TAC) workshop – May 22, 2019
- Citizen Advisory Committee (CAC) workshop – June 12, 2019
- CRWD staff workshop – June 25, 2019
- Community conversation events (four), including:
  - CRWD office – May 6, 2019
  - Hallie Q. Brown Community Center – May 13, 2019
  - Gloria Dei Lutheran Church – May 30, 2019
  - Arlington Hills Community Center – June 4, 2019

- Face-to-face meetings with the following organizations:
  - Urban Roots
  - Hmongtown Marketplace
  - African Economic Development Solutions
  - Lower Phalen Creek Project
  - Frogtown Farms
  - East Site Area Business Association
- Meetings with St. Paul District Councils, including:
  - North End Neighborhood Organization
  - Union Park District Council Environment and Parks Committee
  - Capitol River Council
- Surveys, including:
  - Long form hosted online at the CRWD website
  - Short form completed via tablet at community events

CRWD's stakeholder outreach activities were advertised via eight circulars reaching over 175,000 readers as well as 14 social media posts reaching over 8,000 accounts (shared 55 times and resulting in over 200 comments, reactions, or shares). In addition to the structured meetings and workshops listed above, CRWD staff attended 17 community events from April 20, 2019 through June 30, 2019 to advertise stakeholder engagement opportunities and solicit input via surveys. Events included:

- Urban Roots Cleanup native planting cleanup event at Bang Brewing
- St. Paul Cleanup events at 7 locations
- St. Paul Regional Water Service (SPRWS) tours
- Waterfest at Phalen Lake
- Como Lake Cleanup
- Lowertown Cleanup at Mears Park
- Parkview 1<sup>st</sup> Grade Field Day at Lake McCarrons
- Falcon Heights Spring Together
- Frogtown Farm Community Celebrations
- Dragonfly Bonanza at Trout Brook Nature Sanctuary
- Peace Celebration at Ober Community Center

Engagement strategies and methods are documented in detail in Section 3 of the Stakeholder Outreach Plan.

## 2.0 Stakeholder Outreach Results

This section summarizes the input received from the various stakeholder outreach activities. In total, CRWD received over 800 comments from the responses to the notification letter, workshops, and face-to-face meetings. Over 150 people completed the online survey (120 short form, 43 long form).

The variety of activities and methods used during stakeholder outreach limits the use of a single, quantitative method to evaluate all input. Instead, the following sections summarize outreach results by activity. Overall results and emerging themes are described in Section 3.0; recommendations for issue prioritization and organization in the Plan are included in Section 4.0.

### 2.1 Responses to Notification Letter

CRWD received responses to the Plan update notification letter from the following organizations:

- City of Falcon Heights
- City of Roseville
- City of St. Paul
- Metropolitan Council
- Minnesota Board of Water and Soil Resources (BWSR)
- Minnesota Department of Natural Resources (MDNR)
- Minnesota Pollution Control Agency (MPCA)
- Ramsey County

Comments provided in the responses to the notification letter are summarized in Table 1; comments are varied in specificity and applicability. Responses from cities generally addressed specific, local issues (e.g., maintenance of the Villa Park weir system). Specific problem areas identified in the City responses will be useful in establishing the Plan implementation program. Several comments addressed the issue of establishing measurable goals and assessing CRWD's progress and performance. Other comments in the responses to the notification letter identified potential issues to be addressed in the Plan (e.g., invasive species, green infrastructure) but generally did not focus on the characteristics of the issue specific to CRWD. Issues identified in the responses to the notification letter were also incorporated into the TAC workshop to provide opportunities for clarification/elaboration (see Section 2.2).



**Table 1 Summary of Responses to Plan Update Notification Letter**

Agency or Local Government Unit	Comment Summary	Comment Topic
City of Falcon Heights	<ul style="list-style-type: none"> <li>- Update flood mapping</li> <li>- Projects to reduce flood risk</li> </ul>	<ul style="list-style-type: none"> <li>- Flood risk</li> <li>- Partnerships</li> </ul>
City of Roseville	<ul style="list-style-type: none"> <li>- Update flood mapping</li> <li>- Projects to reduce flood risk</li> </ul>	<ul style="list-style-type: none"> <li>- Flood risk</li> <li>- Partnerships</li> </ul>
City of St. Paul	<ul style="list-style-type: none"> <li>- Partnerships for regional treatment</li> <li>- Water quality permitting partnerships</li> <li>- Natural resource management partnership opportunities</li> <li>- Como Lake water quality</li> </ul>	<ul style="list-style-type: none"> <li>- Water quality</li> <li>- Regulation</li> <li>- Partnerships</li> <li>- Ecosystem health</li> </ul>
Ramsey County	<ul style="list-style-type: none"> <li>- Projects to reduce flood risk</li> <li>- Studies to inform LGU flood actions</li> </ul>	<ul style="list-style-type: none"> <li>- Flood risk</li> <li>- Partnerships</li> </ul>
BWSR	<ul style="list-style-type: none"> <li>- Need for strong stakeholder input</li> <li>- Measurable goals drive prioritized, targeted implementation</li> <li>- Self-evaluation tied to measurable goals</li> </ul>	<ul style="list-style-type: none"> <li>- Education/outreach</li> <li>- Measurable goals</li> <li>- Implementation</li> <li>- Evaluation/reporting</li> </ul>
MDNR	<ul style="list-style-type: none"> <li>- Use of watershed health assessment framework</li> <li>- Several "recommended actions" provided</li> </ul>	<ul style="list-style-type: none"> <li>- Ecosystem health</li> <li>- Flood risk</li> </ul>
MPCA	<ul style="list-style-type: none"> <li>- Incorporate and implement strategies from TMDLs (Como, chloride, MS River TSS)</li> <li>- Prioritized areas for implementation</li> <li>- Quantitative assessment of progress towards measureable water quality goals</li> </ul>	<ul style="list-style-type: none"> <li>- Water quality</li> <li>- Measurable goals</li> <li>- Implementation</li> <li>- Evaluation/reporting</li> </ul>
Met Council	<ul style="list-style-type: none"> <li>- Consistency with 2040 Policy Plan</li> <li>- Measurable goals to address issues</li> </ul>	<ul style="list-style-type: none"> <li>- Measurable goals</li> </ul>

## 2.2 TAC Workshop

CRWD hosted a TAC workshop at CRWD's offices on May 22, 2019. Fifteen TAC members representing CRWD municipalities, State and regional agencies, and major institutions attended the workshop. At the TAC workshop, CRWD used the 20 issue statements from the 2010 CRWD Plan as a starting point for facilitated discussion. The 20 issue statements were organized on posters according to nine "Topic Areas" as follows (generally based on the 2010 CRWD Plan):

1. Education and outreach
2. Water quality (included as part of Urban Stormwater Management in the 2010 Plan)
3. Water quantity (included as part of Urban Stormwater Management in the 2010 Plan)
4. Monitoring and data
5. Funding and organization
6. Regulation and enforcement
7. Ecosystem health
8. Future trends
9. Other

Comments/issues provided in response to the Plan update notification letter (see Section 2.1) were added to the appropriate topic area posters (as those comments were generated by organizations participating in the TAC). TAC participants were divided into groups of 3-4 and asked to provide additional comments or issues to the appropriate topic area posters. The TAC generated 120 issues/comments during the exercise in addition to comments provided in the responses to the notification letter. After the additional comments/issues had been added, TAC members were given 10 stickers to vote for the 10 highest priority issues (one sticker per issue/comment). The TAC identified the following comments/issues as the highest priority (three of which come from the 2010 CRWD Plan, shown in bold text):

1. **Coordination with District partners on regulatory issues is needed for more efficient and effective stormwater regulation across all jurisdictions** (Regulation category, 9 votes)
2. Focus on climate resilience (Future trends, assigned to Water Quantity category, 8 votes)
3. **Regular maintenance is critical to the success of stormwater BMPs and is not consistently performed to achieve desired performance** (Water Quality category, 7 votes)
4. Ongoing engagement and collaboration with government, institutions, and other partners (Education and Outreach category, 6 votes)
5. Study to evaluate options for regional treatment (Water Quality category, 5 votes)
6. Increased focus on flood risk in response to Atlas 14/climate trends (Water Quantity category, 5 vote)
7. CRWD is uniquely positioned to be the convener of cities, government, large property owners, to work together on shared WQ goals (Funding and Organization category, 5 votes)
8. **The land within the District developed during a time when resource protection was not a priority. As a result, there are a number of opportunities to restore historic resources** (Ecosystem Health category, 4 votes)
9. Establish of native grassland and herbaceous plant communities in place of mowed turf grasses on watershed and highway projects (Ecosystem Health category, 4 votes)
10. Work with cities to eliminate excess pavement; how will future transportation allow this to happen? (Water Quantity category, 4 votes)

11. Update/create 100-year flood mapping and identify vulnerable areas (Water Quantity category, 4 votes)
12. Identify long-term opportunities for District/regional scale stormwater projects (Water Quality category, 4 votes)

After the workshop, the issues/comments identified by the TAC (excluding the existing issues from the 2010 Plan) were categorized into 9 possible topic areas (including topic areas 1-7 listed above and categories for “Groundwater” and “Quality of Life/Recreation”). Comments from the “Other” and “Future Trends” workshop topic areas were redistributed among the other nine categories, as appropriate. Comments addressing multiple topic areas were assigned to a single topic area most directly related to the comment. A breakdown of the number of TAC comments/issues by category is presented in Figure 1 (*note that the total number of issues identified in each category does not reflect the number of votes assigned to individual comments within those categories*).

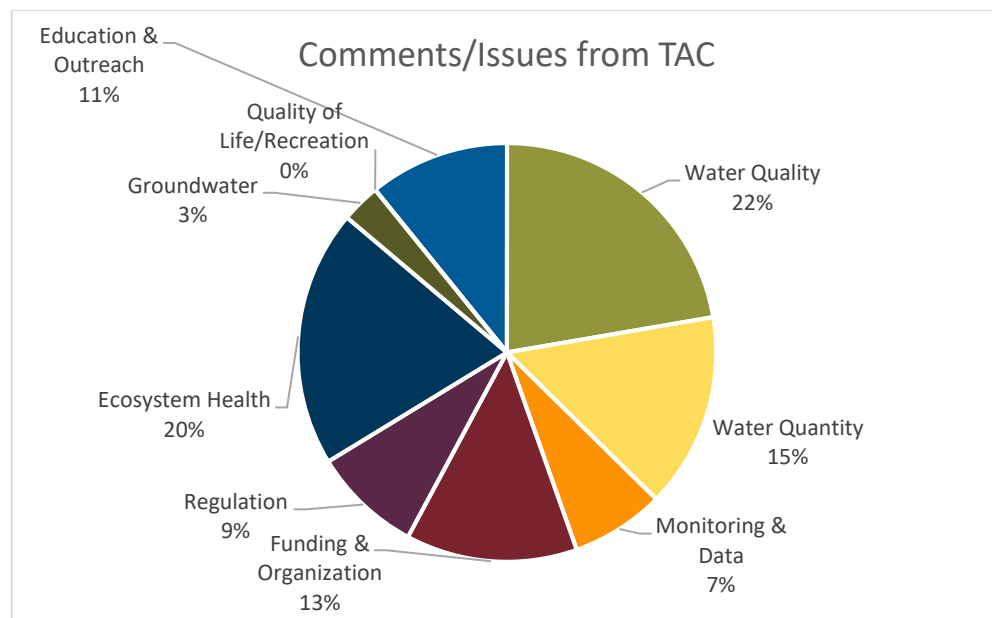


Figure 1 Comments from TAC by category

## 2.3 CAC Workshop

CRWD hosted a CAC issue identification/prioritization workshop at CRWD’s offices on June 12, 2019. Eight CAC members were in attendance. CRWD again used the 20 issue statements and nine topic areas based on the 2010 CRWD Plan (see Section 2.2) as a starting point for the CAC workshop. CAC participants were divided into groups of 3-4 and asked to review the existing issues and add new comments/issues to the appropriate topic area posters. The CAC generated 120 issues/comments in addition to the 20 issues from the 2010 CRWD Plan. After CAC members had the opportunity to add comments/issues to each poster, each CAC member was given 10 stickers to vote for the 10 highest priority issues. The CAC identified the



following comments/issues as the highest priority (several of which are issues from 2010 CRWD Plan, shown in bold text):

1. **Coordination with District partners on regulatory issues is needed for more efficient and effective stormwater regulation across all jurisdictions** (Regulation category, 9 votes)
2. **Future watershed management strategies need to be responsive to emerging issues resulting from climate change and technological advances** (Future Trends category reclassified as Funding and Organization category, 4 votes)
3. **Within an urbanized area, runoff from impervious surfaces is directed to storm sewers and discharged to surface waters rather than infiltrating into the ground resulting in reduced groundwater recharge and impacts to receiving waters** (Water Quantity category, 3 votes)
4. Be a strong presence at neighborhood meetings (Education and Outreach category, 3 votes)

An additional 15 comments each received two votes (including 5 additional issue statements from the 2010 Plan). The 15 comments with two votes each were distributed among the topic categories as follows:

- Ecosystem Health – 5 comments with 2 votes (including 2 issues from the 2010 Plan)
- Education and Outreach – 4 comments with 2 votes
- Water Quality – 3 comments with 2 votes (including 3 issues from the 2010 Plan)
- Water Quantity – 2 comments with 2 votes
- Funding and Organization – 1 comment with 2 votes (from the 2010 Plan)

As was done following the TAC workshop, the comments generated by the CAC staff were categorized according to the 9 general topic areas. The breakdown of CAC comments is presented in Figure 2.

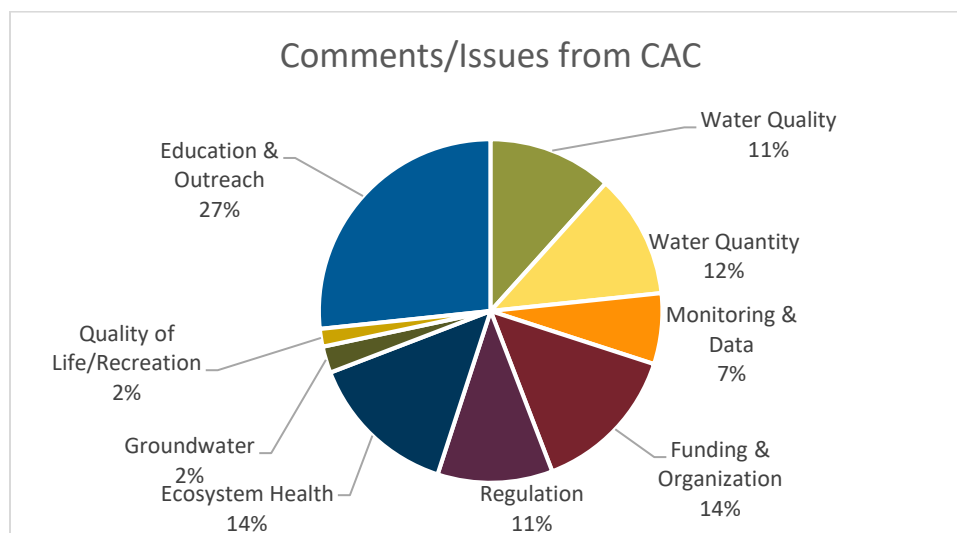


Figure 2 Comments from CAC by category

## 2.4 CRWD Staff Workshop

Similar to the TAC and CAC workshops, CRWD staff participated in an issue identification prioritization workshop. Using the 20 issue statements and nine topic areas based on the 2010 CRWD Plan as a starting point (see Section 2.2), CRWD staff generated 286 new issues or comments. Because of CRWD staff's intimate knowledge of the organization, its operations, and their work, CRWD staff were encouraged to consider how identified issues have evolved since the 2010 Plan and how they may evolve in the future. After CRWD staff had the opportunity to add comments/issues to each poster, they used 10 stickers to vote for the 10 highest priority issues. CRWD staff identified the following comments/issues as the highest priority (none of which are issues from 2010 CRWD Plan):

1. Regulate sites less than 1 acre (Regulation category, 7 votes)
2. Regulate chlorides (Regulation category, 6 votes)
3. Aging infrastructure will need significant funding (Funding and Organization category, 5 votes)
4. Trash! (Water Quality category, 5 votes)
5. Major promotional efforts to get messaging out - CRWD billboard!? (Education and Outreach category, 4 votes)
6. Make the data fun/visual (Education and Outreach category, 4 votes)
7. A comprehensive plan for BMP maintenance for CRWD and partners is desperately needed (Water Quality category, 4 votes)
8. Microplastics (Water Quality category, 4 votes)
9. Build equity into all new management strategies (Funding and Organization category, 4 votes)
10. Need equity in distribution of CRWD funds (Funding and Organization category, 4 votes)
11. Building internal organization capacity and expertise to do the work (Funding and Organization category, 4 votes)
12. More ecological inventories, hubs, and corridors (existing and potential); natural resource inventories (Ecosystem Health category, 4 votes)
13. Connect ecosystem health to human health. New partnerships with underserved communities (Equality of Life/Recreation category, 4 votes)

The comments generated by CRWD staff were categorized into the same 10 general topic areas applied to the TAC and CAC comments. The breakdown of CRWD staff comments by category is presented in Figure 3. The "Future Trends" category was included in the CRWD staff workshop exercise based on the inclusion of that category in the 2010 Plan. Comments generated in this category at the CRWD staff workshop covered a broader range of topics than the comments at the TAC and CAC workshops (see Sections 2.2 and 2.3), although many comments still centered around climate change and its related impacts on CRWD's roles and responsibilities. Other comments in this category addressed topics of vegetation management, equity and income gaps, emerging contaminants, and others.

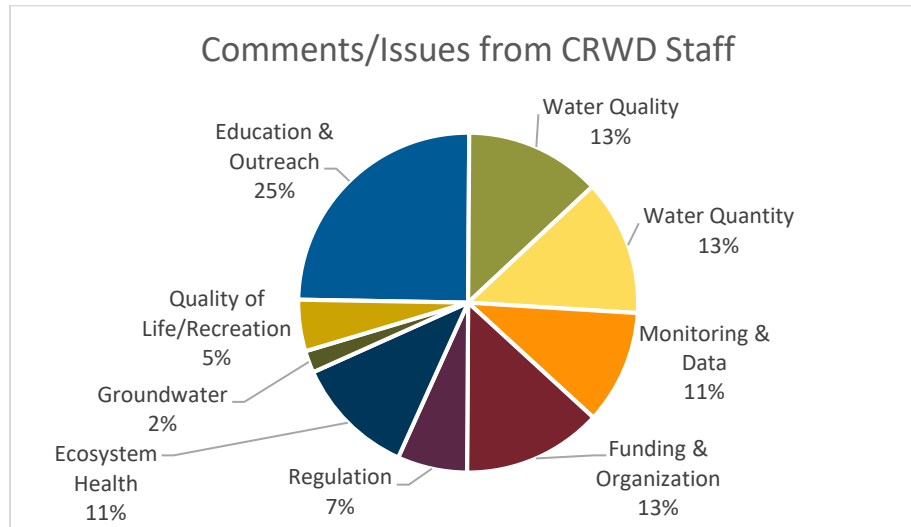


Figure 3 Comments from CRWD Staff by category

## 2.5 Watershed Community Conversations

CRWD hosted four community conversation meetings or watershed community conversations located across the watershed intended to solicit resident input on the Plan update. CRWD advertised the workshops on its website, through social media, in local newspapers and at community events attended by CRWD staff. Also CRWD partner organizations including Saint Paul District Councils advertised the community conversation events. Attendance varied by workshop. In total, over 30 community members attended the watershed community conversations. Programming at the watershed community conversations included a brief introduction to CRWD and the Plan update followed by facilitated, small group discussions focusing on three questions:

1. What are the valuable resources in your community?
2. How does the health (or quality) of water resources and natural areas affect you and your friends, family, and community?
3. Are there parts of your community or natural environments you would like to see improved? If so, how?

Discussion around these questions generated over 70 recorded comments, issues, and recommendations. Participants in the watershed community conversations did not identify priority issues through a voting exercise (as was done for the TAC, CAC, and CRWD Staff workshops). The comments were categorized similar to the TAC, CAC, and CRWD staff comments. The breakdown by category of comments received at the four watershed community conversations is presented in Figure 4.



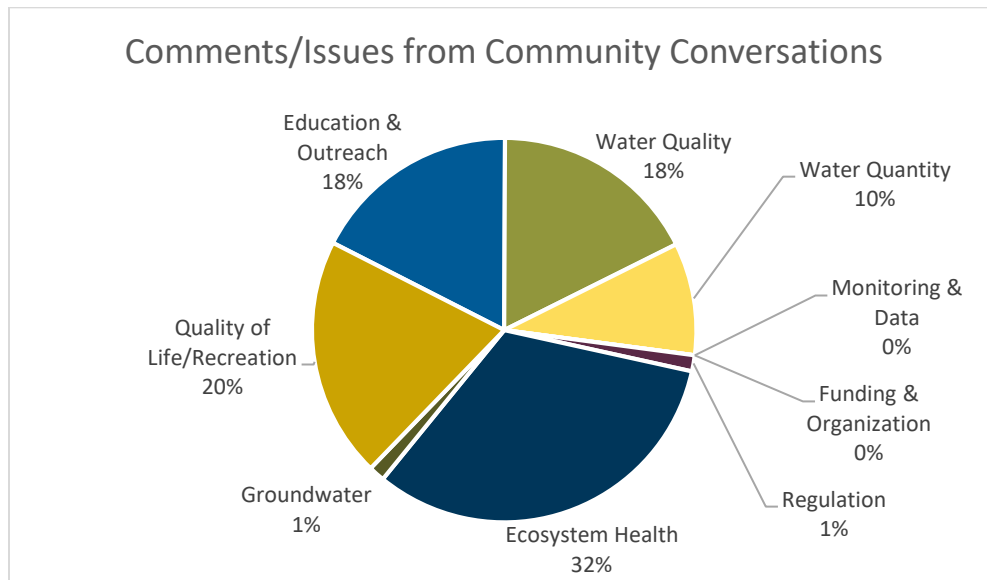


Figure 4 Comments from watershed community conversations by category

## 2.6 Face-to-Face Meetings with Community Organizations

CRWD staff performed face-to-face meetings with several community organizations (see Section 1.0). Organizations were targeted to obtain input from previously under-represented stakeholder groups (see Outreach Plan). CRWD staff conducted face-to-face meetings in a conversational format including questions related to each organization's relationship with CRWD, the community, and water and natural resources. CRWD staff also asked about specific opportunities for community and natural resource improvement and CRWD partnership opportunities.

In many cases, responses to the CRWD interview questions were unique to the community organization's mission and operation. Information about how best to support and engage with each organization will be useful in designing the Plan implementation program and future project/program execution. Some common themes were included among the interview responses, including:

- Green space is important to all populations
- Many community members do not know what they can do about water quality issues
- Lack of resources to invest in innovative or non-critical practices (e.g., rainwater reuse) limits implementation
- CRWD grant programs are valuable to, and utilized by, several organizations
- Government is often perceived as a barrier/challenge to operations
- There are additional education/engagement opportunities through:
  - o Water education at community celebrations
  - o Signage around projects and features
  - o Demonstration of technical skills and implementation of green infrastructure

## 2.7 St. Paul District Planning Council Meetings

CRWD staff contacted 13 St. Paul district planning councils as part of its stakeholder outreach efforts and attended three district planning council meetings upon request (see Section 1.0). Discussion at the North End Neighborhood Organization and Union Park District Council Environmental Committee was based on the three interview questions used at the watershed community conversations. Discussion at the Capitol River Council was more open ended and included less discussion of topics directly related to CRWD's role. Discussion at the planning council meetings generated approximately 100 comments from approximately 20 people. Frequently occurring responses/comments related to the three interview questions include the following:

1. What are the valuable resources in your community?
  - Community gardens and home gardens
  - Parks, trees, and green space
  - Mississippi River and riverfront (Capitol River Council)
  - Loeb Lake and Willow Reserve (North End Neighborhood Organization)
2. How does the health (or quality) of water resources and natural areas affect you and your friends, family, and community?
  - Natural areas promote mental well-being
  - Outdoor recreation: fishing and swimming
  - Safe drinking water
3. Are there parts of your community or natural environments you would like to see improved? If so, how?
  - a. More rainwater capture (rain gardens, rain barrels, rooftop gardens)
  - b. Incentives to reduce turf grass and landscape for clean water
  - c. Improvements to park areas (several specific areas mentioned)

Meeting participants provided over 50 comments in response to the third question, many of which are specific in nature (e.g., "Improve drainage for Rice athletic fields between Cook and Lawson"). Specific improvement suggestions will be referenced when developing the implementation program included in the Plan update. Responses to the third question were categorized among the 10 topic areas applied to the results of the TAC workshop (see Section 2.2); the results are presented in Figure 4.

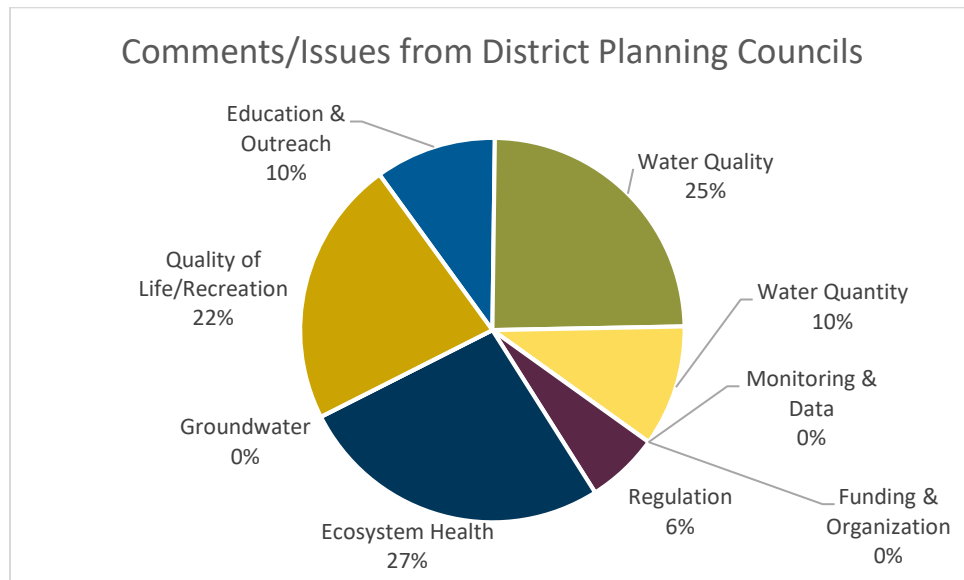


Figure 5 Comments from District Planning Councils by category

## 2.8 Survey (Long and Short Form)

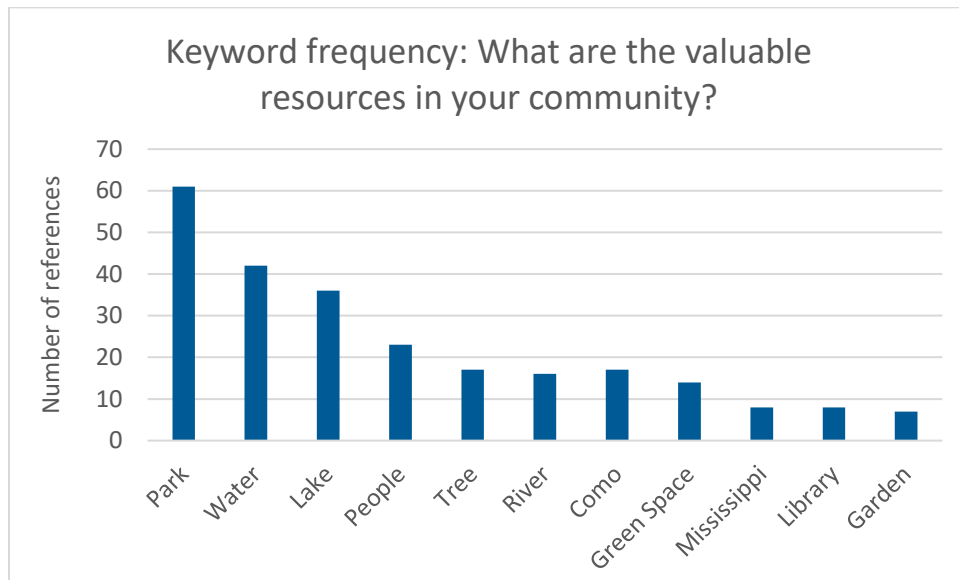
CRWD developed an online survey to obtain input from residents. A long version of the survey, hosted on CRWD's website, included 18 questions related to the value of community and natural resources, concerns about water and natural resource health, resident behaviors, and interactions with CRWD. Three of the questions from the long form were excerpted to create a short version of the survey that could be completed via tablet or paper at community events. The short version includes the same questions used at the watershed community conversations and district planning council meetings:

- What are the valuable resources in your community? (long form question 3)
- How does the health (or quality) of water resources and natural areas affect you and your friends, family, and community? (long form question 5)
- Are there parts of your community or natural environments you would like to see improved? If so, how? (long form question 8)

The long version of the survey was completed 45 times. The short version was completed 120 times. Results of the short form survey and select results from the long form survey are presented in this section. Complete results of the long form survey are available upon request.

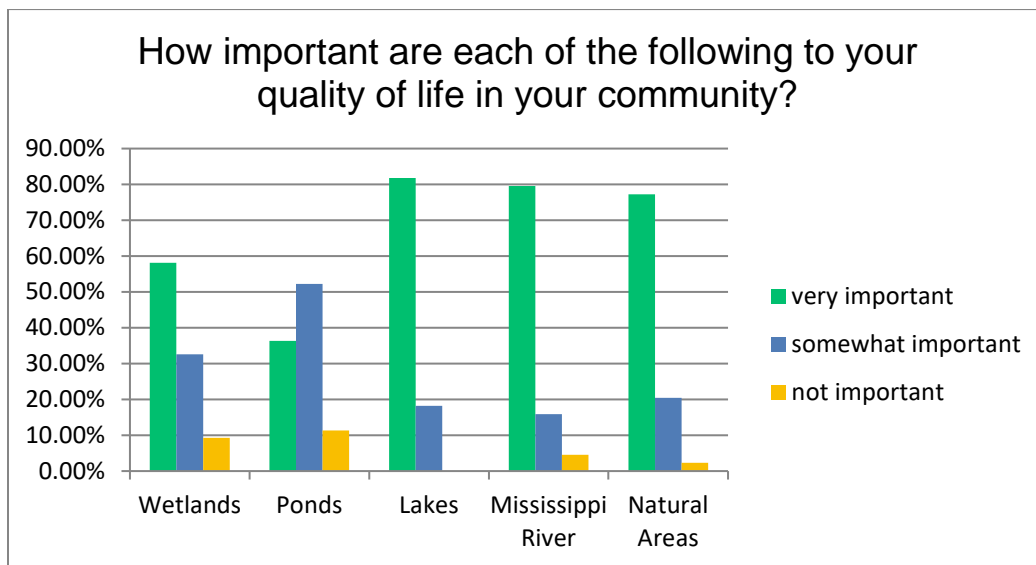
Both surveys asked respondents to identify valuable resources in the community (long form question 3). Among the results, the keywords referenced most frequently when identifying valuable resources in the community are presented in Figure 6.





**Figure 6** Keyword frequency in responses to Long Form Survey Question 3

Question 4 of the long form survey asked survey respondents to further quantify the importance of different types of resources on quality of life. The results are presented in Figure 7 generally corroborate the priority given to parks, lakes, and the river observed in the open-ended responses.



**Figure 7** Responses to Long Form Survey Question 4

Both the short form and long form survey asked: How does the health (or quality) of water resources and natural areas affect you and your friends, family, and community? Overwhelmingly survey respondents cited the following four themes among a total of 152 responses:

- **Physical health and mental wellbeing** – 54 survey responses (36%) cited physical health and/or mental wellbeing as being affected by the quality of water and natural resources. Many of these responses referenced drinking water directly. Some referenced health impacts through pathways such as food production and bathing.
- **Recreation** – 49 survey responses (32%) noted that recreation is impacted by the quality of water and nature resource. Responses cited impacts to swimming, canoeing, fishing, aesthetic viewing, and using trails. Four responses specifically noted the smell/aesthetic of Como Lake as a detractor to recreation.
- **Quality of the community** – 20 survey responses (13%) made a connection between resource health and the overall quality of the community. These responses included references to local economy, property values, resources as community gathering spaces, and contributing to overall quality of life.
- **Plant and wildlife health** – 12 survey responses (8%) referenced impacts to plant, animal, and ecosystem health stemming from water and natural resource health.

Several survey responses noted that water and natural resource health impacts “a lot” but did not elaborate on the type of impacts. Two survey responses specifically mentioned water and natural resource health as affecting education opportunities.

The long form survey further asked if there are specific resources and issues that survey respondents are concerned about (question 6) and provided a pre-populated list of issues that survey respondents could select as concerns (question 7). The specific resources most frequently cited in the 39 responses to question 6 are presented in Figure 8 and identify Como Lake and the Mississippi River as top concerns.

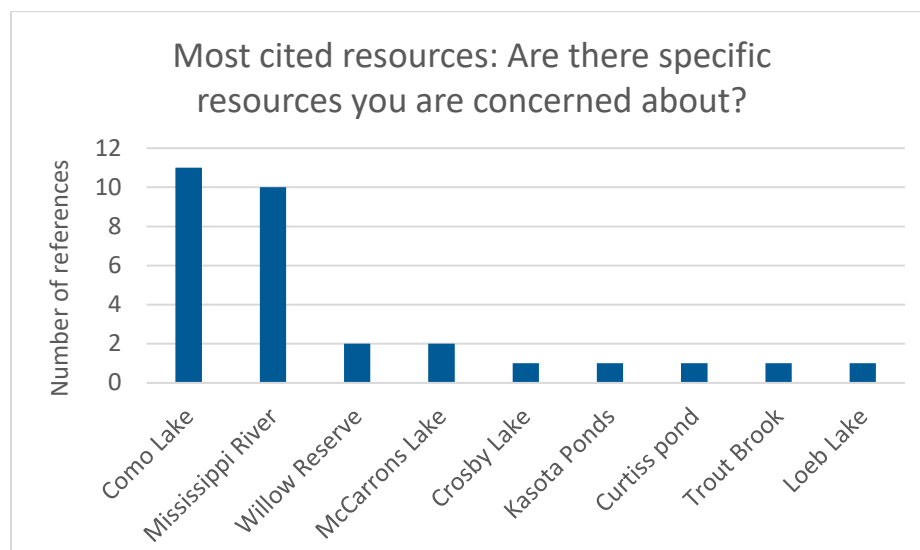


Figure 8 Responses to Long Form Survey Question 6

Figure 9 presents the top concerns as identified among 45 responses to long form survey Question 8. Other concerns identified included use of pesticides, burning or trash, and safety of residents around lakes.

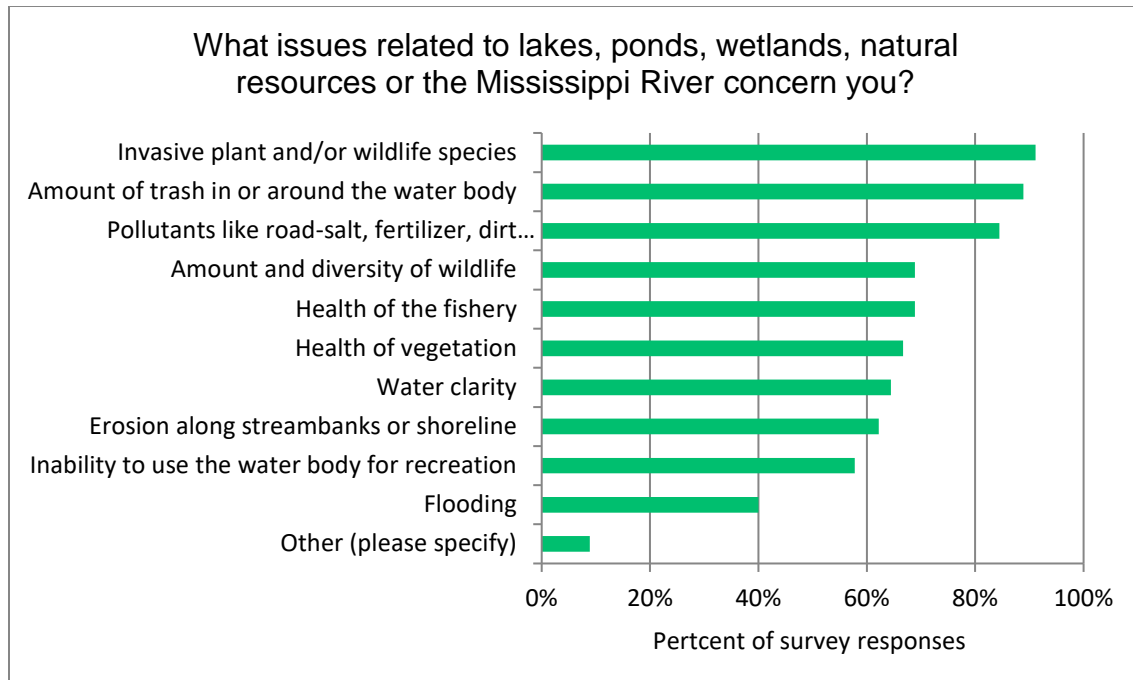


Figure 9 Responses to Long Form Survey Question 6

The short and long form surveys both asked respondents to identify if there are parts of the community or natural environment they would like to see improved (and how). The 160 responses to this question are varied, but the following themes occur most frequently:

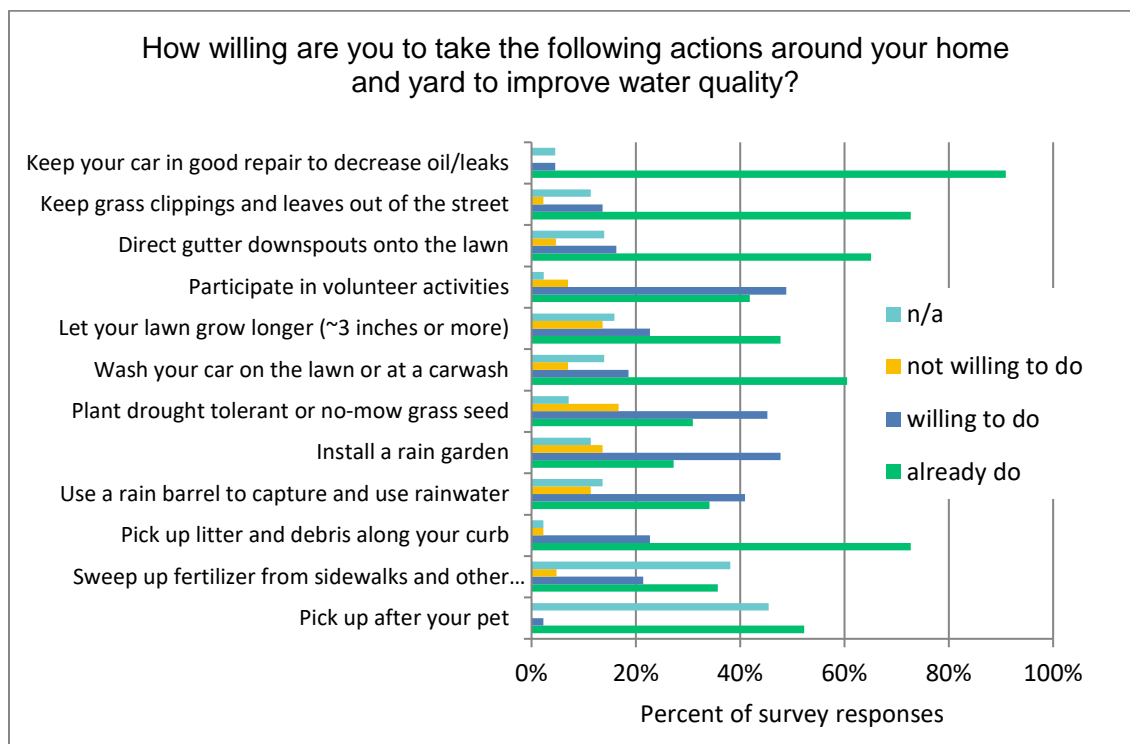
- **Trash and litter** – 31 survey responses (19%) cited excessive trash and litter in parks, raingardens, streets, and water resources as an area for improvement. Several responses suggested more frequent, organized “clean up days” or similar activities.
- **Water quality** – 25 survey responses (16%) indicated a desire for improved water quality. Specific CRWD resources referenced among the responses included: Como Lake, Lake McCarrons, and the Mississippi River. Comments addressed improving in-lake water quality (e.g., algal blooms) as well as reducing pollutant loading from the watershed. Salt and plastics were among the pollutants noted.
- **Green space and/or vegetation** – 41 survey responses (26%) sought more or improved parks, green space, and/or vegetation. Comments included references to vegetated buffers, increased tree canopy, and landscaping with native vegetation. Several comments identified specific locations for improvements.



- **Recreation and access** – 18 survey responses (11%) referenced improvements for recreation and resource access. Comments referenced increased bike paths and trails, free or reduced-cost nature camps, and more accessible paths to water resources.
- **Education and stewardship** – 11 survey responses (7%) indicated a need for increased action from homeowners and community members to address water and natural resource management issues. Comments referenced a need to increase community awareness about stewardship practices and encourage positive behaviors.

Other improvements cited less frequently included improvements to roads, sidewalks, and public safety. Several comments (14 responses) identified specific locations that will be helpful to consider when developing the Plan implementation program.

The long form survey (completed by 43 respondents) contained additional questions regarding community willingness to perform actions to improve water quality (question 9), awareness of CRWD and the Plan update (questions 10 and 11), and what actions the CRWD should emphasize in the future (question 12). Quantitative results of questions 9 and 11 are presented in Figure 10 and Figure 11, respectively.



**Figure 10 Responses to Long Form Survey Question 9**

Responses to survey question 9 indicate that many community members are already performing or willing to perform actions to improve water quality. These results, however, are based on only 23 survey responses, and may not accurately represent the community at large. The results of question 11 (see Figure 11) indicate that >70% of survey respondents are somewhat or very familiar with CRWD. This suggests that long form survey responses may over-represent community awareness of water quality issues; long form survey results may be biased towards those who are concerned about water quality issues and are willing to take action to address water quality issues.

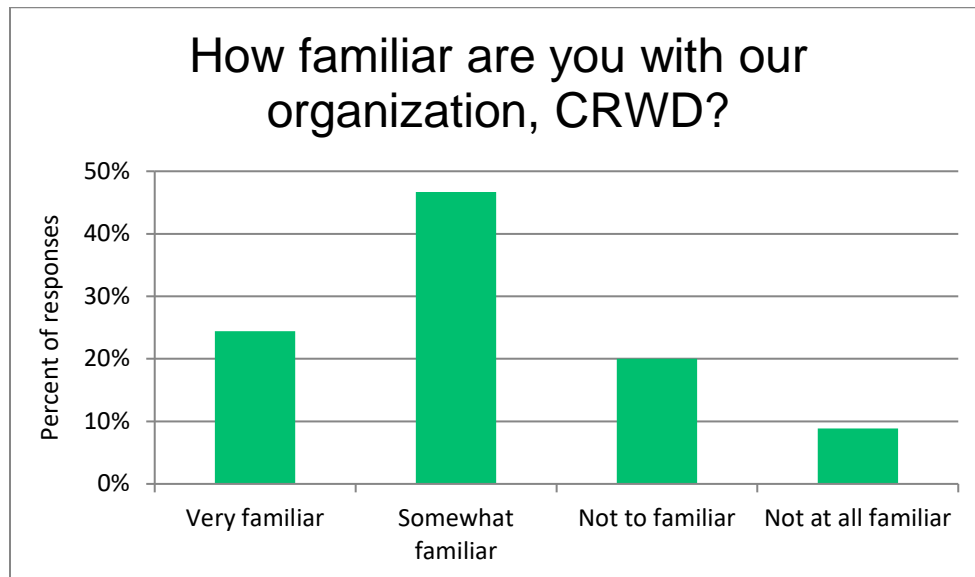


Figure 11 Responses to Long Form Survey Question 11

Twenty-two survey respondents provided input about what CRWD should start doing or do more of (question 12). Several of the responses described similar activities:

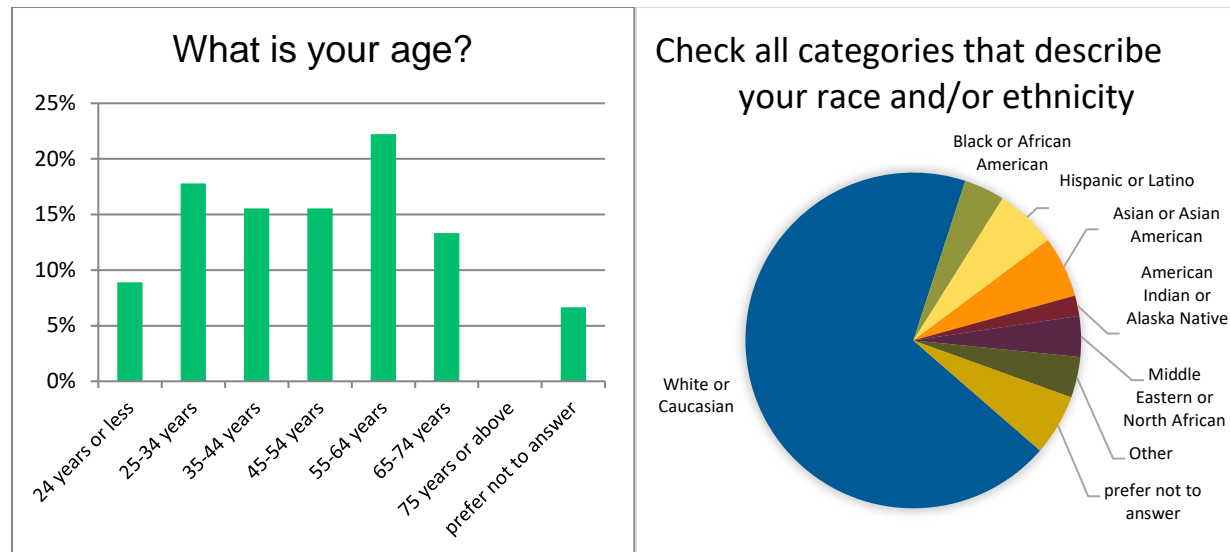
**Community engagement** – 7 responses (32%) encouraged more engagement with the community. Specific suggestions included engaging/training stormwater professionals in the community to provide local leadership, organizing volunteer clean-up events, and increasing engagement opportunities for senior citizens and residents with disabilities.

**Rain garden program** – 6 responses (27%) promoted the continuation or expansion of CRWD's rain garden program, including additional education, oversight, and financial and technical support for maintenance of existing rain gardens.

Other suggestions included additional efforts to manage invasive species, address flooding, promote the CRWD brand, work with private landowners to increase native plantings, and increase organizational transparency.

### 2.8.1.1 Survey Demographics

The long form of the survey included optional questions about the respondent's age, highest level of education, and race/ethnicity (see. Similar questions were not included in the short form survey. Age of survey respondents was well distributed between 25 to 74 years, with three respondents of 24 years or less. Of the 45 long survey responses, over 75% identified as having completed a bachelor's degree or higher (compared to an average of 40% for the City of St. Paul and 39% for Ramsey County). About 80% of survey respondents identified as white or Caucasian.



**Figure 12 Responses to select survey demographic questions**

## 3.0 Aggregate Results

The stakeholder outreach activities conducted by CRWD have generated significant input from target audiences (see Section 2.0). The range of target audiences (e.g., TAC, CAC, community members) and outreach formats (e.g., survey, interview, voting exercise) prevent the application of a single method or tool to concisely summarize stakeholder input. However, some common themes and items of significance among the stakeholder outreach results include:

1. **The issues addressed in the 2010 CRWD Plan remain relevant in 2019.** The issue statements and topic categories from the 2010 CRWD Plan were used as a basis for organizing comments from the TAC, CAC, CRWD Staff, and watershed community conversations. Comments from the workshops were broadly distributed across all categories (see Figure 1, Figure 2, Figure 3, and Figure 4), indicating the continued relevance of a range of issues. Comparison of Figure 1 through Figure 4 identify issues related to Water Quality, Education and Outreach, and Ecosystem Health as high priorities regardless of audience. In both the TAC and CAC workshops, specific issue



statements from the 2010 CRWD Plan were identified as top priorities through a voting exercise, including the following issues statements from the 2010 Plan:

- Coordination with District partners on regulatory issues is needed for more efficient and effective stormwater regulation across all jurisdictions (Regulation category)
- Regular maintenance is critical to the success of stormwater BMPs and is not consistently performed to achieve desired performance (Water Quality category)
- The land within the District developed during a time when resource protection was not a priority. As a result, there are a number of opportunities to restore historic resources (Ecosystem Health category)
- Future watershed management strategies need to be responsive to emerging issues resulting from climate change and technological advances (Future Trends category, reclassified as Funding and Organization category)
- Within an urbanized area, runoff from impervious surfaces is directed to storm sewers and discharged to surface waters rather than infiltrating into the ground resulting in reduced groundwater recharge and impacts to receiving waters (Water Quantity category)

2. **Community audiences (watershed community conversation attendees, survey respondents, district planning councils, and community organizations) emphasized issues related to quality of life and recreation.** Comments from these audiences generally included more references to quality of life, recreation, and resource access than comments from stakeholders affiliated with CRWD (CRWD staff, TAC, CAC). This is expected based on differences in how each audience interacts with water and natural resources (i.e., occupation vs. recreation), but also highlights how public expectations and priorities may differ from those of CRWD.
3. **CRWD-affiliated stakeholders (TAC, CAC, CRWD staff) highlighted regulatory and maintenance issues.** Several comments from the TAC, CAC, and CRWD staff workshop were related to continued or expanded regulatory programs. Regulatory-related issues were identified as high priority issues by the TAC (see Section 2.2) and CRWD staff (see Section 2.4). The TAC, CAC, and CRWD staff all prioritized issues related to ongoing maintenance of BMPs and capital projects.
4. **Strong emphasis on/concern for green space, vegetation, and ecosystem health.** Input from all stakeholder groups identified the recreational and/or ecological importance of green space and vegetation. Trees and native vegetation were the focus of many comments ranging from technical audiences (TAC, CRWD staff) to community members. Comments from community- and CRWD-affiliated stakeholder audiences encouraged an increased role in vegetation management for CRWD. Several comments made the connection between vegetation issues and climate change.
5. **Strong emphasis on water quality, though specific concerns vary.** All stakeholder groups voiced comments and concerns about water quality (see Figure 1 through Figure 5 and Figure 9).

Comments covered a broad range of “water quality” concerns, including aesthetic problems, pollutants like salt, plastics, and nutrients, and safety of drinking water. A range of audiences identified trash as a high priority concern. The range of concerns highlights differences in the technical background and expectations of each stakeholder audience.

6. **TAC-specific concerns about flooding.** Across most of the stakeholder outreach activities, very few stakeholder comments were related to flooding. Flooding, including site-specific concerns, was identified as a priority item for several TAC members.
7. **Focus on inclusive engagement and community action.** All stakeholder groups commented on the role of the community on water and natural resource management and the need for increased community engagement and action. Multiple audiences noted the difficulty in developing community capacity and motivation for action. Several comments noted difficulties engaging historically under-represented groups (as well as identified opportunities). Comments generally eschewed passive educational roles (e.g., distributing information) and promoted interactive (and labor intensive) programs and opportunities.
8. **Climate change and climate resilience are over-arching issues affecting all CRWD activity.** Comments from several stakeholder audiences noted concerns over current and continued climate trends. Comments from CRWD staff identified multiple ways climate change will impact a broad range of CRWD operations.
9. **Assessment of progress.** Several comments from the TAC, CAC, and CRWD staff emphasized the need for increased assessment of CRWD’s projects and programs to promote cost-effectiveness and demonstrate progress towards goals. This issue was not identified among community audiences.
10. **Opportunities for partnerships.** Numerous comments from the TAC, CAC, and CRWD staff workshops cited opportunities to leverage partnerships to increase CRWD effectiveness. Interviews with community organizations (see Section 2.6) identified specific opportunities for CRWD collaboration. Survey responses also suggest that partnerships may be important in addressing issues traditionally outside of CRWD purview, but of concern to the public (e.g., recreational access).

## 4.0 Recommendations for Issue Prioritization

CRWD’s Board of Managers are tasked with establishing priority resources and issues to be addressed by the Plan. These priority issues and resources are generally more specific than the higher-level, organizational priorities established in CRWD’s 2019 Strategic Plan. Our recommendations for issue prioritization are discussed in this section and consider the 2010 CRWD Plan and results of the stakeholder outreach efforts.

Overall, the results of the stakeholder outreach activities corroborate the issues prioritized in the 2010 Plan. Many stakeholder comments focus on the same topics included in the 2010 Plan while highlighting

potential new emphases and/or specific concerns. Therefore, we recommend the following issue priority and organizational structure for the 2020 Plan:

- Resource Issues
  - Water quality
  - Ecosystem health
  - Water quantity and flooding
  - Land use, imperviousness and built environment?
- Organization Issues
  - Community Engagement
  - Communications
  - Regulation
  - Organization and funding
  - Infrastructure Management – Operations and Maintenance

We recommend that the Plan generally distinguish between “resource” issues (i.e., physical) and “organization” (i.e., non-physical) issues based on estimated differences in how CRWD will approach these types of issues. We recommend that resource issues be presented without priority or ranking, owing to the potential for overlap between individual resource issues (e.g., issues related to “infiltration” may be related to water quality, water quantity, and/or land use).

We recommend the elimination of the “Future Trends” issue category included in the 2010 Plan. All of the issues identified in this category in the TAC, CAC, and CRWD staff workshops were applicable to one or more of the proposed issue categories listed above (e.g., emerging contaminations = water quality) or fall under one of the overarching themes (e.g., climate resilience).

We also recommend that the Plan discuss the following overarching themes as applicable to all issues (including themes from the 2010 Plan, shown in bold):

- **Bring water back to St. Paul**
- Community equity and engaging underrepresented groups
- Recreation
- Quality of life
- Climate change and resilience
- **Partnerships**
- **Innovation**
- **Adaptive Management**

The topics listed as overarching themes were highlighted by many audiences throughout the stakeholder outreach efforts, identified both as stand-alone issues (e.g., “More partnerships”) and in reference to other



**To:** Anna Eleria, Capitol Region Watershed District  
**From:** Greg Williams  
**Subject:** Summary of Results from the Capitol Region Watershed District 2020 Plan Update Stakeholder Outreach  
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issues (e.g., “Partnerships to develop regional stormwater treatment). These themes are anticipated to be applicable to a wide range of CRWD projects and programs in varying degrees: as driving forces (e.g., planning for climate resilience), tools to facilitate implementation (e.g., partnerships for cost-share), and as direct or indirect benefits (e.g., enhanced quality of life). Because of the breadth of influence of these issues, we recommend the Plan discuss these issues as applicable to all of CRWD’s projects and programs and include strategies and/or examples of how CRWD activities will consider these themes during the life of the Plan.

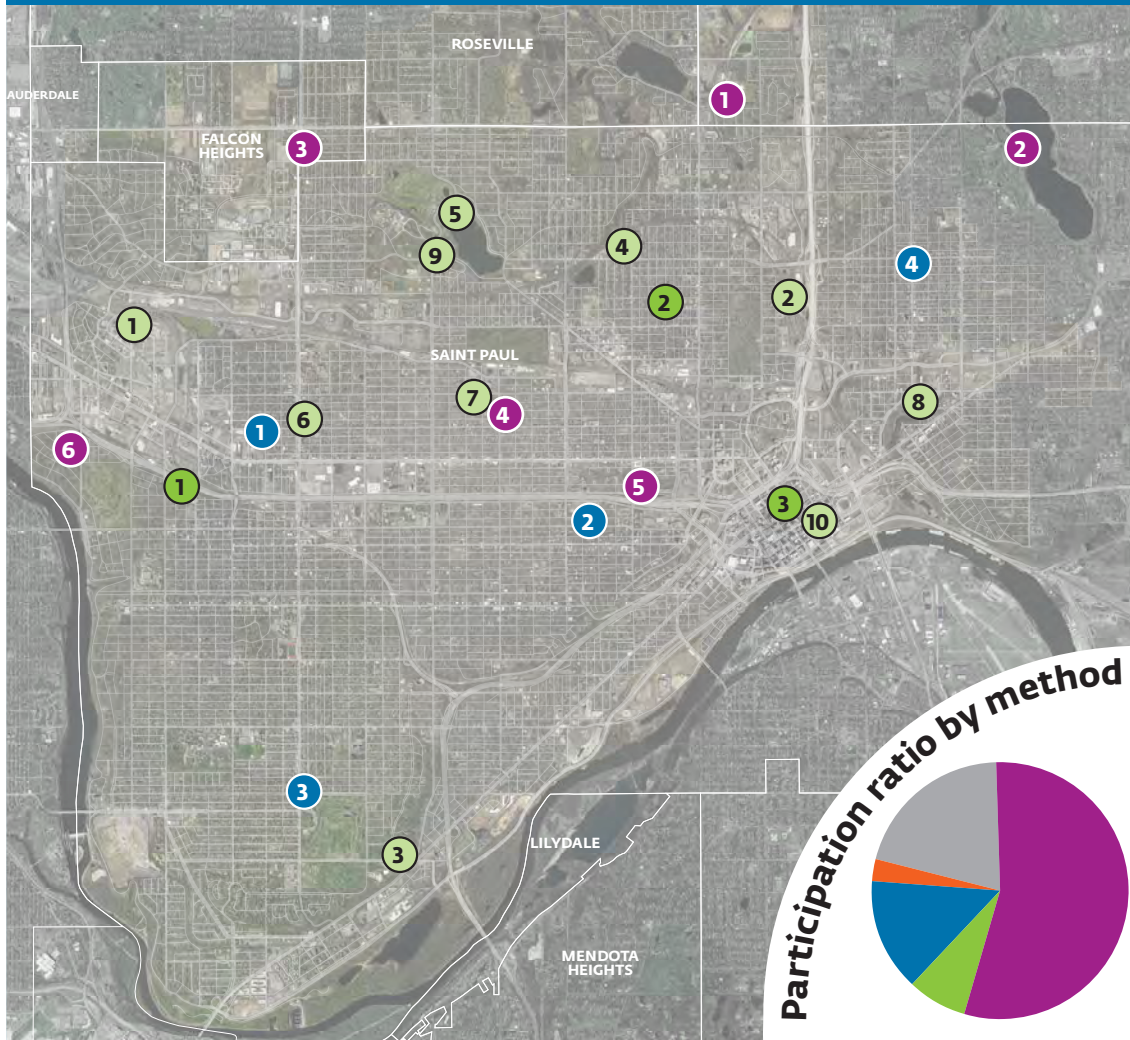
# 2020 WATERSHED MANAGEMENT PLAN

## COMMUNITY PARTICIPANT SUMMARY

As part of the development of the 2020 Watershed Management Plan (WMP), Capitol Region Watershed District (CRWD) conducted outreach activities from April through June 2019 to gather input from a broad, diverse group of stakeholders in order to gain an understanding of their views related to water in their community.

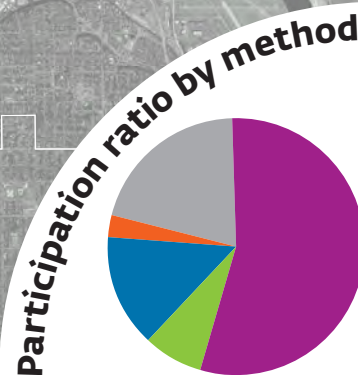


### Locations of Stakeholder Engagement Opportunities



#### Methods of Community Input:

- Participation at community events in the district
- Discussions with District Planning Councils
- Watershed community conversations
- Face-to-face meetings with community leaders
- Online surveys



#### Saint Paul cleanup events

- 1 Urban Roots
- 2 Trout Brook Nature Sanctuary
- 3 Highland Picnic Area
- 4 Willow Reserve
- 5 Como Lakeside Pavilion
- 6 Hamline Park
- 7 Frogtown Farm
- 8 Swede Hollow
- 9 Como Lake
- 10 Lowertown

#### Community events

- 1 St Paul Regional Water Services Tours
- 2 RWMWD Phalen Lake WaterFest
- 3 Falcon Heights Spring Together
- 4 Frogtown Farm Community Celebration
- 5 Peace Celebration
- 6 Desnoyer Park Neighborhood Annual Picnic

#### In-person meetings with local leaders

- 1 Union Park District Council
- 2 North End Neighborhood Organization
- 3 Capitol River Council

#### Watershed community conversations

- 1 CRWD Office
- 2 Hallie Q. Brown Community Center
- 3 Gloria Dei Lutheran Church
- 4 Arlington-Hills Community Center

# VIEWS OF WATER RESOURCES IN THE COMMUNITY

Community members shared their thoughts on valuable community resources, citing recreational benefits and the importance of access to water and natural resources on their lives, and opportunities for resource improvement. Many participants noted the influence of water and natural resources on their physical health and overall well-being, citing recreational benefits of access to high-quality natural areas. Trees, vegetation, and green space were cited as valuable resources and areas for improvement, while many respondents noted concerns of pollution and climate change.

What are the valuable resources in your community?



Are there parts of your community or natural environment you would like to see improved?

Water Quality  
(Pollutants)

Trash & litter

Green space  
& vegetation

Recreation  
and access

Education and  
stewardship

How does the health (quality) of water resources and natural areas affect you and your community?

#1 Physical health and mental well-being

#2 Recreation

#3 Quality of community

#4 Plant and wildlife health

## KEY OUTCOMES

- Strong emphasis on vegetation, green space, and associated benefits for recreation and quality of life
- Concerns about the impact of climate change on water resources and vegetation
- Interest in community participation through rain gardens and other practices
- Increase public awareness of local water resources and CRWD's work to improve resource health

The Mississippi River and Como Lake are resources respondents were most concerned about.

For future updates and more information on the WMP, visit:  
<https://www.capitolregionwd.org/watershed-management-plan/>

Find us on social media!





## Appendix C

### CRWD Strategic Plan

# CRWD Strategic Plan, June 13, 2019

In late 2018, Capitol Region Watershed District began a strategic planning process. The strategic plan was timed to be completed ahead of the District's 2020 Watershed Management Planning process and sought to understand the current situation and define the vision, values and high-level goals of the organization for the next 10 years. A detailed description of the planning process can be found in Appendix 1.

## Mission

To protect, manage and improve the water resources of Capitol Region Watershed District

## Vision statement

Cleaner waters through innovative, resilient and equitable watershed management in collaboration with diverse partners.

## Values

The District values our vibrant, and varied communities and strives to focus our work to support the goals of each community. We complete our work with the following values:

- **Integrity:** transparency, accountability, fiscal responsibility
- **Diversity:** equity, inclusion, openness
- **Collaboration:** strategic partnerships, communities
- **Innovation:** bold, science-based

## Goals (desired future condition)

### 1. Cleaner waters

*Measurably cleaner water resources will be achieved as documented by conventional water quality metrics. Additionally, the public perceives that the District's water resources are noticeably cleaner.*

### 2. Stormwater managed to mimic natural hydrology

*Stormwater management approaches, that include more green infrastructure systems, will improve water quality, recharge groundwater, achieve healthy ecosystems and provide multiple other benefits for the community. Stormwater runoff is embraced as a resource instead of a waste product.*

### **3. Communities connected to water**

*Re-establish historic or previously lost water resources. Connect communities to water resources to achieve more equitable access to water across all communities of the District.*

### **4. Community awareness and action for water quality**

*Community understanding and support of the need for and value of clean water is foundational to implementing the work of the District and accomplishing our mission. A community that is engaged and informed is empowered to take action.*

### **5. Resilient watershed management strategies**

*Changing climate will require the District to incorporate resilient strategies and practices into everything we do. Through implementation of adaptive management, the District will achieve more resilient water management infrastructure.*

### **6. Improved, consistent water governance**

*Water governance will be more consistent, streamlined, and equitable in and adjacent to the District. Consistent watershed boundaries and regulation across municipal jurisdictions will result in better and more efficient efforts towards water quality improvement.*

### **7. Equity in the work of CRWD**

*Diversity of our community will be reflected in the District's staff, board and Citizen Advisory Committee (CAC). Programs and projects are offered and implemented equitably across the watershed.*

### **8. Organizational excellence**

*The District will be a key partner and innovator, both locally and nationally. The District will implement industry-leading work while widely sharing our experiences to help advance the field of water management. The District will be a creative and collaborative workplace with passionate, skilled staff, CAC and Board Managers.*

## **Strategies (actions to achieve our goals)**

### **A. Leadership (Lead in stormwater management)**

#### **1. Increase implementation of green infrastructure**

The District will continue to promote green infrastructure. This approach to stormwater management provides additional community benefits (social, environmental, economic) beyond the stormwater function and focuses on rain as a resource rather than a waste product to be managed.



## **2. Bring water back to St. Paul**

The District will work to restore/re-create water resources that have previously been lost or buried. This strategy includes bringing water back to the consciousness of the community through increased awareness, connection, and access to water.

## **3. Innovate using new technologies and research**

The District will innovate when developing, implementing and evaluating its programs and projects to be most effective in carrying out its mission. Research, including practical application of new technologies, will be critical to effective innovation.

## **4. Ensure long-term project operation and maintenance**

Significant investment has been made in stormwater management practices. Providing adequate resources and commitment to ensure long-term operation and maintenance is critical to making sure these investments are protected and continue to function as designed.

## **5. Implement targeted water management projects that improve water quality, are resilient and provide community benefits**

The District will ensure that the most value is derived from funds spent to implement water management projects. These strategic investments will be maximized through targeted identification and prioritization of cost-effective projects that are resilient to climate change and provide equitable community benefits.

# **B. Inspiration (Inspire and engage stakeholders to actively support the District's mission)**

## **6. Increase visibility to cultivate support**

Increased visibility of the District and its mission is important for long-term public support of its work. Sharing and communicating who the District is, the work we conduct and why its beneficial to the community will help to build community support.

## **7. Maintain existing and cultivate new partnerships**

The District has been successful in cultivating partnerships and will continue to maintain them. Cultivation of new partnerships will need to occur as they are a key method for implementing work to all areas of the District.

## **8. Expand connections and engage with diverse/underserved communities of CRWD**

The District will expand its work with, and in, diverse and underserved communities by connecting them to District work and focusing new projects/programming where the District has had less of a presence.

## **C. Organizational Strength (Strengthen and expand the District's role and capacity)**

### **9. Promote consistent, efficient water management, governance and funding**

Watershed District representation across all of St. Paul would provide a more consistent, equitable and efficient delivery of water resource improvement/protection work to all City residents. The District will strive for consistent water management regulations across all its member municipalities.

### **10. Hire, develop and retain high quality staff**

Passionate and highly skilled staff are vital to implementing the often times complicated and nuanced work of the District. The District will provide competitive compensation, enriching professional development, and a challenging and collaborative workplace to develop and retain high quality staff.

### **11. Recruit and retain high quality volunteers**

Support, train and empower volunteers to help expand the reach and work of the District.

# Appendix 1—Strategic Planning Process

## CRWD strategic planning process

In 2018-2019 the Capitol Region Watershed District created a 10-year strategic plan, which will guide development of the next watershed management plan. The process engaged partners and staff in assessing the current situation, reaffirming the agency’s mission and articulating values, and describing a vision of the desired future, 10-year goals and strategies to achieve the goals. Specific implementation actions will be included in the watershed management plan. The CRWD contracted with the State of Minnesota’s Management Analysis and Development (MAD) office to facilitate the planning process.

## Strategic plan elements

Elements of the strategic plan are intended to answer the following questions:

Situation assessment: What should we keep in mind as we plan for the future?

Vision: What is the desired future state we are helping to create (brief description)?

Mission: Who are we and why do we exist?

Values: How does the organization approach its work?

Goals: What specific outcomes should we look for within this broad vision?

Strategies: How will we achieve the goals?

## Situation assessment (see Appendix 2)

Over the Fall and Winter of 2018-2019 MAD met with stakeholders in one-on-one interviews and focus groups, discussing the following questions:

1. Describe in your own words the mission of the CRWD.
2. What is the CRWD doing well?
3. What are the two most important issues the CRWD needs to address?
4. What should the CRWD enhance or change in order to respond to these issues and effectively carry out its mission over the next 10 years (may include internal organizational considerations)?
5. Is there anything else you would like to comment on?

The stakeholders included:

### Focus groups

- Citizen Advisory Council
- Board of Managers
- CRWD staff

- Agency and city partners
- Grantees, citizens and community groups

### Interviews

- St. Paul Public Works Director



- St. Paul Water Resource Coordinator
- St. Paul Chief Resilience Officer
- CRWD artist in residence

## **Mission and vision**

Board members and strategic planning team members [describe team membership] met in February 2019 to review and draw conclusions about the current situation, review and confirm the agency's mission and identify possibilities for a 10-year vision. Participants also brainstormed values to complement the mission, as a way to express how the organization approaches its work.

## **Goals**

The strategic planning team met in March 2019 to review and refine products created at the previous meeting, identified goals and brainstormed strategies for achieving the goals.

# Appendix 2—CRWD 2018 Situation Assessment

## CRWD Situation assessment

**February 2019**

### Introduction

In preparation for developing a new 10-year strategic plan, the Capitol Region Watershed District (CRWD) asked Management Analysis and Development (MAD) to conduct a situation assessment. Over the Fall and Winter of 2018-2019 MAD met with stakeholders in one-on-one interviews and focus groups, discussing the following questions:

1. Describe in your own words the mission of the CRWD.
2. What is the CRWD doing well?
3. What are the two most important issues the CRWD needs to address?
4. What should the CRWD enhance or change in order to respond to these issues and effectively carry out its mission over the next 10 years (may include internal organizational considerations)?
5. Is there anything else you would like to comment on?

The stakeholders included:

#### Focus groups

- Citizen Advisory Council
- Board of Managers
- CRWD staff
- Agency and city partners
- Grantees, citizens and community groups

#### Interviews

- St. Paul Public Works Director
- St. Paul Water Resource Coordinator
- St. Paul Chief Resilience Officer
- CRWD artist in residence

MAD's summary of the interview and focus group results is presented below, for review and discussion at the February 28, 2019 meeting with CRWD board and strategic planning team members. The intent is to stimulate thinking about the vision and strategies for the CRWD's next strategic plan.

## Mission

All of the interviewees see the mission of the CRWD as to protect, manage, and improve the water resources within St. Paul or the Capitol Watershed district. Many interviewees explained that the CRWD does so through:

- Education and outreach to the public
- Advocating for water resource management
- Coordination and collaboration with other municipal and government entities for water management
- Gathering sound data and using scientific evidence for decision making
- Technical expertise and guidance in developing Best Management Practices (BMPs)
- Securing funds for projects and developing programs to promote water quality
- Playing a regulatory role such as permitting, wetland management, etc.

## Accomplishments

### Leadership

- Many interviewees described the CRWD as leaders in watershed management in the region. Some also added that that work done by CRWD is transferable and they have done a good job of sharing that knowledge.
- One interviewee noted that while in the past the CRWD's role as a regulator had caused friction, the CRWD has managed to balance its role as a regulator and partner.

### Partnership

- Several people commended the work done by CRWD to engage with stakeholders and partners in a meaningful way in the work they do. Examples include:
  - Working with cities to do cooperative projects to share dollars
  - Work with other agencies such as the Central High School parking lot project
  - Work with the city of St. Paul and individual homeowners on raingardens in the Como Park neighborhood
  - Work with the city on the storm water management project at Alliance Field by providing funds to make the system viable and cost competitive.
  - Stormwater management project along University Avenue and Aldine Street.
- One interviewee also noted that CRWD partnerships help to foster innovation in how stakeholders approach watershed management. The interviewee cited the example of the stormwater management project at Alliance Field:

*"That site is the first time the city has done a district stormwater system... the district saw the benefit of that approach. [The CRWD is] a key partner in them pursuing that approach. In fact, ordinance changes are in process to structure rates differently to users. This is really valuable to the city."*

- A few interviewees noted that the CRWD has worked on relationship building over time. One interviewee noted that they have improved their relationship with the communities compared to 10 years ago, while another discussed how CRWD has worked to build trust in their partner relationships.
- One interviewee also noted that the CRWD builds relationships not just with stakeholders in a technical capacity, but also others in the watershed communities to get their involvement in a meaningful way.



## Innovation

- Several people described the CRWD as innovative in their approach to their work. Interviewees mentioned work done by CRWD including: working with the community and individual home owners to use boulevards for raingardens; building cisterns; porous pavements, daylight Trout Brook, work with the CHS field and Met Council to collect water for watering the field and flushing toilets, etc.
- Some interviewees praised the innovative and can-do attitude in leadership and staff of the CRWD.

## Operations

- Many interviewees noted that the high level of skills and expertise of the staff at CRWD. Staff pointed out that CRWD has established ways to collaborate across projects and expertise level, and that the organizations leaderships supports the work they do.
- Similarly a few interviewees noted that the board and staff trusted each other. The board lauded the way that the staff gather information and new ideas. Staff members commended the board for governing well and described them as functional and supportive. Others noted the high level of engagement of the Citizen Advisory Committee (CAC) compared to other districts, some who do not have a CAC.
- Interviewees noted the effective management of the CRWD, including:
  - Thoughtful and informed decision on where to allocate resources and documenting logical decision making (e.g., rule making)
  - Technical expertise in watershed management with well-planned processes grounded in science
  - Clear processes for competing for funds
  - Commitment to monitoring and evaluating impact of project over long-term, and adapting strategies based on this information
  - Tracking information to build database of information (WSKI database and DIRT)
  - Ensuring distribution of projects throughout the district, and willingness to put resources to projects, and
  - Looking for projects with more comprehensive benefits (example reducing groundwater pumping and use of potable water, aesthetic benefits and ways to better engage the community, etc.

A few interviewees noted that the CRWD's skilled workforce, trust between staff and leadership, data-driven decision making, and stakeholder engagement positions them well to address the future needs of the organization.

## Future Challenges

When asked about the two most important issues on the horizon for the CRWD, interviewees noted:

### Climate change

The majority of interviewees noted that CRWD needed to address changing conditions related to climate change. Several interviewees highlighted that the changing climate, resulting in increased storm events, temperature extremes, and higher precipitation will affect how the district manages its watershed and stormwater systems. One interviewee noted about heavier precipitation, “there are going to be challenges with existing infrastructure handling those events in particular . . . requiring even larger facilities, larger pipes, which could create tension with development.” Another noted that the CRWD will need to develop a crisis communication plan. Another interviewee said the CRWD needed to make a deeper connection between water quality and climate change mitigation in its education efforts.

### Education and outreach

Many interviewees focused on changing people’s attitudes towards water through education and outreach. As one interviewee noted, the CRWD needs to “elevate the awareness and appreciation of water across the watershed. Everyone gets drinking water importance. Other water is seen as a waste product.” Specific outreach and education efforts mentioned include:

- The need to raise awareness about the CRWD and its role to build stakeholder support
- Outreach to communities who have not been engaged with in the past, such as apartment owners
- Partnership with communities that are underserved by the district now such as racial and ethnic minority groups, and connecting the work of the district to equity and justice issues. Some interviewees also noted the importance of communicating water quality messages with communities that are different from them (e.g., those who had previously lived in arid regions with different relationship to water), and suggested tapping into local knowledge and cultural heritage of other communities to deliver those messages
- Build capacity of the public to play a role in advocating for public policy changes

### Development and infrastructure

A few interviewees discussed the capacity of the existing infrastructure of the watershed management systems and highlighted future challenges related to development in the region. Interviewees noted that the region is heavily built out, with aging storm systems and infrastructure, so there is a greater need for public policy changes to build resilience. Interviewees cited priorities, such as the need to work together across county, city and the watershed to address these issues, and the need to work with policy makers and individuals to promote changes such as permeable surfaces and raingardens. One city official noted that, with the growing need for newer infrastructure, CRWD can play a role in helping stakeholders work through new systems. Another interviewee noted that CRWD should continue to guide and support the city of Saint Paul in long term maintenance of green infrastructure that has been installed.

## Addressing diversity

A few interviewees discussed the need for the CRWD to address diversity both within the organization and in how it interacts with the communities. One interviewee noted that attracting staff that is diverse is important for the CRWD stating that, “[We] cannot have people go to public meetings and tell the great things we’re doing if the staff don’t reflect the communities we serve.” Some interviewees noted that the CRWD does have a diversity plan aimed at working on issues of race, class and gender, however, as one interviewee noted implementation of the plan is a long journey.

## CRWD’s role

A few interviewees discussed the potential for growth in the role and scope of the CRWD, including:

- How to manage the staff and budget of the CRWD with the growth in the organization
- Providing funding and maintenance for BMPs that are existing and will be built over the next 10 years
- How to address emerging issues such as related to emerging contaminants, and how to address them in project planning, monitoring, and communications
- Prioritizing the initiatives of the CRWD to identify their role while being aware of capacity, and understanding the role of the CRWD within larger state system
- Tackling projects under one acre
- Providing access to water ways by providing seed money to recreation departments such as canoeing and fishing opportunities
- Attracting staff who are forward-thinking, risk-taking, and willing to try new things
- Dealing with impact of salt and road salt
- Advocating for expansion of the watershed boundary to include the rest of St. Paul, which has a lot of activity and development and needs more protection.

## Opportunities

When asked about what the CRWD should enhance or change in order to respond to the challenges outlined above and effectively carry out its mission in the next 10 years, interviewees noted the following;

- **Funding:** Interviewees noted the need to continue to funding BMPs and to develop stable and predictable funding for BMPs such as using bond financing. Other suggestions include alternative funding mechanisms to build new infrastructure to improve water quality, such as environmental impact bonds and new taxing districts. One interviewee proposed setting aside funding for future projects that may come up (e.g. Opportunity Fund).
- **Improve communication and outreach:** Interviewees discussed the need for improving outreach to communities not represented well in CRWD’s work, including expanding outreach efforts, hiring more staff dedicated to outreach and education, advancing diversity and hiring from underrepresented communities, expanding opportunities for youth stewardship (e.g., Youth Farm), collaboration with organizations (such as Fresh Water Society master water stewards, Conservation Corps, Urban Boat Builders), and using arts as an engagement tool. Other suggestions focused on enhancing the brand recognition of the CRWD, including using social media for visibility and credibility. One group suggested specific strategies such as internship and partnership programs (e.g., Kitty Anderson program at the Science Museum, and Frogtown Farm) to promote this field amongst students of color who may otherwise not be exposed to this field.



- **Collecting and sharing data:** A few interviewees discussed the need to collect data including helping communities to collect data, centralizing the data in a storm water database, to allow for more robust tracking and sharing.
- **New building:** A few interviewees the opportunity to use the new building to bring visibility to the work of the CRWD and its outreach efforts. As one interviewee noted, “[the new office will be] a much more dynamic space, designed with so many more elements that explain and illustrate water resources and stormwater management. It will help visitors to understand.”
- **Maintenance:** Interviewees also discussed the need to allocate more resources to doing inspection of previously installed projects, as well as budgeting resources to maintain those projects.
- **Partnerships:** Interviewees discussed the need to diversify partners or consultants in the work that the CRWD does, highlighting the need to target young people and bring them in to the field. They also stressed the importance of maintaining and developing new relationships with large-scale partners, individual residents, etc. Others mentioned educational institutions and other public entities for partnership in research.
- **Clear strategy and prioritization:** Interviewees also discussed the need for the CRWD to have a clear strategy for the work they do. They also discussed the need to move towards a unified sense of priorities and to develop a priority plan.

# CAC vision

In addition to responding to the same questions discussed in all of the other interviews and focus groups, the Citizen Advisory Committee (CAC) brainstormed a vision for the future as a result of the CRWD's work in its next strategic plan. Their individual brainstormed ideas are included below in regular type, and their collective vision themes are included in **boldface type**.

## **Enhanced public recognition**

- High positive visibility of CRWD among residents and organizations
- All of St. Paul + Falcon Heights + Roseville loves the CRWD
- Strong brand/image and broad name recognition

## **Water quality outcomes**

- People swimming in Como Lake safely
- At least one unimpaired water body (Como, McCarrons, etc.)
- Water leaves CRWD better and healthier than when it arrives
- Cleaner water in the sewer drains
- Increased water quality and clarity for Como
- A big impact on Ford Plant Development with high visibility
- Happy wildlife

## **Recognized leadership**

- Establish leadership beyond Minnesota . . . doing similar things in other organizations
- An organization recognized for its innovation and leadership

## **Fully engaged public in water quality activities**

- Residents managing their run-off (in a CRWD style)
- Alternatives to turf (ex. Low mow, bee lawns)
- Every drain is adopted

## **Equity, diversity in outreach**

- 10 BMPs on the East Side of St. Paul (Trout Brook area)

## **Organizational health**

- Maximize skills of CAC members to support CRWD projects
- Succession plan for staff is in place
- Secure, diverse funding sources
- Have a crisis communication plan
- Increased diversity of CRWD staff and CAC

**(Ungrouped)**

Strong sustainable partnerships with commitments to water quality

Continuing successful CRWD projects and activities

The better for CRWD the better for St. Paul/Roseville and the world

Make peace with Ma Nature

Stormwater is seen as a utility (resource that can be reused; grey water, etc.)



## Appendix D

### CRWD Diversity Strategic Plan

Value: Capitol Region Watershed District values diversity and inclusion and can achieve cleaner waters through engagement across communities.

Commitments	Innovation We will be innovative in our approaches to communities who truly represent our district.	Collaboration We will continue to collaborate across differences.	Open We will be open to the challenges our community presents as it relates to diversity and inclusion.	Passion We will approach our efforts of inclusion with the same level of passion as water resource protection.
Goals/Priorities	Action Steps	Indicators of Progress		Timeline
1. Expand CRWD’s internal awareness of the opportunities and challenges related to creating a more diverse and inclusive environment.	Action 1. a) Create safe spaces and opportunities to explore and understand unconscious bias and increase cultural competency.	Indicator 1. a) Attend 1-2 workshops or cultural experiences annually.		2018-2020, ongoing
	Action 1. b) Formalize regular reviews of progress made implementing the Diversity Strategic Plan and share with CRWD’s staff, Board and CAC.	Indicator 1. b) Provide quarterly Diversity Strategic Plan updates at CAC, Board and staff meetings.		2018-2020, semi-annual
2. Deepen relationships with many communities in CRWD by increasing outreach.	Action 2. a) Use local data to learn more about the audiences CRWD serves.	Indicator 2. a) Meet with diverse groups, community leaders and partner organizations to identify three underserved <sup>1</sup> communities to focus engagement and communications work.		2018-2019
	Action 2. b) Create an outreach plan which includes community engagement focused on building long-term, sustainable relationships.	Indicator 2. b) Implement an outreach plan for two underserved communities with guidance from members of the community.		2019-2020, ongoing
	Action 2. c) Create a communications plan which includes materials that are culturally appropriate.	Indicator 2. c) Implement a communications plan for the same two underserved communities (identified in 2. b) with guidance from members of the community.		2019-2020, ongoing
3. Increase organizational diversity and inclusion efforts by increasing recruitment of candidates who truly represent our district for staff, CAC and service providers.	Action 3. a) Identify organizations, schools and student groups working with people of color and underserved communities to encourage them to enter the environmental field.	Indicator 3. a) Engage 3-5 organizations and schools working with people of color and underserved communities.		2019
	Action 3. b) Formalize best practices in hiring staff are used to ensure an inclusive process and to provide diverse pool of candidates.	Indicator 3. b) Research and ensure best practices in hiring are used.		2018, ongoing
	Action 3. c) Outline recruitment efforts for the CAC in communities of color.	Indicator 3. c) Engage community leaders and organizations to invite participation on the CAC.		2018-2020, ongoing
	Action 3. d) Develop and implement best practices to increase contracting with Targeted Group/Economically Disadvantaged/Veteran Owned Small Businesses <sup>2</sup> .	Indicator 3. d) Increase the number of contracts and vendors from the certified Targeted Group/Economically Disadvantaged/Veteran-Owned Small Businesses.		2018-2020, ongoing
4. Be a Leader in Diversity and Inclusion.	Action 4. a) Develop and maintain a list of diversity and inclusion partners.	Indicator 4. a) Invite our partners to explore and implement diversity and inclusion efforts.		2018, ongoing
	Action 4. b) Create a leadership forum focused on sharing diversity and inclusion work with other watershed districts and partners.	Indicator 4. b) Host semi-annual diversity and inclusion workshops for watershed districts, conservation agencies and environmental non-profit organizations.		2019-2020, ongoing
	Action 4. c) Advocate for diversity and inclusion.	Indicator 4. c) Promote CRWD’s approach and efforts at a variety of forums.		2018-2020, ongoing

<sup>1</sup> Underserved is defined as communities where Capitol Region Watershed District has less presence.

<sup>2</sup> The MN Office of State Procurement's Targeted Group/Economically Disadvantaged/Veteran-Owned Small Business Procurement Program supports small businesses owned by a woman, racial minority or person with a substantial physical disability and certified as Economically Disadvantaged or Veteran-Owned.

## Appendix E

### CRWD Communications and Engagement Plan





## Communications and Engagement Plan

February 5, 2020

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## Executive Summary

Capitol Region Watershed District (CRWD) is in the process of creating a 10-year Watershed Management Plan (WMP). As part of that process, the District engaged Tunheim to create this Communications and Engagement Plan to be incorporated into the management plan.

### Methodology

In order to create the recommended strategies described in this Communications and Engagement Plan, Tunheim reviewed previous plans, talked to internal stakeholders, analyzed current communications and engagement tools and vehicles, and reported preliminary findings. The strategies and tactics recommended in this Plan are based on those findings.

### Key Audiences

Because Tunheim's analysis showed that many of CRWD's key audiences had low levels of existing awareness of CRWD and/or low levels of engagement, they recommend that audiences hear consistent messages about CRWD from multiple channels. In order to reach District residents, CRWD should focus first on community, who will in turn communicate directly with the media, community organizations, their constituents and the general public. The second priority audience is the media, which broadcasts to all other audiences. The next priority will be community organizations, and the final priority is communicating directly with District constituents via direct mail, email or social media.

### Communications and Engagement Strategies

To achieve effective external communications and engagement, Tunheim recommends a phased approach where tactics are designed cross-functionally to leverage each other.

The communications strategies include:

- 1) Identify Keystone Projects and Programs
- 2) Build Upon Communications and Engagement Infrastructure
- 3) Track and Leverage Community Partnerships
- 4) Create Content and Target Social Media with Paid Ads and Message Boosts
- 5) Conduct Ongoing Proactive Communications and Engagement

### Conclusions

Because Tunheim found that current understanding of CRWD within the District is limited, all communication and engagement activity needs to reflect a consistent CRWD brand and ensure that the content is created with the intent of serving the needs of residents, business owners, public officials and other stakeholders.



## Situation Analysis

Capitol Region Watershed District (CRWD) is a local unit of government charged with protecting, managing and improving water resources within its 40 square miles. The District includes portions of Falcon Heights, Lauderdale, Maplewood, Roseville and St. Paul. CRWD has a population of approximately 225,000 people and is located within Ramsey County. The Mississippi River is the predominant water resource to which the entire district drains. Como Lake, Crosby Lake, Little Crosby Lake, Loeb Lake and Lake McCarrons are also located within the District.

The District's overall goals are:

- Cleaner waters
- Stormwater managed to mimic natural hydrology
- Communities connected to water
- Community awareness and action for water quality
- Resilient watershed management strategies
- Improved, consistent water governance
- Equity in the work of CRWD
- Organizational excellence

The District engaged Tunheim to create this Communications and Engagement Plan which will be integrated into the overall Watershed Management Plan. All strategies and tactics in this Plan are based on current best practices and are designed to further the mission of the District.

Previously, CRWD put emphasis on promoting its projects and partnerships, but is now moving toward elevating the visibility of the organization (impacts on quality of life, etc.). The District has a long history of communicating about projects and programs to constituents on a case by case basis and reaching out to priority audiences (including those that have typically been underserved).

The addition of a communications and engagement division manager to CRWD's staff has made significant progress toward improving Districtwide communications and engagement. However, the amount of infrastructure work that is required in addition to ongoing projects, coupled with the new priorities on improving Districtwide branding, diverse citizen engagement and social media outreach exceeds the capacity of the District's current staff.

## Communications and Engagement Goals

The objectives for the District's communications and engagement activity over the next 10 years are:

- Support the Watershed Management Plan;
- Increase community participation in activities that improve the quality of the water in the District;
- Promote general Districtwide awareness of CRWD, including traditionally underserved areas; and
- Develop advocates for CRWD who will actively participate in improving the watershed and advocate for projects and programs and activities that improve District water quality.

## Key Audience Matrix

CRWD's primary stakeholders are the residents of the District. For the purpose of the Communications and Engagement Plan, the following audiences have been identified:

- Public Officials
- Business Communities
- Media
- Community Organizations
- Academic Organizations
- CRWD Participants/Ambassadors

The goal is to proactively communicate with these key audiences with the intention that they will share CRWD's messages with their stakeholder groups so that residents hear CRWD's messages from a variety of trusted sources.

Audiences have been prioritized based on the size of the reach with the residents they have—audiences with greater communications reach have been ranked as higher priorities. It is important to work with each of these audiences to ensure CRWD's key messages are amplified consistently across all channels.

Primary Audience: Residents	Secondary Audience, priority one (High communication reach)	Secondary Audience, priority two (Medium communication reach)	Secondary Audience, priority three (Low communication reach)
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Key Audience	Current Communications Vehicles	Proposed Additional Communications Vehicles
Public		
Residents (primary)	Events Partnerships and grants Website Social media Emails	Encourage communications and engagement through multiple channels including: Public officials, Media, Businesses, Community Organizations, Academic and CRWD ambassadors
Public Officials		
Community Leaders	One-to-one meetings Emails Phone calls	Regular updates by mail In person meetings Newsletters
City and County Staff	One-to-one meetings Emails Phone calls	Regular updates by mail Annual in-person meetings Newsletters Resume Annual City Directors' Meeting (Discontinued)
District Planning Councils	One-to-one meetings Emails	Events Newsletters Social Media
Regulators	One-to-one meetings Emails	Newsletters Social Media
Business		
Business organizations (such as local chambers and neighborhood business associations)	One-to-one meetings Events	Events Newsletters Social Media
Independent businesses		Letters Newsletters Social Media
Developers	Permitting outreach	Newsletters Social Media
Media		
Newspapers, including outlets serving non-English speaking communities in the District	Press Releases Events	Hold deskside meetings
Community newspapers	Press Releases	Hold deskside meetings



Key Audience	Current Communications Vehicles	Proposed Additional Communications Vehicles
	Events	
Television	Press Releases Events	Hold deskside meetings
Radio	Press Releases Events	Hold deskside meetings
Community Organizations		
Water and Environment Focused Organizations	One-to-one meetings	Newsletters Social Media
Community Organizations (such as Optimus Clubs, Rotaries, Scouts, Churches, Unions, etc.)	Partnerships Grants	Letters Newsletters Social Media
Other Watershed Districts and Minnesota Association of Watershed Districts	Coalition Meetings	Newsletters Social Media Ads
Academic Community		
K-12 Schools	Partnerships Grants	Newsletters Social Media
Colleges and Universities	Partnerships Grants	Newsletters Social Media Ads
CRWD Participants/Ambassadors		
Project Partners	Partnerships	Newsletters Social Media Ads
Grantees	Grants	Newsletters Social Media Ads
Master Water Stewards	Partnerships	Newsletters Social Media Ads
Volunteers	Emails Newsletters	Newsletters Social Media Ads
Permittees	Letters In-person follow-up	Newsletters Social Media Ads

## Communications and Engagement Plan: Recommended Phased Approach

To achieve effective external communications and engagement, Tunheim recommends focusing all communications and engagement work on the District's keystone projects and programs. All additional strategies will be rolled-out in a phased approach and are designed cross-functionally to leverage each other and engage priority audiences.

The five communications and engagement strategies will be rolled-out in the following order:

- 1) Identify Keystone Projects and Programs
- 2) Build Upon Communications and Engagement Infrastructure
- 3) Track and Leverage Community Partnerships
- 4) Create Content and Target Social Media with Paid Ads and Message Boosts
- 5) Conduct Ongoing Proactive Communications and Engagement

## Phased Strategies

### Strategy One: Identify Keystone Projects and Programs

**Rationale:** In order to amplify the District's key messages over the next 10 years, it will be necessary to prioritize communications and engagement work. Projects and programs will ebb and flow over the decade, so setting criteria for focusing work is important for the success of the Communications and Engagement Plan.

Based on review of CRWD's Strategic Plan and the Diversity Strategic Plan, Tunheim recommends that CRWD adopt the following criteria for identifying keystone projects and programs:

High visibility projects that impact people Districtwide, such as the following current projects:

- Como Lake Golf Course Best Management Practices
- Como Lake In-Lake Treatments
- Ford Site Redevelopment
- Allianz Field
- CRWD building

Projects and programs that are either based on or include partnerships with organizations that are respected within traditionally underserved communities. We have identified the following projects in communities currently underserved by CRWD:

- Trout Brook Nature Sanctuary
- Willow Reserve Restoration
- Midway Peace Park
- Swede Hollow Park
- Lower Phalen Creek

- Bruce Vento

Programs offered Districtwide, such as:

- Master Water Stewards
- Adopt a Drain
- CRWD Grants
- Watershed Artist in Residence

**Timing:** As soon as work on the Communications and Engagement Plan commences, CRWD should adopt criteria for evaluating communications and engagement priorities. Projects and programs should be reassessed annually based on these criteria.

#### **Tactics and Measurement:**

##### Tactics

- 1.1. Focus communications and engagement activities each year on the keystone projects and programs.

##### Measurement

Keystone projects and programs are redefined annually

### **Strategy Two: Build upon Communications and Engagement Infrastructure**

**Rationale:** Our research shows that previously, CRWD put emphasis on promoting its projects, programs and partnerships, but is now working to engage more of the Districts' constituents by elevating the visibility of the organization. CRWD needs consistent branding and messaging standards to serve as foundational infrastructure for all communications and engagement activities.

**Timing:** Tunheim recommends that CRWD focus primarily on developing and upgrading its infrastructure in the first year. Once branding and processes are in place, less time will need to be invested in infrastructure, yet it will require ongoing attention throughout the decade.

#### **Tactics:**

- 2.1 Create standard branding and messaging
  - 2.1.1 Create brand standards and common language for projects, including developing a process to review the branding before printing or sharing information externally.
  - 2.1.2 Translate scientific text to plainspoken language to better engage and inform a wide variety of stakeholders.
  - 2.1.3 Create individual communications and engagement mini-plans for each keystone project and program affiliated with CRWD's brand.
    - Create individual messaging particular to each project, continuing to build on the District's new common language and brand standards.
    - Take ownership of message delivery to stakeholders across channels, including in cases

#### **Measurement:**

Create brand standards

Use focus groups to determine if text is understandable

Implement mini-plan for each keystone project



	where there are partnerships and other organizations in the mix.	
	- Focus ongoing emphasis on the District's keystone projects and programs.	
2.1.4	Make an online depository for communications assets for internal access (photos, profiles, videos, story maps and augmented reality).	Create one depository for communications assets
2.1.5	Create informational videos, virtual/augmented reality demonstrations and animated educational videos to share on social media, website and at informational kiosks.	Create three pieces of digital content for each keystone project and program
2.1.6	Finalize the District's crisis communications plan so that in the event of an incident, there is a standard procedure to follow.	Crisis plan finalized
2.2	Standardize external and internal communications processes	
2.2.1	Maintain and execute a strategic year-long editorial calendar for all communications and engagement activities. Regularly update the editorial calendar for media, engagement, events, blogs, electronic newsletters and social outreach.	Editorial calendar created and maintained
2.2.2	Develop clear guidelines on the use of CRWD language and brand standards and require all external communications to be reviewed by the Communications and Engagement Division.	Guidelines developed
2.2.3	Create a Communications Playbook that standardizes CRWD's communications processes. Include toolkits (with materials, timing, approval process and other necessary information) for the organization and keystone projects.	Playbook created
2.2.4	Clarify and standardize communications expectations and brand standards in partner contracts. Standardize project signage and educational displays.	Contractual requirements standardized

### Strategy Three: Track and Leverage Community Partnerships

**Rationale:** In the past, many of CRWD's stakeholder relationships have been one-and-done, but the District now wants to prioritize strategic community engagement. By developing and tracking professional relationships, CRWD will be able to engage all audiences. The goal of this strategy is for more residents to be aware of, promote and engage with CRWD's mission. This will be achieved by establishing meaningful and dependable allies in the media, among colleagues, with public officials, community leaders and policymakers.

Once the foundation is laid, CRWD should routinely engage with these stakeholders. Ongoing outreach needs to be maintained to strengthen and leverage these relationships. Over time, CRWD will become a valued, community thought leader and position itself as an expert for the public, the media and public officials. As awareness of CRWD increases, so will participation and engagement.

**Timing:** Focusing on engagement should occur once CRWD has its infrastructure and messaging in place. Creating a system for managing and categorizing relationships will be a foundational investment which must be consistently built upon going forward.

**Tactics:**

3.1 Track stakeholder contacts

- Identify individuals and organizations that CRWD has existing relationships with or needs to develop.
- Prioritize stakeholder outreach.
- Record status of key relationships.
- Track communication touch points with each stakeholder.
- Assist in the planning of audience communication.
- Establish ownership of relationships to ensure that CRWD establishes and strengthens priority contacts.

3.2 Establish and strengthen media relationships

3.2.1 Identify critical media contacts who are most important for the District's keystone projects and programs.

- Offer regular project updates and background conversations on District activities.
- When CRWD does not have news to share, there are still opportunities to build media relationships.
- Strive to meet with key media contacts at least once per year to check in about the District and hear about what they are working on, what the latest is in the newsroom, and what their current interests are.
- Reach out to comment on or praise a recent story.
- Share other story ideas and tips outside of your work so they consider you a trusted source.
- Organize newsworthy media events such as a Green Line ride between Allianz and CHS Field to learn about major CRWD projects across Saint Paul.
- When water management-related news stories hit, proactively offer CRWD experts to media for context and interviews, and eventually they will become a go-to source for news outlets.
- Connect clean water resources to personal priorities - community health, cost of drinking water, neighborhood greenspace, property value, etc.
- Create standards for publicizing District activities and accolades it receives for awards, partnerships, grants, etc.

3.2.2 Expand the media list to include radio and TV as well as outlets that communicate with non-English speaking Saint Paul residents.

- The District's media list should be around 100 media-specific contacts and continue to grow over time.

**Measurement:**

Develop a contact management database track stakeholder relationships weekly

Update contact management database weekly to track media outreach

Reach out to at least one member of media each month.

Expanded media list

<p>3.2.3 Create personal stories of Master Water Stewards, Watershed Steward Award winners and board managers.</p> <ul style="list-style-type: none"> <li>- Promote and capitalize on CRWD’s new building and its educational components.</li> <li>- Urgent, call-to-action stories about challenges to the watershed.</li> <li>- Mutual promotion of CRWD grants.</li> <li>- Use of virtual and augmented reality to bring visibility to underground work.</li> <li>- Food and water system connections, like Frogtown Farms.</li> <li>- Personal and community health, and the connection to greenspaces.</li> </ul>	<p>At least two new pieces of content created monthly</p>
<p>3.3 Find events and opportunities to position CRWD as an innovative leader in water management for all audiences, such as:</p> <p>3.3.1 Presentations</p> <ul style="list-style-type: none"> <li>- White papers</li> <li>- Speaking engagements</li> <li>- Op-eds</li> <li>- Authoring blogs and other content</li> <li>- Serving as subject matter experts for water management issues</li> <li>- Enhance public affairs and community relationships</li> </ul>	<p>Create calendar of events and create thought leadership content.</p>
<p>3.4 Conduct strategic community outreach to all District audiences as prioritized:</p> <ul style="list-style-type: none"> <li>- Leverage relationships with other Watershed Districts.</li> <li>- Strengthen relationships with other water and environmentally focused organizations.</li> <li>- Develop relationships with neighborhood organizations.</li> <li>- Execute CRWD’s diversity plan to focus on diverse and underserved areas.</li> <li>- Partner with chambers of commerce and local business associations, including developers and realtors.</li> <li>- Invite schools to visit CRWD to learn about water stewardship.</li> <li>- Send CRWD ambassadors into K-12 schools for demonstrations.</li> <li>- Partner with colleges and universities in the District on research studies.</li> <li>- Form lasting relationships with diverse community leaders by meeting with them regularly and partnering on projects.</li> </ul>	<p>Conduct at least five outreach meetings each month.</p>



- Look at the intersection of cultural traditions and water resources and find ways to link them with joint projects.
- 3.5 Develop, manage and evaluate programs to engage District audiences, such as:
- Master Water Stewards
  - Adopt a Drain
  - CRWD Grants
  - Watershed Artist in Residence
  - Identify new and less obvious partnerships to establish, especially in underserved geographic areas of the District.
- 3.6 Increase external communications to permit holders to decrease the need for annual follow-up.
- Create mini-plans for each program
- Send annual email update to all permit holders.

#### Strategy Four: Create Content and Target Social Media with Paid Ads and Message Boosts

**Rationale:** CRWD must take responsibility for communicating the purpose and success rates of the work it does with the people who live in the District. In order to do that, it must become more strategic and targeted with its use of its own communication channels to distribute its content and messages Districtwide using paid advertising and boosting social media posts.

**Timing:** Creating a plan for distributing targeted paid social media ads and boosting social media content should wait until after the infrastructure and relationship-building strategies are complete.

#### Tactics:

- 4.1 CRWD Website
  - 4.1.1 Integrate stories and calls-to-action into the website that leverage blog and social posts.
    - Continually update newsroom feature of CRWD's website with links to all positive news stories.
- 4.2 Email Newsletters
  - 4.2.1 Continue sending a monthly newsletter to key stakeholders by email.
- 4.3 Social Media
  - 4.3.1 Utilize videos and photography to enhance stories that educate and engage District residents and businesses.
  - 4.3.2 Include paid social media posts that boost views in targeted areas.
  - 4.3.3 Continually monitor external posts on your social media accounts using digital analytics to quantify campaign successes.
  - 4.3.4 Develop and share engaging content.

#### Measurement:

- Website updated monthly
- Newsletters are distributed monthly
- Two new stories about keystone projects or programs posted monthly

## Strategy Five: Conduct Ongoing Proactive Communications and Engagement

**Rationale:** Continual communication and engagement activity evaluation and prioritization that focuses on proactively leveraging key relationships and creating consistent key messages that will drive engagement in District watershed improvement.

**Timing:** Once the first four strategies have been established, communications and engagement need to be proactively maintained, improved and adapted to meet the District's needs over time.

### Tactics:

### Measurement:

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>1.1 Continue to use owned communications channels (newsletters, social media, website) to tell CRWD's story and engage with the community.<ul style="list-style-type: none"><li>5.1.1 As relationships build over time, pursue third-party storytelling, particularly feeding stories about the District to key public officials to share with their constituents.</li><li>1.1.2 Continually measure and reevaluate materials, initiatives, projects and programs.</li></ul></li><li>1.2 Regularly review your communications infrastructure to ensure it is current and update as needed.<ul style="list-style-type: none"><li>1.2.1 After every big initiative, pause and reflect on the process, what worked well and where there are opportunities for growth in the future.</li><li>1.2.2 Every third-year build in time for evaluation of communications and engagement programs to plan for the future.</li></ul></li></ul> | <p>Information about keystone projects and programs are broadcast via all communications channels at least once quarterly</p> <p>Infrastructure is reviewed quarterly</p> |
|--|---|

## Appendices

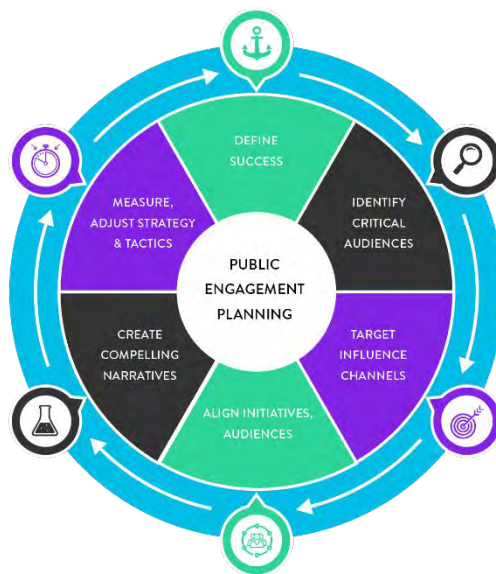


## Methodology

Tunheim's methodology for creating this Communications and Engagement Plan was as follows:

1. Review CRWD guiding documents:
  - CRWD Watershed Management Plan
  - Relevant active project plans
  - Relevant completed project plans
  - Organization newsletters
  - News releases
  - Review history videos
  - Review CAC Minutes (past two years)
  - Review existing CRWD communication plans and policies
2. Review past audits of stakeholders:
  - Conduct one-on-one interviews with key CRWD staff
  - Audit existing communications and engagement tools and processes
  - Report findings
  - Create plan with strategies and measurable tactics

As part of the planning phase, Tunheim followed the precepts of our public engagement planning process described in the diagram below.



## Key Audiences for Communications and Engagement

The objective of the communications and engagement plan is to educate, engage and inspire individuals and community organizations to work with CRWD to help achieve its mission. The preliminary matrix of CRWD's key audiences serves as a launching point for community outreach planning.

In order to reach CRWD's primary stakeholders (residents) we recommend that CRWD focus communications and engagement efforts on the secondary audiences, who will in turn inform the residents. When the secondary audiences promote the goals of the District, those statements can be leveraged through social media and direct communication to engage and inform residents.

### **Primary Audiences:**

- Residents of the District

### **Secondary Audiences/Amplifiers:**

- Public Officials
- Media
- Community Organizations
- CRWD Participants
- Education: K-12 through Higher Ed
- Business Sector

## 1. PRIORITY COMMUNITIES AUDIENCES

Frogtown	North End	East Saint Paul, Payne-Phalen	Summit- University	Rice- Larpenteur	Midway
<b>Media:</b> Pioneer Press St. Paul Monitor Insight News MN Spokesman-Recorder	<b>Media:</b> Pioneer Press St. Paul Monitor Insight News MN Spokesman-Recorder	<b>Media:</b> Pioneer Press Hmong Times Asian American Press	<b>Media:</b> Pioneer Press St. Paul Monitor Insight News MN Spokesman-Recorder Hmong Times Asian American Press	<b>Media:</b> Pioneer Press Hmong Times Asian American Press St. Paul Monitor Insight News MN Spokesman-Recorder	<b>Media:</b> Pioneer Press St. Paul Monitor Insight News MN Spokesman-Recorder
<b>Community:</b> <ul style="list-style-type: none"> <li>• Caty Royce, co-chair, Frogtown Neighborhood Association;</li> <li>• Tia Williams, co-chair, Frogtown Neighborhood Association;</li> <li>• Frogtown Green;</li> <li>• Frogtown Park and Farm;</li> <li>• St. Paul Area Chamber of Commerce;</li> <li>• Mt. Olivet Baptist Church;</li> <li>• St. Paul College;</li> <li>• St. Paul Public Schools;</li> <li>• Charter &amp; Private Schools;</li> <li>• Boys &amp; Girls Club of St. Paul;</li> <li>• District Council 7</li> </ul>	<b>Community:</b> <ul style="list-style-type: none"> <li>• St. Paul Area Chamber of Commerce;</li> <li>• North End Neighborhood Association;</li> <li>• Mt. Olivet Baptist Church;</li> <li>• St. Paul College;</li> <li>• St. Paul Public Schools;</li> <li>• Charter &amp; Private Schools;</li> <li>• Boys &amp; Girls Club of St. Paul;</li> <li>• District Council 6</li> </ul>	<b>Community:</b> <ul style="list-style-type: none"> <li>• Jack Byers, executive director, Payne-Phalen Neighborhood Association;</li> <li>• Hmongtown Market;</li> <li>• Lower Phalen Creek Project;</li> <li>• Minnesota Hmong Chamber of Commerce;</li> <li>• St. Paul Area Chamber of Commerce;</li> <li>• Metro State;</li> <li>• Residents of Phalen Creek;</li> <li>• St. Paul Public Schools;</li> <li>• Charter &amp; Private Schools;</li> <li>• Boys &amp; Girls Club of St. Paul;</li> <li>• District Council 5</li> </ul>	<b>Community:</b> <ul style="list-style-type: none"> <li>• Erica Valliant, Summit-University Planning Council;</li> <li>• Mark Tande, Ramsey Hill Association;</li> <li>• Urban Farm &amp; Garden Alliance;</li> <li>• ASANDC;</li> <li>• Hallie Q. Brown, Unity Church-Unitarian;</li> <li>• St. Paul College;</li> <li>• St. Paul Public Schools;</li> <li>• Charter &amp; Private Schools;</li> <li>• Boys &amp; Girls Club of St. Paul;</li> <li>• District Council 8</li> </ul>	<b>Community:</b> <ul style="list-style-type: none"> <li>• Kim O'Brien, Rice &amp; Larpenteur Alliance;</li> <li>• Hmongtown Market</li> <li>• Minnesota Hmong Chamber of Commerce;</li> <li>• St. Paul Area Chamber of Commerce;</li> <li>• Lake McCarron's Neighborhood Association;</li> <li>• St. Paul Public Schools;</li> <li>• Charter &amp; Private Schools;</li> <li>• Boys &amp; Girls Club of St. Paul</li> </ul>	<b>Community:</b> <ul style="list-style-type: none"> <li>• Hamline Midway Coalition;</li> <li>• Minnesota United;</li> <li>• University United Citizen Coalition;</li> <li>• Midway Chamber of Commerce;</li> <li>• Quorum – Twin Cities Gblta Chamber of Commerce;</li> <li>• Concordia University;</li> <li>• Hamline University;</li> <li>• Somali Museum – Traveling Exhibit;</li> <li>• Eritrean Community Center;</li> <li>• Como Community Council;</li> <li>• Hamline Midway Coalition;</li> <li>• St. Paul Public Schools;</li> </ul>



Frogtown	North End	East Saint Paul, Payne-Phalen	Summit- University	Rice- Larpenteur	Midway
					<ul style="list-style-type: none"> <li>• Charter &amp; Private Schools</li> <li>• Boys &amp; Girls Club of St. Paul</li> <li>• District Council 11</li> </ul>
<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor</li> <li>• Dai Thao, City Council;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner MatasCastillo;</li> <li>• MN Representative Rena Moran;</li> <li>• MN Senator Sandy Pappas</li> </ul>	<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor;</li> <li>• Dai Thao, City Council;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner MatasCastillo;</li> <li>• MN Representative Rena Moran;</li> <li>• MN Senator Sandy Pappas</li> </ul>	<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor</li> <li>• Nelsie Yang, City Council;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner MatasCastillo;</li> <li>• MN Representative Tim Mahoney;</li> <li>• MN Senator Fong Hawj</li> </ul>	<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor</li> <li>• Dai Thao, City Council;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner Carter</li> <li>• MN Representative Rena Moran;</li> <li>• MN Senator Sandy Pappas</li> </ul>	<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor of St. Paul;</li> <li>• Dan Roe, Mayor of Roseville;</li> <li>• Marylee Abrams, Mayor of Maplewood;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner McGuire</li> <li>• MN Representative Peter Fischer</li> <li>• MN Senator Charles Wiger</li> </ul>	<b>Elected Officials:</b> <ul style="list-style-type: none"> <li>• Melvin Carter, Mayor;</li> <li>• Dai Thao, City Council;</li> <li>• Council President Amy Brendmoen;</li> <li>• Commissioner Carter</li> <li>• MN Representative Kaohly Her</li> <li>• MN Senator Dick Cohen</li> </ul>
<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>	<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>	<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>	<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>	<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>	<b>Foundations:</b> <ul style="list-style-type: none"> <li>• St. Paul and MN Foundation;</li> <li>• St. Paul Audubon Society</li> </ul>
<b>Events:</b> <ul style="list-style-type: none"> <li>• Rondo Days;</li> <li>• Frogtown Arts Festival;</li> <li>• Little Mekong; Night Market;</li> <li>• Art at Rondo; Block Party;</li> <li>• Jazz Festival;</li> <li>• National Night Out</li> </ul>	<b>Events:</b> <ul style="list-style-type: none"> <li>• Rondo Days;</li> <li>• Little Mekong Night Market;</li> <li>• Art at Rondo; Block Party;</li> <li>• Jazz Festival;</li> <li>• National Night Out</li> </ul>	<b>Events:</b> <ul style="list-style-type: none"> <li>• East Side Community Festival;</li> <li>• Hmong New Year;</li> <li>• Festival of Nations;</li> <li>• National Night Out</li> </ul>	<b>Events:</b> <ul style="list-style-type: none"> <li>• Grand Old Day;</li> <li>• Rondo Days;</li> <li>• Frogtown Arts Festival;</li> <li>• Little Mekong; Night Market;</li> <li>• Art at Rondo; Block Party;</li> <li>• Jazz Festival;</li> </ul>	<b>Events:</b> <ul style="list-style-type: none"> <li>• Rice Street Gardens;</li> <li>• Farmer's Market;</li> <li>• Frogtown Arts Festival;</li> <li>• National Night Out</li> </ul>	<b>Events:</b> <ul style="list-style-type: none"> <li>• Somali Health Summit;</li> <li>• Somali Week;</li> <li>• Festival of Nations;</li> <li>• MN State Fair;</li> <li>• National Night Out</li> </ul>

Frogtown	North End	East Saint Paul, Payne-Phalen	Summit- University	Rice- Larpenteur	Midway
			<ul style="list-style-type: none"> <li>• National Night Out;</li> <li>• Farmers Market;</li> <li>• Marathon</li> </ul>		

## Communications Toolkit

### CRWD Elevator Speech Template

Capitol Region Watershed District (CRWD) is a local unit of government dedicated to protecting, managing and improving the water resources of the Saint Paul area. The region has abundant water resources, but its lakes, rivers, streams and wetlands are under constant pressure from stormwater runoff and pollution. CRWD works with partners and residents to help keep our water resources clean and beautiful, benefiting residents and supporting the local economy.

### One-Page CRWD Overview

Capitol Region Watershed District (CRWD) is a local unit of government dedicated to protecting, managing and improving water resources in the Saint Paul area.

The Saint Paul region has abundant water resources, but its lakes, rivers, streams and wetlands are under constant pressure from stormwater runoff and pollution. CRWD originated from a small group of dedicated residents who wanted to protect Como Lake and the Mississippi River, and has expanded to protect all the waterways in its 40 square mile district.

CRWD works with local partners and residents to help keep our water resources clean and beautiful, providing economic and recreational benefits. CRWD accomplishes its mission through the following programs, projects and partnerships:

- Water resource improvement projects, such as the restoration of Como Lake and the green infrastructure at Allianz Field;
- Stormwater, lake, river and Best Management Practice (BMP) monitoring;
- Education and outreach programs;
- Providing technical assistance and funding through our grant programs; and
- Watershed rules and permitting.

Funding for CRWD, and the other 45 watershed districts that span across Minnesota, comes from levies and permit fees, as well as through federal and state funds. These funds are awarded through competitive watershed funding such as federal Section 319, state Clean Water Partnership grants and loans, and the Clean Water Fund.

## CRWD Q and A

Question:	Answer:
<b>General Questions</b>	
<b>What is CRWD?</b>	Capitol Region Watershed District (CRWD) is a local unit of government dedicated to protecting, managing and improving the water resources of the 40 square miles of the District.
<b>What does CRWD do?</b>	CRWD works across geographic and political boundaries to protect the health of the District's natural water resources. Through research, planning and action, CRWD helps solve and prevent water-related problems within the region.
<b>Who leads CRWD?</b>	CRWD is governed by a five-member Board of Managers that guides the District in carrying out its Watershed Management Plan. A Citizen Advisory Committee also helps shape the work of the District by reviewing annual budgets, work plans, project and program priorities and leading the annual CRWD Watershed Steward Awards.
<b>Am I in CRWD?</b>	If you live in the State of Minnesota, you may reside in a watershed district. Minnesota is the only state that has been divided into watershed districts. Find out if you live in Capitol Region Watershed District at this link: <a href="https://www.capitolregionwd.org/about-crwd/">https://www.capitolregionwd.org/about-crwd/</a>
<b>How are Minnesota's Watershed Districts funded?</b>	Watershed Districts are local units of government. Funding comes from levies and permit fees, as well as through federal and state grants. These grants are awarded through competitive watershed funding such as federal Section 319, state Clean Water Partnership grants and loans, and the Clean Water Fund.
<b>Program-Related Questions</b>	
<b>What programs does CRWD manage?</b>	<ul style="list-style-type: none"> <li>• Watershed rules and permitting;</li> <li>• Stormwater and Best Management Practice (BMP) monitoring;</li> <li>• Water resource improvement projects;</li> <li>• Education and outreach;</li> <li>• Providing technical assistance; and</li> <li>• Funding water quality improvement projects and programs through our grants program.</li> </ul>
<b>How can I get involved with CRWD?</b>	There are many different ways District residents help CRWD accomplish its mission. We encourage all residents, businesses and organizations to partner with CRWD to protect our lakes, rivers and streams. The District offers tips for residents, an Adopt a Drain program, Master Water Stewards certification, opportunities to join our Citizen Advisory Committee and much more.
<b>Grant-Related Questions</b>	
<b>Does CRWD offer grants to watershed residents?</b>	CRWD grants provide financial and technical assistance to help build projects and programs that protect local lakes and the Mississippi River. Polluted runoff is a leading cause of water pollution in lakes and rivers, particularly in urban areas like the District. As



	much of the land in CRWD is already developed and privately owned, working with residents who build clean water projects and programs is essential for improving water quality.
<b>Which different CRWD grants are available?</b>	<p>CRWD offers a variety of grant programs for its residents:</p> <ul style="list-style-type: none"> <li>• Stewardship Grants help businesses, schools, community organizations and homeowners build projects that prevent stormwater pollution. Click here for a complete list of grants offered by CRWD.</li> <li>• Water Quality Planning Grants provide financial assistance for feasibility and design of cost-effective and/or innovative projects that protect and improve the water quality of waterbodies within CRWD.</li> <li>• Water Quality Capital Improvement Grants provide financial assistance for final engineering and construction of cost-effective and/or innovative projects that protect and improve the water quality of waterbodies within CRWD.</li> <li>• Partner Grants fund programs led by schools, arts, environmental or faith groups that educate residents and promote clean water actions.</li> <li>• Rain Barrel Workshop Grants provide assistance to neighborhood groups who organize a community rain barrel construction workshop.</li> <li>• Abandoned Well Sealing Grants are used for sealing abandoned wells that are located within CRWD.</li> </ul>
<b>How do I apply for a CRWD grant?</b>	To apply for a CRWD grant, the first step is to learn the specific application requirements for each grant. Then, grant applicants will work with CRWD and its partners to determine the projects they want to pursue and submit the appropriate application materials.
<b>How do I check the status of my CRWD grant application?</b>	To check the status of a submitted grant application, please contact the staff member listed on the grants page.
<b>Water Monitoring, Research and Data-Related Questions</b>	
<b>How does CRWD monitor watershed health?</b>	CRWD monitors water quality to identify pollution sources in stormwater runoff as well as in the District's lakes and stormwater best management practices (BMPs). This information helps CRWD and its partners create water quality improvement solutions, develop educational programming and initiate research and project management for other organizations.
<b>How can I access water quality monitoring data collected in CRWD?</b>	CRWD conducts ongoing monitoring and reporting to assess lake health. Our Water Data Reporting Tool (WDRT) is an interactive way for the public to see how our work is having an impact on water quality. WDRT also helps CRWD meet its reporting requirements and incorporates data from all of the District's water quality monitoring stations
<b>What research projects does CRWD manage?</b>	CRWD monitoring helps inform research studies that analyze different aspects of water quality in the District. We work with third-party organizations – including government, higher education, charitable foundations and community partners – to conduct research and gather results. Research helps CRWD assess the success of its stormwater improvements throughout the District and establish best practices for future management.
<b>Where can I find CRWD research reports?</b>	CRWD reports can be found on the relevant pages (for example, the 2016 Lakes Monitoring Report is on the Lakes page) or by using the search tool.
<b>Permit-Related Questions</b>	

<b>What permits does CRWD issue?</b>	CRWD issues permits to ensure that stormwater runoff from development and redevelopment projects does not negatively affect our water resources. Our permitting program regulates construction activity by requiring erosion and sediment control, as well as stormwater Best Management Practices (BMPs) to capture and treat runoff leaving the site. Permit coverage is also required for impacts to wetlands, floodplain and connections to the Trout Brook Interceptor storm sewer system.
<b>What is CRWD's permit application process?</b>	<p>Our permitting program regulates construction activity by requiring erosion and sediment control, as well as stormwater Best Management Practices (BMPs) to capture and treat run-off leaving the site.</p> <p>Permit applications are reviewed by District staff and presented to the Board of Managers at meetings, typically held the first and third Wednesday of every month. Applicants must submit the permit application at least 21 days before a regularly scheduled board meeting in order to be considered</p>
<b>How can I check the status of my permit application?</b>	Contact CRWD to check the status of your permit application or view the CRWD Active Permits map.
<b>Contact Information</b>	
<b>How do I contact CRWD?</b>	<ul style="list-style-type: none"> <li>• Address: 595 Aldine Street in Saint Paul, Minnesota 55104</li> <li>• Phone: 651-644-8888</li> <li>• Email: <a href="https://www.capitolregionwd.org/contact/">https://www.capitolregionwd.org/contact/</a></li> <li>• Social Media: <ul style="list-style-type: none"> <li>Facebook – <a href="http://www.facebook.com/CapitolRegionWD">www.facebook.com/CapitolRegionWD</a></li> <li>Twitter – <a href="http://twitter.com/CapitolRegionWD">twitter.com/CapitolRegionWD</a></li> <li>Instagram – <a href="http://www.instagram.com/capitolregionwatershed/">www.instagram.com/capitolregionwatershed/</a></li> <li>LinkedIn – <a href="http://www.linkedin.com/company/capitol-region-watershed-district/">www.linkedin.com/company/capitol-region-watershed-district/</a></li> </ul> </li> </ul>

### CRWD Overall Key Messages:

- CRWD is working to protect, manage and improve the water resources of Capitol Region Watershed District and the Mississippi River.
- Through research, planning and action, CRWD helps solve and prevent water-related problems within the 40 square mile District.
- The boundary of CRWD includes most of Saint Paul, and parts of Falcon Heights, Lauderdale, Maplewood and Roseville.
- Protecting our shared water resources benefits all Minnesotans by creating a healthy, thriving environment for recreation, commerce and natural beauty.
- CRWD actively looks for opportunities to collaborate with diverse and underserved communities to ensure the benefits of our water resources are available to all residents.
- CRWD works with local partners to help keep our water resources clean and beautiful, providing economic and recreational benefits to the District's residents and businesses.



## Communications and Engagement Audit – As of July 1, 2019

COMMUNICATIONS VEHICLES			
Comms toolkit		2	
Comms plan	1		
Press releases		2	
Media list	1		
Print materials			3
Displays for events		2	
Key messages	1		
FAQ		2	
Boilerplate		2	
Content planner		2	
Crisis Plan		2	
Video/photo reservoir		2	
Website:			
- News room			3
- Blogs		2	
- Story maps		2	
Social Media:			
- Facebook		2	
- Instagram	1		
- LinkedIn		2	
- Twitter	1		
- Newsletter	1		
Media relations		2	
Project signage		2	
ENGAGEMENT STRATEGIES			
Thought leadership	1		
CRWD Ambassadors			3
Education: K-12 and Colleges		2	
Public Affairs		2	
Engagement with Community Organizations		2	

Status Level: 1  
Does not exist, is in infancy or is not functioning

Status Level: 2  
May exist and function, but needs improvement or refinement

Status Level: 3  
Accomplished, successful

## COMMUNICATIONS AND ENGAGEMENT ANALYSIS

### Project Overview

The District is working with Tunheim to create a Communications and Engagement Plan that will be annually reviewed for the next five years, as well as integrated into the strategic plan. All recommendations will be designed to further the mission of the District and propel it toward its goals.

As a first step, Tunheim conducted a communications and engagement audit. Following is a summary of our key findings and recommendations.

### Key Findings

- 1) Previously, CRWD put emphasis on promoting its projects, programs and partnerships, but is now moving toward elevating the visibility of the organization (impacts on quality of life, etc.).
- 2) Communications and partnerships have traditionally been one-and-done, but CRWD would like to build more consistent stakeholder relationships and messaging long-term.
- 3) CRWD needs consistent branding and wording. Public-facing communications need to be in plain language.
- 4) To cut through the din of messages, CRWD needs clarity of communications priorities, boundaries and objectives:
  - a) Create ongoing mini communications and engagement plans around major projects: CRWD's new building, Allianz Field and the Ford Site.
  - b) CRWD gathers a huge amount of data—these findings should be translated to the public, so they understand what's going on under their feet and in the water.
  - c) To motivate the general public to become active and engaged water stewards, CRWD needs more:
    - i) Overall name recognition and increased understanding of CRWD;
    - ii) Personalized stories--what CRWD means to people and how they can get involved;
    - iii) Stories that highlight water issues and those that celebrate successes;
    - iv) Stories that engage previously underserved neighborhoods and/or cultures; and
    - v) Social media needs to be strategically utilized to leverage CRWD's mission.
- 5) Each division of CRWD has developed its own outreach calendar, collateral and outreach lists, which means CRWD as a whole is not strategic about voicing consistent messages.
- 6) No database of the stakeholders that the District has interacted with in the past exists, and no ongoing strategic outreach is maintained to strengthen and leverage these relationships.
- 7) The general public doesn't understand what the "capital region" is, what a watershed district is and how they can help.

## Initial Recommendations

To achieve effective external communications and engagement, Tunheim recommends a layered approach where activities are designed cross-functionally to leverage each other. Our proposed Communications and Engagement Plan will include:

### 1) Communications

#### *a) Branding*

- i) Brand high visibility, long-term projects like Como Lake and Ford Site so people recognize them as CRWD programs.
- ii) Create Brand Standards and common language for programs and projects, including developing a process to review the branding before printing or sharing information externally.

#### *b) Develop Communications and Engagement Infrastructure and Tools*

- i) Create a suite of communications tools:
  - (1) FAQ
  - (2) One-pager
  - (3) Boilerplate
  - (4) Expanded media lists
  - (5) Social media platforms
- ii) Make online depository for communication assets (photos, profiles, videos, story maps and augmented reality).
- iii) Create informational videos, virtual/augmented reality demonstrations and animated educational videos to share on social media, website and at informational kiosks.
- iv) Create an annual editorial calendar for media, engagement, events, blogs, electronic newsletters and social outreach.
- v) Prioritize which stories and activities are of primary importance.

#### *c) Owned Communications*

- i) Website:
  - (1) Integrate stories and calls-to-action into the website.
  - (2) Update newsroom feature of CRWD's website with links to all positive news stories.
- ii) Email Newsletters:
  - (1) Reestablish a quarterly newsletter that will be sent to key stakeholders by email.



iii) Social Media:

- (1) Utilize videos and photography to enhance stories that educate and engage District residents and businesses.
- (2) Include paid social media posts that boost views in targeted areas.
- (3) Continually monitor external posts on your social accounts.
- (4) Use social media analytics to quantify campaign successes.

iv) Programs and Partnerships:

- (1) Feature more storytelling through partners.
- (2) Clarify and standardize communications expectations and brand standards in partner contracts at various level projects.
  - (a) Consider incorporating educational opportunities such as augmented reality engagement.
- (3) Increase external communications to permit holders to decrease the need for annual follow-up.

v) Internal communications:

- (1) Centralize the management of CRWD branding and stakeholder lists within the Communications and Engagement Division
- (2) Develop a system for prioritizing key external communications activities and stories.
- (3) Create and execute a strategic year-long editorial calendar for all communications and engagement activities.

d) *Earned Media*

- i) Establish CRWD as go-to experts for media.
- ii) Create mini media plans for keystone projects like Como Lake and the Ford Site redevelopment.
  - (1) Find opportunities to sit down with media and build relationships.
- iii) Conduct media events such as a Green Line ride between Allianz and CHS fields to learn about major CRWD projects.
- iv) Connect clean water resources to personal priorities -- community health, cost of drinking water, neighborhood greenspace, property value, etc.
- v) Create a standard playbook to publicize different actions: awards, partnerships, grants, successes, challenges, etc.

- vi) Expand media list to include radio and TV as well as outlets that communicate with non-English speaking residents.
- vii) Develop content and story pitches for media, such as:
  - (1) Personal stories of Master Water Stewards, community award-winners and board managers.
  - (2) Promote and capitalize on new CRWD building.
  - (3) Urgent, call-to-action stories about challenges to the watershed.
  - (4) Mutual promotion of partner grants.
  - (5) Use of virtual and augmented reality to bring visibility to underground work.
  - (6) Food and water system connections, like Frogtown Farms.
  - (7) Personal and community health, and the connection to greenspaces.
  - (8) Training all city employees, expand to county and state maintenance crew.

## 2) Community Engagement

### *a) Develop Community Engagement Infrastructure and Tools*

- i) Create a database of community leaders, individual supporters and organizations for outreach.
- ii) Expand list of community events.
- iii) Consider creating enticing, educational outreach activities, such as a mobile water bottle filling vehicle to take to community events that incorporate CRWD information about stormwater.
- iv) Leverage K-12 curriculum surrounding water education.

### *b) Thought Leadership*

- i) Position CRWD as an innovative leader in water management.
- ii) Form lasting relationships with diverse community leaders.
- iii) Look at the intersection of cultural traditions and water resources.
- iv) Create a strategic outreach plan to keep CRWD ambassadors such as Master Water Stewards, CAC members and volunteers engaged, appreciated and motivated.
- v) Identify new and less obvious partnerships to establish, especially in underserved geographic areas of the District.

- c) *Conduct Strategic Community Outreach to all District Audiences*
  - i) Strategically cultivate relationships with key public officials.
  - ii) Leverage relationships with other Watershed Districts.
  - iii) Strengthen relationships with other water and environment focused organizations.
  - iv) Develop relationships with neighborhood organizations.
  - v) Execute diversity plan to focus on diverse and underserved areas.
  - vi) Create a plan for outreach around keystone projects: Como Park, CRWD neighborhood, Ford Site Redevelopment, Green Line.
  - vii) Partner with chambers of commerce and local business associations, including developers and realtors.
  - viii) Invite schools to visit CRWD to learn about water stewardship.
  - ix) Send CRWD ambassadors into K-12 schools for demonstrations.
  - x) Partner with colleges and universities in the District on research studies.



## SWOT Analysis

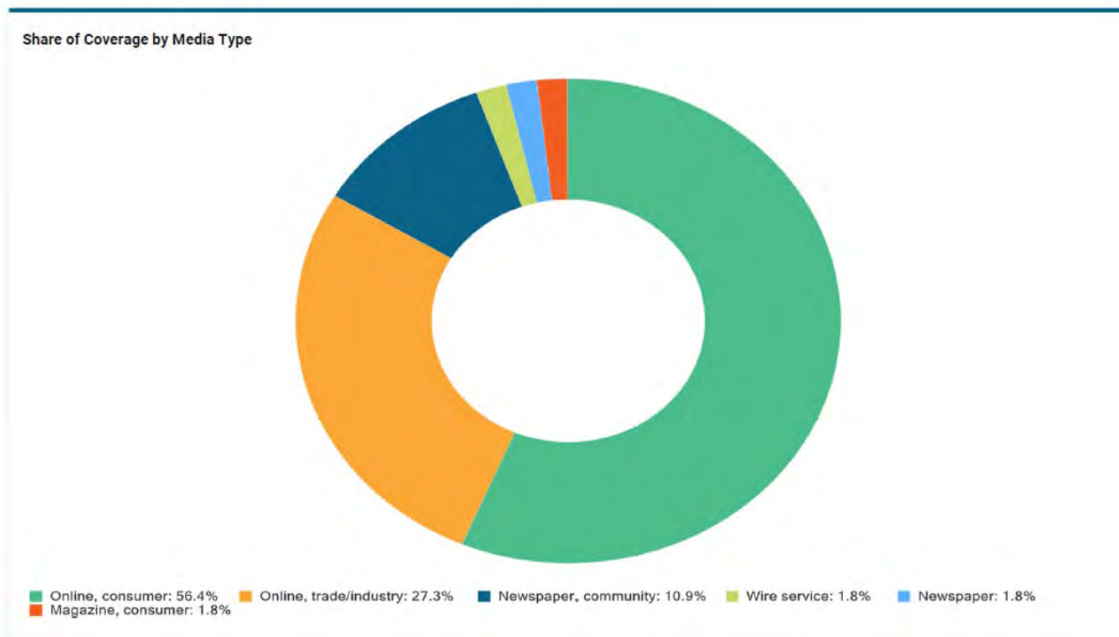
STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Robust research and data to share</li> <li>• Strong mission and vision</li> <li>• Dedicated advocate-partners like volunteers and Citizen Advisory Committee</li> <li>• National innovation in water management systems</li> <li>• Strong photography and video capabilities</li> <li>• Strong digital storytelling capabilities, such as VR and the Como Lake story map</li> </ul>	<ul style="list-style-type: none"> <li>• No overarching plan for organizational communications that encompasses timing and action, and planning across calendars and channels</li> <li>• Ad hoc media relations</li> <li>• Lack of foundational messaging for use across channels and materials</li> <li>• Confusion surrounding watershed definition</li> <li>• Lack of prioritization of communications targets</li> </ul>	<ul style="list-style-type: none"> <li>• Editorial calendar integrating social media, blogs, events and media opportunities</li> <li>• Links to social and environmental justice in district communities</li> <li>• Connection between watersheds, improved quality of life and greenspace</li> <li>• Messaging framework for the organization</li> <li>• Introduction to communities who have not participated in the past</li> <li>• Grand opening of the new building</li> </ul>	<ul style="list-style-type: none"> <li>• Crisis Communication Plan in development, but needs to be finalized</li> <li>• No central oversight of communications activities across divisions</li> </ul>

## Media Channels

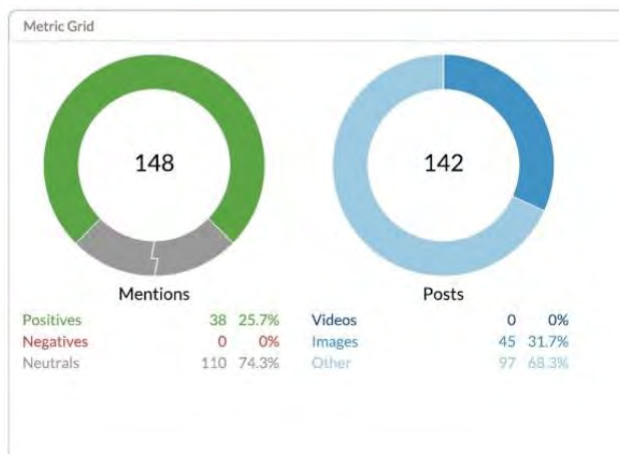
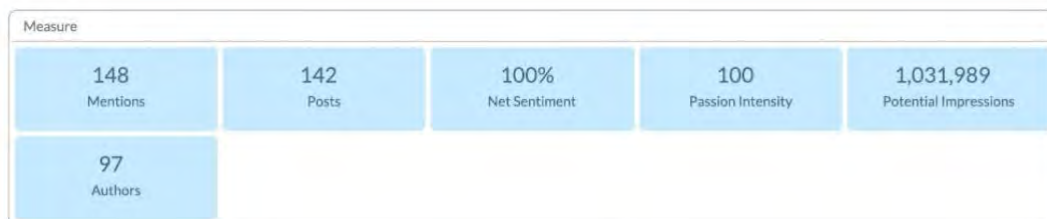
*Coverage between June 2018 – June 2019*

MEDIA TYPE	SHARE
Online, consumer	56.4%
Online, trade/industry	27.3%
Newspaper, community	10.9%
Wire service	1.8%
Newspaper	1.8%
Magazine	1.8%

## CRWD Media and Social Coverage



### Social Media Channels Conversation between June 2018 – June 2019



## CRWD Media List

Outlet	Name	Title	Email	Phone	Notes
AfricaPaper	Issa A. Mansaray	Editor	Executive Editor	(763) 568-4335	Target audience: African community
Asian American Press	Nghi Huynh	Publisher/Editor	nghi@aspress.com	(651) 755-6864	Target audience: Asian community
The Circle	Cat Whipple	Managing Editor	thecirclenews@gmail.com	(612) 722-3686	Target audience: Native American community
Ensa	Mary Hoff	Editor in Chief	mary@ensa.com	(612) 626-2670	Environmental leadership, non-profit outlet, Minnesota-based
Ensa	David Doody	Senior Editor	david@ensa.com	(612) 626-9553	Environmental leadership, non-profit outlet, Minnesota-based
Greening Frogtown	Patricia Chmura	Editor	info@onenationnews.com	(651) 757-5970	Target audience: Frogtown community
Hmong Times	Steve Wetzel	Owner/Editor	hmongtimes@gmail.com	(651) 224-9395	Target audience: Hmong community
Hmong Today	Wameng Moua	Chief Editor	hmongtoday@gmail.com	(651) 489-0021	Target audience: Hmong community
Insight News	Al McFarlane	Editor in Chief, Host of KFAI	al@insightnews.com	(612) 588-1313	Target audience: African American community
KARE-TV	Rita Hathaway	Managing Editor	rhathaway@kare11.com	(763) 546-1111	
KARE-TV	John Simon	Assignment Editor	josimon@kare11.com	(763) 797-7215	
KARE-TV	Kristin Wagner	Assignment Editor	kwagner@kare11.com	(763) 797-7215	
KARE-TV	Gail Knox	Producer	gknox@kare11.com	(763) 546-1111	
KFAI-FM	Mason Butler	Interim Program Director	mason@kfaifm.org	(612) 941-3144	
KMOJ-FM	Kevin Charles	General Manager	info@kmoj.com	(612) 377-0534	Target audience: African American community
KMSP-TV	Kelly Huffman	News Assignment Manager	kelly.huffman@foxtv.com	(352) 946-5654	
KMSP-TV	Mike Durkin	Editor, Digital Content	mike.durkin@foxtv.com	(352) 944-9399	
KMSP-TV	Jeff Orcutt	EP, Fox 9 Buzz and Jason Show	jeff.orcutt@foxtv.com	(352) 946-5688	
KMSP-TV	Nick Lambert	News Assignment Editor	nick.lambert@foxtv.com	(352) 946-5767	
KS TP-TV	Bob Sabo	Assignment Manager	bsabo@kstp.com	(651) 646-5555	
KS TP-TV	Nicole Roddy	Morning Producer	nroddy@kstp.com	(651) 646-5555	
KS TP-TV	Amenda Theisen	Senior Producer	athese@kstp.com	(651) 646-5555	
El Minnesota de Hoy	Gustavo Mancilla	General Manager	gumancilla@mlatinomedia.com	(651) 335-1710	Target Audience: Latino community; St. Paul-based
The Midway Monitor	Lynn Santacaterina	Editor	lynn@deruytermidson.com	(651) 489-9059	Target audience: Midway, Como and Merriam Park communities
Minnesota Monthly	Reed Fischer	Senior Editor	rfischer@greenspring.com	(612) 371-5858	
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## Recommendations for Improving and Coordinating Internal Communications Across All Divisions

To date, we have found that CRWD has done a very good job of communicating project work and engaging the community on a case-by-case basis. The addition of a communications and engagement division manager to CRWD's staff has made significant progress toward improving Districtwide communications and engagement. However, the amount of infrastructure work that is required in addition to ongoing projects and programs coupled with the new priorities of improving Districtwide branding, diverse citizen engagement and social media outreach exceeds the capacity of the current staff.

With regard to the overall workload implicated with this set of recommendations, we appreciate that to carry out the recommended strategies and tactics the District will have to ramp up the number of staff or outside resources dedicated to communications and engagement. As indicated in our recommendations, the foundation for this work depends upon the creation of a centralized infrastructure that is at least closely coordinated, if not outright controlled, through one primary lead. In our view, this centralized coordinating role should reside with the Communications & Engagement Division Manager.

This encompasses ultimate approval for all external messaging and outreach activity, inclusive of key messaging, consistent branding and nomenclature, tracking and qualification of external relationships, media relations, and collaboration with other division leads around priority community projects. These are essential components necessary to effectively promote the overall visibility of the organization.

Within the attached CRWD Timing Map detailing FTEs, the primary assumption is that focus of the communications and engagement work will be on generating key messaging, creating and managing processes internally, and collaborating with other division leads. Hence the dedicated headcount of approximately one to two full time staff. Also baked into the assumptions is an expected prioritization of key projects, such as the Como Lake restoration, as well as relationships with media contacts. With the addition of other projects and programs under the communications and engagement outreach efforts, there will likely be a need for further consideration of staffing resources, internal or external.

The District can elect to utilize existing staff resources to conduct outreach and build messaging but may also want to consider additional assistance per project or more broadly pertaining to the organization's outreach. It is impractical to try and capture the exact extent of additional staff resources required to carry out each successive layer of engagement activity as competing priorities, urgency, duration, scope and quality of relationships are taken into consideration. But the District should anticipate that effective engagement will be on-going and cumulative, requiring additional dedicated resources to deliver results with each additional project.

## Appendix F

### Wetland Management Strategy

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## Acknowledgements

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- Capitol Region Watershed District Technical and Advisory Groups
- Ramsey Conservation District (RCD)
- City of St. Paul

Of particular mention, the District would like to thank the Ramsey Conservation District for the use of the protocols they developed in association with the District for the Wetland Restoration Site Data and Ranking System. The District would also like to thank the City of St. Paul for sharing the data and guidelines they recently collected and developed for their own Wetland Management Plan.





## Introduction

The purpose of this document is to evaluate the wetland resources of the District, describe the approach to protecting their functions and diversity, and lay the groundwork to improve these resources. This document is NOT, however, a Local Comprehensive Wetland Protection and Management Plan as per MN Rule Chapter 8420.0830.

The mission of the District is to “protect, manage, and improve the water resources of the Capitol Region Watershed District.” These goals are consistent with the intent of State and Federal rules for wetland protection. The strategy for addressing these goals is to evaluate wetland resources on an individual basin scale, and on a watershed scale. The watershed scale of analysis allows ecological functions and values to be realized that are lost at a smaller scale. The Wetland Management Plan provides a mechanism to address local wetland management and preservation of aquatic resource functions and values at an individual wetland scale and a watershed scale.



The District currently implements its Watershed Rules through the permitting process. The District issues permits to ensure that runoff from development and redevelopment activity does not adversely affect its water resources. The District’s Rule E governs wetlands but since the WCA was revised on 8/3/2009 the Districts Rules will need to be updated. Since the District is not the Local Government Authority (LGU) for implementing WCA, its Rules work in conjunction with the local governments and State wetland law. Additionally, the MN Department of Transportation (Mn/DOT) is the LGU administering WCA for wetlands on the Mn/DOT right-of-way and the U.S. Army Corps of Engineers governs wetland activities on a Federal level through Section 404 of the Clean Water Act.

Concurrent with the development of this Wetland Management Strategy, the District is also developing the overall Watershed Management Plan along with an extensive public involvement component. Through this public involvement process, concerns and issues revolving around its wetland resources were identified. The implementation activities identified within this wetland management strategy are included in the overall Watershed Management Plan.

## Overall Goals and Objectives for Wetland Management

This document provides additional protection and strategies in managing wetlands in the District. The overall goal of this document is, at a minimum, to protect the functions and diversity of the District’s wetlands and lay the groundwork to improve these resources. The District will work with local municipalities, State agencies, and Ramsey County to achieve their goals and objectives. Emphasis is placed on recommending and prioritizing efforts that can be implemented through three main mechanisms: wetland protection, wetland improvement, and wetland reestablishment.

## Existing District Wetlands

### Existing Wetland Resources

Most of the District has been developed for commercial, roadway, industrial or residential use. However, areas of natural and semi-natural vegetation remain near significant water bodies like the Mississippi River and Lake McCarrons. Less than 5% of the District contains wetlands, and the majority of these wetland resources exist in either small scattered remnants, or are located as larger entities within undeveloped parcels or existing regional parks (e.g. Hidden Falls-Crosby Farm Regional Park, Mississippi Gorge Regional Park).



To some degree, all wetlands within the District are degraded. The District's wetlands do provide opportunities for enhancement and improvement. Many of these lower quality wetlands with potential for improvement are in the northern half of the District. The section titled "Wetland Improvement" discusses options for these lower quality wetlands. The District also contains areas that formerly held wetlands but now provide excellent opportunities for wetland reestablishment. The methodology used to define potential wetland reestablishment sites focused on sites containing historic wetland resources. Potential areas for wetland reestablishment are discussed further in the section titled "Wetland Reestablishment". The District will prioritize wetlands to reestablish in coordination with the greater effort to "Bring Water Back to St. Paul". Wetland reestablishment will be considered along with stream daylighting and green corridor creation opportunities.

### Inventory and Functional Assessment Methodology

In 1999 all wetlands within the District were inventoried and their functions were assessed. The District's Wetland Inventory and Functional Assessment was again reviewed and updated in 2009 by applying the same methodology as used in 1999. The District's Wetland Inventory and Functional Assessment also incorporates the City of St. Paul's recently completed Wetland Inventory. Field visits to each wetland included a functional assessment using the Minnesota Routine Assessment Methodology for Evaluating Wetland Functions. All stormwater ponds identified as such by MnDOT and the City of St Paul have also been identified as stormwater ponds for the District's Wetland Inventory and Functional Assessment. The only exceptions are the wetlands at Willow Reserve which function as natural wetlands in addition to serving a stormwater function.

Table 3 contains the format for data collection and the resulting classification and detailed assessment for each wetland. Wetland functions evaluated included Vegetative Diversity/Integrity, Maintenance of Hydrologic Regime, Flood and Stormwater Storage/Attenuation, Water Quality/Shoreline Protection, Groundwater Interaction, Wildlife Habitat, Fisheries Habitat, and Aesthetics/Recreation.

The functional assessment methodology is a state-approved method for evaluating wetland functions.

The wetland resources in the District are highly valued by its residents. The public's opinion on wetland values was solicited in the process of developing the Watershed Management Plan and during the course of several recent resource planning projects. Wetland functions cover a range of "services" wetlands provide. "Values" are a priority-based selection of functions that meets the specific interest/need of the geographic area or public constituency. Based on input from the District and participants in the public involvement process for the watershed management plan, the District places the highest value on wildlife habitat and aesthetics functions of wetlands. Following is a discussion of each function evaluated in the Wetland Management Strategy.

### **Vegetative Diversity and Integrity**

Vegetative diversity and integrity is the measure of the wetland compared to a an undisturbed reference wetland. Diversity refers to the amount of plant species present, and integrity refers to whether or not the plant species should be present within the wetland community. This type of assessment is specific to each wetland community. Most of the wetlands in the District have low vegetative diversity and/or integrity. Many are monotypic stands of cattail or reed canary grass. Others are open water wetlands with little or no vegetation. Most of the wetlands that do have some vegetative diversity also have invasive or exotic species present. Exotic and invasive species include reed canary grass, purple loosestrife, and buckthorn.



The District and its residents understand the importance of vegetative diversity and integrity of wetlands. Exotic and invasive species along with other anthropogenic influences such as stormwater runoff has significantly impacted wetland resources within the District. Restoration of degraded wetlands and performance-based buffer standards will help improve this function over time. The District could set one of their goals to enhance Vegetative Diversity and Integrity through carrying out hydrologic and vegetative improvement and reestablishment projects such as the restoration of Willow Reserve.

### **Maintenance of Hydrologic Regime**

Wetlands of different types have different hydrologic regimes. For example, ponds and marshes have fairly stable water levels throughout the year and conversely floodplain wetlands and ephemeral basins may fluctuate significantly based on rainfall and season. This function ranks the current hydrologic regime of a wetland compared its representative hydrologic regime if it were in an unaltered setting. Factors such as land use within the drainage area and upland buffer condition are factored into the scoring of this function. The majority of wetlands within the District no longer have the ability to maintain their natural hydrologic regime. This is due to the highly developed nature of the District, the removal of a significant portion of its drainage area, and the use of wetlands for stormwater storage.



Hydrologic regime changes to a wetland can cause changes to the vegetative community and affect watershed runoff characteristics. Oftentimes wetlands are used to control stormwater rate and volume from developed areas thus negatively impacting this function. The District realizes the importance of maintaining or reestablishing hydrologic regimes that fit the existing or targeted wetland community. Buffer and stormwater management rules adopted by the District as well as wetland management and restoration projects could help maintain or enhance this function. The District's relatively new volume control rule could serve to restore the natural hydrologic regime of existing wetland communities.

### **Flood and Stormwater Storage/Attenuation**

Flood/stormwater attenuation is evaluated based upon wetland characteristics such as the wetland plant community's ability to tolerate hydrologic perturbations, adjacent land uses, and the wetland location within the watershed. An exceptional rating for this function is achieved if the wetland is managed to maximize stormwater retention in an area with the potential for flood damages. The wetlands within the District store stormwater to varying degrees. Some store large amounts of stormwater, while others have large outlet structures and have little capacity for stormwater attenuation.

It is a goal of the District to utilize the natural storage capacity and function of wetlands while also preserving the ecological diversity and integrity of the wetlands. However; proper stormwater management practices are needed to ensure this function is balanced with other functions, such as vegetative integrity, that appear to be in conflict. The District's regulatory program and implementation projects could contribute to the enhancement of this function without completely relying on natural wetland systems which can be impacted by excessive stormwater volume.

### **Water Quality/Shoreline Protection**

Water quality protection is evaluated according to the wetland's primary water source, the potential impact of surrounding land uses, estimated storage capacity, vegetation and detritus density, position with respect to other surface waters and evidence of excess nutrient loading. The water quality within wetlands includes numerous chemical, biological and physical processes. When any of these processes are disrupted sufficiently to change the character of the wetland, the wetland water quality is diminished. In general, there are very few wetlands within the District that are directly connected to a lake in the District. There are also few wetlands which are a direct tributary to the lakes of the District.



The District sees value in wetland water quality and believes it should be preserved when possible. In some cases, wetlands may be needed to provide water quality protection/treatment for high priority aquatic resources. If this is the case, planning and design options will be evaluated to ensure the wetland being used for water quality improvement purposes is of suitable type and hydrologic regime to maximize nutrient removal. This will be accomplished by utilizing natural nutrient absorption (via soils and vegetation) and transpiration to ultimately reduce downstream pollutant loading.

### **Groundwater Interaction**

The groundwater interaction function is the most difficult to assess with the rapid methodology used for the Districts inventory and assessment. It usually requires gathering additional hydrologic and geologic data. Lack of time and data availability typically precludes a detailed assessment of the groundwater interaction function. It is included in this method for continuity, and for those instances when more detailed investigation is required or more data are available. Some of the wetlands of the District have a strong correlation to groundwater. This is evident by consistent water levels throughout the growing season despite periods of very low precipitation.



By enforcing sound stormwater management, erosion control and wetland management, the District can help support resources such as springs and seepage wetlands. An inventory of groundwater-dependant features as well recharge areas, will help the District better manage these resources.

### **Wildlife Habitat**

Wildlife habitat refers to the ability of a wetland to provide food and protective cover for animal species, including mammals, birds, reptiles, amphibians, and invertebrates. The assessment methodology assumes that the quality of the wildlife habitat provided by a wetland is related primarily to the level of disturbance or degradation compared to an undisturbed or least disturbed wetland of the same type within the study area. [“Disturbance,” as used here refers to human activities or human-induced conditions that tend to reduce natural diversity or disrupt natural processes. Management activities designed to mimic natural processes (e.g., burning, water level management) or to restore natural diversity (e.g., exotic species control) would not be considered “disturbances” in this context.] The functional level of the habitat can also be influenced by the size of the wetland and its position in the landscape relative to other wetlands and habitat types. The methodology assumes that all wildlife species are ecologically important and that low species diversity is not necessarily a sign of poor wildlife habitat. Some wetland types naturally support a lower diversity of wildlife species or numbers. The assessment of wildlife habitat quality accounts for the fact that some wetlands are used only seasonally or intermittently by certain species but are nonetheless important or even critical for those species. Wetlands ranking high for wildlife habitat would have high quality wetland vegetation, a high level of wetland vegetation and community interspersions, very wide and vegetated upland buffer zones, a natural hydrologic regime, and a low level of wildlife corridor barriers. Very few of the wetlands of the District provide high quality habitat for a variety of wildlife species. Despite the urban setting, the wetlands in the District do provide habitat for many wildlife species. Ramsey County Parks has published a document titled “A Guide to Birding in Ramsey County. In addition to avian species, the guide book provides species lists of animals known to exist within the urban landscape of Ramsey County.

Wildlife habitat is a valued wetland function in the District. The District Rules, projects and programs enhance wetland habitat. Buffers, restoration projects as well as public education all help support wildlife habitat by improving existing natural areas.

### **Fisheries Habitat**

Generally, the function of a wetland for fish habitat is related to its connection to lakes, rivers or streams. A wetland receives a high or exceptional rating for fish if it provides spawning/nursery habitat, or refuge for native fish species. Some isolated deep marshes may intermittently support populations of sunfish and northern pike as a result of colonization during flood events. Such wetlands are rated high to moderate for fish habitat. Permanently flooded isolated wetlands that support native populations of minnows are given a moderate rating. Wetlands with exclusive, high carp populations are given a low rating for fish habitat because carp cause extreme degradation of the wetland.



Isolated wetlands that are not permanently flooded do not generally support fish populations. It is important to note that some wetlands can indirectly contribute to the maintenance of fish populations in lakes, streams and rivers if they are providing high levels of water quality protection or flood storage. Most of the District's wetlands have become less connected from lakes and the river and do not serve a high fisheries habitat function.

The District will evaluate which wetlands serve as important fishery resources for native species. Wetlands that support populations of exotic minnow species, such as carp, and high densities of forage species, such as fat head minnows, can be a significant detriment to water quality. Without top predators (such as bass and pike) to control their population, planktivore species such as bluegill, that prey on algae-feeding plankton, can also cause water quality problems.

### **Aesthetic/Recreation**

The aesthetics/recreation function of a wetland is evaluated based on its visibility, accessibility, evidence of recreational uses, evidence of human influences (e.g. noise and air pollution) and any known educational or cultural purposes. The wetlands within the District have a strong ranking for aesthetic/recreation for the fact that many of them are located within public lands or are highly visible to the public. The aesthetic of many wetlands are degraded due to human influences such as the presence of trash or by encroaching landscaping practices.

The aesthetic/recreation function is a top priority for the District. Resident perception of wetland resources can be greatly influenced by their visual appearance. Visually appealing areas then become higher valued from a recreational perspective. Regulatory controls such as buffer standards and programmatic approaches such as education or "adopt-a-wetland" will help the District improve this function. The District will also work with its partners to more effectively monitor and control illegal dumping into wetlands.



### **Coordination with District Partners**

The City of St. Paul recently completed a Wetland Inventory and Wetland Management Plan. The St. Paul technical data was incorporated into the District's wetland data so that the inventory and Functional Assessment Rankings were exactly the same. Several wetlands in the District inventory were not mapped in the St. Paul inventory. After consultation with the City of St. Paul it was determined that these basins were classified as functioning stormwater ponds. St. Paul's protocol to inventory and assess wetlands intentionally excluded stormwater ponds whereas the District's inventory included evaluation of these resources. This is in part due to the fact that many older stormwater treatment areas were originally low areas and wetlands that may have been dredged and/or altered for stormwater treatment. If feasible, The District will look for alternative treatment and restoration. The basins in the City of St. Paul functioning as stormwater ponds, including wetland basins that are historically used for stormwater management are included in the maps that are found at the end of this document. The basins that are believed to have been constructed within historically upland area are denoted as stormwater ponds whereas the remaining areas used for stormwater management are mapped as wetlands whereas the remaining areas used for stormwater management are mapped as wetlands.

Data were updated for wetlands in Roseville, Maplewood, Lauderdale, and Falcon Heights by conducting field surveys to collect additional data. Please refer to the wetland maps for the results of the Wetland Functional Assessment.

## Wetland Protection

The Wetland Conservation Act (WCA) provides many measures to protect wetland resources from filling and draining. The District has rules to provide additional protection to wetlands. Wetlands are currently protected under the District's Rule E ("Wetland Management") to a higher level than the WCA's regulations.

In addition to these existing measures for protection, the District will consider adopting further measures to increase the protection of high quality wetland resources including the following strategies:

## Buffer Standards

The District Rules currently require a “minimum buffer of 25 feet of permanent District approved non-impacted vegetative ground cover abutting and surrounding a wetland.” In order to provide more functional enhancement throughout the District, and effective and productive buffer standards; modifications to the existing wetland buffer rule could be made. Permit applications could be required to establish permanent buffers adjacent to all existing and created wetlands within the geographic scope of the project. In addition, the District could utilize existing inventory data to prioritize locations for buffer establishment projects. Project selection will be weighted for areas that provide the greatest range of functional enhancement.



Vegetative Performance Standards: The District will consider adding qualitative standards to its current numeric standard for wetland buffers. The updated language will require buffers consist of vegetated land, primarily of plant species native to this region. Designated buffer areas shall not be mowed; fertilized, used as a site for depositing snow, subject to the placement of mulch or yard waste; or otherwise disturbed. Exceptions to this standard would be made for periodic cutting or burning that promotes the health of the buffer or upland habitat area, actions to address disease or invasive species, or other actions to maintain or improve buffer or habitat area quality. Vegetation diversity and density will be important establishment requirements that enhance a range of wetland functions particularly wildlife and aesthetics.

Water Quality Performance Standards: The District will consider including components to the buffer Rule to include requirements that enhance the water quality benefits wetland buffers provide. Specifications will include details on recommended buffer widths appropriate for a range of soil types, slopes and vegetation density.

Signage: Free standing signs clearly delineating the boundary of the established buffer may be required by the District.

## Volume Control for discharging into wetlands

Standards may be developed to regulate the amount of bounce sustained by a wetland according to its sensitivity to stormwater input. Standards could also be developed to strategically protect wetlands that are currently receiving too much stormwater discharge but have the potential for improvement once the discharge volume is controlled. These standards would also require mitigation for excess stormwater bounce.

- Proposed projects that have the potential to impact downstream wetlands will be evaluated against hydroperiod standards adapted from “Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands,” (Minnesota Stormwater Advisory Group, June 1997).



## **Pretreatment of stormwater runoff into wetlands**

Currently the District does not expressly regulate stormwater runoff entering all wetlands. Standards could be developed to address the pretreatment of stormwater prior to discharge for all wetlands for both new and existing discharges.

The District will consider regulating all stormwater runoff rates by requiring performance standards for a proposed project. For a proposed project, the District could require specific water quality and infiltration performance standards to be sized to infiltrate and/or retain the runoff volume generated within the contributing area by a certain storm volume under the developed condition. Performance standards may be selected on the basis of site-specific conditions, including soil types, depth to water table and the presence of known or suspected contaminated soils.

Pretreatment standards may be developed to be based on wetland types. Wetlands that are sensitive to stormwater runoff could be identified based on the Wetland Susceptibility Classifications as described in the previous section addressing standards for Volume Control.

## **Offsite Replacement**

### **Background**

The District understands the importance of replacing lost wetlands as close to the location of the impact as possible. In many cases that means on-site. In other case the best and most feasible location for replacement may be within the immediate watershed. The developed conditions of the watershed make finding sites for replacement extremely difficult. To assist in finding appropriate replacement sites, the District will proactively work with landowners to identify potential replacement sites. By taking a programmatic approach to wetland replacement, the District is able to assist parties in need of wetland credits, find appropriately sited locations that provide the greatest wetland functional replacement within the Watershed. Having a program to facilitate meaningful offsite replacement does obviate the applicant's need to follow sequencing as defined by the Wetland Conservation Act and Section 404 of the Clean Water Act.

### **Wetland Banking**

Wetland Banks are established by applicants through a Wetland Conservation Act LGU as an official process to create wetland credits. Most frequently banks are established by land owners. The credits generated from that effort are then deposited in the bank after successful restoration standards are met. As a general rule, wetland banks are not generated for the purpose of replacing impacts identified in a current project. There are legal restrictions on the use of public dollars to generate credits for sale to private entities. Along with the WCA LGU, the District will provide technical assistance to parties interested in establishing a wetland bank in the CRWD. Assistance will come in the form of site selection and prioritization as well as helping identify restoration efforts that provide high wetland functional replacement. The CRWD does not intend to undertake wetland restoration projects with the purpose of depositing credits into the State Wetland Bank.

### **Offsite Wetland Replacement**

For reasons mentioned above, the District sees value in assisting parties, in need of wetland replacement, find acceptable locations to create credits. Unlike banking, where the credits are created in advance of the impact, offsite wetland replacement typically occurs at the same time as the impact. In order for offsite replacement to be effective, parties in need of credit must have access to known locations where restoration activities are possible. The District will work

proactively to find locations where restoration activities are possible such that parties needing replacement credit can coordinate their development activities with restoration. By doing this, wetland replacement is properly sited in the watershed and can provide the greatest wetland functional replacement.

## Wetland Improvement

### Background

The existing wetland resources in the District provide excellent improvement opportunities for some functions including: Vegetative Diversity and Integrity, Maintenance of Hydrologic Regime, and Wildlife Habitat. In order to achieve the wetland improvement goals of the District, a mechanism for selecting wetland sites with enhancement opportunities has been developed. A monitoring and maintenance commitment from the District and other potential project partners will ensure wetland improvement goals are achieved. Currently, the District is involved with a wetland monitoring program which follows the protocols as outlined in the Minnesota Pollution Control Agency's Biological Monitoring Program for "Macroinvertebrate Community Sampling Protocol for Depressional Wetland Monitoring Sites" and "Aquatic Plant Community Sampling Procedures for Depressional Wetland Monitoring Sites."



### Methodology used to determine Wetland Improvement Sites

Several methodologies have been reviewed for identifying and prioritizing Wetland Improvement opportunities for wetlands in the District.

#### MnRAM 3.2 Protocol

The first of such methodologies is taken directly from MnRAM 3.2 protocol, and assesses attributes such as the number of landowners that would be affected by a potential restoration, the feasibility and potential ease of hydrologic and vegetative restoration, the potential acreage of restorable wetland area, etc. This is the methodology used by the City of St. Paul to rank their potential restoration and improvement projects, and did not identify many wetlands for restoration potential. The wetlands ranked by the City of St. Paul as having wetland improvement/restoration potential are included in Figure 1.



#### Watershed-based Goals Protocol

Watershed-based approaches to identifying key wetland improvement sites include protocols that direct efforts toward improving and managing water quality and quantity to optimize watershed benefit. This analysis identifies wetland sites where improvement work can realistically be

achieved. It is also based on local in-depth knowledge of the District's existing wetland resources and goals. The following criteria consider realistic goals to define potential Wetland Improvement sites:

- (1) Proximity to a lake needing improvements and management of water quality and quantity (contained within that specific subwatershed)
- (2) Proximity to the Mississippi River
- (3) Ownership by a public entity
- (4) Potential for wildlife habitat enhancement
- (5) Public Visibility/Use

Many communities take a similar approach to identifying and evaluating potential Wetland Improvement opportunities. Given the urbanized setting of the District, it is somewhat difficult to directly apply MnRAM 3.2 protocols for identifying the restoration potential of the District's wetland resources. Additionally, this standardized protocol does not tend to capture optimizing watershed-wide benefits and could possibly overlook some of the long-term improvement potential of wetland sites. Therefore additional protocols were used to evaluate potential Wetland Improvement opportunities.

### Function and Value Protocol

The following steps articulate a programmatic approach for determining potential Wetland Improvement sites:

- (1) Identified wetlands with low Vegetative Diversity and Integrity function  
*Please refer to Appendix B for a map of wetlands that rank LOW for Vegetative Diversity and Integrity*
- (2) Identified all wetlands which rank LOW for Maintenance of Hydrologic Regime  
*Please refer to the map of wetlands that rank LOW for Maintenance of Hydrologic Regime wetlands*
- (3) Identified all wetlands which rank LOW for Wildlife Habitat  
*Please refer to the map of wetlands that rank LOW for Wildlife Habitat wetlands*
- (4) Identified all wetlands which rank LOW for Aesthetics and Recreation  
*Please refer to the map of wetlands that rank LOW for Aesthetics and Recreation*

A ranking system was developed based on the above rankings and is depicted in Figure 1. Wetlands with three or more low rankings for the four functions listed above were given a high rating for wetland improvement priority. Wetlands with low rankings for two functions were rated medium and wetlands with only one low ranking were rated low for wetland improvement priority. These four wetland functions were chosen as a best reflection of the priorities of the District and its stakeholders.

### Ramsey Conservation District Protocols

The Ramsey Conservation District (RCD) created a Wetland Management Strategy for the District through a Wetland Restoration Site Data and Ranking System as described in the following Wetland Reestablishment section. The higher the numerical ranking, the greater the priority RCD placed on potential for Wetland Improvement.

Combining these protocols resulted in the following list of potential wetland improvement sites:

- (1) Wetland basins contained within Willow Reserve



- (2) Wetland basins and river banks along the Mississippi River that exist along Randolph Ave (runs northeast/southwest adjacent to Shepard Road near downtown St. Paul)
- (3) Areas at the Sarita Wetland Property as a future priority once stormwater treatment is implemented
- (4) High Priority Ranking Wetland Restoration Sites from the RCD analysis
- (5) Sites with Wetland Restoration Potential from the City of St. Paul's Wetland Management Plan

The wetlands identified through this methodology were given a high rating for wetland improvement as depicted in Figure 1.

Figure 1 depicts the priority rating for wetland improvement sites based on each of the protocols described above. It is a goal of the District to prioritize Wetland Improvement projects above Wetland Reestablishment projects. It is also a goal to evenly distribute the Wetland Improvement projects throughout the District.



## **Wetland Reestablishment**

### **Background**

The creation of additional wetland resources within a watershed enhances overall wetland functions. Especially in an urban setting, the contribution of additional wetlands provide additional wildlife habitat, improve water quality of adjacent waterbodies, increase local vegetative diversity, and reduce the amount of pollutants that ultimately reach the Mississippi River or District Lakes. The District has committed staff and resources to identifying opportunities for reestablishment of historic wetland resources within the District. The District refers to this process as wetland 'reestablishment' in an effort to distinguish it from the terms 'restoration' or 'creation' which have specific definitions is MN Rules 8420 Wetland Conservation Act. The District is also committed to monitoring and maintenance of created wetland features.



### **Wetland Reestablishment Site Identification Methodologies**

The methodology used to define potential Wetland Reestablishment sites focused on sites containing historic wetland resources. This process began with a review of historic maps generated for the District Land and Water Resource Inventory from the 2010 Watershed Management Plan. The following section expands upon the protocol designed by the Ramsey Conservation District specifically for the District.

#### **Ramsey Conservation District Protocol for Wetland Reestablishment Site Identification**

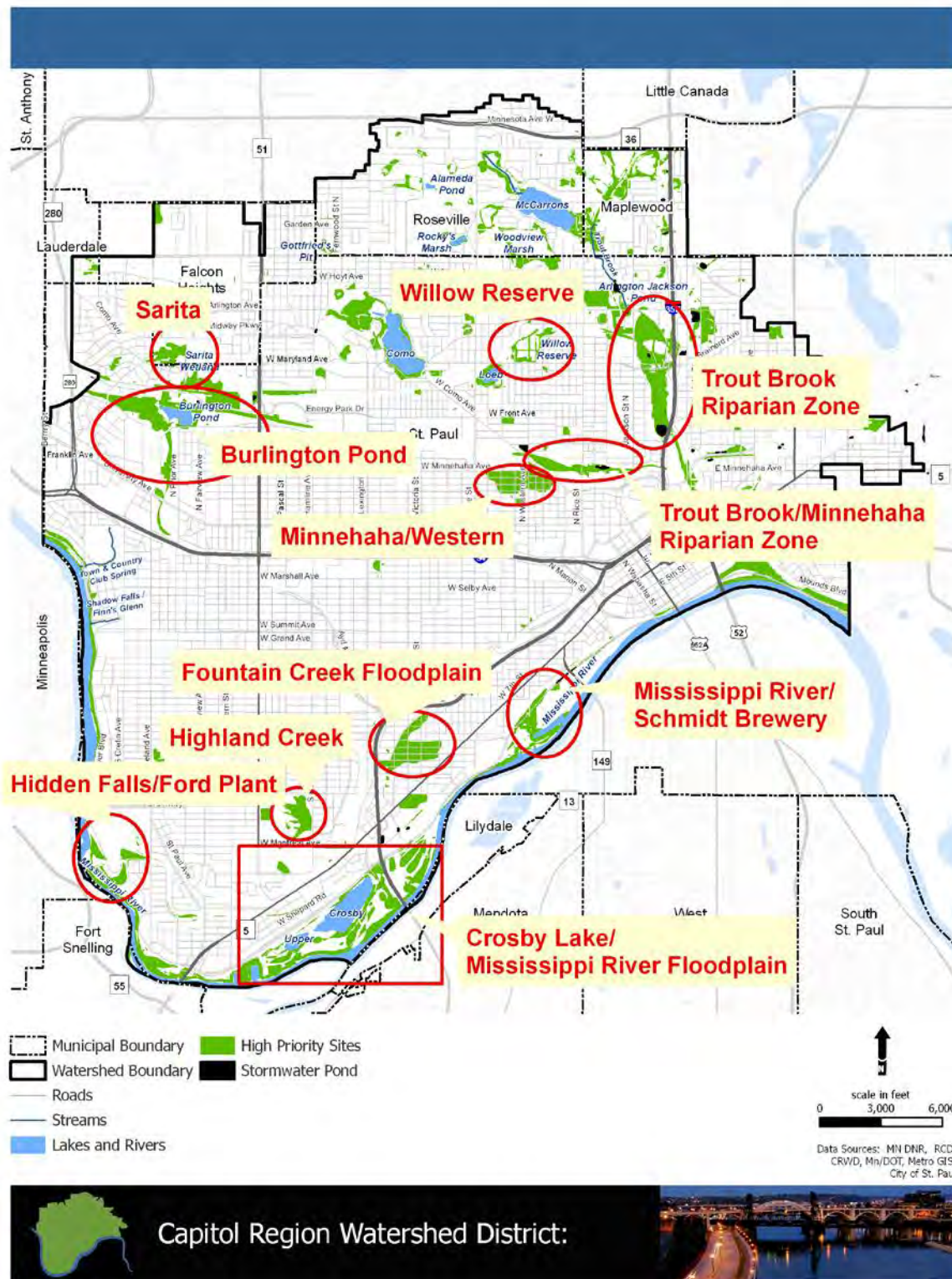
Parcels were given priority rankings based on a numerical score (0-10) through GIS analysis. The Ramsey Conservation District's (RCD's) protocol gave the highest weight to "Historical Wetlands" that had been documented in the 1945 Wetland Inventory for CRWD and from the 1850's Original Land Survey. The RCD's protocol for identifying parcels with Wetland Reestablishment potential next looked at Soil Survey data for Ramsey County. All areas mapped as having hydric (wet) soils were prioritized. Hydric soils will usually hold water and therefore meet the wetland hydrology requirements and indicate depressional areas for large historic catchments. The next area of prioritization for Wetland Reestablishment sites assigned weight to areas adjacent to public parks to promote greenway corridors. Areas adjacent to an existing wetland also received priority ranking because a wetland site reestablished within close proximity to other wetlands provides a much greater wildlife habitat benefit. Priority was also given to potential Wetland Reestablishment sites on public parcels because it is usually easier to acquire access for wetland sites when compared to private land. Therefore the higher the numerical ranking, the greater the priority RCD placed on potential for Wetland Reestablishment.



**Combined Protocol:**

The analyses by Ramsey Conservation District and the information from the City of St. Paul's Wetland Management Plan were combined to develop the District's protocol for evaluating the restoration of existing and potential wetland resources. The following is a map of Wetland Reestablishment opportunity sites identified through this process. PLEASE NOTE there are some large parcels that come up with a potential for Wetland Reestablishment because they are large parcels with components that trigger prioritization; however this does not necessarily mean that the entire parcel could become a wetland.

**Figure 2. Wetland Reestablishment Sites**







**Table 1. Wetland Reestablishment Sites Prioritization Table**

Wetland reestablishment feature name	Location	Coincides with Stream restoration features	MnRAM ranked high	City priority high
<b>Trout Brook Riparian Zone</b>	Restoration of the riparian zone of upper Trout Brook	Yes		
<b>Highlights</b>	Trout Brook Interceptor owned by CRWD; constant inflow (water treatment plant); possible redevelopment southeast of LaFayette Bridge and I-94; proximity to Bruce Vento Nature Sanctuary; partnership and public support/financing likely; existing Trout Brook Greenway Plan (City of St. Paul) identifies restoration; Trout Brook is largest historical stream in CRWD.			
<b>Trout Brook/ Minnehaha Riparian Zone</b>	Restoration of the riparian zone of potential 'daylighting' lower Trout Brook to Mississippi River	Yes		
<b>Highlights</b>	Trout Brook Interceptor owned by CRWD; constant inflow (water treatment plant); possible redevelopment southeast of LaFayette Bridge and I-94; proximity to Bruce Vento Nature Sanctuary; partnership and public support/financing likely; existing Trout Brook Greenway Plan (City of St. Paul) identifies restoration; Trout Brook is largest historical stream in CRWD.			
<b>Hidden Falls/Ford Plant</b>	Through Ford Plant/redevelopment site to Mississippi River	Yes		
<b>Highlights</b>	Likely redevelopment site; good visibility; full site redevelopment gives design flexibility; identified for restoration by Saint Paul on the Mississippi Design Center; potential to include entire historic creek.			
<b>Sarita</b>	Further restoration of Sarita Wetland	Yes		
<b>Highlights</b>	Local flooding and water quality corrections needed; amenity for State Fair; high visibility and collaboration; connects to Sarita Wetland; open areas (UM farms, Fair parking) provides flexibility in restoration footprint.			

<b>Willow Reserve</b>	Restoration of the wetlands within Willow Reserve	No	Yes	
<b>Highlights</b>	Willow Reserve is owned by the City and is prioritized by CRWD			
<b>Mississippi River/ Schmidt Brewery</b>	Restoration of the floodplain areas at the old Schmidt Brewery site and along riparian corridor to Mississippi River	No		
<b>Highlights</b>	Likely redevelopment site; good visibility; full site redevelopment gives design flexibility			

<b>Crosby Lake/ Mississippi River Floodplain</b>	Restoration of Wetlands in Crosby Farm Regional Park, around Crosby Lake, and adjacent riparian zone to Mississippi River	No	Yes	
<b>Highlights</b>	Crosby Farm Regional Park owned by the City, many opportunities on public land to conduct wetland restoration activities			
<b>Highland Creek</b>	Highland Golf Course to Mississippi River	Yes		
<b>Highlights</b>	Through open space; potential park/golf course amenity; some design flexibility; close approximation of historical stream.			
<b>Burlington Pond</b>	Restoration of wetlands adjacent to Burlington Pond	No		
<b>Highlights</b>	owned by the City, adjacent to and area of historical wetlands in an old railroad corridor			
<b>Fountain Creek Floodplain</b>	Along Ayd Mill Road to Mississippi River	Yes		
<b>Highlights</b>	Existing plan for Ayd Mill bike path ; access to Fountain Cave; steady flow possible due to collection of spring water; close approximation of historical Cascade Creek and Fountain Creek.			
<b>Minnehaha/Western</b>	Restoration of areas along Minnehaha Avenue and Western Avenue	No		
<b>Highlights</b>	location of historical wetland areas along an otherwise urban corridor			

## Implementation Costs

The costs to implement the wetland improvement and reestablishment components of the Wetland Management Plan are shown in Table 2. Citizen participation will play a key role in selecting sites for wetland improvement and reestablishment projects. Areas with active, interested citizen groups will be weighted in the site-selection process.

**Table 2.** Implementation Costs

Implementation Program	Description	Budget
<b>Wetland Improvement</b>		
Programmatic (425C)	CRWD Staff conducting ongoing maintenance, weeding etc.	\$10,000 per year (2011 through 2020)
Implementation of Projects (425C)	Environmental Consultant and Contractor performing implementation of projects	\$20,000 per year (2011 through 2020)
<b>Wetland Reestablishment (</b>		
Feasibility Study (325B)	Feasibility Study for 6 Wetland Reestablishment Sites	\$50,000 per year (2011 through 2013)
Implementation of Projects (425D)	Implementation of 2 Wetland Reestablishment Sites	\$100,000 per year (2014 through 2019)
Numbers parenthetically listed are from the Watershed Management Plan Implementation table		





**Table 3. Wetland Function and Value Assessment Database**

WETLAND ID	Mgmt Class	VEGDIVQ	HYDREGQ	F_SQ	WQSHQ	GIQ	WHQ	FHQ	ARQ
62-029-22-19-071-A	M1	Medium	Medium	High	Medium	Recharge	High	N/A	Exceptional
62-029-23-24-053-A	M2	Medium	Medium	High	Medium	Combination	Medium	Medium	Medium
62-029-22-20-078-A	M1	Low	Medium	High	Medium	Recharge	Medium	N/A	Medium
62-029-22-19-072-A	M2	Medium	Medium	High	Medium	Combination	Medium	Medium	Medium
62-029-23-24-055-A	M2	Low	Medium	High	Medium	Recharge	Medium	N/A	Medium
62-029-22-19-070-A	M1	Medium	Medium	High	Medium	Recharge	High	N/A	Exceptional
62-029-23-25-052-A	M1	Medium	Medium	High	Medium	Recharge	Medium	Medium	Exceptional
62-029-22-32-093-A	P	Exceptional	High	High	Exceptional	Combination	Exceptional	High	Exceptional
62-029-22-32-187-A	M1	Medium	High	High	High	Recharge	High	Medium	High
62-029-23-28-033-A	M2	Low	Medium	High	Medium	Combination	Medium	Medium	Medium
62-029-23-28-032-A	M2	Low	Medium	Medium	Medium	Combination	Medium	Medium	Medium
62-028-23-09-028-A	M3	High	Medium	High	High	Recharge	High	Medium	Exceptional
62-029-22-19-068-A	M2	Low	Medium	High	Medium	Recharge	Medium	N/A	Exceptional
62-029-22-19-062-A	M3	Medium	Medium	High	Medium	Combination	Medium	Medium	Medium
62-029-22-19-065-A	M3	Low	Medium	High	Low	Recharge	Medium	N/A	Medium
62-029-22-20-080-A	M2	Low	Low	High	Low	Recharge	Low	N/A	Medium
62-029-22-29-088-A	M2	Medium	Low	High	Medium	Recharge	Medium	N/A	Medium
62-029-23-28-034-A	M2	Low	Low	High	Low	Combination	Medium	Low	Medium
62-029-23-28-037-A	M2	Low	Medium	High	Medium	Recharge	Medium	N/A	Medium
62-028-23-15-043-A	M2	Medium	Medium	Medium	Medium	Combination	Medium	N/A	Medium
62-029-22-20-079-A	M2	Low	Medium	High	Low	Recharge	Medium	N/A	Medium
62-029-23-25-058-A	M2	Low	Low	High	Low	Combination	Medium	Low	Medium
62-029-22-19-059-A	M2	Medium	Low	High	Medium	Recharge	Medium	N/A	Medium
62-028-22-05-094-A	M2	Low	Medium	High	Low	Recharge	Medium	N/A	High
62-029-22-32-095-A	M2	Low	Medium	High	Low	Recharge	Medium	N/A	High
62-029-22-19-063-A	M3	Low	Medium	High	Medium	Combination	Medium	N/A	Medium
62-029-23-28-031-A	P	Medium	Medium	High	Medium	Recharge	Medium	N/A	Medium
62-028-23-14-045-A	M2	Low	Medium	High	Low	Recharge	Low	Low	Medium
62-028-23-14-048-A	M2	Medium	Low	High	Medium	Recharge	Medium	Medium	Medium
62-028-23-15-044-A	M1	High	Medium	High	Medium	Combination	High	N/A	High
62-028-23-17-014-A	M2	Medium	Medium	High	Medium	Recharge	Medium	N/A	Medium
62-029-22-19-069-A	M2	Low	Medium	High	Medium	Combination	Medium	N/A	Exceptional
62-029-22-19-060-A	M3	Low	Low	High	Low	Recharge	Low	N/A	Medium
62-029-22-20-084-A	M2	Low	High	High	Medium	Recharge	Medium	N/A	Exceptional
62-029-22-19-066-A	M2	Medium	Medium	High	Medium	Recharge	Medium	Medium	High
62-029-22-30-075-A	M2	Low	Low	High	Low	Recharge	Low	N/A	Medium
62-028-23-09-029-A	P	Medium	Medium	High	Medium	Recharge	Medium	N/A	Exceptional
62-029-22-28-097-A	M2	Low	Medium	High	Low	Recharge	Medium	N/A	Low
62-029-23-29-011-A	M2	Low	Low	High	Low	Recharge	Low	N/A	Low
62-029-23-25-057-A	M2	Low	Low	High	Low	Combination	Low	Low	Medium
62-028-23-14-109-A	P	Exceptional	Medium	High	High	Combination	Exceptional	N/A	Medium
62-029-22-32-186-A	P	Medium	High	High	High	Recharge	Exceptional	High	High
62-029-22-32-185-A	P	Medium	High	High	High	Recharge	Exceptional	High	High
62-029-22-32-184-A	P	Medium	High	High	High	Recharge	Exceptional	High	High
62-029-23-23-042-A	M1	High	Medium	High	Medium	Recharge	Medium	Medium	Exceptional
62-029-23-28-036-A	M2	Low	Low	Medium	Low	Recharge	Low	N/A	Low
62-029-23-27-039-A	P	Medium	Medium	High	Medium	Recharge	High	N/A	Exceptional
62-029-23-27-040-A	M2	Low	Low	High	Low	Recharge	Low	N/A	Medium
62-029-23-25-051-A	P	High	High	High	High	Combination	Medium	High	Exceptional
62-029-22-19-067-A	M2	Medium	Medium	High	Medium	Combination	Medium	Medium	Exceptional
62-029-22-19-064-A	M3	Low	Low	High	Low	Recharge	Low	N/A	Medium
62-029-23-28-108-A	M2	Low	Medium	High	Medium	Recharge	Medium	Medium	Medium
S112923-1-A	M1	Medium	High	Medium	High	Low	Medium	Low	Low
S112923-1-B	M1	Medium	High	Medium	High	Low	Medium	Low	Low
S122923-2-B	M1	Low	Low	High	Medium	Low	High	Low	Medium
S122923-2-A	M1	Low	Low	High	Medium	Low	High	Low	Medium
S122923-2-C	M1	Low	Low	High	Medium	Low	High	Low	Medium
S122923-1-A	M2	Low	Low	High	Medium	Low	Medium	Low	Medium

WETLAND ID	Mgmt Class	VEGDIVQ	HYDREGQ	F_SQ	WQSHQ	GIQ	WHQ	FHQ	ARQ
S162923-1-A	M1	Medium	High	Medium	Low	Low	High	Low	High
S162923-1-B	M1	Medium	High	Medium	Low	Low	High	Low	High
S152923-1-A		Low	Medium	High	High	Medium	Low	Low	Low
N142923-1-A	M2	Low	Medium	Medium	Medium	High	Low	Low	Medium
N142923-2-A	M2	Low	Medium	High	Medium	Low	Medium	Low	Low
N142923-3-A	M1	Low	Medium	Medium	Medium	Medium	High	Low	Medium
N142923-3-B	M1	Medium	Medium	Medium	Medium	Medium	High	Low	Medium
N142923-4-A	P	High	High	High	High	Medium	High	Low	Low
N142923-4-B	P	High	High	High	High	Medium	High	Low	Low
N142923-4-C	P	High	High	High	High	Medium	High	Low	Low
N142923-5-B	M2	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
N142923-5-B	M2	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
N142923-5-A	M2	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
N142923-6-B	M1	Medium	High	High	High	Medium	High	Low	Medium
N142923-6-A	M1	Medium	High	High	High	Medium	High	Low	Medium
N142923-8-A	P	High	High	High	High	High	High	Medium	High
N142923-8-B	P	High	High	High	High	High	High	Medium	High
N142923-8-C	P	High	High	High	High	High	High	Medium	High
N142923-7-A	M3	Low	Medium	Medium	Low	Low	Low	Low	Low
N142923-7-B	M3	Low	Medium	Medium	Low	Low	Low	Low	Low
S142923-3-A	M1	Medium	Medium	High	High	Low	High	Low	Medium
S142923-3-B	M1	Medium	Medium	High	High	Low	High	Low	Medium
S142923-3-C	M1	Medium	Medium	High	High	Low	High	Low	Medium
S142923-4-A	M1	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium
S142923-4-B	M1	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium
S142923-2-A	M2	Low	Low	Low	Low	Low	Medium	Low	Low
S142923-1-A	M1	Medium	High	High	Medium	Low	High	Low	Medium
N132923-1-A	M1	Medium	High	Low	Low	Low	High	Low	Medium
N132923-2-E	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-E	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-F	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-D	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-C	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-B	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-G	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-A	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-I	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-H	M1	Medium	Medium	Low	High	High	High	High	High
N132923-2-J	M1	Medium	Medium	Low	High	High	High	High	High
N132923-3-A	M1	Low	Medium	Medium	Medium	High	Medium	High	High
N132923-3-A	M1	Low	Medium	Medium	Medium	High	Medium	High	High
N132923-4-A	M1	Low	Medium	Medium	High	High	Low	High	Medium
N132923-5-A	M2	Low	Medium	High	High	Medium	Medium	Low	Low
N132923-6-A	P	High	High	Medium	Medium	Medium	High	Medium	Low
N132923-7-A	M1	Low	Low	Medium	Medium	Low	Low	Low	Low
N132923-8-A	M1	Low	Low	Medium	Medium	Low	Low	Low	Low
N132923-9-A	M1	Medium	High	High	High	High	High	High	High
N132923-9-B	M1	Medium	High	High	High	High	High	High	High
S132923-2-A	M1	Medium	Medium	Medium	High	High	High	High	High
S132923-2-A	M1	Medium	Medium	Medium	High	High	High	High	High
S132923-3-A	M1	High	Low	Medium	High	High	High	High	High
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S132923-1-A	M1	Medium	Medium	Medium	High	High	High	High	High
S132923-4-A	M2	Low	Medium	Medium	Low	Low	Medium	Low	Low
S132923-4-A	M2	Low	Medium	Medium	Low	Low	Medium	Low	Low
S132923-5-B	M1	Medium	Low	Medium	Medium	Medium	Medium	High	High
S132923-5-A	M1	Medium	Low	Medium	Medium	Medium	Medium	High	High
S132923-5-C	M1	Medium	Low	Medium	Medium	Medium	Medium	High	High
S132923-6-A	M1	Medium	High	Medium	Medium	Medium	High	Low	High
S132923-6-A	M1	Medium	High	Medium	Medium	Medium	High	Low	High

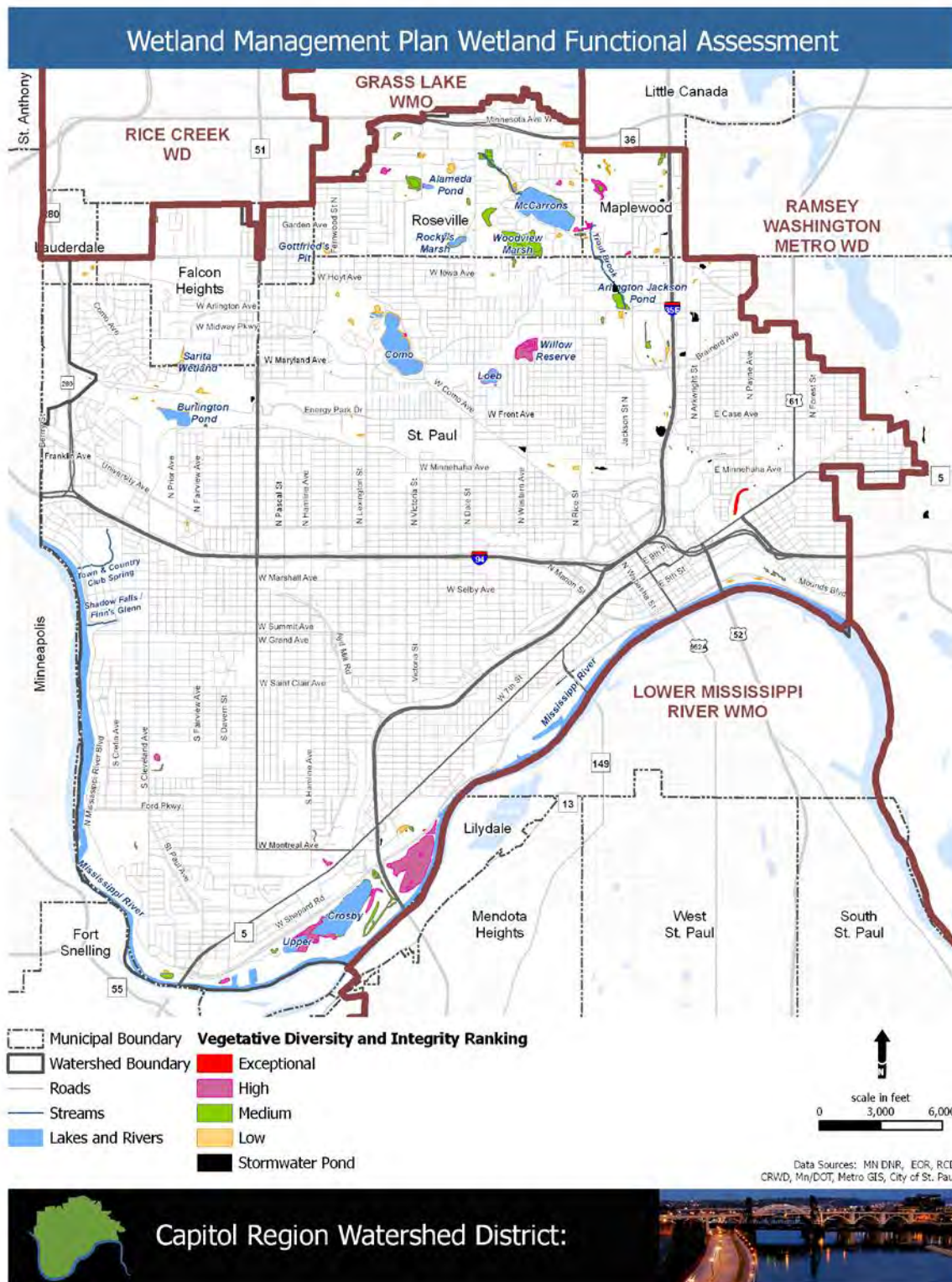
WETLAND ID	Mgmt Class	VEGDIVQ	HYDREGQ	F_SQ	WQSHQ	GIQ	WHQ	FHQ	ARQ
N182922-5-A	M1	Medium	High	High	Low	High	High	Low	High
N182922-5-D	M1	Medium	High	High	Low	High	High	Low	High
N182922-22-A	M2	Low	Medium	High	Medium	Low	Medium	Low	Low
N182922-5-E	M1	Medium	High	High	Low	High	High	Low	High
N182922-5-B	M1	Medium	High	High	Low	High	High	Low	High
N182922-6-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-5-C	M1	Medium	High	High	Low	High	High	Low	High
N182922-19-A	M1	Low	Medium	Low	Low	Low	Medium	Low	High
N182922-18-A	M2	Low	Medium	Low	Low	Low	Low	Low	Medium
N182922-17-A	M2	Low	Medium	Low	Low	Low	Low	Low	Medium
N182922-20-A	M1	Medium	High	High	Low	Low	Medium	Low	Low
N182922-16-B	M3	Low	Medium	Low	Low	Low	Low	Low	Low
N182922-16-A	M3	Low	Medium	Low	Low	Low	Low	Low	Low
N182922-3-A	M2	Low	Medium	High	Low	Medium	Low	Low	Medium
N182922-15-A	M2	Low	High	High	Low	Low	Low	Low	Low
N182922-4-A	M2	Low	Medium	Low	Low	Low	Low	Low	Medium
N182922-7-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-21-A	M2	Low	Low	Medium	Medium	Low	Medium	Low	Medium
N182922-14-A	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-13-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-8-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-14-D	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-14-C	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-2-A	M2	Low	Medium	High	Low	Medium	Low	Low	Medium
N182922-14-B	M1	Medium	Medium	High	Medium	High	High	Medium	Medium
N182922-9-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-14-E	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-12-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-10-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-14-G	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-14-F	M1	High	Medium	High	Medium	High	High	Medium	Medium
N182922-11-A	M1	Medium	Medium	High	Medium	Medium	High	Medium	Medium
N182922-1-A	M2	Low	Medium	Medium	Medium	Low	Low	Low	Medium
N182922-1-B	M2	Low	Medium	Medium	Medium	Low	Low	Low	Medium
S182922-5-B	M1	High	Medium	High	Medium	Low	High	Low	Medium
S182922-5-D	M1	High	Medium	High	Medium	Low	High	Low	Medium
S182922-5-A	M1	High	Medium	High	Medium	Low	High	Low	Medium
S182922-5-C	M1	High	Medium	High	Medium	Low	High	Low	Medium
S182922-5-E	M1	High	Medium	High	Medium	Low	High	Low	Medium
S182922-2-A	M2	Low	Medium	Medium	Low	Medium	Low	Medium	Low
S182922-6-A	M2	Medium	Medium	High	High	Low	Medium	Low	Medium
S182922-6-B	M2	Medium	Medium	High	High	Low	Medium	Low	Medium
S182922-4-A	M1	Low	Low	High	Medium	Low	Low	High	High
S182922-7-A	M3	Low	Low	High	Low	Medium	Low	Low	Low
S182922-1-A	M2	Low	Medium	Medium	Medium	Medium	Low	Medium	High
S182922-3-A	M1	High	High	High	High	Medium	High	Low	Medium
S212923-1-A	M2	Low	Low	Low	Low	Low	Low	Low	Medium
N222923-1-A	M1	Low	High	High	Medium	Low	Low	Low	Low
S222923-1-A	M3	Low	Low	Low	Medium	Low	Low	Low	Low
S232923-3-A	M3	Low	Low	Low	Low	Low	Low	Low	Low
S232923-2-A	M3	Low	Low	Low	Low	Low	Low	Low	Low
S232923-4-A	M3	Low	Low	Low	Low	Low	Low	Low	Low
S232923-6-A	M2	Medium	Low	Medium	Low	Low	Medium	Low	Low
S232923-5-A	M3	Low	Low	Medium	Low	Low	Low	Low	Low
S232923-1-A	P	Low	Low	Low	Medium	High	Medium	Medium	High
S242923-1-C	M1	High	Medium	High	High	High	High	High	High
S242923-1-E	M1	High	Medium	High	High	High	High	High	High
S242923-1-A	M1	High	Medium	High	High	High	High	High	High
S242923-1-A	M1	High	Medium	High	High	High	High	High	High
S242923-1-B	M1	High	Medium	High	High	High	High	High	High
S242923-1-D	M1	High	Medium	High	High	High	High	High	High



WETLAND ID	Mgmt Class	VEGDIVQ	HYDREGQ	F_SQ	WQSHQ	GIQ	WHQ	FHQ	ARQ
N192922-1-D	M1	Medium	High	High	High	High	High	High	High
N192922-1-D	M1	Medium	High	High	High	High	High	High	High
S192922-5-A	M2	Low	Medium	Medium	Medium	Low	Low	Low	Medium
N182922-23-A	M1	Low	Medium	High	Medium	Low	Low	Low	Low
N202922-1-A	M2	Low	High	High	Medium	Low	Low	Medium	Medium
N202922-1-A	M2	Low	High	High	Medium	Low	Low	Medium	Medium
N202922-1-A	M2	Low	High	High	Medium	Low	Low	Medium	Medium
S202922-1-A	M1	Low	High	High	Medium	Low	Low	Low	Low
N272923-2-A	M1	Low	Low	High	Medium	Low	Low	Low	Low
N272923-1-A	M2	Low	Medium	High	Medium	Low	Medium	Low	Medium
S272923-1-A	M2	Low	Low	Low	Low	Low	Low	Low	Medium
S252923-1-A	M1	Low	Medium	High	Medium	Low	Low	Low	Low
S302922-2-A	M2	Low	Medium	High	Low	Low	Low	Low	Low
S302922-2-A	M2	Low	Medium	High	Low	Low	Low	Low	Low
N302922-1-A	M2	Medium	Low	Medium	Low	Low	Low	Low	Medium
S302922-1-B	M2	Low	Medium	High	Medium	Low	Medium	Low	Medium
S302922-1-A	M2	Low	Medium	High	Medium	Low	Medium	Low	Medium
S302922-3-A	M3	Low	Low	Low	Low	Low	Low	Low	Low
N332923-1-A	M2	Low	Low	Medium	Low	Low	Low	Low	Medium
N332923-1-A	M2	Low	Low	Medium	Low	Low	Low	Low	Medium
N312922-1-A	M3	Low	Low	Medium	Low	Low	Low	Low	Low
S162923-2-A	M2	Medium	Medium	Medium	Medium	Low	Medium	Low	High
S162923-3-A	M2	Low	High	High	High	Low	Medium	Low	High
N142823-1-A	P	High	High	Low	Medium	Low	High	Low	Medium
N222823-1-A	M1	Medium	High	High	High	Low	Medium	Low	High
S212823-3-A	P	High	High	Low	Low	Low	High	Low	High
S212823-1-A	M2	Low	Medium	Low	Low	Low	Low	Low	Low
S212823-2-A	M1	Medium	Medium	Medium	Medium	Low	High	Low	Medium
N222823-2-A	M1	Medium	High	Low	High	High	High	High	High
N222823-2-B	P	High	High	Low	High	High	High	High	High
N222823-2-D	P	High	High	Low	High	High	High	High	High
N222823-2-E	P	High	High	Low	High	High	High	High	High
N222823-2-E	P	High	High	Low	High	High	High	High	High
S142823-1-A	M1	Medium	Low	High	High	Low	Medium	High	High
S142823-1-A	M1	Medium	Low	High	High	Low	Medium	High	High
S142823-1-B	M1	Medium	Low	High	High	Low	Medium	High	High
S142823-1-B	M1	Medium	Low	High	High	Low	Medium	High	High
S142823-1-C	M1	Medium	Low	High	High	Low	Medium	High	High
S142823-2-A	M1	Medium	High	Low	Medium	Low	High	High	Medium
N222823-2-F	P	High	High	Low	High	High	High	High	High
S142823-2-B	M1	Medium	High	Low	Medium	Low	High	High	Medium
S142823-2-C	M1	Medium	High	Low	Medium	Low	High	High	Medium
S142823-3-B	P	High	High	Medium	Medium	Low	High	Low	Low
S142823-3-C	P	High	High	Medium	Medium	Low	High	Low	Low
S142823-3-D	P	High	High	Medium	Medium	Low	High	Low	Low
S142823-3-A	P	High	High	Medium	Medium	Low	High	Low	Low
S142823-3-E	P	High	High	Medium	Medium	Low	High	Low	Low
N322922-1-A	M1	High	Medium	Low	Low	High	High	Low	High
N222823-2-G	P	High	High	Low	High	High	High	High	High
N222823-2-C	P	High	High	Low	High	High	High	High	High
N212923-1-A	M2	Low	High	Low	Low	Low	Low	Low	Medium
N202923-1-A	M2	Low	Medium	High	High	Low	Low	Low	Medium
N202923-2-A	M2	Low	Medium	High	Low	Low	Medium	Low	Low

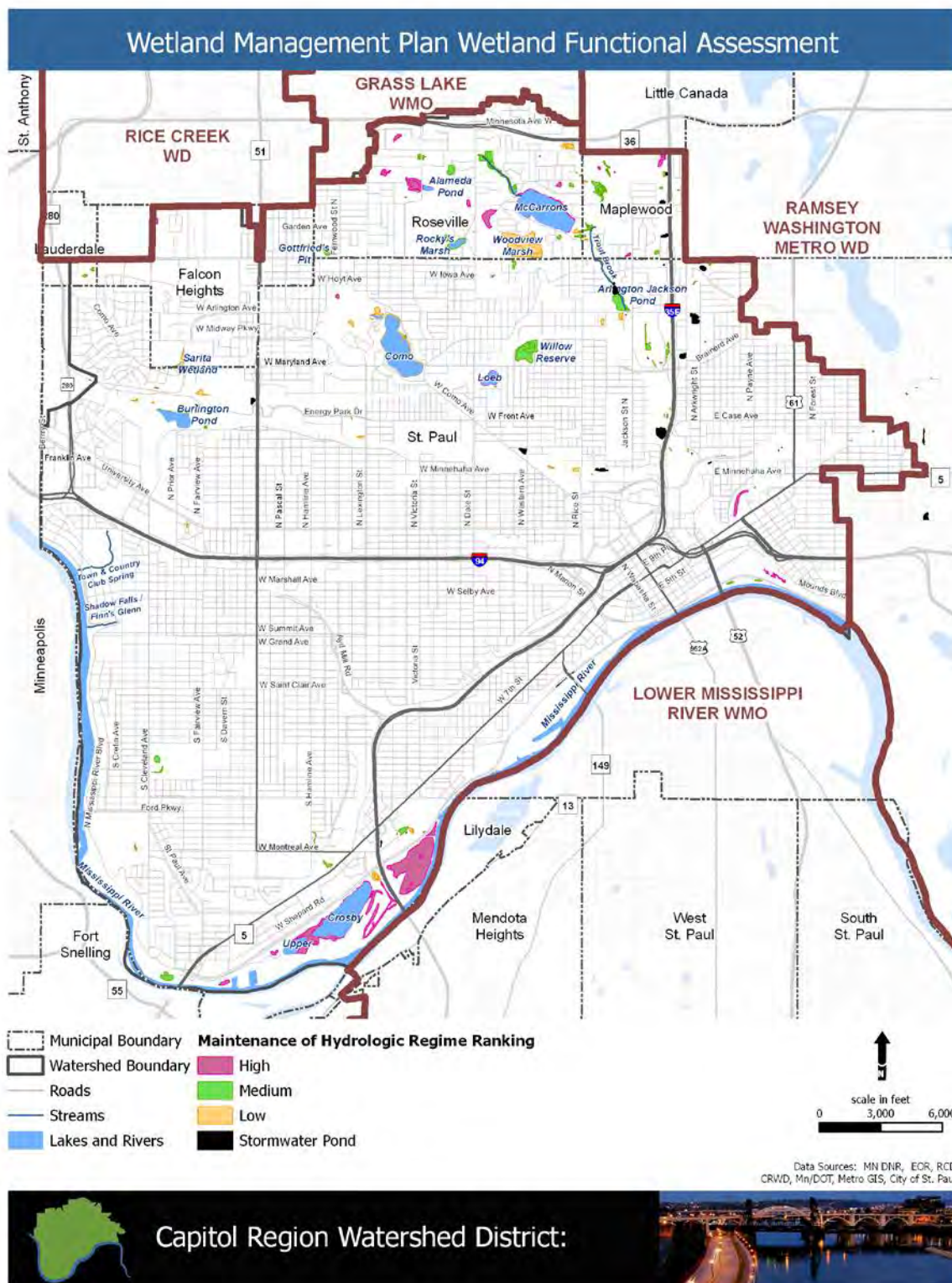
## Wetland Function and Value Assessment Maps

### Vegetative Diversity and Integrity Ranking



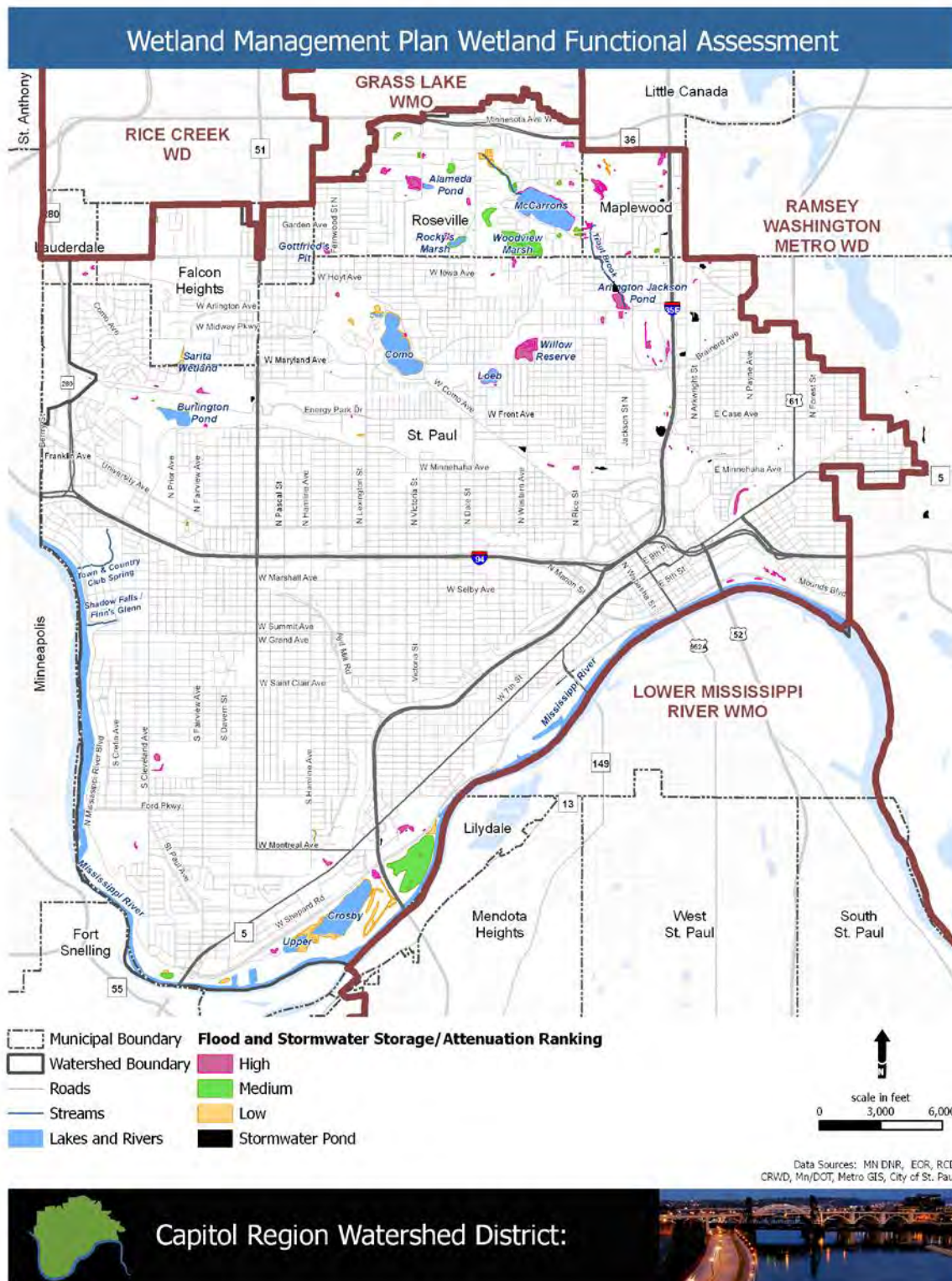


## Maintenance of Hydrologic Regime Ranking

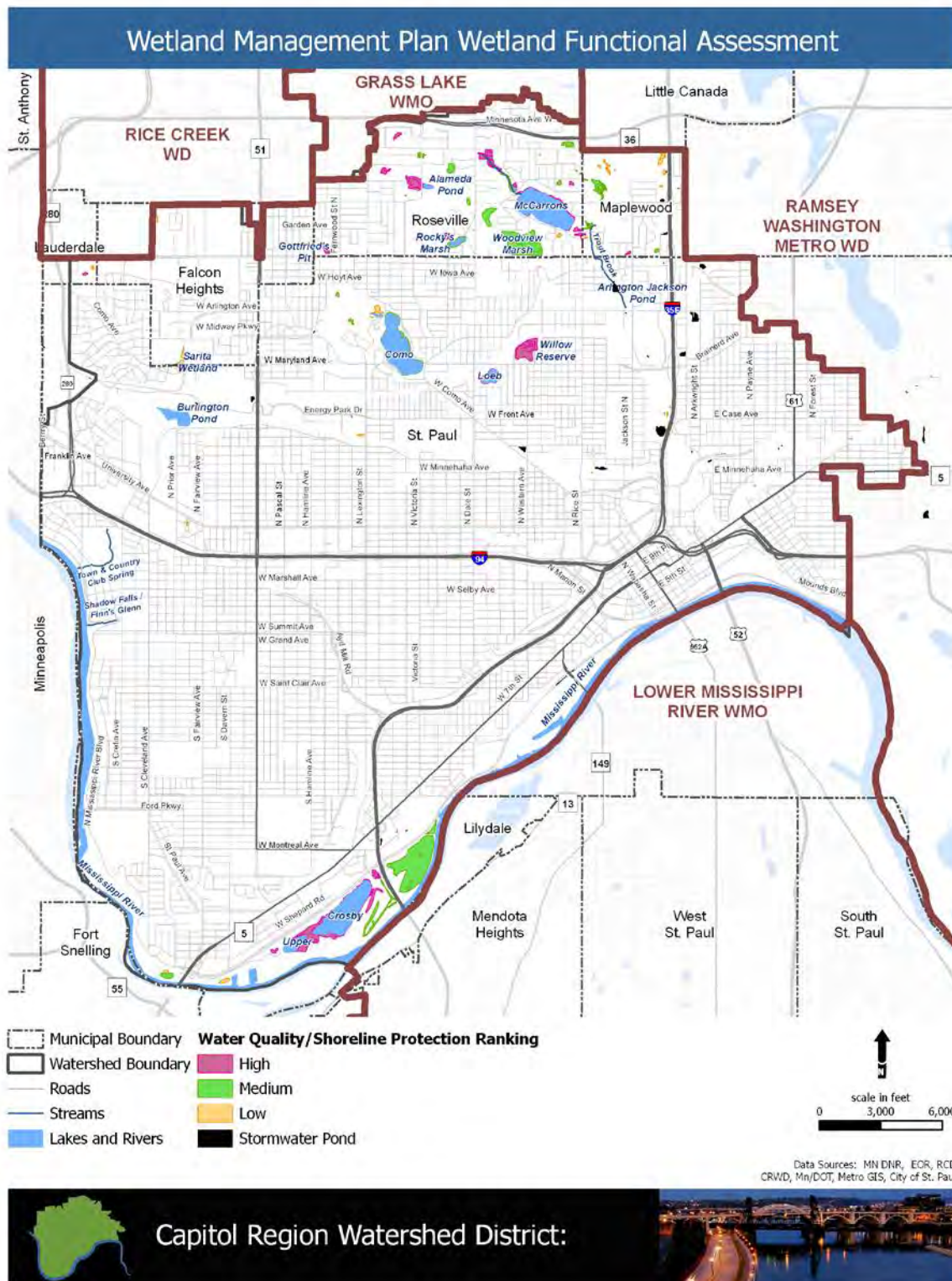




## Flood and Stormwater Storage/Attenuation Ranking

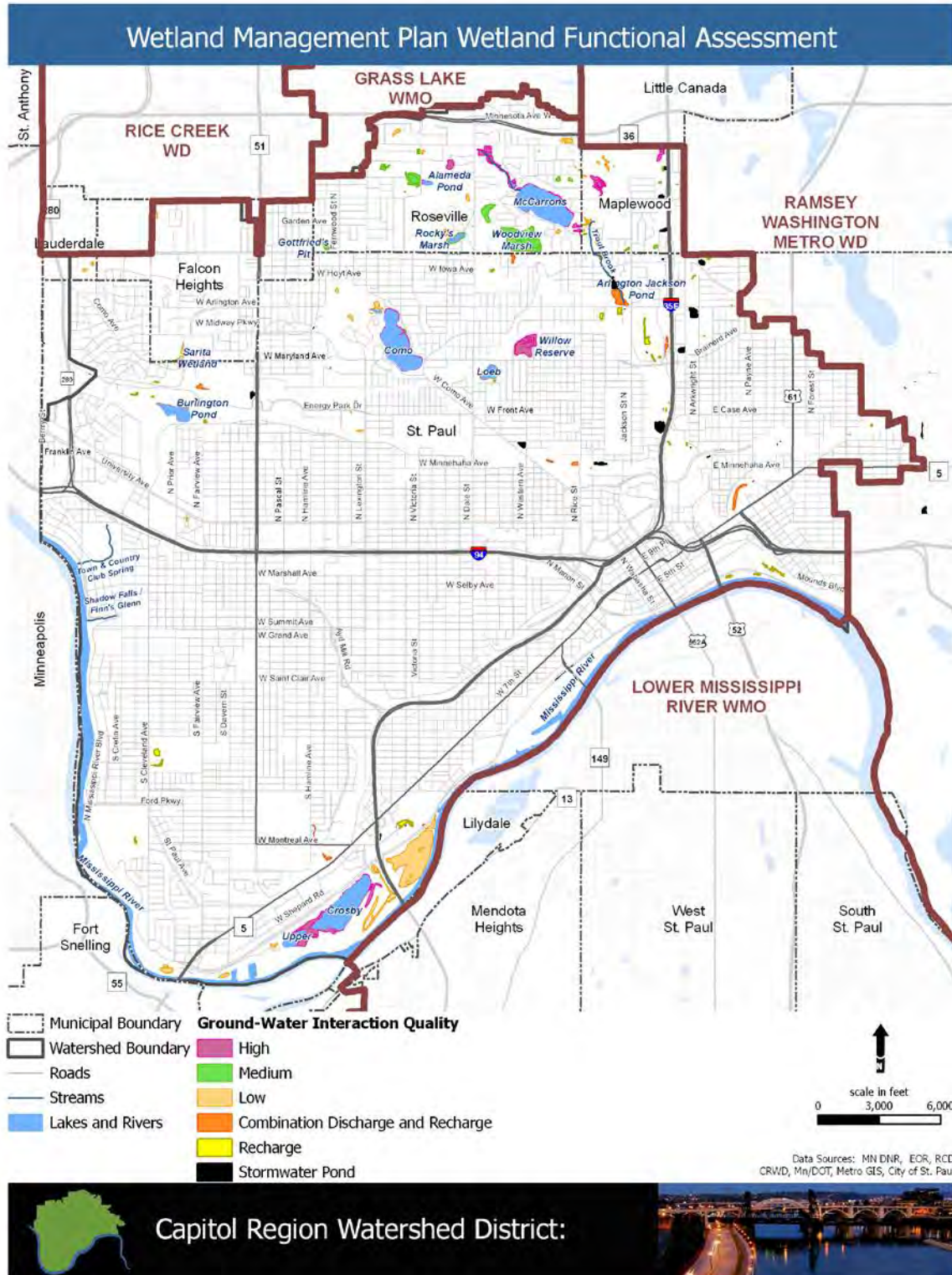


## Water Quality/Shoreline Protection Ranking



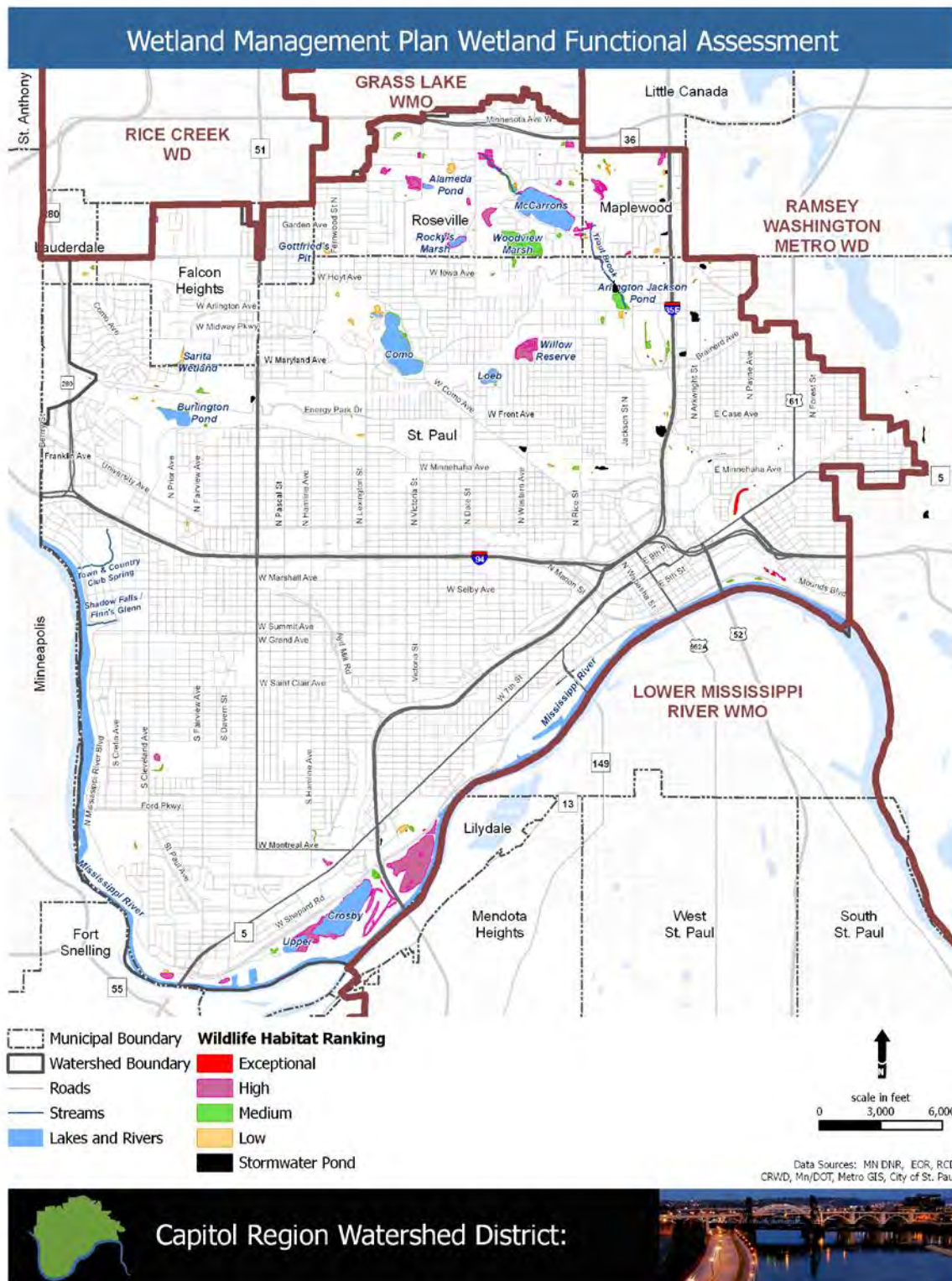


## Groundwater Interaction Ranking

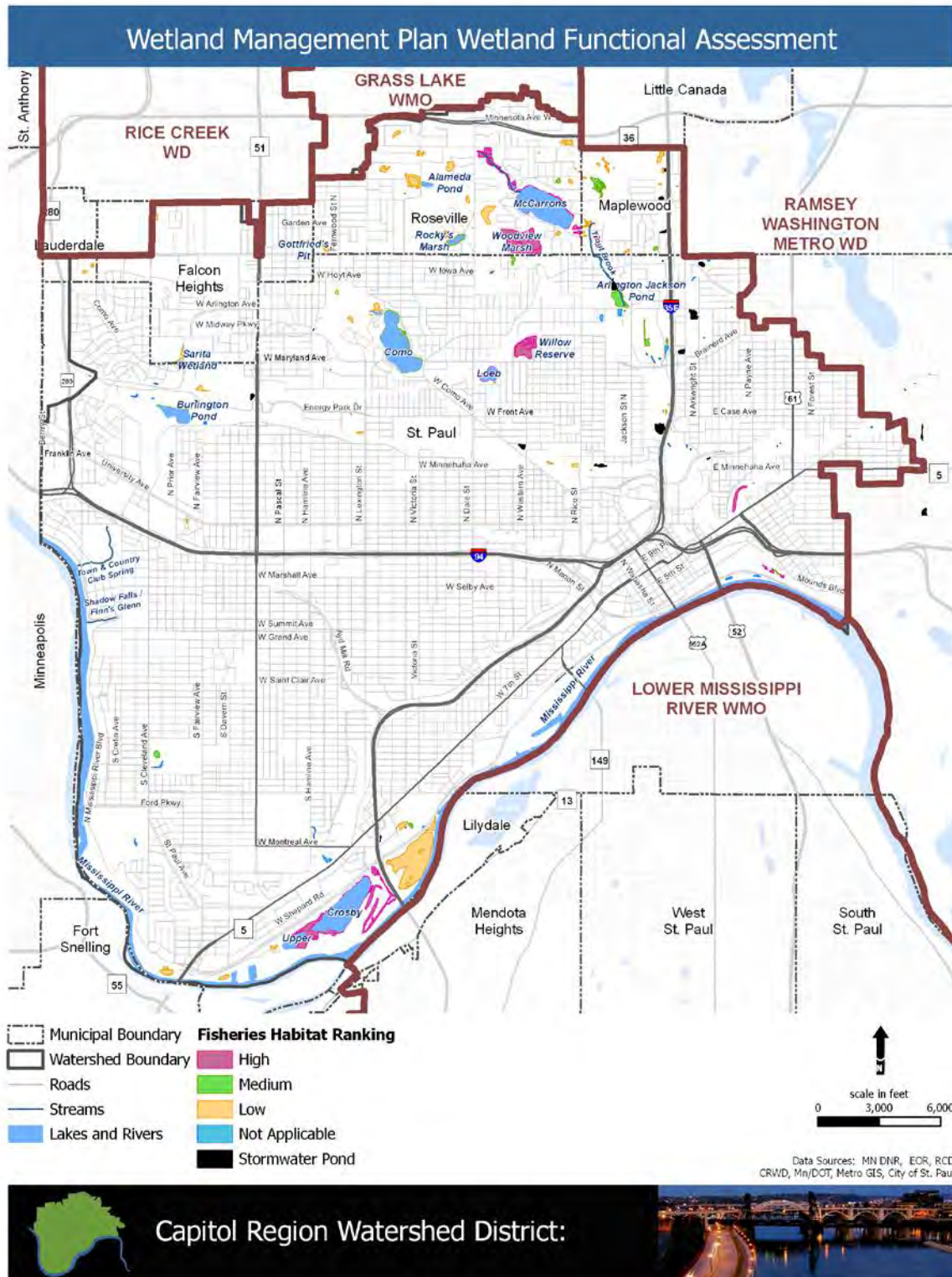




## Wildlife Habitat Ranking

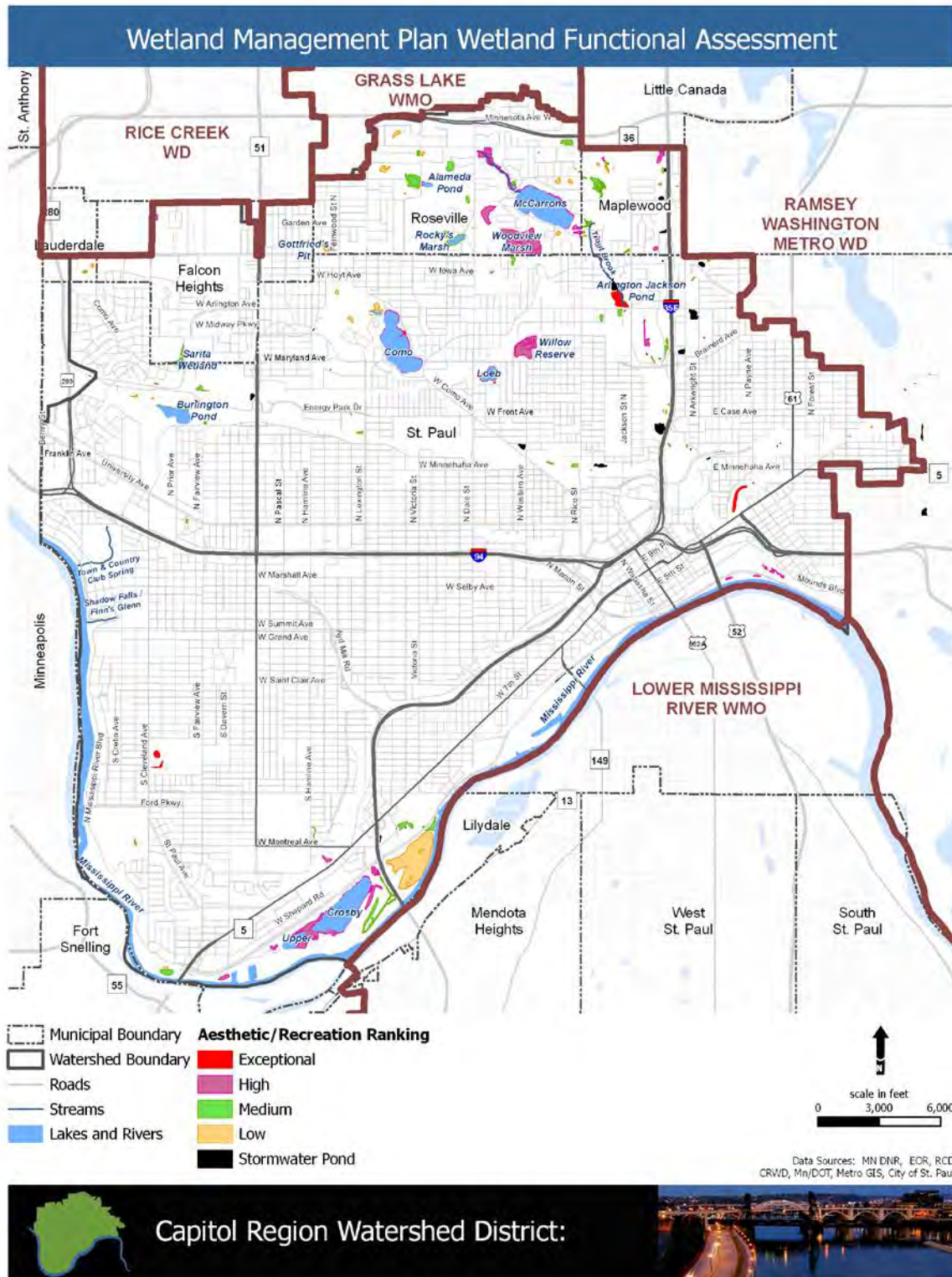


## Fisheries Habitat Ranking



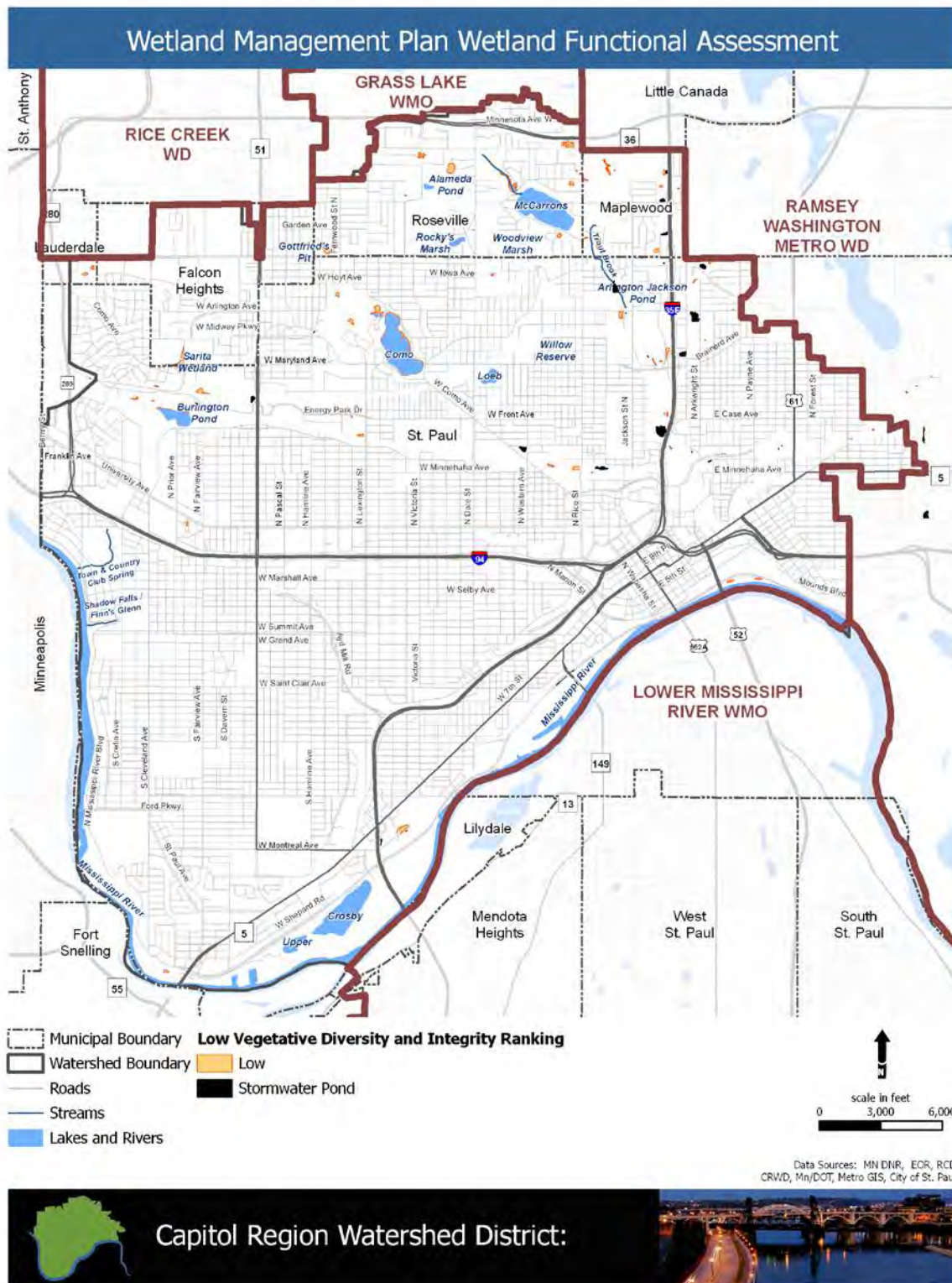


## Aesthetics/Recreation Ranking

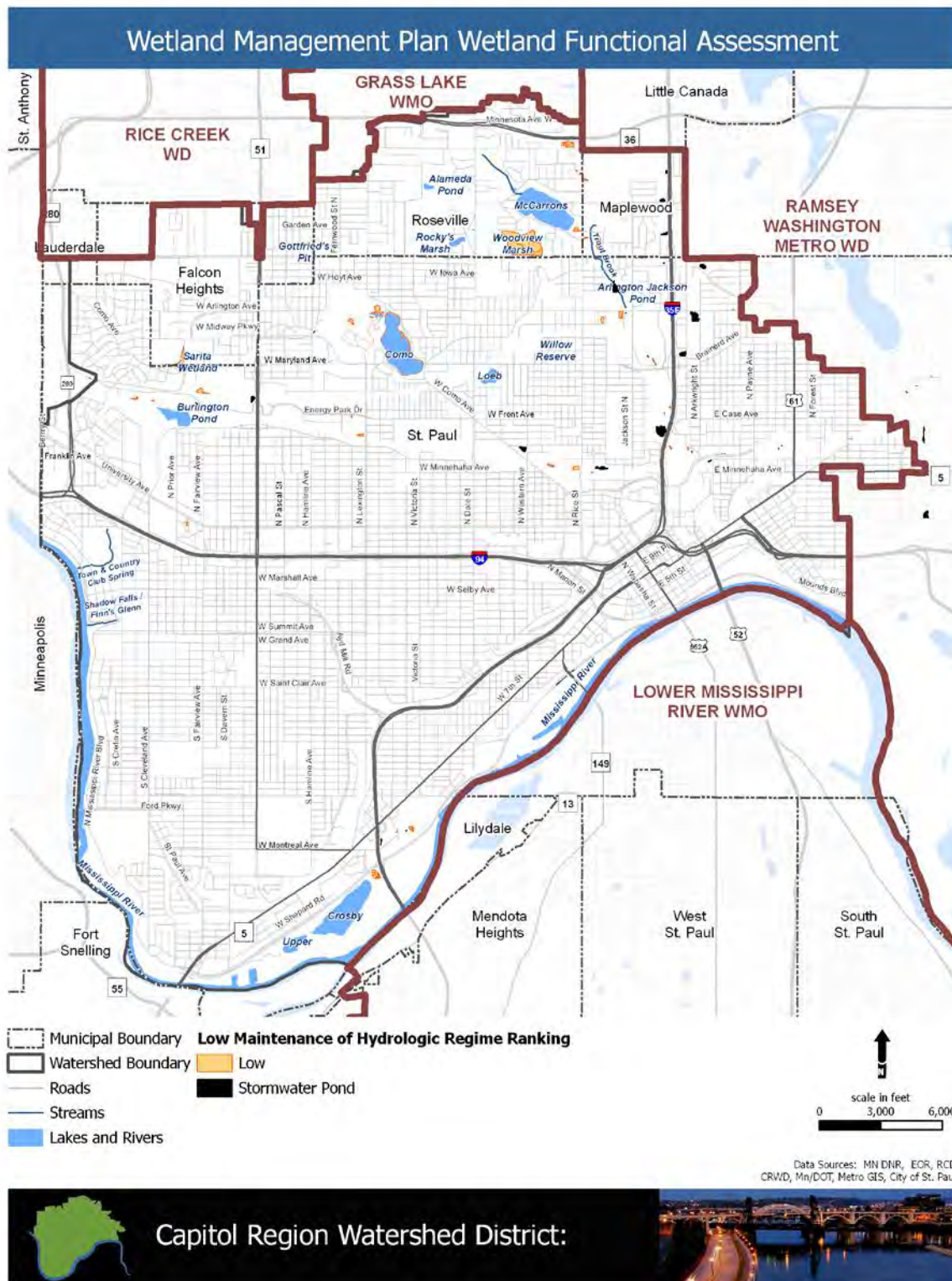




## Wetlands with LOW Vegetative Diversity and Integrity Value

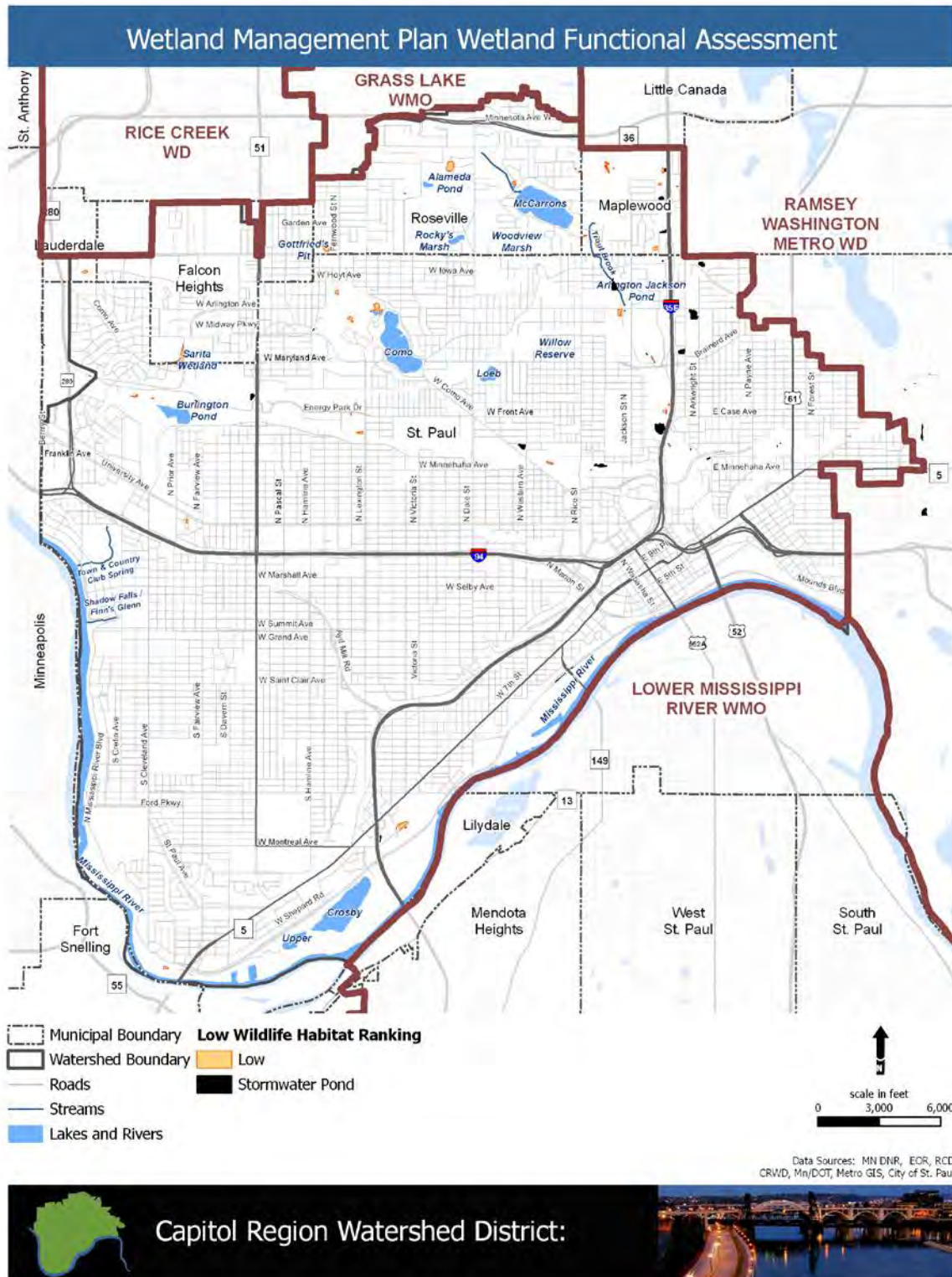


## Wetlands with LOW Maintenance of Hydrologic Regime Value

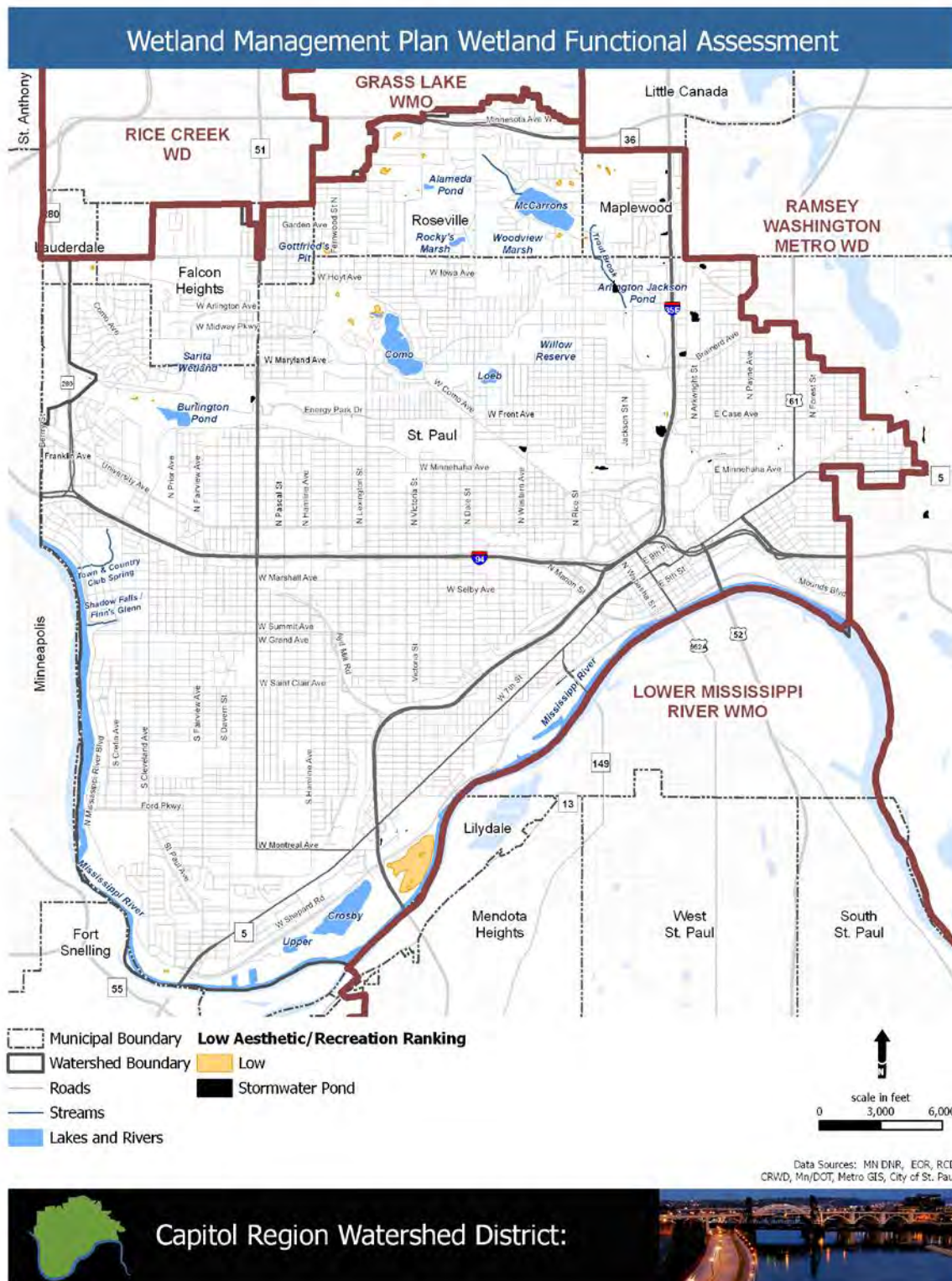




## Wetlands with LOW Wildlife Habitat Value







## Appendix G

### Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
BE-1	Manage stormwater runoff from District-owned, permitted, and grant funded projects with green infrastructure practices and other approaches that mimic natural hydrology by retaining a minimum volume equivalent to 1.1 inches over new, redeveloped, or existing impervious surfaces	208A	General Permitting Implementation	30 permits approved and 7 acre-feet retained annually	
		208I	Green infrastructure incentives in District rules	1 adopted green infrastructure incentive rule	
		210A	Stewardship grants	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		210E	ROW projects - boulevard raingardens	5 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
BE-2	Work with partners to identify, evaluate, and carryout opportunities for regional stormwater management systems on at least one large-scale redevelopment project (e.g., Ford Site, Towerside, Creative Enterprise Zone) over 10 years	331A	Towerside Innovation District stormwater management planning	Towerside stormwater planning study	
		431A	Towerside Innovation District stormwater management planning	1 water quality CIP in Towerside Innovation District	
		331B	Creative Enterprise Zone stormwater management planning	CEZ stormwater planning study	
		431B	Creative Enterprise Zone stormwater management planning	1 water quality CIP in Creative Enterprise Zone	
		332B	Ford redevelopment site comprehensive stormwater planning	Advance stormwater designs at Ford redevelopment site	
		332D	Snelling-Midway Phase II redevelopment planning	Properties connected to District rainwater reuse system	
		432B	Ford redevelopment district stormwater system and central water feature	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	
		333A	Sears Redevelopment Site stormwater planning	Sears redevelopment site stormwater planning study	
		433A	Sears Redevelopment Site	1 Sears site water quality CIP	
		375A	Transportation Redevelopment Projects - Stormwater Feasibility Studies/Preliminary Engineering	1 Transportation-oriented stormwater feasibility studies	
		475A	Transit Redevelopment Stormwater CIPs	1 transportation-related water quality CIP	
		375G	Public private partnership opportunities	2 meetings per year	
BE-3	Explore private-public partnerships on redevelopment projects to implement shared, stacked green infrastructure (SSGI) projects with environmental, economic, and social benefits	210G	Large-scale site planning grants	3 planning grants annually	
		331A	Towerside Innovation District stormwater management planning	Towerside stormwater planning study	
		431A	Explore private-public partnerships on redevelopment projects to implement shared, stacked green infrastructure (SSGI) projects with environmental, economic, and social benefits	1 water quality CIP in Towerside Innovation District	
		331B	Creative Enterprise Zone stormwater management planning	CEZ stormwater planning study	
		431B	Creative Enterprise Zone stormwater management planning	1 water quality CIP in Creative Enterprise Zone	
		332B	Ford redevelopment site comprehensive stormwater planning	Advance stormwater designs at Ford redevelopment site	
		432B	Ford redevelopment district stormwater system and central water feature	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	
		333A	Sears Redevelopment Site stormwater planning	Sears redevelopment site stormwater planning study	
		433A	Sears Redevelopment Site	1 Sears site water quality CIP	
		375A	Transportation Redevelopment Projects - Stormwater Feasibility Studies/Preliminary Engineering	1 Transportation-oriented stormwater feasibility study	
		475A	Transit Redevelopment Stormwater CIPs	1 transportation-related water quality CIP	
		375B	Great River Passage Project - Feasibility Studies/Preliminary Engineering	1 Great River Passage stormwater feasibility study	
		475B	Great River Passage CIPs	1 Great River Passage water quality CIPs	
		375G	Public private partnership opportunities	2 meetings per year	
BE-4	Identify and prioritize improvement projects in each of the District’s high-priority subwatersheds (Trout Brook, Saint Anthony Hill, and Phalen Creek) (see Section 3.2) through development of at least one subwatershed study in each subwatershed	315D	TBI flood mitigation and water quality improvement studies	3 flood mitigation and water quality improvement studies	
		333C	Phalen Creek subwatershed water quality and quantity study	1 Phalen Creek subwatershed water quality and quantity study	
		333D	Saint Anthony Hill subwatershed water quality and quantity study	1 Saint Anthony Hill subwatershed water quality and quantity study	



## Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

*Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.*

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
BE-5	Support the voluntary implementation of green infrastructure practices with a target of 10 BMPs installed per year by continuing to offer grant programs and considering other types of incentives	210A	Stewardship grants	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		210E	ROW projects - boulevard raingardens	5 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
BE-6	Annually monitor and report effectiveness of at least five District green infrastructure practices and other stormwater BMPs in reducing stormwater runoff volumes and pollutant loads	211C	BMP performance monitoring	8 BMPs monitored; volume and pollutant reductions	
		211F	Monitoring data trend analysis and reporting for public	Monitoring trend analysis report	
		211J	Non-structural BMPs effectiveness	Technical memo	
BE-7	Identify and address top 5 sediment or phosphorus pollutant loading hot spot areas for targeted source control (e.g., street sweeping)	210D	Targeted site identification	12 suitable sites identified over the 10-year plan	
		208H	Illicit Discharge Detection and Elimination (IDDE) plan implementation	20 illicit discharges removed over 10 years	
		220C	Clean Streets	300 storm drains adopted and 200 new participants over the 10-year plan; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
WQ-1	Establish Como Lake as an ecologically healthy shallow lake and achieve the following long-term water quality goals identified in the Como Lake Management Plan:	See subgoals below			
WQ-1a	a. Achieve and maintain in-lake summer average total phosphorus (TP) concentration less than 60 µg/L	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		305A	Como Lake water quality model	Como Lake water quality model	
WQ-1b	b. Reduce watershed phosphorus loading by 60% relative to year 2000 baseline	305E	Shoreline management plan and implementation	Shoreline management plan and all of lakeshore maintained in a restored state	
		305F	Street sweeping enhancement	Street sweeping plan and sediment and phosphorus reduction	
		305G	Innovative treatment facility feasibility study (i.e. spent lime)	Study report	
		405J	Como Golf Course BMPs	Infiltration and iron-enhanced pond 55 lbs/year TP reduction 34 acre-ft/year volume reduction	
		405K	Como Pavilion BMPs	1 CIP and stormwater volume retained and sediment and phosphorus reductions	
		405L	McMurray Field	1 water quality CIP	
		405N	East Como Lake Drive BMPs	1 water quality CIP	
		305P/405 P	Future capital improvement projects (CIPs)	1 future water quality CIP	
WQ-1c	c. Reduce internal phosphorus loading by 95%	305A	Como Lake water quality model	Como Lake water quality model	
		405M	Como Lake alum treatment	24,000 gallons of Alum applied to Como Lake	
WQ-1d	d. Reduce other non-point source pollutants (e.g., bacteria, chloride, trash, sediment)	305F	Street sweeping enhancement	Street sweeping plan and sediment reduction	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
		220C	Clean Streets	300 storm drains adopted and 200 new participants over the 10-year plan; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
WQ-2	Manage Lake McCarrons to improve and sustain its ecological health as a deep lake and achieve the following water quality goals identified in the Lake McCarrons Management Plan:	See subgoals below			
WQ-2a	a. Maintain in-lake summer average total phosphorus (TP) concentration less than 33 µg/L	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		310C	Watershed Hydraulic/Hydrologic Modeling	Updated model	
WQ-2b	b. Maintain watershed phosphorus loading of 0.25 lbs/acre/yr (no increase from 2008-2018 baseline)	310B	Villa Park wetland system evaluation	VPWS evaluation report with existing phosphorus reductions	
		410B	Villa Park performance improvements	1 Villa Park CIP project	
		310F	Shoreline management plan and implementation	Shoreline management plan	
		310G/410 G	Future capital improvement projects (CIPs)	1 future water quality CIPs	
WQ-2c	c. Maintain hypolimnetic TP concentrations below 300 µg/L	310A	Alum treatment evaluation	Alum treatment evaluation report	
		410A	Alum treatment	1 alum treatment	
		211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
WQ-2d	d. Work with partners to ensure in-lake chloride concentrations do not exceed 230 mg/L more than once every 3 years	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	

Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
WQ-2e	e. Reduce other non-point source pollutants (e.g., bacteria, chloride, trash, sediment)	220C	Clean Streets	300 storm drains adopted and 200 new participants over the 10-year plan; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
WQ-3	Establish Crosby Lake as an ecologically healthy shallow lake appropriate for its proximity to the Mississippi River and achieve the following long-term water quality goals identified in the Crosby Lake Management Plan:	See subgoals below			
WQ-3a	a. Achieve and maintain in-lake summer average total phosphorus (TP) concentration less than 60 µg/L	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		317C	Update Crosby Lake Management Plan	Updated Crosby Lake Management Plan	
WQ-3b	b. Reduce watershed phosphorus loading by 47% relative to 2000-2009 baseline of 92 lbs/yea	317A	Crosby Farm bluff stabilization plan	Bluff erosion study updates	
		317C	Update Crosby Lake Management Plan	Updated Crosby Lake Management Plan	
		317D	35E Regional stormwater BMP feasibility study	Stormwater feasibility study	
		317E	Shoreline management plan and implementation	Shoreline management plan and # feet of restored shoreline	
		417A	Crosby Farm Park bluff stabilization projects	1 bluff stabilization project	
		317H/417H	Future capital improvement projects (CIPs)	1 future water quality CIP	
WQ-4	Manage Loeb Lake to improve and sustain its ecological health as a shallow lake and maintain or improve water quality of Loeb Lake that meets the following shallow lake water quality standards: a. Maintain in-lake summer average TP concentration less than 60 µg/L b. Maintain clarity of 1 meter c. Maintain chlorophyll a concentration of less than 20 µg/L	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		313A	Update Loeb Lake Management Plan	Updated Loeb Lake Management Plan	
		313C	Shoreline management plan and implementation	Shoreline management plan	
		313D	Loeb Lake sedimentation pond investigation	Study completed	
		313E/413E	Future capital improvement projects (CIPs)	1 feasibility study and 1 CIP	
WQ-5	Reduce sediment loading from the District to the Mississippi River to less than 154 pounds/acre/year (South Metro Mississippi River Turbidity TMDL), through ongoing practices (e.g., regulation) and capital improvements (e.g., assessment, prioritization, and stabilization of eroded ravines)	211A	Stormwater monitoring and data collection	10 monitoring sites; stormwater quality and quantity data	
		210A	Stewardship grants	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		210E	ROW projects - boulevard raingardens	5 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		315I/415I	Future Trout Brook Subwatershed studies and CIPs	2 studies and CIPs	
		417A	Crosby Farm Park bluff stabilization projects	1 bluff stabilization project	
		417H	Crosby Lake Subwatershed CIPs	1 CIP	
		431A	Towerside Innovation District stormwater management planning	1 water quality CIP in Towerside Innovation District	
		431B	Creative Enterprise Zone stormwater management planning	1 water quality CIP in Creative Enterprise Zone	
		431C	UM/MN State Fair Cooperative Projects	1 water quality CIP with UMN/MN State Fair	
		431D	Seminary Pond and ravine stormwater improvements	2 tons of sediment removed and 17 pounds of phosphorus removed annually	
		331E/431E	Future Mississippi River Gorge Subwatershed studies and CIPs	1 study and CIP	
		332A/432A	East Kittsondale subwatershed project prioritization and stormwater BMPs	1 East Kittsondale study and water quality CIP	
		432B	Ford redevelopment district stormwater system and central water feature	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	
		432E	Victoria Park stormwater improvements	Stormwater runoff retained and sediment and phosphorus reductions; stormwater featured constructed	
		332F/432F	Future Mississippi River Confluence Subwatershed studies and CIPs	1 study and CIP	
		433A	Sears Redevelopment Site	1 Sears site water quality CIP	
		333B/433B	Swede Hollow feasibility study and CIP	1 study and CIP	
		433E	Science Museum of Minnesota	1 Science Museum of Minnesota water quality CIP	
		333F/433F	Future Mississippi River Downtown Subwatershed study and CIPs	1 study and 3 CIPs	
		375J	Municipal source control/good housekeeping planning and implementation assistance	Municipal source control and good housekeeping plan	

Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
		475A	Transit Redevelopment Stormwater CIPs	1 transportation-related water quality CIP	
		475B	Great River Passage CIPs	1 Great River Passage water quality CIP	
WQ-6	Reduce total phosphorus loading to the Mississippi River to 0.35 lb/acre/year and achieve total phosphorus concentrations of 125 µg/L and 100 µg/L in the Mississippi River and Lake Pepin, respectively (draft Lake Pepin TMDL)	211A	Stormwater monitoring and data collection	10 monitoring sites; stormwater quality and quantity data	
		210A	Stewardship grants	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		210E	ROW projects - boulevard raingardens	5 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		415F	Future Trout Brook Subwatershed CIPs	2 CIPs	
		417A	Crosby Farm Park bluff stabilization projects	1 bluff stabilization project	
		417H	Crosby Lake Subwatershed CIPs	1 CIP	
		431A	Towerside Innovation District stormwater management planning	1 water quality CIP in Towerside Innovation District	
		431B	Creative Enterprise Zone stormwater management planning	1 water quality CIP in Creative Enterprise Zone	
		431C	UM/MN State Fair Cooperative Projects	1 water quality CIP with UMN/MN State Fair	
		431D	Seminary Pond and ravine stormwater improvements	2 tons of sediment removed and 17 pounds of phosphorus removed annually	
		431E	Future Mississippi River Gorge CIPs	1 CIP	
		432A	East Kittsondale stormwater BMPs	1 East Kittsondale water quality CIP	
		432B	Ford redevelopment district stormwater system and central water feature	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	
		432E	Victoria Park stormwater improvements	Stormwater runoff retained and sediment and phosphorus reductions; stormwater featured constructed	
		432F	Future Mississippi River Confluence Subwatershed CIPs	1 CIP	
		433A	Sears Redevelopment Site	1 Sears site water quality CIP	
		433B	Swede Hollow CIP	1 Swede Hollow water quality CIP	
		433E	Science Museum of Minnesota	1 Science Museum of Minnesota water quality CIP	
		433F	Future Mississippi River Downtown Subwatershed CIPs	3 CIPs	
		375J	Municipal source control/good housekeeping planning and implementation assistance	Municipal source control and good housekeeping plan	
		475A	Transit Redevelopment Stormwater CIPs	1 transportation-related water quality CIP	
		475B	Great River Passage CIPs	1 Great River Passage water quality CIP	
WQ-7	Quantify and reduce the amount of trash entering District lakes, wetlands, ponds, and the Mississippi River	211I	Emerging contaminants and water quality issues	New monitoring parameters and results	
		375I	Trash management planning and implementation for areas surrounding District infrastructure and water and natural resources	Trash management plan	
WQ-8	Achieve bacterial water quality standards (126 CFU/mL monthly geometric mean, April–October) in the Mississippi River (Upper Mississippi River Bacteria TMDL)	211A	Stormwater monitoring and data collection	10 monitoring sites; stormwater quality and quantity data	
		211J	Non-structural BMPs effectiveness	Technical memo	
		220L	Partner grant program	10 Partner Grant projects; 5,000-10,000 participants served; types of products created; pollution reduction; acres of greenspace restored per year	
WQ-9	Establish a baseline and reduce chloride loading to Como Lake and make progress towards meeting the 2,233 pounds/day MS4 waste load allocation to Como Lake through actions identified in the Twin Cities Metro Area Chloride Management Plan	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
		210H	Chloride reduction grants	5 chloride reduction grants annually	
		305F	Street sweeping enhancement	Street sweeping plan and sediment and phosphorus reduction	
		375K	District Chloride Source Assessment and Prevention Plan	Chloride reduction plan	
	Reduce loading of chloride, metals, pesticides, organic	208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
		208H	Illicit Discharge Detection and Elimination (IDDE) plan implementation	20 illicit discharges removed over 10 years	
		208J	Industrial stormwater permittee coordination	10 industrial stormwater site meetings	
		210H	Chloride reduction grants	5 chloride reduction grants annually	
		211A	Stormwater monitoring and data collection	10 monitoring sites; stormwater quality and quantity data	



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Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
WQ-10	Reduce loading of chloride, metals, pesticides, organic contaminants, and other pollutants to District lakes, wetlands, ponds, and the Mississippi River	211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		211I	Emerging contaminants and water quality issues	New monitoring parameters and results	
		220C	Clean Streets	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
		332C	Area C Ford site planning	Environmental investigation study	
		375J	Municipal source control/good housekeeping planning and implementation assistance	Municipal source control and good housekeeping plan	
		375K	District Chloride Source Assessment and Prevention Plan	Chloride reduction plan	
WQ-11	Research the prevalence, extent and impacts of at least two emerging water quality issues (e.g., microplastics, pharmaceuticals, PFAS compounds, and other anthropogenic contaminants)	211I	Emerging contaminants and water quality issues	New monitoring parameters and results	
WQ-12	Document baseline conditions, identify trends, and target areas for reducing pollutant loading and evaluate progress towards achieving water quality goals by monitoring quality and quantity of District water resources annually (five lakes, seven subwatershed stormwater outfalls) and periodically (nine wetlands)	211A	Stormwater monitoring and data collection	10 monitoring sites; stormwater quality and quantity data	
		211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
		211D	Monitoring database and reporting tool	Stormwater and lake data available on monitoring database and reporting tool	
		211E	Wetland biological integrity monitoring	18 wetlands monitored; wetland health grades	
		211F	Monitoring data trend analysis and reporting for public	Monitoring trend analysis report	
WQ-13	Support and collaborate with Ramsey County, the Minnesota Department of Natural Resources (MDNR), Saint Paul Regional Water Services, community suppliers, and other appropriate partners on groundwater quality monitoring and protection efforts	210F	Well-sealing Grants	12 wells sealed annually	
		302A	Groundwater seepage and springs study	Seepage and springs study report	
		302B	Beneficial infiltration study and demonstration projects	Beneficial infiltration study report	
		302C	Infiltration and groundwater quality study	Infiltration-groundwater quality study report	
		302D	Groundwater monitoring well network in the District	Groundwater monitoring well network map	
		302E	Karst area study	Karst study report	
		302F	Ramsey County groundwater study	Updated County groundwater plan	
		402G	Future groundwater projects	1 groundwater project	
FL-1	Maintain critical event (i.e., 10 or 100 year) flood control for all District-sponsored CIPs and permitted redevelopment projects	208A	General permitting implementation	30 permits approved and 7 acre-feet retained annually	
		315I/415I	Future CIPs - Trout Brook Subwatershed	2 CIPs	
FL-2	Ensure that the Trout Brook storm sewer system, a District-owned and operated storm sewer system, adequately and safely conveys stormwater flows by inspecting at least once every five years and conducting two major repairs over the 10-year plan.	222A	District-owned facility management	6 BMPs inspected and maintained	
		315A	TBI 5-year inspection and CIP development	Inspection and CIP reports every five years	
		315B	NPDES stormwater program	Annual MS4 report and updated SWPPP	
		315C	TBI hydrologic and hydraulic model update and expansion	Expanded, updated TBI H/H model	
		415F	TBI Repairs Station 28+65 - 50+72	2200 feet of TBI repaired	
		415G	TBI Repairs Station 135+06 - 180+29	4500 feet of TBI repaired	
		415H	Major sediment removal	1700 cubic feet of sediment removed	
FL-3	Minimize flood risk and reduce impacts to stormwater infrastructure and property in three high-priority flood-prone areas in the Trout Brook subwatershed by investigating the issues and implementing flood-mitigation solutions	315C	TBI hydrologic and hydraulic model update and expansion	Expanded, updated TBI H/H model	
		315D	TBI flood mitigation and water quality improvement studies	3 flood mitigation and water quality improvement studies	
		415D	Future flood mitigation and/or water quality improvement projects	3 flood mitigation/water quality improvement projects	
FL-4	Reduce the likelihood and/or consequences of flooding consistent with partner objectives by working with partners to identify, prioritize, and address existing and potential infrastructure capacity and other contributing issues throughout the District	375H	District Flooding Prioritization and Solution Identification	List of priority flood mitigation sites and potential solutions	
		375M	Mixed use neighborhood node drainage and water quality study	1 study	
		305I	Como Park area drainage infrastructure analysis and planning	Como Park area drainage infrastructure study	
		310C	Watershed Hydraulic/Hydrologic Modeling (McCarrons Watershed)	Updated model	
		331C	UM/MN State Fair Cooperative Projects	1 subwatershed study	
		331D	Saint Anthony Hill subwatershed water quality and quantity study	1 subwatershed study	
		433F	Future Mississippi River Downtown subwatershed CIPs	3 CIPs	
		405O	Gottfried's Pit Improvements	1 CIP	
FL-5	Maintain existing floodplain capacity (i.e., no net loss) through implementation of the District's Rules and identify opportunities to increase floodplain capacity and functionality along Crosby Lake and other areas along the Mississippi River	208A	General permitting implementation	30 permits approved and 7 acre-feet retained annually	
		317G	Floodplain and wetland restoration opportunities around Crosby Lake	Floodplain and wetland restoration plan	
		417G	Floodplain and wetland restoration projects	1 floodplain and wetland restoration project	

## Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

*Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.*

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
FL-6	Adapt to changing climate by evaluating flood risk and designing all new applicable District projects under present and anticipated climate and precipitation trends	211H	Research program	Stormwater research reports	
		208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
		315C	TBI hydrologic and hydraulic model update and expansion	Expanded, updated TBI H/H model	
		315D	TBI flood mitigation and water quality improvement studies	3 flood mitigation and water quality improvement studies	
		415D	Future flood mitigation and/or water quality improvement projects	3 flood mitigation/water quality improvement projects	
		375O	Climate science and community resiliency	Local climate change and adaption study report	
FL-7	Identify and address groundwater quantity issues by supporting and collaborating with appropriate agencies and coordinating with partners at least annually	302A	Groundwater seepage and springs study	Seepage and springs study report	
		302E	Karst area study	Karst study report	
		302F	Ramsey County groundwater study	Updated County groundwater plan	
EH-1	Establish Como Lake as an ecologically healthy shallow lake and achieve the following long-term ecosystem health goals identified in the Como Lake Management Plan:	See subgoals below			
	a. Reduce the occurrence of curly-leaf pondweed to <10% during period of peak abundance	305B	AIS management	< 10% frequency of occurrence of curlyleaf pondweed	
	b. Establish and maintain native aquatic vegetation with species richness greater than eight and at least three species with greater than 20% frequency of occurrence	305C	Lake vegetation management plan and implementation	species richness >8; 3 species having FOC >20%	
	c. Establish and maintain a fishery with balanced populations of piscivorous, planktivorous, and benthivorous fish	305D	Balanced fishery target development	Fishery targets from Como Lake Management Plan	
	d. Maintain existing areas of native vegetation along the shoreline to capture surface runoff, minimize shoreline erosion, and promote wildlife habitat	305E	Shoreline management plan and implementation	Shoreline management plan and all of lakeshore maintained in a restored state	
EH-2	Manage Lake McCarrons to improve and sustain its ecological health as a deep lake and maintain the following ecosystem health goals identified in the Lake McCarrons Management Plan:	See subgoals below			
EH-2a	a. Prevent introduction of new aquatic invasive species and control existing invasive species populations	310D	Lake vegetation management plan; type and abundance of aquatic plants	Lake vegetation management plan; type and abundance of aquatic plants	
		211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
EH-2b	b. Maintain or increase abundance and distribution of native submersed aquatic plants throughout the growing season	310D	Lake vegetation management plan and AIS response plan	Lake vegetation management plan; type and abundance of aquatic plants	
		211B	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
EH-2c	c. Create and maintain stable shoreline buffers around Lake McCarrons	310F	Shoreline management plan and implementation	Shoreline management plan	
EH-2d	d. Maintain a healthy, balanced fishery	310E	Balanced fishery targets	Fishery targets	
		210	Lake monitoring and data collection	5 lakes monitored; lake quality, and quantity data, and biological data	
EH-3	Establish Crosby Lake as an ecologically healthy shallow lake appropriate for its proximity to the Mississippi River and achieve the following ecosystem health goal identified in the Crosby Lake Management Plan: a. Develop and work towards achieving long term targets for fish and aquatic plant diversity	317C	Update Crosby Lake Management Plan	Updated Crosby Lake Management Plan	
		317E	Shoreline management plan and implementation	Shoreline management plan and # feet of restored shoreline	
		317F	Terrestrial and aquatic invasive species management	Type and abundance of invasive species	
EH-4	Manage reestablished native plant communities and control invasive species in Willow Reserve, Highland Ravine, Trout Brook Nature Sanctuary, and other	313A	Update Loeb Lake Management Plan	Updated Loeb Lake Management Plan	
		313B	AIS management	AIS management plan included in Loeb Lake management plan	
EH-5	Improve ecosystem health in the District's high priority-watersheds of, Trout Brook, Saint Anthony Hill, and Phalen Creek by conducting at least one natural resource inventory and developing and implementing a management plan in each priority subwatershed	325C	Swede Hollow Water Resource and Natural Resources Plan	Swede Hollow water and natural resources plan	
		325F	District 6 Natural Resource Management Plan	1 NRI recommendation investigated and feasibility report created	
		325H	Natural resource inventories and/or management plans	2 natural resource inventories and plans	
		425C	Swede Hollow restoration	1 Swede Hollow restoration project	
		425H	Future wetland/stream/ natural resource restoration projects	2 Acres of restored wetland and other natural resource areas	
EH-6	Investigate and pursue opportunities to restore portions of historic streams in the Phalen Creek, Hidden Falls, and East Kittsondale subwatersheds, targeting two projects implemented over 10 years	325A	Phalen Creek Daylighting	Concept design report for daylighted Phalen Creek	
		325B	Hidden Falls Creek Restoration Planning	Planning and design report for restored Hidden Falls Creek	
		325D	Cascade Creek/Fountain Creek daylighting feasibility study	Cascade Creek/Fountain Creek daylighting feasibility study report	
		425A	Phalen Creek daylighting	1 Phalen Creek daylighting project	
		425B	Hidden Falls Creek restoration	1 Hidden Falls Creek restoration project	
		425D	Cascade Creek/Fountain Creek restoration	1 Cascade Creek/Fountain Creek restoration project	
		425H	Future wetland/stream/natural resource restoration projects	2 Acres of restored wetland and other natural resource areas	

Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
EH-7	Pursue wetland restoration and local banking opportunities in the top three priority areas identified in the District’s future Wetland Management Plan	317G	Floodplain and wetland restoration opportunities around Crosby Lake	Floodplain and wetland restoration plan	
		417G	Floodplain and wetland restoration projects	1 floodplain and wetland restoration project	
		325G	Wetland Restoration Planning	Saint Paul wetland restoration plan	
		325H	Natural resource inventories and/or management plans	2 natural resource inventories and plans	
		425H	Future wetland/stream/natural resource restoration projects	2 Acres of restored wetland and other natural resource areas	
EH-8	Promote native vegetated buffers around all water resources beyond the minimum requirements of CRWD and other applicable rules through grant opportunities and communication and engagement efforts	210A	Stewardship Grant Program	10 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
EH-9	Foster the expansion of native plant communities in the District through conversion of turf grass by promoting District and partner grant opportunities and highlighting native plant benefits	210A	Stewardship Grant Program	15 projects annually; stormwater volume retention in the amount equivalent to 1.1"runoff and 90% TSS removal	
		220L	Partner grant program	10 Partner Grant projects; 5,000-10,000 participants served; types of products created; pollution reduction; acres of greenspace restored per year	
CE-1	Increase the visibility of the District and its work to better engage a variety of stakeholders through the following actions:	See subgoals below			
CE-1a	a. Create standard branding and messaging	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database; translate 3 pieces of District materials into at least three languages	
CE-1b	b. Create and implement individual communications and engagement plans, including three pieces of digital content, for District keystone projects and programs	220E	Digital communications	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	
		220B	Project Communication	Project specific communication plans and tools; 3 pieces of digital content per project per year	
CE-1c	c. Proactively engage at least one member of the media each month to amplify the District’s work	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
CE-2	Increase community understanding of, and connection to, natural resources, environmental issues and public health through the following actions:	See subgoals below			
CE-2a	a. Develop and share at least two pieces of accessible and engaging District-owned content each month that ties District goals to the interests of stakeholders	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		220E	Digital communications	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	
CE-2b	b. Create and share information that promotes actions to improve water quality and ecosystem health	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		220B	Project Communication	Project specific communication plans and tools; 3 pieces of digital content per project per year	
		220E	Digital communications	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	
		220M	Public art program	1-2 arts related projects, activities, events per year; demographics of audiences when available	
		220N	595 Aldine communications and engagement	4-5 BMP and interactive exhibit signs; 1-2 exhibits, and activities at District office per year	
CE-2c	c. Host or support events to further understanding and encourage clean water actions, targeting 25 events per year	210B	Stewardship grant outreach	12 community events with translated Stewardship Grant outreach materials; engage with 3 organizations that serve BIPOC residents	
		220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		220C	Clean Streets	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
		220D	Maintenance workshops for water quality	2-4 workshops with 20-45 attendees per year	
		220M	Public art program	1-2 arts related projects, activities, events per year; demographics of audiences when available	
		220N	595 Aldine communications and engagement	4-5 BMP and interactive exhibit signs; 1-2 exhibits, and activities at District office per year	
		220I	Events	25 community events attended by the District; 2,000 people reached per year	
CE-3	Enhance the District’s public affairs and community relationships and increase community engagement through the following actions:	See subgoals below			
	a. Build community engagement infrastructure and	211G	Citizen Science Monitoring Program	Citizen science monitoring program	
		220F	Volunteer programs	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	



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Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
CE-3a	tools, including long-term program opportunities (e.g., K 12 curriculum, regular volunteer opportunities, citizen science, etc.)	220I	Events	25 community events attended by the District; 2,000 people reached per year	
		220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		220K	Youth programs	500 youth engaged; types of youth programs; 5 schools worked with per year	
CE-3b	b. Expand outreach to neighborhood groups, environmental organizations, local businesses, K 12 schools, colleges and universities, and other District audiences through 5 outreach meetings per month	210I	District "watercorps" position	1 position offered annually	
		220H	Partnerships	50 hours spent collaborating with 10 key community partners per year	
		220K	Youth programs	500 youth engaged; types of youth programs; 5 schools worked with per year; career mentorship to at least 3 youth groups per year	
		220L	Partner grant program	10 Partner Grant projects; 5,000-10,000 participants served; types of products created; pollution reduction; acres of greenspace restored per year	
CE-3c	c. Gather information from audiences where engagement is lacking to identify barriers to adoption of clean water behaviors and develop strategies to overcome those barriers.	101H	Diversity and inclusion program	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	
		220H	Partnerships	50 hours spent collaborating with 10 key community partners per year	
CE-3d	d. Increase recruitment and support of volunteers who will promote programs and activities that align with District goals and actively participate in improving our water resources, targeting 300 adopted storm drains, 200 new participants, and 300 volunteer hours per year	220F	Volunteer programs	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	
		220G	Sponsorships	5-10 District sponsored events/activities; 1,000-5,000 people served per year	
		220H	Partnerships	50 hours spent collaborating with 10 key community partners per year	
		220J	Awards program	Annual awards program to recognize up to six individuals or organizations.	
CE-4	Connect with members of Dakota, Ojibwe, and other indigenous communities to build relationships and develop materials that acknowledge their history and ongoing engagement in the stewardship of the land and water in the District.	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		101H	Diversity and inclusion program	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	
CE-5	Support the continued integration of the arts, technology and storytelling as a vibrant means to communicate, educate, and enliven the experiences of District residents.	220E	Digital communications	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	
		220M	Public art program	1-2 arts related projects, activities, events per year; demographics of audiences when available	
CE-6	Support the creation of recreational access points and programming to better connect people with Willow Reserve and other water and natural resources of the District	220B	Project Communication	Project specific communication plans and tools; 3 pieces of digital content per project per year	
		305H	Water-based recreational activities support	Support of partner water-based recreational activities	
		317B	Hidden Falls/Crosby Farm trail reconstruction planning	Trail reconstruction plan	
		325E	Willow Reserve signage and access	Willow Reserve interpretive signage and access	
		325H	Natural resource inventories and/or management plans	2 natural resource inventories and plans	
		425H	Future wetland/stream/natural resource restoration projects	2 Acres of restored wetland and other natural resource areas	
CE-7	Increase communication and engagement efforts to help address chloride and trash pollution.	220A	General communications and engagement	Brand standards and common language; 5 outreach meetings per month; contact database	
		220C	Clean Streets	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	
		220F	Volunteer programs	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	
		220G	Sponsorships	5-10 District sponsored events/activities; 1,000-5,000 people served per year	
		375I	Trash management planning and implementation for areas surrounding District infrastructure and water and natural resources	Trash management plan	
		375K	District Chloride Source Assessment and Prevention Plan	Chloride reduction plan	
R-1	Achieve the District's 1.1 inch volume retention standard and other performance standards on 100% of redevelopment projects disturbing 1 acre or more of land	208A	General permitting implementation	30 permits approved and 7 acre-feet retained annually	
		208C	Permittee post construction BMP inspections	20 inspected BMPs and BMP conditions status reports per year	
		475P	Stormwater impact fund implementation	Stormwater impact fund CIP(s)	

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Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
R-2	Work with agency partners to provide consistent and efficient stormwater regulations and controls across jurisdictions	208A	General permitting implementation	30 permits approved and 7 acre-feet retained annually	
		208D	Engagement activities with permittees, developers, engineers, and applicants	5 meetings with private developers during the plan period	
		208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
		208K	Water reuse policy support	Adopted water reuse guidance document	
		375F	Saint Paul watershed governance exploration	Technical memorandum evaluating water governance in Saint Paul	
R-3	Meet with agency partners every 2 years to ensure that stormwater regulations reflect the most pressing water quality issues, current research, and science to make progress in protecting and improving water and natural resources	208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
		208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
		208G	Stormwater rule requirements on sites less than one acre	1 Rule Revision for Small Sites	
		208I	Green infrastructure incentives in District rules	1 adopted green infrastructure incentive rule	
R-4	Work with agency partners to evaluate and consider regulations for deicing practices	208F	Deicing practices rule	1 chloride reduction rule or ordinance assistance package	
R-5	Work with agency partners to evaluate and develop requirements for stormwater management on sites disturbing less than 1 acre of land	208G	Stormwater rule requirements on sites less than one acre	1 Rule Revision for Small Sites	
R-6	Support the State's efforts to develop comprehensive water reuse policy and guidance and updates to the State plumbing code.	208K	Water reuse policy support	Adopted water reuse guidance document	
R-7	Work with partners to improve coordination and processes on overlapping aspects of regulatory programs:	See subgoals below			
R-7a	a. review of permit applications early in the project design phase	208D	Engagement activities with permittees, developers, engineers, and applicants	5 meetings with private developers during the plan period	
		208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
R-7b	b. detection and elimination of at least 20 illicit discharges over 10 years	208H	Illicit Discharge Detection and Elimination (IDDE) plan implementation	20 illicit discharges removed over 10 years	
R-7C	c. inspection and enforcement of all projects during and after construction	208B	Coordinated erosion and sediment control inspections	(% compliance) Active Sites Visited once per week during construction	
		208C	Permittee post construction BMP inspections	20 inspected BMPs and BMP conditions status reports per year	
R-8	Identify and implement ways to improve engagement with developers, engineers and applicants	208D	Engagement activities with permittees, developers, engineers, and applicants	5 meetings with private developers during the plan period	
R-9	Identify and leverage opportunities that combine incentives for green infrastructure with regulations to address District and partner goals	208A	General permitting implementation	30 permits approved and 7 acre-feet retained annually	
		208E	Rules evaluation and update	5 Rules TAC meetings; # updates to District Rules	
		208I	Green infrastructure incentives in District rules	1 adopted green infrastructure incentive rule	
IM-1	Achieve desired performance of District-owned and funded stormwater infrastructure through regular inspection of all District-owned and funded infrastructure, consistent routine and non-routine maintenance, and replacement according to individual infrastructure operation and maintenance plans	222A	District-owned facility management	6 BMPs inspected and maintained	
		222B	Shared ownership (District/partner) facility management	4 BMPs inspected and maintained	
		222C	Partner owned facility management and ownership evaluation	Evaluation report	
		222E	BMP database	BMP database	
		315E	TBI easement verification, acquisition and documentation	8 acres of additional easement	
IM-2	Establish effective and efficient long-term management approach(es) for publicly owned stormwater management systems, including individual, shared, and/or regional systems	222B	Shared ownership (District/partner) facility management	4 BMPs inspected and maintained	
		222C	Partner owned facility management and ownership evaluation	Evaluation report	
IM-3	Support our public and private partners in the maintenance of stormwater infrastructure by developing and implementing a stormwater infrastructure maintenance service program	220D	Maintenance workshops for water quality	2-4 workshops with 20-45 attendees per year	
		222C	Partner owned facility management and ownership evaluation	Evaluation report	
		222D	Cooperative BMP maintenance service program	6 BMPs inspected and maintained	
		375J	Municipal source control/good housekeeping planning and implementation assistance	Municipal source control and good housekeeping plan	
IM-4	Offer BMP inspection and maintenance support to District grantees to ensure at least 90% of District grant-funded projects meet their design goals annually	210C	Stewardship grant project inspection and maintenance assistance	90% BMPs rated fair or better for functionality	
		222D	Cooperative BMP maintenance service program	6 BMPs inspected and maintained	
IM-5	Develop and implement program(s) for inspection of District-permitted and other privately owned stormwater infrastructure	222B	Shared ownership (District/partner) facility management	4 BMPs inspected and maintained	
		222C	Partner owned facility management and ownership evaluation	Evaluation report	

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Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
IM-6	Work with partners to assess inspection and maintenance needs and costs for regional stormwater management systems, identify partner roles, and develop an approach/program for regional stormwater systems	222C	Partner owned facility management and ownership evaluation	Evaluation report	
IM-7	Increase public and private sector knowledge of stormwater BMP inspection and maintenance by offering or promoting annual education and training programs by others	210C	Stewardship grant project inspection and maintenance assistance	90% BMPs rated fair or better for functionality	
		222D	Cooperative BMP maintenance service program	6 BMPs inspected and maintained	
		220C	Clean Streets	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed	
		220D	Maintenance workshops for water quality	2-4 workshops with 20-45 attendees per year	
O-1	Foster equitable implementation of all District programs and projects across the watershed by engaging traditionally underserved populations and expanding geographic reach into the Trout Brook, Saint Anthony Hill, and Phalen Creek subwatersheds	101H	Diversity and inclusion program	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	
		210B	Stewardship grant outreach	12 community events with translated Stewardship Grant outreach materials; engage with 3 organizations that serve BIPOC residents	
		220B	Project Communication	Project specific communication plans and tools; 3 pieces of digital content per project per year	
		315I/415I	Future Trout Brook subwatershed stormwater management planning and CIPs	2 studies and CIPs	
		333C	Phalen Creek subwatershed water quality and quantity study	1 Phalen Creek subwatershed study	
		333D	Saint Anthony Hill subwatershed water quality and quantity study	1 Saint Anthony Hill subwatershed study	
		433F	Future CIPs	3 CIPs	
O-2	Assess District programs, activities, and water governance within and adjacent to the District through an equity lens on a bi-annual basis and make recommendations for consistent, equitable, and efficient water resource management	101B	Citizen Advisory Committee	12 CAC members and monthly meetings	
		101D	Program effectiveness assessment	Bi-annual assessment report	
		101H	Diversity and inclusion program	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	
		375C	Watershed management plan update	Updated WMP	
		375D	Partner agency plan review and comment	5 comment letters on draft updates to District cities' local surface water management plans comment letters	
		375F	Saint Paul watershed governance exploration	Technical memorandum evaluating water governance in Saint Paul	
		375L	District boundary corrections	Corrected District boundaries	
O-3	Ensure that high value and multiple benefits are derived from funds spent on District projects and programs through planning, adaptive management and biannual evaluation of progress	101A	General administration	Annual budget, audit and report	
		101C	External funding opportunities	1 external funding opportunities study	
		101D	Program effectiveness assessment	Bi-annual assessment report	
		101E	Office operations	Annual office operations	
		375C	Watershed management plan update	Updated WMP	
		375E	GIS Program	Updated GIS information and data	
		375F	Saint Paul watershed governance exploration	Technical memorandum evaluating water governance in Saint Paul	
		375N	Tools for quantification of non-SW benefits of green infrastructure	Technical memorandum of green infrastructure cost-benefit tools	
O-4	Advance the field of water management through demonstration, research, and monitoring of innovative technologies and practices with partners	211C	BMP performance monitoring	8 BMPs monitored; volume and pollutant reductions	
		211H	Research program	Stormwater research reports	
		302B	Beneficial infiltration study and demonstration projects	Beneficial infiltration study report	
		211J	Non-structural BMPs effectiveness	Technical memo	
O-5	Maintain and enhance the capacity of the District to achieve water and natural resource management goals through:	See subgoals below			
O-5a	a. Expanding existing and creating new partnerships with government agencies, institutions, and non-profits to expand water resource management	375D	Partner agency plan review and comment	5 comment letters on draft updates to District cities' local surface water management plans comment letters	
		375G	Public private partnership opportunities	2 meetings per year	
		210B	Stewardship grant outreach	12 community events with translated Stewardship Grant outreach materials; engage with 3 organizations that serve BIPOC residents	



Appendix G - Correlation Table of Plan Goals to Implementation Activities and Measurable Outputs

Note: It is the desire and intent of the District to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

Goal #	Goal	Activity ID #	Implementation Activity	Activity Measureable Outputs	Status (to be updated biennially)
		101H	Diversity and inclusion program	1 -2 workshops for staff annually; outreach and communication plan for two underserved communities; engage 3-5 organizations/schools working with BIPOC; implement best practices in hiring; semi-annual diversity and inclusion workshops for partners	
O-5b	b. Identifying and expanding public-private partnership opportunities for incorporating water and natural resource improvements into redevelopment projects (i.e., local chambers of commerce and business councils, Saint Paul Port Authority, redevelopment companies)	208D	Engagement activities with permittees, developers, engineers, and applicants	5 meetings with private developers during the plan period	
		210G	Large-scale site planning grants	3 planning grants annually	
		375G	Public private partnership opportunities	2 meetings per year	
O-5c	c. Pursuing non-traditional state grant funding and explore other funding mechanisms to support District and partner activities	101C	External funding opportunities	1 external funding opportunities study	
		475Q	Debt and loan service	Semi-annual debt service payments	
O-5d	d. Expanding the District’s role as a thought leader and advocate for sustainable water resource management	101D	Program effectiveness assessment	Bi-annual assessment report	
		101F	MAWD support	Annual MAWD support	
		211H	Research program	Stormwater research reports	
		375N	Tools for quantification of non-SW benefits of green infrastructure	Technical memorandum of green infrastructure cost-benefit tools	
		211I	Emerging contaminants and water quality issues	New monitoring parameters and results	
O-5e	e. Recruiting and retaining high quality staff and volunteers including Citizen Advisory Committee members and resident volunteers	101B	Citizen Advisory Committee	12 CAC members and monthly meetings	
		101E	Office operations	Annual office operations	
		101G	Safety Program	Annual training and monthly staff meeting safety reminders	
		210I	District "watercorps" position	1 position offered annually	
		220F	Volunteer programs	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	