

# Chapter 54: Stormwater Management Ordinance Requirements for Linear Projects Guide



City of Minneapolis  
Chapter 54: Stormwater Management Ordinance Requirements for  
Linear Projects Guide

*Guidelines and Regulations*



Prepared for  
City of Minneapolis Public Works  
Surface Water and Sewers Division



Prepared by  
Young Environmental Consulting Group

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### List of Abbreviations

<b>Abbreviation</b>	<b>Term/Phrase/Name</b>
BCWMC	Bassett Creek Watershed Management Commission
BMPs	Best Management Practices
CAD	Computer Aided Design
CPTF	Capital Project Task Force
DWSMA	Drinking Water Supply Management Area
EPA	Environmental Protection Agency
ERA	Emergency Response Area
GSI	Green Stormwater Infrastructure
MCO	Minneapolis Code of Ordinances
MCWD	Minnehaha Creek Watershed District
MDH	Minnesota Department of Health
MEP	Maximum Extent Practicable
MIDS	Minimal Impact Design Standards
MN	Minnesota
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
MWMO	Mississippi Watershed Management Organization
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
ROW	Right of Way
SCWMC	Shingle Creek Watershed Management Commission
SDG	Street Design Guide
SWMM	Stormwater Management Model
SWPPP	Stormwater Pollution Prevention Plan
SWS	Surface Water and Sewers
TMDL	Total Maximum Daily Load
TP	Total Phosphorus

<b>Abbreviation</b>	<b>Term/Phrase/Name</b>
TSS	Total Suspended Solids
WD	Watershed District
WLA	Waste Load Allocation
WMO	Watershed Management Organization
WinSLAMM	Source Loading and Management Model for Windows

# 1 Introduction

Recognizing the complex nature of stormwater design, regulations, and infrastructure management, the City of Minneapolis (City) developed the *Chapter 54: Stormwater Management Ordinance Requirements for Linear Projects Guide* (Linear Guide). This document outlines the stormwater ordinance design standards and provides guidance to assist internal, external, and water resources and civil engineering professionals in developing plans for linear projects that will comply with the Minneapolis Code of Ordinances (MCO) Chapter 54. — Stormwater Management (Chapter 54).

## 1.1 Background

The City is required to manage stormwater drainage and surface water systems to comply with federal, state, and local regulatory requirements. The City has broad general powers to enact legislation for the health and welfare of the community. One mechanism the City uses to obtain compliance with stormwater management is its ordinances. The primary ordinances governing stormwater management can be found in [MCO Title 3—Air Pollution and Environmental Protection, Chapter 54. — Stormwater Management](#). This ordinance establishes requirements for all projects with land-disturbing activities.

In January 2022, the City revised Chapter 54 in response to changes to the City’s National Pollutant Discharge Elimination System (NPDES) Individual Municipal Separate Storm Sewer System (MS4) Permit and updates from other governing watershed management organizations’ policies and rules. The policies and rules from state and local agencies require that the City address stormwater management standards that prevent or reduce water pollution after construction activity is completed, especially related to new development, redevelopment, and linear projects. Chapter 54 now includes stormwater management requirements for linear projects, such as projects that involve construction of new or reconstructed roadways, pathways, or walkways. The following guidance is intended to streamline compliance with the revised ordinance.

## 1.2 User Instructions

Complete the following steps in sequence to successfully develop a linear project that complies with Chapter 54:

- 1) Read [Chapter 54](#) to understand the governing stormwater management requirements.
- 2) Review the Chapter 54 Guidance and Submittal Checklist (see Section 1.2.2) to understand the stormwater management design process and deliverable requirements.
- 3) Consult this Linear Guide to support the stormwater management design process and demonstrate compliance with Chapter 54 requirements.

A user directory in [Appendix A](#) can be referenced for a summary of Chapter 54 requirements, the approximate plan stage where the requirement is introduced in design, and where in the Linear Guide to find guidance on how to meet the requirements.

Other resources that can assist in designing stormwater best management practices (BMPs) include:

- [Minnesota Stormwater Manual](#)
- [Minneapolis Street Design Guide, Chapter 3.3E Green Stormwater Infrastructure](#)

### 1.2.1 Regulatory Compliance

All projects subject to Chapter 54 must meet or exceed the stormwater performance standards for water quality, rate, and volume control as provided in [Chapter 54](#), Section 54.80(c)(1)-(3). Consult the ordinance to become familiar with the City's stormwater design standards, which are also summarized in this section. Additional information regarding how to determine and quantify water quality, rate, and volume control requirements for specific project stages can be found in Section 3.3 Design Standards, 4.2 30% Design Standards, and 5.1 60% Design Standards.

#### 1.2.1.1 Water Quality

All projects subject to Chapter 54 must comply with the following water quality standards:

- **Total Suspended Solids (TSS) Removal:** 70% removal of TSS from a 1.25-inch, 24-hour storm event.
- **Total Phosphorus (TP) Removal:** Project sites that discharge to a lake, pond, or wetland in Table 1-1 must also reduce TP load, as specified in the table for the 1.25-inch, 24-hour storm event.

The percent removal is not a comparison of the existing conditions with no BMPs to proposed conditions with BMPs.

**Table 1-1. Total Phosphorus Reduction Goals for Discharges to Minneapolis Waterbodies**

Waterbody	TP Load Goal When Compared to Existing Conditions' TP Load <sup>1</sup>
Birch Pond	0% increase
Loring Park Pond	
Webber Pond	
Brownie Lake	10% reduction
Lake Harriet	20% reduction
Lake of the Isles	
Lake Nokomis	25% reduction
Bde Maka Ska Lake	30% reduction
Crystal Lake	
Diamond Lake	
Grass Lake	
Other Wetlands <sup>2</sup>	
Powderhorn Lake	
Ryan Lake	
Spring Lake	
Wirth Lake	
Cedar Lake	40% reduction
Lake Hiawatha	42% reduction

<sup>1</sup>Source: City Council Resolution 2000R-042

<sup>2</sup>Refer to the Minnesota Department of Natural Resources *National Wetlands Inventory* to determine whether a waterbody is considered a wetland.

#### 1.2.1.2 Rate Control

All projects subject to Chapter 54 must comply with the following rate control standards:

- No increase in peak discharge over existing conditions

### 1.2.1.3 Volume Control

All projects subject to Chapter 54 must comply with the following volume control standards:

- Linear projects must capture and retain the larger of the following:
  - 0.55 inches of runoff from the new and fully reconstructed impervious surfaces within the disturbed area
  - 1.1 inches of runoff from the net increase in impervious surfaces within the disturbed area
- Stormwater infiltration practices may be restricted or prohibited in areas defined in the City of Minneapolis's [NPDES MS4 Permit](#) (MN0061018), Part III.C.5.a.(3)(a)-(j)

## 1.2.2 Project/Plan Development Stages

This guide and the Chapter 54 Guidance and Submittal Checklist are organized by overall project plan stage to outline the necessary design requirements and deliverables to demonstrate compliance with the Chapter 54 stormwater ordinance for linear projects. The following sections describe the major project stages and available data that inform the design of stormwater management features within the larger linear projects.

### 1.2.2.1 Scoping or 0% Plan

Scoping identifies the appropriate project type, budget, goals, limits, impacts, and funding sources of potential project concepts. The level of scoping required will vary according to the scale of the project concepts being evaluated. The project scope may include a narrative and supporting concept figure to convey project information. The likelihood that the Chapter 54 requirements will apply to the project should be made based on approximate calculations of land-disturbing activities.

### 1.2.2.2 Concept Layout Development

During concept layout development, a project's right of way (ROW) is allocated for multiple uses, including parking, bike lanes, bus routes, pedestrian walkways, stormwater infrastructure, and stormwater BMPs. Concept layout also involves identifying and displaying major project elements in a planimetric format, typically illustrated on a concept layout plan sheet that includes designer notes and considerations for proposed stormwater management features. The project narrative is improved by updating preliminary calculations for disturbed areas, and impervious areas. However, it is assumed that the preliminary calculations are subject to change as the design progresses and additional information becomes available. Chapter 54 applicability should be refined based on the updated calculations of land-disturbing activities.

### 1.2.2.3 30% Plan

Design elements are enhanced with the addition of profiles and alignments at the 30% plan stage. A 30% plan set is developed to include, but is not limited to, concept-level stormwater BMP details and typical sections, storm sewer alignments, and landscape plans. Construction limits are also defined, and existing utilities and potential conflicts are identified. Proposed stormwater BMP locations, including the locations and extent of stormwater BMPs, are defined. The project narrative becomes more detailed and begins to inform the outline of the stormwater management report. Calculations for total disturbed area, drainage areas, and impervious areas are revised, and stormwater plan design standards are updated as needed. The stormwater management report draft is populated with the information that has been generated with the analyses, modeling, and design completed to this point.

#### *1.2.2.4 60% Plan*

At the 60% plan stage, design elements are solidified. Profiles, alignments, and construction limits are refined with design changes, and the 60% plan set is updated to represent accurate elevations and dimensions of stormwater BMPs and storm sewer systems. Stormwater BMP design progresses by factoring in cross-sections and connections to the storm sewer system and modeling is performed to demonstrate compliance with stormwater design standards. The stormwater management report draft is revised with the updated design information.

#### *1.2.2.5 90% Plan*

The 90% plan is updated to reflect comments received from the 60% plan submittal. All Chapter 54-related design elements and final calculations are fully defined at the 90% plan stage. Draft Division 5 Special Provisions are developed to support the proposed design elements.

#### *1.2.2.6 100% or Final Plans*

Final plans include 100% completion of construction plans and supporting documentation, modeling information, and the stormwater management report. A Minnesota registered and licensed professional engineer must sign the plans and certify the stormwater management report.

### **1.2.3 Chapter 54 Guidance and Submittal Checklist**

The Chapter 54 Guidance and Submittal Checklist was developed to support the stormwater management design process; a copy is included in the Linear Guide for reference. Use the Chapter 54 Guidance and Submittal Checklist in tandem with the Linear Guide to track stormwater management requirements and deliverables at each plan stage. [Appendix B](#) is reserved for example deliverables. Designers are responsible for ensuring that deliverables contain all necessary information for their specific project.

#### [Chapter 54 Guidance and Submittal Checklist](#)

The City of Minneapolis Surface Water and Sewers (SWS) Division reserves the right to require additional information and submittals if the stormwater management design is incomplete or insufficient. Written notice will be provided to the designer outlining what additional information is needed to make the design complete and sufficient.

# Chapter 54 Guidance and Submittal Checklist

## ROAD OR LINEAR PROJECTS

Project Information			
Project name	Click or tap here to enter text.		
Project number	Click or tap here to enter text.		
Planning project manager	Click or tap here to enter text.		
Design project manager	Click or tap here to enter text.		
Consultant project manager (if applicable)	Click or tap here to enter text.		
Primary Surface Water and Sewers (SWS) contact	Click or tap here to enter text.		
Scoping or 0% Development			
Scoping or 0% Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Define the project area and scope	Project Narrative	Section 2.1	<input type="checkbox"/>
Determine possibility of Chapter 54 applicability	Project Narrative	Section 2.2	<input type="checkbox"/>
Identify the following: <ul style="list-style-type: none"> <li>▪ Watershed Management Organizations(s) (WMOs)</li> <li>▪ Receiving waterbody(s), water quality requirements, and impairments (total maximum daily load or waste load allocation)</li> <li>▪ Other relevant stormwater studies/priority areas</li> <li>▪ Sustainable landscaping index (tree canopy, impervious area/vegetative cover)</li> </ul>	Project Narrative	Section 2.3	<input type="checkbox"/>
Scoping or 0% Deliverables			
Project Narrative			<input type="checkbox"/>
Concept drawing (cross section or plan concept layout of proposed street)			<input type="checkbox"/>
High-level, scoping cost estimate for stormwater management to inform the Capital Improvement Program			<input type="checkbox"/>

Concept Layout Development			
Concept Layout Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Characterize the project area: <ul style="list-style-type: none"> <li>▪ Calculate total disturbed area, total drainage area (including area outside the disturbed area) and proposed impervious areas. For projects that have more than one WMO or receiving waterbody, break these calculations out by jurisdiction.</li> <li>▪ Describe the types of stormwater best management practices (BMPs) expected</li> </ul>	Concept Layout	Section 3.1	<input type="checkbox"/>
Confirm Chapter 54 applicability	Project Narrative	Section 3.2	<input type="checkbox"/>
Preliminary Water Quality Analysis <ul style="list-style-type: none"> <li>▪ Total suspended solids (TSS) goal and expected removal percentage</li> <li>▪ Total phosphorus (TP) goal and expected removal percentage (if applicable)</li> </ul>	Project Narrative	Section 3.3.1	<input type="checkbox"/>
Preliminary Rate Control Analysis <ul style="list-style-type: none"> <li>▪ Increases to impervious area or changes in the total drainage area to an outfall or to a trunk system connection may require analysis and should be discussed with the primary SWS contact</li> </ul>	Project Narrative	Section 3.3.2	<input type="checkbox"/>
Preliminary Volume Control Analysis <ul style="list-style-type: none"> <li>▪ Volume retention requirement and estimated volume retention</li> <li>▪ Preliminary infiltration assessment               <ul style="list-style-type: none"> <li>○ Identify potential infiltration prohibitions and restrictions</li> <li>○ Identify the need for additional geotechnical or environmental assessment</li> </ul> </li> </ul>	Project Narrative	Section 3.3.3	<input type="checkbox"/>
Concept Layout Plan Deliverables			
Project Narrative, including preliminary design standard calculations for water quality, rate control (if applicable), and volume control			<input type="checkbox"/>
Concept layout plan sheet including designer's notes and considerations for stormwater management BMPs			<input type="checkbox"/>
Cost estimates for stormwater management; specify the funding sources (federal, county, state, etc.) and the internal division cost split			<input type="checkbox"/>

30% Plan Development			
30% Plan Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Refine the Project Area <ul style="list-style-type: none"> <li>▪ Refine disturbed areas</li> <li>▪ Define the construction limits</li> <li>▪ Calculate total disturbed area, total drainage area, and existing, proposed, and net new impervious surface areas. For projects that have more than one WMO or receiving waterbody, break these calculations out by jurisdiction.</li> </ul>	Plans	Section 4.1	<input type="checkbox"/>
Confirm Chapter 54 applicability	Report	Section 4.1.1	<input type="checkbox"/>
Update the Water Quality Analysis broken out by WMO and receiving waterbody, as needed <ul style="list-style-type: none"> <li>▪ TSS requirement and expected removal percentage</li> <li>▪ TP requirement and expected removal percentage (if applicable)</li> </ul>	Report	Section 4.2.1	<input type="checkbox"/>
Rate Control Analysis <ul style="list-style-type: none"> <li>▪ Increases to impervious area or changes in the total drainage area to an outfall or to a trunk system connection may require analysis and should be discussed with the primary SWS contact</li> </ul>	Report	Section 4.2.2	<input type="checkbox"/>
Update the Volume Control Analysis broken out by WMO and receiving waterbody, as needed <ul style="list-style-type: none"> <li>▪ Volume retention requirement and proposed volume retention</li> <li>▪ Infiltration assessment               <ul style="list-style-type: none"> <li>○ Identify potential infiltration prohibitions and restrictions</li> <li>○ Consider the need for additional geotechnical or environmental assessment</li> </ul> </li> </ul>	Report	Section 4.2.3	<input type="checkbox"/>
Document project constraints in draft report	Report	Section 4.2	<input type="checkbox"/>
Coordinate with the City Forester's office regarding tree preservation requirements near stormwater BMPs	Plans	N/A	<input type="checkbox"/>
Update the areas of proposed stormwater BMPs, including locations and extent of BMPs, and include connections to the storm sewer system <ul style="list-style-type: none"> <li>• Provide typical sections and design details of the proposed BMP types</li> </ul>	Plans	Section 4.3	<input type="checkbox"/>
Operation and Maintenance <ul style="list-style-type: none"> <li>• Initial coordination with SWS Operations through the primary SWS contact for unique and proprietary stormwater BMPs or maintenance agreements</li> </ul>	Report	Section 4.4	<input type="checkbox"/>

30% Plan Deliverables			
30% Plan Set			<input type="checkbox"/>
Stormwater Management Report (preliminary draft only)			<input type="checkbox"/>
Cost estimates for stormwater management consistent with the 30% plans and Stormwater Management Report; specify the funding sources (federal, county, state, etc.) and the internal division cost split			<input type="checkbox"/>
60% Plan Development			
60% Plan Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Hold a comment resolution meeting if design team has questions about comments or design team doesn't accept or agree to implement all SWS comments, if needed.	Initial Comment Response	N/A	<input type="checkbox"/>
Update the Water Quality Analysis with modeling to demonstrate compliance for each WMO and receiving waterbody broken. Modeling should include a summary of the results.	Report	Section 5.1.1	<input type="checkbox"/>
Update the Rate Control Analysis with hydrologic and hydraulic (H&H) modeling, if necessary, based on previous rate control analysis and discussions with SWS. Modeling should include a summary of the results.	Report	Section 5.1.2	<input type="checkbox"/>
Update the Volume Control Analysis based on new project information or updated soil data, broken out by jurisdiction when applicable. Provide updated volume retention requirement and proposed volume retention.  Update infiltration assessment including assumed infiltration rates and potential location of issues. If additional geotechnical investigation or environmental assessment was required, include results from the investigation.	Report	Section 5.1.3	<input type="checkbox"/>
Document project constraints in Stormwater Management Report	Report	N/A	<input type="checkbox"/>
Stormwater BMPs (per BMP): <ul style="list-style-type: none"> <li>○ Design (cross-section, type (infiltration/filtration), underdrains, connections to storm sewer system, etc.)</li> <li>○ Location and details for Inlets, pretreatment, and energy dissipation (where applicable)</li> </ul>	Plans	Section 5.2	<input type="checkbox"/>
Operation and Maintenance <ul style="list-style-type: none"> <li>▪ Follow-up meeting with SWS to discuss maintenance, access and special needs relating to access (i.e., concrete drive access, reinforced turf path, maximum side slopes, etc.)</li> </ul>	Report	Section 5.3	<input type="checkbox"/>

60% Plan Deliverables			
30% Comment Resolution Responses. The above referenced comment resolution meeting should be conducted before finalizing 30% Comment Resolution Responses.			<input type="checkbox"/>
60% Plan Set			<input type="checkbox"/>
Draft Stormwater Management Report			<input type="checkbox"/>
Operations and Maintenance Plan (only applicable for unique and proprietary BMPs)			<input type="checkbox"/>
Cost estimates for stormwater management consistent with the 60% plans and Stormwater Management Report			<input type="checkbox"/>
90% Plan Development			
90% Plan Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Hold a comment resolution meeting if design team has questions about comments or design team doesn't accept or agree to implement all SWS comments, if needed.	Initial Comment Response	N/A	<input type="checkbox"/>
Update Stormwater Management Report, modeling, and design drawings per 60% comments and other project constraints	Report, Plans	Section 6	<input type="checkbox"/>
Operation and Maintenance (O&M) <ul style="list-style-type: none"> <li>▪ Ongoing coordination with SWS to discuss maintenance</li> </ul>	Report	Section 6	<input type="checkbox"/>
90% Plan Deliverables			
60% Comment Resolution Responses. The above referenced comment resolution meeting should be conducted before finalizing 60% Comment Resolution Responses.			<input type="checkbox"/>
90% Plan Set			<input type="checkbox"/>
Draft Stormwater Management Report			<input type="checkbox"/>
Operations and Maintenance Plan (only applicable for unique and proprietary BMPs)			<input type="checkbox"/>
Cost estimates for stormwater management consistent with the 90% plans and Stormwater Management Report			<input type="checkbox"/>
Draft of Division S Special Provisions (complete set addressing all Chapter 54 items)			<input type="checkbox"/>
100% Plan Development and Final Submittals			
100% Plan Development Requirements	Deliverable	Chapter 54 Linear Guide Reference Section	Check the box when items are complete
Ensure the final submittals maintain compliance with Chapter 54	Report, Plans	Section 7	<input type="checkbox"/>

100% or Final Plan Deliverables	
90% Comment Resolution Responses. Additional comment resolution meetings may be necessary prior to finalizing 90% Comment Resolution Responses.	<input type="checkbox"/>
100% Construction Plans signed by a Minnesota registered and licensed professional engineer	<input type="checkbox"/>
Final Stormwater Management Report in accordance with the provided submittal checklist (below) <ul style="list-style-type: none"> <li>▪ Includes a Minnesota registered and licensed professional Engineer's Certification</li> <li>▪ Complies with Chapter 54 requirements</li> <li>▪ Approved by SWS</li> </ul>	<input type="checkbox"/>
Final Models in their native electronic format and PDF of inputs and outputs	<input type="checkbox"/>
Final Microstation or AutoCAD native design files of the proposed stormwater management system in .dgn or .dwg	<input type="checkbox"/>
Final Operations and Maintenance Plan (only applicable for unique and proprietary BMPs)	<input type="checkbox"/>
Final Division S Special Provisions	<input type="checkbox"/>
Final Engineer's Cost Estimate (addressing all Chapter 54 items)	<input type="checkbox"/>
Stormwater Management BMP Tracking Entry Forms (Linear Guide Appendix D)	<input type="checkbox"/>

Notes or Additional Information

## Project Milestone Approvals

### SCOPING OR 0% DEVELOPMENT REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

### CONCEPT LAYOUT PLAN DEVELOPMENT REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

### 30% PLAN DEVELOPMENT REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

### 60% PLAN DEVELOPMENT REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

### 90% PLAN DEVELOPMENT REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

### 100% PLAN DEVELOPMENT AND FINAL SUBMITTALS REQUIREMENTS

Documents submitted to SWS:	
Is the project ready to move to the next milestone?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up/Resubmittals Required:	

\_\_\_\_\_  
SWS Reviewer

\_\_\_\_\_  
Date

## 2 Scoping or 0% Development

Scoping or 0% Development is the first step of project initiation. At this stage, preliminary information is collected to inform a potential project concept, including an initial determination of the applicability of Chapter 54.

This section of the guide should be used in conjunction with the *Scoping or 0% Development Requirement* and *Scoping or 0% Deliverables* section from the Chapter 54 Guidance and Submittal Checklist.

### 2.1 Define the Project Area

When defining the project area at the scoping stage, denote the approximate location and extent of the limits of construction, which includes disturbed and impervious areas<sup>1</sup>. Land-disturbing activities are any activities that result in a change or alteration in the existing ground cover (both vegetative and nonvegetative) and/or the existing topography. Land-disturbing activities include (but are not limited to): development, redevelopment, demolition, construction, reconstruction, clearing, grading, filling, stockpiling, excavating, and constructing borrow pits.<sup>2</sup> Land-disturbing activities do not include mill and overlay or full-depth reclamation on linear projects.

### 2.2 Determine Applicability

Use the estimated disturbed area and [Chapter 54, Section 54.50-Applicability](#), to estimate whether the project may trigger Chapter 54 and be required to meet stormwater management requirements. At this stage projects will likely fall into one of three categories:

1. Subject to ordinance
2. Not subject to the ordinance
3. Possibly subject to the ordinance

It is encouraged to conservatively estimate the amount of disturbed area. A conservative estimate may help prevent project delays due to small changes that trigger Chapter 54 and thereby require additional design needs to meet stormwater management requirements.

#### 2.2.1 Chapter 54 Applicability Standards

A project triggers Chapter 54 if the following applies to the project:

#### Applicability

**All land-disturbing activities in excess of 0.5 acres (21,780 square feet), including common plans of developments or sale and connected or phased actions, are subject to the requirements of Chapter 54.**

<sup>1</sup> Impervious areas should include areas of existing, new, and reconstructed impervious surfaces. New impervious includes areas that were previously pervious and will be converted into an impervious surface. Reconstructed impervious exposes underlying soils during the construction process. Rehabilitation of impervious surfaces, such as mill and overlay, and other resurfacing activities are not considered reconstructed impervious surfaces.

<sup>2</sup> The definition of land-disturbing activities originates from Chapter 54, Section 54.40, last updated on January 1, 2022.

Certain project activities may be exempt from Chapter 54. To determine whether the project or portions of the project are exempt, consult [Chapter 54, Section 54.60](#) and the following linear project exemptions:

- (2) Emergency work to protect life, limb, or property.
- (4) Sidewalk or underground utility-only projects that restore the ground surface to its pre-project condition.
- (5) Mill and overlay activities and full-depth reclamation activities that do not disturb the underlying soil below the base material and as long as those activities do not also raise the grade of the impervious surface more than six (6) inches or move curb lines..
- (6) Linear projects that involve noncontiguous disturbed areas, such that each noncontiguous disturbed area shall be considered a separate land-disturbance area, regardless of whether the noncontiguous areas are part of the same plan set.

If one of the exemptions applies, the project or applicable portions of the project do not need to comply with Chapter 54 design standards; however, it is advised to reconfirm applicability during subsequent phases to verify that project changes will not trigger Chapter 54. If the exemptions do not apply and the land disturbance is more than 0.5 acres, the project is required to comply with Chapter 54 design standards.

### 2.3 Other Regulatory Considerations

The project may require permits or approvals beyond those required by the City, including, but not limited to, the watershed management organizations (WMO) listed below (Figure 1-1).

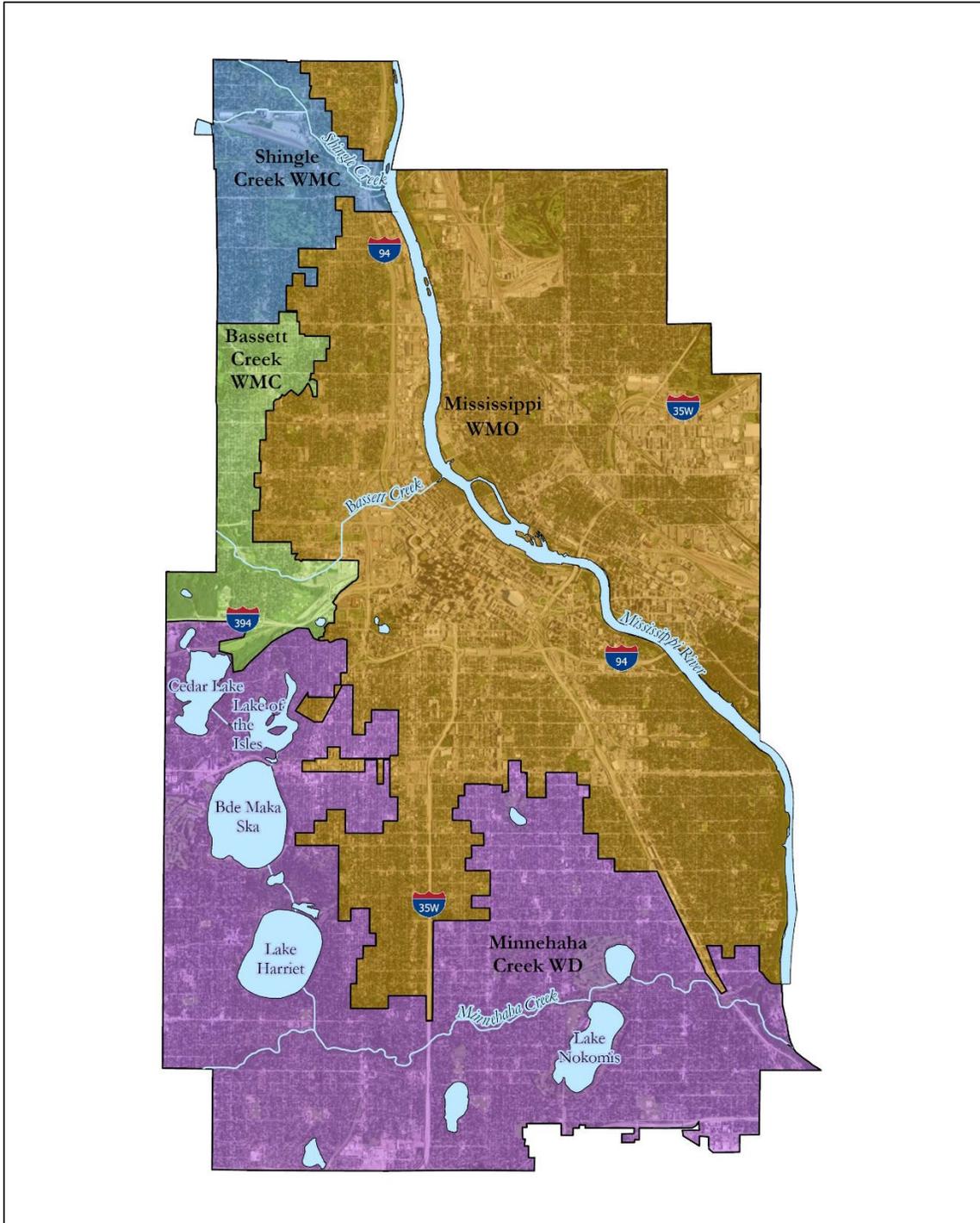
- Bassett Creek Watershed Management Commission (BCWMC)
- Minnehaha Creek Watershed District (MCWD)
- Shingle Creek Watershed Management Commission (SCWMC)
- Mississippi Watershed Management Organization (MWMO)

It is important to note that a permit may be required for projects that drain to a WMO, but do not necessarily lie within the WMO boundary.

There may be additional factors that can affect the project's scope and require coordination with SWS. Verify the following items with SWS:

- Receiving waterbody(s), water quality requirements, and impairments (total maximum daily load [TMDLs] or waste load allocations [WLAs])
- Other relevant stormwater studies and priorities in the project area
- Sustainable landscaping index (e.g., tree canopy, impervious area/vegetative cover)

Figure 1-1. Watershed Management Organizations in Minneapolis<sup>3</sup>



<sup>3</sup> The information on this map is provided for informational and planning purposes only and is subject to change. Designers are encouraged to verify the information with the relevant WMO to determine permit requirements.

## 2.4 Scoping or 0% Plan Deliverables

### 2.4.1 Project Narrative

Provide a project narrative that includes the following information:

- Approximate calculations for land disturbance and both existing and new/proposed impervious surface areas
- Chapter 54 applicability and reasoning
- WMO(s) that the project is in
- Receiving waterbody(s), water quality requirements, and impairments (TMDLs or WLAs)
- Other relevant stormwater studies/priority areas

### 2.4.2 Plans

Provide a concept drawing to denote the approximate location and extent of the limits of construction, including the disturbed and impervious areas.

### 2.4.3 Cost Estimates

Develop a high-level scoping cost estimate, including the probable cost for stormwater management improvements, to inform the capital improvement plan. Corresponding funding sources (federal, county, state, etc.) and division cost splits must also be included. Contact the SWS primary contact for the project with funding questions.

## 3 Concept Layout Development

Concept layout development includes allocating a project's ROW for multiple uses. The major project elements are displayed in a planimetric format. During this stage, preliminary calculations performed in scoping are updated and the applicability of Chapter 54 is refined.

This section of the guide should be used in conjunction with the *Concept Layout Development Requirements* and *Concept Layout Plan Deliverables* from the Chapter 54 Guidance and Submittal Checklist.

### 3.1 Characterize the Project Area

As the project scope becomes refined during concept layout, estimate the disturbed areas and existing and proposed impervious surface areas. Provide approximate calculations for these areas. For projects located in more than one WMO or that have more than one receiving waterbody, break these calculations out by jurisdiction.

Additionally, provide a drainage overview map showing drainage area delineations. Specify contributions both within and outside of the ROW, WMO boundaries (if any cross the project corridor), and potential areas to consider for stormwater BMPs (planimetric only).

#### 3.1.1 Off-site surface drainage areas flowing to the project

Surface runoff generated from off-site ROW that drains to a facility in the project area may be counted toward volume and water quality requirements for the project.

- The treatment of runoff from the ROW portion of the off-site drainage area may count towards the volume and water quality requirements.
- The treated offsite areas do not increase the project's volume or water quality requirement.
- The equivalent runoff depth for each BMP should be below 2.5 inches over the drainage area to the facility.

Process:

- Delineate the total surface drainage area that flows to the project.
  - Identify existing treatment on intersecting roads.
  - Identify possible upcoming transportation projects that may trigger the stormwater ordinance and intersect with the current project area.
  - Identify if intersecting ROW is not city-owned.
- Delineate the total surface drainage area to each facility and identify the portion within the ROW.
  - The project can count treatment for up to 2.5" over the area within the ROW.

### 3.2 Chapter 54 Applicability

Use the estimated disturbed area to determine whether Chapter 54 may be applicable to the project. Generate a map showing areas of land disturbance using different colors or hatching to differentiate between contiguous areas of disturbance, clearly labeling each area of disturbance and providing the

total estimate in acres or square feet. Continue using conservative land disturbance estimates to prevent schedule and project delays due to Chapter 54 compliance issues.

### 3.3 Design Standards

3.3.1 Develop a stormwater management plan that meets the design standards in Chapter 54 and maximizes the use of vegetated surface stormwater BMPs. If it becomes apparent because of space constraints, runoff routing, or other factors that the design standards cannot be met using vegetated surface stormwater BMPs within project limits, document the constraints in the project narrative and contact the SWS primary contact to discuss alternative options for treatment. Standard BMPs include: bioretention, tree trenches, and rain gardens, BMPs outside of these should be discussed with SWS staff before planning, design, and implementation.

#### 3.3.2 Water Quality

All projects subject to Chapter 54 must comply with the following water quality standards:

**Water Quality Standard**

- **Total Suspended Solids (TSS) Removal: 70% removal of TSS from a 1.25-inch, 24-hour storm event.**
- **Total Phosphorus (TP) Removal: Project sites that discharge to a lake, pond, or wetland listed in Table 3-1 must also reduce TP load, as specified in the table for the 1.25-inch, 24-hour storm event.**

**The percent removal indicated in the standards is determined by first calculating the TSS or TP loading from the proposed project without BMPs and then summing the overall removal provided by the proposed BMPs, for each receiving waterbody. The percent removal is not a comparison to existing conditions.**

Perform preliminary calculations for the project to estimate the TSS and TP removal percentages using the updated project, impervious surface areas, and anticipated stormwater BMPs. Reference Table 3-1 for phosphorus reduction goals. If the project has multiple receiving waterbodies, it must meet the minimum water quality requirements for each waterbody.

**Table 3-1. Total Phosphorus Reduction Goals for Discharges to Minneapolis Waterbodies**

Waterbody	TP Load Goal When Compared to Existing Conditions' TP Load <sup>1</sup>
Birch Pond	0% increase
Loring Park Pond	
Webber Pond	
Brownie Lake	10% reduction
Lake Harriet	20% reduction
Lake of the Isles	
Lake Nokomis	25% reduction

Bde Maka Ska Lake	30% reduction
Crystal Lake	
Diamond Lake	
Grass Lake	
Other Wetlands <sup>2</sup>	
Powderhorn Lake	
Ryan Lake	
Spring Lake	
Wirth Lake	
Cedar Lake	
Lake Hiawatha	42% reduction

<sup>1</sup>Source: City Council Resolution 2000R-042

<sup>2</sup>Refer to the Minnesota Department of Natural Resources *National Wetlands Inventory* to determine whether a waterbody is considered a wetland.

### 3.3.3 Rate Control

All projects subject to Chapter 54 must comply with the following rate control standards:

## Rate Control Standard

**No increase in peak discharge over existing conditions**

Project components that may alter discharge rates include, but are not limited to, the items listed below. If the project includes one of the following items, the proposed peak discharge will likely see an increase from existing conditions, requiring mitigation measures to meet the rate control standard.

Discuss rate control analysis with the primary SWS contact, if plans include:

- Modifying the drainage area to a pipeshed, outfall, or pipe connection through grading or storm sewer modifications
- Increasing impervious surface areas from existing conditions
- Changing existing storm sewer service line diameters, shape, material, invert elevations, or slope

### 3.3.4 Volume Control

All projects subject to Chapter 54 must comply with the following volume control standard:

## Volume Control Standard

Linear projects must capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces within the disturbed area
- 1.1 inches of runoff from the net increase in impervious surfaces within the disturbed area

Stormwater infiltration practices may be restricted or prohibited in areas defined in the City of Minneapolis’s NPDES MS4 Permit (MN0061018), Part III.C.5.a.(3)(a)-(j)

The project's volume retention requirement is equal to the larger of the two volumes calculated based on the volume control standard. Perform preliminary calculations to estimate the proposed volume retention for the project. Complete a preliminary infiltration assessment for the project as outlined below to determine whether the locations identified for stormwater BMPs have an infiltration restriction or prohibition.

#### *3.3.4.1 Preliminary Infiltration Assessment*

Stormwater infiltration practices may be restricted or prohibited in areas defined in the City's NPDES MS4 Permit. The permit states that the construction of infiltration stormwater BMPs is prohibited if they will receive discharge from, or be constructed in, areas:

- a) That receive discharges from vehicle fueling and maintenance, regardless of the amount of new and/or fully reconstructed impervious surfaces.
- b) That receive stormwater runoff from entities regulated under NPDES for industrial stormwater—automobile salvage yards; scrap recycling and waste recycling facilities; hazardous waste treatment, storage, or disposal facilities; or air transportation facilities that conduct deicing activities.
- c) Where high levels of contaminants in soil or groundwater may be mobilized by the infiltrating stormwater. To make this determination, the owners and/or operators of construction activity must complete the Minnesota Pollution Control Agency (MPCA) site screening assessment checklist, which is available in the [Minnesota Stormwater Manual](#), or conduct their own assessment. The assessment must be retained with the site plans.
- d) Where soil infiltration rates are more than 8.3 inches per hour, unless soils are amended to slow the infiltration rate below 8.3 inches per hour.
- e) With predominantly Hydrologic Soil Group D (clay) soils.
- f) Within 1,000 feet upgradient or 100 feet downgradient of active Karst features.
- g) Outside of an Emergency Response Area (ERA) within a Drinking Water Supply Management Area (DWSMA) ([Minn. R. 4720.5100, subp. 13.](#)) classified as high or very high vulnerability as defined by the Minnesota Department of Health (MDH), unless the permittee performs or approves a higher level of engineering review that is sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater.
- h) Inside an ERA within a DWSMA classified as high or very high vulnerability, as defined by the Minnesota Department of Health.
- i) Inside an ERA within a DWSMA classified as moderate vulnerability, as defined by the Minnesota Department of Health, unless the permittee performs or approves a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater.
- j) With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of the bedrock.

Use the data sources listed in Table 3-2 to help evaluate the project site characteristics and determine whether one of the ten corresponding infiltration prohibitions or restrictions (a–j) exists on-site. In areas where infiltration restrictions or prohibitions may exist, additional investigation, such as additional geotechnical borings or phase II environmental site assessment, is recommended during 60% plan development to help determine appropriate placement of stormwater BMPs.

If infiltration is not possible due to site restrictions the project area that is under the restriction is exempt from volume control requirements. Rate control and water quality standards must still be met for the entirety of the project area.

**Table 3-2. Site Characteristics Required to Determine Infiltration Prohibitions and Restrictions**

Site Characteristics	Prohibition/Restriction	Action	Data Source
Soils	(d) and (e)	Determine the suitability of soils on the project site for locating stormwater BMPs	City storm and sewer plat maps in conjunction with available soil borings
Bedrock, Groundwater	(j)	Determine the suitability of the soil profile on the project site for locating stormwater BMPs	City storm and sewer plat maps in conjunction with available soil borings
Karst	(f)	Follow Minnesota Stormwater Manual guidance for Karst	<a href="http://state.mn.us">Karst - Minnesota Stormwater Manual (state.mn.us)</a>
DWSMA	(g), (h), (i)	Compare project location to DWSMA mapping	MDH Mapping: <a href="#">Source Water Protection Web Map Viewer</a>
Contamination	(c)	Complete a screening assessment for contamination at potential stormwater infiltration sites	<a href="#">Minnesota Stormwater Manual Screening Assessment</a>
Site Operations/Land use	(a) and (b)	Determine land use within the drainage area to each BMP	Field assessment and <a href="#">Minnesota Geospatial Commons</a>

### 3.4 Concept Layout Plan Deliverables

#### 3.4.1 Project Narrative

In addition to the project narrative requirements from scoping (Section 2.4.1), update the necessary project components and include a compliance narrative that describes the following:

- If the project meets the design standards at this stage of design:
  - Identify “above and beyond” or treatment opportunities and goals for green stormwater infrastructure (if applicable)
- If the project does not meet the design standards at this stage of design:
  - Identify types of stormwater management practices included in the concept layout

- Describe the constraints limiting greenspace and stormwater BMPs
- List the actions taken to modify the concept layout or justification for the inability to modify the concept layout
- Provide plans for additional investigation
- Quantify the remaining needs for compliance

Coordination with SWS (through the SWS primary contact for the project) is required to ultimately determine project compliance with Chapter 54.

#### *3.4.1.1 Design Standard Calculations*

Submit design standard calculations for water quality, rate control (if applicable), and volume control as part of the project narrative deliverable. Include methods, assumptions, and results to document the water quality, rate control, and volume control analyses. Preliminary calculations are accepted at concept layout stage but must be updated during subsequent stages with accurate modeling.

#### 3.4.2 Plans

Submit the following for each stormwater BMP (or suite of BMPs) on the concept layout plan sheet:

- Estimate of the location and extent (planimetric only)
- Total drainage area to each BMP
- Drainage area within the disturbed areas to each BMP
  - Tabulate drainage in and out of ROW separately
- Impervious area within the disturbed area to each BMP
  - Tabulate impervious area in and out of ROW separately
- Typical section, catalog illustration, or similar of each type of BMP

The information requested for the concept layout plan sheet is a preliminary estimate and subject to change; however, the plans must demonstrate how a project intends to meet Chapter 54 requirements. Include designer notes and considerations for stormwater management features on the plan sheet submitted to SWS for review.

#### 3.4.3 Cost Estimates

Provide an updated preliminary estimate, including the probable cost for stormwater management improvements. Corresponding funding sources (federal, county, state, etc.) and division cost splits must also be included. Contact the SWS primary contact for the project with funding questions.

## 4 30% Plan Development

During 30% plan development, major design elements are enhanced with the addition of street profiles and alignments, including proposed stormwater BMPs and the calculations that support the design.

Use this section of the guide in conjunction with the *30% Plan Development Requirements* and *30% Plan Deliverables* from the Chapter 54 Guidance and Submittal Checklist. Develop and submit a 30% plan set and stormwater management report outline that demonstrates compliance with Chapter 54 at this stage.

### 4.1 Refine the Project Area

After the construction limits have been defined, update the drainage areas, disturbed areas, and existing and proposed impervious surface areas. The total drainage area, including off-site, and the portion of the drainage area within the disturbed area must be depicted in the stormwater management plan.

#### 4.1.1 Confirm Applicability

Based on comments from concept layout submittal and project modifications from concept layout, use the updated disturbed area to confirm Chapter 54 applicability.

### 4.2 Design Standards

Reference Section 3.3 for Chapter 54 Plan Design Standards.

Update the stormwater management plan as needed to meet the design standards in Chapter 54 and continue to maximize the use of vegetated surface stormwater BMPs. If it becomes apparent because of space constraints, runoff routing, or other factors that the design standards cannot be met using vegetated surface stormwater BMPs within project limits, document the constraints in the preliminary stormwater management report and contact the SWS primary contact to discuss alternative options for treatment.

#### 4.2.1 Water Quality

Update the water quality analysis based on refinement and development of the project plans. Update the preliminary water quality calculations to estimate the TSS and TP removal percentages for the proposed stormwater BMPs. If the project drains to more than one WMO or waterbody, it must meet the water quality requirements for each jurisdiction and waterbody separately. Discuss underground treatment facilities with the SWS primary point of contact to determine acceptability. Results of these analyses should be tabulated by jurisdiction and/or receiving waterbody when appropriate.

#### 4.2.2 Rate Control

During development of the proposed storm sewer system, rate control will be required on-site if the project proposes one or more of the following changes. A hydrologic and hydraulic model is not required for 30% development.

- Modifying the drainage area to a pipeshed, outfall, or pipe connection through grading or storm sewer modifications
- Increasing impervious surface areas from existing conditions
- Changing existing storm sewer service line diameters, shape, material, invert elevations, or slope

### 4.2.3 Volume Control

Update the volume control analysis based on refinement and development of the project plans. Update the project's volume retention requirement and the anticipated volume retention for each stormwater BMP. Estimate the equivalent depth in inches (anticipated volume retention of BMP divided by the drainage area impervious to the BMP) for each BMP to ensure the proposed volume retention is appropriate. Equivalent depth for each BMP should be below 2.5 inches. If the equivalent depth exceeds this, consider design modifications or discuss options with the SWS primary contact. Discuss underground infiltration facilities with the SWS primary point of contact to determine acceptability.

#### 4.2.3.1 Preliminary Infiltration Assessment

Update the infiltration assessment as needed to confirm locations of infiltration prohibitions or restrictions on-site. Refer to Table 3-2 in Section 3.3.3.1 for guidance. In areas where soil, groundwater, or bedrock restrictions or prohibitions may exist, begin planning for additional geotechnical investigation to be completed during 60% plan development to help determine appropriate placement of stormwater BMPs.

### 4.2.4 Compliance Sequence

This section is reserved for future use.

Coordinate with the SWS primary point of contact if site constraints prohibit compliance with Chapter 54 requirements for volume control and water quality.

## 4.3 Stormwater BMP Design Guidance

The City considers the Minnesota Stormwater Manual, prepared by the MPCA, to be the City's approved design manual. The City also recommends reviewing the Street Design Guide (SDG) to find comprehensive guidance on integrating stormwater management into proposed linear projects. The SDG includes guidance on concept layout dimensions, strategies to minimize impervious surfaces, and ways to combine stormwater benefits with transportation needs. The Minnesota Stormwater Manual and SDG can be found on the following websites:

- [Minnesota Stormwater Manual](#)
- [Minneapolis Street Guide](#)

Using the Minnesota Stormwater Manual, develop concept-level cross-sections and identify elevations of stormwater BMPs to update and improve the locations and extents of the proposed BMPs in the 30% plan set.

## 4.4 Operations and Maintenance

Initial coordination with SWS Operations (through the SWS primary contact for the project) is required for all proposed stormwater BMPs and devices that are unique or proprietary to identify potential long-term operations and maintenance requirements for stormwater infrastructure.

## 4.5 30% Plan Deliverables

### 4.5.1 Plans

In addition to the plan requirements from the concept layout plans (Section 3.4.2), update the necessary project components and include the following new items in the 30% plan:

- Construction limits
- Disturbed area boundary(s)
- Existing and proposed impervious areas
- Extents (area) of proposed stormwater BMPs
- Elevations of proposed stormwater BMPs (if known)
- Locations of connections to storm sewer

### 4.5.2 Stormwater Management Report (Preliminary Draft Only)

Submit a preliminary draft Stormwater Management Report in accordance with the template provided in Appendix C. The preliminary draft should include all available information (subject to change) and placeholders for information that is being developed for future stages. Design standard calculations for water quality, rate control (if applicable), and volume control are required as part of the preliminary draft Stormwater Management Report.

### 4.5.3 Cost Estimates

Update the preliminary cost estimate using the 30% plans. Corresponding funding sources (federal, county, state, etc.) and division cost splits must also be included. Contact the SWS primary contact for the project with funding questions.

## 5 60% Plan Development

At the 60% stage, most design elements are established. Stormwater BMP design continues to be refined, with cross-section, elevations, and design detail information and modeling performed to demonstrate compliance with stormwater plan design standards.

This section of the guide should be used in conjunction with the *60% Plan Development Requirements* and *60% Plan* from the Chapter 54 Guidance and Submittal Checklist. Develop and submit a 60% plan set and draft stormwater management report that demonstrates compliance with Chapter 54 at this stage.

### 5.1 Design Standards

Reference Section 3.4 for Chapter 54 Plan Design Standards.

#### 5.1.1 Water Quality

Update the water quality analysis based on development of the plans and previous comments and discussions with SWS. For 60% plans, use water quality modeling to demonstrate that the proposed stormwater BMPs will achieve the water quality design standards. Use a BMP naming convention that is consistent among report figures, plans, and modeling. Use subcatchment labels that reference the BMP naming convention. The water quality models SWS accepts include:

- P8 (version 2.4 or newer)
- MIDS Calculator
- Calculations based on the Minnesota Stormwater Manual guidance
- WinSLAMM (version 9.4.0 or newer)
- SWS must approve other models prior to submitting the 60% Stormwater Management Report

#### 5.1.2 Rate Control

Update the rate control analysis based on development of the plans and previous comments and discussions with SWS. If a project proposes to increase the amount of impervious surface within a subcatchment, alter the drainage area, or modify storm sewer sizes, use hydrologic and hydraulic modeling to demonstrate that the proposed stormwater BMPs will achieve the rate control design standards. The hydrologic and hydraulic models accepted by SWS include:

- HydroCAD
- XP-SWMM
- SWS must approve other models prior to submitting the 60% Stormwater Management Report

Models must:

- Simulate the 2-, 10-, and 100-year, 24-hour rainfall events
- Use National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rainfall depths
- Use a Natural Resources Conservation Service (NRCS) nested rainfall distribution with Atlas 14-based data (e.g., MSE-3)
- Use the NRCS curve number or XP-SWMM runoff methodology
- Use accurate storage curves to represent the proposed stormwater BMPs
- Use a BMP naming convention that is consistent among report figures, plans, and modeling
- Use subcatchment labels that reference the BMP naming convention
- Include all drainage area draining to a BMP

Provide a statement in the Stormwater Management report if a project does not propose to alter drainage to any stormwater system that could result in an increase in peak flows, therefore exempting them from providing rate control modeling.

### 5.1.3 Volume Control

Update the volume control analysis based on development of the plans and previous comments and discussions with SWS. For 60% plans, provide volume control calculations demonstrating the proposed stormwater BMPs will achieve the volume control design standards. Recalculate the equivalent depth in inches (anticipated volume retention of BMP divided by the drainage area impervious to the BMP) for each BMP to ensure the proposed volume retention is appropriate. Equivalent depth for each BMP should be below 2.5 inches. If the equivalent depth exceeds this, consider modifications to the design or discuss options with the SWS primary contact.

#### 5.1.3.1 Final Infiltration Assessment

Perform additional geotechnical investigation or environmental assessment early in this phase of design if needed to determine and finalize the locations of infiltration prohibitions and restrictions. Update infiltration rates where necessary (based on the geotechnical investigation) to ensure that the modeling and design of the proposed stormwater BMPs are accurate. Finalize the locations and extents of the stormwater BMPs based on the results of the geotechnical investigation and environmental assessment. If new prohibitions or restrictions make it impractical to meet Chapter 54 design standards, describe the site constraints in the Stormwater Management Report.

### 5.1.4 Compliance Sequence

This section is reserved for future use.

Coordinate with the SWS primary point of contact if site constraints prohibit compliance with Chapter 54 requirements for volume control and water quality.

## 5.2 Stormwater BMP Design Guidance

### 5.2.1 BMP Design

Continue to use the Minnesota Stormwater Manual and SDG to inform the design. For each stormwater BMP, provide refined typical stormwater BMP cross-sections and design details. See section 5.4.1 for 60% plan and cross-section requirements. If it's necessary to add new types of BMPs after 30% in order to comply with Chapter 54, discuss these with the SWS point of contact.

## 5.3 Operations and Maintenance

Continued coordination with SWS Operations (through the SWS primary contact for the project) is required to discuss any outstanding maintenance requirements and special needs relating to BMP access (i.e., concrete drive access, reinforced turf path, maximum side slopes, etc.) for unique or proprietary stormwater BMPs and devices.

## 5.4 60% Plan Deliverables

### 5.4.1 Plans

In addition to the plan requirements from the 30% plans (Section 4.5.1), update the necessary project components and include the following new items in the 60% plans:

- Extents (area) of proposed stormwater BMPs
  - Grading (labeled 0.5-foot contours or greater accuracy, if needed) for surface BMPs

- Alignments and pipe/structure information for subsurface BMPs
- Storage volume (separated by underground and above ground)
- Details and location for
  - Pretreatment
  - Inlet
  - Energy dissipation
  - Outlet control structure
  - Emergency overflow
- Typical cross-section for each stormwater BMP, including the following applicable items depending on BMP type:
  - Stormwater BMP type
  - Grading (bottom elevation, side slopes, dimensions)
  - Pipe/structure dimensions and elevations (bottom elevation, surrounding stone storage elevations)
  - Normal water level, water quality outlet elevation, and high water level
  - Underdrains (inverts, diameter, clean outs, material)
  - Soil/media type
  - Liner type
  - Consider using tabulations of the above if several BMPs use the same typical section

#### 5.4.2 Comment Resolution

Submit 30% comment resolution responses with the 60% Capital Project Task Force (CPTF) submittal package.

#### 5.4.3 Stormwater Management Report

Update the Stormwater Management Report based on development of the plans and previous comments and discussions with SWS. Use the Stormwater Management Report template provided in Appendix C.

#### 5.4.4 Operations and Maintenance Plan

A site- and BMP-specific draft operations and maintenance plan must be submitted at this plan stage for unique and proprietary stormwater BMPs installed as part of the project. The draft plan must include:

- Identification of responsible parties for each maintenance task
- Maintenance for the following components of each BMP:
  - Primary BMP
  - Pretreatment devices
  - Unique maintenance requirements
  - Access and safety considerations
- Description of above- and below-ground access points and procedures

#### 5.4.5 Cost Estimates

Stormwater management design modifications completed during the 60% plan development will require an updated cost estimate.

## 6 90% Plan Development

At 90%, all Chapter 54-related design elements and final calculations are fully defined. During this plan stage, design elements—including stormwater BMP design—are refined and draft special provisions are provided to support design elements.

This section of the guide should be used in conjunction with the *90% Plan Development Requirements* and *90% Plan Deliverables* from the Chapter 54 Guidance and Submittal Checklist. All documents should be updated from the 60% submittal, and draft special provisions are also required. Although the special provisions are a draft, they should be complete and address all Chapter 54 elements and requirements. Submit 60% comment resolution responses with the 90% CPTF submittal package.

In some cases, project modifications may require changes to stormwater BMPs. Refer to the 30% and 60% guidance sections for design guidance and a list of items that should be included in the design plans and Stormwater Management Report. Submit an updated engineer's estimate based on the 90% plans and special provisions.

### 6.1.1 Draft Division S Special Provisions

Use the [Minnesota Department of Transportation \(MnDOT\) Standard Specifications for Construction](#) for construction and design requirements, except where modified or amended by the City of Minneapolis. Special provisions for stormwater management features not otherwise detailed in the City's standard specifications and detail plates must be approved by SWS.

The most current information regarding special provisions and standard plates for the City can be found on the [City's Standard Specifications and Detail Plates](#) webpage. Identify and submit a complete draft of the Division S Special Provisions with the 90% plan.

## 7 100% Plan Development and Final Submittals

At the final submittal stage, all Chapter 54-related design elements and calculations are finalized and certified by a Minnesota registered and licensed professional engineer.

Refer to the *100% or Final Plan Deliverables* section from the Chapter 54 Guidance and Submittal Checklist for final submittal requirements.

At final submittals, the designer will be required to submit 100% construction plans and a final Stormwater Management Report, both signed by a Minnesota registered and licensed professional engineer certifying that the project meets Chapter 54 requirements. Additionally, final special provisions, operations and maintenance plans, and an engineer's cost estimate are also required. Submit 90% comment resolution responses with the final submittal package.

Use Appendix D Stormwater Management BMP Tracking Entry Form to record the final stormwater BMPs in the City's asset management system before the project proceeds to construction. Submit the completed form to the SWS Regulatory Group.

## Appendix A

### User Directory

## User Directory

The following table includes a summary of Chapter 54 requirements, the approximate plan stage in which the requirement is introduced in design, and where in *Chapter 54: Stormwater Management Ordinance Requirements for Linear Projects Guide* (Linear Guide) to find guidance on how to meet the requirements.

**Table A-1. Linear Guide User Directory**

Chapter 54 Requirement	Plan Stage for Consideration	Linear Guide Reference Section
Chapter 54, Section 54.50. Applicability	0% Plan	Section 2.2.1. Chapter 54 Applicability Standards
Chapter 54, Section 54.60. Exemptions	0% Plan	Section 2.2.1. Chapter 54 Applicability Standards
Chapter 54, Section 54.70. Stormwater Management Plan Approval Requirement	30% Plan	Section 4.5.2. Stormwater Management Report
Chapter 54, Section 54.80(a). On-site management	30% Plan	Section 4.3 Stormwater BMP Design Guidance
Chapter 54, Section 54.80(b). Full or partial off-site management	30% Plan	Section 4.2. Plan Design Standards
Chapter 54, Section 54.80(c)(1)-(3). Plan design standards for water quality, rate control, and volume control	30% Plan	Section 4.2. Plan Design Standards
Chapter 54, Section 54.80(c)(4)-(5). Operations and maintenance plan, and accessibility for maintenance	60% Plan	Section 5.2. Operations and Maintenance
Chapter 54, Section 54.80(c)(6)-(7). Impacts on other properties, and conformity with other requirements	0% Plan	Section 1. Introduction and Section 2.3. Other Regulatory Considerations
Chapter 54, Section 54.80(c)(8). Conditions of approval	100% Plan	Section 7. 100% Plan Development/Final Submittals
Chapter 54, Section 54.80(c)(9). Changes to plans	100% Plan	Section 7. 100% Plan Development/Final Submittals

## Appendix B

### Deliverable Examples (RESERVED FOR FUTURE USE)

Appendix C  
Stormwater Management Report Template

## User Instructions

*(These instructions are for the user's reference and are not to be included in the report.)*

A Stormwater Management Report is required for all City of Minneapolis linear projects that are regulated by the [Minneapolis Code of Ordinances Chapter 54: Stormwater Management](#). Consult the City of Minneapolis Chapter 54: Stormwater Management Ordinance Requirements for Linear Projects Guide (Linear Guide) for guidance on regulatory requirements and stormwater management design. This template was developed to help designers create a project-specific Stormwater Management Report that addresses Chapter 54 requirements. Designers are responsible for ensuring that all necessary information and deliverables specific to their project are included in the report.

**Instructions or suggested items for inclusion are shown in *italics*.**

Contact the Primary Surface Water and Sewers representative if additional assistance is needed to complete the Stormwater Management Report.

# Stormwater Management Report

***Project Name***

*Project Number*



Prepared for  
City of Minneapolis Public Works  
Surface Water and Sewers Division

Insert Your  
Company Logo  
Here

Prepared by  
*Consultant Name*

*Date*

*Revision #*

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a Registered Professional Engineer under the laws of the State of Minnesota.

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*Name*

*State Reg. No. 55555*

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*Date*

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# 1 Project Scope

Describe the scope of the proposed project and include the following items:

- *General description of proposed activities*
- *Project purpose*
- *Street or description of section of roads*
- *Project length (in miles)*
- *Disturbed area acreage*
- *Other regulatory considerations (if applicable)*
  - *Watershed management organization*
  - *Receiving waterbodies and water quality requirements*
  - *Flooding concerns and mitigation*
  - *Other relevant stormwater studies or priority areas*
  - *Sustainable landscaping index (e.g., tree canopy)*

Include a Project Area Map as Figure 1 ([Sample Map](#)). Include in the map the items listed below. If areas within the overall project area discharge to various receiving waterbodies, provide the information for each receiving waterbody.

- *Orthophoto background and/or CAD linework*
- *Disturbed areas boundary*
  - *Identify assumed noncontiguous disturbed areas within the project*
  - *Note the total disturbed area and existing and proposed impervious areas for each contiguous disturbed area*
- *Total disturbed area (square footage) noted*
- *Watershed jurisdiction boundaries*
- *Municipal boundary when relevant*
- *Existing drainage boundaries with highlighted flow to receiving waterbodies*
- *Total existing and proposed impervious area (square footage) noted*
- *Impervious area should be clearly identifiable through hatching, color, etc.*
- *Calculation for 0.55" of runoff from new and fully reconstructed impervious and 1.1" of runoff from net increase in impervious*
- *Potential infiltration prohibition/restricted areas*

## 2 Existing Conditions

*Describe the existing conditions of the project area, and include the following items:*

1. *Existing impervious area*
2. *General description of land use and topography*
3. *Area soil conditions*
  - a. *Infiltration potential/prohibitions*
4. *The water management organization(s) containing the project's location*
5. *Receiving waterbodies, wetlands, and associated floodplains*
6. *Other key features or special considerations*

### 2.1 Drainage Summary

*Describe the current drainage conditions of the project, and include the following items:*

1. *Existing drainage patterns*
2. *Existing drainage infrastructure*
3. *Existing stormwater management facilities*
4. *Discharge points from existing drainage patterns*

### 3 Proposed Conditions

Describe the proposed project conditions, and include the following items:

1. Proposed impervious area (distinguish among existing, new, and reconstructed impervious [within project area only])
2. Proposed change in impervious area (within project area only)
3. Proposed drainage modifications (if applicable)
  - a. Receiving waterbody(s)
  - b. Project discharge locations
4. General description of proposed stormwater management facilities
  - a. Above ground/underground
  - b. Types of BMPs
  - c. Proprietary devices
5. Other key features

**Table 1. Impervious Areas within Project Area**

Area Description	Area (SF)
Existing Impervious	
Reconstructed Impervious	
New Impervious	
Total Proposed Impervious	
Net Change in Impervious	

Include a Drainage Area and Stormwater Management Map as Figure 2 ([Sample Map](#)). Include the items listed below in the map. Separate this map into areas that are draining to individual BMPs or untreated areas. BMPs that are hydraulically connected may be grouped together and treated as an individual BMP. Groups of BMPs may be separated by catch basins, drainage divides, neighborhood blocks, and intersections. Figure 3 gives an example of how stormwater BMPs can be hydraulically grouped to calculate treatment volume and water quality benefits.

- **General**
  - Orthophoto background and/or CAD linework
  - Watershed jurisdiction boundaries
  - Municipal boundary (when relevant)
  - Existing drainage boundaries with highlighted flow to receiving waterbodies
  - BMP locations (shown and labeled)
  - Potential infiltration prohibition/restricted areas
  - Identify locations that will require further rate control (e.g., modifications to drainage areas, increase in impervious area, or redirection of flow)
  - Existing storm sewer network
- **Boundary lines showing disturbed area to each BMP or discharge location**
  - Total disturbed area (square footage) noted
  - Total proposed impervious area (square footage) noted

- *Flow arrows—surface flow along the street/ground, BMP outlets, bypasses and emergency overflows*
- *Develop BMP naming convention that is consistent between report figures, plans, and all models*
- *Subcatchment area labels should reference the BMP naming convention*
- *Boundary lines showing off-site (outside of disturbed areas) drainage to each BMP*
  - *Total area (square footage) noted*
  - *Total impervious area (square footage) noted*
  - *Flow arrows—surface flow along street/ground*
  - *Identify location of roof discharge, and note if they are surface or piped connections*
- *Polygons within boundary lines should be symbolized to differentiate between elements*
- *Treatment effectiveness for each subwatershed included in a table*
  - *Load TSS and TP (in lbs)*
  - *Removal TSS and TP (in lbs)*
  - *Removal TSS and TP (in %)*
  - *Volume reduction provided (in cu.ft.)*

### 3.1 Stormwater Management Summary

Use [Chapter 54 Ordinance](#) in conjunction with the Linear Guide to comply with the following standards

#### 3.1.1 Water Quality

- *Describe how the project proposes to meet Chapter 54 water quality standards, and state whether the standard is met. If the standard is not met, describe the project constraints, actions taken to meet the standard, and plans for additional investigation or modifications.*
- *List the receiving waterbody(s) and its required TP load goal (reference Table 3-1 in the Chapter 54 Linear Guide).*
- *Summarize water quality modeling results in Table 2.*
- *Include water quality modeling inputs and outputs in Appendix A (Water Quality Analysis) of Stormwater Management Report.*

**Table 2. Water Quality Analysis Results**

Receiving Waterbody	BMP Name	TSS Loading (lbs)	TSS Removed (lbs)	TSS Percent Removal	TP Loading (lbs)	TP Removed (lbs)	TP Percent Removal
Lake 1	A						
	B						
	C						
	Total						
Lake 2	D						
	E						
	Total						
<b>Project Total</b>							

3.1.2 Rate Control

- Describe project conditions that may alter discharge rates leaving the project area.
  - If there are no project conditions that alter discharge rates leaving the project area, state this, and do not complete the rest of this section.
  - If there are project conditions that alter discharge rates leaving the project area, describe how the project proposes to meet Chapter 54 rate control standards, and state whether the standard is met. If the standard is not met, describe the project constraints, actions taken to meet the standard, and plans for additional investigation or modifications.
  - Summarize rate control results in Table 3.
  - Include rate control modeling inputs and outputs in Appendix B (Hydrologic and Hydraulic Modeling) of the Stormwater Management Report.
  - Although the following calculations are not required for Chapter 54 compliance, they are necessary for design. Include analysis for the following:
    - Inlet spacing (spread calculations)
    - Pipe sizing calculations
    - Routing
    - Identify capacity issues

**Table 3. Rate Control Analysis Results**

Discharge Location	Existing Conditions			Proposed Conditions		
	2-year	10-year	100-year	2-year	10-year	100-year
A-1						
A-2						
B-1						

3.1.3 Volume Control

- Describe how the project proposes to meet Chapter 54 volume control standards, and state whether the standard is met. If the standard is not met, describe the project constraints, actions taken to meet the standard, and plans for additional investigation or modifications.
- Summarize volume control results in Table 4.
- Calculate equivalent depth for each BMP. Equivalent depth is calculated by taking the provided treatment volume and dividing by the drainage area impervious to the BMP. Provide the depth in inches. The equivalent depth for each BMP should be below 2.5 inches.
- Include volume control modeling inputs and outputs in Appendix B of the Stormwater Management Report when necessary to support volume control calculations.

**Table 4. Volume Control Analysis Results**

Receiving Waterbody	BMP name	New or reconstructed impervious area (SF)	Net increase in impervious area (SF)	1.1 inches of runoff from the net increase in impervious area (CF) or 0.55 inches of runoff from new and reconstructed impervious area (CF)	Provided treatment volume (CF)	Equivalent depth (inches)
Lake 1	A					
	B					
	C					
	Total					
Lake 2	D					
	E					
	Total					
<b>Project Total</b>						

#### 3.1.3.1 Infiltration Assessment

- Summarize and reference soil information as well as current and planned geotechnical investigations.
- Describe the infiltration capabilities of soils at the proposed BMP sites.
- Identify infiltration prohibitions or restrictions on-site. Reference Section 3.3.3.1 of the Linear Guide for prohibitions.
- Include geotechnical information in Appendix C (Geotechnical Investigation) of the Stormwater Management Report.

#### 3.1.4 Operation and Maintenance Plan

- Identify any unique or proprietary stormwater management facilities that are being proposed, and label them in Figure 2.
- Provide a long-term operation and maintenance (O&M) plan to ensure the proprietary stormwater management facility functions as designed. Include in Appendix D (Operations and Maintenance Plan) of the Stormwater Management Report.
- Reference Section 5.4.4 of the Linear Guide for items to include in the O&M plan.

Figure 1. Project Area Map

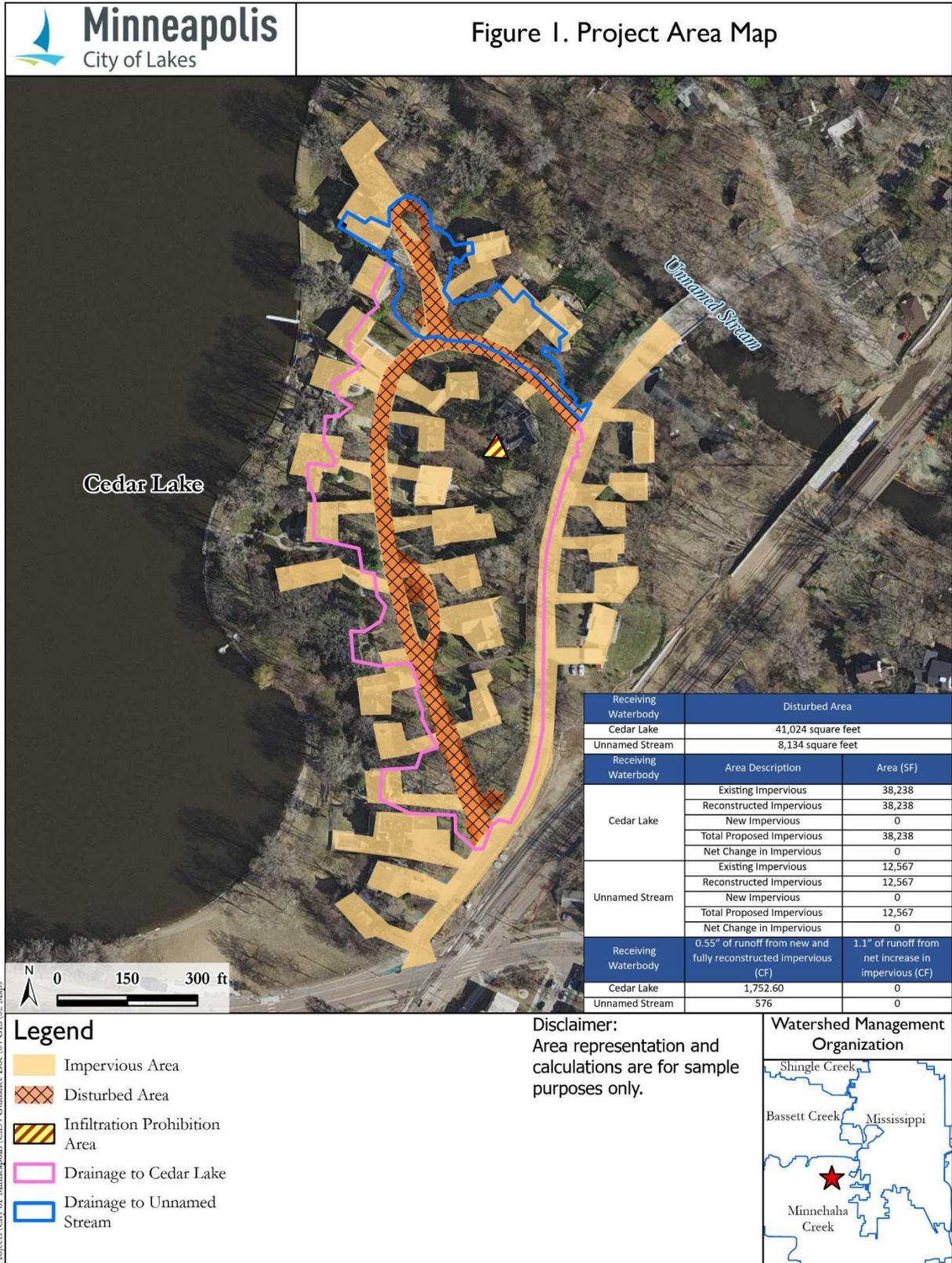
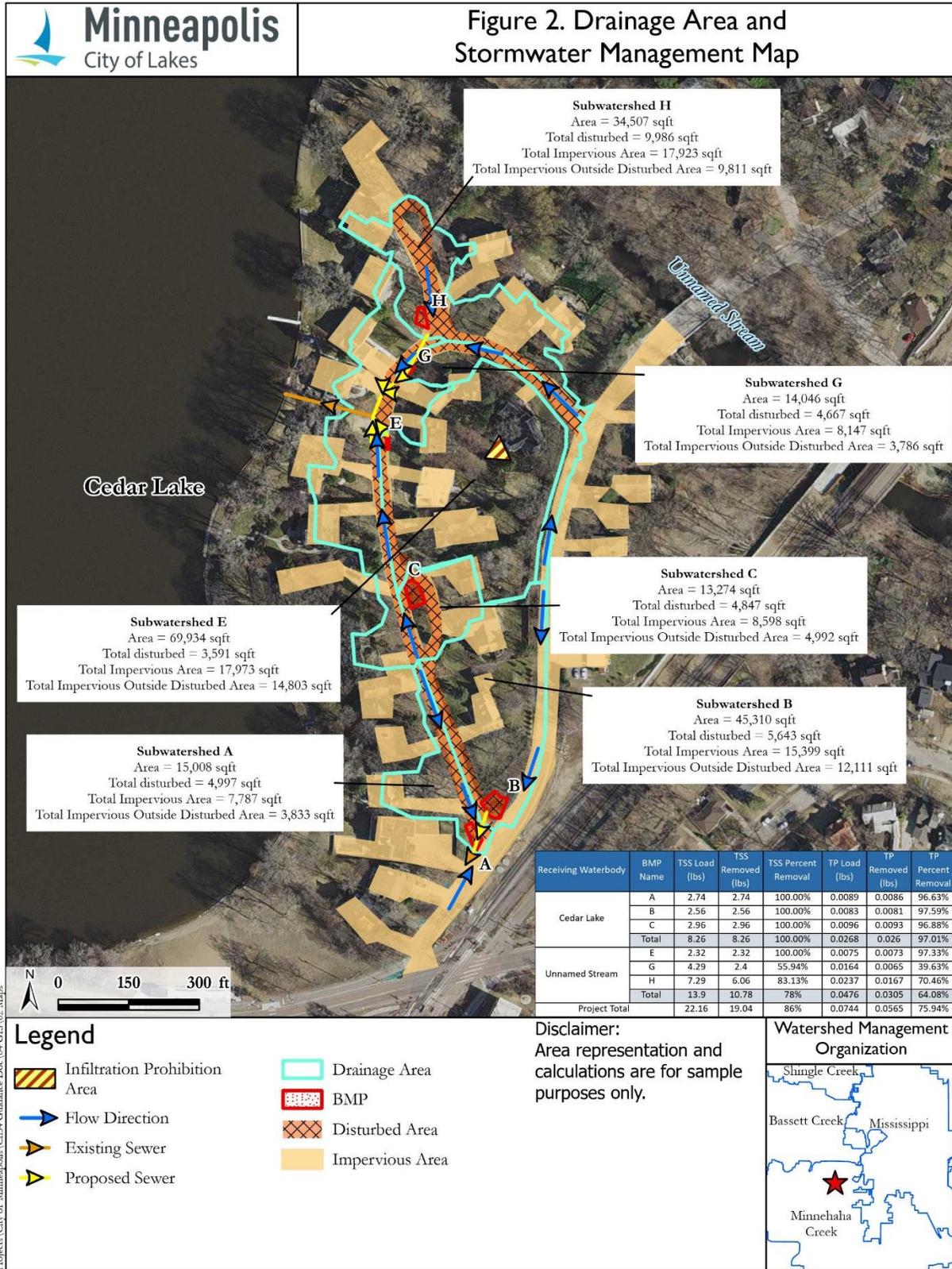
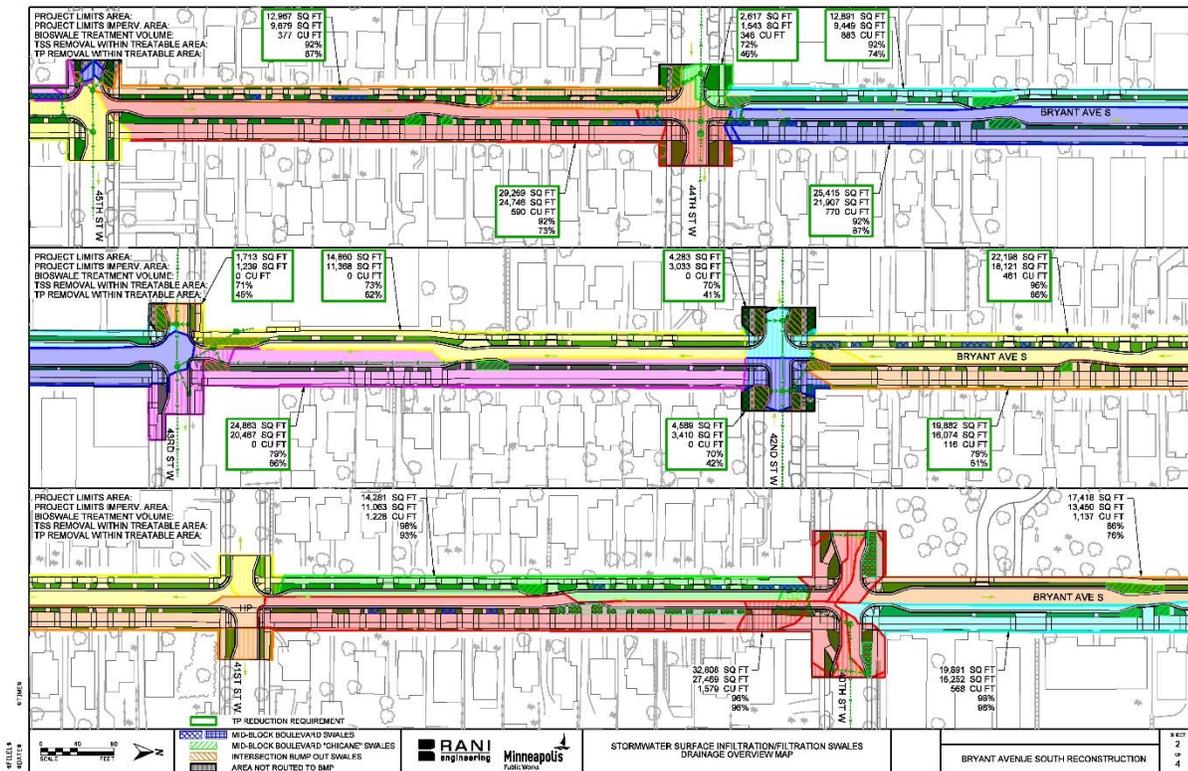
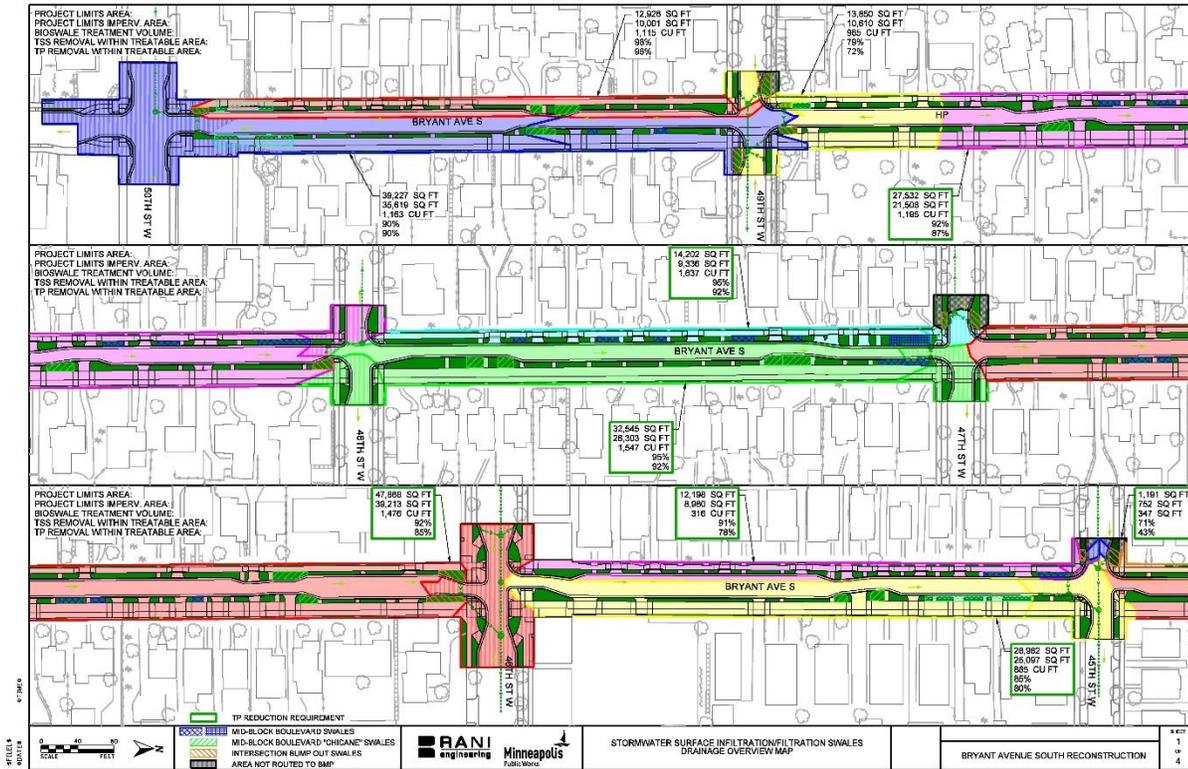


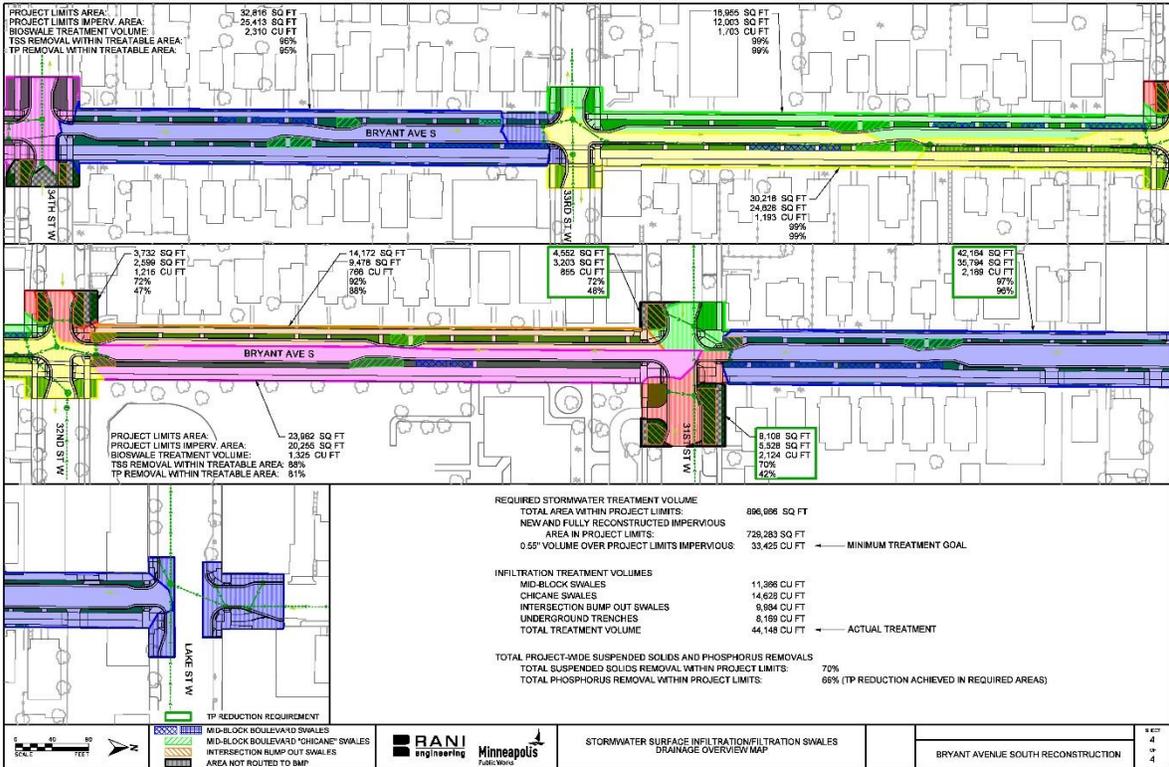
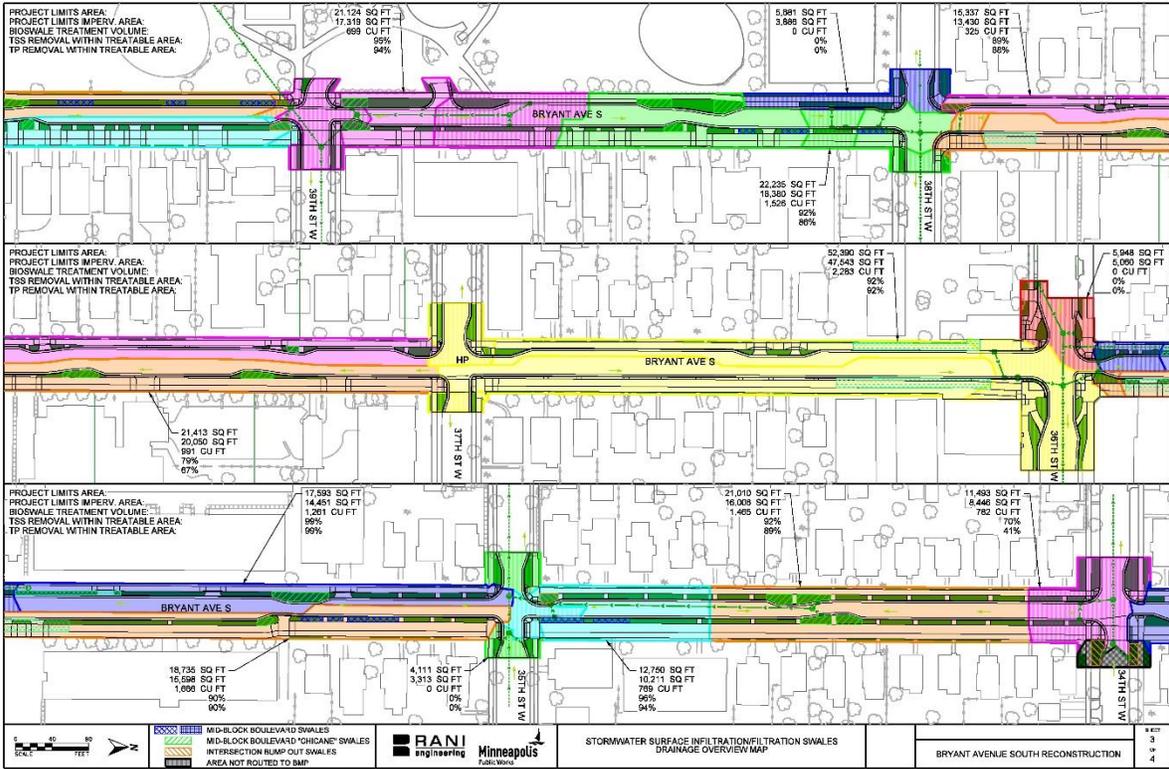
Figure 2. Drainage Area and Stormwater Management Map



Project: City of Minneapolis, City of Lakes, Guidance Doc, 04 GIS 02 Maps

Figure 3. Bryant Avenue Drainage Overview Map





## Appendix A - Water Quality Analysis

*These are suggested Appendices fly sheets. The layout of the Appendix is up to the discretion of the engineer*

## Appendix B - Hydrologic and Hydraulic Modeling

*These are suggested Appendices fly sheets. The layout of the Appendix is up to the discretion of the engineer*

## Appendix C - Geotechnical Analysis

*These are suggested Appendices fly sheets. The layout of the Appendix is up to the discretion of the engineer*

## Appendix D - Operations and Maintenance Plan

*These are suggested Appendices fly sheets. The layout of the Appendix is up to the discretion of the engineer*

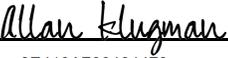
Appendix D  
Stormwater Management BMP Tracking Entry Form



## Public Works Division Director Approval

DocuSigned by:  
  
F60148321AA1451...  
Angie Craft  
Director of Surface Water & Sewers

03/19/2024  
Date

DocuSigned by:  
  
2E419A766464473...  
Allan Klugman  
Director of Traffic & Parking Services

03/26/2024  
Date

DocuSigned by:  
  
036854568A81419...  
Joseph Paumen  
Director of Transportation Maintenance & Repair

03/21/2024  
Date

DocuSigned by:  
  
5567AD13D57A454...  
Donald Elwood  
Director of Transportation Engineering & Design

03/21/2024  
Date

DocuSigned by:  
  
09A144E7D066486...  
Jenifer Hager  
Director of Transportation Planning & Programming

03/28/2024  
Date

DocuSigned by:  
  
3597D71D5395461...  
Annika Bankston  
Director of Water Treatment & Distribution Services

03/19/2024  
Date

DocuSigned by:  
  
9E133E36C89445E...  
Bryan Dodds  
City Engineer

03/29/2024  
Date