

2021–2030 Watershed Management Plan

Capitol Region Watershed District
Saint Paul, MN

Adopted November 4, 2020



ACKNOWLEDGEMENTS

The CRWD 2021 – 2030 Watershed Management Plan was approved by MN Board of Water and Soil Resources on October 28, 2020 and adopted by CRWD Board of Managers on November 4, 2020. This is the third-generation plan for the District.

In accordance with Minnesota Statutes, the Plan was developed by District staff and Board of Managers with input and review by the District's Citizen Advisory Committee, interested District citizens, community groups, and partner agencies and organizations.

The following agencies were provided opportunities to review and comment on the Plan:

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:

- 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 Co.

De Dakota Makóče, this is Dakota Land

The District would like to acknowledge the Dakota peoples on whose land we work. We thank the Dakota peoples and their relatives for their care of the land, and we recognize their continuing connection to the land, waters, and community. We pay our respects to Dakota people and their culture; past, present and future. We pledge to treat this land honorably and respectfully.

CERTIFICATIONS

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



11/04/2020

Joe Collins, Board of Managers President

Date



11/04/2020

Mark Doneux, Administrator

Date



11/04/2020

Anna Eleria, Planning, Projects and Grants Division Manager

Date

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Watershed Issues & Goals cover page: Sara Rubinstein

Implementation Plan cover page: Sara Rubinstein

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- [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](#)
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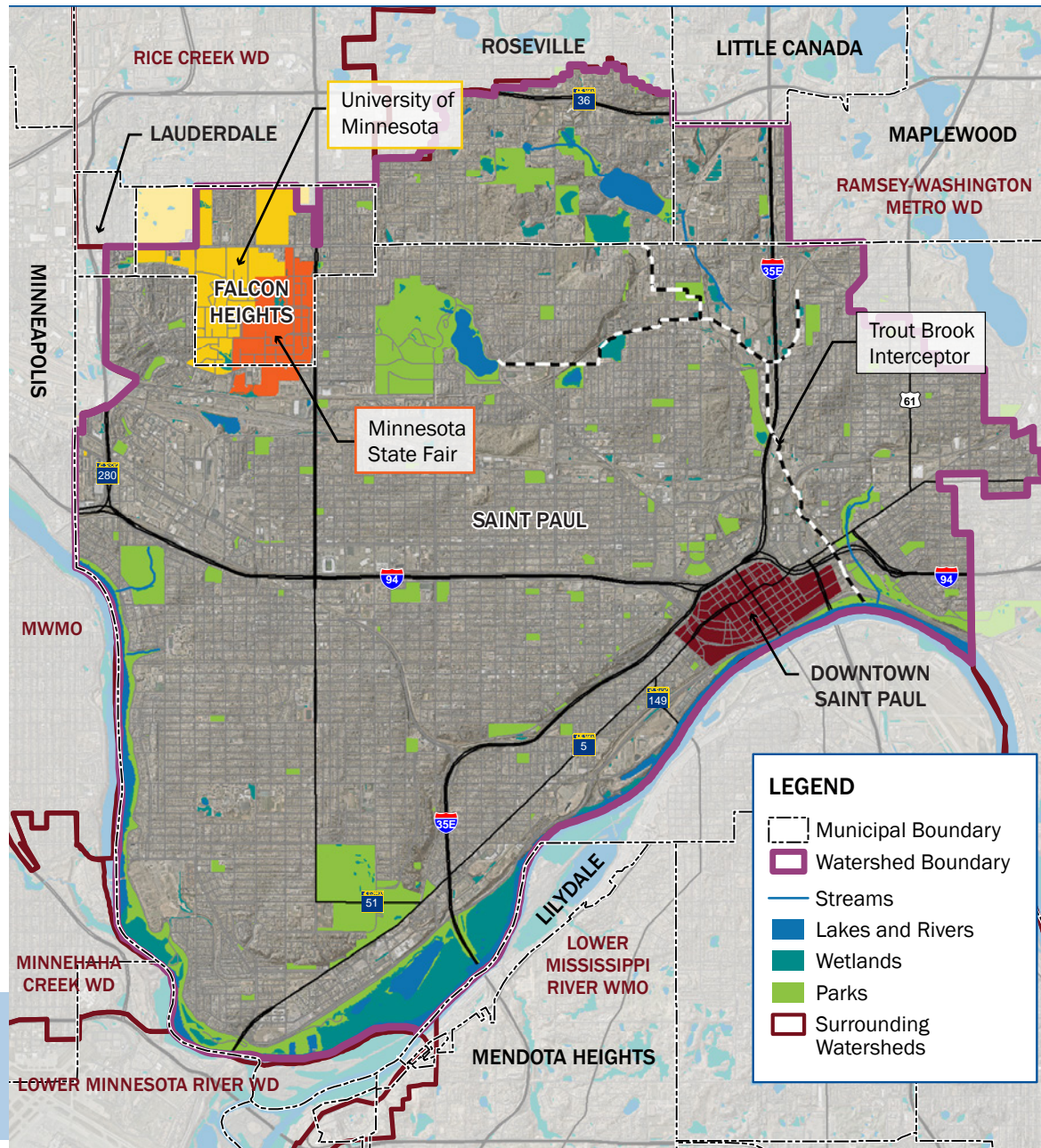
ABBREVIATIONS

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



EXECUTIVE SUMMARY

CRWD 2021–2030 Watershed Management Plan



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, goals, and themes included in the [District's 2010 Plan](#). This document builds on a strong

Figure ES-1: Capitol Region Watershed District

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

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, Community 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



Trout Brook Nature Sanctuary

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.



Green Line rain garden (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.

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:



CRWD staff at community festival (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.



Como Lake (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.



Central High School Plaza with permeable pavement and tree trench

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.



Flood control project at Curtis Field (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.



Urban Roots volunteers (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.



Rainwater harvesting and reuse at Allianz Field (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.



Alum treatment at Como Lake

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 will evaluate the outputs of the implementation activities associated with each 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: Most notable Plan Goals

Resource Issues	Built Environment	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 (BE-1)
		Explore private-public partnerships on redevelopment projects to implement shared, stacked green infrastructure (SSGI) projects with environmental, economic, and social benefits (BE-3)
	Water Quality	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 Section 2.3 (WQ-1/2/3/4)
		Reduce sediment and pollutant loading to the Mississippi River as defined by its TMDLs and defined in Section 2.3 (WQ-5/6)
		Quantify and reduce the amount of trash entering District lakes, wetlands, ponds, and the Mississippi River (WQ-7)
		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 Implementation Plan (WQ-9)
	Water Quantity and Flood Risk	Adapt to changing climate by evaluating flood risk and designing all new applicable District projects under present and anticipated climate and precipitation trends (FL-6)
		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-2)
	Ecosystem Health	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 (EH-5)
		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 (EH-6)
		Manage District lakes to achieve ecosystem health goals identified in their lake management plans and defined in Section 2.5 (EH-1/2/3)

Table ES-1: Most notable Plan Goals (continued)

Organization Issues	Communications and Engagement	Increase the visibility of the District and its work to better engage a variety of stakeholders through a variety of actions defined in Section 2.6 (CE-1)
		Increase community understanding of, and connection to, natural resources, environmental issues, and public health through actions defined in Section 2.6 (CE-2)
		Enhance the District's public affairs and community relationships and increase community engagement through actions defined in Section 2.6 (CE-3)
	Regulation	Work with agency partners to evaluate and consider regulations for deicing practices (R-2)
		Work with agency partners to evaluate and develop requirements for stormwater management on sites disturbing less than 1 acre of land (R-5)
		Work with partners to improve coordination and processes on overlapping aspects of regulatory programs (R-7)
	Infrastructure Management	Establish effective and efficient long-term management approach(es) for publicly owned stormwater management systems, including individual, shared, and/or regional systems (IM-2)
		Support our partners in the maintenance of stormwater infrastructure by developing and implementing a stormwater infrastructure maintenance service program (IM-3)
	Organization	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 (O-1)
		Maintain and enhance the capacity of the District to achieve water and natural resource management goals through the actions defined in Section 2.9 (O-5)

Implementation Plan

Individual District implementation activities are described in [Section 3](#). 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, equity 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



Frogtown Green leads neighborhood nature walk.

Image credit: Caroline Yang

- 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 ([Appendix G](#)).



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

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.

A scenic landscape featuring a calm body of water reflecting a bright sun and a sky filled with scattered clouds. The sun is positioned in the upper center, creating a strong reflection on the water's surface. The shoreline is lined with dark, silhouetted trees. In the foreground, a vibrant green, wavy graphic element curves across the bottom of the frame. The word "INTRODUCTION" is centered in a large, white, sans-serif font, with its reflection visible in the water below it.

INTRODUCTION

CRWD 2021–2030 Watershed Management Plan

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 and programmatic 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.

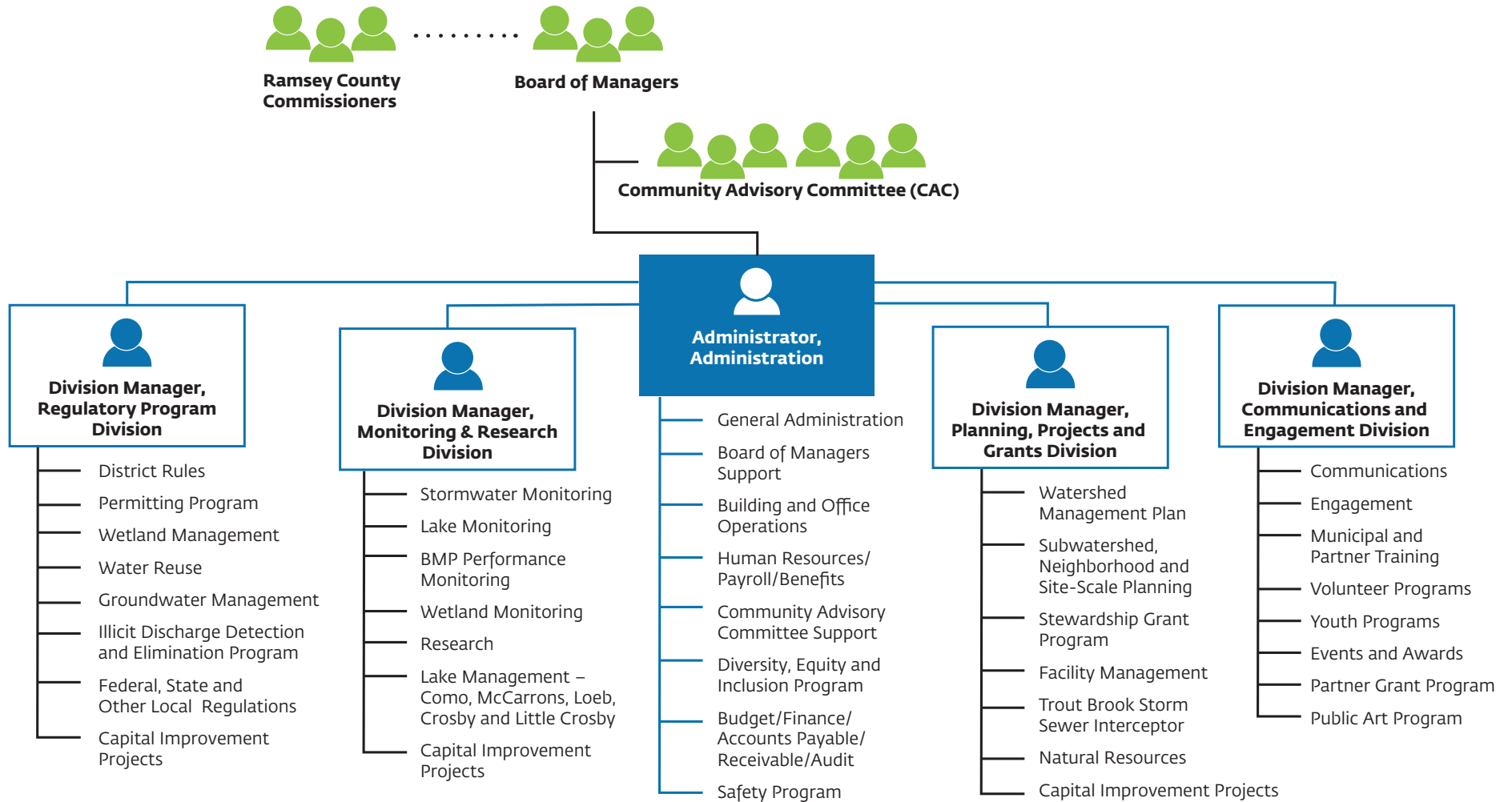
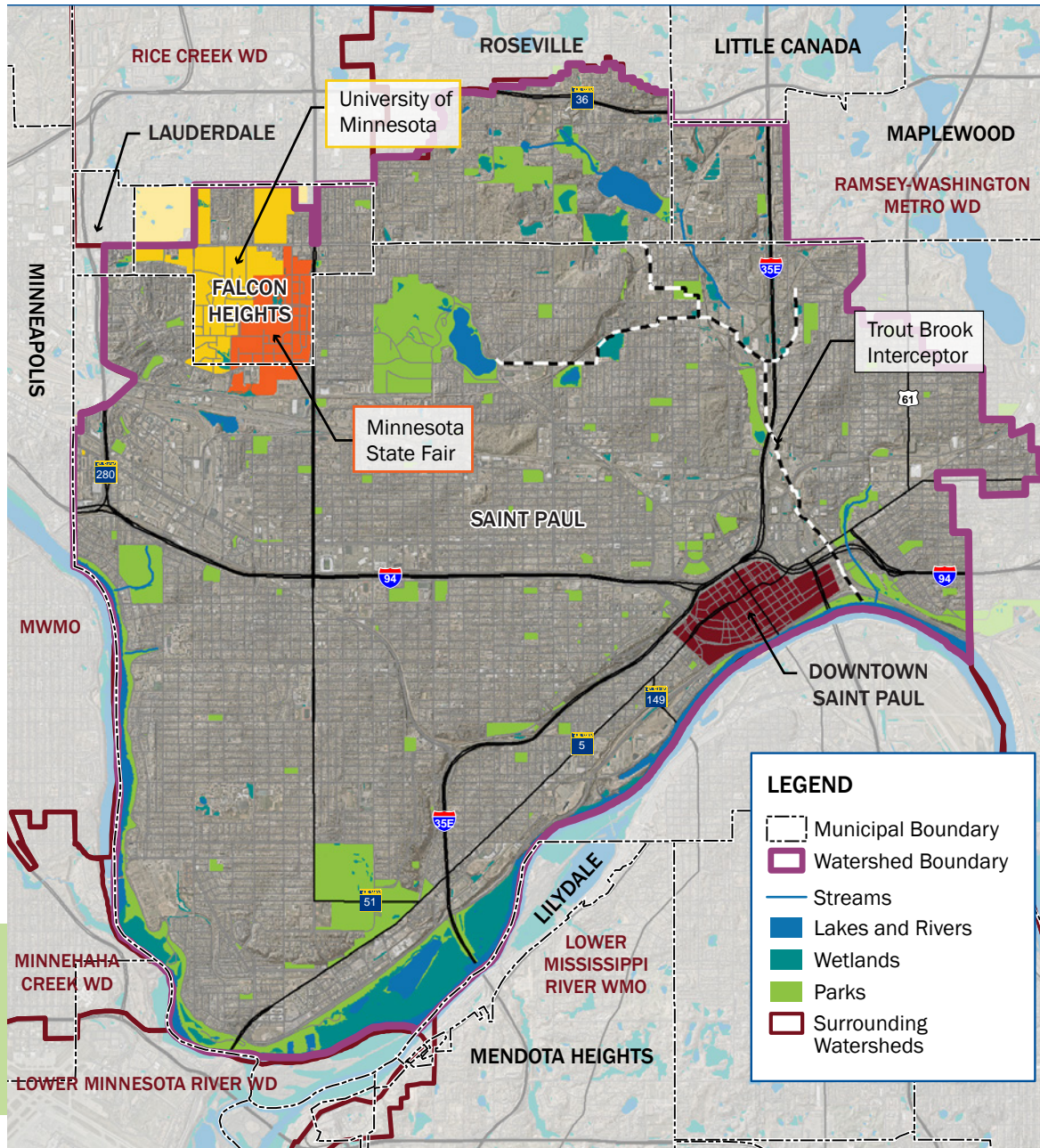


Figure 1-1: District Organization and Programming Chart



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.

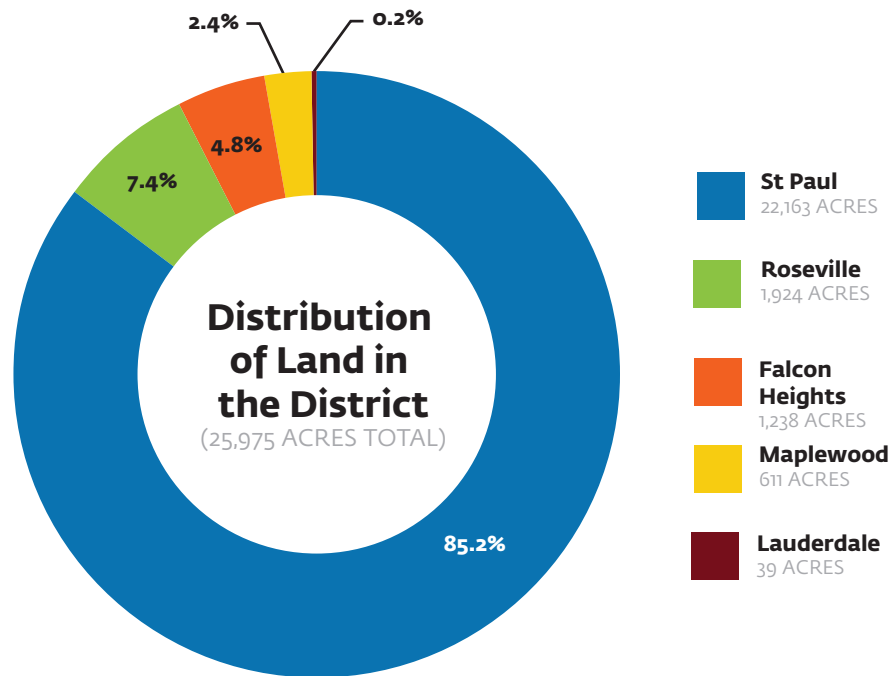


Figure 1-3: Distribution of land in the district

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. The program has resulted 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 and equitable 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:

- District Strategic Plan (2019)
- [District Diversity and Inclusion Plan \(2020\)](#)
- [Como Lake Management Plan \(2019\)](#)
- District Communications and Engagement Plan (2020)
- [Lake McCarrons Management Plan \(2020\)](#)
- Trout Brook Storm Sewer Interceptor Capital Improvement Plan (2020)
- 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, Community 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 [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; 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 [Section 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](#)).

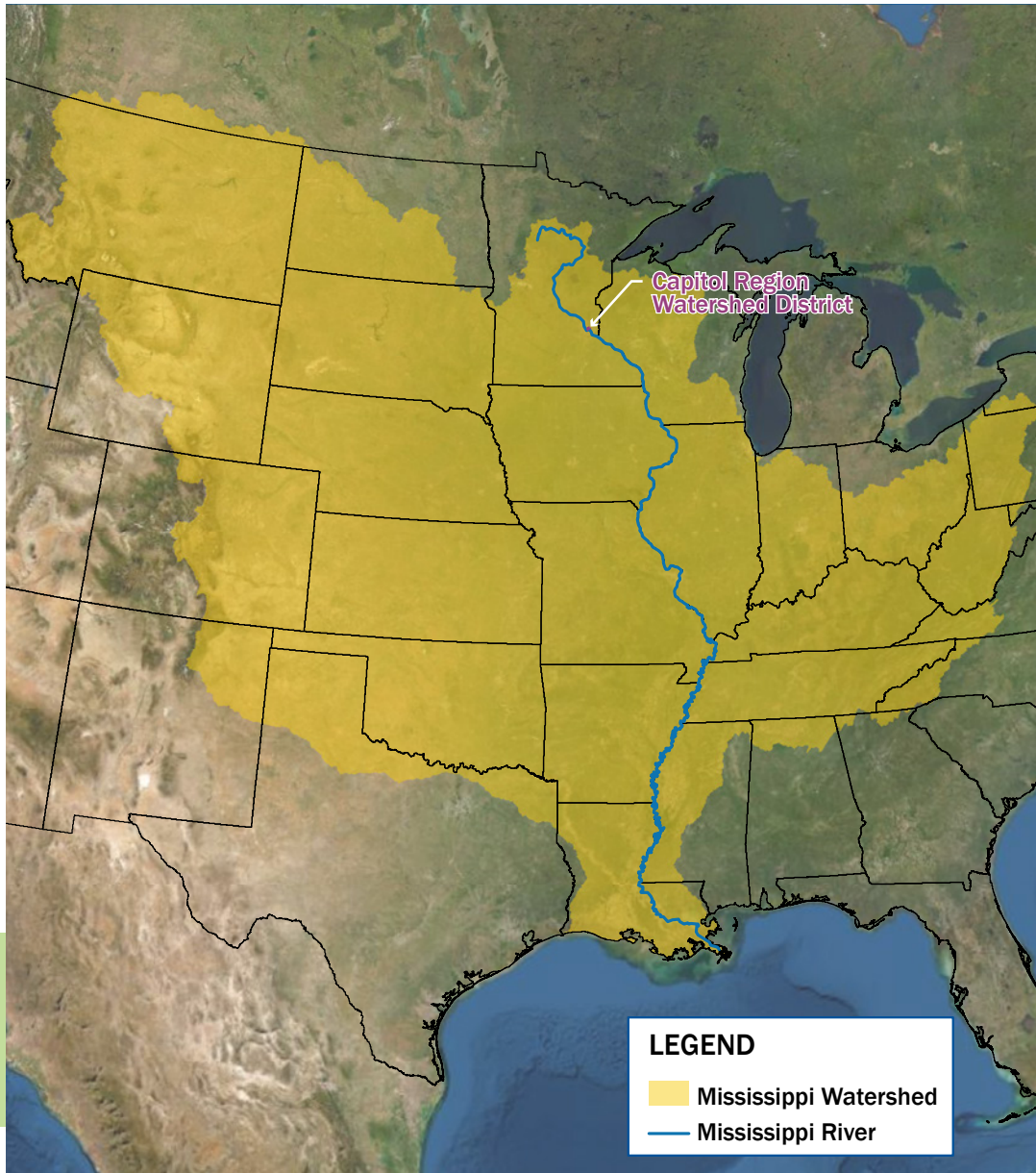
Dating back to the [2010 Plan](#), the District has sought to reconnect the community to its water resources, including the Mississippi River, through its “bring water back” campaign. This applies to both the physical restoration of water resources within the urban watershed as well as bringing water 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 [Section 3.5.7](#) and [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 using rainwater as a resource and 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.

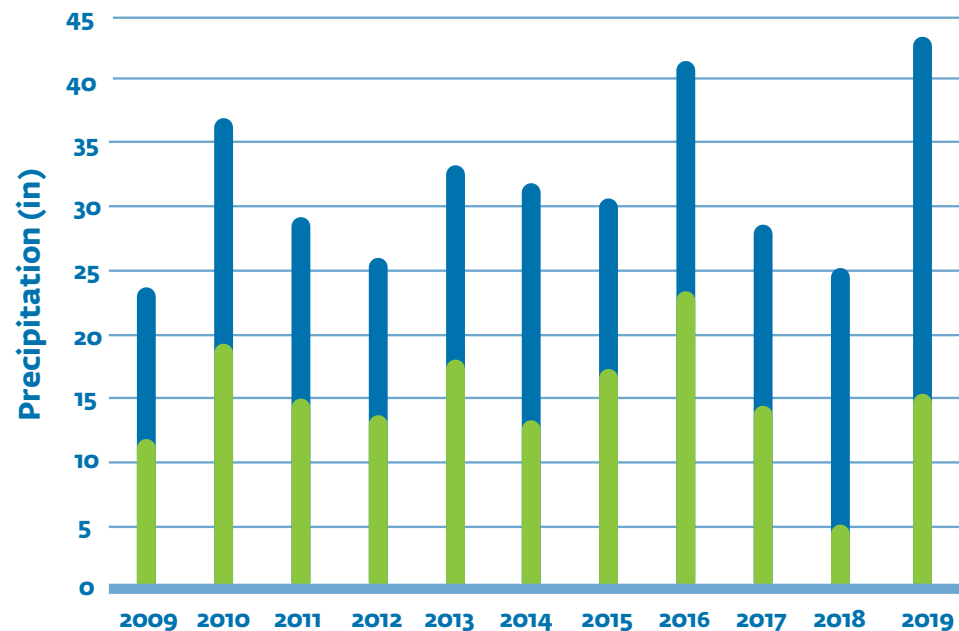
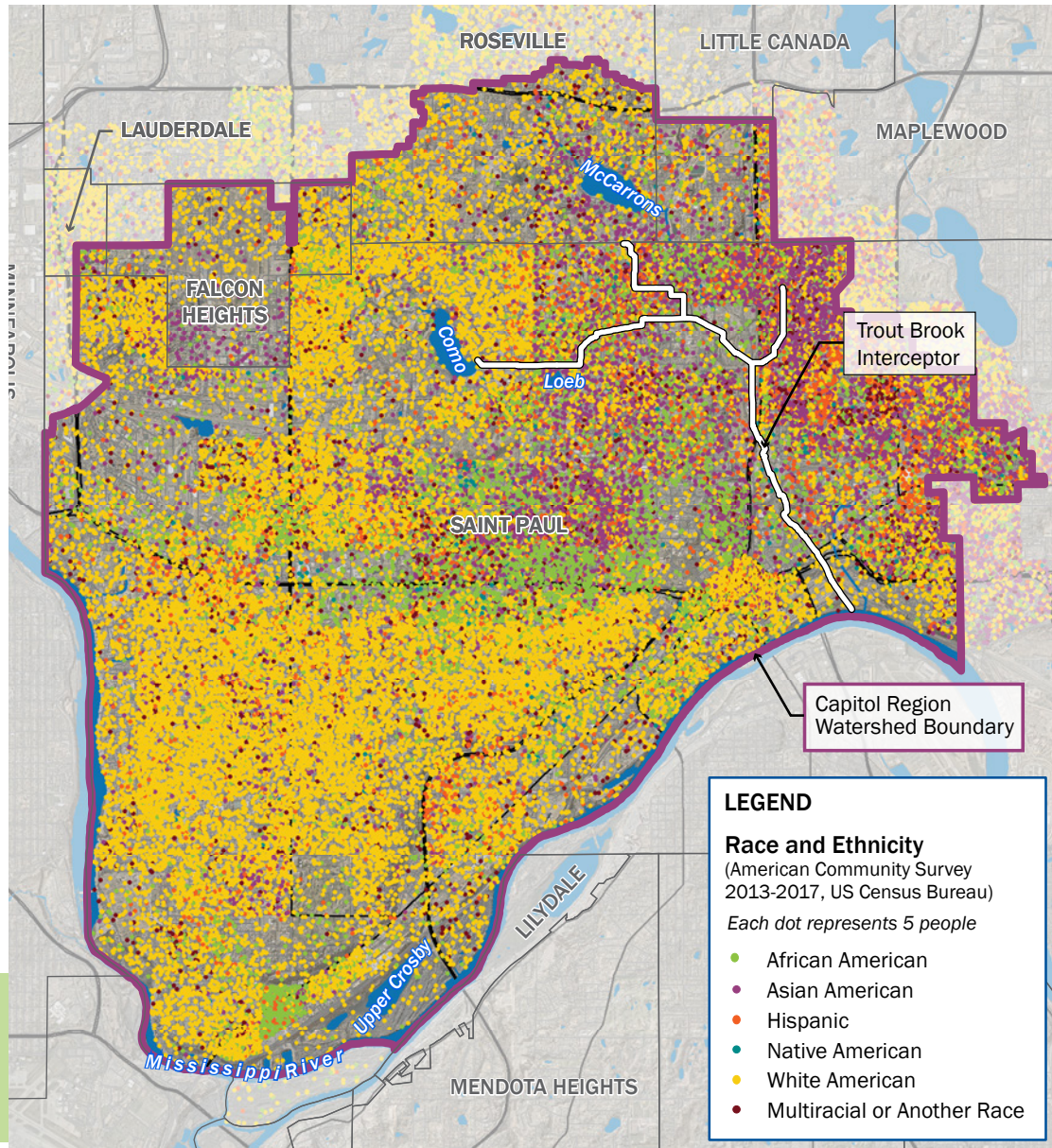


Figure 1-5: Fate of Precipitation in the TBI

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

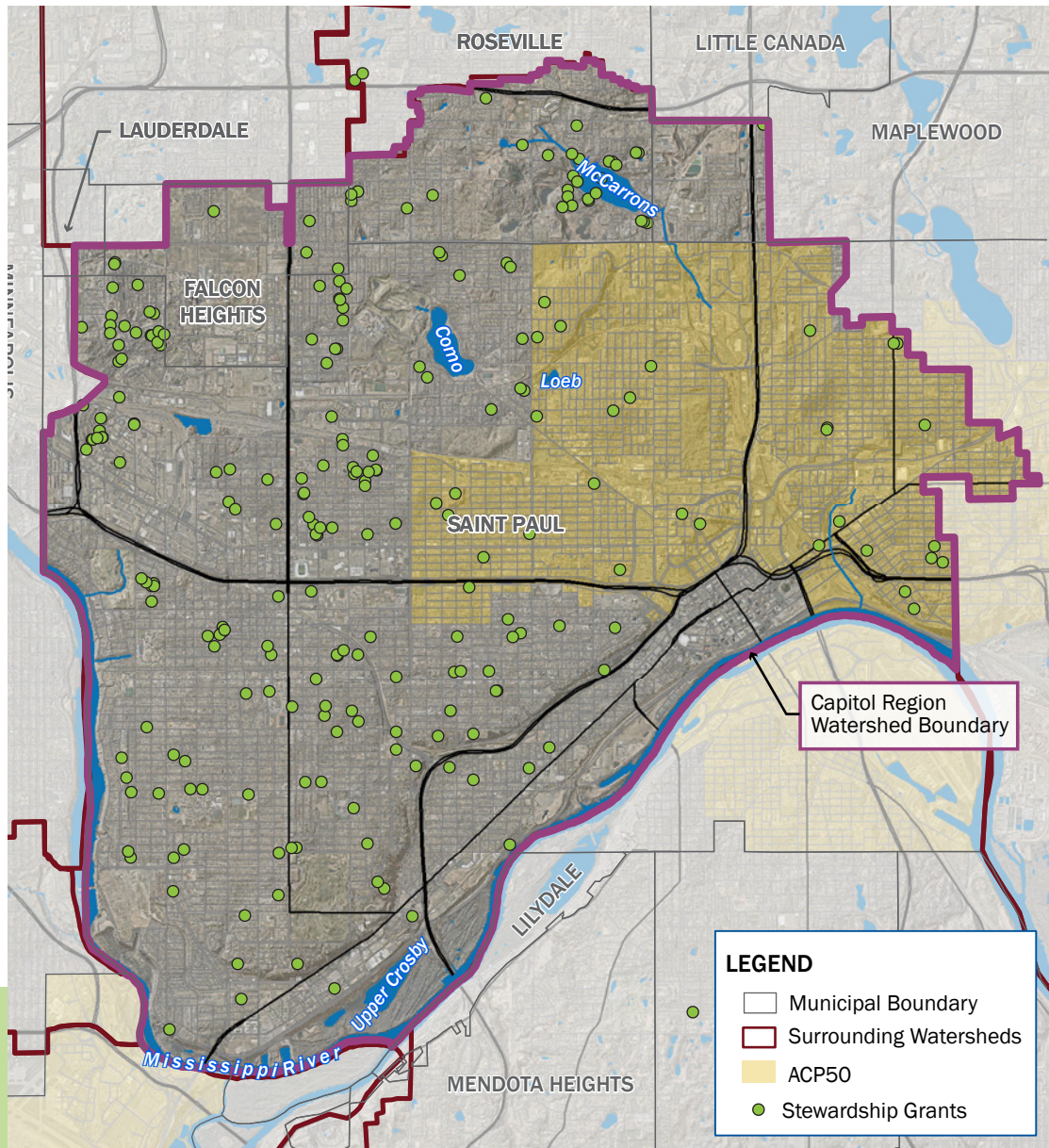


Watershed residents and community groups serve important roles in water and natural resource stewardship—effectively increasing the District’s capacity by preventing pollution and partnering with the District to implement BMPs. In 2019, staff, partners, and volunteers collaborated to provide resource 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, 2019a). In 2019, the District adopted a diversity, equity, 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, Equity, and Inclusion 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](#)).

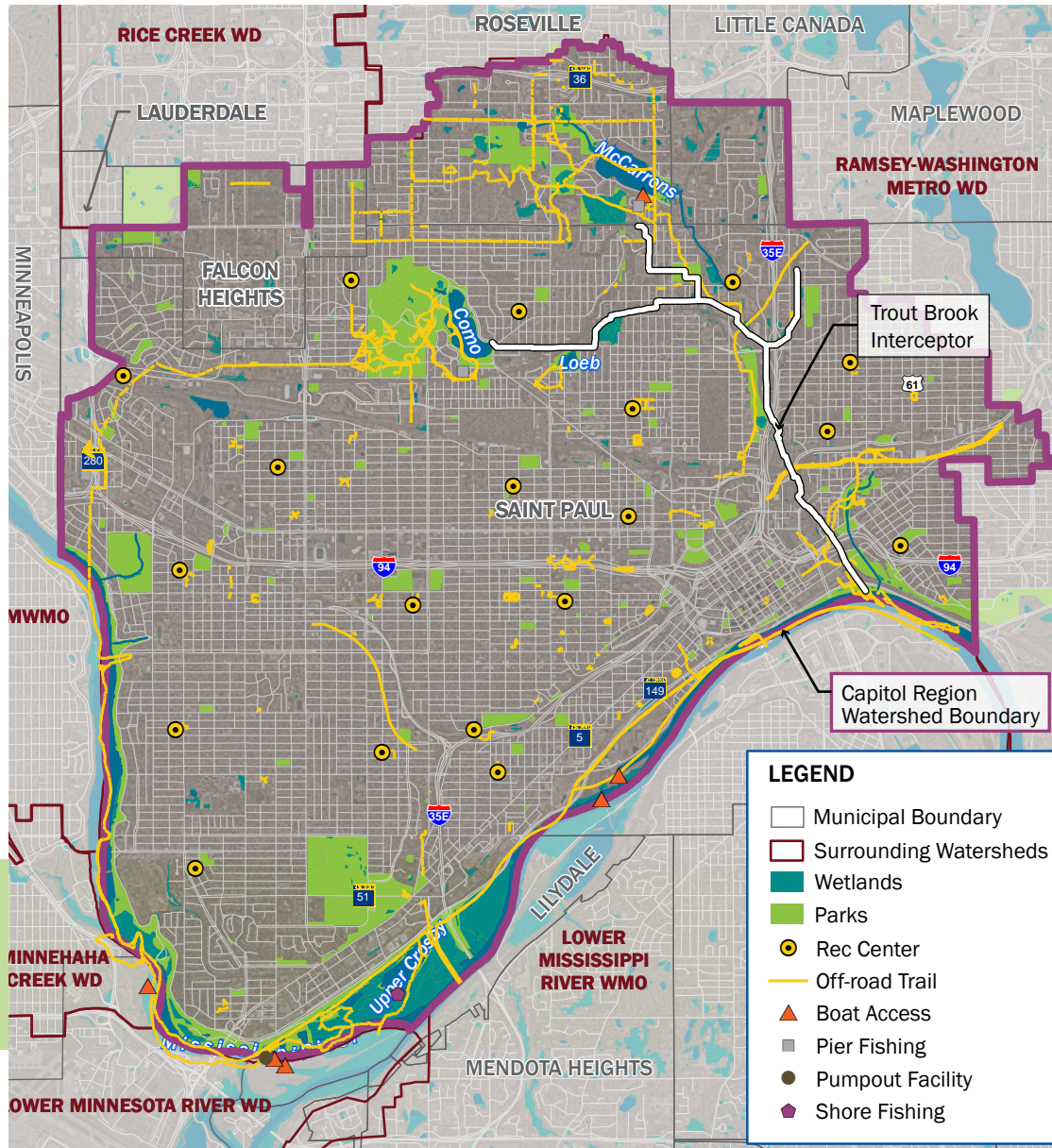
Income gaps can impact the community's ability to engage in water resources stewardship by limiting one's financial ability to implement practices, time available to become aware of and participate in stewardship practices or District programs, and property ownership that is often critical for siting 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 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:

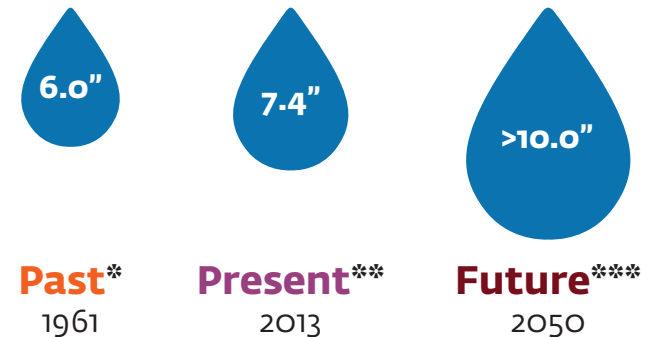
- Warmer winters—decline in severity and frequency of severe cold periods and warming periods leading to mid-winter snowmelt.
- Changing precipitation patterns—the annual amount of precipitation is increasing as more rainfall is coming from heavy thunderstorm events and winters have increased snowfall.

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)



* 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 21st century have increased by more than 30% over current design values, exceeding 10 inches in a 24-hour 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 [Section 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

CRWD 2021–2030 Watershed Management Plan

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

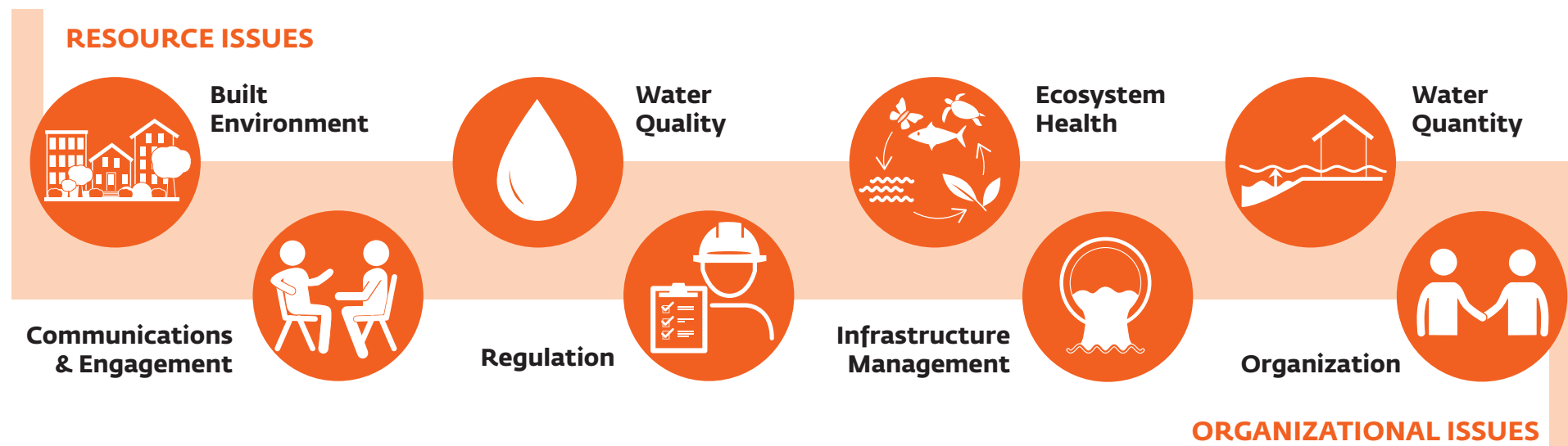
As part of Plan development, District staff executed multi-element stakeholder engagement to gather input from District Board of Managers, staff and CAC members, residents, community and neighborhood groups, city staff, state agency technical staff, and other partners (see [Section 1.2](#)). Supporting 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](#)).

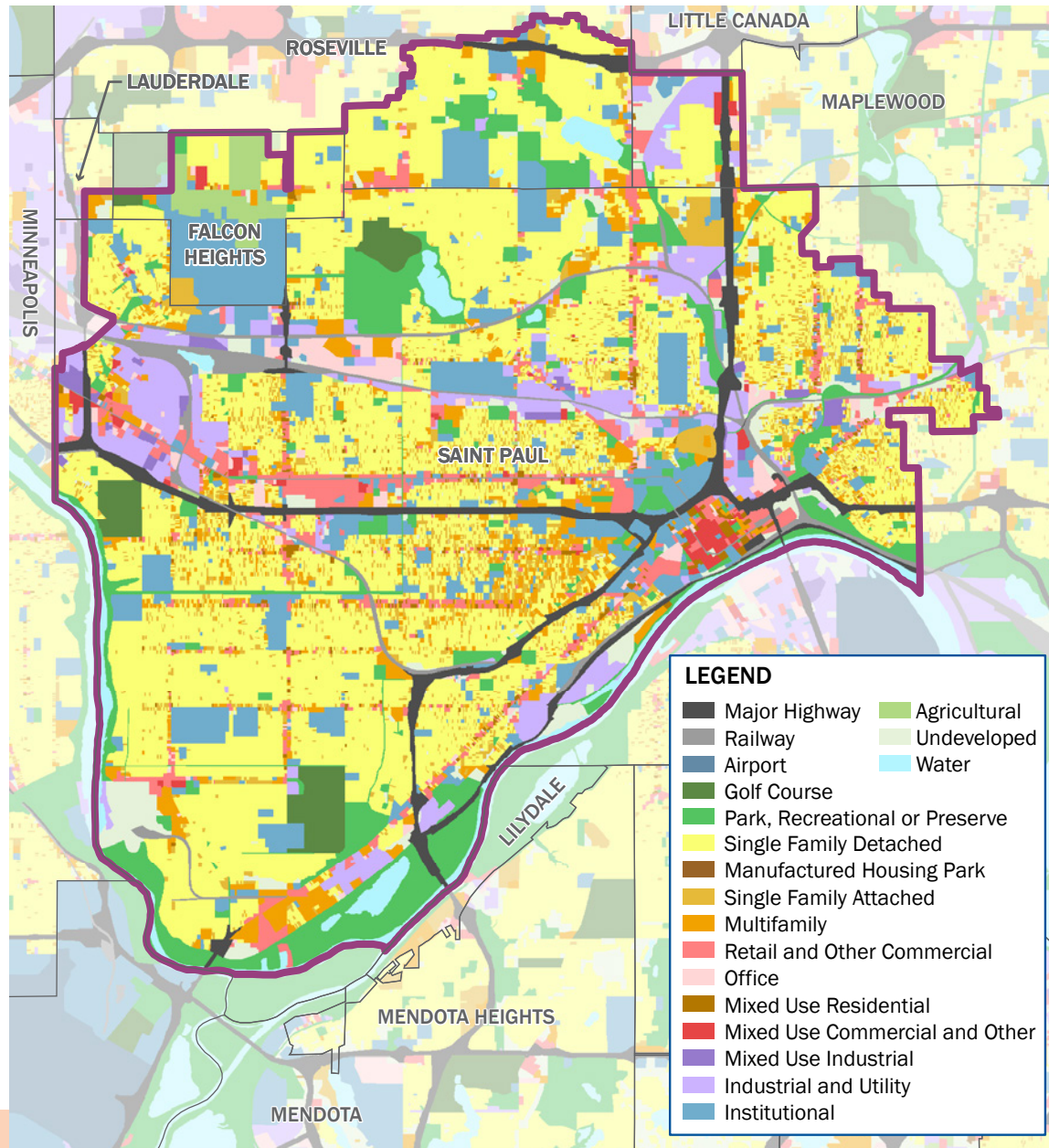
District staff reviewed the input received from stakeholder engagement activities in the context of past District accomplishments (see [Section 1.1.2](#)), resource monitoring and assessment data (see [Appendix A](#)), and current District programs. Staff interpretation, recommendations, and supporting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





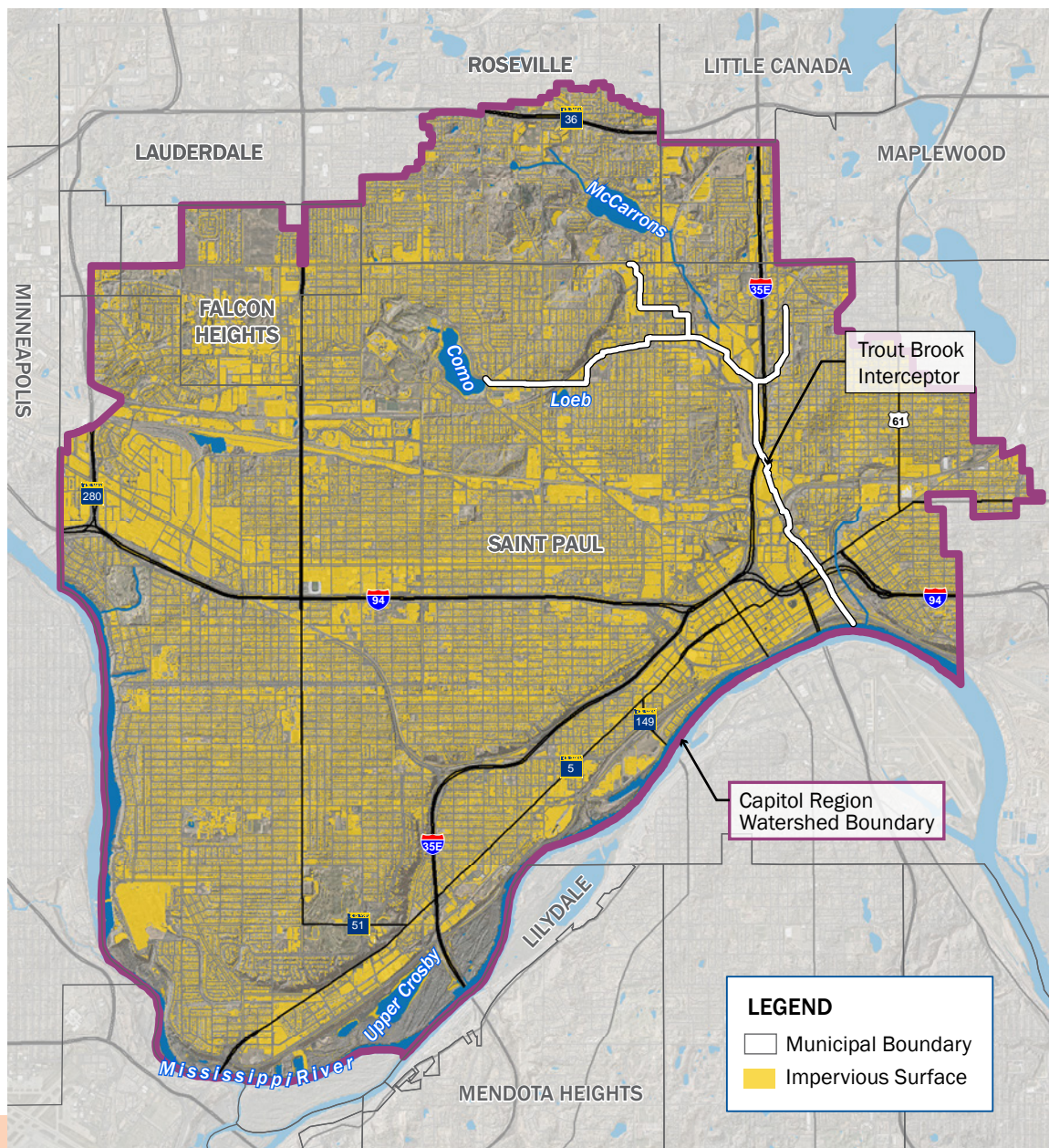
2.2. Built Environment Issues and Goals

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

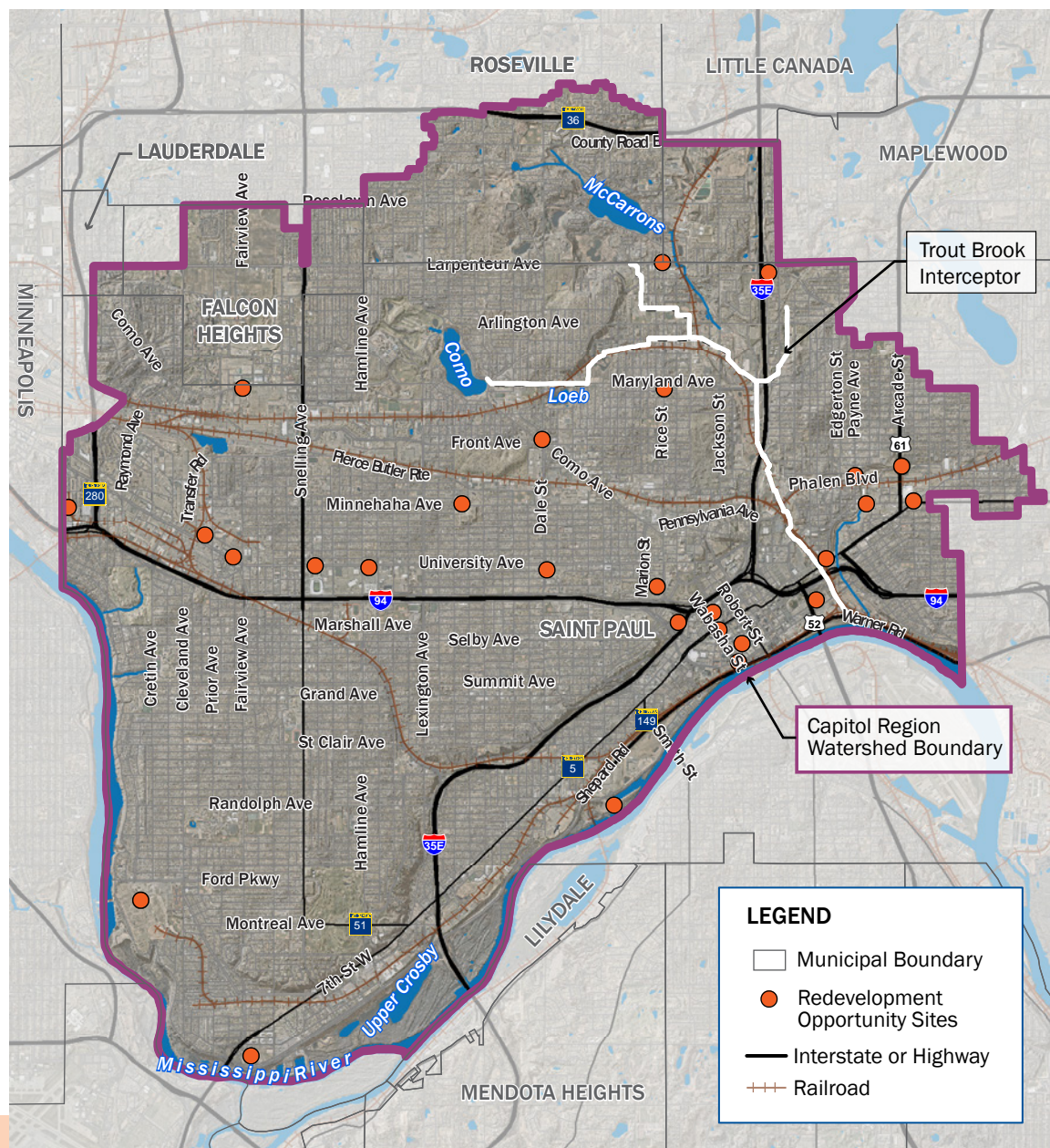


Increased stormwater runoff rates and volumes resulting from impervious area also contribute to erosion, threaten existing infrastructure and increase flood risk.

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,

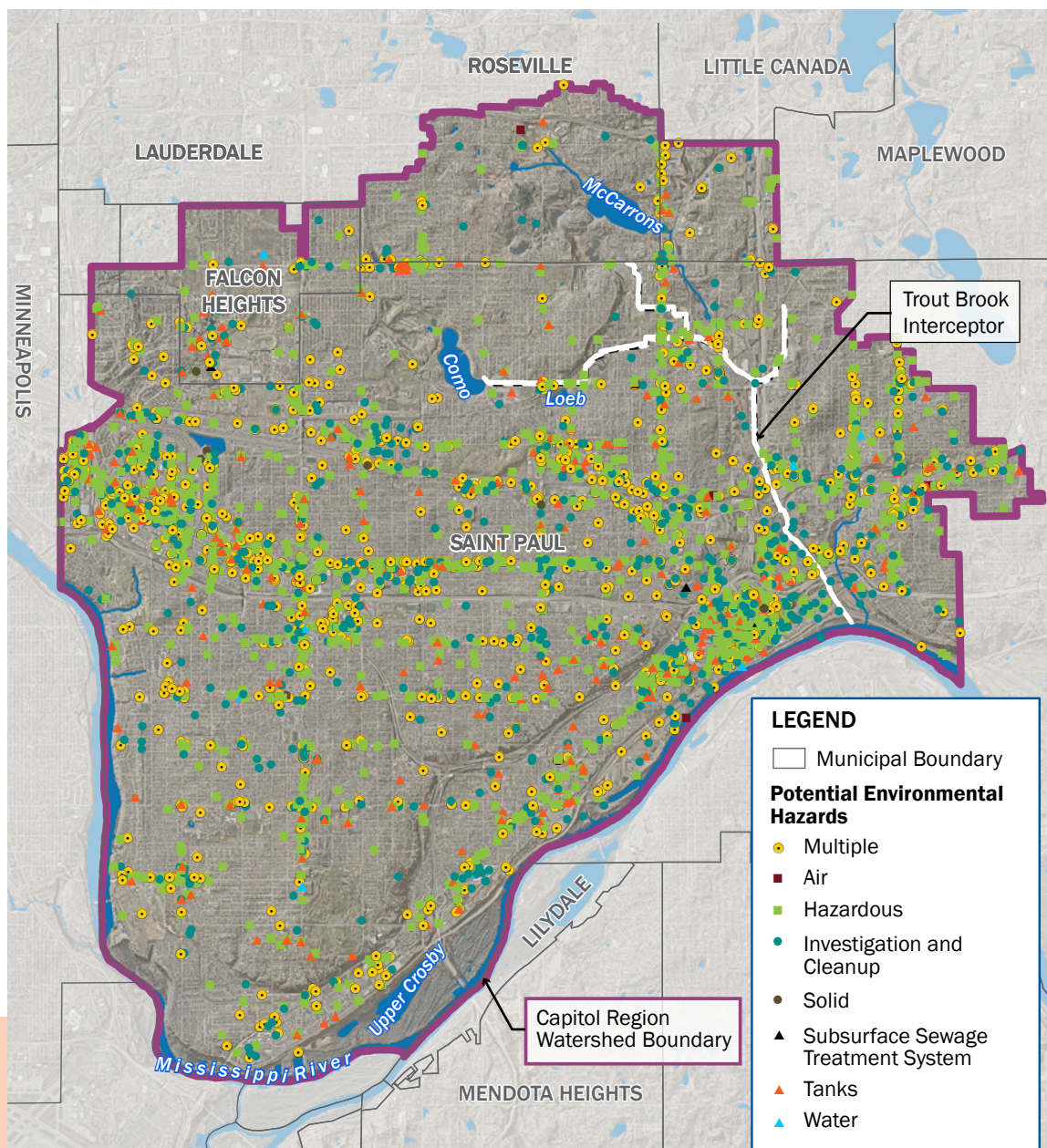


Figure 2-4: Potential Pollutant Sources

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. Chloride loading from runoff carrying road salt applied to roadways, parking lots, sidewalks, and other paved areas throughout the winter months is also a significant pollutant source.

In District lakes and wetlands, phosphorus 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 McCarrons have excellent water quality that the District and its partners seek to maintain through ongoing pollution

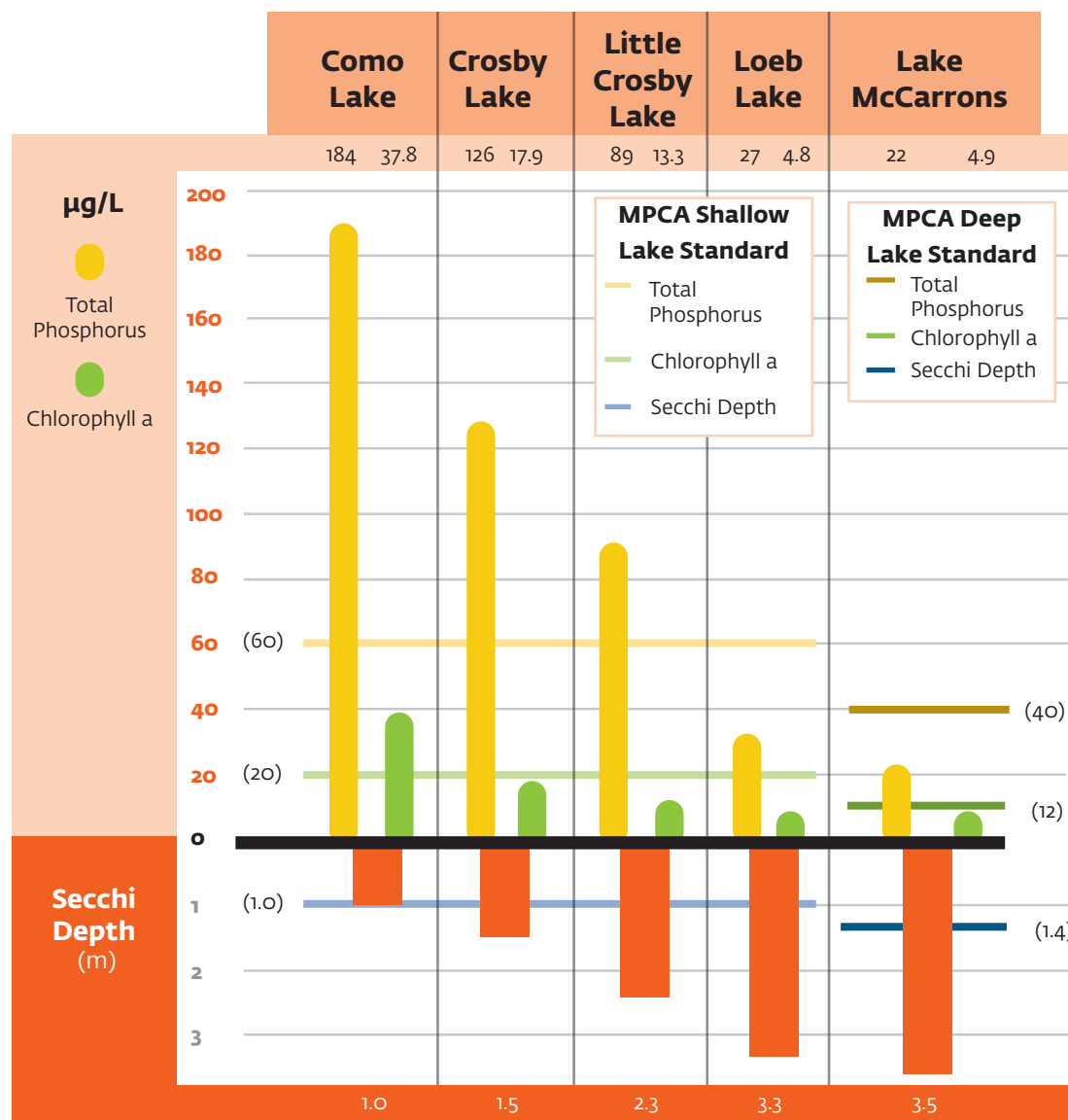
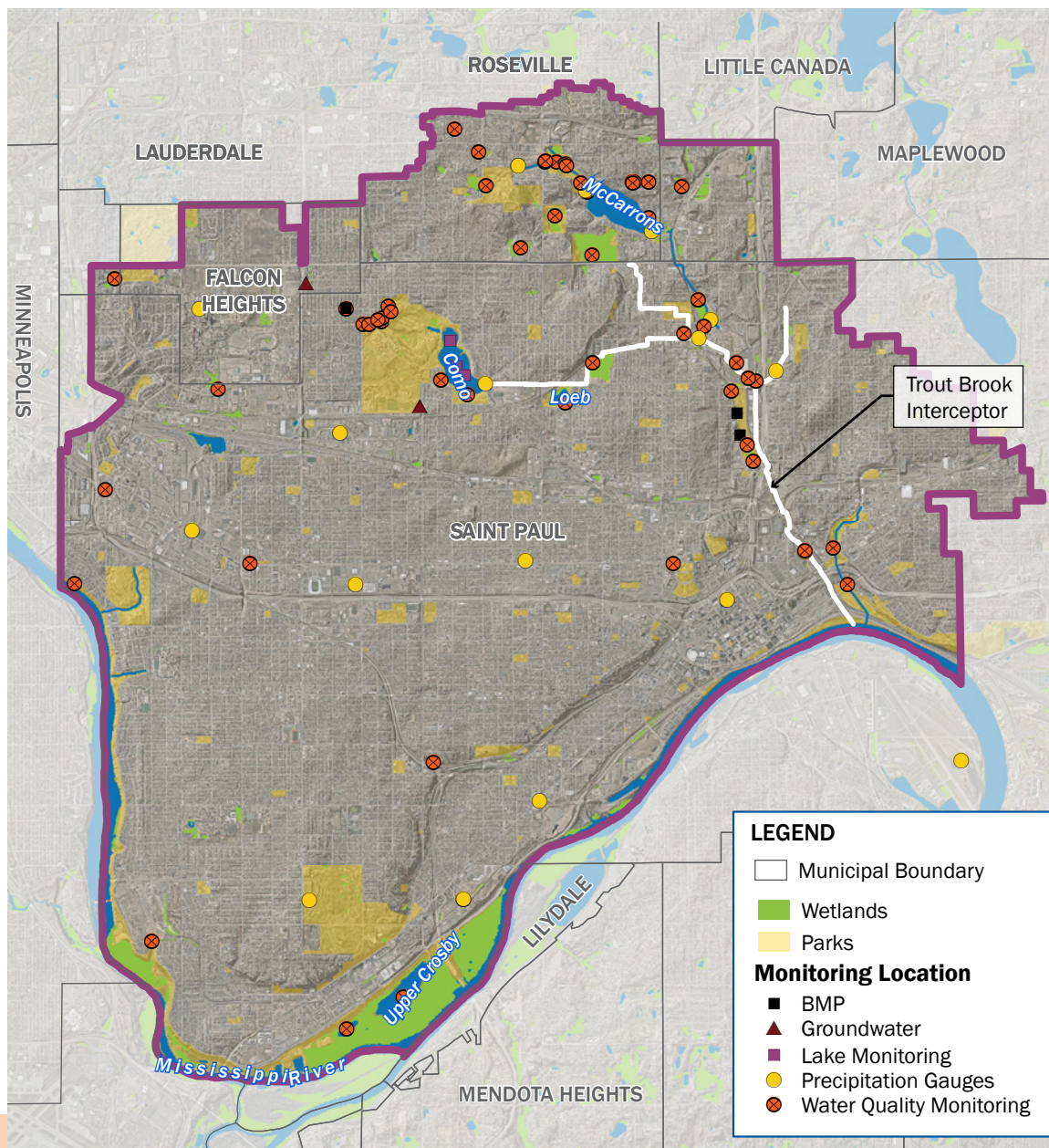


Figure 2-5: District Lake Water Quality Data (2009-2019)

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.



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, 2010), while others are incorporated into the more recent [Como Lake Management Plan](#) (CRWD, 2019).

Figure 2-6: District Monitoring Locations



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 watershed is approximately 0.5 pounds/acre/year and 200 pounds/acre/year, respectively. Average chloride concentrations in District

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
Como Lake	Aquatic Consumption	Mercury in fish tissue	2008	2008 ¹	
	Aquatic Life	Chloride	2014	2016 ²	
	Aquatic Recreation	Nutrients/Eutrophication	2002	2010 ³	
Lake McCarrons	Aquatic Life	Mercury in fish tissue	2006	2010 ¹	
Mississippi River	Aquatic Consumption	Mercury in fish tissue	1998	2007 ¹	
		Mercury in water	1998	2007 ¹	
		PCB in fish tissue	1998	--	2020
		PFOS in fish tissue	2008	--	2025
		PFOS in water	2014	--	2025
	Aquatic Life	Total suspended solids	2014	2015 ⁴	
		Aluminum	2020 (draft)		2033
	Aquatic Recreation	Nutrients/Eutrophication	2016	--	2029
		Fecal coliform	1994	2016 ⁵	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)



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 ¹ (cfu/100 mL)	Lead (µg/L)	TP (µg/L)	TSS (mg/L)	Zinc (µg/L)
Stormwater Outlets							
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
Mississippi River Locations and Standards							
Mississippi River Mile 839.1 (Downtown St Paul)	24	1.8	130.9	0.7	134	46	5.8
Mississippi River Mile 847.9 (Lock and Dam #1)	18	2.4	130.6	0.5	68	11	5.2
Mississippi River Standard (in Mississippi River)	230 ²	-- ⁵	1260 ³	-- ⁵	100 ²	32 ⁴	-- ⁵

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-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 below 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-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-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 greater than 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 TDML](#)) through ongoing practices (e.g., regulation) and capital improvements



- 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** Monitor water quality and quantity of District water resources including five lakes and seven subwatershed stormwater outfalls every year and nine wetlands periodically to document baseline conditions, identify trends, target areas for reducing pollutant loading and evaluate progress towards achieving water quality goals

- 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 natural, undeveloped settings, pervious ground cover allows rainwater, snowmelt and stormwater runoff to infiltrate into the soil. 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 can exceed the capacity of the storm sewer system and increase the potential for flooding and property damage. Increased precipitation also results in high water tables and increased groundwater flow to springs, which increases the potential for flooding and property damage.

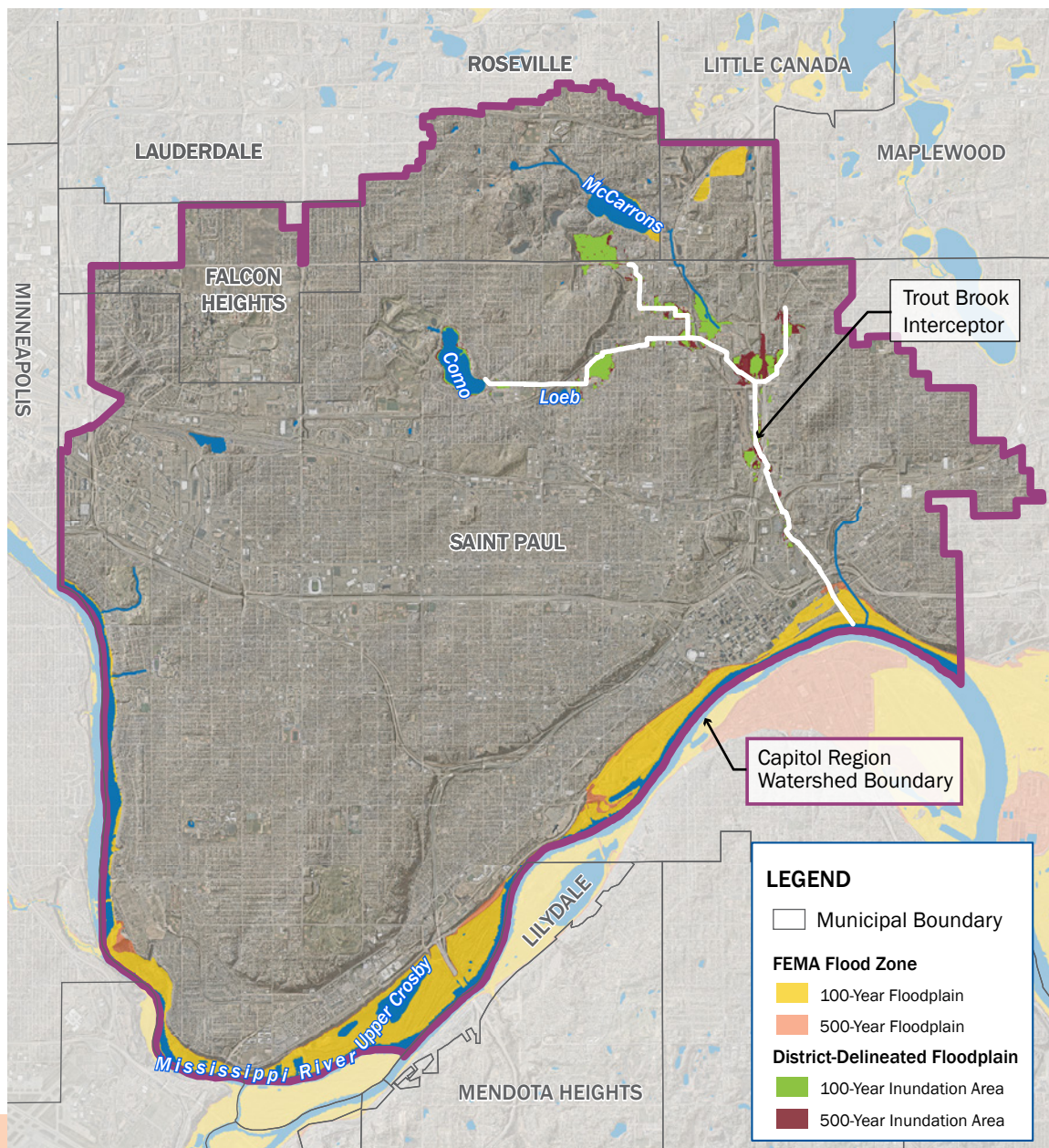
Managing the risk of flooding is a primary focus of the District and its partners due to the potential threat to public health and safety, infrastructure, and the environment. In addition to property damage, flooding may cause other impacts that are harder to quantify, including the following:

- 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 inundation areas adjacent to the Trout Brook Interceptor (TBI) stormwater system ([Figure 2-7](#)). The District has used this information to



Water flows into the underground stormwater system



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 by thoughtful management of the floodplain achieved through education and other activities. The District will continue to work with its

Figure 2-7: District and FEMA Floodplains



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-21st 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 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 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,

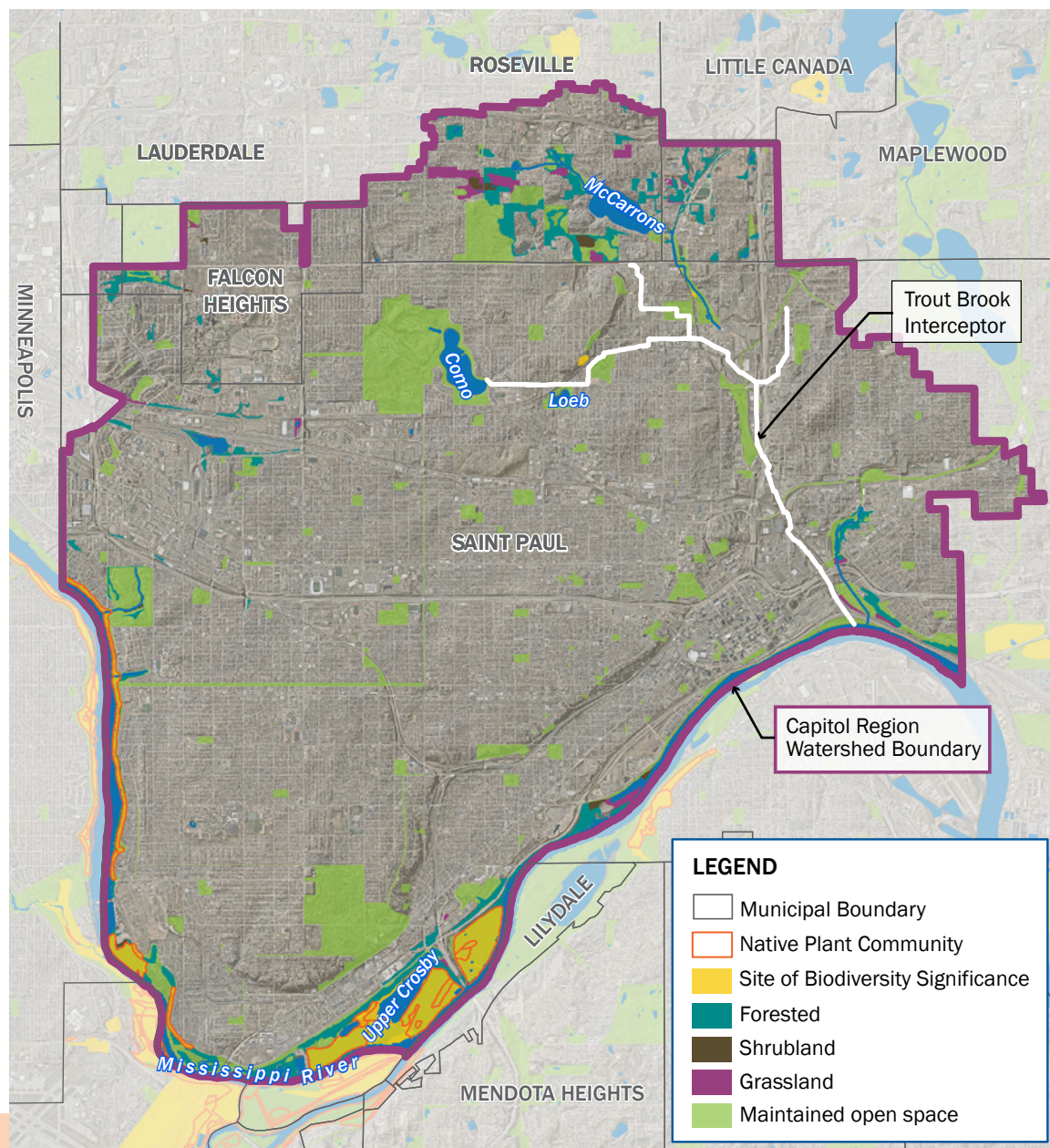
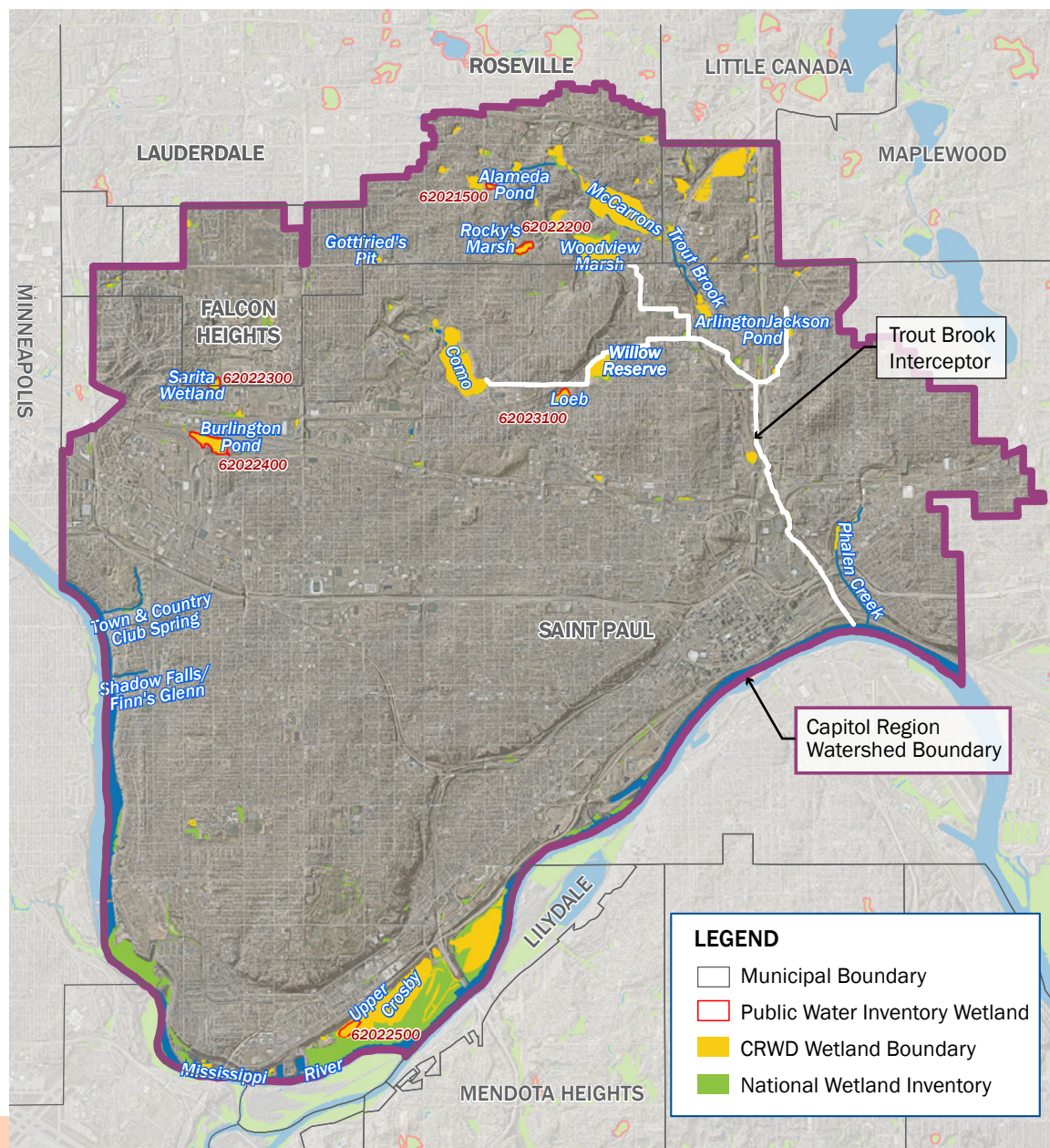


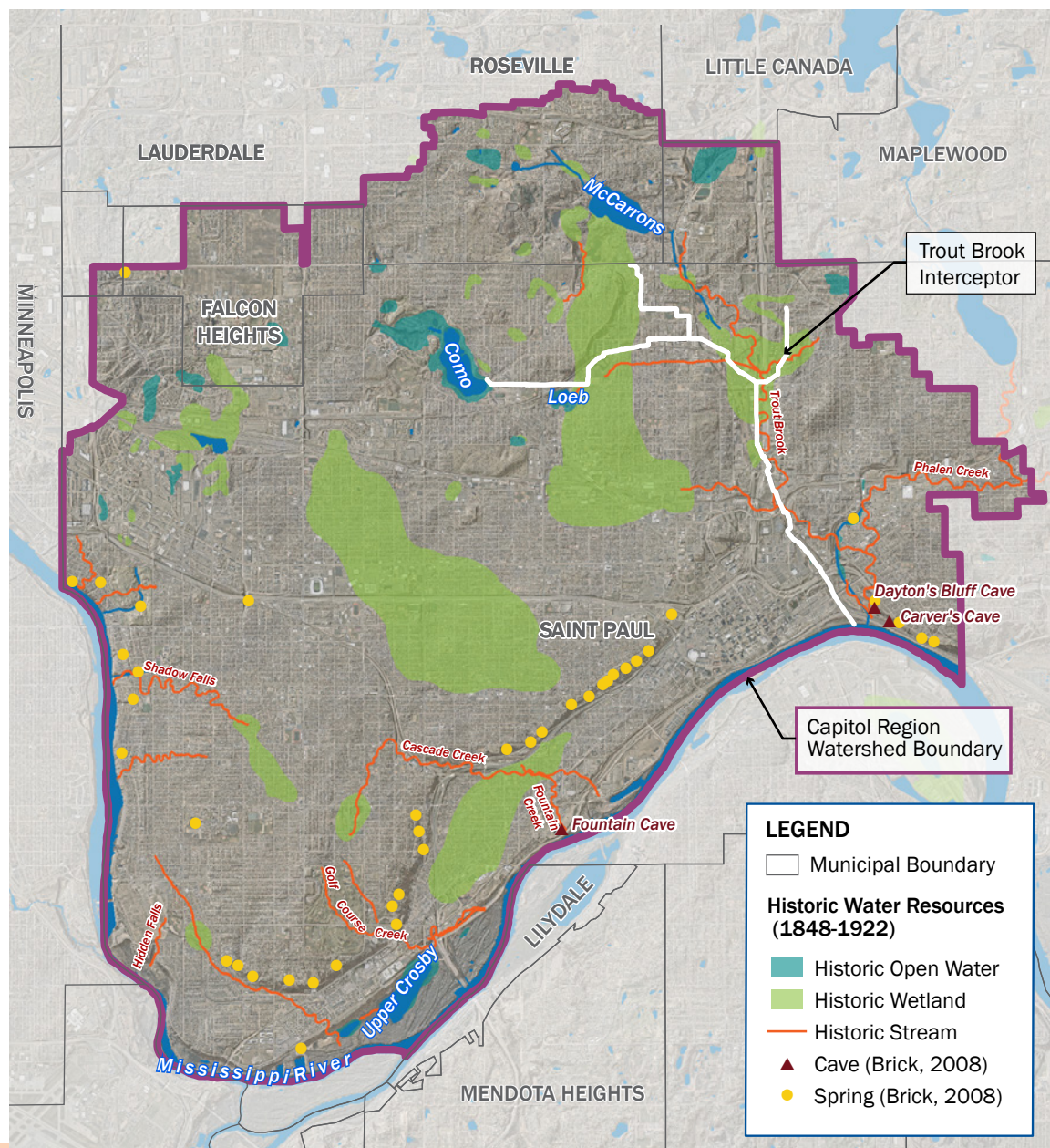
Figure 2-8: Remaining Vegetation and Sites of Biological Significance



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. This analysis will be updated based on 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 for

Figure 2-9: District Wetlands



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.

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 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.

Figure 2-10: Historic Resources



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** Develop a District Wetland Management Plan and pursue wetland restoration and local banking opportunities in the top three priority areas identified in the plan
- EH-8** Promote native vegetated buffers around all water resources beyond the minimum requirements of the District 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 1-7](#)) 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 1-6](#)). 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% ([Appendix A](#)). 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](#)). 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, opportunities to implement stormwater management improvements and environmental protections on small sites (i.e., less than one acre) are missed because they 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-7** 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-8** Identify and implement ways to improve engagement with developers, engineers, and applicants
- R-9** 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

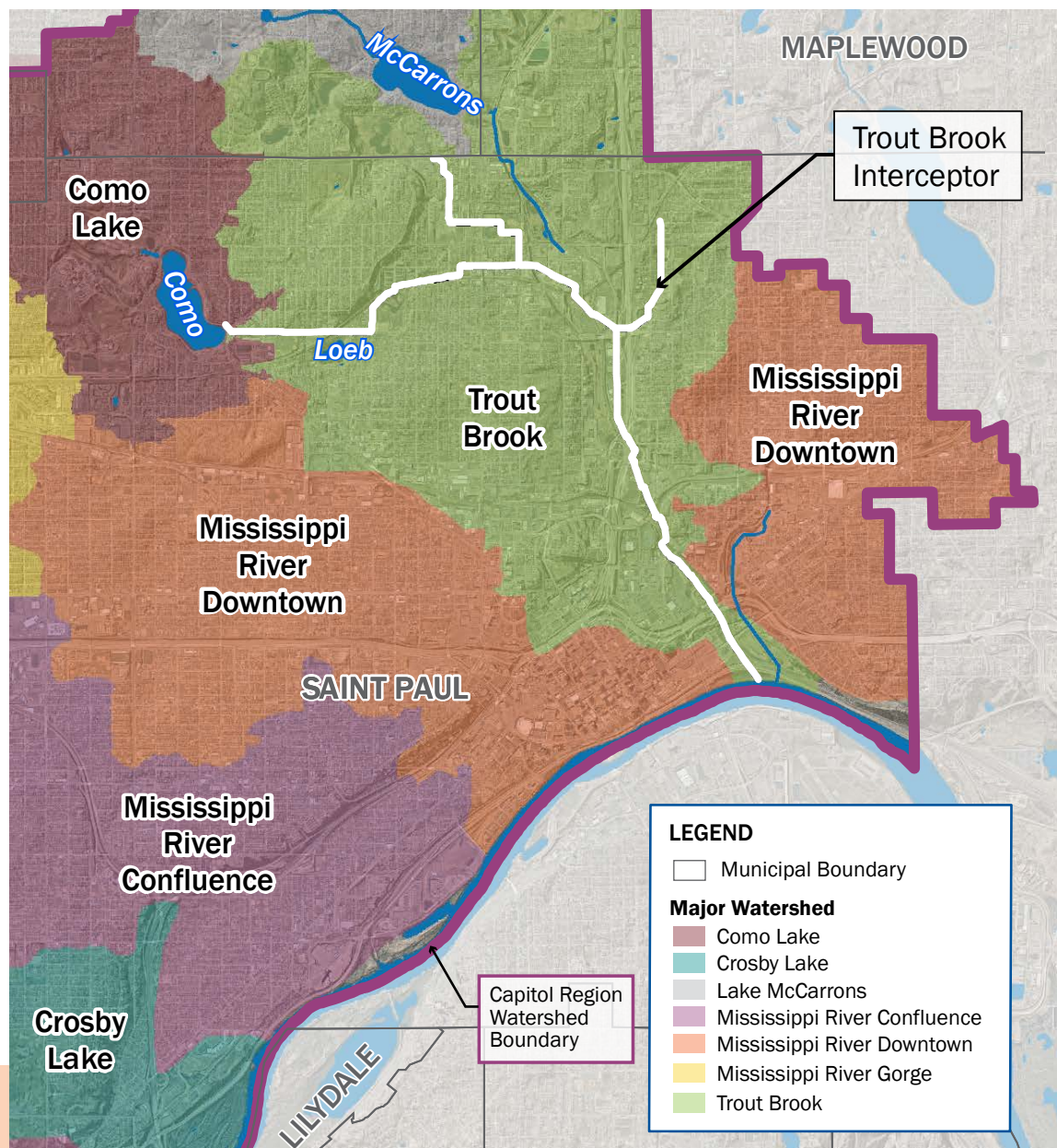


Figure 2-11: Trout Brook Interceptor (TBI)

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



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.



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



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

- | | |
|--|--|
| <p>IM-1 Achieve desired performance of District-owned and funded stormwater infrastructure through regular inspection, consistent routine and non-routine maintenance, and replacement according to individual infrastructure operation and maintenance plans</p> | <p>IM-5 Develop and implement program(s) for inspection of District-permitted and other privately owned stormwater infrastructure</p> |
| <p>IM-2 Establish effective and efficient long-term management approach(es) for publicly owned stormwater management systems, including individual and shared</p> | <p>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</p> |
| <p>IM-3 Support our public and private partners in the maintenance of stormwater infrastructure by developing and implementing a stormwater infrastructure maintenance service program</p> | <p>IM-7 Increase public and private sector knowledge of stormwater BMP inspection and maintenance by offering or promoting annual education and training programs by the District and others</p> |
| <p>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</p> | |

2.9. Organization Issues and Goals

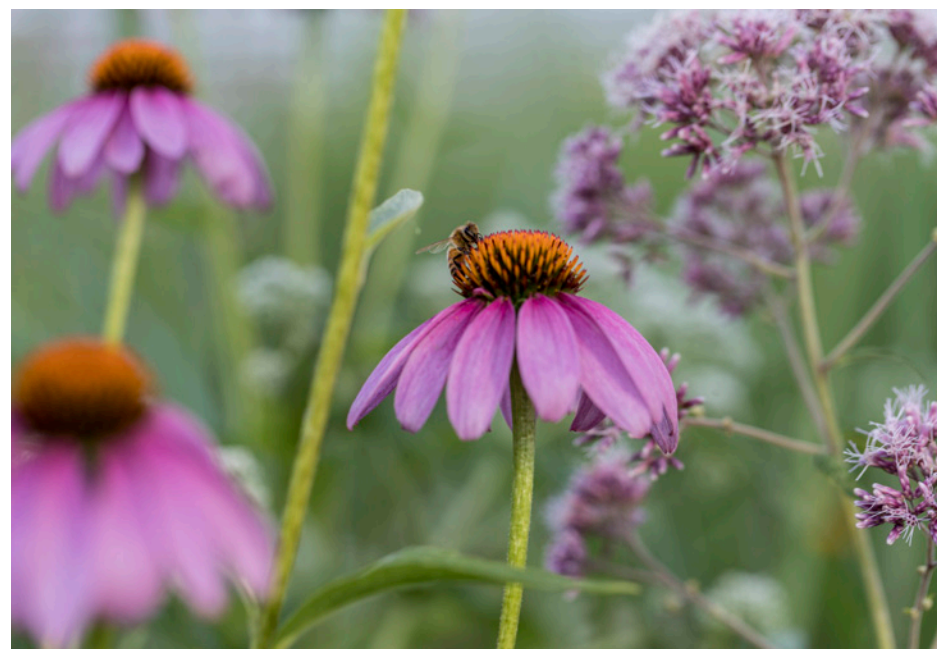
The District performs many functions consistent with its statutory duties and is one of many entities with water management authority within the watershed. Clear roles and responsibilities, administrative processes, and funding sources are necessary for the District to accomplish its many goals efficiently. 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 Diversity, Equity and Inclusion Plan (see [Appendix D](#)). 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 diverse communities and evolving 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 biennially 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](#)).

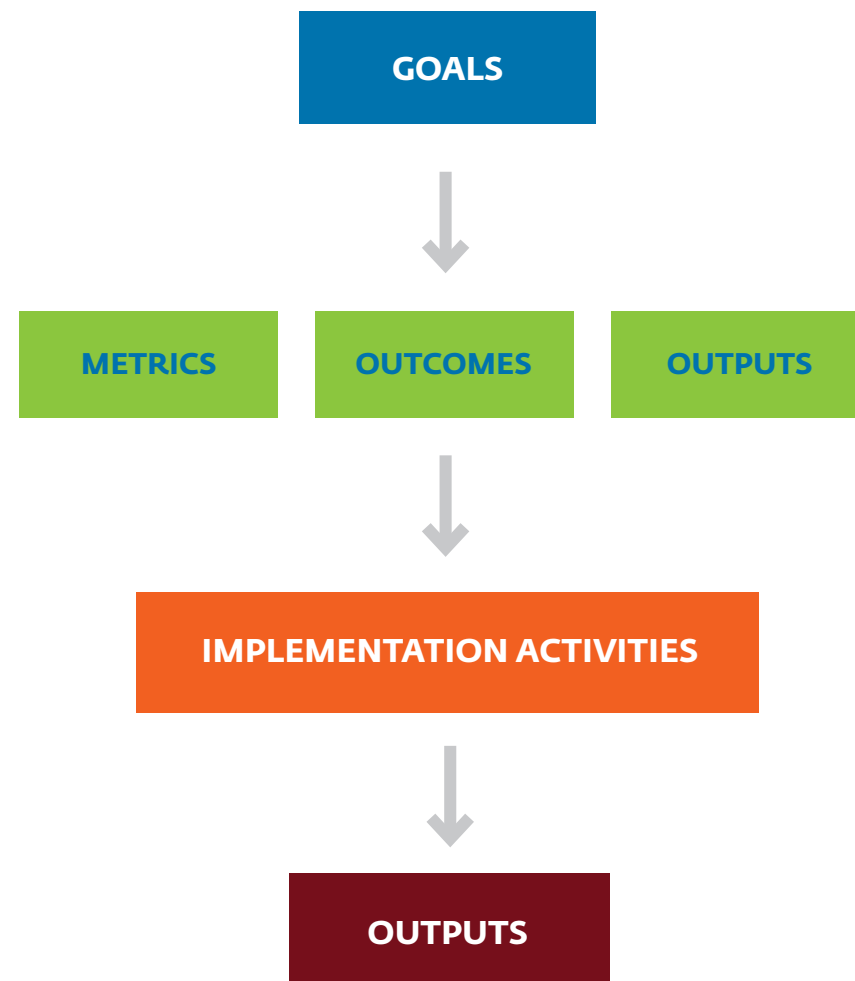


Figure 2-12:
Measurability of qualitative and quantitative goals



IMPLEMENTATION PLAN

CRWD 2021–2030 Watershed Management 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 among the two documents. 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

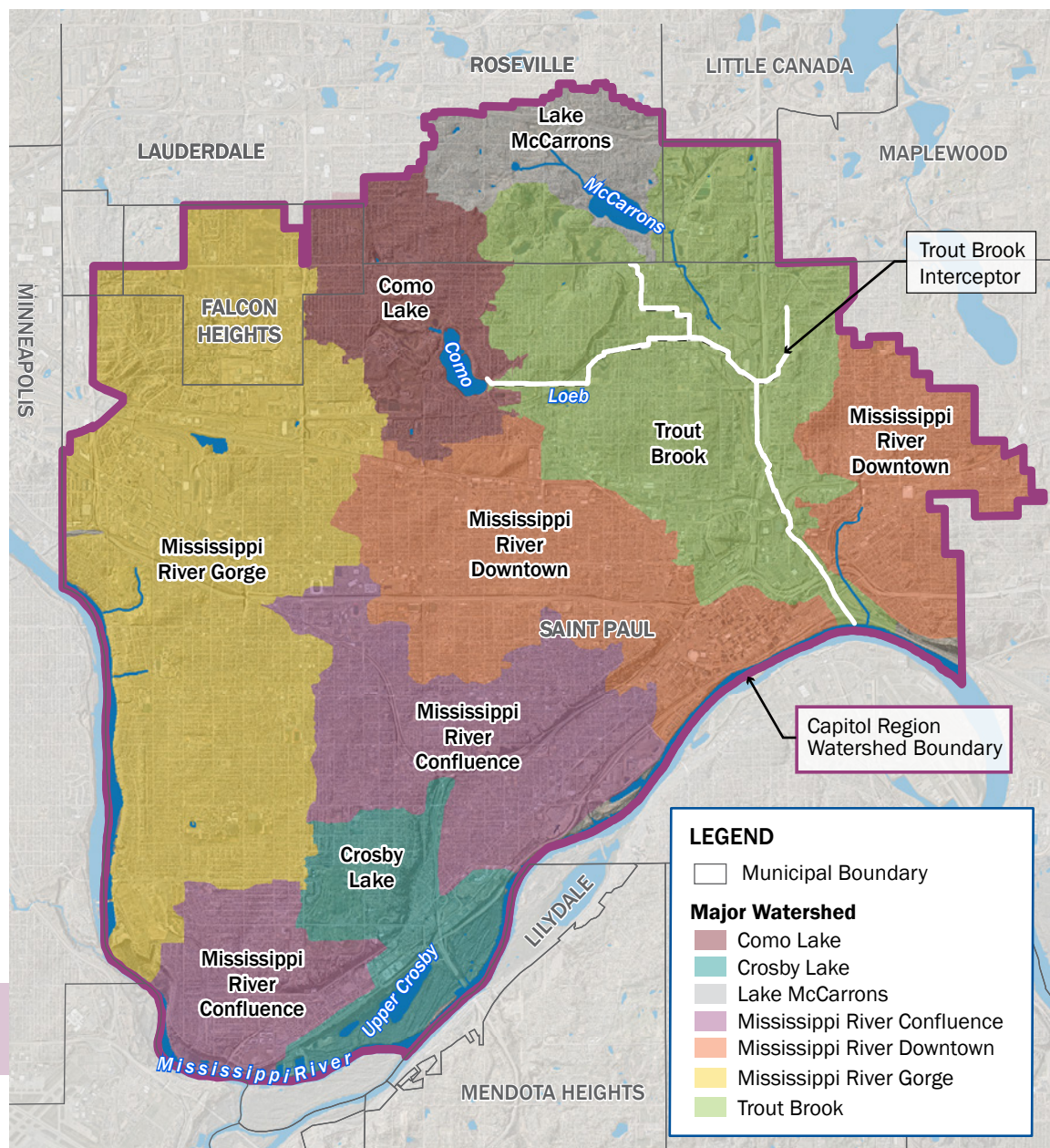
Type	Code	Category
Admin	101	Administration
Programs	208	Regulatory Program
	210	Grants Program
	211	Monitoring, Data Assessment, and Research Program
	220	Communications and Engagement Program
	222	Facility (Infrastructure) Management Program
Projects Planning, Design, and Capital Improvements	302/402	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 Budget

Program	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
100 Admin	\$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	\$11,123,000
200 Programs	\$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	\$43,215,000
300 Projects	\$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	\$11,348,000
400 CIP	\$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	\$43,604,000
Total	\$12,009,000	\$9,105,000	\$8,951,000	\$9,580,000	10,907,000	\$10,167,000	\$11,471,000	\$11,142,000	\$11,899,000	\$14,057,000	\$109,290,000

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, and 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

- 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

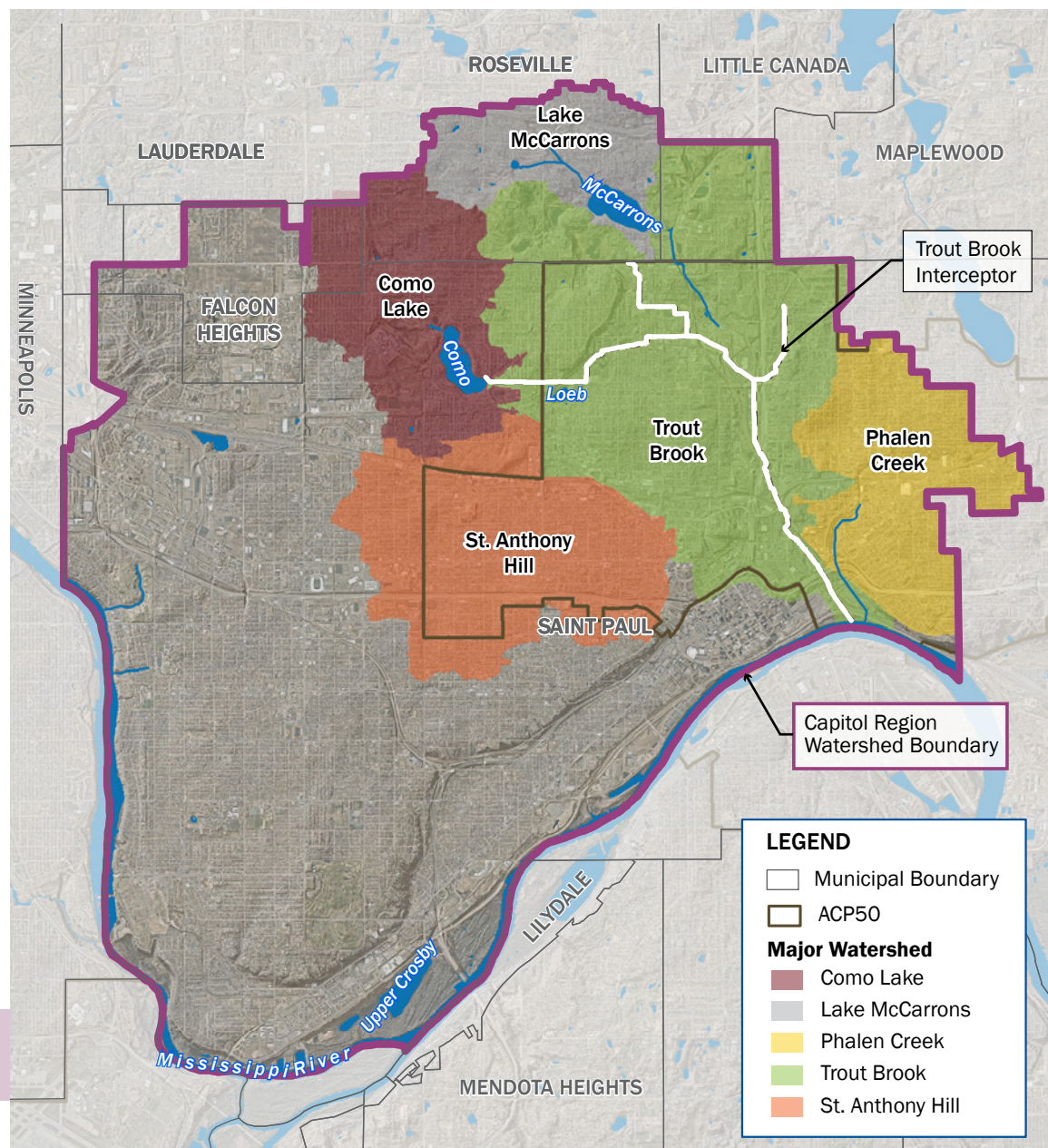
If planned implementation actions must be deferred due to a recession or significant economic downturn, prioritization will be given to activities on their classification as critical, important, or beneficial and the applicable factors listed above.

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.

Priority subwatersheds were considered in the development of the implementation plan (Table 3-5). Nearly all activities planned in priority subwatersheds are classified as “critical” or “important” (those identified as “beneficial” are dependent on partner involvement). During implementation, priority subwatersheds will be considered in implementation of watershed-wide programs (e.g., cost-share grants). 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)



CRWD Board of Managers, 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.

Community 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 biennial basis. The procedure for this review is described in [Section 3.8](#). Based on the findings of the biennial 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 10-year 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, Equity, 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 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 to support 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 build projects (e.g. rain gardens, cisterns, permeable pavement) to reduce stormwater pollution	District cities, homeowners, businesses, schools, and community organizations	Up to \$150K	All year
220L	Partner Grants	Provide financial assistance to organizations that educate and engage residents in clean water behaviors and actions	Community organizations, schools, faith-based institutions, and others who will work in the District	\$2K-\$20K	Once/year, Fall
210F	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
210G	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 volumes 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 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 Minnesota 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 District 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 key to implementation. 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 – 402A

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.

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 Villa 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/413E

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.



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 – 317G/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/417H

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, 2019b) 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

Cascade and Fountain Creeks historically flowed through the Ayd-Mill Road 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 Organization 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 the University of Minnesota, Minnesota State Fair, Ramsey County and the City of Falcon Heights. The study is investigating regional, multi-benefit stormwater BMPs in the vicinity of Larpenteur Avenue between Cleveland and Snelling Avenues. In addition, there is an opportunity to restore Sarita Wetland, depending on the interest and involvement of the State Fair and University of Minnesota. The District will support technically and financially these partners in the design and construction of future CIPs based on this study or other cooperative studies.

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 (City of Saint Paul, 2019c).

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.

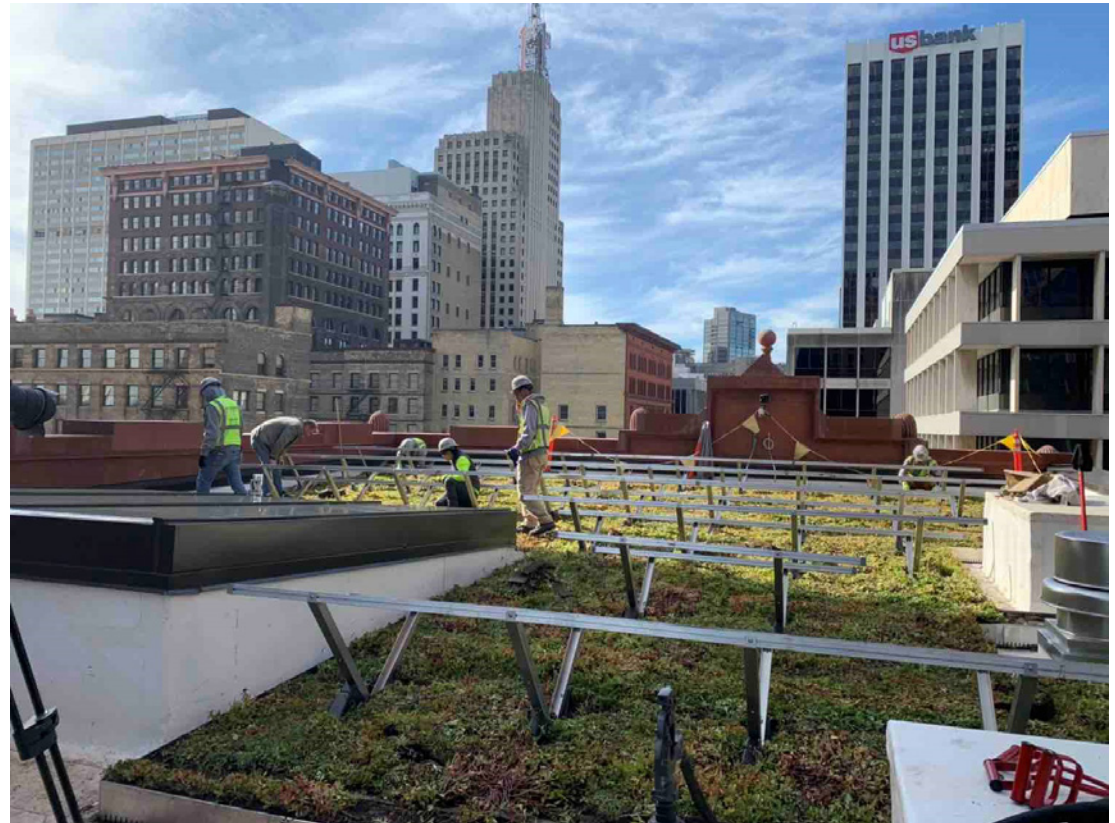
Science Museum of Minnesota – 433E

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 (City of Saint Paul, 2013). 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

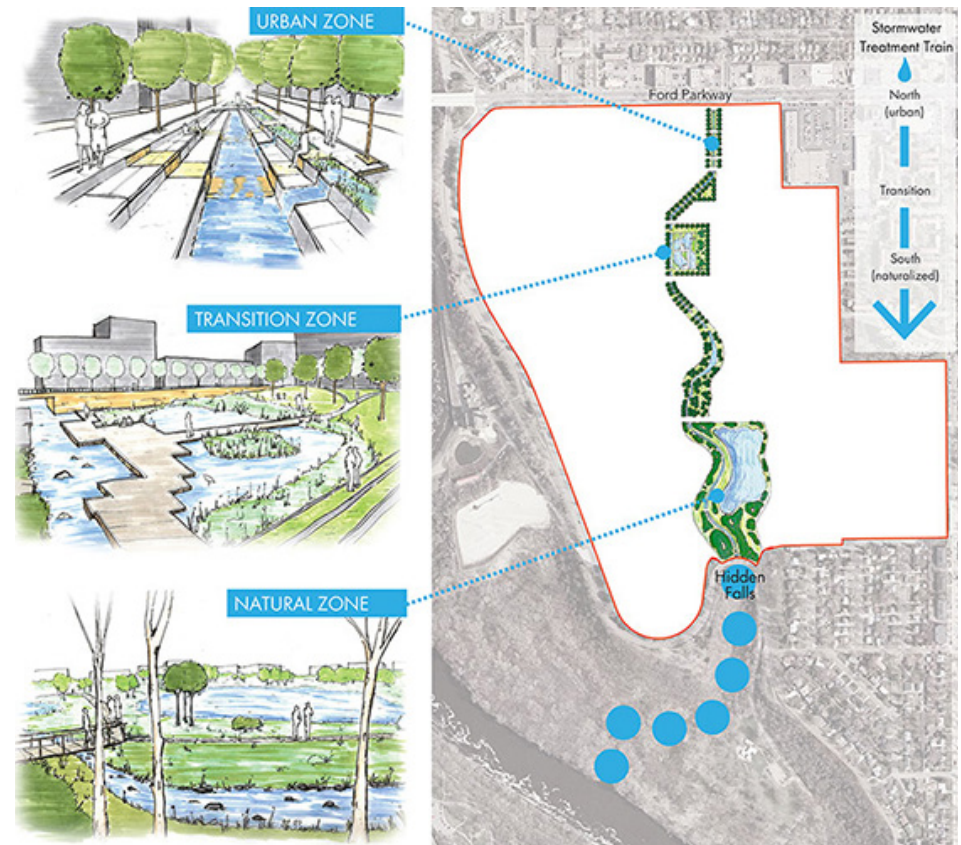
The District will incorporate current and future understanding of climate change and precipitation trends as they pertain to the quality and quantity of District water resources, flood risk, and stormwater best management practice design and maintenance. The District's climate change and community resiliency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



Former Ford Site sustainable stormwater management concept 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 reflect new information, address new challenges, and/or seize new opportunities, and perform 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 in 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
- 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, Central High School 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 tax levy was \$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 demonstrates fiscal responsibility by evaluating its annual tax levy and property tax impacts. 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. 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 that 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.

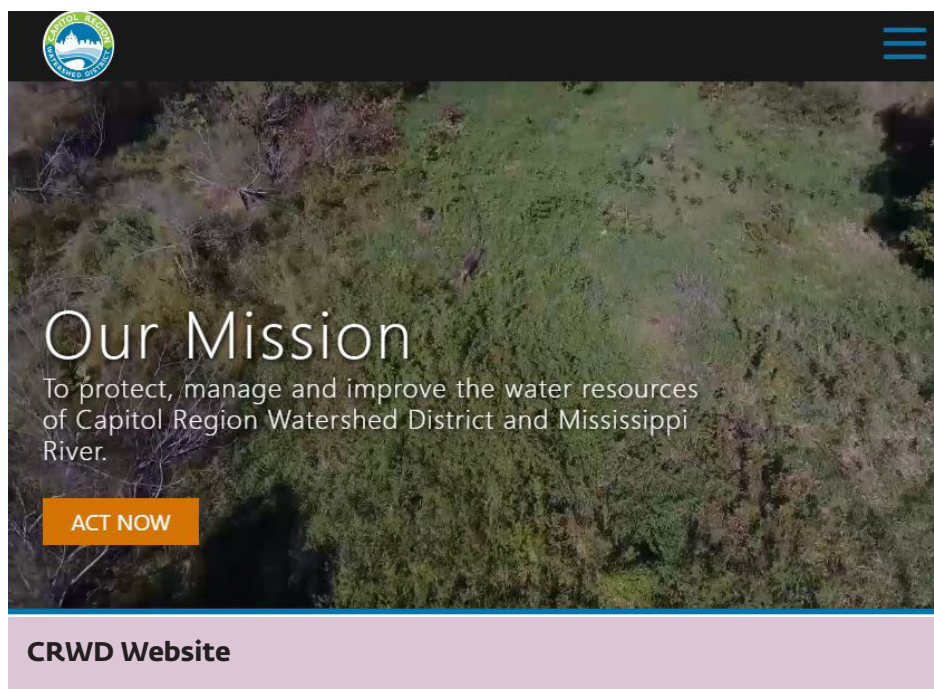
Thus, the assessment of District progress may include quantitative values and/or qualitative (narrative) discussion of progress towards each goal. It is also important to consider the level of effort performed to achieve these results. Therefore, the measurable outputs of the implementation activities 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.



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 (www.capitolregionwd.org).

Amendments to this Plan are subject to the review process provided in [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 BWSR 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 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.

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 103.B.235](#), [Minnesota Rules 8410.1060](#), and is consistent with the District Plan (this document). [Minnesota Rules 8410.1060](#) and [Minnesota Statutes 103.B.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.

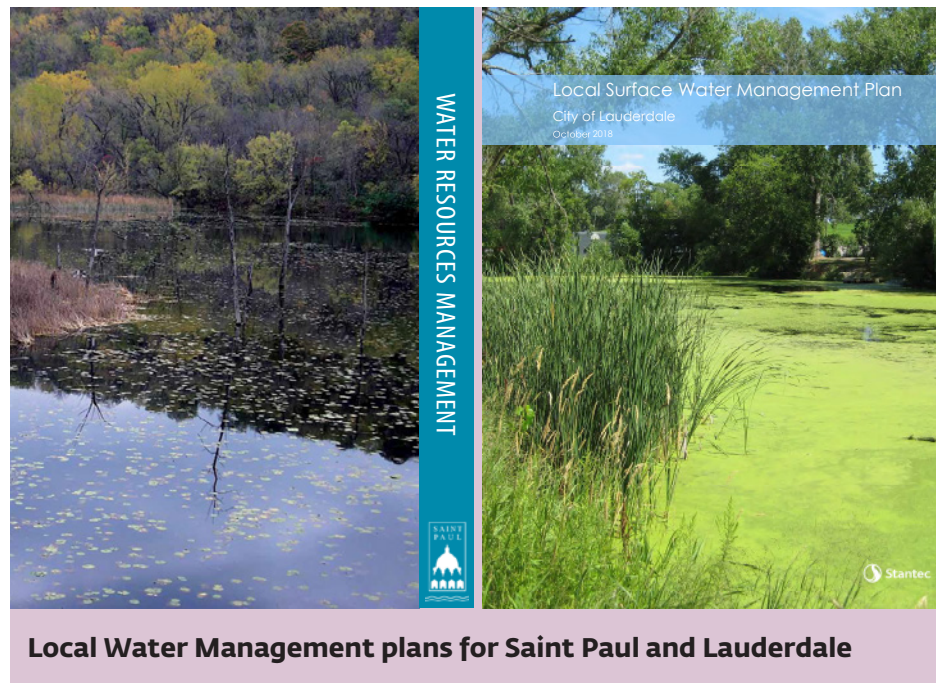
Table 3-4: Local Water Plan Status

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

LWMPs must be submitted to the District for review and approval per the requirements of [Minnesota Statutes 103.B.235](#). The District will review the LWMP following the process and schedule described in [Minnesota Statutes 103.B.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 103.B.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 City's local plan must also address issues identified in District lake water management plans for lakes within the city, and must include implementation recommendations that involve City action 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

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 ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ADMINISTRATION														
101- Administration														
101A- General administration	C	Annual budget, audit and report	D	\$8,856	\$773	\$796	\$820	\$844	\$869	\$896	\$922	\$950	\$979	\$1,008
101B- Community Advisory Committee	C	12 CAC members and monthly meetings	D	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
101C- External funding opportunities	C	1 external funding opportunities study	D	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
101D- Program effectiveness assessment	C	Bi-annual assessment report	D, SRA	\$23	\$-	\$5	\$-	\$6	\$-	\$6	\$-	\$6	\$-	\$-
101E- Office operations	C	Annual office operations	D	\$1,535	\$134	\$138	\$142	\$146	\$151	\$155	\$160	\$165	\$170	\$175
101F- MAWD support	I	Annual MAWD support	D	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
101G- Safety Program	C	Annual training and monthly staff meeting safety reminders	D	\$472	\$41	\$42	\$44	\$45	\$46	\$48	\$49	\$51	\$52	\$54
101H- Diversity, Equity and Inclusion Program	C	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	D, CI, CO, SRA, W, E, B, C	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
				\$11,123	\$968	\$1,003	\$1,027	\$1,064	\$1,090	\$1,128	\$1,156	\$1,197	\$1,226	\$1,263

NOTES:

¹ Priority Level=C=Critical, I=Important, B=Beneficial
² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/ Non-profits
³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PROGRAMS														
208- Regulatory Program														
208A- General permitting implementation	C	30 permits approved and 7 acre-foot retained annually	D	\$3,333	\$206	\$212	\$328	\$338	\$348	\$358	\$369	\$380	\$391	\$403
208B- Coordinated erosion and sediment control inspections	I	(% compliance) Active Sites Visited once per week during construction	D, CI, CO, SRA	\$3,333	\$206	\$212	\$328	\$338	\$348	\$358	\$369	\$380	\$391	\$403
208C- Permittee post construction BMP inspections	I	20 inspected BMPs and BMP conditions status reports per year	D, CI, CO, E, B	\$177	\$15	\$16	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
208D- Engagement activities with permittees, developers, engineers, and applicants	I	5 meetings with private developers during the plan period	D, B	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
208E- Rules evaluation and update	C	5 Rules TAC meetings; # updates to District Rules	D, CI, CO, SRA, W	\$177	\$15	\$16	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
208F- Deicing practices rule	I	1 chloride reduction rule or ordinance assistance package	D, CI, CO, SRA, W	\$25	\$-	\$-	\$-	\$-	\$-	\$-	\$12	\$6	\$7	\$-
208G- Stormwater rule requirements on sites less than one acre	C	1 Rule Revision for Small Sites	D, CI, CO, SRA, W	\$44	\$-	\$-	\$22	\$23	\$-	\$-	\$-	\$-	\$-	\$-
208H- Illicit Discharge Detection and Elimination (IDDE) plan implementation	I	20 illicit discharges removed over 10 years	D, CI, CO, SRA	\$229	\$41	\$42	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
208I- Green infrastructure incentives in District rules	I	1 adopted green infrastructure incentive rule	D, CI, CO, SRA, W	\$24	\$-	\$-	\$-	\$-	\$12	\$12	\$-	\$-	\$-	\$-
208J- Industrial stormwater permittee coordination	I	10 industrial stormwater site meetings	D, CI, CO, SRA	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
208K-Water reuse policy support	C	Adopted water reuse guidance document	D, CI, CO, SRA, W, E	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
				\$7,520	\$500	\$515	\$743	\$765	\$777	\$800	\$824	\$842	\$868	\$887

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
210- Grants Program														
210A- Stewardship grants	C	10 projects annually; stormwater volume retention in the amount equivalent to 1.1" runoff and 90% TSS removal	D, CO	\$5,904	\$515	\$530	\$546	\$563	\$580	\$597	\$615	\$633	\$652	\$672
210B- Stewardship grant outreach	C	12 community events with translated Stewardship Grant outreach materials; engage with 3 organizations that serve BIPOC residents	D, C	\$59	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$6	\$7	\$7
210C- Stewardship grant project inspection and maintenance assistance	I	90% BMPs rated fair or better for functionality	D, CO	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
210D-Targeted site identification	I	12 suitable sites identified over the 10-year plan	D, CI, CO	\$88	\$-	\$27	\$-	\$-	\$29	\$-	\$-	\$-	\$33	\$-
210E-ROW projects - boulevard raingardens	I	5 projects annually; stormwater volume retention in the amount equivalent to 1.1" runoff and 90% TSS removal	D, CI, CO, W, C	\$295	\$26	\$27	\$27	\$28	\$29	\$30	\$31	\$32	\$33	\$34
210F- Well-sealing grants	B	12 wells sealed annually	D, CI	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
210G- Large-scale site planning grants	I	3 planning grants annually	D	\$1,181	\$103	\$106	\$109	\$113	\$116	\$119	\$123	\$127	\$130	\$134
210H- Chloride reduction grants	I	5 chloride reduction grants annually	D	\$486	\$-	\$-	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
210I- District "watercorps" position	I	1 position offered annually	D, CI, E	\$431	\$-	\$42	\$44	\$45	\$46	\$48	\$49	\$51	\$52	\$54
				\$8,798	\$680	\$769	\$820	\$844	\$898	\$896	\$922	\$950	\$1,011	\$1,008

NOTES:

¹ Priority Level=C=Critical, I=Important, B=Beneficial
² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/ Non-profits
³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
211- Monitoring, Assessment and Research Program														
211A- Stormwater monitoring and data collection	C	10 monitoring sites; stormwater quality and quantity data	D, CI	\$4,133	\$361	\$371	\$382	\$394	\$406	\$418	\$430	\$443	\$457	\$470
211B-Lake monitoring and data collection	C	5 lakes monitored; lake quality, and quantity data, and biological data	D, CO	\$1,299	\$113	\$117	\$120	\$124	\$128	\$131	\$135	\$139	\$144	\$148
211C-BMP performance monitoring	C	8 BMPs monitored; volume and pollutant reductions	D, CI, CO, SRA	\$1,771	\$155	\$159	\$164	\$169	\$174	\$179	\$184	\$190	\$196	\$202
211D-Monitoring database and reporting tool	I	Stormwater and lake data available on monitoring database and reporting tool	D	\$708	\$62	\$64	\$66	\$68	\$70	\$72	\$74	\$76	\$78	\$81
211E-Wetland biological integrity monitoring	I	18 wetlands monitored; wetland health grades	D, CI, CO, SRA	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
211F -Monitoring data trend analysis and reporting for public	I	Monitoring trend analysis report	D, E	\$42	\$21	\$21	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
211G- Citizen Science Monitoring Program	I	Citizen science monitoring program	D, SRA, E, C	\$119	\$-	\$-	\$33	\$11	\$12	\$12	\$12	\$13	\$13	\$13
211H-Research program	I	Stormwater research reports	D, CI, CO, SRA, W, E	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
211I- Emerging contaminants and water quality issues	I	New monitoring parameters and results	D, CI, CO, SRA, W, E	\$177	\$15	\$16	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
211J- Non-structural BMPs effectiveness	B	Technical memo	D, CI, CO, SRA, W, E, C	\$72	\$-	\$-	\$-	\$-	\$23	\$24	\$25	\$-	\$-	\$-
				\$9,147	\$798	\$822	\$858	\$861	\$910	\$937	\$965	\$969	\$998	\$1,028

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
220- Communications and Engagement Program														
220A- General communications and engagement	C	Brand standards and common language; 5 outreach meetings per month; contact database	D, CI, CO, SRA, W, E, B, C	\$3,070	\$268	\$276	\$284	\$293	\$301	\$310	\$320	\$329	\$339	\$349
220B- Project Communication	C	Project specific communication plans and tools; 3 pieces of digital content per project per year	D, CI, CO, SRA, W, E, B, C	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
220C-Clean Streets	I	300 storm drains adopted; 200 new participants; 5,000 lbs. of trash, sediment and organics removed collected in 300 hours per year	D, CI, CO, , E, B, C	\$472	\$41	\$42	\$44	\$45	\$46	\$48	\$49	\$51	\$52	\$54
220D- Maintenance workshops for water quality	C	2-4 workshops with 20-45 attendees per year	D, CI, CO, E, B, C	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
220E-Digital communications	C	18,000 website visitors/65,000 pageviews, 10,400 engagements on social media, 1,000-3,000 newsletter subscribers per year	D, CI, CO, SRA, W, E, B, C	\$828	\$62	\$64	\$66	\$68	\$70	\$191	\$74	\$76	\$78	\$81
220F-Volunteer programs	I	15-20 volunteers, 100-200 hours served at 50 or more community events or site visits per year	D, SRA, C	\$472	\$41	\$42	\$44	\$45	\$46	\$48	\$49	\$51	\$52	\$54
220G- Sponsorships	I	5-10 District sponsored events/ activities; 1,000-5,000 people served per year	D, CI, W, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/ Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
22oH- Partnerships	C	50 hours spent collaborating with 10 key community partners per year	D , CI, CO, SRA, W, E, B, C	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
22oI- Events	I	25 community events attended by the District; 2,000 people reached per year	D , CI, CO, SRA, W, E, B, C	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
22oJ- Awards program	B	Annual awards program to recognize up to 6 individuals or organizations.	D , CI, CO, SRA, WE, B, C	\$177	\$15	\$16	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
22oK- Youth programs	I	500 youth engaged; types of youth programs; 5 schools worked with per year	D , CI, CO, SRA, E, C	\$295	\$26	\$27	\$27	\$28	\$29	\$30	\$31	\$32	\$33	\$34
22oL- Partner grant program	I	10 Partner Grant projects; 5,000-10,000 participants served; types of products created; pollution reduction; acres of greenspace restored per year	D , CI, CO, E, C	\$2,692	\$180	\$186	\$219	\$225	\$261	\$269	\$307	\$317	\$359	\$370
22oM- Public art program	I	1-2 arts related projects, activities, events per year; demographics of audiences when available	D , E, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
22oN- 595 Aldine communications and engagement	I	4-5 BMP and interactive exhibit signs; 1-2 exhibits, and activities at District office per year	D	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
				\$10,722	\$870	\$896	\$951	\$979	\$1,038	\$1,188	\$1,131	\$1,165	\$1,233	\$1,270

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
222- Facility (Infrastructure) Management Program														
222A- District-owned facility management	C	6 BMPs inspected and maintained	D, C	\$3,850	\$206	\$233	\$264	\$300	\$339	\$385	\$436	\$494	\$559	\$634
222B- Shared ownership (District/partner) facility management	C	4 BMPs inspected and maintained	D, CI, CO,	\$963	\$52	\$58	\$66	\$75	\$85	\$96	\$109	\$123	\$140	\$158
222C- Partner owned facility management and ownership evaluation	C	Evaluation report	D, CI, CO	\$1,155	\$62	\$70	\$79	\$90	\$102	\$115	\$131	\$148	\$168	\$190
222D- Cooperative BMP maintenance service program	I	6 BMPs inspected and maintained	D, CI, CO, E, B, C	\$705	\$-	\$-	\$55	\$62	\$70	\$79	\$90	\$102	\$116	\$131
222E-BMP database	C	BMP database	D, CI, CO, SRA, W, E, B, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
				\$7,027	\$350	\$394	\$497	\$560	\$631	\$711	\$802	\$905	\$1,022	\$1,154

NOTES:

¹ Priority Level=C=Critical, I=Important, B=Beneficial
² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/ Non-profits
³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PROJECTS - Planning, Design and CIPs														
302/402 Groundwater Projects and Capital Improvements														
302- Groundwater Projects														
302A- Groundwater seepage and springs study	B	Seepage and springs study report	D, CI , CO , SRA	\$51	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$25	\$26	\$-
302B- Beneficial infiltration study and demonstration projects	B	Beneficial infiltration study report	D , CI, CO, SRA, W	\$59	\$-	\$-	\$-	\$-	\$29	\$30	\$-	\$-	\$-	\$-
302C- Infiltration and groundwater quality study	I	Infiltration-groundwater quality study report	D , CI, CO, SRA, W	\$83	\$-	\$-	\$55	\$28	\$-	\$-	\$-	\$-	\$-	\$-
302D- Groundwater monitoring well network in the District	B	Groundwater monitoring well network map	D, CI, CO, SRA , W	\$13	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$13
302E- Karst area study	B	Karst study report	D, CI , CO, SRA, W	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
302F- Ramsey County groundwater study	I	Updated County groundwater plan	D, CI, CO , SRA, W	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$27
				\$233	\$-	\$-	\$55	\$28	\$29	\$30	\$-	\$25	\$26	\$40
402- Groundwater Capital Improvements														
402A-Future groundwater projects	I	1 groundwater project	D, CI , CO , SRA , W	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
305/405 Como Lake Subwatershed														
305- Como Lake Subwatershed Projects														
305A-Como Lake water quality model	C	Como Lake water quality model	D, CI	\$21	\$21	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
305B- AIS management (including herbicide treatment of curlyleaf pondweed)	C	< 10% FOC of curlyleaf pondweed	D, CI, CO, SRA	\$177	\$15	\$16	\$16	\$17	\$17	\$18	\$18	\$19	\$20	\$20
305C- Lake vegetation management plan and implementation	C	Plan is done, implementation: species richness >8; 3 species having FOC >20%	D, CI, CO, SRA	\$79	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$-	\$-	\$-
305D- Balanced fishery target development	I	Fishery targets from Como Lake Management Plan	D, SRA	\$59	\$8	\$8	\$8	\$8	\$9	\$9	\$9	\$-	\$-	\$-
305E- Shoreline management plan and implementation	I	Shoreline management plan and all of lakeshore maintained in a restored state	D, CI, CO, C	\$47	\$26	\$2	\$2	\$2	\$2	\$2	\$2	\$3	\$3	\$3
305F- Street sweeping enhancement	I	Street sweeping plan and sediment and phosphorus reduction	D, CI, C	\$105	\$52	\$53	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
305G- Innovative treatment facility feasibility study (i.e. spent lime)	B	Study report	D, SRA	\$132	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$65	\$67
305H- Water-based recreational activities support	B	Support of partner water-based recreational activities	D, CI, SRA	\$266	\$23	\$24	\$25	\$25	\$26	\$27	\$28	\$29	\$29	\$30
305I- Como Park area drainage infrastructure analysis and planning	I	Como Park area drainage infrastructure study	D, CI, CO	\$78	\$52	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
305P- Future stormwater management planning	I	1 future stormwater management study	D, CI, CO	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$1,200	\$227	\$161	\$84	\$87	\$89	\$92	\$95	\$75	\$143	\$147

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
405- Como Lake Subwatershed Capital Improvements														
405J-Como Golf Course BMPs	C	Infiltration and iron-enhanced pond 55 lbs/year TP reduction 34 acre-ft/year volume reduction	D, CI	\$1,168	\$1,030	\$138	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
405K- Como Pavilion BMPs	C	1 water quality CIP	D, CI	\$2,285	\$-	\$-	\$-	\$1,126	\$1,159	\$-	\$-	\$-	\$-	\$-
405L- McMurray Field	C	1 water quality CIP	D, CI	\$1,958	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$633	\$652	\$672
405M- Como Lake Alum Treatment	C	24,000 gallons of Alum applied to Como Lake	D, CI, SRA	\$361	\$361	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
405N-East Como Blvd. BMPs	C	1 water quality CIP	D, CI	\$662	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$326	\$336
405O- Gottfried's Pit Improvements	I	1 water quality CIP	P D, CI, CO	\$105	\$52	\$53	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
405P- Future capital improvement projects (CIPs)	I	1 future water quality CIP	D, CI, CO, SRA,	\$941	\$103	\$212	\$-	\$-	\$290	\$-	\$-	\$-	\$-	\$336
				\$7,479	\$1,545	\$403	\$-	\$1,126	\$1,449	\$-	\$-	\$633	\$979	\$1,344

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
310/410 Lake McCarrons Subwatershed Projects														
310- Lake McCarrons Subwatershed Projects														
310A- Alum treatment evaluation	I	Alum treatment evaluation report	D, CI, CO, SRA,	\$18	\$-	\$-	\$-	\$-	\$-	\$18	\$-	\$-	\$-	\$-
310B- Villa Park wetland system evaluation	I	VPWS evaluation report with existing phosphorus reductions	D, CI, CO	\$45	\$-	\$-	\$-	\$45	\$-	\$-	\$-	\$-	\$-	\$-
310C-Watershed Hydraulic/ Hydrologic Modeling	I	Updated model	D, CI, CO	\$78	\$41	\$37	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
310D-Lake vegetation management plan and AIS response plan	I	Lake vegetation management plan; type and abundance of aquatic plants	D, CI, CO, SRA	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
310E- Balanced fishery targets	I	Fishery targets	D, CI, CO, SRA	\$16	\$-	\$16	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
310F- Shoreline management plan and implementation	I	Shoreline management plan	D, CI, CO, SRA, C	\$34	\$-	\$-	\$16	\$2	\$2	\$2	\$2	\$3	\$3	\$3
310G-Future stormwater management planning	I	1 future BMP study	D, CI, CO, E, B, C	\$47	\$-	\$-	\$-	\$-	\$23	\$24	\$-	\$-	\$-	\$-
				\$474	\$62	\$74	\$38	\$70	\$49	\$68	\$27	\$28	\$29	\$30
410-Lake McCarrons Subwatershed Capital Improvements														
410A-Alum treatment	C	1 alum treatment	D, CI, CO, SRA	\$615	\$-	\$-	\$-	\$-	\$-	\$-	\$615	\$-	\$-	\$-
410B-Villa Park performance improvements	I	1 Villa Park CIP project	D, CI, CO	\$580	\$-	\$-	\$-	\$-	\$580	\$-	\$-	\$-	\$-	\$-
410G-Future CIPs	I	1 future CIP	D, CI, CO, SRA, E, B, C	\$190	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$190	\$-	\$-
				\$1,385	\$-	\$-	\$-	\$-	\$580	\$-	\$615	\$190	\$-	\$-

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
313/413 Loeb Lake Subwatershed														
313-Loeb Lake Subwatershed Projects														
313A-Update Loeb Lake Management Plan	I	Updated Loeb Lake Management Plan	D, CI, CO, SRA, C	\$42	\$26	\$16	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
313B-AIS management	I	AIS managment plan included in Loeb Lake management plan	D, CI, CO, SRA	\$16	\$-	\$11	\$5	\$-	\$-	\$-	\$-	\$-	\$-	\$-
313C-Shoreline management plan and implementation	I	Shoreline management plan	D, CI, CO	\$17	\$-	\$-	\$11	\$6	\$-	\$-	\$-	\$-	\$-	\$-
313D-Loeb Lake sedimentation pond investigation	I	Study completed	D, CI	\$41	\$21	\$21	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
313E-Future stormwater planning	I	1 feasibility study	D, CI, CO	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
				\$234	\$57	\$58	\$27	\$17	\$12	\$12	\$12	\$13	\$13	\$13
413-Loeb Lake Subwatershed Capital Improvements														
413E-Future CIPs	I	1 CIP	D, CI, CO, SRA	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
				\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40

NOTES:

¹ Priority Level=C=Critical, I=Important, B=Beneficial
² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits
³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
315/415 Trout Brook Subwatershed														
315-Trout Brook Subwatershed Projects														
315A- TBI 5-year inspection and CIP development	C	Inspection and CIP reports every five years	D	\$252	\$-	\$-	\$-	\$135	\$-	\$-	\$-	\$-	\$117	\$-
315B- NPDES stormwater program	I	Annual MS4 report and updated SWPPP	D, CI, CO, SRA, C	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
315C- TBI hydrologic and hydraulic model update and expansion	I	Expanded, updated TBI H/H model	D, CI, CO, SRA	\$103	\$103	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
315D- TBI flood mitigation and water quality improvement studies	C	3 flood mitigation and water quality improvement studies	D, CI, CO, SRA	\$355	\$77	\$-	\$-	\$84	\$-	\$-	\$92	\$-	\$-	\$101
315E-TBI easement verification, acquisition, and documentation	I	8 acres of additional TBI easement	D, CI, CO	\$547	\$103	\$106	\$109	\$113	\$116	\$-	\$-	\$-	\$-	\$-
315I- Future stormwater management planning	I	2 BMP feasibility studies	D, CI, CO, SRA, E, B, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
				\$1,729	\$324	\$149	\$153	\$377	\$162	\$48	\$141	\$51	\$170	\$155
415-Trout Brook Subwatershed Capital Improvements														
415F-TBI Repairs Station 28+65 - 50+72	C	2200 feet of TBI repaired	D	\$953	\$953	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
415G-TBI Repairs Station 135+06 - 180+29	C	4500 feet of TBI repaired	D	\$2,535	\$-	\$-	\$-	\$-	\$232	\$1,134	\$1,168	\$-	\$-	\$-
415H-Major sediment removal	I	1700 cubic feet of sediment removed	D	\$122	\$-	\$-	\$55	\$-	\$-	\$-	\$-	\$-	\$-	\$67
415D-Future flood mitigation and/or water quality improvement projects	C	3 flood mitigation/water quality improvement projects	D, CI, CO, SRA	\$2,124	\$-	\$318	\$328	\$-	\$348	\$358	\$-	\$380	\$391	\$-
415I-Future CIPs	C	2 CIPs	D, CI, CO, SRA, E, B, C	\$1,181	\$103	\$106	\$109	\$113	\$116	\$119	\$123	\$127	\$130	\$134
				\$6,913	\$1,056	\$424	\$492	\$113	\$696	\$1,612	\$1,291	\$507	\$522	\$202

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
317/417 Crosby Lake Subwatershed														
317-Crosby Lake Subwatershed Projects														
317A-Crosby Farm bluff stabilization plan	I	Bluff erosion study update	D, CI , CO, SRA,	\$19	\$-	\$-	\$-	\$-	\$-	\$-	\$12	\$6	\$-	\$-
317B-Hidden Falls/Crosby Farm trail reconstruction planning	B	Trail reconstruction plan	D, CI , CO, SRA, C	\$118	\$-	\$-	\$-	\$-	\$58	\$60	\$-	\$-	\$-	\$-
317C-Update Crosby Lake Management Plan	I	Updated Crosby Lake Management Plan	D , CI, CO, SRA	\$55	\$-	\$-	\$27	\$28	\$-	\$-	\$-	\$-	\$-	\$-
317D-35E Regional stormwater BMP feasibility study	I	Stormwater feasibility study	D , CI, CO, SRA, W, E, B, C	\$59	\$-	\$-	\$-	\$-	\$29	\$30	\$-	\$-	\$-	\$-
317E-Shoreline management plan and implementation	I	Shoreline management plan and # feet of restored shoreline	D , CI, CO, SRA	\$75	\$-	\$-	\$-	\$-	\$12	\$12	\$12	\$13	\$13	\$13
317F-Terrestrial and aquatic invasive species management	I	Type and abundance of invasive species	D , CI, CO, SRA	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
317G-Floodplain and wetland restoration opportunities around Crosby Lake	B	Floodplain and wetland restoration plan	D, CI , CO, SRA, C	\$61	\$-	\$-	\$-	\$-	\$-	\$30	\$31	\$-	\$-	\$-
317H- Future stormwater management planning	I	1 feasibility study	D , CI, CO, SRA, B	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$740	\$31	\$32	\$60	\$62	\$133	\$167	\$92	\$57	\$52	\$54
417- Crosby Lake Subwatershed Projects Capital Improvements														
417A- Crosby Farm Park bluff stabilization projects	B	1 bluff stabilization project	D, CI , CO, SR	\$265	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$130	\$134
417G-Floodplain and wetland restoration projects	B	1 floodplain and wetland restoration project	D , CI , CO, SRA, C	\$132	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$65	\$67
417H- Future CIPs	I	1 future water quality CIP	D , CI, CO, SRA, B	\$886	\$77	\$80	\$82	\$84	\$87	\$90	\$92	\$95	\$98	\$101
				\$1,283	\$77	\$80	\$82	\$84	\$87	\$90	\$92	\$95	\$294	\$302

NOTES:¹ Priority Level=C=Critical, I=Important, B=Beneficial² Partners (Lead=**bold**): D=District, CI=Cities, CO=Counties, SRA=State/Regional Agencies, W=Other WMD/WMOs, E=Educational institutions, B=Business/Developers, C=Community groups/Non-profits³ Costs are shown rounded to the nearest \$1,000

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
325/425 Wetland, Stream, and Ecosystem Restoration														
325-Wetland, Stream, and Ecosystem Restoration Projects														
325A- Phalen Creek Daylighting	C	Concept design report for daylighted Phalen Creek	D, CI, SRA, C	\$103	\$103	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325B- Hidden Falls Creek Restoration Planning	C	Planning and design report for restored Hidden Falls Creek	D, CI	\$121	\$-	\$-	\$-	\$-	\$-	\$60	\$61	\$-	\$-	\$-
325C- Swede Hollow Water Resource and Natural Resources Plan	I	Swdede Hollow water and natural resources plan	D, CI, C	\$94	\$-	\$-	\$-	\$-	\$46	\$48	\$-	\$-	\$-	\$-
325D- Cascade Creek/Fountain Creek daylighting feasibility study	B	Cascade Creek/Fountain Creek daylighting feasibility study report	D, CI	\$78	\$52	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325E- Willow Reserve signage and access	I	Willow Reserve interpretive signage and access	D, CI, C	\$159	\$26	\$106	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325F- District 6 Natural Resource Management Plan	I	1 NRI recommendation investigated and feasbility report created	D, CI, C	\$56	\$-	\$-	\$22	\$23	\$12	\$-	\$-	\$-	\$-	\$-
325G- Wetland Restoration Planning	I	Saint Paul wetland restoration plan	D, CI, CO, SRA, W	\$107	\$26	\$27	\$55	\$-	\$-	\$-	\$-	\$-	\$-	\$-
325H- Natural resource inventories and/or management plans	I	2 natural resource inventories and plans	D, CI, CO, C	\$295	\$26	\$27	\$27	\$28	\$29	\$30	\$31	\$32	\$33	\$34
				\$1,014	\$232	\$186	\$131	\$51	\$87	\$137	\$92	\$32	\$33	\$34
425-Wetland, Stream, and Ecosystem Restoration Capital Improvements														
425A- Phalen Creek daylighting	C	1 Phalen Creek daylighting project	D, CI, SRA	\$550	\$-	\$106	\$219	\$225	\$-	\$-	\$-	\$-	\$-	\$-
425B- Hidden Falls Creek restoration	C	1 Hidden Falls Creek restoration project	D, CI	\$1,248	\$-	\$-	\$-	\$-	\$-	\$-	\$615	\$633	\$-	\$-
425C- Swede Hollow restoration	I	1 Swede Hollow restoration project	D, CI	\$993	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$489	\$504
425D-Cascade Creek/Fountain Creek restoration	B	1 Cascade Creek/Fountain Creek restoration project	D, CI	\$672	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$672
425H-Future wetland/stream/natural resource restoration projects	I	2 Acres of restored wetland and other natural resource areas	D, CI, CO, SRA, W, E, B, C	\$945	\$82	\$85	\$87	\$90	\$93	\$96	\$98	\$101	\$104	\$108
				\$4,408	\$82	\$191	\$306	\$315	\$93	\$96	\$713	\$735	\$594	\$1,283

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
331/431 Mississippi River Gorge Subwatersheds														
331-Mississippi River Gorge Subwatersheds Projects														
331A- Towerside Innovation District stormwater management planning	I	Towerside stormwater planning study	D, CI, W, E, B, C	\$113	\$26	\$-	\$27	\$-	\$29	\$-	\$31	\$-	\$-	\$-
331B- Creative Enterprise Zone stormwater management planning	I	CEZ stormwater planning study	D, CIE, B, C	\$116	\$-	\$27	\$-	\$28	\$-	\$30	\$-	\$32	\$-	\$-
331C- UM/MN State Fair Cooperative Projects	I	1 stormwater planning study	D, CI, CO, SRA, E, B, C	\$118	\$26	\$-	\$-	\$28	\$-	\$-	\$31	\$-	\$-	\$34
331E- Future stormwater management planning	I	1 stormwater management planning study	D, CI, CO, SRA, W, E, B, C	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$583	\$72	\$48	\$49	\$79	\$52	\$54	\$86	\$57	\$26	\$60
431-Mississippi River Gorge Subwatersheds Capital Improvement Projects														
431A- Towerside CIP	B	1 water quality CIP in Towerside Innovation District	D, CI, W, E, B,	\$269	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$269
431B- Creative Enterprise Zone CIP	B	1 water quality CIP in Creative Enterprise Zone	D, CI, E, B	\$672	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$672
431C- UM/MN State Fair Cooperative Projects	B	1 water quality CIP with UMN/MN State Fair	D, CI, CO, SRA, E, B,	\$475	\$206	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$269
431D- Seminary Pond and ravine stormwater improvements	C	2 tons of sediment removed and 17 pounds of phosphorus removed annually	D, CI, W, E, B, C	\$621	\$515	\$106	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
431E- Future CIPs	I	1 future water quality CIP	D, CI, CO, W, E, B, C	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
				\$2,627	\$773	\$159	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$1,277

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
332/432 Mississippi River Confluence Subwatersheds														
332- Mississippi River Confluence Subwatersheds Projects														
332A- East Kittsondale Subwatershed Project Prioritization	B	1 East Kittsondale study and water quality CIP	D, CI, CO, E, C	\$28	\$-	\$-	\$-	\$28	\$-	\$-	\$-	\$-	\$-	\$-
332B- Ford Redevelopment Site comprehensive stormwater planning	C	Advance stormwater designs at Ford Redevelopment Site	D, CI, B	\$105	\$52	\$53	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
332C- Area C Ford Site planning	I	Environmental investigation studies	D, CI, SRA, B, C	\$215	\$52	\$53	\$55	\$56	\$-	\$-	\$-	\$-	\$-	\$-
332D- Snelling-Midway Phase II Redevelopment Planning	C	Properties connected to District rainwater reuse system	D, CI, B, C	\$174	\$-	\$53	\$-	\$-	\$58	\$-	\$-	\$63	\$-	\$-
332F- Future stormwater management planning	I	1 stormwater planning study	D, CI, CO, SRA, E, B, C	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$759	\$124	\$180	\$76	\$107	\$81	\$24	\$25	\$89	\$26	\$27
432-Mississippi River Confluence Subwatersheds Capital Improvement Projects														
432A-East Kittsondale stormwater BMPs	B	1 East Kittsondale water quality CIP	D, CI, C	\$130	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$63	\$33	\$34
432B-Ford Redevelopment District stormwater system and central water feature	C	Stormwater runoff retained and sediment and phosphorus reductions; central stormwater featured constructed	D, CI, B	\$1,030	\$1,030	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
432E-Victoria Park stormwater improvements	C	Stormwater runoff retained and sediment and phosphorus reductions; stormwater featured constructed	D, CI, C	\$857	\$103	\$371	\$382	\$-	\$-	\$-	\$-	\$-	\$-	\$-
432F-Future CIPs	I	1 future water quality CIP	D, CI, CO, SRA, E, B, C	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
				\$2,607	\$1,185	\$424	\$437	\$56	\$58	\$60	\$61	\$127	\$98	\$101

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³											
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
333/433 Mississippi River Downtown Subwatersheds															
333- Mississippi River Downtown Subwatersheds Projects															
333A- Sears Redevelopment Site stormwater planning	I	Sears redevelopment site stormwater planning study	D, CI, SRA, B	\$108	\$-	\$53	\$55	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
333B- Swede Hollow BMP feasibility study	I	Swede Hollow BMP feasibility study	D, CI	\$180	\$-	\$53	\$-	\$-	\$-	\$60	\$-	\$-	\$-	\$67	
333C- Phalen Creek subwatershed water quality and quantity study	C	1 Phalen Creek subwatershed water quality and quantity study	D, CI, CO	\$236	\$-	\$-	\$55	\$56	\$-	\$-	\$61	\$63	\$-	\$-	
333D- Saint Anthony Hill subwatershed water quality and quantity study	C	1 Saint Anthony Hill subwatershed water quality and quantity study	D, CI, CO	\$236	\$-	\$-	\$55	\$56	\$-	\$-	\$61	\$63	\$-	\$-	
333F- Future stormwater management planning	I	1 future stormwater planning study	D, CI, CO, SRA, B, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40	
				\$1,113	\$31	\$138	\$197	\$146	\$35	\$96	\$160	\$165	\$39	\$108	
433- Mississippi River Downtown Subwatersheds Capital Improvement Projects															
433A- Sears Redevelopment Site	I	1 Sears site water quality CIP	D, CI, SRA, B	\$374	\$-	\$-	\$-	\$-	\$-	\$-	\$184	\$190	\$-	\$-	
433B- Swede Hollow CIP	I	1 Swede Hollow water quality CIP	D, CI	\$789	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$127	\$326	\$336	
433E- Science Museum of Minnesota	C	1 Science Museum of Minnesota water quality CIP	D, C	\$523	\$258	\$265	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
433F- Future CIPs	I	3 future water quality CIPs	D, CI, CO, SRA, B, C	\$1,771	\$155	\$159	\$164	\$169	\$174	\$179	\$184	\$190	\$196	\$202	
				\$3,457	\$412	\$424	\$164	\$169	\$174	\$179	\$369	\$507	\$522	\$538	

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
375/475 Watershed Wide Planning, Assessment and Implementation														
375- Watershed Wide Planning and Assessment Projects														
375A- Transportation Redevelopment Projects - Stormwater Feasibility Studies/ Preliminary Engineering	I	1 Transportation-oriented stormwater feasibility study	D, CI, CO , SRA ,	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
375B- Great River Passage Project - Feasibility Studies/ Preliminary Engineering	I	1 Great River Passage stormwater feasibility study	D, CI , CO, SRA, C	\$354	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39	\$40
375C- Watershed Management Plan update	C	Updated Plan	D , CI, CO, SRA, W, E, B, C	\$390	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$95	\$261	\$34
375D- Partner agency plan review and comment	I	5 comment letters on draft updates to District cities' local surface water management plans comment letters	D, CI , CO , SRA , W	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
375E- GIS Program	I	Updated GIS information and data	D , CI, CO, SRA	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
375F-Saint Paul watershed governance exploration	I	Technical memorandum evaluating water governance in Saint Paul	D, CI , CO, SRA, W	\$64	\$21	\$21	\$22	\$-	\$-	\$-	\$-	\$-	\$-	\$-
375G-Public private partnership opportunities	I	2 meetings per year	D , CI, E, B, C	\$118	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$13	\$13	\$13
375H-District Flooding Prioritization and Solution Identification	I	List of priority flood mitigation sites and potential solutions	D , CI, CO, SRA	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
375I-Trash management planning and implementation	I	Trash management plan	D , CI, CO, SRA, E, B, C	\$298	\$-	\$-	\$82	\$28	\$29	\$30	\$31	\$32	\$33	\$34
375J- Municipal source control/ good housekeeping planning and implementation assistance	I	Municipal source control and good housekeeping plan	D, CI , CO, SRA, E	\$48	\$-	\$-	\$-	\$-	\$-	\$24	\$25	\$-	\$-	\$-
375K-District Chloride Source Assessment and Prevention Plan	I	Chloride reduction plan	D , CI, CO, SRA	\$78	\$52	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
375L- District boundary corrections	I	Corrected District boundaries	D , W	\$29	\$-	\$-	\$-	\$-	\$29	\$-	\$-	\$-	\$-	\$-

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

FUND- PROGRAM/PROJECT TITLE	PRIORITY ¹	MEASURABLE OUTPUTS	PARTNERS ²	Cost (in thousands) ³										
				Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
375M-Mixed use neighborhood node drainage and water quality study	B	Mixed use neighborhood study	D, CI	\$66	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$33	\$34
375N-Tools for quantification of non-SW benefits of green infrastructure	I	Technical memorandum of green infrastructure cost-benefit tools	D , E	\$52	\$26	\$27	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
375O- limate science and community resiliency	C	Local climate change and adaption study report	D , CI, CO, SRA, W, E, B, C	\$236	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27
				\$3,504	\$314	\$297	\$333	\$264	\$301	\$304	\$314	\$393	\$600	\$383
475-Watershed Wide Capital Improvement Projects														
475A-Transit Redevelopment Stormwater CIPs	I	1 transporation-related water quality CIP	D, CI, CO , SRA	\$590	\$52	\$53	\$55	\$56	\$58	\$60	\$61	\$63	\$65	\$67
475B-Great River Passage CIPs	I	1 Great River Passage water quality CIP	D, CI , CO, SRA, B, C	\$886	\$77	\$80	\$82	\$84	\$87	\$90	\$92	\$95	\$98	\$101
475P- Stormwater Impact Fund Implementation	I	1 stormwater impact fund CIP	D	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
475Q- Debt and Loan Service	C	Semi-annual debt service payments	D	\$11,380	\$1,082	\$1,114	\$1,147	\$1,126	\$1,159	\$1,194	\$1,230	\$1,077	\$1,109	\$1,142
				\$12,856	\$1,210	\$1,247	\$1,284	\$1,266	\$1,304	\$1,343	\$1,384	\$1,235	\$1,272	\$1,310

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Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals

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	Community 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		

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

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			
210	Grants Program										
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				
211	Monitoring, Assessment and Research Program										
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				
220	Communications and Engagement Program										
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				

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

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				
222	Facility (Infrastructure) Management Program										
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				
PROJECTS - Planning, Design and CIPs											
302/402	Groundwater Projects and Capitol Improvements										
302	Groundwater Projects										
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			
402	Groundwater Capital Improvements										
402G	Future groundwater projects	BE-1	FL-3				WQ-13	FL-7			
305/405	Como Lake Subwatershed										
305	Como Lake Subwatershed Projects										
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		
305F	Street sweeping enhancement	WQ-2	WQ-1				WQ-1	WQ-9			

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
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
405	Como Lake Subwatershed Capital Improvements										
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
310/410	Lake McCarrons Subwatershed Projects										
310	Lake McCarrons Subwatershed Projects										
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	
410	Lake McCarrons Subwatershed Capital Improvements										
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
313/413	Loeb Lake Subwatershed										
313	Loeb Lake Subwatershed Projects										
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				
313E	Future stormwater planning	BE-1	WQ-1	FL-1	EH-1		WQ-3	WQ-5	WQ-6	WQ-10	FL-1

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
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

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
325/425	Wetland, Stream, and Ecosystem Restoration										
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										
431A	Towerside CIP	BE-2	WQ-1	FL-1							
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	

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals(continued)

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
332/432	Mississippi River Confluence Subwatersheds										
332	Mississippi River Confluence Subwatersheds Projects										
332A	East Kittsondale Subwatershed Project Prioritization	BE-1	BE-2	WQ-1			WQ-5	WQ-6	WQ-10		
332B	Ford Redevelopment Site comprehensive stormwater planning	BE-1	BE-2	WQ-1			BE-2	BE-3	WQ-5	WQ-6	WQ-10
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	
432	Mississippi River Confluence Subwatersheds Capital Improvement Projects										
432A	East Kittsondale stormwater BMPs	BE-1	BE-2	WQ-1			WQ-5	WQ-6	WQ-10		
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	
333/433	Mississippi River Downtown Subwatersheds										
333	Mississippi River Downtown Subwatersheds Projects										
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	
433	Mississippi River Downtown Subwatersheds Capital Improvement Projects										
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	

Table 3-6: Correlation of Plan Implementation Activities to Issues and Goals (continued)

Fund	Title	Related Issues (Section 2)					Applicable Goals (Section 2)				
		More Relevant -----> Less Relevant					More Relevant -----> Less Relevant				
375/475	Watershed Wide Planning, Assessment and Implementation										
375	Watershed Wide Planning and Assessment Projects										
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			
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								
470	Watershed Wide Capital Improvement Projects										
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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