APPENDIX - A
CAPITAL IMPROVEMENT PROGRAM

2019-2024 Capital Improvement Plan
Parks Department
101-45200

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total Cost	Notes
Huset Park												
Implement Master Plan including:								$2,075,000			**$2,375,000**	
Site Grading, EC, landscaping and restoration											$400,000	
Pinwheel Ballfields (west)											$600,000	
Remove block garage / Install concession & restroom bldg											$475,000	
Remove Jefferson bld park house & picnic shelter											$125,000	
Install Baseball and Soccer Fields (East)											$400,000	
JPM Parking lot and access drive							$300,000				$300,000	
Playground Replacement (east)											$75,000	
Gauvitte Park				$965,000							**$965,000**	
Develop Master Plan / SWIA											$25,000	
Construct storm water infiltration area(SWIA)											$400,000	
Purchase property for site access to SWIA											$225,000	
Replace playground equipment											$80,000	
Building demolition / new picnic shelter											$110,000	
Site Grading, EC, landscaping and restoration											$150,000	
McKenna Park					$420,000						**$420,000**	
Develop Master Plan			$18,000								$18,000	
Remove wading pool											$20,000	
Reconstruct parkhouse											$175,000	
Reconstruct Athletic Fields											$150,000	
Site Grading, EC, landscaping and restoration											$75,000	
Sullivan Park						$470,000					**$470,000**	
Reconstruct park storage building											$225,000	
Reconstruct tennis courts											$95,000	
Replace trail and park lighting											$150,000	
53rd & Central												
Construct entrance sign to city			$15,000								$15,000	
Ramsdall Park											**$425,000**	
Remove wading pool / construct splash pad											$325,000	
Complete trail (shown in Master Plan)											$25,000	
Trail Lighting											$75,000	
Hilltop Park												
Replace playground equipment			$65,000								$65,000	
Silver Lake Park												
Construct pathway from Stinson Blvd to Benjamin St									$110,000		$110,000	
Keyes Park												
Reconstruction based on Master Plan	$495,000										$495,000	
North Sidewalk (46th and Reservoir)									$85,000		$85,000	
Complete trail (shown in Master Plan)									$25,000		$25,000	
Ostrander Park											**$445,000**	
Develop Master Plan				$18,000							$18,000	
Site Grading, ponding, EC, landscaping and restoration											$150,000	
Replace playground equipment											$85,000	
Remove Park Building											$30,000	
New Picnic Shelter											$95,000	
Reconstruct Hockey Rink											$50,000	
Trail Connection											$35,000	
La Belle Park												
Retrofit existing and add Lighting for walking trail											$75,000	
Silver Lake Boat Landing												
Reconstruct boat landing			$125,000								$125,000	
Reconstruct stormwater retention pond		$325,000									$325,000	
Prestemon Park										$407,500	**$407,500**	
Reconstruct basketball court											$75,000	
Reconstruct Parking lots											$100,000	
Remove Park Building											$22,500	
Construct Picnic Shelter											$95,000	
Construct Dog Park											$115,000	
Lomianki Park												
Replace playground equipment							$65,000				$65,000	
Rehabilitate Park Building											$0	
Edgemoor Park												
Replace playground equipment							$65,000				$65,000	
Wargo Court												
Develop Master Plan		$18,500									$18,500	
Park Reconstruction based on Master Plan			$275,000								$275,000	
Hart Lake												
Install Trail west side of Hart Blvd									$110,000		$110,000	
Replace ped lighting west side of Hart Blvd									$30,000		$30,000	
		2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**		
ANNUALLY:	$495,000	$343,500	$498,000	$983,000	$420,000	$470,000	$430,000	$2,075,000	$360,000	$407,500	**$5,987,000**	

2019-2027 Capital Improvement Plan
Water Department
601-49430

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Funding/Notes
2018 Watermain Clean and Line	**350000**										Operations (~6,000 LF of pipe)
Misc Water Main Repairs	**55000**										Operations
2019 Watermain replacement		**465,000**									Operations (~2,100 LF of pipe)
Pump Station #3: VFD's, valving and power feas		**15,000**									Operations
Misc Water Main Repairs		**50,000**									Operations
2020 Watermain cleaning and lining			**425,000**								Operations (~4,600 LF of Pipe)
Pump Station #3: VFD's, valving and power			**145,000**								Operations
2021 Watermain cleaning and lining				**430,000**							Operations (~4,600 LF of Pipe)
Misc Water Main Repairs				**165,000**							Operations
Facility Maintenance Updates: PS 2 and PS 3				**50,000**							
2022 Watermain cleaning and lining					**435,000**						Operations (~4,600 LF of Pipe)
Misc Water Main Repairs					**55,000**						Operations
Replace/Update SCADA System (1/3)					**25,000**						
2023 Watermain cleaning and lining						**440,000**					Operations (~4,600 LF of Pipe)
Misc Water Main Repairs						**55,000**					Operations
2024 Watermain cleaning and lining							**445,000**				Operations (~4,600 LF of Pipe)
Misc Water Main Repairs							**55,000**				Operations
2025 Watermain cleaning and lining								**450,000**			Operations (~4,600 LF of Pipe)
Misc Water Main Repairs								**55,000**			Operations
2026 Watermain cleaning and lining									**455,000**		Operations (~4,600 LF of Pipe)
Misc Water Main Repairs									**55,000**		Operations
2027 Watermain cleaning and lining										**460,000**	Operations (~4,600 LF of Pipe)
Misc Water Main Repairs										**55,000**	Operations
	$405,000	**$530,000**	**$570,000**	**$645,000**	**$515,000**	**$495,000**	**$500,000**	**$505,000**	**$510,000**	**$515,000**	

2018-2027 Capital Improvement Plan
Sewer Department
602-49450

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total Cost	Funding / Notes
Collection District 3: I/I Reduction	**$55,000**										**$55,000**	Operations
Sanitary Sewer Lining Program	**$165,000**										**$165,000**	Operations
Silver Lake Lift Station Feasibility		**$25,000**									**$25,000**	Bonding
Collection District 3: I/I Reduction		**$60,000**									**$60,000**	
Sanitary Sewer Lining Program		**$165,000**									**$165,000**	
Silver Lake Lift Station Recon			**$295,000**								**$295,000**	
Collection Districts: I/I Reduction			**$65,000**								**$65,000**	Operations
Sanitary Sewer Lining Program			**$165,000**								**$165,000**	Operations
Update/Replace SCADA System												
Collection Districts: I/I Reduction				**$70,000**							**$70,000**	Operations
Sanitary Sewer Lining Program				**$165,000**							**$165,000**	Operations
Update/Replace SCADA System (1/3)					**$25,000**						**$25,000**	Cost share w/ Water and Storm
Collection District 3: I/I Reduction					**$70,000**						**$70,000**	Operations
Sanitary Sewer Lining Program					**$170,000**						**$170,000**	Operations
Sanitary Sewer Collection Model						**$30,000**					**$30,000**	
Collection Districts: I/I Reduction						**$75,000**					**$75,000**	Operations
Sanitary Sewer Lining Program						**$170,000**					**$170,000**	Operations
Collection Districts: I/I Reduction							**$75,000**				**$75,000**	
Sanitary Sewer Lining Program							**$175,000**				**$175,000**	
Collection Districts: I/I Reduction								**$75,000**			**$75,000**	
Sanitary Sewer Lining Program								**$175,000**			**$175,000**	
Collection Districts: I/I Reduction									**$75,000**		**$75,000**	
Sanitary Sewer Lining Program									**$175,000**		**$175,000**	
Collection Districts: I/I Reduction										**$75,000**	**$75,000**	
Sanitary Sewer Lining Program										**$175,000**	**$175,000**	
	$220,000	**$250,000**	**$525,000**	**$235,000**	**$265,000**	**$275,000**	**$250,000**	**$250,000**	**$250,000**	**$250,000**	**$2,770,000**	

2018-2027 Capital Improvement Plan

Storm Sewer Department
604-49650

Project Description	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total Cost	Funding / Notes
\												
Reconstruction of MH's and/or CB's in Street Zone Work	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$50,000	$50,000	$55,000	$55,000	$480,000	by Annual Street Rehabilitation Zone
Trunk storm sewer lining: Central to Jackson Pond								$325,000			$325,000	Local: Bonding
Tyler Place (AREA) Storm Sewer Imprt (Central to easement)				$275,000							$275,000	Local: Bonding
Boat Landing Pond Reconstruction (RCWD)		$325,000										RCWD Cost Share
40th Avenue: Central to La Belle Pond piping replacement	$275,000										$275,000	Coordinate w/ County
Trunk storm sewer lining: Labelle Park to easement					$300,000						$300,000	Local: Bonding
University-TH47 flood mitigation/infiltration (study - w/MNDOT)		$25,000									$25,000	Coordinate w/ MnDOT; MWMO
44th & Tyler Place flood mitigation (property acquisition/grading)			$325,000								$325,000	DNR Flood Hazard Mitigation Grant
Trunk storm sewer lining: 44-1/2th Easement									$275,000		$275,000	Local: Bonding
49th & Central flood mitigation (study - w/MNDOT)					$25,000						$25,000	Operations / MnDOT
Westside flood mitigation (study - multi jusidictional)					$35,000						$35,000	Coordinate w/ Fridley, County, MnDOT
SCADA system upgrades/replacements					$25,000						$25,000	Operations
Gauvitte Park Area: Flood control / Water Quality study		$25,000									$25,000	Coordinate w/ Fridley, County, MnDOT
Gauvitte Park Area: Property Acquisition				$225,000							$225,000	Coordinate w/ Fridley, County, MnDOT
Gauvitte Park Area: Flood control / Water Quality Improvements						$475,000					$475,000	Coordinate w/ Fridley, County, MnDOT
Huset Park East - rate control and WQ improvements							$500,000				$500,000	
Railroad Yard: Pipe Replacement										$360,000	$360,000	Local: Bonding
Total by Year:	$320,000	$420,000	$370,000	$545,000	$430,000	$520,000	$550,000	$375,000	$330,000	$415,000		
										CIP Average:	$427,500	

CAPITAL IMPROVEMENT PROGRAM 2018-2023

SUMMARY LISTING BY DEPARTMENT AND YEAR OF REQUEST

STREETS/MUNICIPAL STATE AID: 2018

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED COST *	FUNDING SOURCES	REMARKS
1	MSAS 110	39th Avenue Huset Pkwy to Central Ave Street Reconstruction	2018	**$875,000**	402 Assess	MSA, Local
2	MSAS 101	Bituminous Overlay 37th Avenue Main St to 5th St	2018	**$620,650**	402 Assess Cost Share	MSA, Local 1/2 cost w/ City of Minneapolis
3	MSAS 102	Main Street 37th Ave to 40th Ave	2018	**$267,850**	402 Assess	MSA, Local
			TOTAL 2018:	$1,763,500		

STREETS/MUNICIPAL STATE AID: 2019

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED MSA COST *	FUNDING SOURCES	REMARKS
4	MSAS 101	Bituminous Overlay 37th Avenue 5th St to Central Ave	2019	**$300,000**	402 Assess Cost Share	MSA, Local 1/2 cost w/ City of Minneapolis
5	MSAS 104	44th Avenue University to Jefferson	2019	**$750,000**	402 Assess	MSA, Local
6	MSAS 112	40th from McKinley to Hayes defects	2019	**$95,000**	212	MSA Maint, Local Pavement rutting
7	TH 65	Traffic Signal Replacement, 41st & TH *(estimate provided by MnDOT)*	2019	**$390,000**	Cost Share 402	1/2 Share with MnDOT MSA
8	TH 47	Bituminous Trail TH 47, 38th Ave to 40th Ave	2019	**$145,000**	402, 212 Other	MSA Off-System MSA Maint
			TOTAL 2019:	$1,680,000		

STREETS/MUNICIPAL STATE AID: 2020

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED MSA COST *	FUNDING SOURCES	REMARKS
9		Retaining Walls	2020			MSA Maint
	MSAS 101	37th Avenue, E of Polk St		**$115,000**	212	
	MSAS 112	40th Avenue, W of Hayes St		**$85,000**	212	
10		Bituminous Overlay	2020			MSA, Local
	MSAS 118	53rd Avenue Raised Median & Roundabout University Ave to Central Ave		**$1,400,000**	402 Cost Share	HSIP Grant Joint w/Fridley Possible trail south side
	MSAS 117	47th Avenue Central Ave to Tyler St		**$225,000**	402 Assess	
	MSAS 106	Hart Blvd 37th Ave to 39th Ave		**$285,000**	402 Assess	Possible Trail west side
			TOTAL 2020:	$2,110,000		

CAPITAL IMPROVEMENT PROGRAM 2018-2023

SUMMARY LISTING BY DEPARTMENT AND YEAR OF REQUEST

STREETS/MUNICIPAL STATE AID: 2021

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED MSA COST *	FUNDING SOURCES	REMARKS
11	MSAS 116	Trail: Reservoir Blvd and Fillmore Street, 44th Ave to 49th Ave	2020	**$51,800**	402	MSA MWW site alignment
12	MSAS *VARIOUS*	Crack Seal and Seal Coat	2021	**$105,500**	212	MSA
13	CSAH 2	40th Avenue	2021	**$2,760,033**	402	
		University Ave to Central Ave including:		TBD	Assess	
		Full Reconstruct		$2,160,000	Cost Share	Anoka Co Cost Share & MSA
		Storm Sewer		$385,000		MWMO, MSA , Local
		Streetscape		$215,000		MSA Off-System, Local
			TOTAL 2021:	$2,917,333		

STREETS/MUNICIPAL STATE AID: 2022

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED MSA COST *	FUNDING SOURCES	REMARKS
14	MSAS 101	37th Avenue	2022	**$10,000,000**	402	Fed Grant, MSA, Utility Funds
		Central Ave to Stinson Blvd			Cost Share	1/2 cost w/ City of Minneapolis
		Street Reconstruction, utilities, trail, lighting			Assess	
15	MSAS 114	37th Place	2022	**$235,000**	402	MSA - Cul-de-Sac street
		37th Ave to Stinson Blvd				existing concrete
		Street Removal/Recon				
		Bituminous Overlay				
16	MSAS 116	Reservoir Boulevard	2022	**$475,000**	402	MSA Local
		44th Avenue to 46th Avenue			Assess	
		Fillmore Street				
		44th Ave to 49th Ave				
			TOTAL 2022:	$10,710,000		

STREETS/MUNICIPAL STATE AID: 2023

ITEM NO.	ROUTE NO.	IMPROVEMENT DESCRIPTION	CONSTRUCTION YEAR	ESTIMATED MSA COST *	FUNDING SOURCES	REMARKS
17	TH 65	Central Ave: 43rd to 47th	2023	**$1,450,000**	402	Fed HSIP Grant, MSA
		Sidewalk reconstruction, ROW, new lighting			Cost Share	Hilltop
18	MSAS 104	44th Avenue	2023	**$825,000**	402	MSA, Local
		Jefferson to Central			Assess	
		Street Removal/Recon				
19	MSAS 116	Trail: Reservoir Blvd and Fillmore	2020	**$51,800**	212	MSA
		Street, 44th Ave to 49th Ave				MWW site alignment
			TOTAL 2022:	$2,326,800		

MSAS CAPITAL IMPROVEMENT PROGRAM TOTAL: $21,507,633

* Estimated Project Costs consists of construction costs plus 20% of the construction cost for engineering

CAPITAL IMPROVEMENT PROGRAM 2018-2023

SUMMARY LISTING BY DEPARTMENT AND YEAR OF REQUEST

2018-2027 Capital Improvement Plan
Traffic Signals and Signs Department(s)
101-43170, 101-43160 & 212-43190

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026
Replace street signs in reconstruction zone			$7,500	$7,500	$7,500	$7,500	$7,500		
Paint semiphores, Central & University	$60,000				$30,000				
Street Light LED Changeout									
Huset Parkway					$29,500	$25,500			
Central Avenue: 37th - 43rd Avenues			$104,500	$55,500					
41st Avenue (east and west of Central)							$15,000		
Traffic Signal Replacement (Central Ave @ 41st)		$160,000							
Traffic Signal Replacement (Central Ave @ 44th)					$170,000				
Traffic Signal Replacement (University at 44th)								$180,000	

2027	Total Cost	Notes
	$37,500	regulatory and street name
$30,000	$120,000	
	$55,000	
	$160,000	
	$15,000	
	$160,000	incl painting and backlit street signs
	$170,000	incl painting and backlit street signs
	$180,000	incl painting and backlit street signs

APPENDIX - B
VALLEY VIEW ELEMENTARY SCHOOL SRTS PLAN

Valley View Elementary

Safe Routes to School Plan

Columbia Heights, Minnesota | August 2013

Funded through a MnDOT
Safe Routes to School Planning Assistance Grant

alta PLANNING + DESIGN

community design group

MINNESOTA DEPARTMENT OF TRANSPORTATION

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Acknowledgements

The following key people/entities participated in the Safe Routes to School (SRTS) plan efforts for Columbia Heights School District. Their creativity, energy, and commitment were critical to the success of this planning effort.

Kristen Stuenkel - Director of Community Education

Bryan Hennekens - Director of Technology and Security Services

Tom Foley - Manager of Building and Grounds

Bill Holmgren - Director of Finance and Operations

Michele DeWitt - Highland Elementary Principal

Jeff Cacek - North Park Elementary Principal

Willie Fort - Valley View Elementary Principal

Mary Bussman - Columbia Academy Principal

Carl Lightbody - Highland Elementary Teacher and Crossing Guard Instructor

Mark Renner - Valley View Elementary Teacher and Crossing Guard Instructor

John Schwint - Valley View Elementary Teacher and Crossing Guard Instructor

Stan Mraz - North Park Elementary Teacher and Crossing Guard Instructor

Terry Nightingale - City of Columbia Heights Police Officer

Krista Czerwinski - Anoka County Community Health and Environmental Services Statewide Health Improvement Program Educator

Carla Pederson - Anoka County Community Health and Environmental Services Statewide Health Improvement Program Educator

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Table of Contents

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Introduction

What is Safe Routes to School?

Safe Routes to School (SRTS) is a program with a simple goal: helping more children get to school by walking and bicycling. Envision active kids using safe streets, helped by engaged adults (from teachers to parents to police officers), surrounded by responsible drivers.

Safe Routes to School programs use a variety of strategies to make it easy, fun and safe for children to walk and bike to school. These strategies are often called the "Five Es."

- Education: programs designed to teach children about traffic safety, bicycle and pedestrian skills, and traffic decision-making.
- Encouragement: programs that make it fun for kids to walk and bike. These programs may be challenges, incentive programs, regular events (e.g. "Walk and Bike Wednesdays") or classroom activities.
- Engineering: physical projects that are built to improve walking and bicycling conditions.
- Enforcement: law enforcement strategies to improve driver behavior near schools.
- Evaluation: strategies to help understand program effectiveness, identify improvements, and ensure program sustainability.

Benefits of Walking and Bicycling to School

Safe Routes to Schools programs directly benefit schoolchildren, parents and teachers by creating a safer travel environment near schools and by reducing motor vehicle congestion at school drop-off and pick-up zones. Students that choose to bike or walk to school are rewarded with the health benefits of a more active lifestyle, with the responsibility and independence that comes from being in charge of the way they travel, and learn at an early age that biking and walking can be safe, enjoyable and good for the environment.

Safe Routes to Schools programs offer ancillary benefits to neighborhoods by helping to slow traffic and by providing infrastructure improvements that facilitate biking and walking for everyone. Identifying and improving routes for children to safely walk and bicycle to school is also one of the most cost-effective means of reducing weekday morning traffic congestion and can help reduce auto-related pollution.

In addition to safety and traffic improvements, a SRTS program helps integrate physical activity into the everyday routine of school children. Health concerns related to sedentary lifestyles have become the focus of statewide and national efforts to reduce health risks associated with being overweight. Children who bike or walk to school have an overall higher activity level than those who are driven to school, even though the journey to school makes only a small contribution to activity levels. Active kids are healthy kids. Walking or bicycling to school is an easy way to make sure that children get daily physical activity.

SRTS benefits children:

- Increased physical fitness and cardiovascular health
- Increased ability to focus on school
- A sense of independence and confidence about their transportation and their neighborhood

SRTS benefits neighborhoods:

- Improved air quality as fewer children are driven to school
- Decreased crashes and congestion as fewer children are driven to school
- More community involvement as parents, teachers and neighbors get involved and put "eyes on the street"

SRTS benefits schools:

- Fewer discipline problems because children arrive "ready to learn"
- Fewer private cars arriving to drop off and pick up children
- Opportunities to integrate walking, bicycling and transportation topics into curriculum (e.g. "Walk & Bike Across America,"
- Increased efficiency and safety during drop off and pick up times

Why is a Safe Routes to School Program Important?

Although most students in the United States walked or biked to school pre-1980's, the number of students walking or bicycling to school has sharply declined. Statistics show that 48 percent of students between 5 and 18 years of age walked to school in 1969, with 87 percent walking or bicycling within a mile of school. In 2009 fewer than 14 percent of all students walked to get to school[1]. This decline is due to a number of factors, including urban growth patterns and school siting requirements that encourage school development in outlying areas, increased traffic, and parental concerns about safety. The situation is self-perpetuating: As more parents drive their children to school, there is increased traffic at the school site, resulting in more parents becoming concerned about traffic and driving their children to school.

According to a 2005 survey by the Center for Disease Control, parents whose children did not walk or bike to school cited the following barriers:

- Distance to school 61.5%
- Traffic-related danger 30.4%
- Weather 18.6%
- Crime danger 11.7 %
- Prohibitive school policy 6.0%
- Other reasons (not identified) 15.0%

A comprehensive Safe Routes to School program addresses the reasons for reductions in walking and biking through a multi-pronged approach that uses education, encouragement, engineering and enforcement efforts to develop attitudes, behaviors and physical infrastructure that improve the walking and biking environment.

The downward cycle of traffic and reduced walking and bicycling

[1] National Safe Routes Partnership, 2009

Valley View Elementary SRTS Planning Background

The Columbia Heights District, including Valley View Elementary, has developed partnerships with district and school staff, and Statewide Health Improvement Plan (SHIP) Initiative staff. Existing policies related to SRTS include a Bus Safety Policy, a bike parking policy, and a Wellness Policy which promotes physical activity but makes no direct reference to SRTS.

The Columbia Heights District has set several SRTS goals which will apply to all participating schools, including the creation of school-specific plans that include recommendations related to traffic control devices, parking, drop-off zones, crosswalks and bike lanes to ensure future improvement projects are effective in maximizing safety; creating consistent transit plans across the identified schools within the district to streamline traffic flow, information sharing and enforcement efforts in an effective and cost savings approach; and creating consistent SRTS best practices through district-wide training and standardized building implementation.

Support for Implementation

Proposed SRTS plans for Columbia Heights would receive implementation support from participating Columbia Heights Schools including Valley View, as well as support from SHIP staff. Evaluation efforts would include additional pedestrian and bicycle counts as well as parent surveys and school hand tallies to measure progress.

In the spring of 2013, the Columbia Heights School District received a MnDOT Non Infrastructure Implementation Grant to help support Safe Routes to school programs throughout the district. The grant will provide funds for a fleet of bicycles for safety skills training and additional funds to support SRTS programming.

Related Community Planning

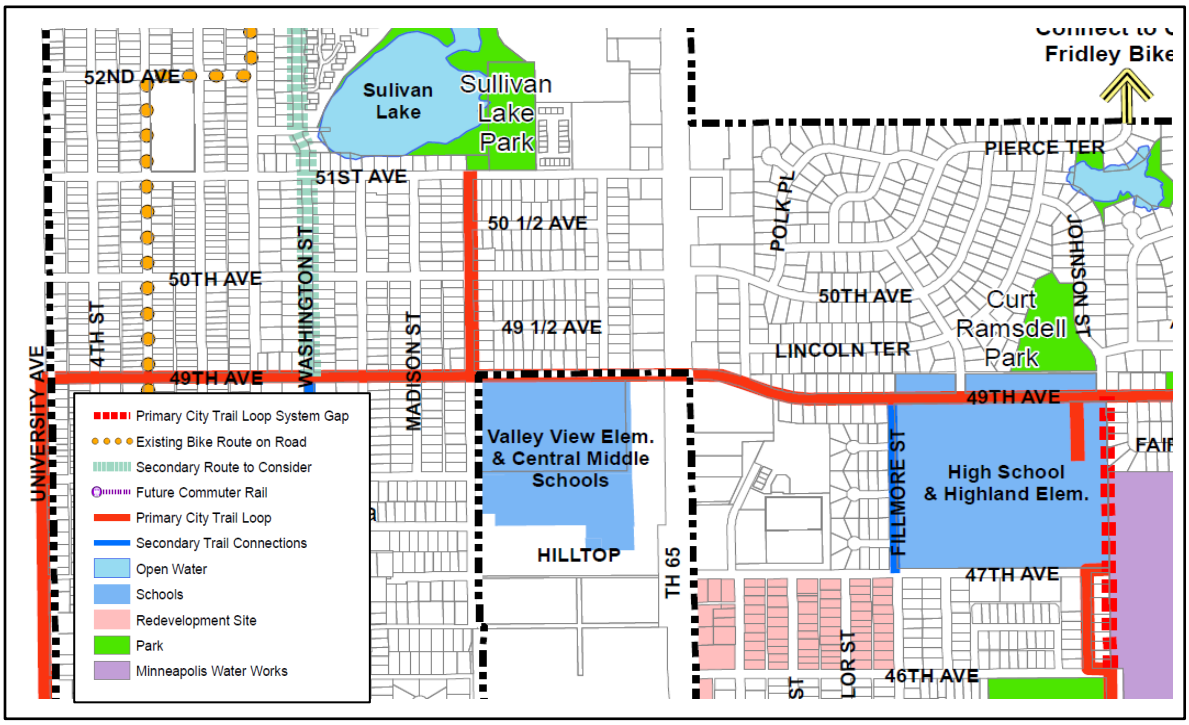
The following plans, programs, and efforts have taken place in Columbia Heights separate from this project's SRTS process, and may have important implications for student walking and biking to area schools:

- **The Columbia Heights Bicycle and Pedestrian Mobility Plan**
  This 2008 plan was developed to ensure that future development includes infrastructure that provides access and connections for bicyclists and pedestrians. Additionally, the plan's intention was to outline a bicycle and pedestrian network that connects important destinations within the city to each other and to the broader regional network

- **The Columbia Heights Comprehensive Plan**
  This 2010 plan provides an overview and plan for developing off-road and on-road bicycle facilities in the city, including bicycle lanes, shared bus/bicycle lanes, shared lanes, widened curb/widened outside lanes or shoulders, and local roadways. The Park and Trails Plan Recommended Route Network within this document calls out the following roadways/paths adjacent to Highland Elementary as key routes:

- 49th Ave from University Ave to Chatham Rd is identified as part of the Primary City Trail Loop
- Monroe St from 49th Ave to Sullivan Lake Park

"Connecting residential areas to schools and parks" is also one of five prioritization criterion listed in the plan.
In addition, the plan presents a list of strategies for addressing pedestrian and bicycle facility needs such as prioritizing accessibility improvements, encouraging traffic calming measures, implementing bicycle and pedestrian best practices, and prioritizing a programming schedule for developing the desired network outlined in the 2008 Pedestrian and Bicycle Mobility Plan.

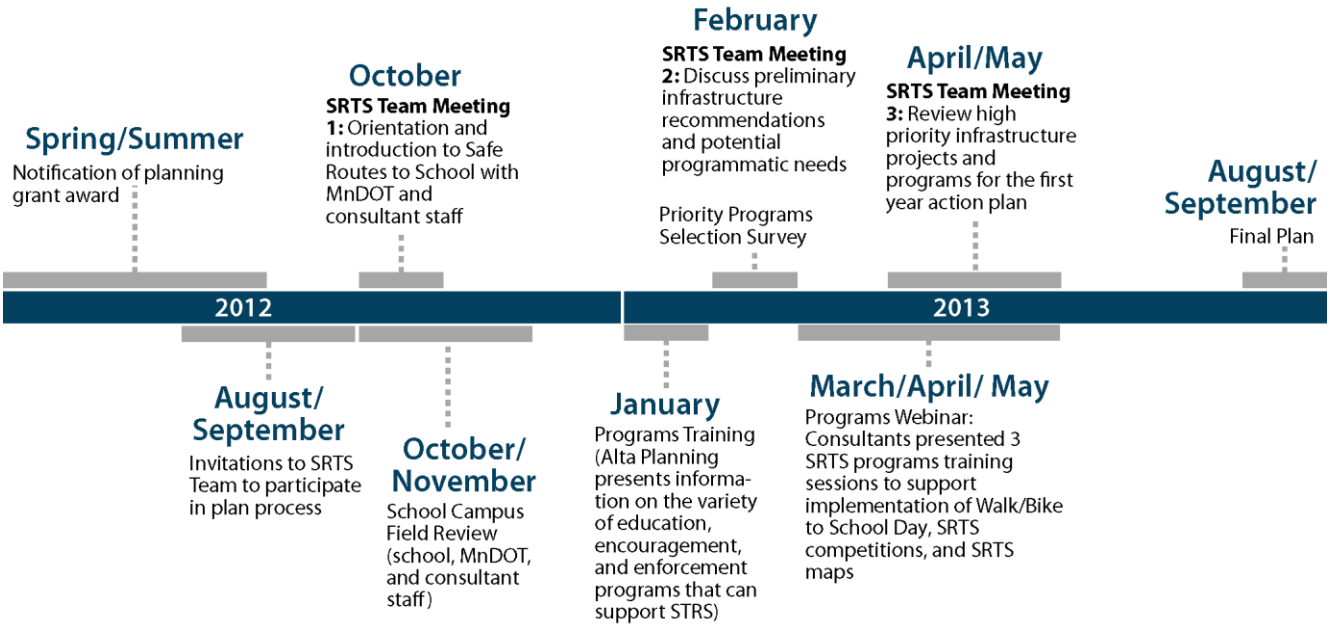


Excerpt from Figure 5-1of the Columbia Heights Comprehensive Plan

Planning Process

The year-long planning process for this SRTS Plan included building a SRTS team; gathering data and information about existing conditions; developing recommendation for the 5 E's; and developing a written document that set forth a path for the SRTS program at Liberty Ridge Elementary School. The graphic below depicts key milestones in the planning process.

SRTS Plan Milestones



How to Use this Plan

This SRTS plan provides an overview of Safe Routes to School with specific recommendations for a 5 E's approach to improve the safety and the health and wellness of Valley View Elementary School students. The specific recommendations in this plan are intended to support infrastructure improvements and programs over the next 5 years.

It should be noted that not all of these projects and programs need to be implemented right away to improve the environment for walking and biking to school. The recommended projects and programs listed in this plan should be reviewed as part of the overall and ongoing strategy for Valley View Elementary School. Some projects will require more time, support, and funding than others. It is important to achieve shorter-term successes while laying the groundwork for progress toward some of the larger and more complex projects.

A clear goal of SRTS programs is simply to increase the number of students that bike and walk to school, however, many schools are located in neighborhoods or along roadways that do not have the infrastructure to support students biking or walking to school. This does not mean that the school community will not benefit from a SRTS program. The infrastructure will likely improve over time, but the school community can begin to improve safety and healthy options for students through programs and innovative approaches that meet the unique school context.

Valley View Elementary School currently has significant gaps in pedestrian infrastructure and thus major barriers to walking and biking to school. While the first priority is to increase the number of students walking and cycling, he environment better for bicycling and walking to school and in the greater community.

Secondary priority SRTS objectives include:

- **Reducing the number of private cars on campus.** This can be accomplished via increasing bus ridership, carpooling for students and staff. Fewer private cars on campus reduces congestion and potential for conflicts.
- **Improving air quality**. Introduce 'no idling' campaigns and enforcement for buses and private cars
- **Establish programs that build on safety in numbers.** Developing programs to encourage students to bike or walk to school with adult supervised events such as walking Wednesdays, and remote drop off locations for parents to walk their students in to school. Walking and cycling in large groups with adult supervision can overcome some of the issues associated with a lack of infrastructure.
- **Incorporate daily activity into the student's school day**. Establish opportunities for students walk or run throughout the day while at school to create healthy lifelong habits in the students.
- **Teach students pedestrian and bicycle safety and competence.** Safe walking and biking skills are life skills, and will be useful for students traveling to friend's houses, soccer games, aquatic centers, etc, with and without their parents. Knowing how to walk safely in the road on neighborhood streets, and how to determine if a street is appropriate to walk or bike in are useful skills at all ages.

This plan includes recommendations for infrastructure projects both long and short term as well as programmatic recommendations. At the heart of every successful Safe Routes to School comprehensive program is a coordinated effort by parent volunteers, school staff, local agency staff, law enforcement and community advocates, such as, public health. The following paragraphs highlight the unique contributions of key partners in Safe Routes to School.

Parents can use this report to understand the conditions at their children's school and to become familiar with the ways a SRTS program can work to make walking and biking safer. Concerned parents or city residents have a very important role in the Safe Routes to School process. Parent groups, both formal and informal have the ability and the responsibility to help implement many of the educational and encouragement programs suggested in this plan. Parent groups can also be critical to ongoing success by helping to fundraise for smaller projects and programs that are implementable without serious effort on behalf of the district or local agency.

School district and school administrative staff can use this report to prioritize improvements identified on District property and develop programs that educate and encourage students and parents to seek alternatives to single family commutes to school.

District officials are perhaps the most stable of the stakeholders for a Safe Routes to School program and have the responsibility for keeping the program active over time. District staff can work with multiple schools sharing information and bringing efficiencies to programs at each school working on Safe Routes.

Parents lead students on walking school bus from a park and walk site.

School Administrators have an important role in implementing the recommendations contained within this SRTS Plan. This plan is unique to Valley View Elementary School; as such the impetus for change and improvement must be supported by the leadership of the school. School administrators can help with making policy and procedural changes to projects that are within school grounds and have the responsibility to distribute informational materials to parents within school publications.

City and County staff can use this report to identify citywide issues and opportunities related to walking and biking and to prioritize infrastructure improvements. City staff can also use this report to support Safe Routes to School funding and support opportunities such as:

- MnDOT Safe Routes to School (SRTS) grants
- Federal Safe Routes to School (SRTS) grants
- Future Statewide Health Improvement Program (SHIP)

For all infrastructure recommendations, a traffic study and more detailed engineering may be necessary to evaluate project feasibility, and additional public outreach will be conducted before final design and construction. For recommendations within the public right-of-way, the responsible agency will determine how (and if) to incorporate suggestions into local improvement plans and prioritize funding to best meet the needs of each school community.

Police department staff can use this report to understand issues related to walking and biking to school and to plan for and prioritize enforcement activities that may make it easier and safer for students to walk and bike to school. The Police Department will be instrumental to the success of the enforcement programs and policies recommended in this plan. The Police Department will also have a key role in working with school administration in providing officers and assistance to some of the proposed education and encouragement programs.

Public health staff can use this report to identify specific opportunities to collaborate with schools and local governments to support safety improvements and encourage healthy behaviors in school children and their families.

Bicycle rodeos help students learn important safety lessons and riding skills.

School Site Description

School Context:

Valley View Elementary is a K-5 school located on 49th Avenue Northeast with the boundaries of Hilltop, a small city of just under 500 residents completely surrounded by the City of Columbia Heights. The school is located next to Columbia Academy Middle School. Columbia Heights is a suburban city of 19,496 people located just north of Minneapolis. Two primary corridors, University Avenue NE and Central Avenue NE, offer access into Northeast Minneapolis. To the east of the school sits Central Avenue NE, which sees heavy vehicle traffic and is lined with commercial land uses. To the north and west of the school sit single-family residential homes built on an urban-like grid structure. To the south is trailer park housing in the City of Hilltop. The average age of Columbia Heights residents was 36.9 years at the time of the 2010 U.S. Census, below the state average of 37.4 years. Median household income in Columbia Heights is $51,967, below the statewide average of $58,476, based on 2007-2011 American Community Survey 5-Year Estimates. School enrollment for the 2012-2013 school year was 459 students.

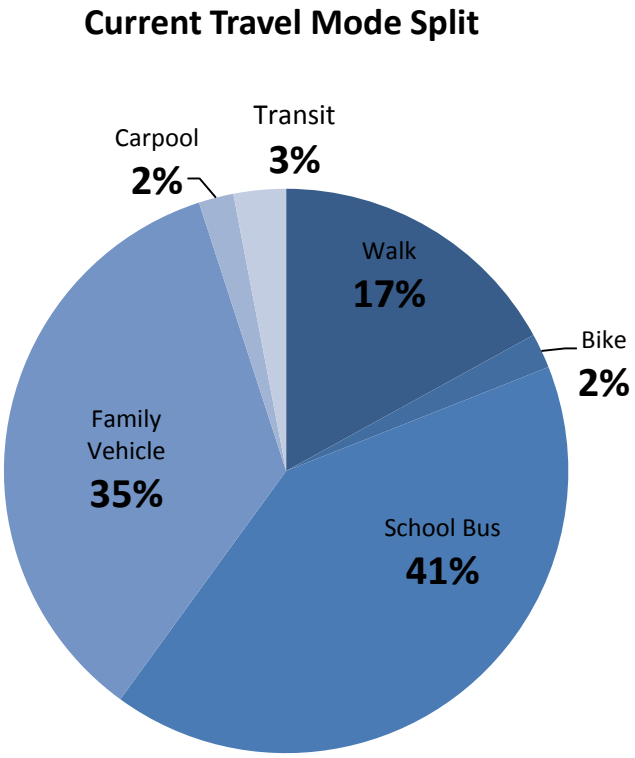
Current Travel Modes:

In-classroom tallies of students' arrival and departure modes were conducted at Valley View Elementary School in May 2013 over 2 days. A total of 712 trips were tallied in the mornings of the two days on which surveys were implemented. Surveys were not implemented in the afternoons to determine modes of transportation for school departure. As shown in the chart, an average of 17% of students currently walk to school, and 2% bike. The predominant mode to and from school is by school bus, with an average of 41% of students using this mode.

School Campus:

The school sits on a large parcel (approximately 24 acres) that also hosts a baseball diamond and soccer facilities, as well as a middle school (Columbia Academy, also included in this project). A visitor parking lot is located on the west side of the building, directly north of a large recess / play court that is separated by a fence. Buses use a loop directly in front of the school building. The exit of the bus loop is adjacent to the entrance to Columbia Academy's parent loop, and is coincident with the entrance to a staff parking lot, and is very wide. On-site crossings and sidewalks join Valley View and Columbia Academy

, and connect to the south side of 49th Avenue NE. An unpaved / degraded path connects the school to the Hilltop mobile home community directly south of the campus. A staircase at the southwest corner of the play court connects the campus to Monroe Street NE. Bike racks are present in the front of the school but are of a "comb" type, not recommended for securely locking bicycles.



Surrounding Land Use:

Valley View Elementary is located along 49th Avenue NE - a B-Minor Arterial two-lane street connecting primarily single family residential districts to the west and east of the school with Highway 65 / Central Avenue NE, a major north-south multi-lane roadway classified as an A-Minor Augmentor. A school speed zone is present on 49th Ave in front of the school campus which reduces the 35 mph speed limit to 30 mph. The school is located about one eighth of a mile from Highway 65, which presents hazardous conditions for pedestrians attempting to cross east-west at street level. The school is located within the City of Hilltop (population 750), which has the distinction of being one of only of two cities in the US where the majority of residents live in manufactured (trailer) housing. All four trailer park locations comprising the city are sited immediately adjacent to the south of the school. Locations immediately west and north of the parcel where the school sits are primarily single family residential. Points east of the school host strip-mall businesses fronting Highway 65 / Central Avenue NE.

The path to the Hilltop community is not paved and lacks lighting currently.

Student Walking and Biking - Existing Conditions:

In general, sidewalks are not provided on the residential neighborhoods surrounding the school. The only continuous sidewalk provided is on the southern edge of 49th Avenue NE, immediately adjacent to the school's entrance, and connecting the pedestrian bridge over Highway 65 with the school and points west, until it reaches University Avenue NE / Highway 47, where it ends. This sidewalk has minimal buffer (planted edge) on the parcel where the school sits. West of Monroe Street NE (west edge of parcel) the buffer disappears and the sidewalk then sits directly adjacent to the roadway.

Monroe Street NE lacks sidewalks. Students walk on the grass and on the street. During winter, they walk on the street

The northeast street corner of Monroe Street NE / 49th Ave, where a marked crosswalk terminates, is not paved and is used as a location for snow storage. School staff have note that they routinely clear accumulation to facilitate student crossing movements. In addition, this location experiences significant runoff issues, especially during spring when snow melts. This makes it difficult for students to cross at this location due to large puddles which collect here.

Crossing Guard Locations:

Student patrols are positioned at north-south and east-west crossings at the intersection of Monroe Street NE and 49th Avenue NE. Teachers assist as crossing guards in the parking lot, but during dismissal they do not arrive at their posts ahead of time as they finish their day at the same time or after students are let out.

Parent Driver Staging Area:

Parents drop-off and pick up their students using the lot on the west side of the school building. Parents queue around the lot and make their drop-offs and pickups at a sidewalk on the school building side of the lot. The exit to the lot is shared with the entrance to the bus lot. To exit the lot parents must cut across the one-way lane which is used to enter the lot which can create difficulties and potential traffic conflicts. In addition to using the parking lot for pickup and drop-off, parents also queue in the street where there is a shoulder available.

The staircase from the campus to Monroe Street NE is in poor condition

Bus Staging Area:

Three - four buses use a one-way loop on the front side of the school as their staging area. The loop entrance is on the west side and is shared with the entrance/exit to the parent driver staging area. The exit to the loop is in the center of the site and is shared with the staff parking lots as well as the entrance to the parent driver staging area for Columbia Academy, whose dismissal and arrival processes do not coincide with Valley View's.

Infrastructure Recommendations

Current conditions were in part observed during a 2007-09 police analysis of pedestrian accidents which resulted in the construction of a pedestrian bridge at 49th and Central Ave. Additionally, conditions on site and around Valley View Elementary were observed during a walking audit which took place on October 23rd, 2012. The audit was led by consulting staff with expertise in SRTS, with participation from local stakeholders. Observations of the dismissal process were also made during this audit.

The combined campuses of Valley View Elementary and Columbia Academy present some great opportunities for improvements. However, their location along 49th and near 65th/Central creates challenges for students walking and cycling as well. The initial study yielded specific recommendations to address the key identified barriers to walking and biking at Valley View School. This plan does not represent a comprehensive list of every project that could improve conditions for walking and cycling in the neighborhood – but rather the key conflict points and highest priority infrastructure improvements to improve walking and cycling access to the school. The recommendations range from simple striping changes and school signing to more significant changes to the streets. Short term projects that should be addressed in the 2013-2014 school year are noted in the One Year Action Plan at the end of the infrastructure and programmatic recommendations. Some of the more significant recommendations for changes to streets may require policy changes, additional discussion and coordination, or significant funding sources. The One Year Action Plan notes the importance of getting started on planning and design for these larger projects.

All recommendations are described in Table 1 with locations shown on the Recommended Improvements Map. It should be noted that funding is limited and all recommendations made are planning level concepts only. Additional engineering studies will be needed to confirm feasibility and final costs for projects. The MNMUTCD guidelines (7C.2), encourage the use of crosswalks and signing on school routes in areas where there are likely to be conflicts and/or the need to delineate student travel paths. While existing traffic controls may meet standards for average traffic volumes on the roadway, the presence of school aged children should be considered a mitigating factor in selecting appropriate traffic control infrastructure. Crossings and key access points on school routes should be enhanced to provide increased legibility of desired travel patterns and behavior for all modes.

For more information about specific types of facilities mentioned, reference the Infrastructure Toolkit Glossary which is include directly after the recommendations map.

Maintenance

School routes and crosswalks should be prioritized for maintenance. To ensure high visibility crosswalks maintain their effectiveness, review all crosswalks within one block of the school each year. If there is notable deterioration, crosswalks should be repainted annually. In addition, crosswalks on key school walk routes should evaluated annually and repainted every other year or more often as needed.

While walking and cycling diminish during the cold winter months, it is particularly important to prioritize snow removal and maintenance of school routes. Snow removal is a critical component of pedestrian and bicycle safety. The presence of snow or ice on sidewalks, curb ramps, or bikeways will deter pedestrian and cyclist use of those facilities to a much higher degree than cold temperature alone. Families with children will avoid walking in locations where ice or snow accumulation creates slippery conditions that may cause a fall. Curb ramps that are blocked by ice or snow effectively sever access to pedestrian facilities. Additionally, inadequately maintained facilities may force pedestrians and bicyclists into the street. Identified routes to school should be given priority for snow removal and ongoing maintenance.

Table 1: Summary of SRTS infrastructure issues and recommendations for Valley View Elementary and Columbia Academy Middle

Project	Location	Problem/Issue	Solution/Recommendation	Lead Agency
A	Driveway off of 49th Ave NE and in between schools	Driveway is not formalized and makes for a long crossing.	Reevaluate driveway design to decrease pedestrian crossing distance.	School District
B	Pedestrian bridge over Central Ave NE	Students bypass bridge and attempt to cross highway at grade.	Provide education and a safety campaign specific to the pedstrian bridge over Central Ave NE. Consider targeted enforcment with school staff or law enforcement at key point during the year.	School Administration in collaboration with the Police Department
C	Monroe Street and 49th Ave NE	Critical intersection for SRTS, long crossing on 49th Ave NE.	Consider bump outs in the parking lanes on 49th Ave NE. Intersection should be considered a high priority for maintenance.	City of Columbia Heights
D	Informal path from trailer park to campuses	Informal trail can be seen on air photo leading from mobile home park to the back of the school.	This is important asset as many students live in the mobile home park. Consider formalizing the connection and institute a winter maintenance effort. Formal connection to the trailer park will require an easement.	City of Hilltop/School District
E	Central Ave NE and 47th Ave NE	Signalized intersection with crosswalks on the south and east legs.	Shorten curb radius of 47th Ave NE to discourage high speed right hand turns.	Anoka County/City of Columbia Heights
F	Campus and Monroe Street NE	Lack of sidewalk.	Consider sidewalk along entire length of campus.	School District
G	49th Ave NE from Central to Monroe	Critical SRTS corridor, lack of awareness of drivers that this is a school zone.	Increase signage and pavement markings to increase driver awareness. Consider speed and pedestrian yielding enforcement occasionally during the school year with concentrated enforcement at the beginning and end of the school year.	City of Columbia Heights (Public works and Police)
H	Jackson St NE and 49th Ave NE	Busy pedestrian crossing with minimal accommodations.	Consider bumpouts to decrease crossing distance. Consider a raised crosswalk. Install a bit of sidewalk at the northwest corner and pave the terrace to the sidewalk on the south side.	City of Columbia Heights

Table 1 Continued : Summary of SRTS infrastructure issues and recommendations for Columbia Academy Middle/ Valley View Elementary

Project	Location	Problem/Issue	Solution/Recommendation	Lead Agency
I	Driveway at west end of campus off of 49th Ave NE	Lack of crosswalks connecting existing sidewalks	Add ladder crosswalk across drive.	School District
J	Driveway between the schools off of 49th Ave NE	Lack of crosswalks connecting existing sidewalks	Add ladder crosswalk across drive.	School District
K	Driveway at east end of campus off of 49th Ave NE	Lack of crosswalks connecting existing sidewalks	Add ladder crosswalk across drive.	School District

Columbia Academy Middle and Valley View Elementary

Recommended Improvements Map

A short sidewalk on the NW corner of 49th Ave & Jackson St would provide a safe place for students to cross to.

- **A** Reevaluate driveway design to decrease pedestrian crossing distance.
- **B** Provide education and a safety campaign specific to the pedestrian bridge over Central Ave NE. Consider targeted enforcment with school staff or law enforcement at key point during the year.
- **C** Consider bump outs in the parking lanes on 49th Ave NE. Intersection should be considered a high priority for maintenance.
- **D** Consider formalizing the path from the mobile home park to the school entrance and institute a winter maintenance effort.
- **E** Shorten curb radius of 47th Ave NE to discourage high speed right hand turns.
- **F** Consider installing sidewalk along entire length of campus.
- **G** Increase signage and pavement markings to increase driver awareness. Consider speed and pedestrian yielding enforcement occasionally during the school year with concentrated enforcement at the beginning and end of the school year.
- **H** Consider bumpouts to decrease crossing distance. Consider a raised crosswalk. Install a bit of sidewalk at the northwest corner and pave the terrace to the sidewalk on the south side.
- **I** Add ladder crosswalk across drive.
- **J** Add ladder crosswalk across drive.
- **K** Add ladder crosswalk across drive.

alta PLANNING + DESIGN

community design group

MINNESOTA DEPARTMENT OF TRANSPORTATION

Data obtained from MnDOT

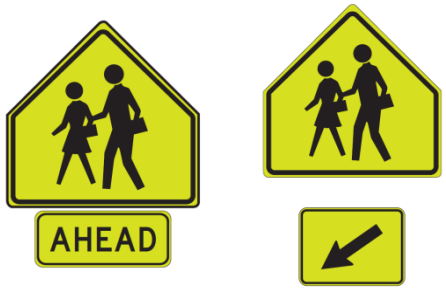
Infrastructure Toolkit Glossary

This toolkit is intended to provide an introduction to the specific infrastructure improvement commonly used for Safe Routes to School. It is included directly in the plan in effort to make it an easily available reference point for all parties using this plan. Not all treatments are appropriate at every school location. In all cases engineering judgement should be exercised when determining the best infrastructure solution.

School Area Specific Signing and Marking

School Sign (S1-1)

The School Sign (S1-1) is used to warn drivers that they are approaching a school area, or to identify the beginning of a designated school zone.



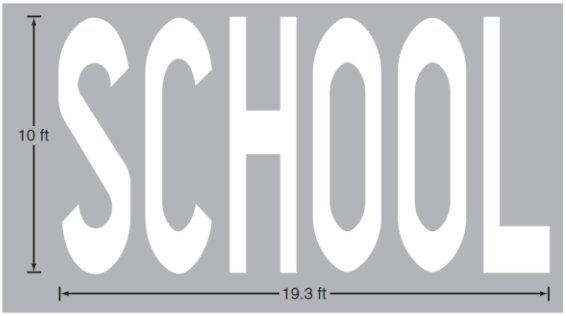
School Crossing Assemblies

The School Sign may be combined with small plaques to indicate specific crossing locations. A school sign combined with an AHEAD plaque (W16-9p) creates a *School Advance Crossing Assembly*, used to warn road users that they are approaching a crossing where schoolchildren cross the roadway.

At specific crosswalks or crossing locations, a *School Crossing Assembly* indicates the location of the crossing point where schoolchildren are expected to cross. It includes a School sign (S1-1) and a diagonal downward arrow (W16-7p) must be included.

School Zone Speed Limit Assembly

A School Zone Speed Limit Assembly identifies a speed limit for used in a specific geographic area. Speed limits may apply over limited time frames or conditions as indicated on the sign.



School Crossing Pavement Markings

As a supplement to a marked crosswalk, the SCHOOL word marking may provide additional warning to drivers about the potential presence of school children.

Crosswalk Treatments

Active Warning Beacon

Active warning beacons are user-actuated flashing lights that supplement warning signs at unsignalized intersections or mid-block crosswalks. Rectangular Rapid Flash Beacons (RRFBs), a type of active warning beacon, use an irregular flash pattern similar to emergency flashers on police vehicles.

Standard Marked Crossings

The simplest form of marked crosswalk is two transverse lines, indicating the crossing area. A marked crosswalk signals to motorists that they must stop for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer especially on multi-lane roadways.

In-Street Yield to Pedestrian Sign

In-street pedestrian crossing signs reinforce the presence of crosswalks and remind motorists of their legal obligation to yield for pedestrians in marked or unmarked crosswalks. This signage is often placed at high-volume pedestrian crossings that are not signalized. On streets with multiple lanes in each direction, additional treatments such as median islands or active warning beacons may be more appropriate.

High Visibility Marked Crossings

A marked crossing typically consists of a marked crossing area, warning signs and other markings to slow or stop traffic.

When space is available, a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one half of the street at a time.

Median Refuge Island

Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings. Crossings of two-way streets are simplified by allowing bicyclists and pedestrians to navigate only one direction of traffic at a time. This may also functions as a *Traffic Calming* technique when configured to manage access to streets.

Raised Crosswalk

Raised crosswalks are crossings elevated to the same grade as the multi-use trail. Raised crosswalks may be designed as speed tables, and have a slowing effect on crossing traffic.

A raised crossing profile design known as a sinusoidal profile may be selected for compatibility with snow removal equipment.

Pedestrian Hybrid Beacon

Pedestrian hybrid beacon are traffic control signals commonly used to stop traffic along a major street to permit safe crossing by pedestrians or bicyclists. The signals provide very high levels of compliance by using a red signal indication, while offering lower delay to motorized traffic than a conventional signal.

The Minnesota Manual on Traffic Control Devices permits Pedestrian Hybrid Beacon installation at both mid-block and intersection locations. (Section 4F.2) The Minnesota MUTCD says: "If installed at an intersection, appropriate side street traffic control should be considered." This may include STOP or YIELD signs as determined by a traffic engineer.

Additional Tools

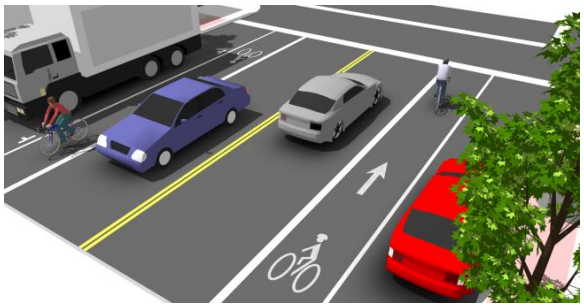
ADA Compliant Curb Ramps

Curb ramps allow all users to make the transition from the street to the sidewalk. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access.

Although diagonal curb ramps might save money, they create potential safety and mobility problems for pedestrians, including reduced maneuverability and increased interaction with turning vehicles, particularly in areas with high traffic volumes.

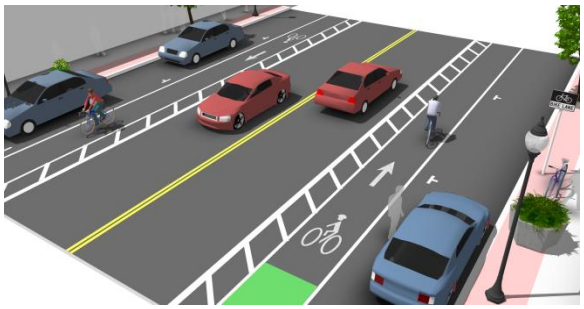
Advance Stop Bar

Advance stop bars increase pedestrian comfort and safety by stopping motor vehicles well in advance of marked crosswalks, allowing vehicle operators a better line of sight of pedestrians and giving inner lane motor vehicle traffic time to stop for pedestrians.



Bike Lanes

Bicycle lanes designate an exclusive space for bicyclists with pavement markings and signage. The bicycle lane is located adjacent to motor vehicle travel lanes and bicyclists ride in the same direction as motor vehicle traffic. Bicycle lanes are typically on the right side of the street (on a two-way street), between the adjacent travel lane and curb, road edge or parking lane.



Buffered Bike Lanes

Buffered bicycle lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.

Countdown Pedestrian Signal

Countdown pedestrian signals are particularly valuable for pedestrians, as they indicate whether a pedestrian has time to cross the street before the signal phase ends. Countdown signals should be used at all signalized intersections.

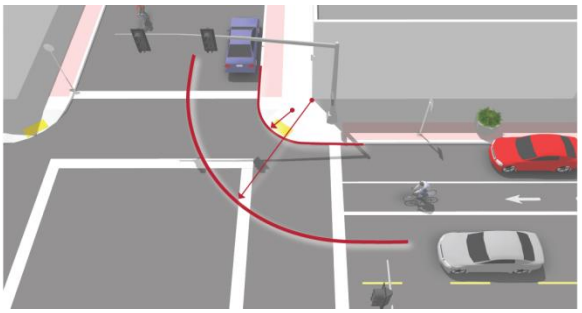
Signals should be timed to provide enough time for pedestrians to cross the street. The MUTCD recommends a longer pedestrian clearance time in areas where pedestrians may walk slower than normal, including the elderly and children.

Leading Pedestrian Interval

A leading pedestrian interval is a condition where a pedestrian signal displays a WALK signal for pedestrians prior to displaying a green signal for adjacent motor vehicle traffic. This early display gives pedestrians a head start and may increase the percentage of drivers who yield to crossing pedestrians.

Curb Extensions

Curb extensions are areas of the sidewalk extended into the roadway, most commonly where a parking lane is located. Curb bulbs help position pedestrians closer to the street centerline to reduce crossing distances and improve visibility and encourage motorists to yield at crossings.



Minimize Corner Radii

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances.

No Turn On Red

No Turn on Red restrictions prevent turns during the red signal indication to reduce motor vehicle conflicts with bicyclists and pedestrians using the crosswalk.

Traffic Calming

Reducing speeds or volumes along streets improves the pedestrian environment by limiting exposure, enhancing drivers' ability to see and react, and diminishing the severity of crashes if they occur. Common traffic calming techniques include speed humps, neighborhood traffic circles, chicanes, and pinch points.

Shared Use Paths

Shared Use paths may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, or as neighborhood cut-throughs to shorten connections and offer an alternative to busy streets.

Warning Signs

Warning signs call attention to unexpected conditions on or adjacent to a street or bicycle facility.

Around schools, the School Crossing Assembly is the most common type of warning sign, used to warn drivers to expect and anticipate bicycle crossing activity.

Program Recommendations

The Safe Routes to School movement has been a leader in acknowledging that infrastructure changes are a necessary but insufficient condition for shifting school travel behavior. While engineering improvements like sidewalks, crosswalks, and bikeways are important, equally important are education programs to make sure children and families have basic safety skills, encouragement programs to highlight walking and biking to school as fun and normal, enforcement against unsafe and illegal motorist behavior, and evaluation of the impact of investments and non-infrastructure efforts.

Priority Programs

The following five programs have been identified as priority programs for Valley View Elementary. For each program concept, the recommendation includes the primary intended outcomes, potential lead and partners, a recommended timeframe for implementation, resources and sample programs, and a short description. Additional program recommendations not identified as priority are listed in a subsequent section.

1. In-School Pedestrian Safety Education

Primary Outcomes	Improved walking safety behavior; youth empowerment
Potential Lead	Columbia Heights Public Schools: district, administrators, and teachers
Potential Partners	PTA/parents; Anoka County Community Health & Environmental Services; Columbia Heights Police; City of Columbia Heights
Recommended Timeframe	Once per year for first or second graders
Planning Resources	National Center for Safe Routes to School: http://www.saferoutesinfo.org/program-tools/NHTSA-pedestrian-curriculum
Sample Programs	Oregon Safe Routes to School: http://walknbike.org/pedestrian-safety/ National Highway Traffic Safety Administration: http://www.nhtsa.gov/ChildPedestrianSafetyCurriculum

Pedestrian safety education aims to ensure that every child understands basic traffic laws and safety rules. It teaches students basic traffic safety, sign identification, and decision-making tools. Pedestrian safety training is typically recommended for first- and second-graders and teaches basic lessons such as, "look left, right, and left again." In-school curriculum often includes three parts: in-class lessons, mock street scenarios, and on-street practice, if conditions allow it.

Pedestrian safety training teaches basic lessons such as, "look left, right, and left again."

In-class lessons introduce the topic of pedestrian safety to children, including what types of situations they may encounter on the road, how to follow street signs, and how to interact with drivers. Rhymes, songs, and videos can be used to help children remember how to walk and cross streets safely.

Mock street scenarios allow students to practice safe pedestrian behaviors at signalized intersections, unsignalized intersections, and driveways in a controlled environment. This can be done inside the classroom or on the blacktop. Once students have mastered the mock streets, they are taken on-street to practice. A short route with as many types of crossing situations as possible should be mapped before taking students out. At least one parent/chaperone should be encouraged to attend for increased adult support, though additional volunteers are recommended. Chaperones should be given safety materials, such as high visibility vests and stop paddles.

Various existing curricula are available online from a number of sources at no cost, or schools may choose to develop one on their own. Many of the curriculums available include scripts that are helpful for new teachers who may be unfamiliar with how to present the material.

2. In-School Bicycle Safety Education

Primary Outcomes	Improved bicycling safety behavior; youth empowerment
Potential Lead	Columbia Heights Public Schools: district, administrators, and teachers
Potential Partners	PTA/parents; Anoka County Community Health & Environmental Services; Columbia Heights Police; City of Columbia Heights
Recommended Timeframe	Once per year for third or fourth graders
Planning Resources	Bike Smart: http://www.bikesmart.org/
Sample Programs	Oregon Safe Routes to School: http://walknbike.org/bike-safety New York, NY: http://www.columbiasecondary.org/taxonomy/term/122?page=6

Bicycle safety training is generally most appropriate beginning in or after the third grade and helps children understand that they have the same responsibility as motorists to obey traffic laws. In-school curriculum often includes three parts: in-class lessons, mock street scenarios or skills practice, and on-street riding, if conditions allow it.

In-class lessons typically teach students about helmet safety, traffic laws, and hazards they may encounter on the roadway. On the mock street courses, children practice bicycle handling skills, riding in traffic, and hazard avoidance drills in a controlled environment. Once they have mastered their skills on the mock street, students are taken on the road to practice in real traffic situations. The route should be planned ahead of time to ensure a variety of bikeway and roadway types. When taking students on the road, there should be approximately one adult instructor per five children.

Various existing curricula are available online from a number of sources at no cost, or schools may choose to develop one on their own. Schools may also choose to bring in local instructors or bicycling experts to teach the courses. If taught during class time, helmets and bicycles of the appropriate size will need to be acquired as many students do not have access to their own. Cones, street signs, and chalk may also be necessary for the mock street scenario.

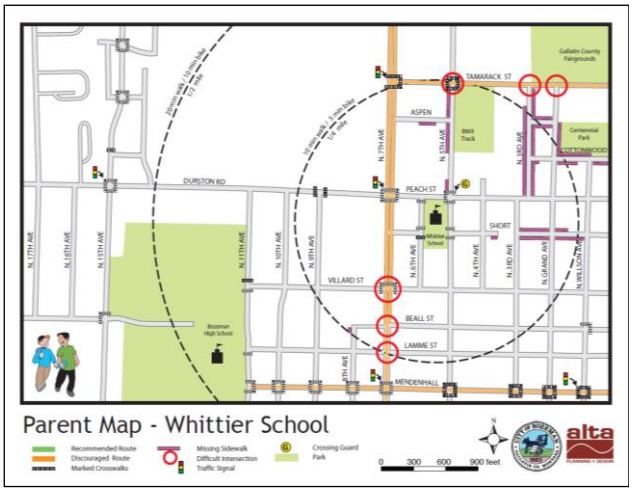
Students can practice bike safety skills in the controlled setting of the school campus

3. Walk and Bike to School Route Maps

Primary Outcome	Improved walking and bicycling safety
Potential Lead	Columbia Heights Public Schools
Potential Partners	Anoka County Community Health & Environmental Services; Columbia Heights Police; PTA/parents
Recommended Timeframe	Distribute when students and families are adjusting to new habits, e.g., back-to-school, following winter/spring break, as weather gets warmer. Revise and redistribute annually, if possible.
Planning Resources	National Center for Safe Routes to School's Map-a-Route Tool: http://maps.walkbiketoschool.org/
Sample Maps	Bozeman, MT: http://www.bozeman.k12.mt.us/schools/safe_routes/ Santa Clarita, CA: http://www.santa-clarita.com/index.aspx?page=177 Rochester, NY: http://www.walkinginfo.org/pedsafe/casestudy.cfm?CS_NUM=33

Walk and Bike to School Maps, sometimes called Suggested Route to School maps, help families choose the best route for walking or biking to school. Maps show stop signs, signals, crosswalks, sidewalks, bikeways, paths/trails, school entrances, bike parking, and/or crossing guard locations around a school. Maps may also show transit routes and stops, school enrollment areas, pick-up/drop-off zones, and important destinations, such as community centers and parks. Some less objective elements to consider include recommended routes, good walking/biking routes, and hazardous locations.

The team leading the mapping effort should decide in advance whether the maps will be distributed electronically or in paper form, as this can inform how the map is produced. Maps may be produced using mapping or drawing technologies, such as GIS or Adobe Illustrator, but can also be as simple as hand drawn maps or marked up Google maps. Students may also be engaged in the making of maps through classroom or after school activities.



Walk and Bike to School Maps show the safest streets and crossings for getting to school

4. Parent/PTA Workshop

Primary Outcome	Will depend on workshop topics, but could include increased walking, bicycling, transit use, and/or carpooling; improved walking, bicycling, and/or driving safety behavior; and health and/or environmental connections
Potential Lead	Columbia Heights Public Schools
Potential Partners	Teachers/administrators/staff; PTA/parents; Anoka County Community Health & Environmental Services; Columbia Heights Police; City of Columbia Heights
Recommended Timeframe	Once per year per topic, near the beginning of the school year or as habits change
Planning Resources	National Center for Safe Routes to School Guide: http://guide.saferoutesinfo.org/education/parents.cfm
Sample Program	Alameda County, CA: http://www.alamedacountysr2s.org/programs/parent-workshops/

Since parents are usually the ones deciding whether their children walk or bike to school, a workshop designed for them can provide the tools, resources, and support needed to begin walking or biking for transportation. Topics could include starting a walking school bus, carpool matching, launching a safety campaign, how to be a responsible driver, or organizing an event, such as Walk and Bike to School Day. Parent drivers are often part of the problem around school campuses – but can also be a powerful force for improved safety.

The workshop team will need to work with the school to schedule the workshop at a time that will facilitate the highest participation, such as in the evening after work or on weekend mornings. The team will also need to do substantial outreach to inform parents of the event, such as by sending flyers home with students, posting in school newsletters and on websites/bulletins, and putting up posters around the school. Outside instructors/speakers and materials/handouts may require additional funds.

Since parents are usually the ones deciding whether their children walk or bike to school, a workshop designed for them can develop a base of support for SRTS

5. Crossing Guards

Primary Outcomes	Improved walking/biking safety behavior; improved driving safety behavior
Potential Lead	Columbia Heights Public Schools; individual school administrators
Potential Partners	City of Columbia Heights; Columbia Heights Police; PTA/parents; teachers/administrators/staff; local volunteers
Recommended Timeframe	Ongoing, every day during drop-off and/or pick-up
Planning Resources	National Center for Safe Routes to School Guide: http://guide.saferoutesinfo.org/crossing_guard/index.cfm
Sample Program	Marin County, CA: http://www.tam.ca.gov/index.aspx?page=97

Crossing guards are trained adults, paid or volunteer, who are legally empowered to stop traffic to assist students with crossing the street. Crossing guards can be very effective in many traffic situations, such as stop-controlled intersections where drivers do not stop for pedestrians, midblock crossings with visibility issues and a lack of traffic control, and signalized intersections with high vehicle speeds and volumes.

Crossing guards should successfully complete a training program prior to beginning to assist children that includes appropriate training materials and equipment, such as safety vests and stop signs. Funding to pay crossing guards may be required and could come from the jurisdiction or the school district.

Crossing guards are legally empowered to stop traffic to assist students with crossing the street.

Additional Program Recommendations

The following additional programs are recommended as lower-priority options for Columbia Heights Public Schools.

1. Law Enforcement Activities

Primary Outcomes

Improved driving safety behavior

Sample Program

Charles County, MD: http://www.ccso.us/index.php?option=com_content&task=view&id=614

Description

Enforcement tools are aimed at ensuring compliance with traffic and parking laws in school zones. Enforcement activities help to reduce common poor driving behavior, such as speeding, failing to yield to pedestrians, turning illegally, parking illegally, and other violations. Law enforcement actions include School Zone Speeding Enforcement and Crosswalk Stings. Other enforcement actions can be led by the school administration, such as parking lot "citations."

2. School Safety Campaign

Primary Outcomes

This will depend on the communications; however, outcomes may include increased walking, bicycling, transit, and/or carpooling; improved walking, bicycling, and/or driving safety behavior; health and/or environmental connections; and youth empowerment.

Sample Program

San Jose (CA) Street Smarts Campaign: http://www.getstreetsmarts.org/

Description

A safety campaign is an effective way to build awareness around students walking and biking to school and to encourage safe driving behavior among parents and passersby. A school traffic safety campaign can use media at or near schools - such as posters, business window stickers, yard signs, and/or street banners - to remind drivers to slow down and use caution in school zones. This type of campaign can also address other specific hazards or behaviors, such as walking or bicycling to school, school bus safety, and/or parent drop-off and pick-up behavior.

3. School/Community Communications

Primary Outcomes

This will depend on the communications; however, outcomes may include increased walking, bicycling, transit, and/or carpooling; improved walking, bicycling, and/or driving safety behavior; and health and/or environmental connections.

Description

The strongest Safe Routes to School efforts are those that, over time, begin to make change to the culture of school transportation by normalizing walking and bicycling. One of the ways to help promote walking and bicycling as normal, everyday activities is to disseminate consistent, ongoing communications to the school community. The most effective way to reach parents and other community members is through existing communications, through media they already see, hear, and pay attention to. For this reason, it is recommended that Columbia Heights schools

identify the most used communication methods and take advantage of those existing channels for sharing Safe Routes to School facts, tips, education, and encouragement. The specific communication methods may depend on the individual school and could include parent emails, backpack mail, PTA publications, newsletters, community papers, websites, blogs, or social media. For example, a school may choose to feature a Safe Routes to School corner or page on their existing website if it is well used by parents and updated often.

Evaluation

Why evaluate?

Evaluation is an important component of any Safe Routes to School effort. Not only does evaluation measure a program's reach and impact on a school community, it can also ensure continued funding and provide a path forward for ongoing and future efforts. Evaluation can measure participation and accomplishments, shifts in travel behavior, changes in attitudes toward biking and walking, awareness of the Safe Routes to School program, and/or the effectiveness of processes or programs.

Safe Routes to School evaluation is beneficial in the following ways:

- Indicates whether your SRTS efforts are paying off. Evaluation can tell you what's working well, what's not, and how you can improve your program in the future.
- Allows you to share your program's impact with others. Evaluation can demonstrate the value of continuing your program, with school faculty and administration, the district, parents, and elected officials.
- Provides a record of your efforts to serve as institutional memory. The nature of Safe Routes to School teams is that they change over time, as parents and their children move on to other schools and as staff turns over. Recording and evaluating your efforts provides vital information to future teams.
- Tells you if you are reaching your goals. Evaluation can confirm that you are accomplishing or working towards what you set out to do. On the other hand, evaluation efforts can reveal that there is a mismatch in your efforts and your goals or that you need to correct course.
- Encourages continued funding for Safe Routes to School programs. Data collected and shared by local programs can influence decisions at the local, state and national level. In part, today's funding and grant programs exist because of the evaluations of past programs.

Basics of Evaluation

At a minimum, SRTS evaluation should include the standard classroom hand tallies and parent surveys expected in order to be consistent with the national Safe Routes to School program. Evaluating the programs can - and should where possible - delve beyond this, but it need not be burdensome. Evaluating the program can be as simple as recording what you did and when you did it, and counting or estimating the number of students who participated or were reached. Recording planning efforts and taking photos is also helpful for the legacy of the program. In most cases, it is beneficial to measure more, such as school travel mode split and/or miles walked/biked, from which the school, district or city can estimate environmental, health, and other impacts.

There are two kinds of information that can be collected: quantitative data (numbers, such as counts, logs, and survey results) and qualitative data (words/images, such as observations, interviews, and records). Further, there are several different ways to collect information. This includes the following:

1. Conducting tallies/counts
2. Keeping logs (such as for mileage tracking)
3. Conducting surveys and interviews
4. Conducting observations and audits

5. Keeping planning and process records

Regardless of how elaborate you make your evaluation, it is important to plan ahead for measuring and tracking results. When you are designing your program, consider how you are going to evaluate it from the beginning, so that you can build in mechanisms for collecting the necessary data. For example, if showing changes in travel behavior over time is important to your effort, you will need to start by collecting baseline data s you know how students are getting to school currently in order to be able to demonstrate any change later.

Below is a series of basic steps to take in designing and executing your program evaluation:

1. Establish your goals and plan the specific program.
2. Decide what, how, and when to measure.
3. Collect baseline information, if necessary.
4. Conduct the program and monitor progress.
5. Conduct any post-program data collection, if necessary.
6. Interpret your data.
7. Use and share your results.

More resources for evaluation can be found on the National Center for Safe Routes to School's website here: http://guide.saferoutesinfo.org/evaluation/index.cfm.

First steps

At the beginning of each year establish which programs and improvements will be made and what needs to be done to complete basic steps 1-3.

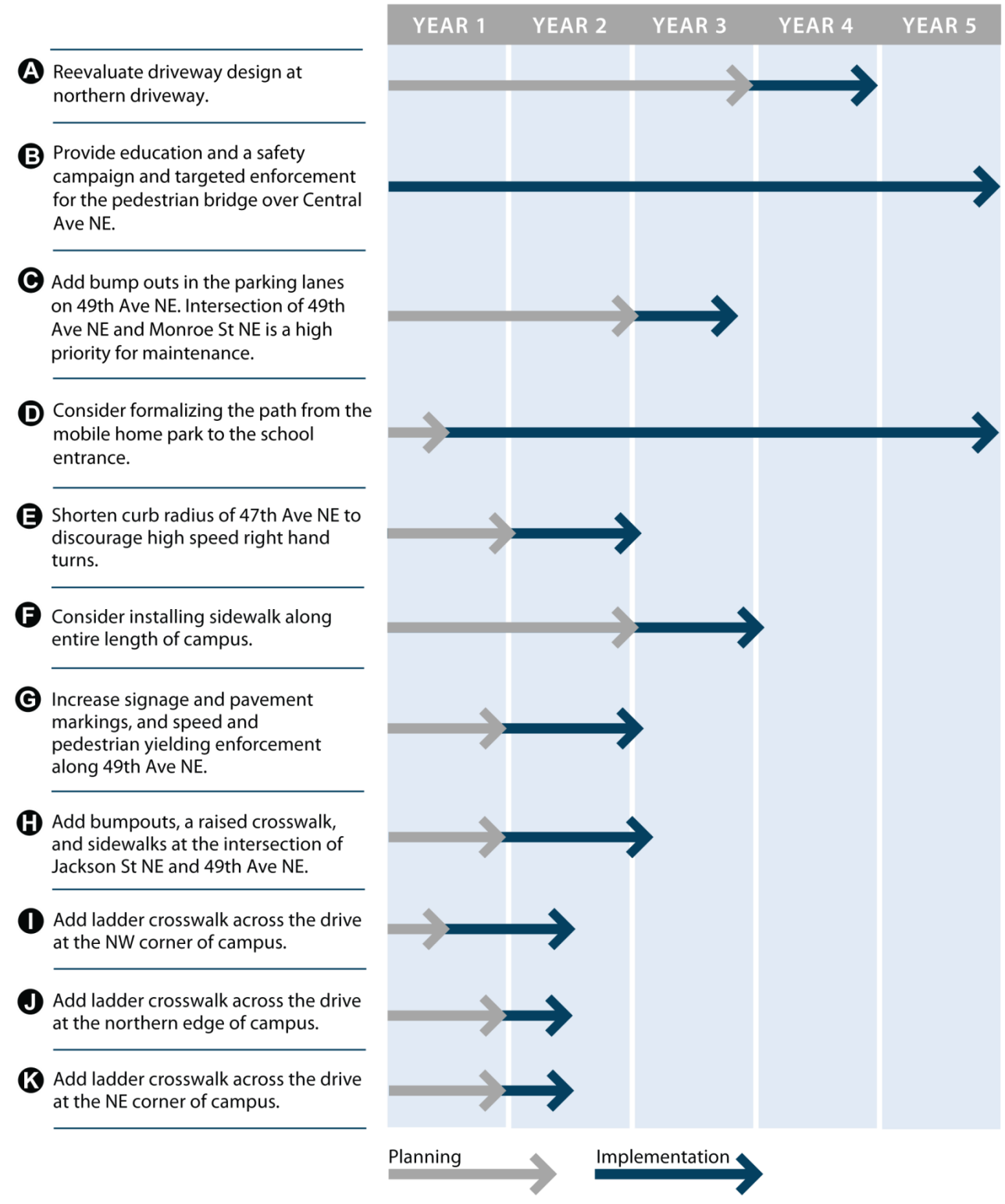
One Year Action Plan

The Action Plan is based on a one year forecast of reasonably attainable goals as determined by the SRTS Team. The Action Plan is meant to complement the recommendations. The table should be updated periodically with new goals as the previous goals are met or new opportunities arise. It is important to note that while the overall Safe Routes to School Plan has a will support action for five years, the Action Plan provides specific recommendations for the first year of the plan. Annual evaluation should be part of the Safe Routes Programs. Each year the Action Plan should be updated with recommendations that have been accomplished removed and new annual projects and programs added. Some education, encouragement and enforcement programs will be ongoing and the action plan should represent those programs that need increased resources or attention.

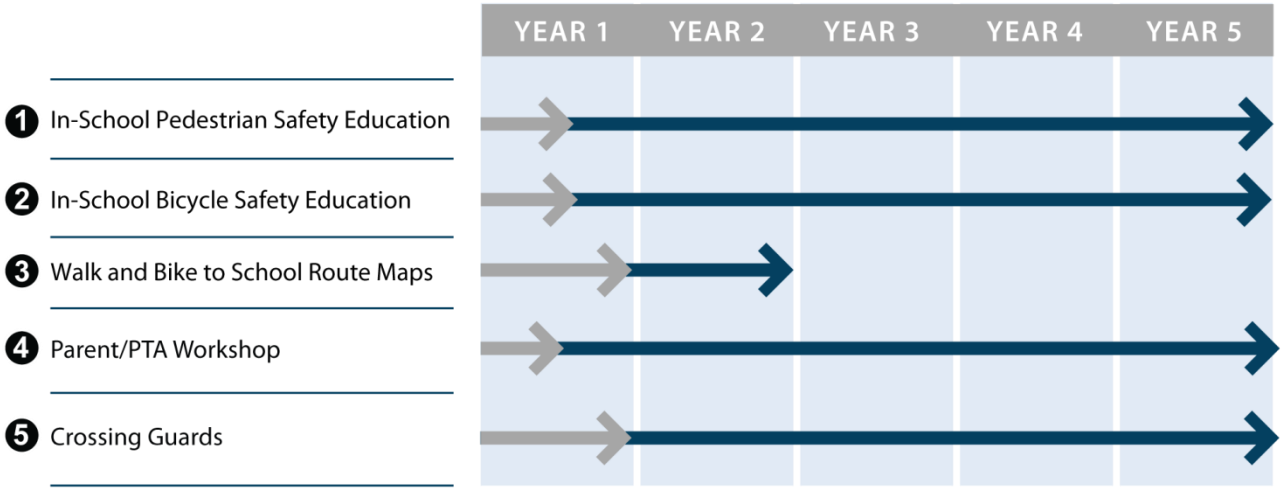
Valley View One Year Action Plan 2013-2014 School Year	
Program	
Type	
Encouragement	Establish support and encourage participation through a Parent/PTA workshop on Safe Routes to School
Enforcement	Frequent enforcement of "Yield to Pedestrians" in crosswalks and speed limit on 49th Ave NE
Education	Include a SRTS Fact Corner in the regular school communications
	Develop a bike safety course using the new fleet of bikes from the 2013 SRTS grant
	Develop a walk and bike to school map for parents and students
	Establish an in school pedestrian safety training for students
Infrastructure	
Type	
Crosswalks	Add high visibility crosswalk s at 49th Ave NE and Fillmore St NE, 49th Ave NE and Johnson St NE, and 47th Ave NE and Fillmore St NE
School Property	Assess options for funding the design by Larson Engineering to improve the layout and separation of walking traffic and motorized traffic of the driveways along the north side of the school campuses
	Formalize and celebrate the trail connection to the mobile home park
Signage for School Area Traffic Control	Install School Zone signage as recommended in the Minnesota Manual on Uniform Traffic Control Devices (MMUTCD)

Recommendations Summary and Timeline

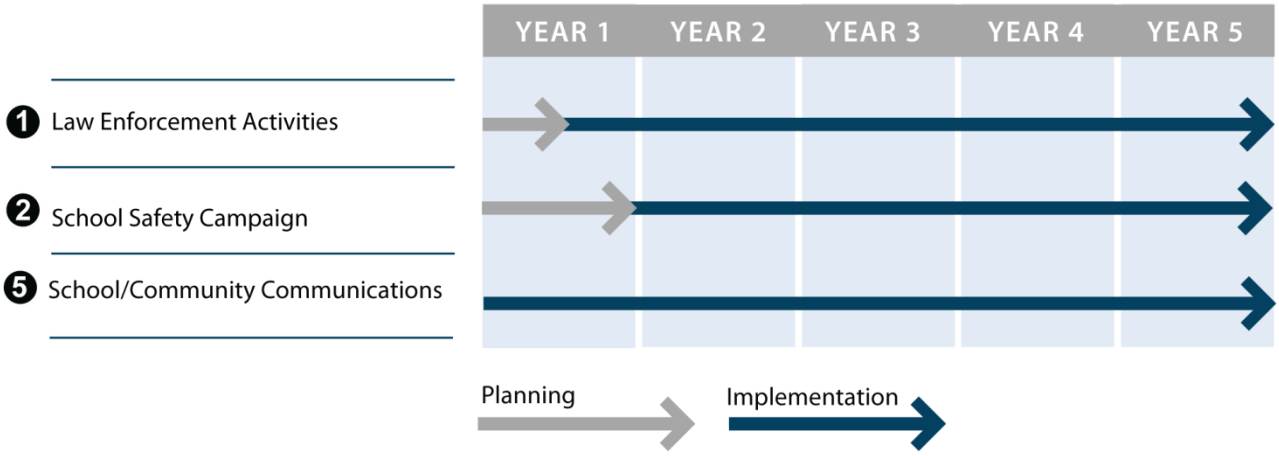
Infrastructure Recommendations



Priority Programs Recommendations



Additional Programs Recommendations



APPENDIX - C
WATER SUPPLY PLAN

Local Water Supply Plan Columbia Heights

Third Generation for 2016-2018

Formerly called Water Emergency & Water Conservation Plan

Cover photo by Molly Shodeen

For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

This information is available in an alternative format upon request.

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DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND WATER RESOURCES AND METROPOLITAN COUNCIL

INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNRs actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the DNR webpage at http://www.dnr.state.mn.us/gwmp/areas.html

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. M.S.103G.291 to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval.
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.

- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR/Metropolitan Council Water Supply Plan Template www.mndnr.gov/watersupplyplans
2. Save the document with a file name with this naming convention: WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their webpage http://www.metrocouncil.org/Handbook/Plan-Elements/Water-Resources/Water-Supply.aspx. All out-state water suppliers do *not* need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document to insure all data is complete and attachments are included. This will allow for a quicker approval process. www.mndnr.gov/watersupplyplans
8. Plans should be submitted electronically – no paper documents are required. https://webapps11.dnr.state.mn.us/mpars/public/authentication/login
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	**1978-6216**
Ownership	☒ Public or ☐ Private
Metropolitan Council Area	☒ Yes or ☐ No (Anoka)
Street Address	**637 38th Avenue NE**
City, State, Zip	**Columbia Heights, MN 55421**
Contact Person Name	Kevin Hansen
Title	Director of Public Works/City Engineer
Phone Number	763-706-3705
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

The category "Total Water Pumped" is the amount of water that Minneapolis sold to Columbia Heights. Columbia Heights does not have any wells and therefore do not pump water themselves. Some of the 2005 data could not be found.

Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)

Year	Pop. Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Water used for Non-essential	Wholesale Deliveries (MG)	Total Water Delivered / Sold(MG)	Total Water Purchased (MG)	Water Supplier Services	Percent Unmetered/ Unaccounted	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)	Total per capita Demand (GPCD)
2005	18261	6,415	442	85.9	0.0	N/A	527.6	N/A	0.0	N/A	N/A	2.63	N/A	N/A	N/A
2006	18288	6,441	445	84.3	0.0	N/A	529.6	660.7	0.0	19.9%	1.81	2.59	7/12/2006	66.7	99.0
2007	18124	6,514	450	88.8	0.0	N/A	538.9	648.8	0.0	16.9%	1.78	2.77	7/7/2007	68.0	98.1
2008	18137	6,555	433	85.8	0.0	N/A	518.8	605.8	0.0	14.4%	1.66	2.20	7/6/2008	65.4	91.5
2009	18361	6,695	433	85.6	0.0	N/A	518.3	559.9	0.0	7.4%	1.53	2.41	6/4/2009	64.6	83.5
2010	19496	6,694	393	123.3	0.0	N/A	516.1	574.2	0.0	10.1%	1.57	2.10	9/8/2010	55.2	80.7
2011	19568	6,726	374	80.1	0.0	N/A	454.2	644.2	0.0	29.5%	1.76	2.32	8/9/2011	52.4	90.2
2012	19667	6,670	374	121.9	0.0	N/A	495.9	665.3	0.0	25.5%	1.82	2.42	7/2/2012	52.1	92.7
2013	19667	6,738	379	82.2	0.0	N/A	461.5	638.8	0.0	27.7%	1.75	2.25	8/22/2013	52.8	89.0
2014	19674	6,705	368	51.8	0.0	N/A	419.4	608.1	0.0	31.0%	1.67	1.79	8/4/2014	51.2	84.7
2015	19758	6,702	375	80.3	0.0	N/A	455.5	597.6	0.0	23.8%	1.64	1.72	8/30/2015	52.0	82.9
Avg. 2010-2015	19667	6708	377	90	0	N/A	467.1	621	0.0	24.6%	1.70	2.10	N/A	52.6	86.7

MG – Million Gallons **MGD –** Million Gallons per Day **GPCD** – Gallons per Capita per Day

See Glossary for definitions

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
Independent School District 13	Institutional	3,646,000	0.8%	Unknown
Mr. Car Wash	Commercial	3,550,000	0.8%	Unknown
Columbia Heights Center LLC	Commercial	3,217,000	0.7%	Unknown
Labelle Park Building No. 3	Residential	3,046,000	0.7%	Unknown
Grand Central Loft Condo	Residential	2,408,000	0.5%	Unknown
Crest View Lutheran Home	Residential	2,365,000	0.5%	Unknown
Labelle Park Building No. 2	Residential	2,325,000	0.5%	Unknown
Medtronic Inc.	Commercial	2,186,000	0.5%	Unknown
Northeast Senior Apartments	Residential	2,184,000	0.5%	Unknown
Labelle Park Building No. 1	Residential	2,094,000	0.5%	Unknown

B. Treatment and Storage Capacity

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Amount of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Columbia Heights does not currently have a water treatment plant. The City currently purchases treated water from Minneapolis and therefore does not require water treatment facilities. The water source for Minneapolis is the Mississippi River. This water source is treated by the process of softening, coagulation, sedimentation, filtration, membrane filtration, chlorination, and fluoridation. The City has purchased a share of the 40 MG that are stored in the Hilltop Reservoir. The total water used in the Columbia Heights water system is small in comparison to the demand that is served by the Minneapolis system.							

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
Tower 1	Elevated storage	1975	Steel	250,000
Hilltop Reservoir (Leased from MPLS water)	Ground Storage	N/A	Steel	6,200,000
Total	NA	NA	NA	6,450,000

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier's projected average water demand over the next 10 years (see Table 7 for projected water demand):

The City of Columbia Heights purchases water from Minneapolis who treats water from the Mississippi River. The City owns and operates one elevated water storage structure. The water tower has a capacity of 250,000 gallons and is located on the east side of the City. Historical records indicate the City has an average day demand of 1.70 MGD. Ten States Standards recommends have a storage capacity greater than average day demand. The City does purchase water from Minneapolis out of a 40 MG storage structure called the Hilltop Reservoir. By 2025, the City has a projected average day demand of 1.89 MGD. The City can purchase up to 6.2 MG of water from the Hilltop Reservoir. With the capacity in the Hilltop reservoir from Minneapolis available to the City, there is no need for additional storage as there is enough supply to meet future demands. With the storage available from the Hilltop Reservoir along with the existing elevated storage structure, a surplus of storage is projected over the next 10 years.

The City does not have any water treatment facilities. Currently, the City has purchased enough water to meet maximum day demand. By 2025, the maximum day demand is projected to be 3.77 MGD. Historically, the City has purchased enough water from Minneapolis to supply maximum day demands. The City is supplied with enough water to meet demands over the next 10 years. The total water used in the Columbia Heights water system is small in comparison to the demand that is served by the Minneapolis system.

C. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1.**

Table 6. Water sources and status

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection)	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Surface Water	Mississippi River	N/A	N/A	139,000 (total capacity)	N/A	Active Water Supply to Minneapolis Water Works (City of Minneapolis supply)	Yes
Interconnection	MPLS – Columbia Heights Reservoir	N/A	N/A	3.0 MGD (2,100 gpm)	N/A	Active Interconnection. Main water supply to City of Columbia Heights from Minneapolis.	Yes
Interconnection	New Brighton Interconnection	N/A	N/A	600	N/A	Emergency Interconnection	Yes
*No wells are operated by the City.							

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

Only 0.85 MGD is available from an interconnect with the City of New Brighton. Communications are required for the interconnection with Minneapolis. Both Columbia Heights and New Brighton must open the connection for the emergency connection between the two communities.

D. Future Demand Projections – *Key Metropolitan Council Benchmark*

Water Use Trends

Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

Population served has increased from 18,288 in 2006 to 19,758 in 2015. This represents an increase of 7.4%. It is projected that the population served will continue to increase as the total population increases.

The total per capita water demand has been decreasing over the last 10 years even though there has been an increase in the population served. In 2006 the total demand was 99.0 gpcd. By 2015, the demand has been reduced to 82.9 gpcd, a decrease of 19%. However, the lowest demand was observed in 2010 where the total demand was

80.7 gpcd. Overall, the trend is decreasing due to the implementation of conservation water rates and other water conservation practices. The total demand also corresponds to a decrease in water purchased from Minneapolis over the last 10 years. A reduction on total demand has reduced the total volume of water purchased.

The average daily demand has slightly fluctuated over the 10 years. In 2006, the demand was 1.81 MGD while in 2015 the demand was 1.64 MGD. The 10-year average for daily demand is 1.7 MGD. Years where purchased water decreased are years where the average daily demand decreased. Drought and or years with significant rainfall most likely affected average daily demands. Drought years saw an increase in demand while wet years saw a decrease in demand. As the population increased, the average daily demand has averaged 1.7 MGD. Water conservation education and updated rate structures within the City have helped to maintain an average day demand.

Max day demand has slightly decreased from a peak in 2007 of 2.77 MGD, to a low of 1.72 MGD in 2015. The trend follows a similar pattern as the average day demand, indicating that the peak day and average day demands are most likely linked to water usage by the customers. As customer water use increases, the max day demand will increase. Generally, the max day demand occurs near the end of summer when temperatures are warmest and residents use more water. The last 5 years of data show the max day demand has been decreasing. This could be due to increased water conservation education and more water efficient strategies implemented by customers.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

Table 7. Projected annual water demand

Year	Projected Total Population	Projected Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2016	20,158	20,158	89	1.80	3.60
2017	20,244	20,244	89	1.81	3.61
2018	20,329	20,329	89	1.81	3.63
2019	20,415	20,415	89	1.82	3.64
2020	20,500	20,500	89	1.83	3.66
2021	20,630	20,630	89	1.84	3.68
2022	20,760	20,760	89	1.85	3.70
2023	20,890	20,890	89	1.86	3.73
2024	21,020	21,020	89	1.88	3.75
2025	21,150	21,150	89	1.89	3.77
2030	21,800	21,800	89	1.95	3.89
2040	23,100	23,100	89	2.06	4.12

GPCD – Gallons per Capita per Day **MGD** – Million Gallons per Day

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Water demand projections were based on historical trends and the increase in population. Metropolitan Council population projections were used to for population projections through 2040. It is assumed that the projected service population will equal the projected total population.

The historical total per capita demand from 2006 through 2015 of 89 gallons per capita per day (gpcd) was used to make water demand projections through 2040. This excludes 2005, which did not have complete data. Based on historical trends in per capita demand and future population projections, it is acceptable to use 89 gpcd through 2040. Water conservation efforts have been incorporated over the last several years, which were accounted for by using the historical demands to make future projections. It is important to consider these water conservation measures when making projections as they can help make accurate projections with regards to the City's plan of conserving water and reducing per capita demands. Commercial and industrial development was accounted for by using the historical demands to make projections. It is assumed that the rate at which commercial and industrial water usage increases will remain the same as the historical demands. Since Columbia Heights is located in a highly developed area, there is not as much land available for future development of commercial and industrial sites. It is assumed that the commercial and industrial growth will remain similar to historical trends.

The projected average day demand was calculated by multiplying the projected total per capita demand of 89 gpcd by the projected service area population. The projected average day demand shows a slightly increasing demand because the average day demand is calculated based on population. As the population increases and the per capita demand remains constant, the average day demand will slightly increase. By 2040, a projected average day demand of 2.06 GMD is expected.

The projected maximum day demand was calculated by multiplying the average day demand by a peaking factor. A peaking factor of 2 was used to make future demand projections. The average historical peaking factor from 2005 through 2015 is only 1.37. To account for unknowns and dry years in the future, Ten States Standards was referenced to determine a peaking factor suitable for a population the size of Columbia Heights. Ten States Standards has recommendations for peaking factors using an empirical equation that calculates peaking factors based on a communities population. Based on Ten States Standards recommendations, a peaking factor for a city with a population similar to Columbia Heights would have a peaking factor of approximately 2. Therefore, after reviewing historical data and comparing to the Ten States Standards recommendation, a peaking factor of 2 will provide accurate future water demands.

E. Resource Sustainability

Monitoring – *Key DNR Benchmark*

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. List should include all production wells, observation wells, and source water intakes or reservoirs. Add rows to the table as needed. Find information on groundwater level monitoring program at: http://www.dnr.state.mn.us/waters/groundwater_section/obwell/index.html

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
N/A Columbia Heights has no municipal wells.	☐ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☐ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☐ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☐ steel tape ☐ stream gauge

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed.

Provide water level data graphs for each well in **Appendix 3** for the life of the well, or for as many years as water levels have been measured. See DNR website for Date Time Water Level http://www.dnr.state.mn.us/groundwater/hydrographs.html

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
N/A Columbia Heights has no municipal wells.	N/A	N/A	☐ Falling ☐ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____

Potential Water Supply Issues & Natural Resource Impacts – *Key DNR & Metropolitan Council Benchmark*

Complete Table 10 by listing the types of natural resources that are or could be impacted by permitted water withdrawals. If known, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold, and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the *Master Water Supply Plan Appendix 1 (Water Supply Profiles*, provides information about potential water supply issues and natural resource impacts for your community.

Table 10. Natural resource impacts

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
☐ River or stream	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___	N/A	☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	N/A
☐ Calcareous fen	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___	N/A	☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	N/A
☐ Lake	N/A	☐ Flow/water level decline	☐ GIS analysis ☐ Modeling ☐ Mapping	N/A	☐ Revise permit	N/A

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Lake	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___	N/A	☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	N/A
☐ Wetland	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___	N/A	☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	N/A
☐ Trout stream	N/A	☐ Flow/water level decline	☐ GIS analysis ☐ Modeling	N/A	☐ Revise permit	N/A

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Aquifer	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Endangered, threatened, or special concern species habitat, other natural resource impacts	N/A	☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
Columbia Heights does not own or operate any municipal wells. Therefore, they do not draw any water from an aquifer. There are no known natural resources impacts that are being affected by Columbia Heights water use.						

* Examples of thresholds: a lower limit on acceptable flow in a river or stream; water quality outside of an accepted range; a lower limit on acceptable aquifer level decline at one or more monitoring wells; withdrawals that exceed some percent of the total amount available from a source; or a lower limit on acceptable changes to a protected habitat.

Wellhead Protection (WHP) and Surface Water Protection (SWP) Plans

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Surface Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	☐ In Process ☐ Completed ☒ Not Applicable	Not required	Not required
SWP	☐ In Process ☐ Completed ☒ Not Applicable	N/A	N/A

F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition	N/A	Columbia Heights does not have any wells
Water Storage Facilities	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition	N/A	Current storage is adequate for current and future demands.
Water Treatment Facilities	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition	N/A	Columbia Heights does not operate a WTP
Distribution Systems (pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2017-2020	Repair and replace water mains as needed. Also consists of lining water mains yearly.
Pressure Zones	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		Two PRV's are in adequate condition for the next 10 years. Components are replaced as needed.
Other:	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		

Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	N/A	N/A	N/A	N/A	N/A
Surface Water	N/A	N/A	N/A	N/A	N/A
Interconnection to another supplier	N/A	N/A	N/A	N/A	N/A

Water Source Alternatives - *Key Metropolitan Council Benchmark*

Do you anticipate the need for alternative water sources in the next 10 years? Yes ☐ No ☒

For metro communities, will you need alternative water sources by the year 2040? Yes ☐ No ☒

If you answered yes for either question, then complete table 14. If no, insert NA.

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
☐ Groundwater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Surface Water	N/A	N/A	N/A	N/A	N/A	N/A
☐ Reclaimed stormwater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Reclaimed wastewater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Interconnection to another supplier	N/A	N/A	N/A	N/A	N/A	N/A

Part 2. Emergency Preparedness Procedures

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan.

Do you have a federal emergency response plan? Yes ☒ No ☐

If yes, what was the date it was certified? December 15, 1996

Complete Table 15 by inserting the noted information regarding your completed Federal Emergency Response Plan.

Table 15. Emergency Preparedness Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	KEVIN HANSEN	763-706-3705	PUBLICWORKS@COLUMBIAHEIGHTSMN.GOV
Alternate Emergency Response Lead	LAUREN MCCLANAHAN	763-706-3711	PUBLICWORKS@COLUMBIAHEIGHTSMN.GOV

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes ☒ No ☐

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280 . Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been

approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. A template is available at www.mndnr.gov/watersupplyplans

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state, and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes ☒ No ☐

Can staff access records and maps from a central secured location in the event of an emergency?

Yes ☒ No ☐

Does the appropriate staff know where the materials are located?

Yes ☒ No ☐

Procedure for Augmenting Water Supplies

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
CITY OF MINNEAPOLIS	3.0 MGD (2,100 GPM)	COMMINICATION BETWEEN MINNEAPOLIS AND COLUMBIA HEIGHTS REQRUIED	PROVIDED BY CITY OF COLUMBIA HEIGHTS AND MINNEAPOLIS
CITY OF NEW BRIGHTON	0.85 MGD (600 GPM)	EMERGENCY ONLY	N/A

GPM – Gallons per minute MGD – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
NONE	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

None

Allocation and Demand Reduction Procedures

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)

3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand (GPD)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	1,034,000	909,920
Commercial/Institutional/ Industrial	2	247,000	135,850
Non-Essential	3	0	0
TOTAL	NA	1,281,000	1,045,770

GPD – Gallons per Day

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
☐ Contamination ☐ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☒ Other: Hilltop reservoir not able to meet demand	☐ Supply augmentation through ____ ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.	☐ Supply augmentation through ____ ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☐ Meeting with large water users (> 10% of total city use) ☒ Other: Public Service Announcement	☐ Daily ☒ Weekly ☒ Monthly ☐ Annually	None
☒ Long-term Ongoing demand reduction declared	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☐ Meeting with large water users (> 10% of total city use) ☒ Other: Public Service Announcement	☐ Daily ☒ Weekly ☒ Monthly ☐ Annually	None

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Governor's critical water deficiency declared	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☐ Meeting with large water users (> 10% of total city use) ☒ Other: Public Service Announcement	☐ Daily ☒ Weekly ☒ Monthly ☐ Annually	None

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority's water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes ☒ No ☐

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

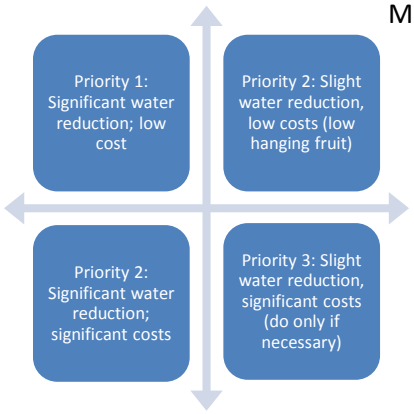
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☒ No ☐

If yes, cite the regulatory authority reference: City Manager_____.

If no, who has authority to implement water use restrictions in an emergency?

N/A

PART 3. WATER CONSERVATION PLAN



Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.

There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is use to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

Progress since 2006

Is this your community's first Water Supply Plan? Yes ☐ No ☒

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

N/A

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	☒ Yes ☐ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☒ Yes ☐ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☐ Yes ☐ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.	☐ Yes ☐ No
Enforcement	☒ Yes ☐ No
Describe other	☐ Yes ☐ No

What are the results you have seen from the actions in Table 21 and how were results measured?

Results of the above include a slight decrease in residential and total per capita demand as well as a reduction in total water delivered to the system. These results were measured by seeing a reduction in water metered. The average day demand has also reduced since 2006. Maximum day demand has also decreased making it likely that conservation measures have helped to reduce demands.

A. Triggers for Allocation and Demand Reduction Actions

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	☐ Low stream flow conditions ☐ Reports of declining wetland and lake levels ☐ Other: _____	☐ Increase promotion of conservation measures ☐ Other: _____
Short-term demand reduction (less than 1 year	☒ Extremely high seasonal water demand (more than double winter demand) ☐ Loss of treatment capacity ☒ Lack of water in storage ☐ State drought plan ☐ Well interference ☐ Other: _____	☒ Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Supply augmentation through ____ ☐ Water allocation through____ ☒ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☒ Per capita demand increasing ☒ Total demand increase (higher population or more industry) ☐ Other: _____	☒ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course, and park irrigation & other nonessential uses. ☐ Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. ☒ Meet with large water users to discuss user's contingency plan. ☐ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☒ Per capita demands are increasing and there is not enough water available to meet max day demands. Columbia Heights will follow what Minneapolis does when a "Critical Water Deficiency Order" is declared.	☒ Supplement water supply through all interconnections. Enforce and/or revise water restriction ordinances and restrict non-essential water usage if possible. Discuss with Minneapolis on their plan to determine future action items during a water emergency.

B. Conservation Objectives and Strategies – *Key benchmark for DNR*

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Waters Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your five-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?

Yes ☒ No ☐

What is your leak detection monitoring schedule? (e.g. monitor 1/3rd of the city lines per year)

Leak detection is done on an "as needed" basis. If high water usage is recognized and determined to be unaccounted-for water, leak detections are performed to find and repair the leak.

Water Audits - are intended to identify, quantify, and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The American Water Works Association (AWWA) recommends that ten percent or less of pumped water is unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association www.mrwa.com . Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built.

What is the date of your most recent water audit? _____

Frequency of water audits: ☐ **yearly** ☒ **other (specify frequency) As needed**
Leak detection and survey: ☐ **every year** ☐ **every other year** ☒ **periodic as needed**
Year last leak detection survey completed: 2016

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

Since water losses are greater than 10% from Table 2, several measures will be investigated to reduce water losses to less than 10%. First, increased leak detection will help find leaks before they lead to significant water losses. Secondly, replacing water mains when they break or replacing leaking services will also help reduce water losses. The City will investigate the possible sources of unaccounted-for water and make changes to reduce water lost. The City has been proactive in lining existing water mains. They will continue to line existing water mains to help reduce the volume of water lost through leaks. Education about water losses and how consumers can conserve water will help find and isolate areas that have high water loss. Replacing infrastructure is done as needed or when components break. The goal is to reduce water losses to less than 10% within the next 10-15 years.

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. AWWA also recommends that water suppliers conduct regular water audits to ensure accountability. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years
Residential	6318	6318	6318	6318	10-15 years/ As needed
Commercial	228	228	228	228	10-15 years/ As needed
Industrial	1	1	1	1	10-15 years/ As needed
Public facilities	30	30	30	30	10-15 years/ As needed
Other (Government)	28	28	28	28	10-15 years/ As needed
TOTALS	6605	6605	6605	NA	10-15 years/ As needed

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

N/A

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years
Water source (wells/intakes)	1 (From Hilltop Reservoir)	As needed	1	N/A / As needed
Treatment plant	N/A	N/A	N/A	N/A / As needed

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes ☐ No ☒

What was your 2010 – 2015 five-year average residential per capita water demand? 52.6 **g/person/day**

Describe the water use trend over that timeframe:

Water use has decreased from 55.2 gpcd in 2010 to 52.0 gpcd in 2015. This follows a reduction in the volume of residential water sold. Even though the number of users has increased, water conservation strategies seem to

have played a key role in the reduction of residential demand. Historically, the City has seen a steady decrease in residential demand.

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☐ Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	
☒ Revise ordinances to limit irrigation. Describe the restricted irrigation plan: Possibly add a odd – even sprinkling ban	Within 5 – 10 years
☒ Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	Ongoing
☒ Make water system infrastructure improvements	Continuous. The City continues to update aging infrastructure as needed.
☐ Offer free or reduced cost water use audits) for residential customers.	
☒ Implement a notification system to inform customers when water availability conditions change.	Ongoing
☐ Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	
☒ Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Within 10 years
☐ Identify supplemental Water Resources	
☐ Conduct audience-appropriate water conservation education and outreach.	
☐ Describe other plans	

Objective 3: Achieve at least a 1.5% per year water reduction for Institutional, Industrial, Commercial, and Agricultural GPCD over the next 10 years or a 15% reduction in ten years.
Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water.

Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However several state agencies are addressing this issue.

Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☒ Install enhanced meters capable of automated readings to detect spikes in consumption	10 years
☐ Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
☐ Install water conservation fixtures and appliances or change processes to conserve water	
☒ Repair leaking system components (e.g., pipes, valves)	Ongoing
☐ Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
☒ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Ongoing. Continue to expand over the next 10 years.
☐ Train employees how to conserve water	
☒ Implement a notification system to inform non-residential customers when water availability conditions change.	Ongoing
☐ Rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Proposed plumbing code 4714.1702.1 http://www.dli.mn.gov/PDF/docket/4714rule.pdf	
☐ Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

Residential demand has been steadily decreasing over the last 10 years from 66.7 gpcd in 2006 to 52.0 gpcd in 2015. This trend follows the downward trend of water sold to residential customers. The implementation of a conservation water rate structure as well as education on water conservation has helped reduce residential demand during this timeframe. Increased maintenance and replacement of

old and leaking pipes and services have also helped reduce demand. The linear trend shows a continual decline in residential demand over the next 10 years. However, it is most likely that the residential demand will reach a terminal demand and remain constant instead of continuing to drop.

The total demand has followed the same trend as the residential demand. Total demand fluctuated in the past 10 years but shows a decline. In 2010, the demand hit a low point at 80.7 gpcd while rebounding to 92.7 gpcd in 2012. The demand has since decreased to 82.9 gpcd in 2015. The linear trend shows a continually decreasing total demand over the next 10 years. It is most likely that the total demand will follow the same trend as the residential demand and reach a low point and become constant.

The C/I/I demand has remained steady with only a slight decrease over the last 10 years. The trend does not follow either the residential or the total demand trends. It is likely that since Columbia Heights in a community that is nearly fully developed the water demands are consistent for the C/I/I customers. However, there is a slight decrease projected in demand. This could be due to increased water conservation in this category as larger C/I/I users update water infrastructure in their facilities.

Objective 5: Reduce Peak Day Demand so that the Ratio of Average Maximum day to the Average Day is less than 2.6

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes ☐ No ☒

Calculate a eleven year average (2005 – 2015) of the ratio of maximum day demand to average day demand: 1.37

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement a Conservation Water Rate Structure and/or a Uniform Rate Structure with a Water Conservation Program

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume (*Minnesota Statutes*, section 103G.291, subd. 3 and 4). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a

Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: _per 1,000__ gallons or ____ cubic feet ___ other

Frequency of billing: ☐ Monthly ☐ Bimonthly ☒ Quarterly ☐ Other: _____

Water Rate Evaluation Frequency: ☒ every year ☐ every ___ years ☐ no schedule

Date of last rate change: January 1, 2016__

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	☐ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☒ Service charge not based on water volume ☐ Other (describe)	☒ Uniform ☐ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)
Commercial/ Industrial/ Institutional	☐ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☒ Service charge not based on water volume	☒ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	☐ Other (describe)		
☐ Other			

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
    - The first tier is for the winter average water use.
    - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
    - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates**: if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons**: simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate**: rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

The City has a uniform billing strategy in place with a partially tiered system. The fixed fee for all residential customers is the same. Commercial customers fixed fee increases with increasing meter size.

There are two tiers in place. Tier 1 bills a price per 1,000 gallons of water for water use less than 25,000 gallons while Tier 2 bills a price per 1,000 gallons of water for water use more than 25,000 gallons. The Tier 1 and 2 rates are the same for all residential and commercial customers.

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

☒	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 "Best Practices" for water
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☒	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☐	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☐	Adopt an outdoor lawn irrigation ordinance
☐	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☒	Implement a stormwater management program
☐	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations)
☐	Adopt a water offset program (primarily for new development or expansion)
☐	Implement a water conservation outreach program
☐	Hire a water conservation coordinator (part-time)
☐	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
☐	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

The City will continue to monitor usage across all categories of users to determine if water efficiencies and water reductions are occurring. The City will also continue to monitor unaccounted for water, which will help determine if the City is properly metering and monitoring water use within the City. The City currently participates in the GreenStep Cities program and they have a stormwater management plan as well as a comprehensive open space plan.

Tip: The process to monitor demand reduction and/or a rate structure includes:

a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion.

For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.

c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.

d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.

e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

A. Regulation

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
☐ Rainfall sensors required on landscape irrigation systems	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☒ Water efficient plumbing fixtures required	☒ New development ☐ Replacement ☐ Rebate Programs
☐ Critical/Emergency Water Deficiency ordinance	☐ Only during declared Emergencies
☒ Watering restriction requirements (time of day, allowable days, etc.)	☒ Odd/even ☐ 2 days/week ☒ Only during declared Emergencies
☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☐ Shoreland/zoning ☐ Other
☒ Soil preparation requirement s (after construction, requiring topsoil to be applied to promote good root growth)	☒ New Development ☒ Construction Projects ☐ Other
☒ Tree ratios (requiring a certain number of trees per square foot of lawn)	☒ New development ☐ Shoreland/zoning ☐ Other
☐ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☐ Describe

B. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
☒ Low flush toilets, ☐ Toilet leak tablets, ☐ Low flow showerheads, ☐ Faucet aerators;	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☐ Water conserving washing machines, ☐ Dish washers, ☐ Water softeners;	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☐ Rain gardens, ☐ Rain barrels, ☐ Native/drought tolerant landscaping, etc.	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

Columbia Heights has taken efforts to add water efficient structures in new housing and developments.

C. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency

notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports	Water quality and water conservation	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Presentations to community groups			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community news letters	Water quality and water conservation tips and education.	2	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Direct mailings (water audit/retrofit kits, showerheads, brochures)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Information kiosk at utility and public buildings	Water quality and water conservation tips and education.	Continual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Cable TV Programs			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community events (children's water festivals, environmental fairs)	Water conservation and water quality	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Website (include address: www.ci.columbia-heights.mn.us)	Water conservation, billing information, water quality reports	Continual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Targeted efforts (large volume users, users with large increases)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Emergency conservation notices			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

The City is planning on conducting staff training over the next 10 year on how to be water efficient and to learn innovative water conservation techniques.

The City also is planning on issuing billing inserts with water bills. The inserts may contain water efficiency information, possible water re-use grant information, water efficient appliance rebate information and any other information related to water conservation.

Part 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.

Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The *Master Water Supply Plan* provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles).* This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of

future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes ☒ No ☐

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
☒ None at this time	N/A	None
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ Other:		

Technical assistance

From your community's perspective, what are the most important topics for the Metropolitan Council to address, guided by the region's Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

☒ Coordination of state, regional and local water supply planning roles
☒ Regional water use goals
☒ Water use reporting standards
☒ Regional and sub-regional partnership opportunities
☒ Identifying and prioritizing data gaps and input for regional and sub-regional analyses
☐ Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled "low flow". These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water "lost" by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category "Water Supplier Services".

Population Served - The number of people who are served by the community's public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community's public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the

premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

Acronyms and Initialisms

AWWA – American Water Works Association

C/I/I – Commercial/Institutional/Industrial

CIP – Capital Improvement Plan

GIS – Geographic Information System

GPCD – Gallons per capita per day

GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,

MDH – Minnesota Department of Health

MGD – Million gallons per day

MG – Million gallons

MGL – Maximum Contaminant Level

MnTAP – Minnesota Technical Assistance Program (University of Minnesota)

MPARS – MN/DNR Permitting and Reporting System (new electronic permitting system)

MRWA – Minnesota Rural Waters Association

SWP – Source Water Protection

WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries – see Part 1C

Appendix 2: Water level monitoring plan – see Part 1E

Appendix 3: Water level graphs for each water supply well - see Part 1E

Appendix 4: Capital Improvement Plan - see Part 1E

Appendix 5: Emergency Telephone List – see Part 2C

Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C

Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C

Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4

Appendix 9: Water Rate Structure – see Part 3 Objective 6

Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7

Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see www.mndnr.gov/watersupplyplans

Appendix 1

(Columbia Heights does not own or operate municipal wells)

Appendix 2

(Columbia Heights does not own or operate municipal wells. Therefore, no water level monitoring plan is required.)

Appendix 3

(Columbia Heights does not own or operate municipal wells)

Appendix 4

WATER MAIN DISTRIBUTION SYSTEM / CLEAN-LINE PROGRAM

Background:
The City has over 71 miles of water main. The majority of these lines were installed over 50 years ago and made unlined cast iron pipe. Columbia Heights purchases all of its drinking water from the City of Minneapolis provided through a 24-inch connection to the Minneapolis Reservoirs. Our long term agreement was last updated in 2013. The City of Columbia Heights also operates two booster stations along with a single water tower.

As demographics, land uses and water demands change, it is important to regularly analyze our water distribution systems' ability to provide adequate water to all of our customers via a Water Distribution System Analysis (WDSA). This detailed and comprehensive engineering analysis of the water system provides technical information as well as a planning document to guide Columbia Heights as it maintains and improves its system. The WDSA performs a more exhaustive scientific, engineering and financial analysis of the water system than is required to meet the minimum local demand needs and State requirements. System wide WDSA's were prepared in 1999 and again in 2012.

Water Main Cleaning and Lining Program:
Columbia Heights has received complaints of discolored water at various locations and for many years throughout the City. City staff has determined that the rusty water is caused by encrusted iron scale deposits sloughing off the inside of the water main and into the water distribution system. To date, the problem originates only in unlined cast iron pipe, which was common prior to 1962. Although iron scale has a tendency to turn the color of the water yellow or light brown, it is not known to be a health risk by federally regulated standards. The problem in general is called 'tuberculation' and results in restricted flows and discolored water. In January of 2005, staff reported to the City Council that there are likely multiple areas of the distribution system affected by tuberculation.

In 2005, Columbia Heights began an annual cleaning and lining program partnering with the City of Minneapolis' established Cleaning and Lining Program. The process of **Mechanical Cleaning and Lining** involves shutting down a pipe segment, cutting open and accessing (excavating and cutting open) the water main every 400 to 600 feet, and pulling or pushing a mechanical cleaning device (sometimes called a 'pig') through the line to remove the encrustation. Since this process leaves the iron wall exposed, lining the interior pipe is necessary to prevent water contact with the iron surface which would allow the tuberculation process to start all over.

Minneapolis utilizes *cement mortar lining* by applying lean cement through a rotating head of a specific diameter. As the lining machine moves through the pipe, it leaves a smooth trowelled finish. The new lining of the pipe provides a smooth interior wall resistant to mineral deposits and future tuberculation buildup. To date, the City of Columbia Heights has cleaned and lined over 34,000 L.F. of water main. Based on public comment from completed areas, this has been a very well received program to correct water quality complaints and is more cost effective that pipe replacement.

2012-2020 Capital Improvement Plan
Water Department
601-49430

Proj No.	Project	2013	2014	2015	2016	2017	2018	Total Cost	Funding/Notes
W. 13-01 (annual)	Watermain cleaning and lining	$265,000						$265,000	Operations
W. 13-02	Rehabilitation of PRV #2	$150,000						$150,000	Operations
W. 14-01 (annual)	Watermain cleaning and lining		$365,000.00					$365,000	Operations (~6,000 LF of pipe)
W. 14-02	Water Tower Rehabilitation		$50,000.00	$550,000.00				$600,000	Bonding
W. 14-03	Pump Station #2 VFD's and valving		$110,000.00					$110,000	Operations
W.15-01 (annual)	Watermain cleaning and lining			$285,000.00				$285,000	Operations (~5,800 LF of Pipe)
W.15-02 (annual)	Watermain Replacement			$110,000.00					Operations: Zone 1: 1,300 lf
W. 16-01 (annual)	Watermain cleaning and lining				$300,000.00			$300,000	Operations (~4,800 LF of Pipe)
W 16-02 (annual)	Watermain Replacement				$165,000.00				Operations: Zone 2: 2,600 lf
W. 16-03	Facility Maintenance Updates: PS 2 and PS 3				$50,000.00				
W. 17-01 (annual)	Watermain cleaning and lining					$305,000.00		$305,000	Operations (~4,800 LF of Pipe)
W.17-02 (annual)	Watermain Replacement					$90,000.00			Zone 3(Includes street restoration)
W. 17-03	Replace/Update SCADA System					$25,000.00		$25,000	
W.18-01 (annual)	Watermain cleaning and lining						$300,000.00	$300,000	Operations (~3,200 LF of Pipe)
W.18-02 (annual)	Watermain Replacement						$90,000.00	$90,000	Zone 4(Includes street restoration)
		$415,000	$525,000	$945,000	$515,000	$420,000	$390,000	$2,795,000	

PROJECT YEAR: 2013

PROJECT NO. W. 13-01

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Cleaning and Lining Program (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2013: NW Quadrant

Since 2005 the City has cleaned and lined water main pipe on an annual basis. Cleaning and lining involves providing access pits every 400-600 feet, cleaning the main, and providing an interior coating to prevent future buildup (tuberculation) in the pipe walls.

JUSTIFICATION

Cleaning and lining provides a cost-effective alternative to full replacement of unlined water main pipe where structural issues are not present. It is expected to add 30 years to the life of interior pipe diameter. Program year includes approximately 4,100 cubic feet of pipe.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2013			
Feasibility Study	from 01/13 to 02/13		$ --	Date
Final Design	from 02/13 to 03/13		$ --	Date
Property Acquisition	from ____ to ____	N/A	$ ____	Date
Bid Preparation - Award	from 04/13 to 05/13		$ ____	Date
Construction	from 06/13 to 09/13		$ 265,000	Date
		TOTAL	$ 265,000	

COLUMBIA HEIGHTS

Water System Capital Improvements

Year: 2013

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main
- Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 13-01** Cost: **$265,000**

Project Description: Water Main Cleaning and Lining Program

PROJECT YEAR: 2013

PROJECT NO. W. 13-02

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Rehabilitation of PRV #2 Department

Project Type
( ) City Facilities
( ) Land Acquisition
( ) Park Development
( ) Sanitary Sewer
( ) Streets
(X) Water
( ) Storm Sewer
( ) Water Quality
( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)	X	
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION: RESERVOIR AT 44TH AVENUE

Replace vault structure, pressure reducing valves and associated piping located at water pumping station #2.

JUSTIFICATION

Piping inside existing vault is severely corroded; vault structure is prone to leaking with no drainage.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT
Architectural/Engineering		X
Property Acquisition	N/A	
Construction		X

	PROJECT LIFE	APPROPRIATIONS REQUIRED
Beginning Date of Project	January 2013	
Feasibility Study	from ____ to ____	$ 5,000 Date
Final Design	from ____ to ____	$ 5,000 Date
Property Acquisition	from ____ to ____	$ ____ Date
Bid Preparation - Award	from ____ to ____	$ 3,000 Date
Construction	from ____ to ____	$ 140,000 Date
	TOTAL	$ 150,000

COLUMBIA HEIGHTS

Water System Capital Improvements

Year: 2013

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main

Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall

Project Number: **W. 13-02** Cost: **$150,000**

Project Description: Rehabilition of PRV #2

PROJECT YEAR: 2014

PROJECT NO. W. 14-01

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Cleaning and Lining Program (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2014: MATHAIRE AREA

Since 2005 the City has cleaned and lined water main pipe on an annual basis. Cleaning and lining involves providing access pits every 400-600 feet, cleaning the main, and providing an interior coating to prevent future buildup (tuberculation) in the pipe walls.

JUSTIFICATION

Cleaning and lining provides a cost-effective alternative to full replacement of unlined water main pipe where structural issues are not present. It is expected to add 30 years to the life of interior pipe diameter.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2014			
Feasibility Study	from 01/14 to 02/14		$ --	Date
Final Design	from 02/14 to 03/14		$ --	Date
Property Acquisition	from ____ to ____	N/A	$ ____	Date
Bid Preparation - Award	from 04/14 to 05/14		$ ____	Date
Construction	from 06/14 to 09/14		$ 365,000	Date
		TOTAL	$ 365,000	

COLUMBIA HEIGHTS

Water System Capital Improvements

Year: 2014

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main

Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall

Project Number: **W. 14-01** Cost: **$365,000**

Project Description: Water Main Cleaning and Lining Program (annual)

PROJECT YEAR: 2014

PROJECT NO. W. 14-02

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE September 2012 _____ _____ Revised

Project Title Water Tower Rehabilitation Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION: 4701 STINSON BOULEVARD

Based on a detailed inspection report conducted in 2009 by Kollmer Consulting, Inc., the City's 250,000 gallon spheroid water tower is in need of structural repair, coating removal and new coating on both the interior and exterior of the structure.

JUSTIFICATION

The City water tower is a major capital investment in the water distribution system. The 2009 inspection report recommendations were delayed due to time proximity of major rehab. The last tower rehab was conducted in 1995. Coatings have a useful life of 15-20 years.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT
Architectural/Engineering	_____	X
Property Acquisition	_____ N/A	
Construction	_____	X

	PROJECT LIFE	APPROPRIATIONS REQUIRED
Beginning Date of Project	September 2014	
Feasibility Study	from 09/14 to 10/14	$ 8,000 Date
Final Design	from 10/14 to 11/14	$ 12,000 Date
Property Acquisition	from _____ to _____ N/A	$ _____ Date
Bid Preparation - Award	from 12/14 to 01/15	$ 30,000 Date (and construction admin)
Construction	from 05/15 to 09/15	$ 550,000 Date
	TOTAL	$ 600,000

COLUMBIA HEIGHTS

Water System Capital Improvements

Year: 2014

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main

Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 14-02** Cost: **$600,000**

Project Description: Water Tower Rehabilitation

PROJECT YEAR: 2014

PROJECT NO. W. 14-03

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Rehabilitation of Water Pump Station 2 Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)	X	
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION: 44TH AND RESERVOIR

The City owns and operates two water pumping (or booster) stations that service the high zone (east of Central).

JUSTIFICATION

The update of the City's water model showed that significant pressure spiking occurs at startup and at off sequencing. This causes distribution system pressure surges/spikes that are likely contributors to water main breaks. Replacement of pumps and motors with VFD would alleviate this problem and provide energy saving.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT
Architectural/Engineering		X
Property Acquisition	N/A	
Construction		X

	PROJECT LIFE	APPROPRIATIONS REQUIRED
Beginning Date of Project	January 2013	
Feasibility Study	from ____ to ____	$ 0 Date
Final Design	from ____ to ____	$ 8,000 Date
Property Acquisition	from ____ to ____	$ ____ Date
Bid Preparation - Award	from ____ to ____	$ 7,000 Date
Construction	from ____ to ____	$ 95,000 Date
	TOTAL	$ 110,000

COLUMBIA HEIGHTS

Water System Capital Improvements

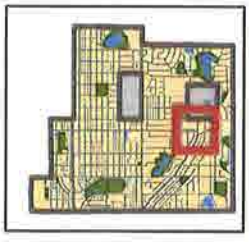
Year: 2013

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main

Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall



Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 14-03** Cost: **$110,000**

Project Description: Rehabilition of Water Pump Station 2

PROJECT YEAR: 2015

PROJECT NO. W. 15-01

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Cleaning and Lining Program (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2015:

Since 2005 the City has cleaned and lined water main pipe on an annual basis. Cleaning and lining involves providing access pits every 400-600 feet, cleaning the main, and providing an interior coating to prevent future buildup (tuberculation) in the pipe walls.

JUSTIFICATION

Cleaning and lining provides a cost-effective alternative to full replacement of unlined water main pipe where structural issues are not present. It is expected to add 30 years to the life of interior pipe diameter.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE	APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2015		
Feasibility Study	from 01/15 to 02/15	$ --	Date
Final Design	from 02/15 to 03/15	$ --	Date
Property Acquisition	from ____ to ____ N/A	$ ____	Date
Bid Preparation - Award	from 04/15 to 05/15	$ ____	Date
Construction	from 06/15 to 09/15	$ 285,000	Date
	TOTAL	$ 285,000	

PROJECT YEAR: 2015

PROJECT NO. W. 15-02

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Replacement (annual) Department

Project Type	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2015: Street Rehab Zone 1

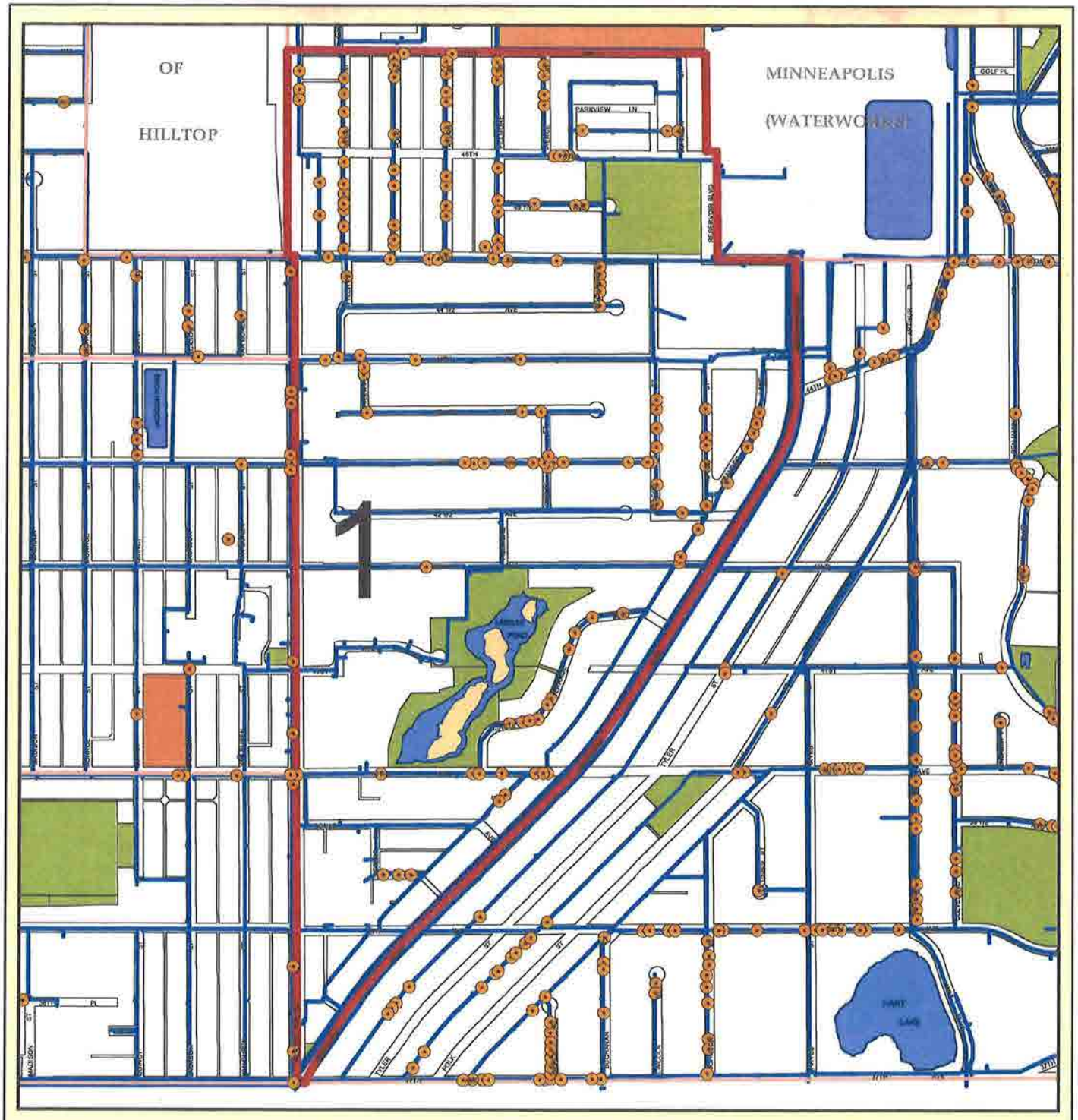
Complete replacement of 6-inch water main with new 8" water main and appurtenances; approximately 1,300 linear feet of main.

JUSTIFICATION

In locations where cleaning and lining will not work, full replacement is required. This is due to structural deficiencies in the pipe such as frequency of water main breaks. Pipe replacement will correct water quality issues, improve system flow, and correct pipe structural deficiencies.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2015			
Feasibility Study	from 01/15 to 02/15		$ --	Date
Final Design	from 02/15 to 03/15		$ --	Date
Property Acquisition	from ____ to ____	N/A	$	Date
Bid Preparation - Award	from 04/15 to 05/15		$	Date
Construction	from 06/15 to 09/15		$ 110,000	Date
		TOTAL	$ 110,000	



COLUMBIA HEIGHTS

Water Main Replacement Capital Improvements

Year: 2015

Street Management Zones
Water Main
Waterbreaks
Island
Water

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 15-02** Cost: **$110,000**

Project Description: Street Management Zone 1

PROJECT YEAR: 2016

PROJECT NO. W. 16-01

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Cleaning and Lining Program (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2016:

Since 2005 the City has cleaned and lined water main pipe on an annual basis. Cleaning and lining involves providing access pits every 400-600 feet, cleaning the main, and providing an interior coating to prevent future buildup (tuberculation) in the pipe walls.

JUSTIFICATION

Cleaning and lining provides a cost-effective alternative to full replacement of unlined water main pipe where structural issues are not present. It is expected to add 30 years to the life of interior pipe diameter.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2016			
Feasibility Study	from 01/16 to 02/16		$ --	Date
Final Design	from 02/16 to 03/16		$ --	Date
Property Acquisition	from ____ to ____	N/A	$ ____	Date
Bid Preparation - Award	from 04/16 to 05/16		$ ____	Date
Construction	from 06/16 to 09/16		$ 300,000	Date
		TOTAL	$ 300,000	

PROJECT YEAR: 2016

PROJECT NO. _W. 16-02

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE _____October 2013_____ Revised

Project Title __Water Main Replacement (annual)_____ Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2016: Street Rehab Zone 2

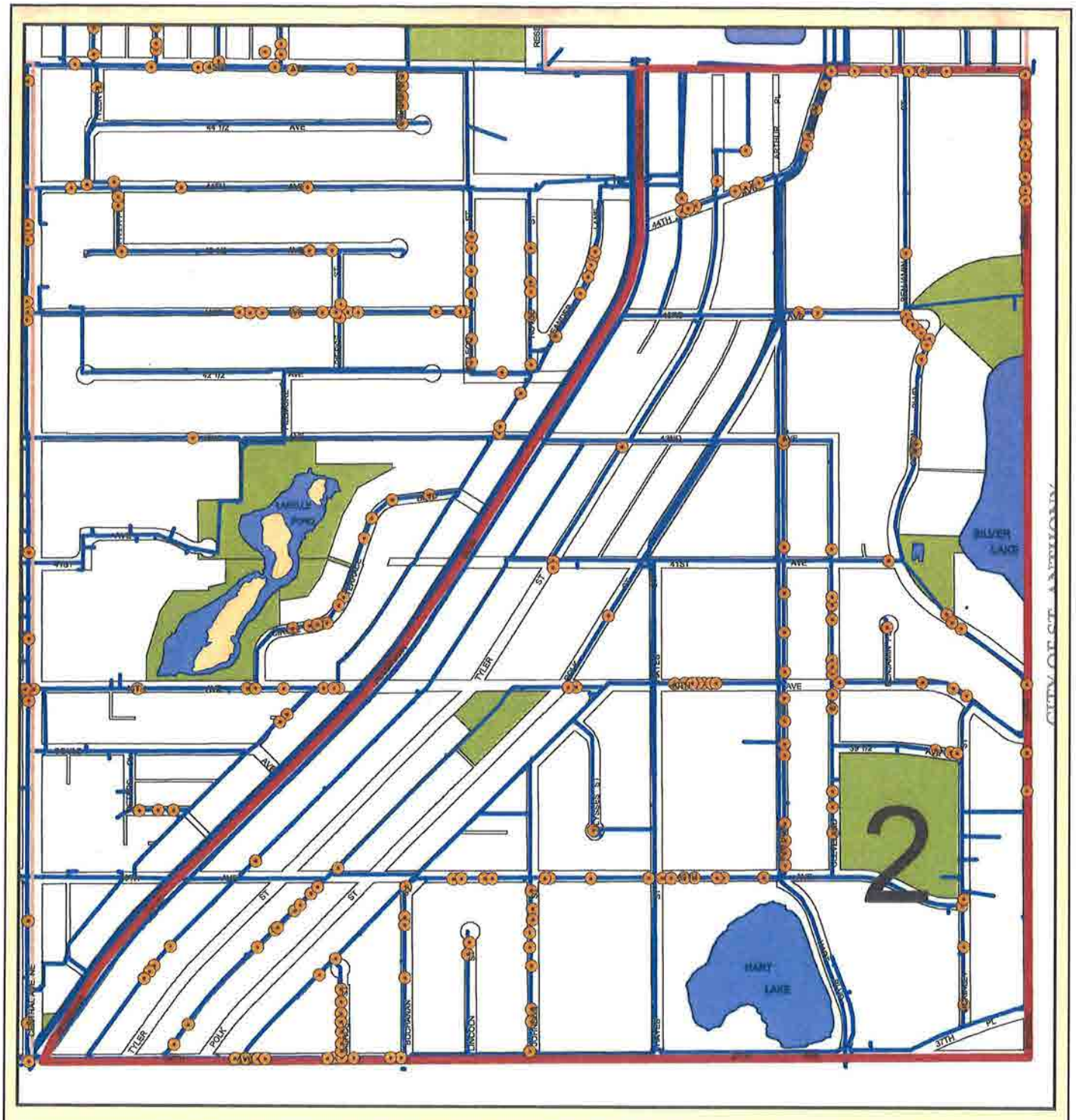
Complete replacement of 6-inch water main with new 8" water main and appurtenances; approximately 2,000 linear feet of main.

JUSTIFICATION

In locations where cleaning and lining will not work, full replacement is required. This is due to structural deficiencies in the pipe such as frequency of water main breaks. Pipe replacement will correct water quality issues, improve system flow, and correct pipe structural deficiencies.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	_____ N/A		
Construction	X	X	(both)

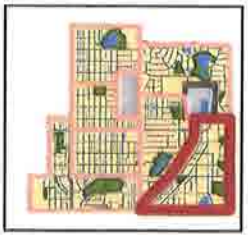
	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2016			
Feasibility Study	from 01/16 to 02/16		$ --	Date
Final Design	from 02/16 to 03/16		$ --	Date
Property Acquisition	from_____ to_____	N/A	$ _____	Date
Bid Preparation - Award	from 04/16 to 05/16		$ _____	Date
Construction	from 06/16 to 09/16		$ 165,000	Date
		TOTAL	$ 165,000	



COLUMBIA HEIGHTS

Water Main Replacement
Capital Improvements
Year: 2016

Street Management Zones
Water Main
Waterbreaks
Island
Water



Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 16-02**

Cost: **$165,000**

Project Description: Street Management Zone 2

PROJECT YEAR: 2016 PROJECT NO. W.16-03

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Facility Maintenance Updates Department

Project Type			
	(X) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available) Photos	X	

LOCATION AND DESCRIPTION

Pump Station 3 (4633 Ivanhoe Place) and Pump Station 2 (4400 Reservoir Boulevard): Replace building HVAC, replace roofs, exterior repairs and painting.

JUSTIFICATION

Maintain condition and safety of water pumping stations.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT
Architectural/Engineering	X	
Property Acquisition	N/A	
Construction		X

	PROJECT LIFE	APPROPRIATIONS REQUIRED		
Beginning Date of Project	January 2016			
Feasibility Study	from ____ to ____	$ N/A	Date	
Final Design	from ____ to 03/16	$ ---	Date	March 2016
Property Acquisition	from ____ to ____	$ N/A	Date	
Bid Preparation - Award	from ____ to 04/16	$ ---	Date	April 2016
Construction	from 05/16 to 08/16	$ 50,000	Date	May-August 2016
	TOTAL	$ 50,000		

COLUMBIA HEIGHTS

Water System Capital Improvements

Year: 2016

Ponds
- BMP
- Infiltration Pond
- Infiltration Pond (not city)
- Infiltration Pond - Proposed
- Pond
- Sump
- Underground Treatment

- Parks
- Lots / Parcel Boundaries
- School
- City of Hilltop
- Minneapolis Water Works
- Lift Stations

- Storm Line
- Water Main
- Water Main Cleaning & Lining
- Manhole
- Catch Basins
- Outfall

Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 16-03** Cost: **$50,000**

Project Description: Pump Station 2 and Pump Station 3

PROJECT YEAR: 2017

PROJECT NO. W. 17-01

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Cleaning and Lining Program (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2017:

Since 2005 the City has cleaned and lined water main pipe on an annual basis. Cleaning and lining involves providing access pits every 400-600 feet, cleaning the main, and providing an interior coating to prevent future buildup (tuberculation) in the pipe walls.

JUSTIFICATION

Cleaning and lining provides a cost-effective alternative to full replacement of unlined water main pipe where structural issues are not present. It is expected to add 30 years to the life of interior pipe diameter.

WORK TO BE COMPLETED BY:	**CITY STAFF**	**CONTRACT**	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		**APPROPRIATIONS REQUIRED**	
Beginning Date of Project	January 2017			
Feasibility Study	from 01/17 to 02/17		$ --	Date
Final Design	from 02/17 to 03/17		$ --	Date
Property Acquisition	from ____ to ____	N/A	$ ____	Date
Bid Preparation - Award	from 04/17 to 05/17		$ ____	Date
Construction	from 06/17 to 09/17		$ 305,000	Date
		TOTAL	$ 305,000	

PROJECT YEAR: 2017

PROJECT NO.: W-17-02

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Water Main Replacement (annual) Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	( ) Storm Sewer
	( ) Land Acquisition	( ) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)		X
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)	X	

LOCATION AND DESCRIPTION 2017: Street Rehab Zone 3

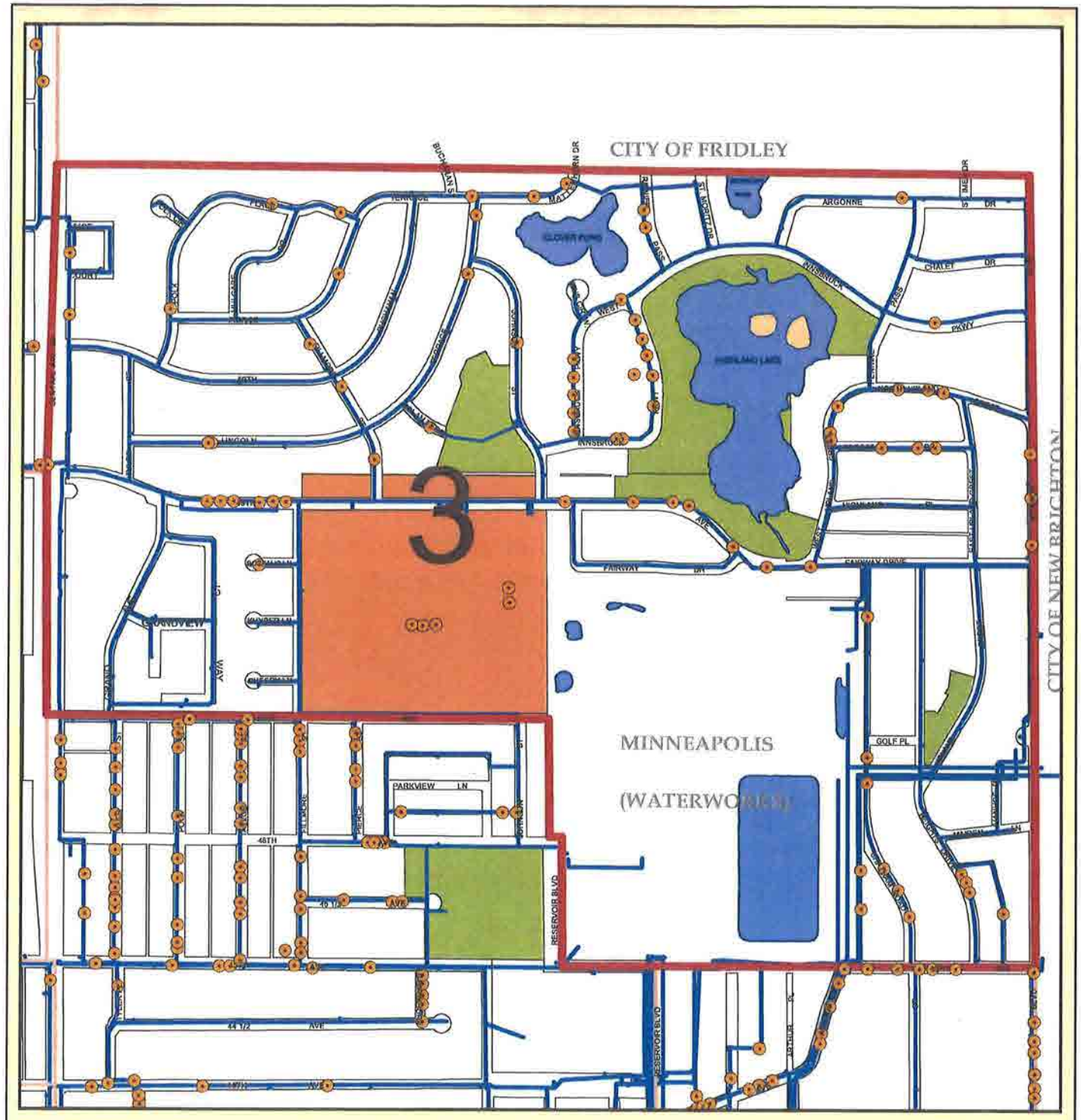
Complete replacement of 6-inch water main with new 8" water main and appurtenances; approximately 750 linear feet of main.

JUSTIFICATION

In locations where cleaning and lining will not work, full replacement is required. This is due to structural deficiencies in the pipe such as frequency of water main breaks. Pipe replacement will correct water quality issues, improve system flow, and correct pipe structural deficiencies.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT	
Architectural/Engineering	X		
Property Acquisition	N/A		
Construction	X	X	(both)

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2017			
Feasibility Study	from 01/17 to 02/17		$ --	Date
Final Design	from 02/17 to 03/17		$ --	Date
Property Acquisition	from ____ to ____	N/A	$ ____	Date
Bid Preparation - Award	from 04/17 to 05/17		$ ____	Date
Construction	from 06/17 to 09/17		$ 90,000	Date
		TOTAL	$ 90,000	

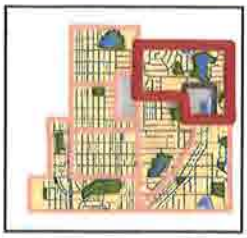


COLUMBIA HEIGHTS

Water Main Replacement Capital Improvements

Year: 2017

Street Management Zones
Water Main
Waterbreaks
Island
Water



Prepared By:
GIS, Engineering, Assessing

Map Date: 10/29/2013

Project Number: **W. 17-02**

Cost: **$90,000**

Project Description: Street Management Zone 3

PROJECT YEAR: 2017

PROJECT NO. W. 17-03

PRIORITY RATING
(to be assigned)

CAPITAL PROJECT REQUEST FORM

DATE October 2013 Revised

Project Title Replace/Update SCADA System Department

Project Type			
	( ) City Facilities	( ) Sanitary Sewer	(X) Storm Sewer
	( ) Land Acquisition	(X) Streets	( ) Water Quality
	( ) Park Development	(X) Water	( ) Other

SUPPORTING DOCUMENTS	YES	NO
Request for Equipment/Vehicle Purchase (if applicable)	X	
Project Map	X	
Financing Schedule/Operating Budget Impact	X	
Additional Data (if available)		X

LOCATION AND DESCRIPTION

Replace/update SCADA system at base station and remote facilities.

JUSTIFICATION

Both equipment and technology will have reached its useful life.

WORK TO BE COMPLETED BY:	CITY STAFF	CONTRACT
Architectural/Engineering		X
Property Acquisition	N/A	
Construction		X

	PROJECT LIFE		APPROPRIATIONS REQUIRED	
Beginning Date of Project	January 2017			
Feasibility Study	from 01/17 to 02/17		$	Date
Final Design	from 03/17 to 04/17		$	Date
Property Acquisition	from to	N/A	$	Date
Bid Preparation - Award	from 04/17 to 05/17		$	Date
Construction	from 05/17 to 08/17		$	Date
		TOTAL	$ 15,000	Storm Sewer
		TOTAL	$ 20,000	Sewer
		TOTAL	$ 20,000	Water

Appendix 5

Emergency Telephone List

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Kevin Hansen	763-706-3705	
Alternate Emergency Response Lead	Lauren McClanahan	763-706-3711	
Water Operator	Sherri Jensen	763-706-3721	
Alternate Water Operator			
Public Communications	Sue Schmidtbauer	763-706-3702	

State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
County Emergency Director			
National Guard	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Gary Peterson	763-706-3607	
Fire Chief	Gary Gorman	763-706-8152	763-706-8156
Sheriff	James Stuart	763-323-5000	
Police Chief	Scott Nadeau	763-706-8100	
Ambulance	Police Department	763-706-8100	
Hospital			
Doctor or Medical Facility	Fairview Clinic	763-782-8183	

State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer			
MDH	Drinking Water Protection	651-201-4700	
State Testing Laboratory	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
MPCA			
DNR Area Hydrologist	Kate Drewry	651-259-5753	
County Water Planner			

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company			
Gas Company			
Telephone Company			
Gopher State One Call	Utility Locations	800-252-1166	651-454-0002
Highway Department			

Mutual Aid Agreements	Name	Work Telephone	Alternate Telephone
Neighboring Water System	City of New Brighton	651-638-2100	
Emergency Water Connection	City of New Brighton	651-638-2100	
Materials			

Technical/Contracted Services/Supplies	Name	Work Telephone	Alternate Telephone
MRWA Technical Services	MN Rural Water Association	800-367-6792	
Well Driller/Repair			
Pump Repair			
Electrician			
Plumber			
Backhoe			
Chemical Feed			
Meter Repair			
Generator			

Valves			
Pipe & Fittings			
Water Storage			
Laboratory			
Engineering firm			

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Sun Focus	763-424-7372	
Radio Station			
School Superintendent	Kathy L. Kelly	763-528-4436	
Property & Casualty Insurance			

Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:			
Nursing Home Critical Use:			
Public Shelter Critical Use:			

Appendix 6

AMENDMENT NUMBER 1
MINNEAPOLIS – CITY OF COLUMBIA HEIGHTS
WATER AGREEMENT – 2004
AMENDMENT TO CONTRACT NO. C-20603

This agreement is made and entered into as of the 21 st day of February, 2013, by and between the City of Minneapolis, a Minnesota home rule charter city in Hennepin County, Minnesota (City) and the City of Columbia Heights, a Minnesota Municipal Corporation (Columbia Heights)

WITNESSETH:

RECITALS

Whereas, the City of Minneapolis operates a municipal water system known as the Minneapolis Public Works – Division of Water Treatment and Distribution Services; and,

Whereas, the City of Minneapolis and the City of Columbia Heights have previously entered, into an Agreement for the City to supply water to the City of Columbia Heights to be effective the 1st day of June 2004 entitled "Minneapolis – City of Columbia Heights Water Agreement; and

WHEREAS, the City of Minneapolis and the City of Columbia Heights deem it appropriate to make amendments to that agreement as specified herein.

Now THEREFORE, it is mutually agreed as follows:

That Section 4 Measurement is amended to read as follows:

The water delivered pursuant to this Agreement shall be measured by meters to be furnished and maintained by the City of Minneapolis at its own cost and expense at existing locations. Such meters shall be subject to periodic inspection and testing by the City of Minneapolis according to American Water Works Association (AWWA) Standards for frequency of testing, accuracy and tolerances of such meters. The cost of testing shall be paid by the City of Minneapolis.

That Section 9 Indemnification by Minneapolis is amended to read as follows:

Indemnification by Minneapolis

Minneapolis agrees to indemnify and save City of Columbia Heights harmless for any and all claims based on the quality of the water supplied to City of Columbia Heights by Minneapolis, as described in Section 8 of this Agreement, which arise or may result from Minneapolis' operations or the actions or neglect of Minneapolis' officers, employees or agents pursuant to this Agreement, or from the use, installation, maintenance, and repair of Minneapolis facilities, inside or outside of Minneapolis or the reading of City of Minneapolis' master meters by Minneapolis personnel, and will assume the defense of any actions arising therefrom in which City of Columbia Heights is made a party defendant. City of Columbia Heights shall give Minneapolis prompt notice of such action. The forgoing indemnification, and any liability assumed by Minneapolis as a result thereof,

shall be subject to the limits of liability and other provisions set forth in Minnesota Statutes, Chap. 466.

BE IT FURTHER RESOLVED, That the existing meters for Columbia Heights shall become the property of the City of Minneapolis and this amendment shall be effective January 1, 2013.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first above written.

WITNESSETH

City of Minneapolis

Department Responsible for
Administering this Agreement
Department of Public Works

Department Director

Approved as to Form:

Assistant City Attorney

Finance Officer/Designee

04.10.13
Date

City of Columbia Heights

By

ITS Mayor

By: City Manager

ITS:

the project. *(9 votes)*
Action Taken: Approved.

4. Oak Lake Ave N and 10th Ave N Street Resurfacing Project:
   a) Passage of Resolution ordering the work to proceed and adopting special assessments for the project; and
   b) Passage of Resolution requesting the Board of Estimate and Taxation to issue and sell assessment bonds for the project. *(9 votes)*
Action Taken: Approved.

5. Capital Budget Amendment:
   Passage of Resolution amending the 2013 Capital Budget by increasing the Water Revenue appropriation by $1,750,000 to fund three additional capital projects in the Water Treatment and Distribution Services Division.
Action Taken: Approved.

6. Water Contracts:
   Authorize amendments to water contracts with the City of Edina, City of Columbia Heights, and the Metropolitan Airports Commission to change the ownership of the water meters to the City of Minneapolis.
Action Taken: Approved.

7. Special Service District Snow and Ice Removal Contract:
   Approve increase to contract with Custom Products and Services by $262,452 for sidewalk snow clearing and ice control in six Special Service Districts.
Action Taken: Approved.

8. University Ave NE Renovation - Cooperative Agreement:
   Authorize execution of a Cooperative Agreement with the Minnesota Department of Transportation (MnDOT) for the City's share of the cost for concrete paving and mill and overlay of parking areas associated with MnDOT's renovation of University Ave NE, from Central Ave NE to 27th Ave NE.
Action Taken: Approved.

9. Park and Portland Ave Bridges - Cooperative Agreement:
   Authorize execution of a Cooperative Agreement with the Minnesota Department of Transportation (MnDOT) for the City's share of the cost for pedestrian level street lighting, signal work, and decorative railings associated with MnDOT's rehabilitation of the Park Ave and Portland Ave bridges over I-94.
Action Taken: Approved.

10. Bids:
   a) OP 7756, Accept low responsive bid of Advanced Waterjet Technologies, LLC to furnish a water blaster unit to the Public Works Equipment Division;
   b) OP 7759, Accept low bid of Commercial Asphalt Company for hot mix asphalt as needed through March 31, 2014;
   c) OP 7763, Accept low bid of Fischer Mining, LLC for fine aggregate through March 31, 2014; and
   d) OP 7767, Accept single bid of Whipps, Inc. to furnish and deliver stop logs, slide gates, and associated equipment to the Water Treatment and Distribution Division. *Early signature by Mayor requested.*
Action Taken: Approved.

T&PW Adjourned Meeting of March 28, 2013

11. Self-Managed Special Service District Policy:
   Adopt Self-Managed Special Service District Policy to guide the formation and management of new and existing Self-Managed Special Service Districts, with the exception of the Downtown Business Improvement Special Service District (DID), which is governed by a separate ordinance.
Action Taken: Approved, as amended.

Ways & Means/Budget

W&M/Budget agenda of 3/26/2013

AMENDMENT NO. 2
MINNEAPOLIS-CITY OF COLUMBIA HEIGHTS
WATER AGREEMENT-2004
AMENDMENT TO CONTRACT NO. C-20603

This agreement is made and entered into as of the 12th day of November, 2013, by and between the City of Minneapolis, a Minnesota home rule charter city in Hennepin County, Minnesota, and the City of Columbia Heights, hereinafter referred to as "City of Columbia Heights".

WITNESSETH:

RECITALS

WHEREAS, the City of Minneapolis operates a municipal water system known as the Minneapolis Water Works ("MWW"); and,

WHEREAS, the City of Minneapolis and the City of Columbia Heights have previously entered into an Agreement for the City to supply water to the City of Columbia Heights to be effective as of the 1st day of June 2004 entitled "Minneapolis- City of Columbia Heights Water Agreement;" and, maintained by the Minneapolis Finance Department as Agreement "C-20603;" and,

WHEREAS, The City and Columbia Heights have previously entered into an Amendment #1 as of the 21st day of March 2013, (Contract Management #C-20603); and,

WHEREAS, the City and the City of Columbia Heights deem it to be appropriate to make amendments to that Agreement as specified herein.

NOW THEREFORE, it is mutually agreed as follows:

I. That in Section 10, Paragraph D, a second paragraph be added as follows:
The published price charged to residential customers living within the Minneapolis city limits is expressed as a fixed charge plus a volume charge expressed on a dollars per hundred cubic feet (HCF) metered consumption basis. The published price may involve a rate structure involving more than a single rate per HCF, based upon season, volume of water consumed or any other variable factor that is reasonable. The City of Columbia Heights rate will be based on the percentage of the Minneapolis Inside Residential Rate as determined by the "Cost of Service Methodology" as described in this section. For years between the years when wholesale costs of service studies are prepared, each intervening-year rate change shall be based on the monthly cost change to a Minneapolis residential customer when the City adopts retail rates in its annual budget process. This cost shall be calculated by the percent (%) change year over year for an inside-city residential customer using a 5/8" meter and 7 billing units of water in a month. Therefore, the monthly cost for a residential customer is the sum of the monthly fixed cost for a 5/8" meter and the cost for 7 units of water per month. These rate increases will be based on rounding to the nearest one-hundredth of a per cent. The new rate to the City of Columbia Heights will be rounded to the nearest cent.

II. That in section 2 "Supply of water" paragraph C be added as follows:

(a) The parties understand that Minneapolis is planning to drill groundwater wells so that it will have the ability to augment or replace all or a portion of its surface water supply with the water from these groundwater wells. The parties understand that in the future the City of Minneapolis may be using groundwater for one of two purposes:

(i) Provide temperature control, hardness control, or supply water to remedy very short-term interruptions that could occur in the supply from the river. In these types of instances the groundwater would be used seamlessly to provide a continuous supply of softened drinking water to all customers, including customers of the City of Columbia Heights. This could occur when the groundwater supply reaches a fourth of its ultimate design capacity.

(ii) Provide a backup supply of water (emergency source) to supplement or substitute for Minneapolis' own surface water supply. This will occur when the groundwater supply reaches full design capacity.

(b) The parties understand that Minneapolis intends to keep its operating expenses, depreciation, and return on capital separate related to water supplied through its surface water supply and to water supplied through its groundwater supply as outlined above in subparagraph (a) (i) and in subparagraph (a) (ii).

(c) In the event that Minneapolis should begin using groundwater as described in subparagraph (a) (i) to substitute for surface water on an occasional basis for distribution to customers inside and outside of Minneapolis that are part of the Minneapolis system, then Minneapolis and the City of Columbia Heights shall in good faith negotiate the parameters of a new cost of service model based on the prior methodology. These changes in the cost of service study caused by a planned use of groundwater by Minneapolis shall be effective for the three-year study period following Minneapolis' implementation of groundwater as a source of supply pursuant to subparagraph (a) (i). The new cost of service model shall allow Minneapolis to include costs related to its production of surface water including groundwater used as specified in subparagraph (a) (i).

(d) The new cost of service model will include the costs of Minneapolis groundwater being constructed and maintained for use as a backup source of supply pursuant to subparagraph (a) (ii) from the cost model used to determine the City of Columbia Heights rates. These changes in the cost of service study caused by the planned use of groundwater by Minneapolis as a backup source of supply shall be effective for the three-year study period following Minneapolis' full or partial implementation of groundwater as a backup source of supply pursuant to subparagraph (a) (ii).

III. That in Section 10, paragraph D, be amended by deleting the 2nd paragraph and replacing it with the following two paragraphs:

A cost of service study was completed in 2012 and shall be completed every three (3) years thereafter. The last basis year used was 2012. For the remainder of the contract, the cost of service basis years will be 2015, affecting rates starting in 2017; in 2018, affecting rates starting in 2020; and so on until the end of the contract.

For future cost of service studies, the volume used for the base year cost of service calculations shall be an average of the three years, these three years being the base year and two immediately preceding prior years. For example, the 2015 cost year will be studied in 2016 and the volumes used shall be the average volumes for 2013, 2014, and 2015.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first above written.

WITNESSETH:

CITY OF MINNEAPOLIS

Bernie R. Bullert
Printed Name of Department Head

Bernie R. Bullert
Signature of Department Head

CITY OF COLUMBIA HEIGHTS

By: _____
Mayor

By: _____
City Manager

Approved as to Form:

_____
City Attorney/Assistant City Attorney

GARY WARNBERG
Printed Name of Finance Officer/Designee

_____
Signature of Finance Officer/Designee

12/18/13
Date

Appendix 7

(See City Code section 4.318 (F))

In the event of a water emergency, the City of Columbia Heights does have a City code related to water restrictions, but they will also follow what Minneapolis does during a water emergency. Minneapolis will take the lead and Columbia Heights will follow.

Print

Columbia Heights, MN Code of Ordinances

ARTICLE III: WATER SERVICE

Section

§ 4.301 COMPLIANCE WITH PROVISIONS.

No person shall make, construct or install any water service installation, or make use of any water service connected to the water system except in the manner provided in this chapter, nor shall any person make, construct, install or make use of any installation connected to the water system contrary to the regulatory provisions of this chapter.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.302 WATER SERVICE CONNECTIONS; PERMIT REQUIREMENTS.

(A) *Permit required.* No person other than a city employee shall uncover or make or use any city municipal water system except pursuant to a permit obtained from the Inspections Department.

(B) *Conditions of permit.* No permit to tap or connect with sewer or water service in the city shall be granted for service to property for which there are delinquent taxes, delinquent special assessments, or unpaid special charges, as of the date of the permit application.

(C) *Deposit for water used during construction.* A deposit for the estimated amount of water to be used during construction shall be paid when filing for a plumbing permit.

(D) *Excavation permit.* An excavation permit pursuant to § 6.301 is required if any part of the excavation for municipal water is within the public right-of-way.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.303 WATER SERVICE CONNECTIONS AND DISCONNECTIONS; CHARGES; MANNER AND COSTS.

(A) *Connection and disconnection charges.*

(1) Water service for any premises, building or building unit, shall not be commenced or restarted until a connection fee in an amount set by resolution of the Council is paid to the Utility Billing Office, together with any delinquent water bills from past service to said building or building unit, and any unpaid and delinquent special assessments.

(2) Where separate water meters are installed to service separate locations or units within the same building, the provisions of this section relating to delinquent water bills shall only apply to those locations or units for which such delinquencies exist.

(3) The provisions of this section shall remain in full force and effect without regard to any private contractual agreements or responsibilities between individuals or firms, regarding the payment of water bills, and the providing of utility services.

(4) A disconnection fee as set by resolution of the Council shall be charged upon voluntary or involuntary termination of water service at any premises, building or building unit.

(B) *Manner and costs.*

(1) Taps or connections to the water mains shall be made by the Public Works Department at no extra cost to the applicant for taps up to and including one inch in size.

(2) Taps larger than one inch shall be made by applicant at the expense of the applicant.

(3) All taps and connections shall be left uncovered until inspected and tested by the Public Works Department. All connections shall conform with city specification.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.304 INSTALLATION AND CONSTRUCTION REQUIREMENTS AND SPECIFICATIONS.

All installations of services shall comply with the following:

(A) All services shall be constructed by a licensed plumber at the owner's expense.

(B) Services three inches in diameter and less shall be “Type K” copper. All services larger than three inches in diameter, shall be ductile iron.

(C) All taps two inches in diameter or smaller shall be made with the use of a corporation stop designed for tapping under pressure.

(D) The maximum size corporation stop that can be tapped directly into the main is as follows:

Pipe Size	*Tap Size*
Up to 6-inch ductile iron	¾ inches
8-inch ductile iron	1 inch

(E) The maximum size corporation stop that can be used with double-strap bronze service saddle is as follows:

Pipe Size	*Tap Size*
6-inch ductile iron	1½ inches
8-inch ductile iron	2 inches

(F) All taps other than those allowed in the preceding division shall be made only with the use of an approved tapping sleeve and valve.

(G) All corporation stops must have clear openings of the same diameter as the pipe with which they are placed and be of a make and pattern approved by the Public Works Department.

(H) All curb stops one inch and larger shall be of the Mueller Oriseal design or approved equal.

(I) All services must be placed not less than seven feet below finished grade; and each service two inches in diameter and smaller shall have a Minneapolis pattern base curb stop fitted with a stop box set on the property line at finished grade or proposed sidewalk.

(J) The stop box used shall have a Minneapolis base and be of a design approved by the Public Works Department. Stop boxes on curb stops one and one-fourth inch diameter and smaller shall have an unobstructed opening of one and one-half inch diameter. Curb stops one and one-half inch diameter and larger shall have an unobstructed opening of a minimum size as the service pipe. All stop boxes shall be fitted with a cover approved by the Public Works Department. Every service pipe must have a shut-off valve placed adjacent to and on the street side of the meter which must be kept in working order at all times so that the water may be shut off by the occupant of the premises. Said valve shall be no more than one foot from the inside wall of the structure. There shall also be a gate valve placed on the outlet side of the water meter, not more than one foot from the meter so that the meter can be taken out or replaced without draining the plumbing system of the building. All valves shall have a clear opening the size of the inside diameter of the service.

(K) The minimum size water service allowed shall be one inch.

(L) Plumbers shall leave all new water services shut off at the curb stop after completing the testing. Curb stops are to remain off until a water meter has been installed.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.305 RESTRICTIONS ON LAYING OF PIPES.

No customer shall be permitted to conduct water pipes across lots or buildings to adjoining properties; but all service pipes shall be laid on streets, alleys, or public ground to the properties to be served and entered at the front or rear when practical of the building nearest the main.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.306 SEPARATE SERVICE TO EACH BUILDING.

No new service shall be constructed and no existing service shall be changed in such manner that more than one building, and in the case of residential property one living unit, shall be on the same service pipe, without specific approval of the City Engineer.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.307 SEPARATE CURB STOP REQUIRED FOR EACH BUILDING.

Owners of properties having water services which do not have separate curb stops and boxes for each building or which otherwise do not conform to the requirements in this chapter at the time of its passage may be required to put in such curb stop or make such other changes as are necessary to conform to these requirements, when so instructed by the City Engineer.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.308 TWO OR MORE SERVICES ON ONE CURB STOP.

Where there are two or more services on one curb stop the water will not be turned on for one service unless the service pipes supplying the entire premises are metered and the water bill is paid for each service. The property owner shall be held responsible for the water bill and any maintenance, repairs or replacements of the service line where more than one unit is served by one service line.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.309 MAINTENANCE RESPONSIBILITY OF SERVICE PIPES.

(A) It shall be the responsibility of the property owner to maintain in good working order and/or replace service pipes, including curb stops, from the main to the meter.

(B) The property owner shall immediately repair any leak occurring in his service pipe when the property owner is notified by the Public Works Department that the leak is in their service. Within 24 hours, the property owner shall provide the Department the name of the contractor that will make the repair and when the repair will be made, which repair must be completed within two days. If the repair has not been completed within three days from the date the property owner was first notified of the leak, the Public Works Department shall cause the work to be completed and the property owner will be billed for all expenses involved. If for some reason the work is deemed to be a hazard for the safety and welfare of the general public, the Public Works Department may cause the work to be completed immediately after discovering the leak, and bill all expenses to the customer.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.310 UNUSED SERVICE PIPE.

All service pipes that become useless or abandoned, including previously abandoned or unused services upon discovery of the same, must be permanently closed off and capped at the watermain by the property owner and so reported to the Public Works Department. In the event the property owner fails to shut off the service after being notified by certified mail, the Public Works Department may perform the necessary work and charge all expenses involved to the owner of the property.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.311 CONTROL OF WATER; DISCLAIMER; LIABILITY.

(A) *Right to shut off water or vary water pressure.* The Public Works Department reserves the right, at any time when necessary and without notice, to discontinue water supply or to vary water pressure for the purpose of making repairs or extensions or for any other purpose deemed to be in the best interest of the general public health and welfare. No claim shall be made against the City of Columbia Heights for any damage that may result from shutting off water or from varying the water pressure. The Public Works Department shall give notice prior to shutting off water if conditions are such that it is possible to do so.

(B) *Pressure and supply not guaranteed.* The Public Works Department does not guarantee the customer any fixed pressure or a continuous supply. In emergencies water may be shut off without notice.

(C) *Disclaimer of liability.* The City of Columbia Heights shall not be held responsible by reason of the breaking of any service pipe or apparatus, frozen water services, shut-off, fixtures within the premises, for failure in the supply of water, or variances in pressure.

(Ord. 1227, passed 8-26-91)

§ 4.312 WATER METERS.

(A) *Requirements and installation.*

(1) Except for extinguishing of fire, no person or other entity except authorized city employees shall use water from the water supply system or permit water to be drawn there from unless the same be metered by passing through a meter furnished by the Public Works Department at the expense of such person or entity.

(2) The Public Works Department shall ensure that every customer and user of city water is provided with a properly installed water meter upon request therefore. All meters shall be installed by a licensed plumber or by the Public Works Department in accordance with the following rules:

(a) Meters shall be placed on the service pipe not to exceed one foot from the wall or floor where such pipe enters the premises;

(b) Valve installation requirements as set forth in § 4.304(J);

(c) The meter must be placed in a suitable place so as to keep it dry and clean, protected from frost;

(d) All meters shall be readily accessible to the meter reader, inspectors and Public Works Department personnel.

(3) For purposes of enforcing the provisions of this code, delegated city officials upon presentation of proper identification shall have the authority to enter any premises during reasonable hours to read, inspect, maintain, or replace said water meter.

(B) *Requirements of seal.*

(1) Every water meter shall be sealed by an employee of the city at the time of installation; and at any time thereafter where the seal has been broken.

(2) No person shall break or remove said seal except an authorized employee of the Public Works Department, provided however, that a licensed plumber may break said seal for the purpose of making necessary repairs after being granted specific permission by the Public Works Department.

(3) Any broken seal or removed water meter shall be reported to the city within 24 hours of such action, or as soon as discovered.

(C) *Protection damage and repairs.* The property owner or occupant of premises where a meter is installed shall be held responsible for its care and protection from freezing or hot water, and from other injury or interference from any person or persons. Meters that are liable to become damaged by hot water shall be protected by the installation of a reliable check and relief valve. In case of damage to the meter, or in case of its stoppage or imperfect working, the property owner or occupant shall give immediate notice to the office of the Public Works Department. All meters that are broken or damaged by negligence of owners or occupants of the premises, or by freezing, hot water, or other damage, including ordinary wear and tear, shall be repaired or replaced by the Public Works Department and the cost of repairs or replacement shall be paid by the owner or occupant.

(D) *Removal; replacement.* Whenever a water meter is installed on a water service in a premise that is to be remodeled, removed, or destroyed, or where the service is discontinued so that the water meter is no longer needed, the owner of such premises shall give notice to the Public Works Department to remove such meter, and free access to such meter must be provided so that the meter may be removed. If the meter is lost or damaged, the owner of the premises shall be required to replace the same at the replacement value.

(E) *Tampering prohibited; estimation of bill.* No one shall in any way interfere with the proper registration of a water meter. If any meter is found to have been tampered with, the water bill shall be estimated for the period and the meter repaired and tested. Upon repetition of the offense, it will be optional with the Public Works Department to discontinue the water service or collect the amount estimated due. The basis of estimating the bill shall be on the amount of the largest quarter billed in the preceding year from the date of the tampering of the meter.

(F) *Meter testing.* In case there is doubt as to the accuracy of a water meter on the part of the customer, he may have the meter tested by the Public Works Department; at which test he may be present if he so desires. If the meter is found to register within 2% of being correct a charge will be made to pay for the labor of making such tests. If the meter is found to measure 2% or more incorrectly, no charge shall be made for making the test. If the meter should be found to over-register more than 2%, there shall be a proportional deduction made from the previous water bill. A water meter shall be considered to register satisfactorily when it registers within 2% of accuracy.

(G) *Remote meter registers.* When remote registers have been installed, and there is a conflict between the inside meter reading and the remote register reading, the inside meter reading shall prevail as the actual reading for billing purposes.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.313 SERVICE RATES AND CHARGES; RULES AND REGULATIONS.

(A) *Charges.* The Council shall by resolution fix all charges and penalties for late payment for water and sewer service and for garbage and rubbish hauling rates for dwellings and shall similarly fix the rates by which such charges shall be computed. All such utility bills may be collected as provided for water billing by division (C) of this section.

(B) *Owner liability for charges.* In billing water service the rates shall be applied separately for the consumption through each meter. The property owner shall be liable for water supplied to the property owner's property, whether the owner is occupying the property or not, and any charges unpaid shall be a lien upon the property.

(C) *Statements; delinquent bills, shut-off for non-payment; resumption of services.*

(1) *Accounting.* The administration services of the city shall provide for a method of periodic accounting and recording of water consumed at each metered location throughout the city. Bills shall then be calculated to include connecting and disconnecting charges; minimum charges for availability of water

services, regardless of connection or usage; and consumption charges as necessary and appropriate for revenue for the maintenance and operation of the city water works facilities.

(2) *Statements.* The administrative service shall mail said water bills to the owner at the address listed for each specified meter location or to such address as the owner of record may request in writing.

(3) *Due date.* Water bills are due and payable on the tenth day of the month following the date of the postmark. Any bill not paid by the close of business on the tenth day of the month following its mailing is delinquent, at which time a charge established by the City Council shall be added to the billing. Partial payments shall be considered as payment towards most dated amounts billed.

(4) *Delinquent bills.* The administrative service shall ascertain all water bills that are delinquent after the tenth day of the month and mail notice of such delinquency to the occupant of the metered location by the twentieth day of the same month. If such bill remains unpaid at the last day of the month in which the delinquency notice was sent, the administrative service shall send a second written notice of such delinquency. Said notice shall include a statement that water service will be discontinued unless full payment is received by the tenth day of the month following the month in which the first delinquency notice was mailed. Before the water will be turned on, the entire account, including any current charges must be paid along with and including the charge established by the Council for turning the water off and on. Water will be turned on only during regular working hours. If water bills are not paid, the bills may be levied against the property owner prior to turning the water back on, and proof of levy payment must be provided to the administrative service prior to said service being turned back on.

(5) *Shut-off for non-payment.* Water service may be discontinued at any time thereafter, subject to the following exceptions: Service may not be discontinued in this manner for:

(a) Any tenant, lessee, or individual occupant of a multiple dwelling or commercial building which does not have a separate meter for each separate tenant, lessee, or occupant unit.

(b) Any person who has filed with the Finance Director a written protest of the amount billed, either in whole or in part, together with the reasons or basis for such protest.

(c) Any person who is subject to the Cold Weather Rule, M.S. § 216B.097, as it may be amended from time to time.

(6) *Shut-off for non-payment under subdivision (C)(5)(a).*

(a) Water service may be discontinued under circumstances described in subdivision (C)(5)(a) by providing 30 days' written “Final Notice” to each individual tenant, lessee or occupant.

(b) Upon expiration of 25 days of said 30-day period, additional written notice shall be provided to each individual tenant, lessee, or occupant indicating whether the delinquent water bills remain unpaid.

(7) *Shut-off for non-payment under subdivision (C)(5)(b).* Under circumstances described in subdivision (C)(5)(b), the administrative service shall investigate the basis for the protest and issue a report of its findings to the aggrieved party. When so warranted by the results of the investigation, water service may thereafter be terminated upon 24 hours' notice.

(8) *Certification of delinquent bills.* The Council may certify unpaid and delinquent water bills to the County Auditor annually for collection pursuant to the provisions of M.S. § 444.075, as it may be amended from time to time.

(D) *Water service bills payable at Finance Department.* All bills for water and other services are payable at the office of the Finance Department during regular working hours, or as otherwise provided by said Finance Department.

(Ord. 1227, passed 8-26-91)

§ 4.314 DISCONTINUANCE OF SERVICE.

Any customer desiring to discontinue the use of water must notify the Finance Department in writing. The Public Works Department shall turn off the water, subject to any fees established.

(Ord. 1227, passed 8-26-91)

§ 4.315 REINSTATEMENT OF SERVICE.

No firm, company or corporation or individuals from whose premises the water shall have been shut off shall turn the water on without permission from the Public Works Department.

(Ord. 1227, passed 8-26-91)

§ 4.316 FIRE SERVICES.

(A) *Construction.* The construction of fire services shall be allowed as provided under the building code and Inspection Department. Detector flow meters shall be installed on any separate fire service line.

(B) *Activation of detector flow meter.* When the detector flow meter is activated by flow through the fire system, it shall be the duty of the property owner or occupant to notify the Public Works Department within 24 hours thereafter.

(C) *Limitation of size.* The Public Works Department shall reserve the right to limit the size of fire protection services where the street mains are of such size as to make it necessary in order to protect public interest.

(D) *Prohibited use.* In any case when the owner or occupant of any premises are found to be using water from a fire service for other purposes than fire protection, such act shall be cause for requiring metering of the fire service with a meter specified by the Public Works Department, at the expense of the owner.

(E) *Requirement of meter.* The Public Works Department reserves the right at any time to require the property owner of the premises supplied with fire services to furnish and install, at his expense and under the direction of the Public Works Department an approved water meter and to keep the same in accurate operating condition, if it finds it necessary to do so to protect the public interest.

(Ord. 1227, passed 8-26-91)

§ 4.317 FIRE HYDRANTS.

(A) *Permit requirements.* No person other than an authorized city employee shall use a fire hydrant without first obtaining a permit therefor from the Public Works Department.

(B) *Flushing streets and sewers.* Hydrants used for construction purposes or for flushing sewers and streets shall have a reducing coupling attached to the nozzle of the hydrant with an independent throttling valve for regulating the supply. Backflow preventer must be available at the hydrant or the vehicle.

(C) *Opening hydrants.* Hydrants shall be opened only with a numbered hydrant spanner.

(D) *Use as temporary service by contractors.* Temporary service from fire hydrants is available for contractors. A meter will be obtained from the Public Works Department and a charge shall be made for hook-up. The charges for such water service shall be at the same rate as other services. Responsibility for the safety of and security of the meter lies with the contractor. The contractor shall place a deposit for the replacement value of the meter with the Public Works Department at the time of the request for application.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

§ 4.318 MISCELLANEOUS PROVISIONS.

(A) *Water supply from two sources; private supply substituted for city water.* On premises where water is supplied from two sources, the city water being one of the systems, the piping system for city water must be entirely separated from that of the other source. If other than city water is to be furnished on premises previously supplied with city water, the property owner or his plumber must give notice at the office of the Public Works Department when he will make this change and must also cut off the water at the corporation stop and disconnect the service pipe.

(B) *Disconnection of direct connection of two sources.* Premises now having direct connection between the city water supply and another supply shall forthwith disconnect the same.

(C) *Requirements of safety devices.* Customers are required to equip boilers, heating plants, and refrigeration machinery with safety devices and/or backflow preventers; or provide auxiliary supplies.

(D) *Repairs to comply with provisions.* Repairs made to existing services shall cause such service to conform in every respect with this chapter.

(E) *Accuracy of information not guaranteed.* Such information as may be obtained from the records, maps, employees, and the like, of the Public Works Department relative to the location of water mains and service pipes will be furnished to licensed plumbers and interested parties, but the Public Works Department does not guarantee the accuracy of the same.

(F) *Restriction of water use.* The Public Works Department reserves the right to prohibit the use of water for yard sprinklers, elevators, air conditioners, coolers, and large consumers of water when in the judgment of the Public Works Department it shall be necessary to do so for the protection of public interest.

(G) *Provisions considered part of every contract.* The foregoing rules and regulations shall be considered a part of the contract for every person who takes water supplied by the City of Columbia Heights, and shall be considered as having expressed his agreement to be bound thereby.

(Ord. 1227, passed 8-26-91) Penalty, see § 4.319

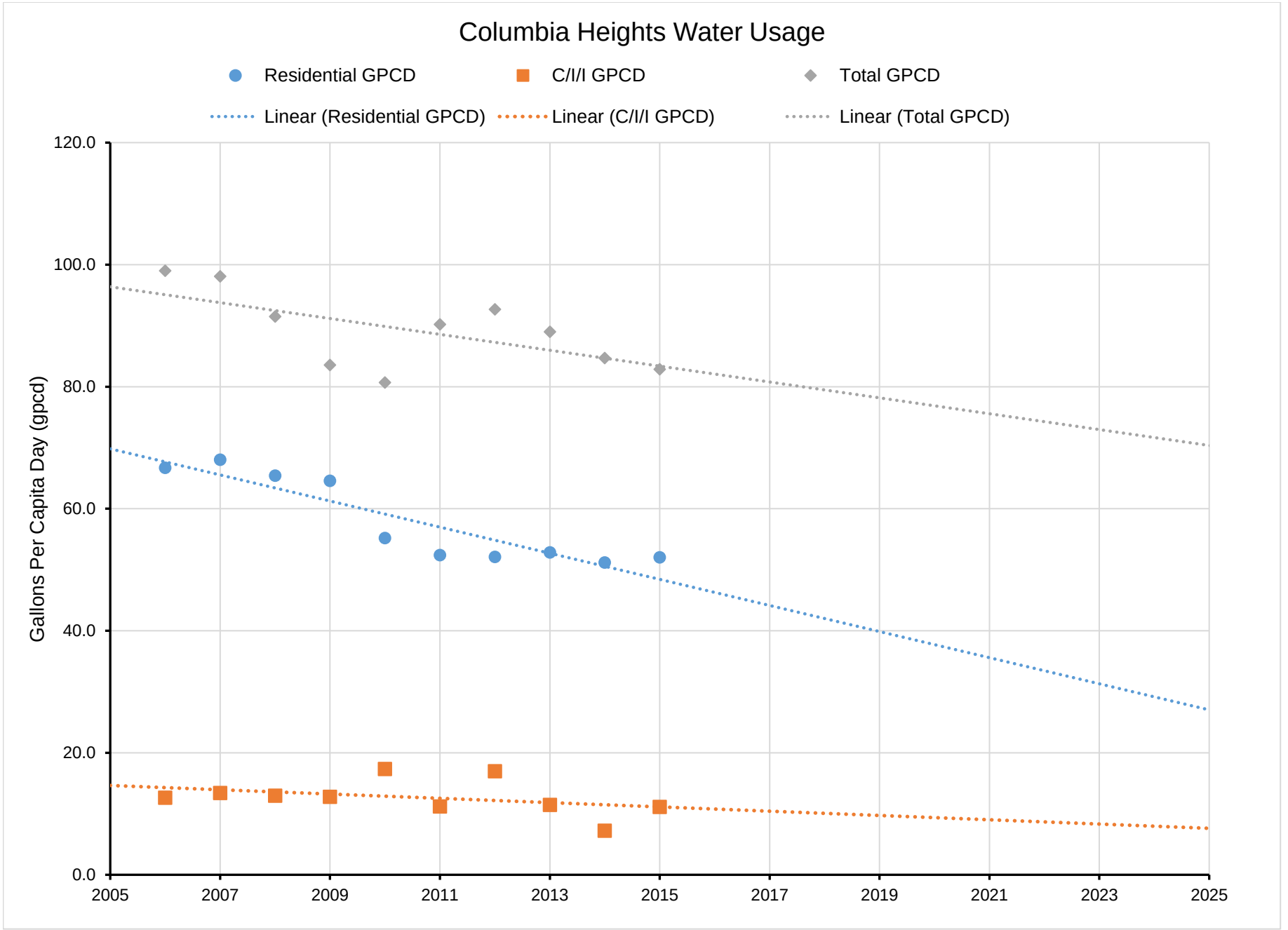
§ 4.319 PENALTY.

(A) Any person, firm, or corporation who violates or refuses to comply with any of the provisions of this article, upon conviction thereof, shall be punished as provided in § 1.999. Each day that a violation exists shall constitute a separate offense.

(B) Any person violating any of the provisions of this article is liable to the city for any expense, loss, or damage occasioned the city by reason of such violation.

(Ord. 1227, passed 8-26-91)

Appendix 8


Columbia Heights Water Usage
Residential GPCD
C/I/I GPCD
Total GPCD
Linear (Residential GPCD)
Linear (C/I/I GPCD)
Linear (Total GPCD)
Gallons Per Capita Day (gpcd)
120.0
100.0
80.0
60.0
40.0
20.0
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2021
2023
2025

Appendix 9

RESOLUTION NO. 2015-98

A resolution of the City Council for the City of Columbia Heights, Minnesota,

Whereas, a Utility Rate Study has been completed which has analyzed the past, current and future financial health of the City of Columbia Heights' Water, Sanitary Sewer, Storm Sewer and Refuse funds and;

Now, therefore, in accordance with the foregoing, and all ordinances and regulations of the City of Columbia Heights, the City Council of the City of Columbia Heights makes the following:

FINDINGS OF FACT

In accordance M.S. 103G.29, and with the operating costs and rates to be paid by the City of Columbia Heights to the Metropolitan Council Environmental Services and the Minneapolis Water Department and other primary vendors of the City's utility funds, the following quarterly rates shall be effective for all billings rendered on or after January 1, 2016:

1. Water Supply Conservation Rates:

   Second tier rates established in section 2 below, apply as follows:
   - Residential
     Second tier rate is for water use greater than 25,000 gallons per quarter per dwelling unit.
   - Non-Residential - Less than 1 inch Meter
     Second tier rate is for water use greater than 25,000 gallons per quarter.
   - Non-Residential - 1 inch Meter or larger
     Second tier rate is for water use greater than 250,000 gallons per quarter.
   - Irrigation Meters: The Second Tier rate applies to all water run through sprinkler meters.

2. Water Supply Rates:

Customer Classification	Year	2016	2017	2018	2019
Residential Single Family					
Fixed Fee		$ 25.25	$ 27.27	$ 28.22	$ 29.21
Tier 1 Per 1000 gallons		$ 3.79	$ 4.09	$ 4.23	$ 4.38
Tier 2 Per 1000 gallons		$ 4.73	$ 5.11	$ 5.29	$ 5.48
Water Meter Surcharge		$ 3.00	$ 3.00	$ 3.00	$ 3.00
Residential Multi-Family					
Fixed Fee (Per Dwelling Unit)		$ 25.25	$ 27.27	$ 28.22	$ 29.21
Tier 1 per 1000 gallons		$ 3.79	$ 4.09	$ 4.23	$ 4.38
Tier 2 per 1000 gallons		$ 4.73	$ 5.11	$ 5.29	$ 5.48
Non-Residential Commercial					
Fixed Fee (Based on Meter Size)					
Less than 1" Meter		$ 25.25	$ 27.27	$ 28.22	$ 29.21
1" Meter		$ 50.50	$ 54.54	$ 56.45	$ 58.43
1.5 " Meter		$ 63.13	$ 68.18	$ 70.57	$ 73.04

Customer Classification	Year	2016	2017	2018	2019
2" Meter		$ 101.00	$ 109.08	$ 112.90	$ 116.85
3" Meter		$ 227.25	$ 245.43	$ 254.02	$ 262.91
4" and Larger Meter		$ 404.00	$ 436.32	$ 451.59	$ 467.40
Tier 1 per 1000 gallons		$ 3.79	$ 4.09	$ 4.23	$ 4.38
Tier 2 per 1000 gallons		$ 4.73	$ 5.11	$ 5.29	$ 5.48

3. Sanitary Sewer Disposal Rates:

Customer Classification	Year	2016	2017	2018	2019
Residential Single Family					
Fixed Fee		$ 21.96	$ 23.72	$ 24.55	$ 25.41
Rate per 1000 Gallons		$ 2.38	$ 2.57	$ 2.66	$ 2.75
Residential Multi-Family					
Fixed Fee (Per Dwelling Unit)		$ 21.96	$ 23.72	$ 24.55	$ 25.41
Rate per 1000 Gallons		$ 2.38	$ 2.57	$ 2.66	$ 2.75
Non-Residential Commercial					
Fixed Fee (Based on Meter Size)					
Less than 1" Meter		$ 21.96	$ 23.72	$ 24.55	$ 25.41
1" Meter		$ 43.92	$ 47.43	$ 49.09	$ 50.81
1.5 " Meter		$ 54.90	$ 59.29	$ 61.37	$ 63.52
2" Meter		$ 87.84	$ 94.87	$ 98.19	$ 101.63
3" Meter		$ 197.64	$ 213.45	$ 220.92	$ 228.65
4" Meter		$ 351.36	$ 379.47	$ 392.75	$ 406.50
Rate per 1000 Gallons		$ 2.38	$ 2.57	$ 2.66	$ 2.75

Sanitary sewer volume rates apply as follows:

- Residential use up to 25,000 gallons per quarter per dwelling unit, single and multi-family.
- Non-residential use for all volume metered.

4. Storm Sewer Rates:

Customer Classification	Year	2016	2017	2018	2019
R-1 Single Family Residential		$ 10.24	$ 11.06	$ 11.45	$ 11.85
R-2 One and Two Family Residential		$ 10.24	$ 11.06	$ 11.45	$ 11.85
R-3 Multi-Family Residential		$ 67.57	$ 72.98	$ 75.53	$ 78.17
R-4 Multi-Family Residential		$ 67.57	$ 72.98	$ 75.53	$ 78.17
RB Residential Business		$ 131.54	$ 142.06	$ 147.03	$ 152.18
LB Limited Business District		$ 131.54	$ 142.06	$ 147.03	$ 152.18
GB General Business District		$ 148.68	$ 160.57	$ 166.19	$ 172.01

CBD	Central Business District	$ 148.68	$ 160.57	$ 166.19	$ 172.01
I	Light Industrial	$ 116.08	$ 125.37	$ 129.76	$ 134.30
I-1	Heavy Industrial	$ 131.54	$ 142.06	$ 147.03	$ 152.18
MWW	Minneapolis Water Works	$ 16.32	$ 17.63	$ 18.25	$ 18.89

5. Residential Refuse:

Service Size	**Year**	**2016**	**2017**	**2018**	**2019**
30 Gallon Container		$ 37.19	$ 37.95	$ 39.28	$ 40.65
60 Gallon Container		$ 38.96	$ 39.75	$ 41.14	$ 42.58
90 Gallon Container		$ 48.59	$ 49.58	$ 51.32	$ 53.11
1 Yard Service		$ 127.53	$ 130.13	$ 134.68	$ 139.40
1-1/2 Yard Service		$ 174.01	$ 177.56	$ 183.77	$ 190.21
2 Yard Service		$ 203.20	$ 207.35	$ 214.61	$ 222.12
3 Yard Service		$ 261.58	$ 266.92	$ 276.26	$ 285.93
4 Yard Service		$ 319.96	$ 326.49	$ 337.92	$ 349.74
6 Yard Service		$ 436.70	$ 445.61	$ 461.21	$ 477.35
8 Yard Service		$ 481.13	$ 490.95	$ 508.13	$ 525.92
Recycle and Yard Waste per Dwelling Unit (1-3 Units)		$ 15.61	$ 15.93	$ 16.49	$ 17.06
Recycling without Yard Waste per Dwelling Unit (4 or more units)		$ 8.11	$ 8.28	$ 8.57	$ 8.87

Additional refuse information:

- Quarterly prices shown are for weekly pickup.
- Household recycling cost is based on every-other week collection.
- Optional cart for yard waste is not included in the yard waste service price. Cart is available for an additional cost.
- 90 gallon refuse service allows for additional trash bags not in container to be picked up.
- 2 yard compacted service computed as 6 yard non-compacted.

6. Senior Utility Rates (same as residential, except as below):

Owner Occupied Home Income-qualified Senior	**Year**	**2016**	**2017**	**2018**	**2019**
Water - Fixed Fee		$ 19.62	$ 21.19	$ 21.93	$ 22.70
Sanitary Sewer - Fixed Fee		$ 16.17	$ 17.46	$ 18.07	$ 18.70
Maximum Charge for 25,000 Gallons/Quarter		$ 75.67	$ 81.71	$ 84.57	$ 87.45
Refuse - Any Size Container Up to 90 Gallons		$ 37.19	$ 37.95	$ 39.28	$ 40.65

BE IT FURTHER RESOLVED that all foregoing rates do not include state fees or sales tax, and

BE IT FURTHER RESOLVED that all state fees and taxes will be added to the utility bills in addition to the foregoing rates.

ORDER OF COUNCIL

Passed this 14th day of December, 2015

Offered by: Williams
Seconded by: Murzyn, Jr.
Roll Call: All Ayes

Gary L. Peterson, Mayor

Attest:

Katie Bruno, City Clerk/Council Secretary

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Columbia Heights, MN Code of Ordinances

§ 9.106 GENERAL DEVELOPMENT STANDARDS.

(A) *General provisions.*

(1) *Purpose.* The purpose of this section is to establish regulations of general applicability to property throughout the city, to promote the orderly development and use of land, to minimize conflicts between uses of land, and to protect the public health, safety and welfare.

(2) *Applicability.* The regulations set forth in this section shall; apply to all structures and uses of land, except as otherwise provided in this article.

(B) *Lot controls.*

(1) *Purpose.* Lot controls are established to provide for the orderly development and use of land, and to provide for adequate light, air, open space and separation of uses.

(2) *Use of lots.* All lots shall be used in a manner consistent with the requirements of the zoning district in which the property is located. No part of any existing lot shall be used as a separate lot or for the use of another lot, except as otherwise provided in this article.

(3) *Lot divisions.* No lot shall be divided into two or more lots unless all lots resulting from such division conform to all applicable regulations of this article.

(4) *Lots of record.* A lot of record shall be deemed a buildable lot provided it has frontage on a public right-of-way and meets the setback and area requirements for the district in which it is located, or adjusted to conform as follows: a lot or lot of record upon the effective date of this article which is in a residential district and which does not meet the requirements of this article as to area or width, may be utilized for single-family detached dwelling purposes provided the measurements of such lot meets 100% of the front yard, side yard and rear yard setback requirements for the district in which it is located and 60% of the minimum lot area or lot width requirements for the district in which it is located.

(5) *Principal buildings in residential districts.* There shall be no more than one principal building on a lot in any residential district, unless otherwise provided for through a mixed use planned development.

(6) *Principal buildings in non-residential districts.* There may be more than one principal building on a lot in non-residential districts, provided each building meets all of the requirements, including setbacks, of the district in which it is located.

(7) *Required yards.* Yard requirements shall be as specified for the zoning district in which the lot is located. No yard or other open space shall be reduced in area or dimension so as to make such yard or other open space less than the minimum required by this article. If the existing yard or other open space is less than the minimum required, it shall not be further reduced. In addition, no required yard or other open space allocated to a building or dwelling group shall be used to satisfy yard, open space, or minimum lot area requirements for any other structure or lot.

(8) *Setback exception in residential districts.* In any residential district where the average depth of the front yard for buildings within 200 feet of the lot in question and within the same block front is lesser or greater than that required by article, the required front yard for the lot in question shall be the average plus or minus 10% of the depth; however, the depth of the required front yard shall not be less than 10 feet nor more than 50 feet.

(9) *Corner lots.* For corner lots, the shorter lot line abutting a public street shall be deemed the front lot line for purposes of this article, and the longer lot line abutting a public street shall be deemed a side lot

(11) *Stacking requirements.* Drive-up and drive-through facilities shall provide adequate stacking space for vehicles in accordance with the following table. Stacking spaces shall require a minimum pavement width of 12 feet, a length of 20 feet per vehicle, and shall be exclusive of any other required parking spaces or drive aisles.

Use	Minimum Stacking Spaces
Automobile washing facility–self-service	4 spaces per bay at entrance, 1 space per bay at exit
Automobile washing facility–automatic	4 spaces per bay at entrance, 1 space per bay at exit
Food service–fast food drive-through	4 spaces behind menu board, 4 space behind first window
Financial institution	4 spaces per teller window, 2 spaces per ATM kiosk
Other drive-up or drive-through uses	2 spaces per window

(12) *Off-street loading requirements.* Off-street loading space shall be provided for any non-residential use that receives or distributes materials or merchandise by trucks or similar vehicles and has a gross floor area of 5,000 square feet or more, in accordance with the following standards:

(a) *Dimensions.* Loading berths shall be no less than 12 feet in width, 50 feet in length and 14 feet in height, exclusive of aisle and maneuvering space.

(b) *Location.* Loading berths shall be located on the site and shall be separate from any required off-street parking. Loading berths shall not be located less than 50 feet from the property line of any residential property or residentially zoned property. Loading berths shall not be located within the front yard setback area.

(c) *Access.* Each loading berth shall be located with appropriate means of vehicular access to and from a public street or alley and shall not interfere with automobile or pedestrian traffic either on the site or adjacent to the site.

(d) *Surfacing.* All loading berths and access driveways shall be surfaced with a dustless all-weather material and constructed to control drainage according to a plan approved by the City Engineer.

(e) *Use.* Any space designated as a loading berth or access drive in accordance with the terms of this section shall not be used for the storage of goods, inoperable vehicles or required off-street parking.

(f) *Number.* For facilities with less than 20,000 square feet gross floor area, the off-street loading requirements may be met by providing a designated loading zone on site, as opposed to constructing a loading berth. For facilities with 20,000 square feet gross floor area or greater, one off- street loading berth shall be provided for every 30,000 square feet gross floor area or fraction thereof.

(M) *Landscaping and screening.*

(1) *Purpose.* Landscaping and screening requirements are established to buffer non-compatible land uses, screen unsightly views, reduce noise and glare, minimize storm water runoff, and generally enhance the quality and appearance of development within the community.

(2) *Landscape plan required.* A landscape plan is required for all new commercial, industrial, institutional and multi-family development. For development having an anticipated construction value in excess of $750,000, the landscape plan must be prepared by a landscape architect registered in the State of Minnesota. Said landscape plan shall include the location, size, quantity and species of all existing and proposed plant materials.

(3) *Design considerations.* The following design concepts and requirements should be considered when developing a landscape plan for submittal to the city:

(a) To the maximum extent possible, the landscape plan shall incorporate existing vegetative features on the site.

(b) The overall composition and location of landscaped areas should complement the scale of the development and its surroundings.

(c) Landscaped areas should be of adequate size to allow proper plant growth, protect plantings from both pedestrian and vehicular traffic, and provide adequate area for plant maintenance.

(d) A variety of trees and shrubs should be used to provide visual interest year round. No more than 50% of the required number of trees or shrubs may be comprised of any one species. No less than 25% of the required number of trees shall be over-story deciduous trees and no less than 25% shall be coniferous.

(e) Final slopes greater than 3:1 will not be permitted without special treatment such as terracing, retaining walls or special ground covers.

(f) All plant materials shall meet the following minimum size standards:

Plant Type	Minimum Size at Planting
Trees	
Evergreen	6 feet in height
Deciduous–over-story	2.5 inches diameter, measured 2 feet from base
Deciduous–ornamental	2 inches diameter, measured 2 feet from base
Shrubs	
Evergreen	2 feet in height
Deciduous	2 feet in height
Screening shrubs–either	3 feet in height

(4) *Landscaping requirements.* Landscaping shall be provided in accordance with the following requirements:

(a) All required setbacks shall be landscaped with turf grass, native grasses, trees, shrubs, vines, perennial flowering plants, or other pervious ground cover.

(b) A minimum of one tree shall be planted for every 50 feet of street frontage or fraction thereof. The trees shall be planted within the front yard and may be arranged in a cluster or placed at regular intervals to best complement existing landscape design patterns in the area.

(c) A minimum of four trees shall be planted for every one acre of lot area covered by buildings, parking areas, loading areas, exterior storage areas and other impervious surfaces.

(d) Parking areas shall have a minimum of 100 square feet of landscape area and one over- story tree for each 20 spaces or, fraction thereof. The remainder of the landscape area shall be covered with turf grass, native grasses, trees, shrubs, vines, perennial flowering plants, or other pervious ground cover.

(5) *Screening requirements.* Screening shall be provided in accordance with the following requirements:

(a) All off-street parking areas containing six or more parking spaces and located adjacent to a residential or residentially zoned property, the parking area shall be screened along the boundary with the

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Columbia Heights, MN Code of Ordinances

§ 5A.201 BASIC EQUIPMENT AND FACILITIES.

(A) Occupancies shall meet the minimum requirements for basic equipment and facilities as set forth in the Minnesota State Building Code, Minnesota State Fire Code, and city code for the type of occupancy.

(B) No owner, operator or occupant shall cause any service, facility equipment or utility which is required under this chapter to be removed from or shut off from or discontinued for any occupied premises except for temporary interruptions as may be necessary while actual repairs or alterations are made or during temporary emergencies. No premises may use the utilities, services or facility equipment of another premises after their utility service or facility equipment has been removed or shut off unless it is with the permission of the Building Official.

(C) Buildings in existence at the time of the adoption of the code may have their use or occupancy continued, if such use or occupancy was legal or legal nonconforming at the time of the adoption of the code, provided such continued use is not dangerous to life. Nonconformities shall follow the requirements of Chapter 9, Article I of city code.

(Ord. 1532, passed 11-26-07) Penalty, see § 5A.602

§ 5A.202 EXTERIOR PROPERTY AREAS.

(A) *Sanitation.* All exterior property and premises shall be maintained in a clean, safe and sanitary condition.

(B) *Outside storage.* Outside storage of articles including, but not limited to, equipment, construction materials, excess soil, garbage, rubbish, yard waste, recyclables, hazardous waste, items not designed for exterior use, and maintenance equipment shall not be allowed. A weather tight, rodent-proof storage building or shed must be constructed for storage of items not storable within the building. Storage containers including, but not limited to, trailers, semi trailers, cargo containers, PODS, and dumpsters, are not allowed as permanent storage structures. The use of these types of storage containers for temporary use, up to 60 consecutive days, is allowed by meeting all requirements of city code.

(C) *Grading and drainage.* All premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon. Drainage from a property shall not adversely affect adjoining premises.

(D) *Ground cover.* All exposed ground area surrounding the principle structure and accessory structures, which are not devoted to driveways, parking areas, sidewalks, or patios, shall be sodded or landscaped with shrubs, trees, gardens, or other ornamental landscape materials. Ground cover areas shall be maintained free of weeds, trash, yard waste, garbage and outside storage. No landscaped area shall be used for the parking of automobiles, trucks, sport utility vehicles, buses, vans, trailers, campers, motor-homes, boats, motorcycles, personal watercraft, motorized construction equipment, snowmobiles, all terrain vehicles, and agricultural tractors/equipment or the storage or display of materials, supplies or merchandise. Materials used for landscaping, including but not limited to, stone, brick, wood, edging materials, plastic, weed barriers shall be maintained. Damaged or deteriorated materials shall be repaired or replaced.

(E) *Slopes and berms.* Final grades with a slope ratio of greater than three to one will not be permitted without special approved treatment such as special ground covers or reforestation, terracing, or retaining walls. Berating used to provide required screening of parking lots and other open areas shall not have slopes in excess of three to one.

(F) *Trees and weeds.* All exterior property and premises shall be maintained free from diseased, dead and hazardous trees, noxious weeds, and long grass per Chapter 4, Article II of city code herein adopted by reference, and this code.

(G) *Maintenance.* All diseased, dead, and hazardous trees, shrubs, ground covers, and sod shall be removed and/or replaced in accordance with this code. All trees, or other vegetation, which spring up in crevices by foundations and along walls and fences, must be promptly removed to avoid structural damage. Tall weeds or grass shall not be allowed to grow to a height greater than allowed in Chapter 4, Article II of city code. Inspectors may grant an exception for wildlife areas, areas bordering ponds, wildflower areas, ornamental grasses, other such areas that are part of an orderly landscape, and other vegetation as the Council shall, from time to time designate by resolution. These exceptions shall be maintained weed free and confined to the designated area. Orderly landscape areas do not include yard/lawn areas that are sodded where other types of vegetation are allowed to freely grow in it.

(H) *Tree stumps.* All tree stumps shall be removed to four inches below the surface of the ground, including root extensions. Stump debris shall be removed and the hole filled in to match the surrounding area. Stumps that are to be used for other purposes including, but not limited to, art, furniture, and landscaping shall be separated from the root system. The remaining stump/roots shall be removed as outlined above.

(I) *Fire wood.* The accumulation of twigs, branches, leaves, and trunk sections are not allowed. Firewood is allowed if it is cut to fireplace length/split, neatly stacked in rear yards only, and is placed in an area that does not promote rodent harborage or the deterioration of adjacent surfaces and does not adversely affect adjoining premises. No more than 400 cubic feet of stored firewood allowed per premises.

(J) *Placement of plant materials.* No landscaping shall be allowed within any drainage utility easements, road right-of-way, or immediately adjacent to any driveway or road intersection if such landscaping would interfere with a motorist's view of the street or roadway or with the use of the easement for its intended purpose.

(K) *Sidewalks, parking, and driveways.* All sidewalks, walkways, stairs, driveways, parking spaces and similar areas shall be kept in a proper state of repair, and maintained free from hazardous conditions. Hazardous conditions include, but are not limited to, the accumulation of snow, ice and debris, deteriorated, broken, uneven and missing pavement and the growth of vegetation in cracks and crevices. All off-street parking areas, all driveways leading to such parking areas and all other areas upon which vehicles may be located shall be hard surfaced and shall conform to Chapter 9, Section I of city code. Driveway and parking areas that are currently hard surfaced, but do not meet all of the current requirements, can maintain the legal nonconforming driveway and parking areas until such time as the hard surface is damaged, deteriorated, or replaced. At which time driveway and parking areas shall be reconstructed to the current requirements of Chapter 9, Section I of city code. Premises that have handicap accessible parking shall maintain the required handicap parking per the State Building Code.

(L) *Infestation.* All structures and exterior property shall be kept free from insect, bird and rodent infestation. All structures in which insects, birds or rodents are found shall be promptly exterminated by approved processes that will not be injurious to human health. After extermination, proper precautions shall be taken to prevent re-infestation. No owner or occupant of a premises shall accumulate or permit the accumulation of any materials in such a manner that may provide insect, bird and rodent harborage, or serve as food for same, in or about structures or premises.

(M) *Exhaust vents.* Pipes, ducts, conductors, fans or blowers shall not discharge gases, steam, water, vapor, hot air, grease, smoke, odors or other gaseous or particulate wastes directly upon abutting or adjacent public or private property or that of another tenant.

(N) *Accessory structures.* All accessory structures, including detached garages, storage buildings and sheds, shall be maintained structurally sound and in good repair per § 5A.203.

(O) *Fences, free standing walls, and retaining walls*. All fences, free standing walls, and retaining walls shall be constructed and regulated in accordance with Chapter 6, Article IV of the city code and maintained per § 5A.203.

(P) *Junk vehicles and abandoned motor vehicles*. Junk vehicles and abandoned motor vehicles shall conform to the requirements of Chapter 7, Article II of city code incorporated herein. Vehicles that are inoperative and are awaiting repairs on the premises of an approved repair or body shop occupancy or their storage areas may be inoperative up to seven days. Junk or abandoned vehicles that are taken, or impounded, due to a legal process may be stored on a premises that meets city zoning for this type of storage, for up to two weeks after the legal holding time or process is complete. Painting of vehicles is prohibited unless conducted inside an approved spray booth. A vehicle of any type is permitted to undergo major overhaul, including bodywork, provided that such work is performed inside a structure or similarly enclosed area designed and approved for such occupancy through the Minnesota State Building Code, Minnesota State Fire Code and meeting city zoning regulations.

(Q) *Defacement of property*. No person shall willfully or wantonly damage, mutilate or deface any exterior surface of any structure or building on any private or public property by placing thereon any marking, carving or graffiti. It shall be the responsibility of the owner to restore said surface to an approved state of maintenance and repair per § 8.204(S) of city code.

(R) *Swimming pools*. Swimming pools, spas and hot tubs, including all required fencing and safety features, shall be maintained in a clean and sanitary condition, and in good repair. Swimming pools, spas, and hot tubs shall conform to Chapter 6, Article V of the city code incorporated herein by reference.

(S) *Pets*. Exterior of premises where animals are allowed to roam, including caged areas and pens, shall be maintained free of an accumulation of animal waste, bedding materials and food that would attract insects, rodents, or any other vermin and cause an odor that would adversely affect adjoining properties.

(Ord. 1532, passed 11-26-07) Penalty, see § 5A.602

Appendix 11

Implementation Checklist

The City of Columbia Heights plans to focus on continuing to reduce and maintain low residential and total demands. They currently are proactive in reducing demands and will continue to utilize all resources to reduce demands. The City will also discuss with Minneapolis on their potential water conservation activities to see if some of those activities can be utilized in Columbia Heights.

Activity Implemented	Activity or Action Item	Timeframe
	Revise city ordinances/codes to limit irrigation	City continues to review and revise as needed
X	Make water system infrastructure improvements	Ongoing
	Revise ordinance to limit irrigation – Odd and even day sprinkling ban enforcement	Within 5 – 10 years
	Implement a notification system to inform customers when water availability conditions change.	Possibly within 10 years
	Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	City will need to evaluate possible options first prior to implementation.
	Install enhanced meters on all commercial and industrial water connections	Within 10 years
X	Repair leaking system components (e.g., pipes, valves)	Ongoing
	Staff training on water conservation	Sometime over the next 10 years
	City to issue billing inserts in water bills	Within 5 years

Minnesota Water Supply Plan Instructions & Checklist 2016-2018

Public Water Suppliers

All public water suppliers in Minnesota that operate a public water distribution system, serve more than 1,000 people and/or all cities in the seven-county metropolitan area, must have a water supply plan approved by the Department of Natural Resources (DNR). Water supply plans must be updated and submitted to the DNR for approval every ten years. This requirement, in place since the 1990s, is designed to encourage communities to deal proactively with providing sustainable drinking water for citizens, businesses, and industry.[1]

These plan updates will be due between 2016 and 2018; the DNR will be notifying communities of the due date for each specific city water plan. All sections of the water supply plan must be completed in order for the plan to be approved. A checklist is included with these instructions on pages 4 and 5.

What is New?

- Plans can be submitted through Minnesota DNR Permitting and Reporting System (MPARS).
- DNR Hydrologists will be meeting with clusters of communities rather than individually. In the Twin Cities metropolitan area, Metropolitan Council staff will also provide technical assistance and in Greater MN, staff from MN Rural Waters Association will join us.
- There is a greater emphasis on water conservation/demand reduction and on developing rate structures that encourage conservation.
- Simplified reporting: More tables with check boxes; less writing required.
- Part 4 of the plan, required for communities in the seven-county metropolitan area, now reflects the Twin Cities metropolitan area Master Water Supply Plan
- Resources - can be found at www.mndnr.gov/watersupplyplans including copies of sample rate structures, conservation ordinances, education programs, water level recording forms, certificate of adoption, and other items as well as links to useful conservation web pages.

Submitting a Plan for DNR Approval

Preferably, please submit plans electronically to:

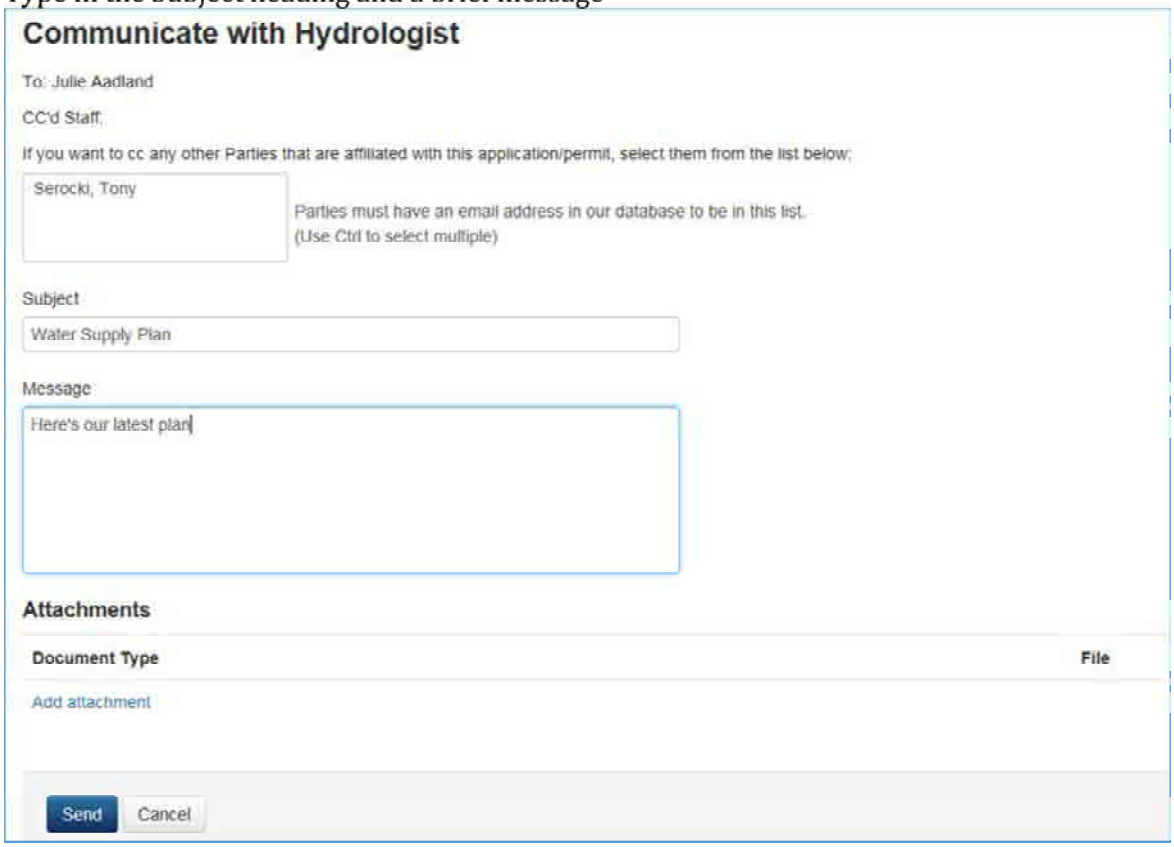
https://webapps11.dnr.state.mn.us/mpars/public/authentication/login

Steps for electronic submission:

1. Follow the above link and log into MPARS.
2. From your Account Overview Permits Tab, click on your primary Water Supply Permit Number.
3. Then click on Communication Tab.
4. Click New Message to Hydrologist (under Communication heading)

[1] see Minn. Stat. 103G.291

5. Type in the Subject heading and a brief message



6. Click Add Attachment
7. Under Document Type drop down, select Water Supply Plan
8. Click choose file and attach your Water Supply Plan - Naming convention: WSP_cityname_permitnumber_date.doc
   Please include list of all permit numbers associated with this Water Supply in the message field
9. Hit Send at the bottom of the page

Or submit completed plans to:

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4025

Plans for communities in the seven-county metropolitan area will be automatically shared with the Metropolitan Council.

If you have questions regarding water supply plans, please call (651) 259-5034 or e-mail questions to wateruse.dnr@state.mn.us

Twin Cities Metropolitan Area Requirements

All communities that operate a public water supply system within the seven county Twin Cities metropolitan area, even those with fewer than 1,000 people, must complete a local water supply plan and submit it to the Metropolitan Council, adjacent communities, and the county for review and comment. These plans include completion of Part 4 of the local water supply plan template.

Please submit plans to DNR Ecological and Water Resources Division as described above. Plans for communities in the seven-county metropolitan area will be shared with the Metropolitan Council.

Final Plan Adoption by City or Board

Communities give the plan preliminary approval subject to DNR review and, for communities in the seven-county metropolitan area, by Metropolitan Council review.

If the DNR or Metropolitan Council have recommended changes, the community should incorporate them into the plan or respond before the plan is finally adopted.

Communities and utility boards must officially adopt the plan after it is approved by the DNR and, for metro communities, reviewed by Metropolitan Council.

A template of a city certification of adoption is found at www.mndnr.gov/watersupplyplans

Water Supply Plan Checklist

All sections of the plan must be completed in order for the plan to be approved. The following checklist can be used to make sure all elements of the plan have been completed.

Part 1. Water Supply System Description and Evaluation

☑	Table 1. DNR Water Appropriation Permit Number & Utility Contact Information
☑	Table 2. Historic Water Demand (Part 1, A)
☑	Table 1. Large volume users (Part 1, A)
☑	Table 2. Water treatment capacity and treatment processes (Part 1, B
☑	Table 3. Storage capacity, as of the end of the last calendar year (Part 1, B)) & discussion of current and future storage capacity needs
☑	Table 4. Water sources & status (Part 1, C) & discussion of limitations
☑	Table 5. Projected annual water demand (Part 1, D) & discussion of water use trends & projection method
☑	Table 6. Source water quality monitoring (Part 1, E)
☑	Table 9. Water level data (Part 1, E)
☑	Table 10. Natural resource impacts (Part 1, E)
☑	Table 11. Status of Wellhead Protection and Source Water Protection Plans (Part 1, E)
☑	Table 12. Adequacy of Water Supply System (Part 1, F)
☑	Table 13. Proposed future installations/sources (Part 1, F)
☑	Table14. Alternative water sources (Part 1, F)
☑	Appendix 1: Well records and maintenance summaries
☑	Appendix 2: Water level monitoring plan
☑	Appendix 3: Water level graphs for each water supply well
☑	Appendix 4: Capital Improvement Plan

Part 2. Emergency Planning and Response Procedures

☑	Table 15. Emergency response plan contact information (Part 2, A) & Y/N questions
☑	Table 16. Interconnections with other water supply systems to supply water in an emergency (Part 2, C) & Y/N questions
☑	Table 17. Utilizing Surface Water as an Alternative Source (Part 2, C) & discussion of additional emergency water provisions
☑	Table 18. Water use priorities (Part 2, C)
☑	Table 19. Emergency demand reduction conditions, triggers and actions (Part 2, C)
☑	Table 20. Plan to Inform Customers Regarding Conservation Requests, Water Use Restrictions, and Suspensions (Part 2, C) & discussion of restriction authority
☑	Appendix 5: Emergency Telephone List
☑	Appendix 6: Cooperative Agreements for Emergency Services
☑	Appendix 7: Municipal Critical Water Deficiency Ordinance

Part 3. Water Conservation Plan

☑	Table 21. Implementation of previous ten-year Conservation Plan (Part 3, A) & discussion of progress and results
☑	Table 22. Short and long-term demand reduction conditions, triggers & actions (Part 3, A)
☑	Y/N & discussion of leak detection monitoring , water audits & water loss (Part 3, B)
☑	Table 23. Customer Meters (Part 3, B)
☑	Table 24. Water Source Meters (Part 3, B)
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Part 4. Items Metropolitan Area Water Suppliers

☑	Table 32. Alternative Approaches (Part IV, D)
☑	Complete Technical Assistance question

Plan Submittal and Adoption

☑ Follow MPARS submission guidelines on page 1 of this document (preferred) or
Mail to: DNR Ecological & Water Resources
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032 Or e-mail to http://www.dnr.state.mn.us/mpars/index.html

☐ *(Metro communities with less than 1,000 people only)*
Follow MPARS submission guidelines on page 1 of this document (preferred) or
Mail to: Metropolitan Council
Reviews Coordinator
390 N Robert St
St. Paul, MN 55101 Or e-mail to ReviewsCoordinator@metc.state.mn.us

Certification of Plan Adoption Date:

APPENDIX - D
SURFACE WATER MANAGEMENT PLAN

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

SURFACE WATER MANAGEMENT PLAN

June 2018

WSB

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The purpose of this plan is to describe how the current Surface Water Management Plan (SWMP) when combined with City policy and procedures meets statutory, rule, and Metropolitan Council requirements. The purpose of this Surface Water Management Plan is broad and the goal is to guide the City in managing its surface and groundwater resources. This will enable the City to develop drainage facilities in a cost-effective manner, while maintaining or improving the quality of its water resources.

1.1. Surface Water Management Plan Purposes

The City of Columbia Heights' Surface Water Management Plan (plan, SWMP, City plan, local plan) is a local management plan that meets the requirements of Minnesota Statutes 103B, Minnesota Rules 8410, the Mississippi Watershed Management Organization (MWMO) Third Generation Watershed Management Plan 2011-2021 (dated May 10, 2011, changes notification July 17, 2016) and the Rice Creek Watershed District 2010 Watershed Management Plan *(*adopted January 4, 2010 and amended November 9, 2016). Minnesota Statute states that the purposes of the water management programs are to:

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

Minnesota Rule 8410 augments the statutory requirements by requiring the following of local plans:

1. Table of contents
2. Purpose
3. Water resource management related agreements
4. Executive Summary
5. Land and water resource inventory
6. Establishment of policies and goals
7. Relation of goals and policies to local, regional, state, and federal plan, goals and programs
8. Assessment of problems
9. Corrective actions
10. Financial considerations
11. Implementation priorities
12. Amendment procedures
13. Implementation program

There is some overlap in the statutory and rule requirements, though the current Water Resources Management Plan (WRMP) generally meets these requirements as discussed below.

1.1.1. Metropolitan Council Requirements

Metropolitan Council's 2040 Water Resources Policy Plan expands upon the requirements of Rule 8410 as follows:

1. Communities must commit to a goal of no adverse impacts (non-degradation) for area water resources.
2. The assessment of problems and corrective actions must include Total Maximum Daily Load (TMDL) considerations.
3. Require infiltration of the first half inch of runoff from impervious areas created by projects where there are A and B soils.
4. Require infiltration in wellhead protection areas be based on City's wellhead protection plan.
5. Communities with trout streams must identify actions to reduce thermal pollution.
6. Communities must meet state requirements for development near outstanding resource value waters.
7. Communities must consider stormwater management practices that promote infiltration and filtration including the reduction of impervious surface.
8. Include information of types of Best Management Practices (BMPs) used to improve stormwater quality and quantity including maintenance schedules.

1.2. Surface Water Management Responsibilities and Related Agreements

Two watershed districts have jurisdiction over the City of Columbia Heights:

1. Mississippi Watershed Management Organization (MWMO) covers Minneapolis, Saint Paul, Lauderdale, Saint Anthony Village, Fridley, Hilltop, and the Minneapolis Park and Recreation Board. The total watershed extends 39.9 square miles The MWMO makes up approximately 90.3% of Columbia Heights.

2. RCWD includes parts of Anoka, Ramsey and Washington Counties, with a small portion in Hennepin County. RCWD covers approximately 186 square miles and includes 28 cities and townships. RCWD is divided into five different planning regions and Columbia Heights falls within the Lower Rice Creek planning region. RCWD makes up approximately 9.7% of Columbia Heights.

The City also has the following agreements:

1. An agreement with Fridley on the maintenance and discharge from Tertiary Pond.

2. Maintenance agreements with the City of Fridley and MnDOT governing maintenance of storm sewer facilities.

Upon approval of this SWMP by the two watersheds with jurisdiction over the City, it is the City's intent to maintain its current permitting powers through its Permit for Land Disturbing Activities. Currently, the MWMO does not issue permits; no impact to this organization would occur. RCWD is a permitting agency for stormwater management, erosion control, crossings, wetlands, illicit stormwater discharge, drainage systems, floodplains, and appropriation of public waters. The watersheds would continue in their role as project review agencies. MWMO and RCWD have surface water requirements that are discussed in Section 5 of this plan.

The City of Columbia Heights is responsible for construction, maintenance, and operation of the City's stormwater management systems (i.e., ponds, BMP, mechanical structures, sump manholes, pipes, channels) in accordance with its MS4 Permit.

1.3. Report Structure

The Columbia Heights Surface Water Management Plan is divided into six sections:

- ***Section 1.0 Executive Summary*** provides background information and summarizes the plan contents.
- ***Section 2.0 Land and Water Resource Inventory*** presents information about the topography, geology, groundwater, soils, land use, public utilities, surface waters, hydrologic system and data, and the drainage system.
- ***Section 3.0 Agency Cooperation*** outlines other governmental controls and programs that affect stormwater management.
- ***Section 4.0 Assessment of Problems and Issues*** presents the City's water management related problems and issues.
- ***Section 5.0 Goals and Policies*** outlines the City's goals and policies pertaining to water management.
- ***Section 6.0 Implementation Program*** presents the implementation program for the City of Columbia Heights, which includes defining responsibilities, prioritizing, and listing the program elements.

1.4. Background

This report provides the City of Columbia Heights with a Surface Water Management Plan that serves as a guide to managing the City's surface water system, and brings the City into compliance with Minnesota Statutes. The Plan will guide stormwater activities in the City for the next 10 years (2018-2027). Periodic amendment to the Plan will likely occur in the intervening 10 years so that the Plan remains current to watershed plan amendments and Metropolitan Council requirements.

As shown in **Figure 1**, the City of Columbia Heights (population 19,709 in 2014) is located in southern Anoka County just east of the Mississippi River. Columbia Heights is a well-established community that is fully developed. The City has put emphasis on high quality residential neighborhoods, open space and parks, and well-planned commercial and industrial areas.

The Village of Columbia Heights was formed in 1898 and incorporated as a city of Minnesota in 1921. It is a first ring northern suburb of Minneapolis, just east of the Mississippi River and north of Minneapolis. According to the United States Census Bureau, the city is 3.52 square miles, including 0.11 square miles of water. The City of Hilltop is entirely enclosed within the city. Hilltop relies on Columbia Heights for fire and police service, but manages its own water and sewer services.

Columbia Heights is within two watershed districts: Mississippi Watershed Management Organization (MWMO) and the Rice Creek Watershed District (RCWD). This plan addresses the standards, rules and regulations put forth by the MWMO and the RCWD.

The City of Columbia Heights is considered fully developed. **Section 2.1** of this plan discusses land use in the City.

2. LAND AND WATER RESOURCE INVENTORY

2.1. Physical Setting

2.1.1. Land Use

Figures 2 and 3 provide the existing and future land uses for the City of Columbia Heights. The future land uses come directly from the City's 2040 Comprehensive Plan. The City of Columbia Heights is fully developed, although significant redevelopment will likely occur. Though part of the urban core, the City has maintained areas of public open space, wetlands, lakes, and woods that provides balance given the City's urban density. Redevelopment in the City provides opportunities for regional stormwater treatment systems as well as integrated habitat and trail corridors. As redevelopment occurs, the City will consider these types of improvements.

Now and in the future, the portion of Columbia Heights west of Central Avenue will consist primarily of low density residential development. Commercial, industrial, and medium density residential development will exist along the City's southern border with Minneapolis, its western border with Fridley, and along Central Avenue. The City of Hilltop resides entirely within the borders of Columbia Heights. Located from Monroe Street to Central Avenue and between 45th Avenue and 49th Avenue, Hilltop manufactured housing represents medium to high density residential development.

The area east of Central Avenue consists primarily of residential land use and this will persist with minor variation due to redevelopment. Low density, medium density, and high density residential properties are located in the area east of Central Avenue. Minneapolis Water Works facilities represent a major land use on the east side of Central Avenue. More details on land use can be found in the City's 2030 Comprehensive Plan.

Columbia Heights prepared a Water Resources Management Plan in 2000 and has not updated this plan. The 2000 Plan was not approved by the watersheds, which at that time consisted in Six Cities Watershed Management Organization (SCWMO) and Rice Creek Watershed District (RCWD). In 2010, the Six Cities WMO did not have an approved plan and RCWD was updating its own plan, so Columbia Heights chose to not seek official approval until the watershed plans were finalized. Since that time, Six Cities WMO disbanded and its territory was ceded to Mississippi Watershed Management Organization (MWMO). At present, both watersheds have approved watershed plans so Columbia Heights must now obtain official watershed approval of this SWMP.

2.1.2. Topography and Watersheds

Columbia Heights is made up of primarily hilly terrain and features one of the highest points in Hennepin, Ramsey, and Anoka Counties. Elevation in the city ranges from approximately 1,020 feet above mean sea level near the Minneapolis Water Works property to approximately 850 feet above mean sea level along the City's southern border with Minneapolis.

The City's hill topography creates numerous landlocked areas. These landlocked areas combined with undersized storm sewers typical of older, urban areas cause widespread urban flooding during intense summer storms, such as occurred in 1997 and 2001. **Figure 4** shows the drainage patterns for the City.

There are four lakes in the city: Sullivan Lake, Highland Lake, Silver Lake, and Hart Lake. There are also several small ponds around the city. The City's park system is primarily in low lying areas of former swampland that was not suitable for building.

Hydrologically, the City drains to both the Mississippi River and Rice Creek. Jurisdictionally, the City lies within the borders of RCWD and Mississippi WMO as shown in **Figure 5**. On a large scale, the entirety of Columbia Heights is part of the Upper Mississippi River Basin. Approximately 228 acres of the City are within Lower Rice Creek Planning Region of the Rice Creek Watershed District and the remaining 2,025 acres are in the MWMO.

The City of Columbia Heights has contour data that covers the entire City and is based on 2011 LiDAR (Light Detection and Ranging) data. The delineation of hydrologic boundaries occurs through analysis of contour information.

Information regarding the City's surficial and bedrock geology and aquifers is available in the Anoka County Geologic Atlas from the Minnesota Geological Survey.

2.1.3. Surficial Geology

The surficial mean surface geology of Columbia Heights consists of glacial and alluvial (outwash) deposits. Columbia Heights lies within the Grantsburg Sublobe of the Des Moines Lobe. The Grantsburg Sublobe deposited silty till that was reworked by glacial meltwaters which converted much of the area within the community into a sand plain, sandy lacustrine, and valley terrain deposits.

In the Columbia Heights' portion of the sublobe, a till deposit is present as the Hilltop Moraine. These glacial deposits, along with older glacial deposits, range from 100 to 250 feet in thickness and are underlain by bedrock. These glacial deposits were placed 12,500 to 14,000 years ago during the last period of glaciation in the Twin Cities area.

2.1.4. Bedrock Geology

The bedrock underlying the surficial deposits is composed of sedimentary units that are part of the Twin Cities Structural Basin. Several sandstone and limestone units occur as aquifers that are separated by shale confining units. Many Twin Cities communities use these aquifers for their drinking water supply. Columbia Heights does not use aquifer water for its drinking water but rather purchases water from Minneapolis Water Utility, which draws surface water from the Mississippi River at its Fridley intake.

2.1.5. Soils

Soils of the Columbia Heights area are classified into three associations of multiple soil series:

- Zimmerman Complex
- Hayden-Kingsley Complex
- Dundas Complex
- Lino Complex
- Hubbard Complex
- Udorthents Wet Substratum
- Urban Land
- Auolls and Histosols

The texture and composition of the surficial materials are factors that affect permeability. For example, fine-grained, densely packed till has low permeability and high water retention. In these areas, high clay content increases the absorption properties and lessens the permeability. In contrast, outwashes of relatively course-

grained, well-sorted materials will have relatively high permeability and lower water retention ability. Changes in texture and composition of materials may be gradual or abrupt.

Local variations in surficial materials may not be apparent within the City of Columbia Heights because urbanization and development have substantially altered the surface soils. In fact, most near surface soils within Columbia Heights must be considered disturbed unless specific soil borings establish otherwise.

Information about each of the soils in these associations area is available from the Soil Survey of Anoka County (SCS 1977). **Table 2.1** shows the drainage characteristics of each soil series from the above associations. This characteristic determines the amount of surface water runoff from a given area. If the soil is well-drained, a significant portion of the precipitation will be infiltrated into the ground. Alternately, if a soil is very poorly drained, much more precipitation becomes runoff. The Hydrologic Soil Group (HSG) defines a soil's propensity to generate runoff for a given runoff event. More information about HSG and their properties can be found in the Minnesota Pollution Control Agency's (MPCA) Minnesota Stormwater Manual (http://stormwater.pca.state.mn.us/).

Table 2.1 Soil Series Characteristics

Soil Series	Drainage Characteristic	Hydrologic Soil Group
Zimmerman	Excessively drained	A
Hayden-Kingsley	Well drained	B
Dundas	Poorly drained	B/D
Lino	Somewhat poorly drained	A/D
Hubbard	Excessively drainage	A

Hydrologic Soil Groups characterize diverse soils by similar infiltration capacity. Group A soils have the highest infiltration capacity while Group D have the lowest. Generally, infiltration is not an appropriate practice on Hydrologic Soil Group D soils. **Figure 6** shows the extent of the Hydrologic Soil Groups in the City.

The Minnesota Stormwater Manual, design infiltration rates are provided below:

Group A – Group A soils generally range from high infiltration capacity soils (primarily gravel, sandy gravel and silty gravels) with an infiltration rate of 1.63 in/hr to moderately high infiltration capacity soils (primarily sand, loamy sand and sandy loam) with an infiltration rate of 0.8 in/hr.

Group B – Group B soils are generally loam or silty loam with an infiltration rate of 0.3 to 0.45 in/hr.

Group C – Group C soils are primarily sandy clay loam with an infiltration rate of 0.2 in/hr.

Group D – Group D soils are primarily clay loam, silty clay loam, sandy clay, silty clay or clay soils with a low infiltration rate of 0.06 in/hr.

In many cases, development and redevelopment projects rely on soil borings to classify underlying soils. In cases where borings area available, these should be used in lieu of HSG to determine site specific soil infiltration capacity utilizing guidance provided in the Minnesota Stormwater Manual.

2.1.6. Climate and Precipitation

The climate within the Twin Cities is typical of a continental climate. Without the buffering influence of large bodies of water, cold winters and hot summers predominate. It is generally understood that global climate change has had an effect on the Twin Cities' local climate. One area where climate change manifests itself is in rainfall intensities and rainfall depths. The Twin Cities has seen more intense rainfalls the last two decades. The implications of this are clear:

- Flood control facilities, if designed for the 100-year rainfall, may get larger as the statistical 100-year rainfall gets larger.

- Facilities designed for smaller rainfalls, such as infiltration areas and small storm sewer may also get larger as rainfall depths increase for the 1-year to 5-year rainfall events.

The total average annual precipitation in the Twin Cities is approximately 31 inches. The total average annual snowfall is approximately 54 inches. Average monthly temperature, precipitation and snowfall are shown in **Table 2.2**.

TABLE 2.2 – AVERAGE MONTHLY CLIMATE DATA, MINNEAPOLIS/ST. PAUL, 1981-2010

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Daily Temperature (°F)	15.6	20.8	32.8	47.5	59.1	68.8	73.8	71.2	62.0	48.9	33.7	19.7	46
Average Precipitation (in.)	0.9	0.8	1.9	2.7	3.4	4.2	4.0	4.3	3.1	2.4	1.7	1.2	31
Average Snowfall (in.)	12.2	7.7	10.3	2.4	0.1	0.0	0.0	0.0	0.0	0.6	9.3	11.9	54

Source: Minnesota Climatology Working Group

Additional climatological information for the area can be obtained from the Minnesota State Climatology Office at http://www.climate.umn.edu/.

Rainfall frequency estimates are used as design tools in water resource projects. In 2013, the National Oceanic Atmospheric Administration (NOAA) published the Atlas 14 Precipitation-Frequency document that showed an increase in rainfall intensity and design storms from the previous Technical Paper 40 precipitation values. Selected Atlas 14 rainfall frequencies for Columbia Heights are found in **Table 2.3**.

TABLE 2.3 – ATLAS 14 RAINFALL FREQUENCIES

Recurrence Interval (yrs)	24-hr Rainfall Depth (in)
1	2.5
2	2.8
10	4.3
50	6.3
100	7.4

2.2. Water Resources

2.2.1. Wetlands

The 2000 Water Resources Management Plan included a Wetland Inventory. All wetlands and water bodies were inventoried and classified throughout the City as part of the plan. The inventory included the following sources:

- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory
- Aerial photography
- USGS 15 Minute topographic maps
- Field observations of wetland characteristics

The boundaries and USFWS classifications of the wetlands are shown in **Figure 7**. The City's classification system for wetlands and water bodies within Columbia Heights was based on the following parameters:

Table 2.4 Wetland Classifications

Classification	Definition
I	Wetlands and water bodies that will be used directly by people; classification is based on water quality parameters
II	Wetlands that are mainly managed for wildlife habitat; the amount of "bounce" during a 1-year storm event is limited to minimize the disruption of fluctuating water levels on wildlife
III	Wetlands whose main function is to assimilate nutrients and sediment; classification is based on nutrient and sediment removal efficiency
IV	Wetlands whose main purpose is flood control

A wetland inventory has not been conducted by the city since that time. The City did not believe that there would be a benefit in conducting a wetland inventory because the city is fully developed. Whenever the opportunity arises, retrofits for water quality and infiltration will occur for public and private projects. Opportunity, rather than inventory, defines how the City proceeds in managing quality of stormwater discharge to wetlands.

The MWMO has conducted a historic wetland assessment within the watershed. In addition, Anoka County completed a 2004 MLCCS Mapping Project, which also defined wetland boundaries.

The Metropolitan Mosquito Control District has developed its own inventory of wetland areas. They have created and maintained a map that provides information on habitat for larval mosquitoes in the seven-county metro area. Each of the identified wetlands is classified based on US Fish and Wildlife Service Circular 39 system. The wetland inventory is updated every five years by field inspection and the maps are available for review at the office of the Metropolitan Mosquito Control District.

2.2.2. Major Bodies of Water

There are four lakes in Columbia Heights: Sullivan Lake (Sandy Lake), Highland Lake, Hart Lake, and Silver Lake. Silver Lake is the largest lake. However, only a small portion of the lake is within the City boundary. All of these lakes are identified by the State of Minnesota as protected waters through the Protected Waters Inventory (PWI).

There are five large ponds in the city: Clover Pond, Labelle Pond, Jackson Pond, Zurek Pond, Secondary Pond, and Tertiary Pond. Labelle Pond and Clover Pond are also PWI water bodies. The regulatory boundary of PWI water bodies is called the ordinary high water level (OHWL). The locations of these major water bodies are shown in **Figure 8**.

Below is a brief summary of each of the lakes and ponds, along with the PWI identification number for the DNR protected waters. Further discussion of lake impairments occurs in **Section 4.**

Sullivan/Sandy Lake (2-80 P): Sullivan Lake, also known as Sandy Lake, is classified as a shallow lake. Sullivan Lake is 16 acres in size, and is located near the north border of Columbia Heights near the city of Fridley. Sullivan Lake serves as a detention area for stormwater and has a drainage basin area of 0.73 square miles. The normal water level (NWL) is 880.3 feet and is controlled by a gated outlet structure. There are several trails around the lake that are used for recreational purposes. Sullivan Lake is on the MPCA Impaired Waters List.

Highland Lake (2-79 P): Highland Lake is a very shallow lake, 16 acres in size, and is located near the northeast border of Columbia Heights near the cities of Fridley and New Brighton. The lake is located in Kordiak County Park and serves as a stormwater detention area. Runoff from a 0.32 square mile area enters the lake through six different inlet locations. The NWL is 996.1 feet. The lake is surrounded by a fully developed residential area and has high levels of total phosphorus. It is considered to be hypereutrophic and currently being studied by Anoka County. Highland Lake is on the MPCA Impaired Waters List.

Hart Lake (2-81 P): Hart Lake is a very shallow lake, 7 acres in size and located near the southern border of Columbia Heights, near the city of St. Anthony Village. The lake is not listed on the impaired waters list. However, it is reported as having very high nutrient concentrations and is classified as hypereutrophic. The lake was assessed in 2010 and determined to have insufficient data for TMDL use assessment.

Silver Lake (62-83 P): Silver Lake is approximately 72.5 acres in size and located along the border of Columbia Heights, the City of St. Anthony Village, and New Brighton. Most of the lake is located in the City of St. Anthony Village. The average depth of the lake is approximately seven feet though the maximum depth is 47 feet. Silver Lake is on the MPCA Impaired Waters List and has a TMDL for which a number of water quality improvement projects have been implemented, as discussed later in this SWMP.

Clover Pond (2-686 W): Clover Pond is located in the northeast corner of the City and to the northwest of Highland Lake. The drainage area for Clover Pond is 18 acres, its water surface area is about 3.2 acres, and its NWL is elevation 988.4. The pond maintains its NWL with a 12-inch RCP outlet structure at the northwest corner of the pond.

Labelle Pond (2-687 P): Labelle Pond is a shallow pond located in Labelle Park and is approximately 9 acres in size. The pond contains a control structure that maintains a normal water level around 924.0.There is a walking trail around Labelle Pond that many citizens in the community enjoy. The pond is currently not a part of a monitoring program and detailed information about the pond is not available.

Jackson Pond: Jackson Pond is located between 43rd Ave and 44th Ave, west of Quincy Street and east of Central Avenue. This pond has a drainage area of 547 acres, and a water surface area of approximately 1.6 acres at a NWL of 880.8 feet. The City and MWMO modified Jackson Pond in 2015 to provide more flood storage through a drawdown pump and to provide water quality treatment through installation of an iron

enhanced filter. The MWMO is considering monitoring the pond in the future to determine the effectiveness of the iron enhanced filter. The City would be interested in this collaboration effort.

Secondary Pond: Secondary Pond is located north of Highland Lake on the boundary of Columbia Heights and Fridley. The drainage area of Secondary Pond is 2.0 acres at NWL and discharge from the pond is controlled through a 24-inch RCP outlet. The outlet of the pond discharges to Tertiary Pond.

Tertiary Pond: Tertiary Pond, located northeast of Secondary Pond within the City of Fridley and the City of New Brighton, has a drainage area of 320 acres in size, and has a water surface area of 1.1 acres at its NWL. Tertiary Pond, located at the low point of the drainage basin, has no outlet and serves as the final retention area for the watershed.

2.2.3. Water Courses/Trunk Storm Sewer

There are no major rivers or water courses flowing through the City of Columbia Heights. However, the City lies near the Mississippi River and discharges to it through storm sewer that connects via Fridley or Minneapolis. The City's main storm drains, as shown in **Figure 4** include:

44th Avenue Storm Drain: This storm drain begins at Labelle Pond, flows north to intersect 44th Avenue at Tyler Place, west along 44th Avenue to Jackson Pond, west along 44th Avenue to a junction with a storm drain from the south along University Avenue, west along 44th Avenue to Main Street, north along Main Street to a storm drain junction at 45th Avenue and Main Street, and then west to the Mississippi River in a 78-inch storm drain.

Boundary Storm Drain (Clover Pond to Central Avenue): This storm drain begins at Clover Pond, flows north to the City boundary with the City of Fridley, and then west along the boundary line to the junction with several storm drains at Central Avenue. The storm drain is located within a drainage easement along the back lot line of properties within the City of Columbia Heights.

Central Avenue to Sullivan Lake Storm Drain: This storm drain begins at the junction of several storm drains: the boundary storm drain from the east, the Central Avenue storm drain from the north, and the Central Avenue storm drain from the south. Thirty-inch and 42-inch parallel pipes increasing to twin 48-inch pipes drain the stormwater runoff to Sullivan Lake.

Sullivan Lake to 53rd Avenue/University Avenue Storm Drain: This storm drain begins at Sullivan Lake and then flows west along Sullivan Drive to 7th Street, north along 7th Street to 52nd Avenue, west along 52nd Avenue to University Avenue, north along University Avenue to the north City boundary, and then north to the Mississippi River in a 48-inch RCP storm drain. Assuming full flow conditions, this storm drain will handle approximately 82 cfs.

Storm Sewers Draining the Area North of Silver Lake: The area north of Silver Lake drains by two major storm sewer systems. These two storm sewers enter the lake through 21-inch RCP and 30-inch RCP outlets with a combined capacity of 40 cfs.

Storm Sewers Draining the Area South of Silver Lake: The area south of Silver Lake is drained by two major storm sewer systems. These two storm sewers are combined at a junction near the intersection of 40th Avenue and McKinley Street and drain to Silver Lake by a single 48-inch RCP. In addition to Hart Lake, substantial storage areas are present north of 39th Avenue and 40th Avenue from Cleveland Street to Stinson Boulevard. A

project near Prestemon Park will provide increased storage for the drainage area south of Silver Lake.

Storm Sewers Draining Southwest corner of the City: The main storm sewer in this area begins at the intersection of 3rd Street and Edgemoore Place and then flows south along 3rd Street, west along 38th Avenue, north along Main Street, and then west along 39th Street to the Mississippi River.

2.2.4. Groundwater and Water Supply

In Minnesota, various state agencies are responsible for groundwater management and protection. Overlapping jurisdiction in this area often causes confusion in matters of groundwater management. The City will continue to use the best available groundwater information for stormwater infiltration projects to avoid impacts to groundwater resources and private wells.

The DNR regulates groundwater appropriation for agricultural, industrial, and water supply uses. Suppliers of domestic water to more than 25 people or applicants proposing a use that exceeds 10,000 gallons per day or 1,000,000 gallons per year must obtain a water appropriation permit from the DNR. **Figure 9** shows the groundwater appropriation locations within Columbia Heights.

The Minnesota Department of Health (MDH) is the official state agency responsible for addressing all environmental health matters, including groundwater protection. For example, the MDH administers the well abandonment program and, along with the DNR, regulates the installation of new wells.

The MPCA administers and enforces laws relating to pollution of the state's waters, including groundwater. The MPCA also administers Minnesota's NPDES general permit for construction activities and its municipal stormwater permit and program. Both these permits required infiltration, which has the potential to affect groundwater.

The Minnesota Geological Survey provides a complete account of the state's groundwater resources.

The MWMO and RCWD are charged with general responsibilities for groundwater protection and use, but their role is limited to cooperating and assisting the DNR, MDH and MPCA in their groundwater protection efforts.

In 2011, the DNR established the North and East Metro Groundwater Management Area (NEM-GWMA). The NEM-GWMA includes ten communities, including Columbia Heights. The purpose of the program is to address difficult groundwater related resource issues (Minn. Stat. 103G.287, Subd. 4). The timing of implementation items span over a period of 5 years, with some activities listed as ongoing work. The NEM-GWMA lists five objectives to ensure the preservation of groundwater. These include identifying and embracing water conservation best practices, protecting surface waters, preserving water quality, improving appropriations permitting, and protecting water availability. Further discussion of NEM-GWMA activities and information is provided in **Sections 4** through **6**. A link to North and East Metro Groundwater Management Area is provided above. Even though Columbia Heights does not consume groundwater for municipal use, the City will continue to work with the associated agencies to be a good steward of land and water resources, including groundwater.

Groundwater use and potential depletion has recently emerged as an important issue in

the Twin Cities. The agencies identified above along with the Metropolitan Council, several municipalities, and St. Paul and Minneapolis water utilities have each participated in discussions and planning efforts related to this subject. Columbia Heights will be something of a bystander in these efforts since it consumes Mississippi River water provided by the Minneapolis Water Utility. However, these ongoing discussions and the initiatives that follow may require all communities to participate in land stewardship and water conservation practices.. The City will use the best available groundwater information for stormwater infiltration projects to avoid any impacts to groundwater resources and private wells.

There are no municipal or non-municipal wells or intakes within Columbia Heights. Consequently, the City does not have a Wellhead Protection Plan with the Minnesota Department of Health (MDH) because it does not provide potable water from public wells. However, the City will follow guidelines and requirements as set forth in the City of Minneapolis "Source Water Protection Plan" (September 2008).

In addition, the City of New Brighton has a Drinking Water Supply Management Area (DWSMA) that overlaps into the City of Columbia Heights. Any future development or projects within the City of Columbia Heights will involve communicating with and working with City of New Brighton and MDH to ensure that safe drinking water is maintained. Any rules or guidelines related to New Brighton's DWSMA will be applied to projects within Columbia Heights.

2.2.5. Monitored Water Quality and Quantity Data

Figure 15, Appendix A provides locations from the MPCA's What's in My Neighborhood data showing environmental information related to contaminated sites, permits, licenses, and inspections, as well as potentially contaminated sites based on land use. Contaminated properties have the potential to impact water quality and should be noted. The What's In My Neighborhood website show an inventory of these properties, as well as sites that have already been cleaned up or in the process of being cleaned up.

Water quality data for the City has been obtained from the Minnesota Pollution Control Agency (MPCA) Environmental Data Access site. This data provides a snapshot of overall water quality and health of local waterbodies. This database is utilized by participating agencies to compile water quality testing data and is almost entirely used for the storage of water quality parameters. This water quality monitoring information/data and monitoring locations can be found at the MPCA's Environmental Data Access site. **Figure 16, Appendix A** shows the location of monitoring sites within the City.

The Metropolitan Council Environmental Services (MCES) Citizen-Assisted Lake Monitoring Program (CAMP) is a group of volunteers who monitor the health of Twin Cities' lakes to assist MCES in providing a comprehensive database that allows cities, counties and watershed management organizations to better manage impaired lakes. The MCES CAMP program involves measuring water transparency. Water transparency trends provide a good indication of water quality and the effectiveness of improved stormwater management practices within a lake's watershed.

MWMO contracts with Anoka Conservation District to monitor lake water quality every 3 years and lake levels annually at Sullivan and Highland Lakes. MWMO monitors stormwater runoff from the City at two discharge locations for the 1NE and 11CHF subwatersheds. Data recorded at the 11CHF discharge location includes flow, water quality, and continuous temperature and conductivity. Data recorded at the 1NE discharge location includes only flow and water quality. MWMO also performs flow monitoring for H&H modeling at La Casita and I694.

The MWMO has two automated rain gauges near Columbia Heights, one at Columbia golf course and one at the railyard by the waterworks.

RCWD performs annual water quality monitoring for Silver Lake. RCWD also continues to support the CAMP program to record data about lake nutrients.

2.2.6. Impaired Waters

Table 2.5 presents the MPCA's 2018 list of impaired waters within Columbia Heights. "Impaired" means that the waters are too polluted or otherwise degraded to meet the water quality standards set by the State of Minnesota.

Table 2.5 – Impaired Waters

Water Body	Target start/end date	Beneficial Use	Year Listed	Impairment Cause
Sullivan/Sandy Lake	2025	Aquatic Recreation	2002	Nutrient/eutrophication biological indicators
Silver Lake		Aquatic Consumption	2012	Mercury in fish tissue
		Aquatic Recreation	2002	Nutrient/eutrophication biological indicators
		Aquatic Life	2014	Chloride
Highland Lake	2025	Aquatic Recreation	2004	Nutrient/eutrophication biological indicators

The locations of these impaired water bodies are shown on the water resource assessment map, **Figure 10,** which can be found in **Appendix A.** For more information on impaired waters and TMDL Plans visit the MPCA website http://www.pca.state.mn.us/. The MPCA website contains an *Impaired Waters Viewer*, an interactive map tool that can be used to view impaired waters and their updated water quality data, as well as their updated TMDL Plans.

The Mississippi River, to which Columbia Heights directly discharges, has a number of impairments that the City must consider in it stormwater management program. **Table 2.6** provides currently identified impairments for the river from the Coon Rapids dam to Lake Pepin.

The MPCA has an approved statewide Mercury TMDL study (conducted in 2007) and has worked with stakeholders across the state to identify strategies and timelines that would be included in the implementation plan. A TMDL was also approved for fecal coliform (E.coli) for this portion of the river. Further discussion of the status of these TMDLs and monitoring data is provided in **Sections 4** through **6**.

Table 2.6 – Mississippi River Impairments Affecting Columbia Heights

Beneficial Use	Assessment Year	Assessed condition	Impairment Cause
Aquatic consumption	1998	One or more standards not met	Mercury in fish tissue
Aquatic recreation	2009	One or more standards not met	Fecal Coliform

Aquatic consumption	2002	One or more standards not met	PCB in fish tissue
Aquatic Life	2016	One or more standards not met	Nutrient/eutrophication biological indicators

The MPCA water quality monitoring includes baseline monitoring. When values of monitored pollutants exceed certain thresholds, active investigation of the source of the exceedance is conducted.

Local governments will be required to incorporate completed TMDL studies into their surface water management plans and incorporate any appropriate TMDL implementation activities within their Stormwater Pollution Prevention Program within 18 months of the approved date. A more detailed discussion on the status of the TMDLs can be found in **Section 4**.

Sullivan/Sandy Lake: Sullivan Lake is a part of both the Anoka Conservation District Water Quality Monitoring and MCES CAMP Program. The period of record for this water body is from 1993 to 2013. In 2013, the MWMO contracted the Anoka Conservation District to conduct monitoring activities on Sullivan Lake and the report can be found on the MWMO website. The 2013 results indicated that Sullivan Lake had poor water quality due to high levels of phosphorus and the high to severe levels of algae. The lake has experienced a significant downward trend in water quality. The City will explore and implement measures to address the impairments when a TMDL has been approved.

Silver Lake: The watershed of Silver Lake lies within four municipalities and three counties (Anoka, Hennepin, and Ramsey). Silver Lake was placed on the MPCA TMDL list in 2002 for excess in nutrients. Since then, Silver Lake has been monitored at several locations. RCWD, along with the MPCA, developed the Silver Lake TMDL Implementation Plan in May 2011. This plan can be found on the MPCA website. The City of Columbia Heights owns a boat ramp on Silver Lake that includes a regional water quality pond. This pond currently provides removal of 42% of the total phosphorus for the contributing watershed area, which is the northern portion of the southwest watershed to Silver Lake.

Highland Lake: Highland Lake is part of the MCES CAMP program and has a period of record of 2000 to 2007. Highland Lake was also a part of a study conducted by Anoka County. The study was developed in support of a report titled “A Review of Transparency Trends in Minnesota Lakes”. The study found that there were ten lakes within Anoka County that had significant transparency and total phosphorus trends. Highland Lake was one of the lakes that showed decreasing transparency trends. Over the same time period that transparency was decreasing, the lake’s total phosphorus concentration was increasing. At the time of the study, Anoka County planned on conducting further monitoring in 2016. The City will explore and implement measures to address the impairments when a TMDL has been approved.

2.3. Existing Flood Insurance Studies

The Federal Emergency Management Agency (FEMA) completed the map modernization process for its Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) to identify flood risk within Anoka County in 2015. A copy of the updated FIS and FIRMs can be obtained online through the FEMA Map Service Center at https://msc.fema.gov.

The City of Columbia Heights was included in the Anoka County Flood Insurance Study, effective December 16, 2015. Within the City the following floodplain types exist: Regulatory Floodway, 1% Annual Chance Flood Hazard (100-year Floodplain), and 0.2% Annual Chance Flood Hazard (500-year Floodplain). These areas are shown in **Figure 11**. Development in

these areas is guided by the City of Columbia Heights Floodplain Management Overlay District requirements.

For information regarding any Letter of Map Amendment (LOMA) and Letter of Map Revision (LOMR) refer to the following website equipped with a mapping function: http://msc.fema.gov/portal/search.

2.4. Hydrologic System and Data

The City of Columbia Heights had developed a number of stormwater models over the years to support its flood control and water quality projects. Since 1997, the City has prepared a number of XP-SWMM models for different parts of the City. Subwatershed data for those drainage areas shown in **Figure 4** is provided in **Appendix F**. MWMO has since began developing XP-SWMM hydraulic models using Atlas 14 values. These are the updated models currently in use by the City.

- MWMO model completed by Houston Engineering
- MWMO model completed by Barr Engineering

MWMO is in the process of developing comprehensive models for all of the subwatersheds within its boundaries. The City has partnered with the MWMO in these efforts, along with several other communities within the district. The timeline is from 2015 to 2019 and the project is currently active. The MWMO has completed hydrologic and hydraulic and water quality models for over half of Columbia Heights. The remainder of the City will be modeled in 2018. An accurate water quality model will be a good resource for managing stormwater and future projects within the City in order to meet water quality and volume control goals in this plan. These models have incorporated Atlas 14 rainfall data. The subwatersheds 1NE and 11CHF have completed models. These models provide the City with flow rate data. A summary is listed below:

1NE & 11CHF Hydrologic and Hydraulic Models- These models were created using XP-SWMM to model hydrology and hydraulics. 1NE represents parts of southern Columbia Heights and 11CHF represents the central and western areas. A main goal modeling studies was to develop information to support and inform capital project planning. Maps in the report show areas of flooding and pipe inundation for the 10-year and 100-year Atlas 14 events. The City has identified some capital improvement projects to address flooding issues in Table 6-1 and will continue to use results from this report in the next phase of budgeting for the CIP. **Table 6-1** will be reviewed annually to add additional projects to address these flooding locations.

1NE & 11CHF Water Quality Models – Water quality reports were completed for these two watersheds using P8. The reports identified pollutant yields and areas where more stormwater treatment might be needed. In the 11CHF P8 model, three water quality BMP scenarios were considered for Gauvitte Park, exploring BMP installation in the south, east and center of the park. Projects have been added to **Table 6-1** to explore options for water quality BMPs in Gauvitte Park. BMPs from the Southern Columbia Heights and Northeast Minneapolis Stormwater Retrofit Analysis report generated by Anoka Conservation District were included in **Table 6-1** to propose additional water quality BMPs within the 1NE watershed.

RCWD has completed hydrologic and hydraulic district-wide watershed models that have been updated for Atlas 14. The District also has water quality models that have been adopted. The City will coordinate use of these models with RCWD as needed for those areas within the RCWD boundary.

2.5. Natural Communities and Rare Species

The Minnesota DNR produces the Minnesota County Biological Survey (MCBS) identifying natural

communities and rare species. Completed in 1994, the Anoka County survey identifies where evidence indicates the presence of federally or state listed plants. The survey shows there are no rare plants and animals present in Columbia Heights.

The entire City of Columbia Heights has been categorized according to the Minnesota Land Cover Classification System (MLCCS). MLCCS categorizes urban areas based on five levels of land cover. **Figure 12** located in **Appendix A** shows a map of the classified MLCCS areas. MLCCS does not place any restrictions on development; rather, it informs land use planners on open space planning and comprehensive planning.

2.6. NPDES Phase II

The City of Columbia Heights is required to have a Municipal Separate Storm Sewer System (MS4) permit through the MPCA's National Pollutant Discharge Elimination System (NPDES) Phase II Program. MS4s designated by rule are urban areas with populations over 10,000 or urban areas with populations greater than 5,000 with the potential to discharge to special or impaired waters. Additionally, NPDES Construction General Permits are required for construction activities that result in land disturbance of equal to or greater than one acre or a common plan of development or sale.

As an MS4, the City is required to implement the following six minimum control measures:

1. Public Education and Outreach
2. Public Participation/Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management
6. Pollution Prevention/Good Housekeeping for Municipal Operations

For more information on NPDES Permit requirements refer to www.pca.state.mn.us. Refer to **Appendix B** for a copy of the City's MS4 SWPPP (Storm Water Pollution Prevention Plan) and a copy of the City's SWPPP Best Management Practice (BMP) Sheets.

2.7. Water Resource Issue Areas

Water resource issue areas were identified through information obtained from City staff, residents, and other agencies. Each issue was analyzed and potential solutions to address the issues were developed as detailed in **Section 4**. Refer to **Figure 13**, in **Appendix A** for the location of site-specific issue areas. The following is a list of some of the water resource issue areas within the City**:**

- Aging and undersized infrastructure
- Drainage issues at various locations
- Vegetation and sediment management within stormwater ponds and DNR waters
- Impaired water quality in area lakes and rivers

2.8. Water Resource Management Ordinances and Policies

The City of Columbia Heights has adopted a number of ordinances and zoning overlay districts in an effort to protect water resources within the City. The City will be revising its ordinances to meet certain post construction requirements now part of the MS4 General Permit.

Ordinances and zoning overlay districts currently in place include the following:

- **Surface Water Management** – purpose of this ordinance is to protect surface water within

the City and adopts by reference the City's Surface Water Management Design Standards and NPDES permitting requirements.

- **Floodplain Management** – purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize potential losses due to flooding hazards. This ordinance is adopted to comply with the rules and regulations of the National Flood Insurance Program and the Watershed Management Commission Rules.
    - The Regulatory Flood Protection Elevation shall be no lower than one foot above the regional flood plus any increases in the flood elevation caused by encroachments on the flood plain that result from designation of a floodway.
    - Floodway District (FW**)** – this district includes those areas designated as floodway on the Flood Insurance Rate Map (FIRM) adopted by the City. This ordinance outlines permitted uses and special uses within the Floodway.
    - Flood Fringe District (FF) - this district includes those areas designated as floodway fringe on the FIRM adopted by the City. This ordinance outlines permitted uses and special uses within the Flood Fringe.
    - General Flood Plain District – this district includes those areas designated as Zone A or Zones AE, Zone AO, or Zone AH without a floodway on the FIRM adopted by the City. This ordinance outlines the permissible uses and defines procedures for Floodway and Flood Fringe determinations within the General Flood Plain District.
- **Erosion Control** – this ordinance regulates construction activities that would result in erosion of soils that endanger water resources by reducing water quality and causing the siltation of aquatic habitat for fish and other desirable species. Eroded soils also necessitate the repair of sewers and ditches and the dredging of lakes, which is undesirable.
- **Shoreland Management Overlay District** – this ordinance prohibits any unregulated use of shorelands in the City that would affect the public health, safety, or general welfare not only by contributing to pollution of public waters but also by impairing the local tax base.
- **Illicit Discharge** – this ordinance prohibits discharge of any hazardous substances to any public sewers

The full text for each of these ordinances or zoning overlay districts can be found on the City's website. These ordinances are regularly revised and are regularly updated on the website for reference.

3. AGENCY COOPERATION

There are a number of local, State, and Federal agencies that have rules and regulations related to local water management. The City recognizes the roles of these other agencies and will cooperate, coordinate, and partner when possible with these agencies.

This Plan is in conformance with but does not restate all other agency rules that are applicable to water resource management. The following agencies manage or regulate more aspects of water resources within Columbia Heights:

- Minnesota Department of Health www.health.state.mn.us
- Minnesota Pollution Control Agency www.pca.state.mn.us
- Board of Water and Soil Resources www.bwsr.state.mn.us and the Wetland Conservation Act www.bwsr.state.mn.us/wetlands/wca/index.html
- Minnesota Department of Natural Resources www.dnr.state.mn.us
- US Army Corps of Engineers http://www.usace.army.mil/
- Minnesota Department of Agriculture www.mda.state.mn.us
- US Fish and Wildlife Service www.fws.gov
- Anoka County Soil and Water Conservation District http://www.anokaswcd.org/
- Mississippi Watershed Management Organization http://mwmo.org/
- Rice Creek Watershed District www.ricecreek.org
- Minnesota Environmental Quality Board www.eqb.state.mn.us
- Metropolitan Council www.metrocouncil.org
- North and East Metro Pilot Groundwater Management Area (NEM-GWMA)

While these other agencies' rules, policies, and guidelines are not all restated in this Plan, they are applicable to projects, programs, and planning within the City. The MPCA Minnesota Stormwater Manual, which is a document intended to be frequently updated, is also incorporated by reference into this Plan and can be found at www.pca.state.mn.us/water/stormwater/stormwater-manual.html.

Each of the two watersheds with jurisdiction over Columbia Heights has specific requirements that local plan must meet. The following two sections outline these requirements:

3.1. Comparison of Regulatory Standards

Applicable developing and redeveloping property within Columbia Heights must meet the requirements of the City's Surface Water Management Design Standards and MWMO Standards Language. Projects located within RCWD's boundaries are subject to review and approval from RCWD and must also meet their applicable permitting requirements.

3.1.1. City of Columbia Heights

In 2016, the City developed their Surface Water Management Design Standards. This document was written to meet the City's goals outlined in the SWPPP and outlines additional requirements that were adopted from the Minimal Impact Design Standards (MIDS). These standards have incorporated the MWMO and RCWD stormwater requirements. The Surface Water Management Design Standards have been adopted by reference through Chapter 9 – Article 1 Zoning and Land Development city ordinance, found on the City's website. A copy of these design standards can be found in **Appendix C** of this plan.

3.1.2. Mississippi Watershed Management Organization (MWMO)

The MWMO does not issue permits for development projects, but relies on permitting and enforcement through the City. The MWMO has developed stormwater standards that the City has adopted into their design standards for applicable development. Additional information can be found

in the MWMO's Watershed Management Plan. A copy of MWMO's current stormwater standards language and flow chart can be found in **Appendix D**.

The City will continue to partner and collaborate with the MWMO on both public and private development. The MWMO offers numerous services that the City will look to utilize as opportunities arise. Some of these opportunities are listed below.

- **Planning Efforts**
  - Partnering to look at their stormwater utility fees and if there's a way to restructure so they can give utility credits to encourage property owners to implement stormwater management.
  - Focusing on the lakes as a natural resource; developing management goals for the lakes and identifying opportunities to improve their ecological function (improve water quality and restore/enhance vegetation/habitat)

- **Capital Improvement Projects and Grant Program**
  - Performing stormwater management as part of their upcoming street reconstruction projects (2019/2020 and beyond)
  - Tree trenches along 37th Ave NE (scheduled to be reconstructed, in partnership with the City of Minneapolis in 2023)
  - Partnering with large property owners to target above-and-beyond and/or innovative stormwater management with a quantifiable public benefit.

- **Chloride Reduction:**
  - Support cities in implementing best practices for reducing the use of chloride (temperature sensors, new technologies, etc.)
  - Outreach campaign to businesses and large property owners about reducing the use of chloride on their properties

- **Upcoming TMDLs:**
  - MWMO staff have been in active communication with MPCA on future TMDLS, including the upcoming draft for the Mississippi River impairment, and are able to support affected cities and possibly reduce potential impacts.

3.1.3. Rice Creek Watershed District (RCWD)

RCWD Permitting Rules were last updated in January 2017. The City will continue to coordinate with RCWD for review and permitting of developments. Rice Creek Watershed District (RCWD) permitting requirements are summarized in their current Watershed Management Plan and can be found on their website. Goals and policies are categorized and defined for lakes, wetlands, drainageways and groundwater. A copy of RCWD's current rules can be found in **Appendix E**.

4. ASSESSMENT OF ISSUES

Outlined below is an assessment of existing and potential local water resource-related issues that are known as of 2018. These issues have been identified based on an analysis of the land and water resource data collected during the preparation of this plan and through information provided by the City, its residents, and the watershed organizations. A description of any existing or potential issue within the City has been listed and potential future corrective actions have been incorporated into an implementation plan. Refer to **Figure 13** in **Appendix A** for the location of many of the issues discussed below.

4.1. System Description

This subsection describes the surface water management system for the City of Columbia Heights. The City was divided into eight major drainage areas, A through H. **Figure 4** shows these areas. The following sections provide a general description of the hydraulic network within each area. Each area's hydrologic characteristics are summarized in the tables included in **Appendix F**.

Area A: This major drainage area, located within the center third of the City along 44th Avenue, is the largest within the City with an area of approximately 1.76 square miles. Area A is subdivided into six smaller drainage areas.

Area A is drained by storm sewer that exits from the City at 45th Avenue and Main Street and discharges stormwater westerly to the Mississippi River through a 78-inch pipe. The three main storm sewer drains are as follows:

- 48th Avenue/Monroe Street (Valley View Elementary and Central Middle Schools) west and south 45th Avenue/Main Street
- Labelle Pond west along 44th Avenue through Jackson Pond to 45th Avenue/Main Street, and
- 38th Avenue/University Avenue north along University Avenue to 44th Avenue and north and west to 45th Avenue/Main Street.

Labelle Pond and Jackson Pond are both located within Area A.

Area B: This drainage area, located along the northern boundary of the City, is the second largest watershed within the City with an area of approximately 0.84 square miles. The area is drained by an extensive storm drain system, which discharges from the City at 53rd Avenue and University Avenue north to the Mississippi River through a 48-inch pipe. The four main storm sewer drains are as follows:

- Clover Pond west along the north City limit to Central Avenue and then west to Sullivan Lake.
- Sullivan Lake at Sullivan Drive/Washington Street west and north to 53rd Avenue/University Avenue
- 49th Avenue/Jackson Street (Valley View Elementary and Central Middle Schools) north to Sullivan Lake at 51st Avenue/Jefferson Street
- Innsbruck Parkway/Johnson Street west along 49th Avenue to Central Avenue and then north along Central Avenue to a junction with the Clover Pond storm sewer

Clover Pond and Sullivan Lake reduce peak flows in the storm sewer system.

Area C: This drainage area, located in the northeast corner of the City, drains approximately 0.50 square miles to a low spot that does not have an outlet. The watershed is drained by an extensive storm drain system, which discharges into Highland Lake located in Kordiak Park. Six storm drains discharge stormwater into Highland Lake. The outlet from Highland Lake flows through a controlled outlet to Secondary Pond, which is located on the City of Columbia Heights' north boundary with the City of Fridley. Highland Lake also has a secondary controlled outlet that discharges to Clover Pond. A storm drain conveys the discharge from Secondary Pond to Tertiary Pond, which is located in the

City of Fridley and does not have an outlet. The City has an agreement with Fridley on the maintenance and discharge from Tertiary Pond.

Area D: This drainage area, located in the southeast corner of Columbia Heights, drains approximately 0.45 square miles of the City to Silver Lake. This watershed also drains a portion of the City of St. Anthony, which is located to the east of Columbia Heights. The area is drained by an extensive storm drain system that runs along the City's east boundary with the City of St. Anthony. The four main storm sewers drain as follows:

- 45th Avenue/Stinson Boulevard south along Stinson Boulevard to Silver Lake
- 45th Avenue/Tyler Street south and east to Silver Lake
- Hart Lake east and north to Silver Lake
- 39th Avenue/Alley located east of Polk Street, northeast and east along 40th Avenue to a junction with the Hart Lake storm sewer near 40th Avenue/McKinley Street.

This drainage area includes Hart Lake.

Area E, F, and G: These drainage areas, located along the southern boundary of the City, drain approximately 0.53 square miles. The areas are drained by an extensive system of storm drains that discharge south into the Minneapolis storm sewer system at eight locations. From the west to east, these connections along 37th Avenue are at: University Avenue, 5th Street, Madison Place, mid-block between Reservoir Boulevard and Tyler Street, Tyler Street, just west of Pierce Street, Johnson Street, and Hayes Street.

Area E was further divided into smaller drainage areas, one for each major discharge point.

Subwatershed E1 – This subwatershed is 0.08 square miles and drains to two discharge storm drains on 37th Avenue. Ultimately, discharge from this area is controlled by a 36-inch RCP at Tyler Street.
Subwatershed E2 – This subwatershed is 0.04 square miles and drains to the 12-inch storm drain at 37th Avenue and Pierce Street.
Subwatershed E3 – This subwatershed is 0.03 square miles and drains to the discharge storm drain at 37th Avenue and Johnson Street.

Area F has a drainage area of 0.04 square miles and drains to the discharge storm drain at 37th Avenue and Madison Place.

Area G has a drainage area of 0.33 square miles and drains to the discharge storm drain at 37th Avenue and 5th Street, ultimately through a 48-inch storm sewer.

Area H: This drainage area, located in the southwest corner of the City, drains approximately 0.12 square miles. The watershed is drained by a storm sewer system that exits from the City at 39th Avenue and California Street and discharges stormwater westerly to the Mississippi River through a 54-inch pipe.

4.2. Water Quantity Assessments

4.2.1. *City Assessment*

The drainage system in Columbia Heights is broken up into eight major areas, referred to as Areas A through H. The following section provides a discussion of issues that have been identified by the City in each of these major areas. The discussion is based on previous modeling results from prior City flood studies. The City will look to partner with the MWMO and RCWD to address those issues within each respective watershed boundary. As the MWMO completes models for

Columbia Heights incorporating Atlas 14 data, more specific projects can be identified to address each issue.

Jackson Pond: Jackson Pond was constructed as a stormwater pond in the 1960s and modified several times since. It's located in a low point of a natural depression. The area around the pond has experienced flooding and the Columbia Heights Flood Insurance Study established 896.2 feet as the 100-year flood level, which would result in the flooding of approximately 30 structures. FEMA has recently reanalyzed Jackson Pond and has established the 100-year flood level as the top of the berm around the pond. The MWMO's XP-SWMM model for the 11CHF watershed currently shows predicted areas of flooding around Jackson Pond for the 100-year Atlas 14 rainfall event as well as some inundated storm sewer pipes for the 10-year rainfall event. The City will collaborate with MWMO to complete a feasibility study for the area to determine appropriate measures for future flooding events. This issue is identified as **Location #1** on **Figure 13, Appendix A**.

Forty-Fourth Avenue Storm Drain: The segment of storm drain from Jackson Pond to Main Street has capacity for approximately 176 cfs. The storm drain size is reduced from a 60-inch RCP east of University Avenue to storm drains of 54 inches, 42 inches, and 48 inches between University Avenue and the Main Street/45th Avenue intersection. These decreases in size create pressure flow in the pipes along with some flooding at the Main Street intersections of 44th Avenue and 45th Avenue. Portions of the storm sewer are fairly shallow limiting the amount of surcharging that can occur before stormwater is discharged out of the system at manholes and catch basins. The emergency overflow route generally is from east to west along 44th Avenue. This issue is identified as **Location #2** on **Figure 13, Appendix A**. The City has identified projects in their CIP for storm sewer improvements near this location. These project areas are shown in **Figure 14, Appendix A.**

Boundary Storm Drain (Clover Pond to Central Avenue): Several low spots exist in the terrain along the storm drain alignment. Stormwater collects in these low spots and previous analysis indicates that this will continue to be the case. Inlets have been placed in these low spots to drain the stormwater runoff into the storm drain system. Excess water during the storm will overflow these low spots and flow west along the storm sewer alignment to Central Avenue. The excess water will collect at Central Avenue causing flooding of the street and surrounding area. Several houses built within the City of Fridley along the north edge of these low spots have experienced flooding problems. This flooding issue has been corrected.

Central Avenue to Sullivan Lake Storm Drain: The outlet pipes at Central Avenue have a combined capacity of approximately 335 cfs, which is less than the calculated 5-year peak runoff rates. The excess runoff would likely cause flooding at the storm drain junction on Central Avenue. The emergency overflow route when the capacity of the storm sewer is exceeded under Central Avenue is to the north. There do not appear to be any structures that are impacted by the overflow route. Localized street flooding does occur in this location. The City will partner with the MWMO to determine any structure impacts from the Atlas 14 rainfall events and possible corrective actions for the street flooding. This issue is identified as **Location #3** on **Figure 13, Appendix A**

Highland Lake: This lake is located in Kordiak County Park in the northeast corner of the City. Discharge from the lake is controlled by an outlet structure that includes a sluice gate in a weir box structure. An additional outlet control structure discharges to Clover Pond. A review of the as-built plans indicates that the 100-year water level will encroach in the backyards of several houses located along the east side of the lake and fronting onto West Upland Crest. The 100-year water level will not, however, result in the flooding of any existing homes along the lake, assuming an SCS Type II storm event. Additional study, potentially partnering with MWMO, might be needed to determine the structural impacts of the Atlas 14 rainfall events from the lake high water level. This issue is identified as **Location #4** on **Figure 13, Appendix A**

Secondary Pond: This pond is located north of Highland Lake on the boundary of Columbia Heights and Fridley. A review of the as-built plans indicates that the 100-year water level will encroach into the backyards of several houses located around the lake and that it will also encroach into some of the structures. The City will look to partner with the MWMO to investigate the Atlas 14 100-year water level impacts. This issue is identified as **Location #5** on **Figure 13, Appendix A.**

Tertiary Pond: This pond is located northeast of Secondary Pond within the City of Fridley and the City of New Brighton. The pond has a large drainage area and a small storage volume and no outlet. This will result in large fluctuations in the water levels for this pond. Additional study of this entire system from Highland Lake to the Tertiary Pond is needed to determine the impacts of the Atlas 14 rainfall event on the systems high water levels. The City will look into partnering with the MWMO to complete this study. This issue is identified as **Location #6** on **Figure 13, Appendix A.**

Storm Sewers Draining the Area North of Silver Lake: The storm sewer network north of Silver Lake includes a 21-inch RCP and a 30-inch RCP that have a capacity less than the calculated 5-year peak runoff rate. The excess runoff would be temporarily stored in lot points in intersections and flow overland to the lake. There do not appear to be any structures impacted by the overflow route. The City will continue to monitor this area and will investigate the need to complete a feasibility study to determine potential storm sewer improvements. This issue is identified as **Location #7** on **Figure 13, Appendix A.**

Storm Sewer along 37th Avenue: Several areas along 37th Avenue experience frequent flooding. This includes the following areas: 37th and Madison Place, 37th Avenue between Reservoir Boulevard and Tyler Street NE, 37th Avenue and NE Pierce Street and 37th Avenue and Johnson Street NE, 37th and Hart Boulevard, 37th and Huset Parkway. The City will perform a feasibility study to determine potential storm sewer improvements or volume control BMPs to mitigate flooding in this area. This issue is identified as **Location #8** on **Figure 13, Appendix A.**

4.3. Water Quality Assessments

4.3.1. *City Assessment*

The following discussion of water quality issues is based on results presented in the 2030 Comprehensive Plan. Water quality was assessed using results of PONDNET modeling. Modeling results indicated that several wetland and waterbodies receive substantial amounts of nutrients and sediment from their tributary watersheds. The discussion below includes information the PONDNET modeling and also the following reports:

- Rice Creek Watershed District 2010 State of the Lakes Report
- Mississippi River Watershed Management Organization 2015 Annual Monitoring Report

Labelle Pond: Labelle Pond is located at 41st Avenue, just east of Central Avenue. Labelle Pond is primarily used for aesthetic enjoyment. The pond is classified as eutrophic. Algae blooms and odor have been a problem for this pond for several years and is treated annually. Three aerators run seasonally. This issue is identified as **Location #9** on **Figure 13, Appendix A.** The City will continue to treat Labelle Pond for algae blooms.

Jackson Pond: Jackson Pond is located southwest of the intersection of Jackson Street and 44th Avenue. The pond was constructed strictly for stormwater detention and reducing stormwater discharge rates and includes filtration as a means to further treat stormwater. Jackson pond has a low aesthetic or wildlife value. The City will look into options to enhance aesthetic and wildlife value as deemed feasible. This issue is identified as **Location #10** on **Figure 13, Appendix A.**

Clover Pond: Clover Pond is located northwest of Highland Lake in the northeast corner of the

City. The pond is categorized as eutrophic and has poor water quality. This issue is identified as **Location #11** on **Figure 13, Appendix A.** The City will continue to monitor the quality of the pond.

Sullivan Lake: Sullivan Lake is located on the northern edge of the City, west of Highway 65. Sullivan Lake is eutrophic and often experiences algal bloom and odor problems. Sullivan Lake is listed as an impaired water body and has an established TMDL. The City will consider partnering with MWMO as projects are identified to address the TMDL requirements. This issue is identified as **Location #12** on **Figure 13, Appendix A.**

Highland Lake: Highland Lake is located in Kordiak County Park in the northeast portion of the City. There is an aeration system in place at the lake that is operated and maintained by Anoka County. The lake is shallow and has high amounts of nutrients. Highland Lake is on the MPCA impaired waters list. Further discussion of Highland Lake is provided in the following section. The City will consider partnering with MWMO in the future as projects are identified to reduce nutrient loading to the lake when a TMDL is approved. This issue is identified as **Location #13** on **Figure 13, Appendix A.**

Secondary Pond: Secondary Pond is located on the border of Columbia Heights and Fridley, just north of Highland Lake. The pond is eutrophic and the value of the pond is primarily flood control and aesthetic enjoyment. Algal blooms and odor have not been an issue to date; however, if excess nutrients continue to increase these could become issues for the pond. This pond is also treated annually for algae. This issue is identified as **Location #14** on **Figure 13, Appendix A.**

Hart Lake: Hart Lake is located in the southeast corner of the City. According to the RCWD Plan, Hart Lake is considered to be of marginal value for water quality treatment. Given its small size, shallow depth and urban watershed, little water quality improvements can be expected. Efforts should be focused on maintaining existing water quality and preventing future problems. This issue is identified as **Location #15** on **Figure 13, Appendix A.**

Silver Lake: Silver Lake is located on the border of Columbia Heights and the City of St. Anthony. The lake is classified as a fisheries lake by RCWD. Water quality problems in the Columbia Heights portion of Silver Lake's watershed result primarily from inadequate treatment of stormwater runoff prior to discharge into the lake. Silver Lake is on the MPCA Impaired Waters List and has an EPA approved TMDL Implementation Plan. A discussion of this is in the following sections. This issue is identified as **Location #16** on **Figure 13, Appendix A.**

Pike Lake: Pike Lake is located just north of I694 in the City of New Brighton. The Rice Creek Watershed District Southwest Urban Lakes TMDL has been complete to address the Pike Lake nutrient impairment. The report identifies a categorical wasteload reduction, of which Columbia Heights is one of the listed MS4 cities. Rice Creek Watershed District identifies that only a small portion of Columbia Heights drains to Pike Lake. The City intends on focusing water quality BMPs in drainage areas to Silver Lake, which ultimately drain to Pike Lake and will benefit the water quality downstream.

Upper Mississippi River: The Upper Mississippi River is impaired for fecal coliform (E.coli), mercury in fish tissue, PCBs in fish tissue, and nutrient/eutrophication biological indicators. The Upper Mississippi River Bacteria TMDL was developed to protect numerous stream reaches within the Upper Mississippi River Corridor from impairment due to E.coli. All cities within Rice Creek Watershed are required to implement actions to address this TMDL. This issue is identified as **Location #17** on **Figure 13, Appendix A.** The City will implement pet waste management to protect water quality of stormwater runoff. The City will also continue to implement stormwater BMPs that will aid in reducing fecal coliform runoff into the Mississippi River.

4.3.2. *Clean Water Act Assessments*

The Impaired Waters List, also known as the 303(d) list from the applicable section of the federal Clean Water Act, records waters that do not currently meet their designated use due to the impact of a particular pollutant or stressor. If monitoring and assessment indicate that a water body is impaired by one or more pollutants, it is placed on the list. At some point a strategy would be developed that would lead to attainment of the applicable water quality standard. The process of developing this strategy is commonly known as the Total Maximum Daily Load (TMDL) process and involves the following phases:

1. Assessment and listing
2. TMDL study
3. Implementation plan development and implementation
4. Monitoring of the effectiveness of implementation efforts

Responsibility for implementing the requirements of the federal Clean Water Act falls to the U.S. Environmental Protection Agency (USEPA). In Minnesota, the USEPA delegates much of the program responsibility to the state Pollution Control Agency (MPCA).

Information on the MPCA program can be obtained at the following web address:
https://www.pca.state.mn.us/water/total-maximum-daily-load-tmdl-projects

A map of impaired waters in Columbia Heights and TMDL's can be found at the following web address:
https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav

The following is an excerpt from the MPCA website describing the program and its need:

> "The Clean Water Act requires states to publish, every two years, an updated list of streams and lakes that are not meeting their designated uses because of excess pollutants. The list, known as the 303(d) list, is based on violations of water quality standards and is organized by river basin. Environmental organizations and citizen groups have sued the EPA because states have not made adequate progress to meet Section 303(d) requirements. The EPA has been sued for various reasons. Over the past 10 years, lawsuits have been filed in 42 states and the District of Columbia. Of those, 22 have been successful. There is currently no such lawsuit in Minnesota. However, beyond the federal requirements, there are many reasons for us to move forward with the development of TMDLs. Foremost is the need to clean up our rivers, streams and lakes to maximize their contributions to the state's economy and quality of life and to protect them as a resource for future generations.
>
> For each pollutant that causes a water body to fail to meet state water quality standards, the federal Clean Water Act requires the MPCA to conduct a TMDL study. A TMDL study identifies both point and nonpoint sources of each pollutant that fails to meet water quality standards. Water quality sampling and computer modeling determine how much each pollutant source must reduce its contribution to assure the water quality standard is met. Rivers and streams may have several TMDLs, each one determining the limit for a different pollutant."

Table 4.1 lists the 303(d) impaired waters within the City of Columbia Heights

Table 4.1
303(d) 2014 Final List of Impaired Waters
Within the City of Columbia Heights

Water Body	Year First Listed	Assessment Unit ID #	Affected Use	Pollutant or Stressor	TMDL Complete
Silver Lake	2012	62-0083-00	Aquatic Consumption	Mercury in fish tissue	2007
Silver Lake	2002	62-0083-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	2010
Silver Lake	2014	62-0083-00	Aquatic Life	Chloride	2016
Sullivan/Sandy Lake	2002	02-0080-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	None
Highland Lake	2004	02-0079-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	None
Mississippi River	1998	07010206-509	Aquatic Recreation	Fecal coliform, Mercury in fish tissue, PCBs in fish tissue Nutrient/eutrophication biological indicators	Complete for mercury and fecal coliform

4.4. Silver Lake:

4.4.1. *Assessment*

Silver Lake is partially located in Columbia Heights and has a TMDL for phosphorus and chloride. The existing load based on modeling years 2006-2007 is 92.5 pounds per year with a target load of 85.7 pounds per year. The City has identified best management practices, including increased ponding and filtration, as an effective way to reduce phosphorus loading to the lake. Regional ponds, rain gardens, native plantings and reforestation, shoreline restoration, and education are specific examples that the City encourages. The City will continue to implement chloride management efforts to meet this TMDL.

4.4.2. *Implementation*

The TMDL implementation plan for Silver Lake can be found on www.pca.state.mn.us. Several implementation activities are listed, including the following (as discussed in the 2011 MPCA Silver Lake Implementation Plan) that involve the City of Columbia Heights:

- Columbia Heights Boat Ramp Improvements: A boat ramp, owned by the City of Columbia Heights, currently includes a regional water quality pond. Modeling indicates that this pond currently provides 42% removal of total phosphorus for the contributing drainage area.

  Opportunities exist for enhancing the total phosphorus removal efficiency, including expanding the area and/or depth, adding additional filtration components, or a skimmer device. The City has evaluated options for improving the function of the existing BMP in this area in coordination with Rice Creek Watershed District.

- Silver Lake Beach Improvements: The City of Columbia Heights has completed plans and installed site improvements to Silver Lake Beach Park. Water quality improvements include two infiltration basins and a vegetated swale with intermittent ponding. In addition, water quality benefits are provided by overall impervious surface reduction and conversion of portions of mowed turf to native plants. The improvement results in total phosphorus (TP) removal from the beach watershed and portions of the direct subwatershed.

- Shoreland Buffers and Restoration: Shoreland buffers can be used to treat direct drainage from properties adjacent to the lake. Buffers provide for wildlife habitat and filtering of stormwater pollutants and act as a filter for stormwater runoff from shoreland properties. These practices are primarily targeted toward homes on the west and south shores of the lake, which would include homes within Columbia Heights.

- Columbia Heights Road Reconstruction Rain Gardens: The City of Columbia Heights has reconstructed several roads within the watershed and has implemented small scale rain gardens to treat runoff. These rain gardens provide water quality treatment of previously untreated road drainage within a fully urbanized portion of the City. They were required by the RCWD.

- Road Reconstruction of Stinson Boulevard Retrofits: In 2011, the City of Columbia Heights planned to reconstruct a portion of Stinson Avenue in the watershed within the next five years (by 2016). The goal was to have rain gardens or small scale water quality treatment practices throughout the road reconstruction project to treat road runoff, as required by RCWD. This project has been complete.

- Fisheries Management: Silver Lake supports a recreational fishery. Fish species present include walleye, northern pike, bluegill, crappie, catfish, bullhead, yellow perch, largemouth bass, and common carp. Lake fishery surveys were completed in 1961, 1976, 1981, 1986, 1991, 2000, and 2006. A survey was completed in 2016 but results have not been published at this time. The 2006 survey showed an average catch rate for bluegill and black crappie with both species being smaller than average. The remaining gamefish species abundance is lower than average based on the survey catch rates. The fishery management plan call for stocking 140,000 walleye fry and 100 adult channel catfish in even numbered years.

  Silver Lake suffered from occasional winterkills due to low winter dissolved oxygen concentrations. To mitigate this, the City of Columbia Heights operates an aerator in the northwest corner of the lake.

  Shore fishing along the Three Rivers Park shoreline and the fishing piers installed by the park district is popular.

  Rough fish (primarily common carp) are identified as an internal loading source for phosphorous in the Silver Lake TMDL and the TMDL implementation plan identifies rough fish management as in implementation activity.

  To address this, the City of Columbia Heights along with the City of St. Anthony Village, City of New Brighton, Three Rivers Park District, and the Rice Creek Watershed District supported a study to quantify the carp population, assess spatial usage of the lake by carp, and remove carp biomass to improve water quality.

  The study determined that the Silver Lake supported 1,086 (± 140) individual adult carp or 129 pounds/acre using an 8.2 pound average weight and only the littoral acreage of the lake (62.5 acres). During the study period, biomass was reduced from 129 pounds/acre to roughly

39 pounds/acre resulting in improved water quality and aquatic vegetation density and distribution. This study has since been complete.

Aquatic Macrophyte Management – There is currently not an approved lake management or lake vegetation management plan for Silver Lake. However aquatic macrophyte surveys are completed frequently to assess overall vegetation density and distribution. Vegetation density, distribution, and diversity were metrics in the common carp study described in the previous section.

As part of the initial Silver Lake Carp Management project, Three Rivers Park District staff have continued to sample aquatic vegetation within Silver Lake. Survey methodology involves navigating to pre-determined points and sampling aquatic vegetation with a rake to assign a density rating of 1-5; one being the least dense and five being the most. A similar survey completed by Ramsey County was used for a comparative analysis. The 2008 survey resulted in only three different plant species being found, with an average and maximum density of one. Only 21percent of the sampling points contained vegetation.

In 2014, three separate species were found, and 66 percent of the sites were vegetated. The average density of those sites was a rating of two. In 2015, two separate surveys were performed; the first in June and the second at the end of August. The first survey resulted in 86 percent of the sites being vegetated and an average density of 3.13. The second survey showed 59 percent of the sites vegetated and an average rating of 1.54. The difference between the two surveys was that by the end of August curly leaf pondweed had died off and was not a significant portion of the plant biomass. These survey results represent the native vegetation community. Species diversity doubled by 2015 with six separate species observed; these species include *Potamogeton Crispus* (invasive), *Ceratophyllum demersum*, *Elodea Canadensis*, *Potamogeton Pusillus*, *Naja Flexilis*, and *Lemna minor*. Filamentous algae growth appears to have increased since water clarity increased and is a concern of lakeshore residents.

- Chemical Treatment: An in-lake alum treatment system was proposed in 2011. The system was proposed as a means to get immediate in-lake results for a moderate cost. The clarity of the water would improve in the short term, thereby helping long-term restoration efforts by increasing the light available to aquatic macrophytes. The system was not intended as a management step to reduce annual loading.

4.4.3. *Monitoring*

Ramsey County conducted bi-weekly in-lake monitoring during implementation between the months of May and September. Monitoring consists of the following parameters:

- Nutrients
- Chlorophyll-a
- Secchi disk
- Dissolved oxygen
- Specific conductance
- Temperature
- pH

Silver Lake is also monitored by private citizens as part of the Citizen Lake Monitoring Program. All water quality data obtained from monitoring Silver Lake is analyzed by RCWD to determine the water quality trends occurring in the lake.

Lake Clarity Trend

The median transparency in Silver Lake from 1973 to 2011 increased at a rate per decade that is insignificant (0.00 feet per decade per MPCA). Between 1973 and 2011 there was such high variability that there was no evidence of a long-term trend, either increasing or decreasing.

Water quality appears to be improving based on more current surface water sampling by Ramsey County Environmental services. This sampling shows a significant increase in secchi depth with the deepest average growing season secchi disk reading within the last 10 years documented in 2015. Additionally, chlorophyll- a, a surrogate for algal concentrations was measured at its lowest level in 2015. Citizen lake monitoring in 2015 recorded a 6.7 meter secchi disk reading; the deepest measurement ever documented. This depth resulted in the sampling station having to be moved. Total phosphorous concentrations have not improved to the extent that chlorophyll-a and secchi depths have improved; however, the 2015 average summer reading met state water quality standards and is on pace to meet those standards again this year.

Based on this recent data and a trend showing that secchi depth, chlorophyll-a, and total phosphorous growing season concentrations are meeting state water quality standards, delisting from the 303(d) impaired waters list may be appropriate.

In addition to the monitoring discussed above, spring and fall aquatic macrophyte surveys were recommended in the implementation plan in 2011.

More information on Silver Lake can be found in the “Silver Lake TMDL Implementation Plan” prepared by RCWD, Emmons & Olivier Resources, Inc and the MPCA in May 2011.

4.5. Other Assessments

Other studies conducted in Columbia Heights include:

- Southern Columbia Heights and Northeast Minneapolis Stormwater Retrofit Analysis, prepared by MWMO & Anoka Conservation District (2014)
- Houston Engineering H & H & Water Quality Modeling
- Barr Engineering H & H & Water Quality Modeling

5. GOALS AND POLICIES

5.1. Purpose

The primary goal of Columbia Heights' Surface Water Management Plan (SWMP) is to bring the City into statutory compliance and provide the City a framework for effective stormwater management. This includes guiding redevelopment activities and identifying and implementing district and regional, retrofits to the existing system. These retrofits consist of both projects and programs. Additionally, the plan provides clear guidance on how Columbia Height's intends to manage surface water in terms of both quantity and quality.

The goals of Columbia Heights' SWMP are consistent with the goals of the Mississippi Watershed Management Organization (MWMO) and Rice Creek Watershed District (RCWD), while addressing the more specific and changing needs of the City. This plan is an update to the 2000 Water Resources Management Plan and the goals of this plan were established in accordance with the guidelines contained in Minnesota Statutes 103B and Minnesota Rules 8410.

A general priority of the City is to cooperate, collaborate, and partner with other entities such as MWMO, RCWD and the MPCA as much as possible as the City implements this plan. Cooperation, collaboration, and partnering results in projects that are less likely to conflict with the goals of the affected entities, are better able to meet long-term goals, and are generally more cost-effective.

In addition to the goals and policies contained in this section, the City will annually review and update its Storm Water Pollution Prevention Plan (SWPPP) to effectively manage its stormwater system and be in conformance with the National Pollutant Discharge Elimination System (NPDES) MS4 Program. Refer to **Appendix B** for the most recent version of the City SWPPP.

5.2. Background

Since its last comprehensive plan, prepared a decade ago, the City of Columbia Heights has consistently maintained the following as its overarching goals for stormwater management:

- To continue to provide quality services with limited funding.
- To understand/adapt to the demographic changes taking place in the City.
- To improve the City's housing stock.
- To attract new residents and to retain existing residents and homeowners for the purpose of promoting household growth and stabilizing the tax base.
- To continue to redevelop the City's commercial and industrial property.

The 2040 Comprehensive Plan carries these overarching goals into the next decade, while also strengthening the City's tradition of supporting development and redevelopment.

Specific to the goals and policies of this Surface Water Management Plan are summarized by the following statements from the 2040 Comprehensive Plan:

> *"The City will coordinate planning for city parks, utilities, parking, ROW and other properties, with surface water management efforts to preserve and improve the quality of water resources within existing parks and open spaces."*
>
> *And*
>
> *"…the goal (of the plan) is to guide the City in managing its surface and ground water resources, and enables the City to develop drainage facilities in a cost-effective manner, while maintaining or improving the quality of its water resources."*

5.3. City of Columbia Heights SWMP Goals and Policies

5.3.1. *Water Quantity*

5.3.1.1. Goal

Reduce the impact of flooding to existing development and use development and redevelopment as an opportunity to retrofit flood control the existing system.

5.3.1.2. Policies

1. All designs must use NOAA Atlas 14 Precipitation Frequency Data in stormwater design calculations and modeling.

2. Emergency overflows and transient storage in parking lots, intersections, etc. must be considered when designing new or retrofitting to old storm sewer systems.

3. Detention basins shall be designed with capacity for the critical 100-year event. At a minimum, detention basins should maintain existing flow rates for the 2-, 10-, and 100-year 24-hour rainfalls

4. Drainage analyses shall utilize a hydrograph method of analysis. For the 24-hour rainfall event, an MSE3 distribution should be used. For shorter duration events other distributions may be used with the approval of the City Engineer.

5. All drainage system analyses and designs shall be based on ultimate full development land use patterns.

6. New development shall incorporate stormwater controls to prevent any increase in peak discharge rates for the 2-, 10-, and 100-year events, unless increased discharge is provided for in an approved regional ponding site, and flood storage volumes shall be maintained within the subwatershed.

7. Intercommunity water resources issues planning shall consider alternative solutions:

    a) All drainage studies or feasibility studies, whether by a WMO, water shed district, or municipality, leading to projects in a subwatershed with an intercommunity drainage issue, shall consider the impact of the project on the drainage issue and shall consider the total intercommunity project cost.
    b) Except in emergencies, no solutions or partial solutions to intercommunity drainage issues shall be implemented without prior completion of a feasibility study of options and adoption of a preferred option by the applicable WMO.

8. The following items shall be considered in the management of landlocked basins:

    a) The flood levels established for landlocked basins shall take into consideration the effects of water level fluctuations on trees,

vegetation, erosion, and property values. Steeply sloped shoreland subject to slope failure and shoreland damage should not be in contact with floodwaters for extended periods of time.

b) The capacity of proposed outlets to landlocked basins should not be so small as to cause extended duration of high water levels that would results in damage to upland vegetation.

c) Only the existing tributary area may discharge to a landlocked basin, unless a provision has been made for an outlet from the basin. The form of outlet may range from temporary pumps to gravity storm sewers. The outlet shall be implemented before increased water levels are likely to affect vegetation, slope stability, and property values.

d) The City will ensure RCWD's Rule C(5)(e) is met when creating outlets for landlocked basins within the RCWD boundary.

Definition: Landlocked basins are those where no outlet exists below proposed or existing structures.

9. When development occurs adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):

   a) Three feet above the HWL determined by modeling back to back 100-year, 24-hour events,

   b) Three feet above the highest known water level, or

   c) Five feet above the HWL determined by modeling a single 100-year, 24-hour event.

   When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey. Additionally, continuous simulation of average annual rainfall conditions will also provide insight into whether significant, adverse impact to vegetation would occur due to development around the landlocked basin.

   Definition: Freeboard is the vertical separation between the HWL of the simulated rainfall or runoff event and the lowest ground elevation adjacent to a structure.

10. For basins with a suitable outlet, freeboard will be two-feet above the HWL determined by modeling the 100-year Atlas 14 event. Emergency overflows a minimum of one and a half feet below lowest ground elevation adjacent to a structure should also be provided.

11. Adjacent to channels, creeks, and ravines freeboard will also be two feet to the 100- year Atlas 14 event elevation.

.

12. New storm sewers and open channels shall be designed using the Rational Method or other technical method approved by the City. Runoff Coefficient "C" shall be in accordance with the guidelines provided in the Minnesota Department of Transportation Drainage Manual.

13. Water quality treatment ponds (wet ponds) shall be designed in accordance with National Urban Runoff Program (NURP) standards.

14. Drainage and utility easements shall be dedicated over newly constructed stormwater management features (volume, rate control, and water quality treatment infrastructure) including but not limited to ponds, infiltration basis, rain gardens, underground storage and treatment devices, tree trenches, etc.

5.3.2. *Water Quality*

5.3.2.1. Goal

The City of Columbia Heights will work with MWMO and RCWD, and neighboring communities to maintain and/or enhance the water quality of Columbia Heights' lakes, wetlands, streams, and other water resources.

5.3.2.2. Policies

1. Surface waters are to be classified and water quality functions are to be maintained according to the provisions set forth in this plan.

2. Wetlands will be protected according to regulations and guidelines in the Wetland Conservation Act. The City will act as the local governmental unit (LGU) for wetlands within the MWMO boundary. RCWD is the WCA LGU for wetlands within the RCWD boundary.

3. Persons proposing or carrying out filling or other development activity in wetlands or water bodies identified in this plan will be notified by the City that their activity may be under the jurisdiction of the 1991 Wetland Conservation Act. They will be directed to contact the City for guidance and permits. For wetlands within RCWD boundary, persons proposing development activity near or within wetlands must also contact RCWD for guidance and permitting requirements.

4. The use of "Best Management Practices" will be promoted to help minimize pollutants in stormwater runoff.

5. The MWMO stormwater standards and flow chart (**Appendix D**) will be applied to development within the City.

    a) For developments that disturb one acre or more acre of land, 1.1 inches of runoff from the net increase in impervious area shall be captured and retained onsite. If this policy cannot be met due to site restrictions, the restrictions must be documented and the development shall follow the Flexible Treatment Options Approach through the MWMO Design Sequence Flow Chart.
    b) The City recognizes that infiltration may not be feasible in some areas either due to land or financial constraints. The City is committed to reducing the pollutant load over time and may consider an aggregate reduction of load across redevelopment areas. This action will occur as redevelopment occurs and will be reviewed on a yearly basis.

6. The City will accept other stormwater quality treatment methods on a case-by-case basis if they meet or exceed the removal efficiencies provided by a NURP pond.

7. Water quality monitoring efforts undertaken by the MWMO, RCWD or Anoka County Soil and Water Conservation District (SWCD) will be supported.

8. The City will actively participate in the development of TMDL studies for Sullivan Lake, Silver Lake and Highland Lake.

9. The City will annually review and update its Storm Water Pollution Prevention Plan (SWPPP).

10. The City will sweep the streets at least two times annually.

11. The City will require the inclusion of skimmers in the construction of new pond outlets, and add skimmers to existing system whenever feasible and practical. The designs shall provide for skimmers that extend 4 inches below the water surface and minimize the velocities of water passing under the skimmer to less than 0.5 feet per second for rainfall events having a one year return frequency. Skimming shall occur for up to the 5-year, 24-hour event.

12. Newly constructed ponds shall include an outlet design allowing for extended detention of the 1- to 5-year rainfall event. The hydrograph duration for pond discharge should extend a minimum of 24 hours for events within the 1- to 5-year range.

13. The City will discourage the use of fertilizers and pesticides in shoreland protection zones to minimize pollutant runoff to public waters.

14. The City will evaluate and implement a road salt application and storage program that reduces the amount of salt usage and chloride contamination. The MPCA website and the Winter Maintenance Assessment tool (WMAt) will be used to the greatest extent possible.

15. The City will continue to implement its retention/treatment basin clean out and maintenance plan that will address maintenance to the extent feasible and practical. The goal of this plan will be to assure that the City's retention and treatment basins will have the capability to retain and treat stormwater in future years.

5.3.3. *Recreation and Fish and Wildlife*

5.3.3.1. Goal

Protect and enhance fish and wildlife habitats, water recreational facilities, and water resource aesthetics

5.3.3.2. Policies

1. The neighborhood and regional benefits to wildlife habitat and aesthetics should be considered in any proposal to alter or eliminate wetlands, understanding that wetland elimination without mitigation is precluded by state law and understanding that even mitigated wetland impacts must meet strict sequencing guidelines.

2. The City will review recreational water body inlets and outlets for aesthetics.

3. Columbia Heights shall seek to coordinate with the Minnesota Department of Natural Resources (DNR) regarding development of DNR public waters and public water wetlands. Notwithstanding ordinance provisions, both existing and future, that control development of shoreland areas, the City will seek Minnesota DNR comments on development proposals adjacent to DNR public waters and public water wetlands. The City has adopted a Shoreland Ordinance meeting the requirements of the DNR. This can be found on the City's website.

4. The City will look to maintain their current ecosystem protection priorities using park redevelopment opportunities. The City will apply for grant opportunities as they arise. The City will also look to implement measures to protect water quality through parks and other recreation areas by minimizing pet waste, planting vegetated buffers, and implementing stormwater BMPs.

5. Water resources shall be maintained in such a manner as to preserve or restore their intrinsic aesthetic qualities and wildlife habitat.

6. The City will collaborate with the MWMO on monitoring activities they undertake throughout the City. These opportunities could include collecting additional data such as macrophyte surveys, assessments of internal phosphorus loading, inlet/outlet loads, and BMP pollutant removal efficiency. The City will utilize MWMO staff that are experienced in sampling, instrumentation and maintenance of stormwater flow and water quality monitoring, confined space entry, and other areas as needed.

5.3.4. *Enhancement of Public Participation; Information and Education*

5.3.4.1. Goal

Inform and educate the public concerning urban stormwater management and the problems pollutants cause if allowed to enter into our water resources.

5.3.4.2. Policies

1. Enact a public education program based on the following objectives to reduce stormwater pollution:

   a) Raise awareness of the problem and solutions,
   b) Promote community ownership of the all surface water features,
   c) Recognize responsible parties and actions to date,
   d) Merge public feedback into program execution.

2. Enact a public education program to satisfy the minimum control measures identified in the City's NPDES permit.

3. Coordinate education efforts with the watershed organizations so that redundant efforts are avoided.

5.3.5. *Groundwater*

5.3.5.1. Goal

Maintain and improve groundwater quality and promote groundwater recharge.

5.3.5.2. Policies

1. To the extent that Wellhead Protection Plans identify areas of groundwater recharge that require protection, the City shall work with the Minnesota Department of Health (MDH) and neighboring communities in developing adequate protection measures. The City will cooperate with other communities that are required to meet the timelines and key milestones described in the North and East Metro Groundwater Management Area (NEM-GWMA) described in Section 2.2.4. Because Columbia Heights does not use groundwater for municipal use, no specific actions are required.

2. Surface water management improvements in likely recharge areas and areas of high vulnerability to chemical or petroleum spills shall be designed to assist groundwater protection. Practically, this means infiltration shall not be considered in developments that include the potential for these types of spills.

Note: The City of Columbia Heights obtains its potable water from the City of Minneapolis Water Utility. Since Columbia Heights is not an active participant in the MDH Wellhead Protection Program, the City will have to rely on MDH and neighboring communities to identify 10-year capture areas. To the extent that future analyses identify these areas within Columbia Heights, the City will then use its subdivision authority to properly regulate these areas.

5.3.6. *Wetlands*

5.3.6.1. Goal

Protect and preserve wetlands through administration and coordination of the Wetland Conservation Act and City Ordinance.

5.3.6.2. Policies

1. The City will act as the local government unit responsible for enforcing the Wetland Conservation Act of 1991 for those wetlands located within the MWMO boundary. RCWD is the LGU for WCA within the RCWD boundary.

2. Wetland disturbance will be discouraged. Wetlands must not be drained, filled, or excavated wholly or partially, unless replaced by restoring or creating wetland areas of equal public value or as permitted by the Wetland Conservation Act.

3. Clearing and grading will be restricted within close proximity of the wetland boundary to provide for a protective buffer strip of natural vegetation to promote infiltration of sediment and nutrients. In the event that grading occurs close to the wetland boundary, native plant materials shall be reestablished as a buffer strip.

4. A wetland assessment will be required to be prepared for any project that includes a wetland. Minnesota Routine Assessment Methodology for evaluating wetland function (current version 3.0 but as updated in the future) is the required method of assessment.

5. Runoff shall not be discharged directly into wetlands without pretreatment of the runoff.

Refer to MWMO and RCWD Rules and Standards on their websites for Wetland Management Policies within the City. The City has adopted the Wetland Management Policies for each watershed through the adoption of this SWMP. Chapter 9 – Article I:

Zoning and Land Development of the City's ordinances lists requirements for permits regarding wetland impacts.

5.3.7. *Erosion and Sediment Control*

5.3.7.1. Goal

Prevent, to the extent possible, sediment from construction sites from entering the City's surface water resources and to control the erosion from drainageways within the City.

5.3.7.2. Policies

1. The City has adopted an Erosion and Sediment Control Ordinance that meets or exceeds standards contained in the NPDES construction site permit and watershed organization plans.

5.3.8. *Floodplains*

5.3.8.1. Goal

Control development in floodplains and floodways including those subject to FEMA Studies (Mississippi and Minnesota Rivers) and those that are not regulated by FEMA Studies like ponds, wetlands, lakes and channels within the City limits.

The City has adopted the following ordinance and policies:

1. Land use constraints along all open channels, storm sewer overflow areas, depressions, wetlands, and lakes will be managed based on their respective 100-year flood levels computed as part of this plan.

2. The City has adopted a floodplain and shoreline management ordinance consistent with Chapter 6120 of the 1991 Minnesota Rules. (Ordinance 1550). A copy of this ordinance can be found on the City's website.

5.3.9. *Columbia Heights NPDES Permit*

5.3.9.1. Goal

Operate and manage the City's surface water system consistent with best current practices and the City's NPDES Permit.

5.3.9.2. Policy

1. Projects to correct existing deficiencies, to the extent they are identified, will be prioritized as follows:
   a) Projects intended to reduce or eliminate flooding of structures in known problem areas.
   b) Projects intended to improve water quality in the City's lakes.
   c) Projects intended to retrofit water quality treatment into developed areas.
   d) Projects intended to reduce maintenance costs.
   e) Projects intended to restore wetlands and habitat.

2. The City will actively inspect, and properly operate, maintain and repair its storm water system. The City will follow a regular inspection, cleaning, and repair schedule. Frequency of maintenance will be event-based and informed by

experience and inspection history. The City's SWPPP pages 13-14 outlines the frequency of these activities. The SWPPP can be found in Appendix B of this Plan. Section 5 of this Plan provides some guidelines on pond maintenance and inspection cycles, but the SWPPP will remain the definitive source on the City's intended maintenance and inspection schedules

3. The City will follow best management practices on its own lands and for its own projects including street reconstruction projects – in accordance with the NPDES construction site permit and the City's NPDES MS4 Permit.

5.3.10. *Nondegradation*

5.3.10.1. Goal

Improve the quality of the City's and region's surface water resources by, whenever feasible, decreasing the total phosphorous, total suspended solids and water volume discharge.

5.3.10.2. Policy

1. Development and redevelopment projects will be reviewed in the context of nondegradation and BMPs will be applied as necessary to maintain or reduce current phosphorous, total suspended solids loads and water volume loads.

2. Treatment will be retrofitted where opportunities on public projects and redevelopment projects exist.

3. The nondegradation strategies of no increase in Total Phosphorus (TP), Total Suspended Solids (TSS) and water volume shall, as much as practical, pertain to discharge to DNR public waters and public watercourses and shall not solely be considered on a city-wide basis.

5.3.11. *Conformance to MPCA Requirements*

5.3.11.1. Goal

Ensure that the City is in conformance with requirements set forth by the MPCA for MS4 communities.

5.3.11.2. Policy

1. The City currently has a Construction Site Storm Water Management Ordinance and Erosion Control Ordinance, found on the City's website. The City will continue to review and amend this ordinance as required to be consistent with the NPDES Construction Stormwater permit and MS4 permit requirements.

2. As a fully developed community that is retrofitting water quality and infiltration to public and private projects, Columbia Heights would not benefit from a wetland inventory as much as developing communities. Columbia Heights will follow wetland management as set forth in the RCWD and MWMO Rules.

3. There will be no net increase in peak runoff rates from existing conditions for the 2-, 10-, and 100-year storm events.

4. All new development must meet TSS and TP reductions of 90% and 60% respectively.

5. All best management practices for redevelopment must meet TSS and TP reductions of 90% and 60% respectively.

5.3.12. *Financial Management*

5.3.12.1. Goal

Ensure that the costs of the surface water system are equitably distributed.

5.3.12.2. Policy

1. The City will periodically update its stormwater utility rate structure to accomplish the following:

   a. Meet the requirements of its NPDES permit.
   b. Provide for the maintenance of ponds and outfall structures.
   c. Conduct repairs to the system.
   d. Update its system planning efforts.
   e. Implement rainwater gardens or other water quality retrofits with downtown redevelopment.

2. Other funding sources will be pursued and used including land sale proceeds, partnerships with the Watersheds, State Aid funds, grants, etc. to pay for the implementation activities, when available and appropriate.

5.3.13. *System Design*

5.3.13.1. Goal

Ensure that the City's goals are met to preserve, protect, and manage its water resources while also meeting federal, state and watershed regulations.

5.3.13.2. Policy

1. The City of Columbia Heights will require new or re-development within the City to follow their "Surface Water Management Design Standards" (March 2016). The design standards have incorporated stormwater requirements of the MWMO and RCWD. For projects located within the RCWD boundary, the more stringent rules shall apply to development. RCWD shall be consulted to determine any necessary permits required from the watershed district.

   The design standards were established to follow the goals and policies that define the City's stormwater management program, which are implemented via the City's Land Use Ordinance (Chapter 9 – Article I: Zoning and Land Development). Generally speaking, the watershed regulations meet the following objectives:

   a) Minimize increases in stormwater runoff rates from any development in order to reduce flooding, siltation and erosion and to maintain the integrity of stream channels,
   b) Minimize increases in nonpoint source pollution caused by stormwater runoff

from development which would otherwise degrade local water quality,
c) Minimize the total annual volume of surface water runoff that flows from any specific hydrologic regime to the maximum extent practicable,
d) Ensure that these management controls are property maintained and pose no threat to public safety, and
e) Implement stormwater management controls to help meet current and future TMDL goals, to address the need to improve water quality, and to meet objectives set forth in this plan.

The entire design standards document can be found in **Appendix C**.

The City's current Land Use Ordinance adopts by reference the Surface Water Management Design Standards document. These Design Standards will be updated in 2018 to incorporate the current MWMO standards; hence adopting the MWMO standards by reference. The updated standards will also be consistent with RCWD rules and the Implementation Table of this Plan. A schedule for this process is outlined below:

- June 2018– August 2018: Review current Design Standards and perform a gaps analysis in comparison with MWMO stormwater standards and flow chart.
- September 2018-October 2018: Update Design Standards and provide a review period that includes MWMO.
- November 2018/December 2018: Approve Design Standards
- January 1, 2019: Begin enforcement of newly adopted Design Standards.

5.3.13.3. Policy

1. The City will look for opportunities to partner with the MWMO on stormwater management. For projects where current city code is a limiting factor in proceeding with: green infrastructure + habitat projects; "One Water projects" (integrated wastewater, stormwater, water supply); multi-parcel projects; and shared public/private regional or restorative district system projects the City will review the barriers identified. The City will seek to modify the code /ordinances in a manner that allows for the project to continue while also meeting the City's needs.

5.3.14. *Water Quality System Concepts*

The only effective way to maintain high quality water bodies is to prevent sediment, nutrients, and other materials from entering the storm drainage system. Complete interception of stormwater for treatment at the point of discharge is not currently feasible, though the City encourages the implementation of techniques such as rainwater gardens, infiltration areas, and filtration swales that capture a portion of runoff at the point of generation. Application of these small-scale techniques should be on a site-specific basis.

Pollutant Control

The three main sources for degradation of water quality are:

1. Solids and associated chemicals (including calcium chloride and salt) from erosion and street sanding;
2. Organic material, such as leaves, that enter stormwater ponds; and
3. Fertilizers and other chemicals from impervious surfaces or lawn care.

Identification of the source and implementation of reasonable control measures can minimize the

degradation of Columbia Heights' waterbodies.

In areas where development is taking place, stormwater runoff frequently contains substantial quantities of solids. Most commonly, these sediments are carried by runoff into the storm sewer from large grading sites though fully developed areas also generate sediment loads particularly from winter sanding operations and in areas of structurally failing pipes. For developing areas, strict on-site erosion control practices are required to prevent sediments from entering downstream water bodies. The City conducts inspections to verify that the erosion control practices have been installed and maintained properly.

The BMPs recommended in the MPCA's Protecting Water Quality in Urban Areas should be followed for all development. The Minnesota general NPDES stormwater permit for construction activity requires a permit for construction activities that disturb one or more acres.

When disturbing 10 or more acres, developers are required to provide temporary sedimentation basins to treat the runoff from their grading sites. These basins are intended to prevent the introduction of sediment and its associated pollution into the storm sewer system and are required to function, in their various forms, until grading has ceased and adequate cover has been established. At a minimum, they should meet the requirements set forth in the NPDES general permit for construction activities.

5.4. County, State and Federal Agency Requirements

This section presents a synopsis of the current agency requirements while acknowledging the existence of other requirements that may be applicable. The City is committed to the preservation and enhancement of its wetlands and water resources through full compliance with local, state, and federal wetland regulations.

5.4.1. *Minnesota Department of Natural Resources*

At the state level, Types 3, 4, and 5 wetlands are protected by statute. These are areas typically recognized as wetlands and are generally characterized by open water and emergent vegetation throughout most of the year. The state has jurisdiction over only those wetlands appearing on the state's inventory of protected waters. Further, wetlands in the inventory were generally those in excess of 10 acres in rural areas or in excess of 2.5 acres in municipalities and incorporated areas. Figure 7 shows the DNR protected waters within the Columbia Heights study area.

If an area meets the jurisdictional criteria but is not on the state's inventory, it is not regulated by the DNR. If it does not meet the statutory criteria but is listed on the inventory, it still is subject to DNR regulation. There is no mechanism presently for adding wetlands to or deleting wetlands from the inventory. The inventory was begun in the late 1970s and all state inventories were completed during the early 1980s. The DNR rules specify that permits may not be issued for any project except those that provide for public health, safety, and welfare. Any private development projects are effectively excluded from permit consideration by this requirement.

The other powers and duties of this Minnesota state agency and its commissioner are wide-ranging. As they affect surface water management within the City they include:

- Regulation of all public waters inventory waterbodies within the City – to the extent of their ordinary high water level
- Regulation of certified floodplains around rivers, creeks, lakes, and wetlands
- Management of the Flood Hazard Mitigation program
- Shoreland Management

5.4.2. *U.S. Army Corps of Engineers (USACE)*

The Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) regulate the placement of fill into all wetlands of the U.S. In 1993, there was a modification of the definition of "discharge of dredged material" to include incidental discharges associated with excavation. This modification of the "discharge of dredged material" definition meant that any excavation done within a wetland required the applicant to go through Section 404 permitting procedures. In 1998, however, this decision was modified so that excavation in wetlands is now regulated by the USACE only when it is associated with a fill action.

5.4.3. *Board of Water and Soil Resources (BWSR)*

The local and regional wetland rules are governed by the Wetland Conservation Act (WCA). The WCA, passed in 1991, extends protection to all wetlands unless they fall under one of the exemptions of the WCA. The WCA follows a "no net loss" policy. The wetlands covered under the WCA must not be drained or filled, wholly or partially, unless replaced by restoring or creating wetland of at least equal public value under an approved replacement plan. Replacement ratio is typically 2:1 (two acres created for every one acre filled) for wetland impacts.

A designated LGU is responsible for making exemption and no-loss determinations and approving replacement plans. Currently, Columbia Heights acts as the LGU for WCA within the City's subdivision authority for those areas within the MWMO boundary. RCWD is the LGU for WCA for wetlands within the RCWD boundary.

The powers and duties of this Minnesota state agency also include:

- Coordination of water and soil resources planning among counties, watersheds, and local units of government.
- Facilitation of communication among state agencies in cooperation with the Environmental Quality Board.
- Approval of watershed management plans.

5.4.4. *Minnesota Pollution Control Agency (MPCA)*

The MPCA implements provisions of Section 404 of the Clean Water Act with guidance from the EPA through a permitting process. The Section 404 permit also requires a Section 401 water quality certification before it is valid. The EPA has given Section 401 certification authority to the MPCA.

The powers and duties of this Minnesota state agency and its commissioner include:

- Fulfilling mandates from the EPA, particularly in regard to the Clean Water Act.
- Administration of Columbia Heights' NPDES Phase II MS4 permit.
- Administration of the NPDES construction site permit program.
- Administration of the NPDES industrial site discharge permit program.
- Development of TMDLs for waterbodies and watercourses in Minnesota (often in conjunction with other agencies or joint powers organizations such as watersheds).

5.4.5. *Environmental Protection Agency*

As it relates to surface water management within Columbia Heights, this agency is charged with interpreting and applying aspects of the Clean Water Act. This has led to the City's need for its NPDES MS4 permit. Total maximum daily load limits, a new initiative mandated by the EPA, also stem from the EPA's role as steward of the Clean Water Act.

5.4.6. *Mississippi Watershed Management Organization and Rice Creek Watershed District*

The powers and duties of these Minnesota statutory authorities include:

- Approval authority over local water management plans.
- Ability to develop rules regarding management of the surface water system.
- Ability to determine a budget and raise revenue for the purpose of covering administrative and capital improvement costs.
- Regulation of land use and development when one or more of the following apply:
    - The City does not have an approved local plan in place.
    - The City is in violation of their approved local plan.
    - The City authorizes the watershed toward such regulation.
- Other powers and duties as given in statute and joint powers agreements.

5.4.7. *State and Federal Jurisdictional Boundaries for Public Wetlands and Waters*

Wetlands are delineated in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987). Wetlands must have a predominance of hydric soils. Hydric soils, by definition, are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of hydrophytic (water tolerant) vegetation typically adapted for life in saturated soil conditions. The USACE and BWSR regulate wetlands as defined by a jurisdictional delineation

5.4.8. *Anoka County*

Anoka County SWCD sits on the Technical Evaluation Panel for administration of the Wetland Conservation Act. Anoka County SWCD also conducts NPDES erosion control inspection for construction sites that have obtained the NPDES Construction Permit for Construction Activities. This inspection program is a pilot project funded by the MPCA.

5.4.9. *Metropolitan Council*

Metropolitan Council, through Metropolitan Council Environmental Services, serves as a review agency for local surface water management plans. They also review and approve municipal comprehensive plans.

6. IMPLEMENTATION PROGRAM

6.1. General

The Implementation Plan section of the Columbia Heights Surface Water Management Plan (SWMP) describes those activities and programs the City will develop toward improving its surface water management program. Since Columbia Heights is largely developed, capital outlay for the trunk sewer system has already occurred so future outlay will be for upgrades and replacement, as well as water quality retrofits as part of redevelopment. Typically, costs for upgrade and replacement would be borne by either the stormwater utility fund or would be recovered through bonds or direct assessment. Given this, a typical financing mechanism developed in most SWMPs, an area charge, is not a part of the Columbia Heights SWMP. The City will partner with MWMO and RCWD on stormwater planning and funding for public and private redevelopment to provide additional stormwater treatment, habitat connections, and alleviate any known flooding areas.

Table 6.1 contains a comprehensive list of the MS4 activities and projects, programs, and studies that make up the City of Columbia Heights implementation program for the next 10 years (2017 through 2026). The program was developed by evaluating the requirements in the MS4 permit (see MS4 SWPPP Application for Reauthorization in **Appendix B**), reviewing existing information (**Section 2**), identifying potential and existing problems (**Section 4**), reviewing goals and policies (**Section 5**), and then assessing the need for programs, studies, maintenance, or projects. Costs were estimated, possible funding sources were identified, and a schedule was developed to complete the implementation activities. It is anticipated these tables will be updated/revised on an annual basis.

Section 6 also includes:

- An overview of the City's NPDES permit
- A discussion of operation and maintenance procedures and strategies
- An outline of an education program
- Financial considerations for the stormwater utility
- A section referencing applicable design standards for stormwater management
- A section on Watershed implementation priorities
- Implementation priorities for the City

6.2. Implementation Priorities

The implementation components listed in **Table 6.1** were prioritized to make the best use of available local funding, meet MS4 Permit requirements, address existing stormwater management problems, and prevent future stormwater management problems from occurring. **Table 6.1** identifies which activities are MS4 Permit Requirements, Annual Requirements, or Capital Projects/Programs/Studies. Projects from the City's Capital Improvement Plan (CIP) are listed and noted in **Table 6.1**. **Figure 14, Appendix A**, shows the locations of these CIP projects. The City's implementation plan reflects its responsibility to protect the public health, safety, and general welfare of its citizens by addressing problems and issues that are specific to the City of Columbia Heights. The City will look for opportunities to increase green space, habitat potential and options for stormwater reuse; and when needed will modify ordinances or best management practices to provide more flexibility in locating District or Regional stormwater treatment for multiple parcels.

Table 6.1 lists the implementation priorities for the City of Columbia Heights. Some of these projects involve additional project partners, as noted in the table.

6.3. Operation and Maintenance

6.3.1. Activities

The stormwater system is a major investment for the City of Columbia Heights – both in terms of initial capital cost and ongoing maintenance costs. The City's primary challenge is to fund ongoing maintenance and periodic upgrades, rehabilitation, and reconstruction. As the system ages, reconstruction will take increasingly more of the stormwater budget. Typically, system maintenance is funded by the city's stormwater utility. The City funds retrofits, upgrades, and reconstruction through a number of mechanisms including the stormwater utility, grants, public/private partnerships, watershed participation, assessments, and the general fund.

The City repairs and maintains all City owned stormwater infrastructure. The City's stormwater system maintenance responsibilities include the following:

- Street sweeping
- Cleaning of sump manholes and catch basins
- Repair of catch basins and manholes
- Assessing pipe condition (typically by televising)
- Inspection of storm sewer inlet and outlet structures
- Pond mowing and other vegetation maintenance
- Excavation of accumulated sediments from ponds

The City has maintained its pipe system for decades and staff has a strong grasp on the costs associated with this. As new development and redevelopment bring ponds and other BMPs into the system, city staff will find that maintenance becomes an increasingly large portion of both staff time and the overall maintenance budget. It is important to quantify the extent of this future commitment so that the funds necessary for pond maintenance activities can be collected via the city's storm water utility. The City's SWPPP found in Appendix B provides additional clarification regarding MS4 requirements for operation and maintenance of City owned stormwater infrastructure.

6.3.2. Stormwater Basins

Stormwater basins represent a sizable investment in the City's drainage system. General maintenance of these facilities helps ensure proper performance and reduces the need for major repairs. Periodic inspections are performed to identify possible problems in and around the basin. Inspection and maintenance cover the following:

- Basin outlets
- Basin inlets
- Side slopes
- Illicit dumping and discharges
- Sediment buildup

6.3.3. Sump Manholes and Sump Catch Basins

Sump manholes and sump catch basins are included in storm sewer systems to collect sediments before they are transported to downstream waterbodies. These structures keep sediments from degrading downstream waterbodies. Once sediments are transported to a lake or pond, they become much more expensive to remove.

Sediments originate primarily from road sanding operations, although construction activity and erosion can also contribute. Since these structures are designed to collect these sediments, they are routinely cleaned to provide capacity for future sedimentation. Suction vacuum equipment is typically used.

6.3.4. Storm Sewer Inlet Structures

To fully utilize storm sewer capacity, inlet structures are kept operational in order to get runoff into the system. All efforts are made to keep catch basins and inlet flared ends free of debris and sediments so as not to restrict inflow and cause flood damage. Leaf and lawn litter are the most frequent cause of inlet obstructions. On a routine basis, City staff visually inspects inlet structures to ensure they are operational.

6.3.5. Open Channels and Ravines

Overland flow routes constitute an important part of the surface water drainage system. Open channels are typically vegetated and occasionally lined with more substantial materials. The lined channels typically require little or no maintenance. Vegetated channels are periodically inspected and maintained, as high flows can create erosion within the channel.

Eroded channels can contribute to water quality problems in downstream waterbodies as the soil is continually swept away. If not maintained, the erosion of open channels would accelerate and the repair would become increasingly more costly. The erosions of channels are accelerated when these are at steep gradients and are used for conveying urban stormwater.

6.3.6. Piping System

The storm sewer piping system constitutes a multimillion-dollar investment for the City. The City performs a comprehensive maintenance program as part of their annual Street Rehab Program to maximize the life of the facilities and optimize capital expenditures. The following periodic inspection and maintenance procedures are followed:

- Catch basin and manhole castings are inspected and are cleaned and replaced as necessary.
- Catch basin and manhole rings are inspected and are replaced and/or regrouted as necessary.
- Catch basin and manhole structures are inspected and are repaired or replaced as needed. Pipe inverts, benches, steps (verifying integrity for safety), and walls are checked. Cracked, deteriorated, and spalled areas are grouted, patched, or replaced.
- Storm sewer piping is inspected either manually or by television to assess pipe condition. Items looked for include root damage, deteriorated joints, leaky joints, excessive spalling, and sediment buildup. The piping system is programmed for cleaning, repair, or replacement as needed to ensure the integrity of the system.

6.3.7. De-Icing Practices

Minnesota receives approximately 54 inches of snow during a typical year. This requires a large amount of de-icing chemicals (primarily salt) to be applied to roads and sidewalks each winter.

Estimates indicate that 80 percent of the environmental damage caused from de-icing chemicals is a result of inadequate storage of the material (MPCA 1989). Improper storage as well as overuse of salt increases the risk of high chloride concentrations in runoff and groundwater. High chloride concentrations can be toxic to fish, wildlife, and vegetation.

The following procedures are used for storing de-icing chemicals in the City:

1. De-icing material and sand is stored in waterproof sheds. When and where this is not possible, stockpiles are covered with polyethylene and placed on impervious surfaces. No salty runoff water shall leave salt sheds
2. Road de-icing stockpiles are not located near municipal well areas or in other sensitive groundwater areas.

The City shall encourage businesses within the City to apply the MPCA's Twin Cities Metropolitan Area Chloride Management Plan, particularly the following procedures:

- Promote businesses using the Winter Maintenance Assessment tool (WMAt), a web-based tool maintained by the MPCA that helps identify opportunities to reduce salt use and save money
- Encourage businesses to use contracts that do not bill by the weight of salt used in order to reduce over-use.
- Re-use winter truck wash water for brine making, and reduce the amount of salt on a truck prior to entering the wash
- Create a chart of items to investigate that may reduce salt use/waste.

6.3.8. Street Sweeping

Street sweeping is an integral part of the City's effective surface water management system. It greatly reduces the volume of sediments that have to be cleaned out of sump structures and downstream waterbodies. The City has a "street sweeping policy" that includes at least two sweeping operation per year. Spring sweeping begins either late March or early April after the risk of later snowfall has passed and targets sand left from winter sanding operations. Occasional fall sweeping occurs after leaf fall.

Columbia Heights does not allow residents to rake leaves into the street for municipal pick up. Anoka County and the City encourage residents toward composting their yard waste. If residents desire to have yard waste removed by their private hauler then compostable bags or reusable containers are required. Alternately, there are composting sites within Anoka County where yard waste can be brought for a fee. Overall the City's approach to minimizing organic matter entering its stormwater system greatly reduces the incidence of inlet blockages and protects the water quality of downstream waterbodies.

The objective of the City's street sweeping and de-icing programs is to minimize impacts from leaf litter, sand, salt and other debris on the surface waters of the City.

6.4. Education and Outreach

6.4.1. General

Education can play an important role in any effort to implement a stormwater management program like the one outlined in this SWMP. The objectives of an education effort are different, depending on the target audience. In general, the target audience for this education program is City staff, City residents, and the development community. The following sections describe why education of each of these groups is important and presents educational methods that may be used for each audience.

One of the more important aspects of education and outreach is close coordination with watershed organizations so that redundant efforts are avoided. The City will work to raise the profile of its watershed organizations by including articles on watershed activities in its informational materials. One simple step toward stronger city/watershed partnership is providing a

link to each watersheds website on the city website.

6.4.2. City Staff

City Staff have a wide range of responsibilities for implementing this plan. These include:

- Implementing street sweeping and spill response programs.
- Maintaining detention basin/stormwater management pond performance and system operability.
- Planning for and management of projects to enhance pollutant removal performance, wetland quality, etc.
- Carrying out grounds maintenance of City-owned lands/facilities in a way that sets a good example for residents.
- Utilizing BMPs in application of ice control material.
- Application of Best Management Practice policies and regulations to new and redevelopment projects.
- Planning and delivering education programs.
- Working out cooperative arrangements with regulatory and non-regulatory organizations to achieve SWMP objectives.
- Assisting the City Council in the application of the SWMP policies.

Because these responsibilities involve many different levels of City staff, City staff members are trained to have a basic understanding of the SWMP, including:

- A description of the major stormwater management issues (including known stormwater management problem areas, stormwater management expectations for new and re-development projects, and incorporation of stormwater mitigation into capital improvement projects, and regulatory jurisdictions).
- The objectives of the SWMP and the general approach outlined in the SWMP for resolution of these issues.
- The responsibilities of the different work units in implementing the SWMP.
- The information the SWMP provides.
- Identification of in-house experts.

This information is disseminated in presentations at staff meetings, coverage in internal newsletters, and issuance of internal memos.

As part of its NPDES permit, the City has also made a commitment to continuing education for staff in stormwater management. This will take the form of attendance at conferences and workshops.

6.5. Financing and the Stormwater Utility

The City will use funds generated from its Stormwater Utility as the primary funding mechanism for its implementation program including; maintenance, repairs, capital projects, studies, etc. If funds from this utility fee do not cover necessary costs, the City will consider adjusting the Stormwater Utility Fee to cover the costs associated with the implementation program. The City will continue to review the stormwater utility fee annually and adjust based on the stormwater related needs of the City and other available funding mechanisms. The City will also take advantage of grant or loan programs to offset project costs where appropriate and cost-effective. The City will look to partner with the MWMO, RCWD, and ACD on cost-sharing for projects within the respective boundaries. Partnership roles will be defined on a project by project basis.

Columbia Heights is a regulated MS4 under the Phase II NPDES Permit. There is a cost associated with preparing an NPDES permit and the associated Storm Water Pollution Prevention Plan (SWPPP). The NPDES permit and SWPPP commit the city to certain activities, including capital projects, for the purpose of improving the quality of the City's stormwater discharge.

6.6. Plan Revision and Amendments

The City may need to revise this Plan to keep it current. The City will review current ordinances and related policies with MS4 permit updates to ensure consistency. The City will also review the implementation of these policies to ensure the intent is being met. Any significant amendments that are made to the plan must be submitted to the MWMO, RCWD, and Met Council for review and approval before adoption by the City. The City anticipates updating the Implementation Plan annually. These changes will be submitted to the Watersheds for their record but not for review and approval. The City may amend this plan at any time in response to a petition by a resident or business. Written petitions for plan amendments must be submitted to the City Manager. The petition must state the reason for the requested amendment, and provide supporting information for the City to consider the request.

The City may reject the petition, delay action on the petition until the next full plan revision, or accept the petition as an urgent issue that requires immediate amendment of the plan. The City of Columbia Heights may also revise/amend the plan in response to City-identified needs. This Plan is intended to be in effect for 10 years per state statute. The Plan will be revised/updated at that time, to the extent necessary.

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TABLE 6.1

LOCAL WATER MANAGEMENT IMPLEMENTATION PLAN

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
CIP														
1	Trunk Storm Sewer Lining: Central to Jackson - The storm sewer along 44th Avenue from Central Avenue to Quincy Street consists of a 48-inch and 54-inch RCP. These pipes were televised and there were several areas that showed joint deficiencies and structural deficiencies. The structural issues may be related to the pipe depth and the higher traffic volumes on 44th Avenue. Lining the pipes will help maintain pipe integrity and prevent further problems from occurring in the future.	$225,000	Stormwater Utility, Grants	$225,000										See City's CIP, Figure 14 ID 13-04
2	Tyler Place Storm Sewer Improvement - This project involves the existing storm sewer system on 44th Avenue east of Central Avenue to Tyler Place. The project includes replacing 48-inch storm sewer and manholes with long radius bends and partial replacement of a deteriorated 48-inch RCP and CMP pipe. The 48-inch CMP currently has 90 degree bends and missing manhole bottoms. Long radius bends will improve the hydraulic capacity of the storm sewer.	$205,000	Stormwater Utility, Grants			$205,000								See City's CIP, Figure 14 ID 14-01
3	Boat Landing Pond Reconstruction - This project involves modifying the existing regional pond located near Silver Lake. The pond receives runoff from an area tributary to 41st Avenue and to the west. Silver Lake has an approved TMDL and this project will reduce the phosphorus loading to Silver Lake, and assist in meeting the City's loading requirement. Currently the pond inlet and outlet are located near each other, which reduces the effectiveness of water quality treatment.	$275,000	Stormwater Utility, Grants, RCWD			$275,000								See City's CIP, Figure 14 ID 14-04

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
4	40th Ave from Central Ave to Labelle Pond Improvements and Reconstruction - Based on televising records, structures and piping are deficient. This project will line the existing piping and construct new storm sewer on the north side of 40th Ave to capture north drainage and redirect to Labelle Park. This project will eliminate localized flooding problems onto private property.	$275,000	Stormwater Utility, Grants				$275,000							See City's CIP, Figure 14 ID 15-01 and 15-03
5	Annual Storm Infrastructure Repair - Work will be conducted as part of the annual street reconstruction project zone areas to replace and/or repair catch basins, manholes, and other stormwater structures.	$250,000	Stormwater Utility, Grants	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	See City's CIP
6	Gauvitte Park Area Flood Control/Water Quality Improvements - This project will include surface water improvements for flood mitigation and water quality BMPS based on the completed modeling report. Flood control improvements will address larger areas prone to flooding. Water quality improvements will provide phosphorus and TSS reduction prior to the Mississippi River.	$425,000	Stormwater Utility, Grants, MWMO			$425,000								See City's CIP Figure 14 ID 18-03, 18-01 and 19-01
7	44th and Tyler Place Flood Mitigation - Properties located at 4347 and 4357 Tyler Place, 981 and 1016 44th Avenue, and 980 43 ½ Avenue have experienced localized flooding during short duration, high intensity rainfall events. Proposal would be to purchase 981 44th Avenue and demolish, purchase an additional easement and construction of an overflow basin along with berming. Project would remove one property historically prone to flooding and provide additional protection to the 100 year storm event for other properties.	$325,000	Stormwater Utility, Grants					$325,000						See City's CIP, Figure 14 ID 16-03
8	Railroad Yard Pipe Replacement - Located on 39th Avenue and west of California Street and through an elevation change to the railroad yards. Work would include the replacement of a failed CMP pipe system along with retaining wall and slope restoration. To make the significant vertical transition from 39th Avenue to the railroad yard, a vertical system of piping was placed using CMP pipe. A variety of backfill was used and placed without compaction. Both the piping and backfill have failed.	$360,000	Stormwater Utility, Grants							$360,000				See City's CIP, Figure 14 ID 20-01
9	Stinson Boulevard Water Quality - Construction of a large bio-infiltration basin along Stinson Boulevard will treat runoff prior to discharging into Silver Lake. This project was identified in the Silver Lake TMDL Implementation Plan. The City will look to partner with RCWD and ACD to help fund the project.	$60,000	Stormwater Utility, RCWD, ACD, Grants	$60,000										Silver Lake TMDL Implementation Plan

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
10	Hydrodynamic Device - Intersection of 39th Ave and Johnson St NE - Hydrodynamic device could be installed to accept runoff from the drainage area north of 39 th Ave. NE. A device at this intersection provides benefit due to the convergence of multiple storm sewer lines at a single location.	$56,000	Stormwater Utility, Grants, MWMO, ACD										$56,000	Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 1-A
11	Curb Cut Raingardens - Curb-cut rain gardens could be installed on private property in various locations to maximize contributing drainage area and ensure close proximity to an existing catch basin if an underdrain would be required. Homeowner participation would be the driving factor for this project, with assistance from MWMO, ACD and the City.	$3,000	Stormwater Utility, Grants, Homeowner Assistance, MWMO, ACD			$1,000			$1,000				$1,000	Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD
12	Disconnect Filtration Basin - N of 37th Ave NE - The proposed filtration basin is located on private property behind the apartment complex adjacent to 37th Ave. NE. There is a large open space that could be converted to a filtration basin into which the existing storm sewer line could be daylighted. This project assumes a partnership could be developed with the apartment complex, so no land acquisition costs were included.	$22,000	Stormwater Utility, Grants, MWMO, ACD								$22,000			Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 2-E
13	Disconnect Filtration Basin - Huset Park - A filtration basin within Huset Park was proposed to provide treatment for the drainage area north of the site. The storm sewer line draining south along Jefferson St. NE would be directed into the basin.	$70,000	Stormwater Utility, Grants, MWMO, ACD						$70,000					Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 8-A1 and 8-A2
14	Water Reuse in Huset Park - A water reuse system has been proposed in the southwestern portion of Huset Park. Based on feasibility, a 100,000 gallon cistern was proposed. Cost share would be needed from MWMO and ACD.	$160,000	Stormwater Utility, Grants, MWMO, ACD									$80,000	$80,000	Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 8-C
15	Iron Enhanced Sand Filter at Huset Park Pond - An Iron enhanced sand filter was proposed as an improvement to the Huset Park pond treatment. The addition of the IESF will increase the reduction of dissolved phosphorus.	$70,000	Stormwater Utility, Grants, MWMO, ACD							$70,000				Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 9-A

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
SWPPP														
16	Public Education and Outreach Program - Refer to SWPPP	$5,000	Stormwater Utility / Staff Time	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	See SWPPP Application for Reauthorization (Appendix B), Section 4.8.A
17	Construction Site Stormwater Runoff Control - Refer to SWPPP	$4,000	Stormwater Utility / Staff Time	$4,000										See SWPPP Application for Reauthorization
18	Water Resource Inventory - Refer to SWPPP	$2,000	Stormwater Utility / Staff Time	$2,000										See SWPPP Application for Reauthorization
19	Annual SWPPP Assessment & Annual Reporting - Refer to SWPPP	$15,000	Stormwater Utility / Staff Time	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	See SWPPP Application for Reauthorization
20	Annual Public Meeting/Event - Refer to SWPPP	$10,000	Stormwater Utility / Staff Time	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	See SWPPP Application for Reauthorization
21	Online Availability of the Stormwater Pollution Prevent Plan (SWPPP) Program Document - Refer to SWPPP	$5,000	Stormwater Utility / Staff Time	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	See SWPPP Application for Reauthorization
22	IDDE Public Education and Outreach - Refer to SWPPP	$5,000	Stormwater Utility / Staff Time	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	See SWPPP Application for Reauthorization
23	Construction Site - Stormwater Runoff Control Program - Refer to SWPPP	$5,000	Stormwater Utility / Staff Time	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	See SWPPP Application for Reauthorization
24	Post Construction Stormwater Management Program Evaluation/Update - Refer to SWPPP	$5,000	Stormwater Utility / Staff Time	$5,000										See SWPPP Application for Reauthorization
25	Municipal Operations Facility Inventory - Refer to SWPPP	$1,500	Stormwater Utility / Staff Time	$1,500										See SWPPP Application for Reauthorization
26	Local Controls - The City will review and revise as necessary ordinances related to stormwater, erosion control, etc. to remain consistent with regulations, including MWMO. This includes the City Surface Water Design Standards, which is adopted as official control by reference.	$3,600	Stormwater Utility / Staff Time	$2,000				$800					$800	
27	Pollution Prevention & Good Housekeeping BMP's - Refer to SWPPP	$15,000	Stormwater Utility / Staff Time	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	See SWPPP Application for Reauthorization

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Routine Maintenance														
28	Pond Inspection and Maintenance - Prioritize inspection and maintenance of BMPs throughout the City to help manage vegetation, sedimentation, and other degradation issues.	$37,000	Stormwater Utility	$10,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	See SWPPP Application for Reauthorization
29	Street Sweeping - Continue to conduct street sweeping operations of all public streets two times annually and as necessary. Refer to SWPPP.	$1,000,000	Stormwater Utility	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	See SWPPP Application for Reauthorization
30	Labelle Maintenance - The Weir south at Labelle Pond is in need of continual maintenance. The City will conduct the flood protection maintenance necessary and add it to its maintenance plan.	$5,000	Stormwater Utility / Private Land Owner	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	
31	Grit Chamber Maintenance - Annual maintenance is needed to clean the underground grit chambers throughout the City.	$100,000	Stormwater Utility	$15,000	$5,000	$15,000	$5,000	$15,000	$5,000	$15,000	$5,000	$15,000	$5,000	
32	Outfall Cleaning - The City will include outfalls in its routine maintenance program and continue to clean on a regular basis and evaluate alternative design.	$5,000	Stormwater Utility	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1] 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Comments
Monitor and Study														
33	Storm Sewer Monitoring - The City will continue to televise storm sewer in conjunction with reconstruction projects and develop/implement a storm sewer routine inspection program which will notify city employees when storm sewers need cleaning, maintenance and replacement.	$100,000	Stormwater Utility, Grants	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	
34	49th and Central Flood Mitigation Study - The low area along Central Ave (TH 65) and south of 49th Ave is subject to flooding. The project would involve creating a stormwater model to reflect existing conditions and evaluate potential solutions. The study would model a shared storm sewer system with the City, MnDOT and the County and would identify alternatives to address flooding on the trunk highway.	$25,000	Stormwater Utility, Grants, MnDOT, Anoka County	$25,000										See City's CIP, Figure 14 ID 17-03
35	University-TH 47 Flood Study - Area on TH 47(MnDOT ROW) floods during high intensity rainfall events requiring road to be temporarily closed. Analysis would identify potential solutions to localized flooding along with opportunity for water quality improvements.	$25,000	Stormwater Utility, Grants, MnDOT				$25,000							See City's CIP, Figure 14 ID 16-01
36	Westside Flood Mitigation Study - The area between Main Street and University Ave from 44th to 45th Avenue is prone to flooding. Drainage area includes the additional cities of Fridley and Hilltop, along with MnDOT and Anoka County. Model would analyze existing conditions and identify potential solutions for localized flooding. The potential for water quality improvements will also identified.	$35,000	Stormwater Utility, Grants, MnDOT, Anoka County	$35,000										See City's CIP, Figure 14 ID 17-04
37	Gauvitte Park Area Flood Control/Water Quality Study - Conduct a stormwater model and a preliminary site layout, including storm piping layout, to evaluate the potential for integrating surface water improvements within a park setting. The model would analyze improvements to address flood control and most cost-effective BMP for water quality improvements.	$25,000	Stormwater Utility, Grants, MWMO		$25,000									See City's CIP, Figure 14 ID 18-01 and 19-01
38	37th Street Storm Sewer Feasibility Study - Several areas along 37th Avenue experience frequent flooding. This includes the following areas: 37th and Madison Place, 37th Avenue between Reservoir Boulevard and Tyler Street NE, 37th Avenue and NE Pierce Street and 37th Avenue and Johnson Street NE, 37th and Hart Boulevard, 37th and Huset Parkway. The City will perform a feasibility study to determine potential storm sewer improvements or volume control BMPs.	$25,000	Stormwater Utility, Grants								$25,000			

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
39	Atlas 14 Flood Study - The City will partner with MWMO to determine any structural impacts for those areas of the City not yet complete for Atlas 14 watershed models.	$20,000	Stormwater Utility, Grants, MWMO					$20,000						

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1] 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Comments
Other														
40	Fish and Weed Management -The City will work with neighboring cities and watershed to develop a fish and vegetation management plan for Silver Lake.	$20,000	Stormwater Utility / Neighboring Cities Grant Funding, RCWD				$20,000							
41	Highland Lake TMDL Projects - Once a TMDL has been completed for Highland Lake, the City will partner with MWMO to complete water quality projects to reduce annual loading.	$80,000	Stormwater Utility / Neighboring Cities Grant Funding, MWMO							$40,000		$40,000		
42	Sullivan Lake TMDL Projects - Once a TMDL has been completed for Sullivan Lake, the City will partner with MWMO to complete water quality projects to reduce annual loading.	$100,000	Stormwater Utility / Neighboring Cities Grant , MWMO								$50,000		$50,000	
	TOTAL	$4,279,100		$526,500	$175,000	$1,066,000	$470,000	$505,800	$221,000	$630,000	$247,000	$280,000	$337,800	

[1] Cost estimates are preliminary and subject to review and revision as engineer's reports are completed and more information becomes available. Table reflects 2015 costs and does not account for inflation. Costs generally include labor, equipment, materials, and all other costs necessary to complete each activity. Some of the costs outlined above may be included in other operational costs budgeted by the City.

[2] Funding for stormwater program activities projected to come from following sources - Surface Water Management Fund, Developers Agreements, Grant Funds, General Operating Fund, or Special Assessments.

[3] Staff time is not included in the cost shown.

APPENDIX A

Figures

Ramsey
Andover
Ham Lake
Columbus
Forest Lake
Anoka
Dayton
Coon Rapids
Champlin
Blaine
Lino Lakes
Centerville
Hugo
Lexington
Circle Pines
Osseo
Spring Lake Park
Maple Grove
Brooklyn Park
Mounds View
White Bear
North Oaks
Fridley
Shoreview
Brooklyn Center
Arden Hills
New Brighton
Columbia Heights
Vadnais Heights
Gem Lake
White Bear Lake
New Hope
Crystal
Robbinsdale
Plymouth
Saint Anthony
Little Canada
Roseville
Maplewood
Medicine Lake
Lauderdale
Golden Valley
Falcon Heights
Minneapolis
Wayzata
Saint Paul
Minnetonka
Saint Louis Park
Deephaven
Hopkins
Edina
West Saint Paul

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 1: Location Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary
- City/Township Boundary
- County Boundary
- Lakes
- Streams/Rivers

N

0 2 Miles

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 2: Existing Land Use Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Existing Land Use

- Unknown
- Single Family Residential
- Townhomes
- TF Residential
- Apartments
- Condominium
- Commercial
- Industrial
- Park
- Vacant
- Public/Semi-Public
- Religious Institution
- ROW

N

0 1,250 Feet

WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 3: Future Land Use Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Future Land Use

- Unknown
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Transit Oriented Development
- Commercial
- TCD
- Industrial
- Park
- Institutional
- Religious Institution
- Multi-Use District

N

0 1,250 Feet

WSB

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Figure 4: Drainage Patterns & Subwatershed Catch Area Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Infiltration Basin
- Rain Garden
- Lakes/Stormwater Ponds
- Catch Basin
- Storm Sewer
- Flow Direction
- Subwatershed Catch Areas
- Parks
- Columbia Heights Boundary

N

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WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 5: Watershed Districts/ Watershed Management Organizations

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Watershed Boundary

Mississippi Watershed Management Organization (MWMO)

Rice Creek Watershed District (RCWD)

N

0 1,250 Feet

WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 6: Hydrologic Soils Group Map

Columbia Heights Surface Water Management Plan
Columbia Heights, MN

Columbia Heights Boundary

Soil Hydric Group

- A
- A/D
- B
- B/D

** Areas that are not shaded indicate urban soils with an unknown hydrologic grouping.

N

0 1,250 Feet

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 7: Wetland Inventory Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

MnDNR National Wetland Inventory

Source: National Wetland Inventory for Minnesota developed by the Minnesota Department of Natural Resources https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html

N

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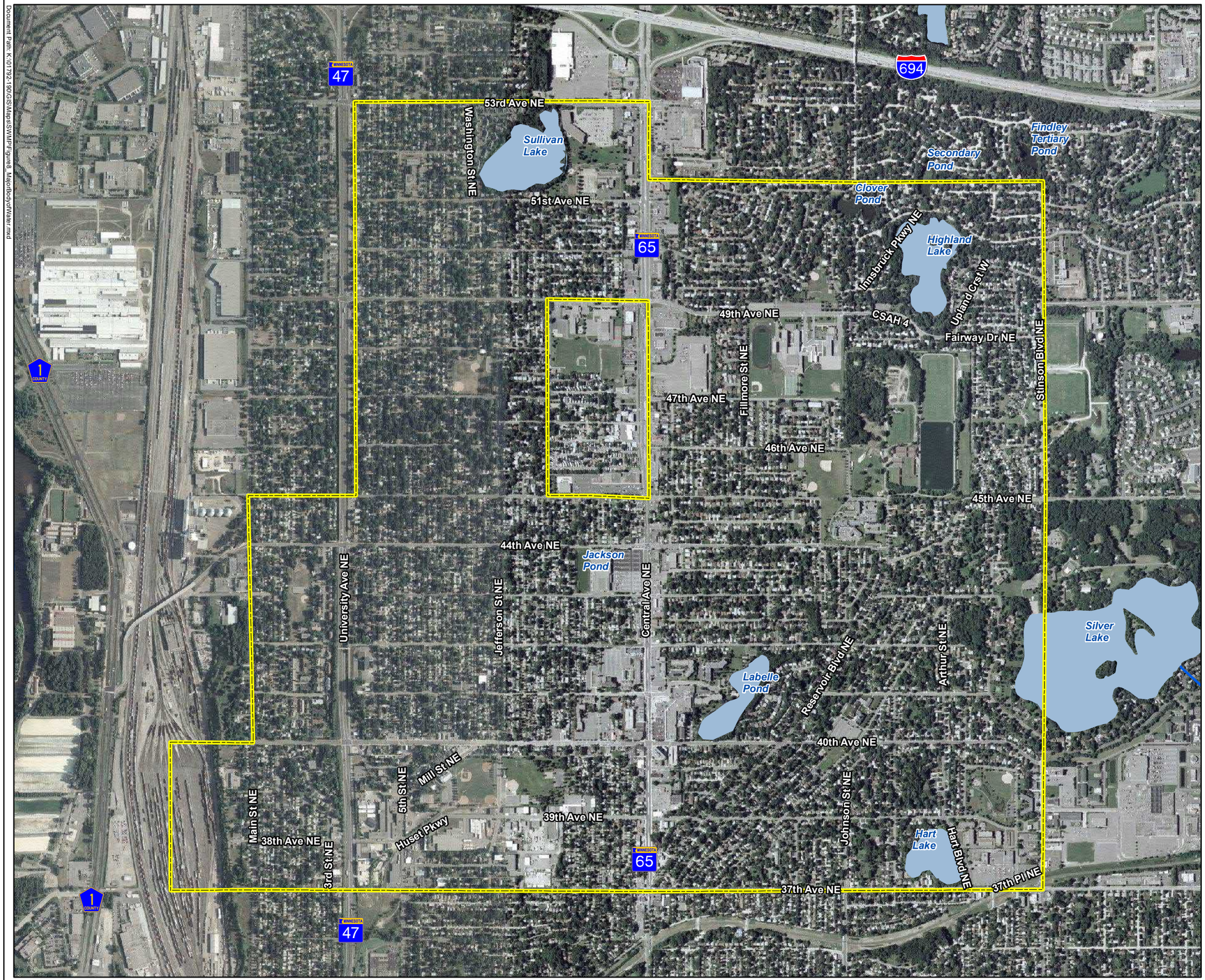

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 8: Major Bodies of Water

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary
- Lakes
- Streams/Rivers

N

0 1,250 Feet

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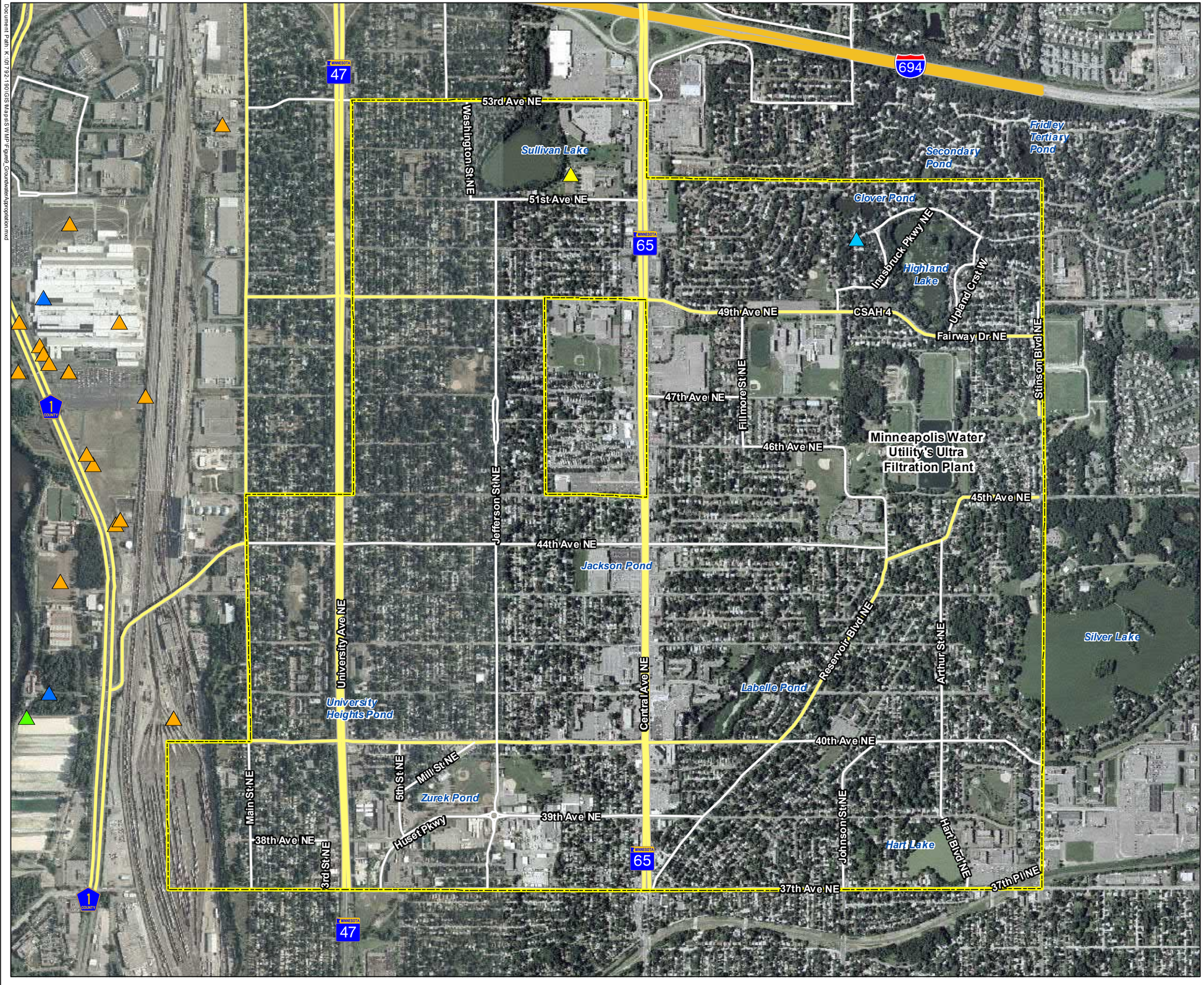

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 9: Groundwater Appropriation Locations Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary

Appropriation Locations

Category

- Non-Crop Irrigation
- Special Categories
- Temporary
- Water Level Maintenance
- Waterworks

Source: Minnesota Water Use Data by the Minnesota Department of Natural Resources

N

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WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 10: 2018 Impaired Waters

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- 2016 Impaired Streams
- 2016 Impaired Lakes
- Columbia Heights Boundary
- Lakes
- Streams/Rivers

N

0 1,250 Feet

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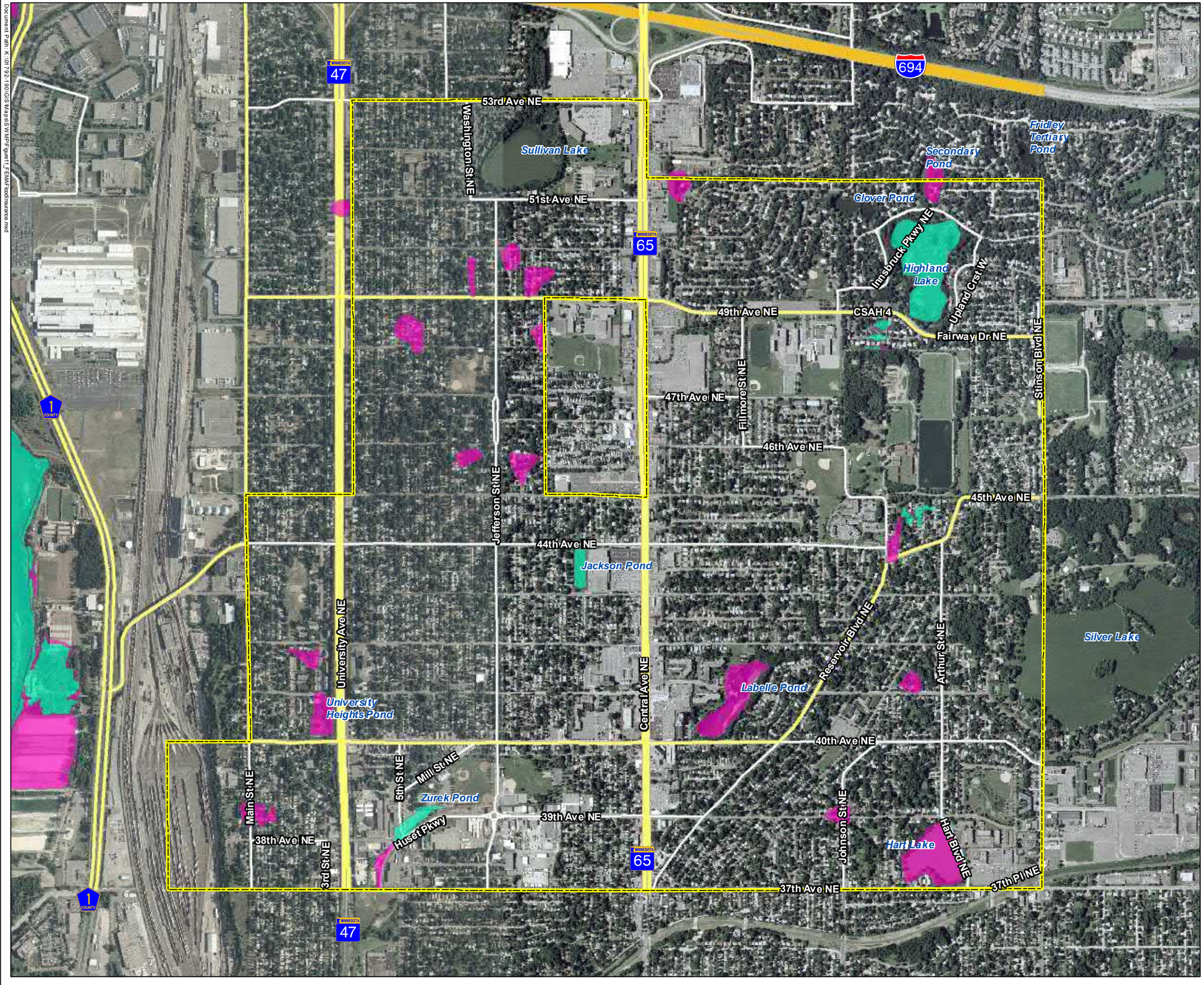
COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 11: FEMA Floodplain Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN



- Columbia Heights Boundary
- Floodplain
  - 100 Year Floodplain
  - 500 Year Floodplain

Source: Anoka County FEMA Flood Zone Map
Released: December 2015

N

0 1,250 Feet

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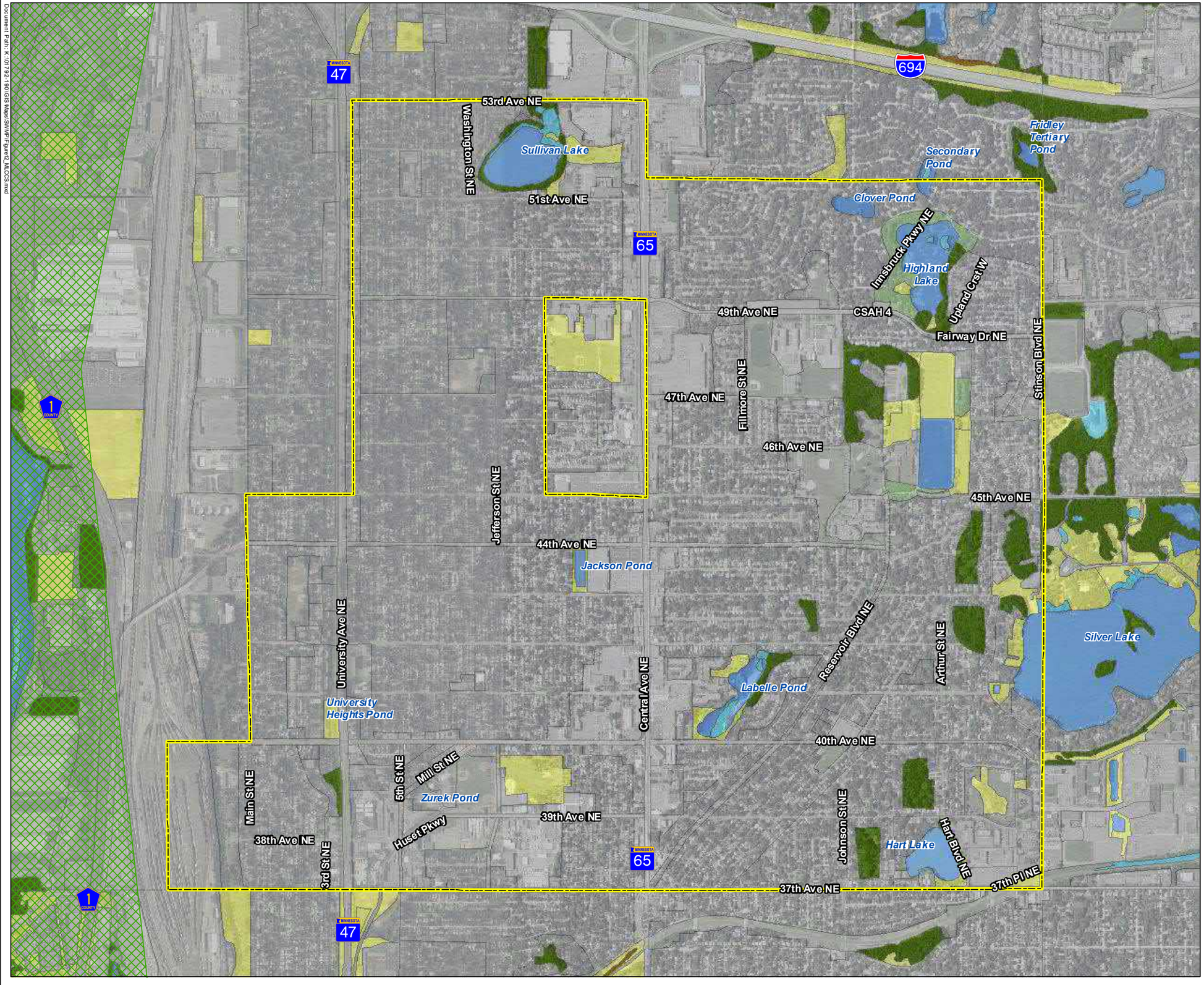

Figure 12: MLCCS Coverage Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Conservation Corridors
- **Columbia Heights Boundary**

MLCCS Type

- Developed Area
- Planted/Cultivated
- Forest
- Herbaceous
- Shrubland
- Wetlands
- Water

N

0 1,250 Feet

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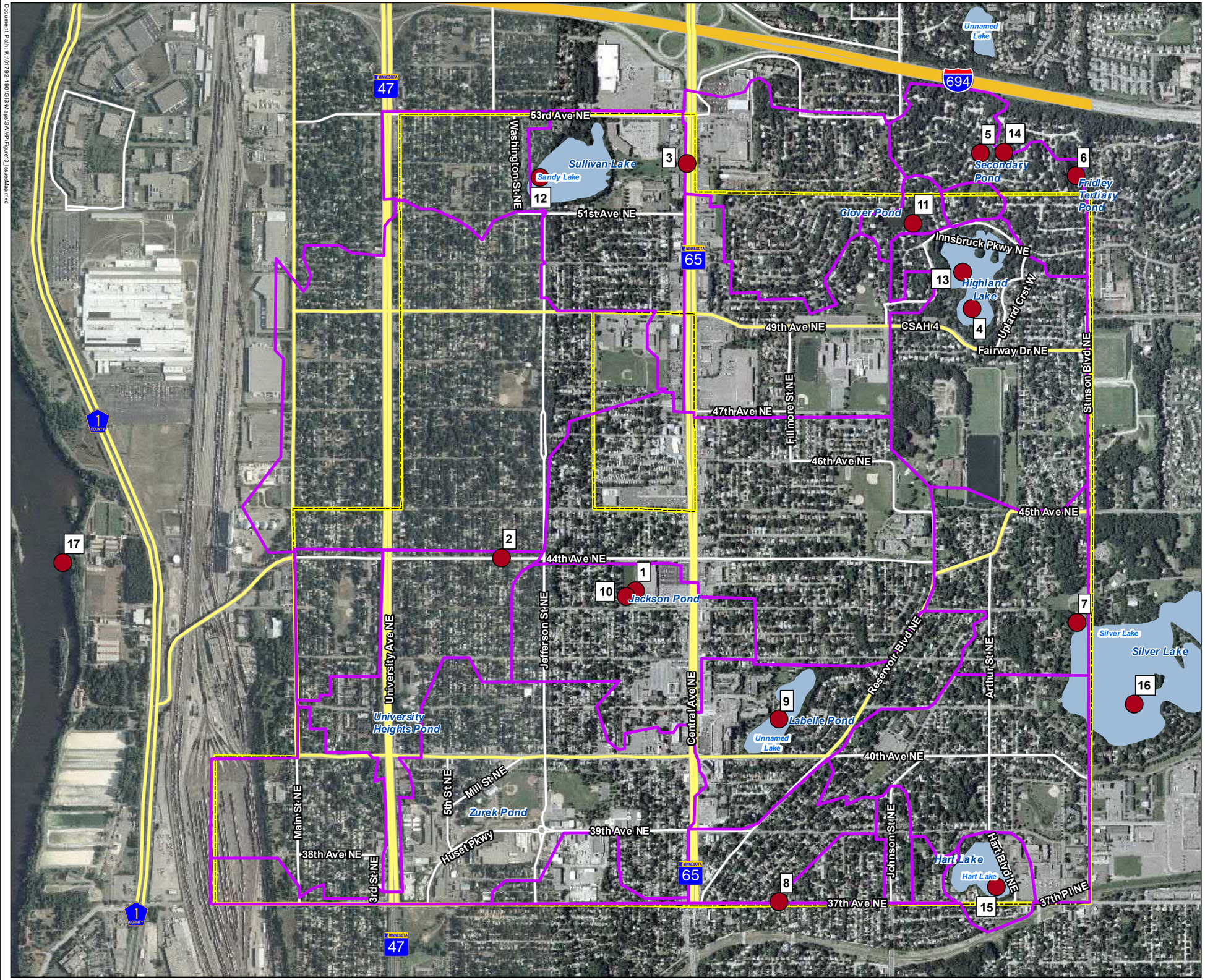

Figure 13: Issues Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Id	Description
1	Localized flooding in Jackson Pond
2	Surcharging in 44th Ave storm pipes
3	Lack of pipe capacity at Central Ave outlet
4	Highland Lake Atlas 14 flooding
5	Secondary Pond flooding
6	Tertiary Pond Atlas 14 flooding
7	Silver Lake outlet limited capacity
8	Localized flooding in storm sewer along 37th
9	Labelle Pond frequent algae blooms
10	Jackson Pond low aesthetic & wildlife value
11	Clover Pond poor water quality
12	Sullivan Lake impairment for phosphorus
13	Highland Lake impairment for phosphorus
14	Secondary Pond water quality concerns
15	Hart Lake poor water quality
16	Silver Lake impairment and TMDL requirement
17	Mississippi River TMDL requirement for E.Coli

- Issue Location
- Subwatersheds
- **Columbia Heights Boundary**
- **Lakes**

N

0 1,250 Feet

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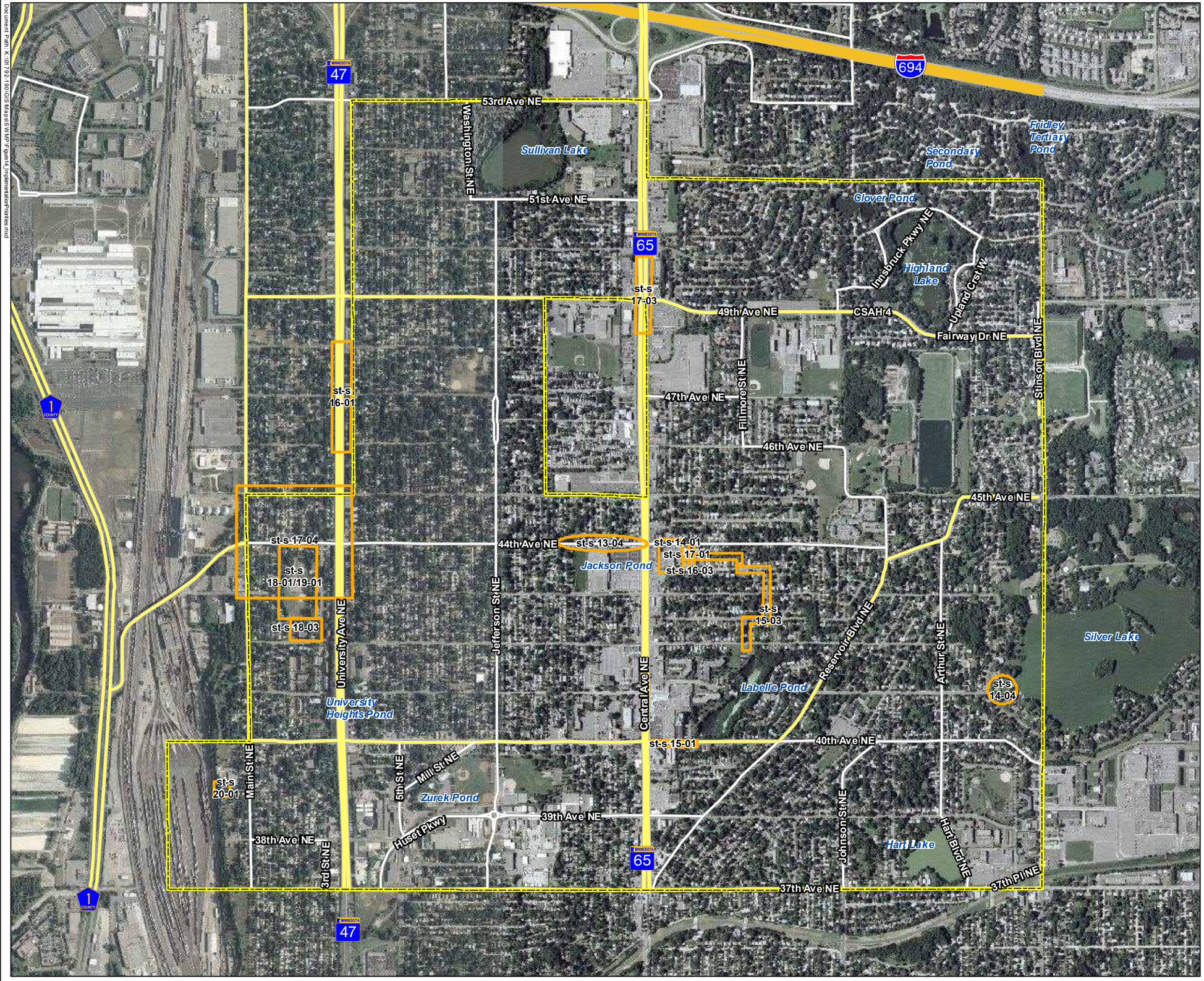

Figure 14: Implementation Priority Locations

Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

CIPs

CIP ID	Description
st-s 13-04	Trunk Storm Sewer Lining: Central to Jackson Pond to Quincy
st-s 14-01	Tyler Place Storm Sewer Improvements
st-s 14-04	Boat Landing Pond Reconstruction
st-s 15-01	40th Ave: Central to LaBelle Pond Piping Replacement
st-s 15-03	Trunk Storm Sewer Lining: LaBelle Pond Outlet to Easement
st-s 16-01	University - TH 47 Flood Mitigation/Infiltration Study
st-s 16-03	44th and Tyler Place Flood Mitigation
st-s 17-01	Trunk Storm Sewer Lining: Easement
st-s 17-03	49th and Central Flood Mitigation Study
st-s 17-04	Westside Flood Mitigation Study
st-s 18-03	Gauvitte Park Area: Property Acquisition
st-s 18-01/19-01	Gauvitte Park Area Flood Control/Water Quality Study
st-s 20-01	Railroad Yard Pipe Replacement

N

0 1,250 Feet

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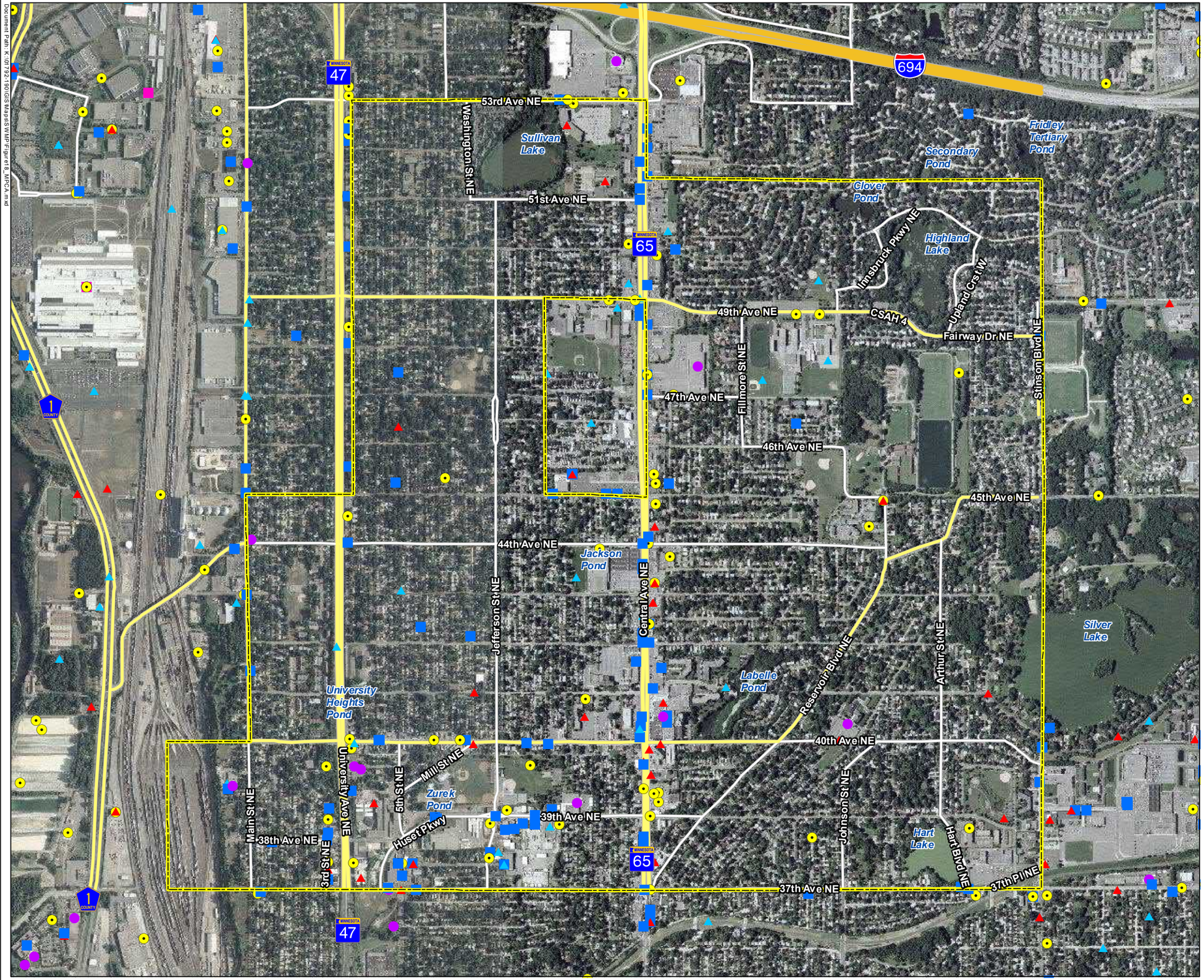
COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 15:
MPCA
Pollutant Sources

Columbia Heights Surface Water Management Plan
Columbia Heights, MN



- Columbia Heights Boundary

MPCA

- Air
- Investigation and Cleanup
- Water
- Hazardous Waste
- Tanks and Leaks
- Multiple Activities

Source: Data is from the MPCA's What's in My Neighborhood information. This data set includes environmental information related to contaminated sites, permits, licenses, and inspections, as well as potentially contaminated sites based on use.

N

0 1,250 Feet

WSB

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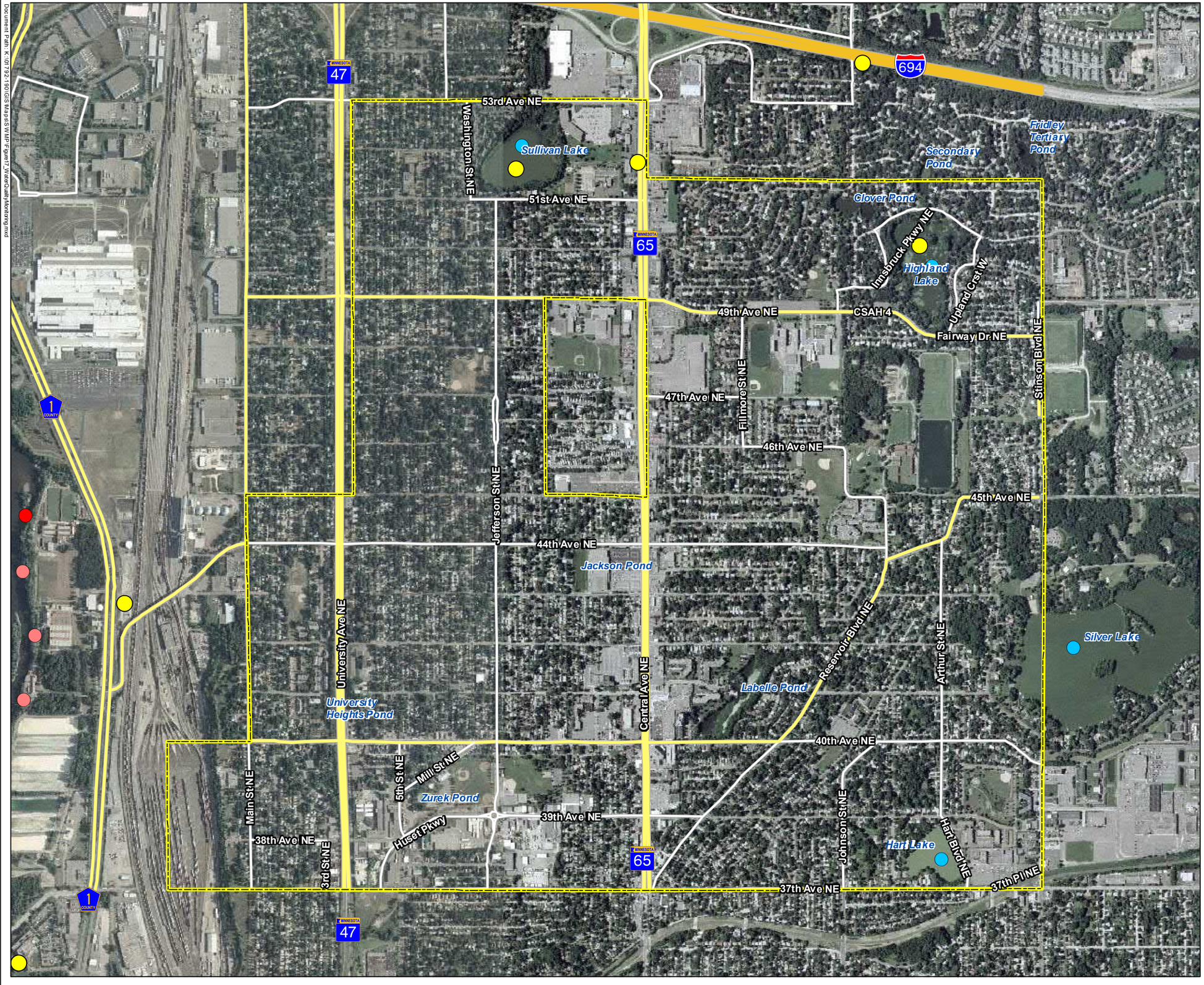

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

Figure 16: Water Quality Monitoring Map

Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary

Surface Water Monitoring Stations

Station Type, Organization

- Discharge, NPDES Permittee
- Lake, MPCA
- Stream, MPCA
- MWMO/ACD Monitoring

N

0 1,250 Feet

WSB

APPENDIX B

MS4 SWPPP Application for Reauthorization and BMP Sheets

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

MS4 SWPPP Application for Reauthorization

for the NPDES/SDS General Small Municipal Separate Storm Sewer System (MS4) Permit MNR040000 reissued with an effective date of August 1, 2013

Stormwater Pollution Prevention Program (SWPPP) Document

Doc Type: Permit Application

Instructions: This application is for authorization to discharge stormwater associated with Municipal Separate Storm Sewer Systems (MS4s) under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit Program. **No fee** is required with the submittal of this application. Please refer to "Example" for detailed instructions found on the Minnesota Pollution Control Agency (MPCA) MS4 website at http://www.pca.state.mn.us/ms4.

Submittal: This *MS4 SWPPP Application for Reauthorization* form must be submitted electronically via e-mail to the MPCA at ms4permitprogram.pca@state.mn.us from the person that is duly authorized to certify this form. All questions with an asterisk (*) are required fields. All applications will be returned if required fields are not completed.

Questions: Contact Claudia Hochstein at 651-757-2881 or claudia.hochstein@state.mn.us, Dan Miller at 651-757-2246 or daniel.miller@state.mn.us, or call toll-free at 800-657-3864.

General Contact Information (*Required fields)

MS4 Owner (with ownership or operational responsibility, or control of the MS4)

*MS4 permittee name: City of Columbia Heights *County: Anoka
(city, county, municipality, government agency or other entity)

*Mailing address: 637 - 38th Ave NE

*City: Columbia Heights *State: MN *Zip code: 55421

*Phone (including area code): (763) 706-3700 *E-mail: andrew-hogg@ci.columbia-heights.mn.us

MS4 General contact (with Stormwater Pollution Prevention Program [SWPPP] implementation responsibility)

*Last name: Hogg *First name: Andrew
(department head, MS4 coordinator, consultant, etc.)

*Title: Engineering Tech IV, Stormwater Specialist

*Mailing address: 637 - 38th Ave NE

*City: Columbia Heights *State: MN *Zip code: 55421

*Phone (including area code): (763) 706-3700 *E-mail: andrew.hogg@ci.columbia-heights.mn.us

Preparer information (complete if SWPPP application is prepared by a party other than MS4 General contact)

Last name: First name:
(department head, MS4 coordinator, consultant, etc.)

Title:

Mailing address:

City: State: Zip code:

Phone (including area code): E-mail:

Verification

1. I seek to continue discharging stormwater associated with a small MS4 after the effective date of this Permit, and shall submit this *MS4 SWPPP Application for Reauthorization* form, in accordance with the schedule in Appendix A, Table 1, with the SWPPP document completed in accordance with the Permit (Part II.D.). ☒ Yes
2. I have read and understand the NPDES/SDS MS4 General Permit and certify that we intend to comply with all requirements of the Permit. ☒ Yes

Certification (All fields are required)

☒ Yes - *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.*

I certify that based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of civil and criminal penalties.

This certification is required by Minn. Stat. §§ 7001.0070 and 7001.0540. The authorized person with overall, MS4 legal responsibility must certify the application (principal executive officer or a ranking elected official).

By typing my name in the following box, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing my application.

Name: Kevin Hansen
(This document has been electronically signed)

Title: Public Works Director/City Engineer Date (mm/dd/yyyy):

Mailing address: 637 - 38th Ave NE

City: Columbia Heights State: MN Zip code: 55421

Phone (including area code): (763) 706-3700 E-mail: kevin.hansen@ci.columbia-heights.mn.us

***Note:** The application will not be processed without certification.*

Stormwater Pollution Prevention Program Document

I. Partnerships: (Part II.D.1)

A. List the **regulated small MS4(s)** with which you have established a partnership in order to satisfy one or more requirements of this Permit. Indicate which Minimum Control Measure (MCM) requirements or other program components that each partnership helps to accomplish (List all that apply). Check the box below if you currently have no established partnerships with other regulated MS4s. If you have more than five partnerships, hit the tab key after the last line to generate a new row.

☐ No partnerships with regulated small MS4s

Name and description of partnership	MCM/Other permit requirements involved
Rice Creek Watershed District Cost-Share Grant Program	*MCM 2*

B. If you have additional information that you would like to communicate about your partnerships with other regulated small MS4(s), provide it in the space below, or include an attachment to the SWPPP Document, with the following file naming convention: *MS4NameHere_Partnerships.*

II. Description of Regulatory Mechanisms: (Part II.D.2)

Illicit discharges

A. Do you have a regulatory mechanism(s) that effectively prohibits non-stormwater discharges into your small MS4, except those non-stormwater discharges authorized under the Permit (Part III.D.3.b.)? ☒ Yes ☐ No

1. If **yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☒ Other, explain: *The City intends to draft a new ordinance within 12 months of the date permit coverage is extended to the City.*

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation:

Chapter 4. Article IV. 4.402, 4.406, Chapter 8. Article II. 8.202 and Article VII. 8.701-8.705

Direct link:

http://www.ci.columbia-heights.mn.us/index.aspx?nid=148

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_IDDEreg.*

2. If **no:**

Describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

Construction site stormwater runoff control

A. Do you have a regulatory mechanism(s) that establishes requirements for erosion and sediment controls and waste controls? ☒ Yes ☐ No

1. If **yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☐ Other, explain:

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation:

Ordinance 1547

Direct link:

http://www.ci.columbia-heights.mn.us/DocumentCenter/Home/View/298

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_CSWreg.*

B. Is your regulatory mechanism at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity (as of the effective date of the MS4 Permit)? ☐Yes ☒ No

If you answered **yes** to the above question, proceed to C.

If you answered **no** to either of the above permit requirements listed in A. or B., describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

Ordinance 1547 (4)(a) will be revised to include the new NPDES-CSW permit standards by reference. Draft ordinance revisions will be completed in 2014, for adoption and full implementation within 12 months of the date MS4 permit coverage is extended to the City.

C. Answer **yes** or **no** to indicate whether your regulatory mechanism(s) requires owners and operators of construction activity to develop site plans that incorporate the following erosion and sediment controls and waste controls as described in the Permit (Part III.D.4.a.(1)-(8)), and as listed below:

1.	Best Management Practices (BMPs) to minimize erosion.	☒ Yes ☐ No
2.	BMPs to minimize the discharge of sediment and other pollutants.	☒ Yes ☐ No
3.	BMPs for dewatering activities.	☒ Yes ☐ No
4.	Site inspections and records of rainfall events	☒ Yes ☐ No
5.	BMP maintenance	☒ Yes ☐ No
6.	Management of solid and hazardous wastes on each project site.	☒ Yes ☐ No
7.	Final stabilization upon the completion of construction activity, including the use of perennial vegetative cover on all exposed soils or other equivalent means.	☒ Yes ☐ No
8.	Criteria for the use of temporary sediment basins.	☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

Post-construction stormwater management

A. Do you have a regulatory mechanism(s) to address post-construction stormwater management activities?
☒ Yes ☐ No

1. **If yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☐ Other, explain: _____

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation: *Chapter 9.106 (Q)(4)(b) & Chapter 9.106 (I)*

Direct link:
http://www.amlegal.com/nxt/gateway.dll/Minnesota/columbiaheights_mn/chapter9landuse?f=templates$fn=

default.htm3.0vid=amlegal:columbiaheights_mn$anc=

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_PostCSWreg.*

B. Answer **yes** or **no** below to indicate whether you have a regulatory mechanism(s) in place that meets the following requirements as described in the Permit (Part III.D.5.a.):

1. **Site plan review:** Requirements that owners and/or operators of construction activity submit site plans with post-construction stormwater management BMPs to the permittee for review and approval, prior to start of construction activity. ☒ Yes ☐ No

2. **Conditions for post construction stormwater management:** Requires the use of any combination of BMPs, with highest preference given to Green Infrastructure techniques and practices (e.g., infiltration, evapotranspiration, reuse/harvesting, conservation design, urban forestry, green roofs, etc.), necessary to meet the following conditions on the site of a construction activity to the Maximum Extent Practicable (MEP):

   a. For new development projects – no net increase from pre-project conditions (on an annual average basis) of: ☐ Yes ☒ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of Total Suspended Solids (TSS).
      3) Stormwater discharges of Total Phosphorus (TP).

   b. For redevelopment projects – a net reduction from pre-project conditions (on an annual average basis) of: ☐ Yes ☒ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of TSS.
      3) Stormwater discharges of TP.

3. **Stormwater management limitations and exceptions:**

   a. Limitations

      1) Prohibit the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) when the infiltration structural stormwater BMP will receive discharges from, or be constructed in areas: ☐ Yes ☒ No

         a) Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
         b) Where vehicle fueling and maintenance occur.
         c) 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 bedrock.
         d) Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater.

      2) Restrict the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), without higher engineering review, sufficient to provide a functioning treatment system and prevent adverse impacts to groundwater, when the infiltration device will be constructed in areas: ☐ Yes ☒ No

         a) With predominately Hydrologic Soil Group D (clay) soils.
         b) Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features.
         c) Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13.
         d) Where soil infiltration rates are more than 8.3 inches per hour.

      3) For linear projects where the lack of right-of-way precludes the installation of volume control practices that meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), the permittee's regulatory mechanism(s) may allow exceptions as described in the Permit (Part III.D.5.a(3)(b)). The permittee's regulatory mechanism(s) shall ensure that a reasonable attempt be made to obtain right-of-way during the project planning process. ☐ Yes ☒ No

4. **Mitigation provisions:** The permittee's regulatory mechanism(s) shall ensure that any stormwater discharges of TSS and/or TP not addressed on the site of the original construction activity are addressed through mitigation and, at a minimum, shall ensure the following requirements are met:

   a. Mitigation project areas are selected in the following order of preference: ☐ Yes ☒ No

      1) Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
      2) Locations within the same Minnesota Department of Natural Resource (DNR) catchment area as the original construction activity.
      3) Locations in the next adjacent DNR catchment area up-stream
      4) Locations anywhere within the permittee's jurisdiction.

b. Mitigation projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP. ☒ Yes ☐ No

c. Routine maintenance of structural stormwater BMPs already required by this permit cannot be used to meet mitigation requirements of this part. ☐ Yes ☒ No

d. Mitigation projects shall be completed within 24 months after the start of the original construction activity. ☐ Yes ☒ No

e. The permittee shall determine, and document, who will be responsible for long-term maintenance on all mitigation projects of this part. ☒ Yes ☐ No

f. If the permittee receives payment from the owner and/or operator of a construction activity for mitigation purposes in lieu of the owner or operator of that construction activity meeting the conditions for post-construction stormwater management in Part III.D.5.a(2), the permittee shall apply any such payment received to a public stormwater project, and all projects must be in compliance with Part III.D.5.a(4)(a)-(e). ☐ Yes ☒ No

5. **Long-term maintenance of structural stormwater BMPs:** The permittee's regulatory mechanism(s) shall provide for the establishment of legal mechanisms between the permittee and owners or operators responsible for the long-term maintenance of structural stormwater BMPs not owned or operated by the permittee, that have been implemented to meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)). This only includes structural stormwater BMPs constructed after the effective date of this permit and that are directly connected to the permittee's MS4, and that are in the permittee's jurisdiction. The legal mechanism shall include provisions that, at a minimum:

a. Allow the permittee to conduct inspections of structural stormwater BMPs not owned or operated by the permittee, perform necessary maintenance, and assess costs for those structural stormwater BMPs when the permittee determines that the owner and/or operator of that structural stormwater BMP has not conducted maintenance. ☒ Yes ☐ No

b. Include conditions that are designed to preserve the permittee's right to ensure maintenance responsibility, for structural stormwater BMPs not owned or operated by the permittee, when those responsibilities are legally transferred to another party. ☒ Yes ☐ No

c. Include conditions that are designed to protect/preserve structural stormwater BMPs and site features that are implemented to comply with the Permit (Part III.D.5.a(2)). If site configurations or structural stormwater BMPs change, causing decreased structural stormwater BMP effectiveness, new or improved structural stormwater BMPs must be implemented to ensure the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) continue to be met. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within twelve (12) months of the date permit coverage is extended, these permit requirements are met:

Chapter 9 and/or the Water Resource Management Plan will be revised to include the new MS4 regulatory standards, consisting of definitions of prohibited and restricted use for infiltration techniques) and new mitigation provisions. The final ordinance language and/or Plan updates will be formally adopted and implemented within 12 months from the date MS4 permit coverage is extended to the City.

III. Enforcement Response Procedures (ERPs): (Part II.D.3)

A. Do you have existing ERPs that satisfy the requirements of the Permit (Part III.B.)? ☐ Yes ☒ No

1. If **yes**, attach them to this form as an electronic document, with the following file naming convention: *MS4NameHere_ERPs*.
2. If **no**, describe the tasks and corresponding schedules that will be taken to assure that, with twelve (12) months of the date permit coverage is extended, these permit requirements are met:

B. Describe your ERPs:

Public works will inspect sites/complaints, based on general inspection requirements and resident complaints. The department has a standardized form and inspection staff are kept update to date on training. In instances where violations are found, public works contacts the property owner or permit holder with either a verbal or written warning. If complainance is not met, public works forwards enforcement action on to the Fire Department in the case of ordinace violation and the community devoplement department in the case of permit violations. ERP's for Construction Site Erosion and Sediment Control are defined in Ordinance 1547 (9). Post-Construction Stormwater Management and illicit discharge ERPs are not well defined, therefore the City intends to draft ordinance language in 2014, for final adoption within 12 months from the date permit coverage is extended to the City.

IV. Storm Sewer System Map and Inventory: (Part II.D.4.)

A. Describe how you manage your storm sewer system map and inventory:

The City of Columbia Heights has an existing AutoCAD map of the the storm sewer system. The map is currently updated, and is revised as needed following new constructionprojects or modifications to the storm sewer system and the discovery or errors or incorrect information contained in the map.

B. Answer **yes** or **no** to indicate whether your storm sewer system map addresses the following requirements from the Permit (Part III.C.1.a-d), as listed below:

1. The permittee's entire small MS4 as a goal, but at a minimum, all pipes 12 inches or greater in diameter, including stormwater flow direction in those pipes. ☒ Yes ☐ No
2. Outfalls, including a unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. ☒ Yes ☐ No
3. Structural stormwater BMPs that are part of the permittee's small MS4. ☒ Yes ☐ No
4. All receiving waters. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

C. Answer **yes** or **no** to indicate whether you have completed the requirements of 2009 Minnesota Session Law, Ch. 172. Sec. 28: with the following inventories, according to the specifications of the Permit (Part III.C.2.a.-b.), including:

1. All ponds within the permittee's jurisdiction that are constructed and operated for purposes of water quality treatment, stormwater detention, and flood control, and that are used for the collection of stormwater via constructed conveyances. ☒ Yes ☐ No
2. All wetlands and lakes, within the permittee's jurisdiction, that collect stormwater via constructed conveyances. ☒ Yes ☐ No

D. Answer **yes** or **no** to indicate whether you have completed the following information for each feature inventoried.

1. A unique identification (ID) number assigned by the permittee. ☒ Yes ☐ No
2. A geographic coordinate. ☒ Yes ☐ No
3. Type of feature (e.g., pond, wetland, or lake). This may be determined by using best professional judgment. ☒ Yes ☐ No

If you have answered **yes** to all above requirements, and you have already submitted the Pond Inventory Form to the MPCA, then you do not need to resubmit the inventory form below.

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

E. Answer **yes** or **no** to indicate if you are attaching your pond, wetland and lake inventory to the MPCA on the form provided on the MPCA website at: http://www.pca.state.mn.us/ms4 , according to the specifications of Permit (Part III.C.2.b.(1)-(3)). Attach with the following file naming convention: *MS4NameHere_inventory*. ☒ Yes ☒ No

If you answered **no,** the inventory form must be submitted to the MPCA MS4 Permit Program within 12 months of the date permit coverage is extended.

V. Minimum Control Measures (MCMs) (Part II.D.5)

A. MCM1: Public education and outreach

1. The Permit requires that, within 12 months of the date permit coverage is extended, existing permittees revise their education and outreach program that focuses on illicit discharge recognition and reporting, as well as other specifically selected stormwater-related issue(s) of high priority to the permittee during this permit term. Describe your **current** educational program, including **any high-priority topics included:**

The City of Columbia Heights educational program constists of providing information to residents through direct contact, informational displays at the library, and during various city events. Information is also distrubed via newsletters and the webpage. The City of Columbia Heights has focused educational information distribuated to residents who live in areas draining to impaired waters and have also focused educational inforamition to local business.High priority topics include water quility issus in areas draining to imparired areas, trash/litter and BMP to home owner.

2. List the categories of BMPs that address your public education and outreach program, including the distribution of educational materials and a program implementation plan. Use the first table for categories of BMPs that you have

established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the U.S. Environmental Protection Agency's (EPA) *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
City Webpage	*The City will provide a minimum of three different stormwater related articles on the Public Works webpage. City staff will review the content and appropriateness of all materials on the webpage a minimum of once per calendar year of the MS4 permit cycle. New/revised articles for existing topics or high priority topics of interest will be posted periodically at the discretion of City staff.*
Printed Stormwater Articles at Library	*City staff will provide a minimum of 6 different stormwater related articles will be provided in individual brochures at the Library. City staff will annually record the number of printed media distributed, review the appropriateness of the existing articles, and provide new articles for existing topics or high priority topics of interest (at the discretion of City staff) each calendar year of the MS4 permit cycle.*
City Newsletter "Heights Happenings"	*One stormwater related article per quarter will be included in the City newsletter each calendar year of the MS4 permit cycle. Article topics will focus on MCM's 3-6 and current/upcoming stormwater related projects within the City. The "Heights Happenings" is mailed to all City residents and is available on the City website.*
Cleanwatermn.org Partner	*The City will continue to provide funding support for cleanwatermn.org each year of the MS4 permit cycle.*

BMP categories to be implemented	Measurable goals and timeframes
Webpage updates (high priority topics)	*The City's stormwater webpage will be updated with high priority topics, such as phosphorus reduction, pet waste management, and Illicit discharge recognition/reporting in 2014. Periodic webpage updates will be completed throughout each year of the MS4 permit cycle.*
Annual SWPPP Assessment & Annual Reporting	*City staff will conduct an annual SWPPP assessment in preparation of each annual report. Proposed SWPPP modifications are subject to Part II.G of the MS4 permit. City staff will submit the annual report to the MPCA prior to June 30th*

3. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

B. MCM2: Public participation and involvement

1. The Permit (Part III.D.2.a.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement a public participation/involvement program to solicit public input on the SWPPP. Describe your current program:

   The City of Columbia Heights' SWPPP is availible on the webpage and upon citizen requests. The city takes input on the SWPPP via email and phone calls.The city promotes public involvement in programs like Grant oppertunties, storm stenical program, resdiental BMPinformation and other educational information though the city newsletter, city webpage, informational handouts at the libray and upon request.

2. List the categories of BMPs that address your public participation/involvement program, including solicitation and documentation of public input on the SWPPP. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories,** hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
Volunteer Storm Drain Stenciling Program	*The City's Public Works department provides stenciling kits and staff time for volunteer groups to paint catch basins along City streets. The City will continue this program and map all stenciled structures each calendar year of the MS4 permit cycle.*
Storm Water Survey	*The City will continue to provide a storm sewer survey on the City's Stormwater webpage (Departments/Public Works). City staff will compile the results of all surveys received each year, in determining the next year's high priority topics and public education materials. This BMP will be completed once each calendar year of the MS4 permit cycle.*
BMP categories to be implemented	**Measurable goals and timeframes**
Volunteer Adopt a Park program	*The City of Columbia Heights will promote an Adopt a Park Program through the webpage, informational handouts at the library, newsletter, and through the parks program. The city will track the number of times residents volunteer, park locations and the number of bags of trash removed.*
Public Review and Comment of the SWPPP and MS4 Program	*City staff will continuously solicit public comments on the adequacy of the City's SWPPP and MS4 program, through the use of the City website. Staff will post the SWPPP, current annual report, supporting documents, and contact information for the public to provide comments. Public input received (oral and written) will be recorded in a record of decision and evaluated by the City's MS4 General Contact. City responses (if relevant) will be made in writing to each commenter.*

3. Do you have a process for receiving and documenting citizen input? ☐ Yes ☒ No

   If you answered no to the above permit requirement, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

   The City of Columbia Heights will devlop a written process for receiving and documenting citizen input that will meet the requirements of the permit within 12 months of the date permit coverage is extended to the City.

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

C. MCM 3: Illicit discharge detection and elimination

1. The Permit (Part III.D.3.) requires that, within 12 months of the date permit coverage is extended, existing permittees revise their current program as necessary, and continue to implement and enforce a program to detect and eliminate illicit discharges into the small MS4. Describe your current program:

   The City of Columbia Heights inspects for illicit discharges at outfalls during a yearly inspection, along with general inspections and maintenance. In addition the City will investigate any incidents of illicit discharges are suspected either by city staff or residents If an illicit discharge is located within the city's storm water system, the city will find the most cost effective and timely way to eliminate the discharge. If the illicit discharge is an issue with a resident or commercial property owner, then the City will work with the property owner to eliminate the discharge in a timely manner through the enforcement policy .

2. Does your Illicit Discharge Detection and Elimination Program meet the following requirements, as found in the Permit (Part III.D.3.c.-g.)?

   a. Incorporation of illicit discharge detection into all inspection and maintenance activities conducted under the Permit (Part III.D.6.e.-f.)Where feasible, illicit discharge inspections shall be conducted during dry-weather conditions (e.g., periods of 72 or more hours of no precipitation). ☒ Yes ☐ No

   b. Detecting and tracking the source of illicit discharges using visual inspections. The permittee may also include use of mobile cameras, collecting and analyzing water samples, and/or other detailed procedures that may be effective investigative tools. ☒ Yes ☐ No

   c. Training of all field staff, in accordance with the requirements of the Permit (Part III.D.6.g.(2)), in illicit discharge recognition (including conditions which could cause illicit discharges), and reporting illicit discharges for further investigation. ☒ Yes ☐ No

   d. Identification of priority areas likely to have illicit discharges, including at a minimum, evaluating land use associated with business/industrial activities, areas where illicit discharges have been identified in the past, and areas with storage of large quantities of significant materials that could ☐ Yes ☒ No

result in an illicit discharge.

e. Procedures for the timely response to known, suspected, and reported illicit discharges. ☒ Yes ☐ No

f. Procedures for investigating, locating, and eliminating the source of illicit discharges. ☒ Yes ☐ No

g. Procedures for responding to spills, including emergency response procedures to prevent spills from entering the small MS4. The procedures shall also include the immediate notification of the Minnesota Department of Public Safety Duty Officer, if the source of the illicit discharge is a spill or leak as defined in Minn. Stat. § 115.061. ☐ Yes ☒ No

h. When the source of the illicit discharge is found, the permittee shall use the ERPs required by the Permit (Part III.B.) to eliminate the illicit discharge and require any needed corrective action(s). ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

The City of Columbia Heights will work to update the above permit requirements within 12 months of permit coverage; these updates will meet the requirements of the permit. The City of Columbia Heights will identify priority areas that are likely to include illicit discharges, using GIS information and property information. The city will create a written document that includes procedures for responding to spills and will include emergency response to prevent spills from entering the MS4.

3. List the categories of BMPs that address your illicit discharge, detection and elimination program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	**Measurable goals and timeframes**
Storm Sewer System Map	*City staff will continue to review and update (as needed) the storm sewer system map each year of the MS4 permit cycle.*
IDDE Inspections	*The City will continue to annually conduct IDDE inspections concurrently with stormsewer, outfall, and ponds inspections per the IDDE inspection program.*

BMP categories to be implemented	***Measurable goals and timeframes***
Written Procedures for Emergency Response	*Draft written procedures for emergency and non-emergency response to non-stormwater spills, discharges, and connections in 2014. Implement final written procedures within 12 months from the date MS4 permit coverage is extended is extended to the City.*
IDDE Priority Inspection Map	*Develop IDDE inspection map in 2014. Utilize map for inspections within 12 months from the date MS4 permit coverage is extended to the city.*
New Illicit Discharge & Connection Ordinance	*The City intends to consolidate all regulatory language for illicit discharges into one new illicit discharge ordinance. This new ordinance will include refined written procedures and enforcement. City staff will draft ordinance language in 2014 for final adoption within 12 months from the date MS4 permit coverage is extended to the City.*

4. Do you have procedures for record-keeping within your Illicit Discharge Detection and Elimination (IDDE) program as specified within the Permit (Part III.D.3.h.)? ☒ Yes ☐ No

   If you answered **no**, indicate how you will develop procedures for record-keeping of your Illicit Discharge, Detection and Elimination Program, within 12 months of the date permit coverage is extended:

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

D. MCM 4: Construction site stormwater runoff control

1. The Permit (Part III.D.4) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a construction site stormwater runoff

control program. Describe your current program:

The Engineering department provides plan review (all public and private development sites) and inspection services for projects that disturb one acre or more. Building department staff conducts plan reviews and regular site inspections on all permitted residential/commercial sites of 5,000 square feet to less than one acre. Engineering department staff receives public complaints of potential non-compliance on all sites within the City and public works inspects and enforce as necessary.

2. Does your program address the following BMPs for construction stormwater erosion and sediment control as required in the Permit (Part III.D.4.b.):

   a. Have you established written procedures for site plan reviews that you conduct prior to the start of construction activity? ☒ Yes ☐ No

   b. Does the site plan review procedure include notification to owners and operators proposing construction activity that they need to apply for and obtain coverage under the MPCA's general permit to *Discharge Stormwater Associated with Construction Activity No. MN R100001*? ☐ Yes ☒ No

   c. Does your program include written procedures for receipt and consideration of reports of noncompliance or other stormwater related information on construction activity submitted by the public to the permittee? ☐ Yes ☒ No

   d. Have you included written procedures for the following aspects of site inspections to determine compliance with your regulatory mechanism(s):

      1) Does your program include procedures for identifying priority sites for inspection? ☐ Yes ☒ No

      2) Does your program identify a frequency at which you will conduct construction site inspections? ☒ Yes ☐ No

      3) Does your program identify the names of individual(s) or position titles of those responsible for conducting construction site inspections? ☐ Yes ☒ No

      4) Does your program include a checklist or other written means to document construction site inspections when determining compliance? ☒ Yes ☐ No

   e. Does your program document and retain construction project name, location, total acreage to be disturbed, and owner/operator information? ☒ Yes ☐ No

   f. Does your program document stormwater-related comments and/or supporting information used to determine project approval or denial? ☒ Yes ☐ No

   g. Does your program retain construction site inspection checklists or other written materials used to document site inspections? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

   The City will add contact information on the stormwater website for the public to provide complaints regarding non-compliance of construction sites. Reciept and consideration of non-compliance will be forward to the Engineering Deparetment for review and appropriate follow-up. City staff will also draft an internal field inspection form for Public Works staff to conduct erosion and sediment control inspections of residential and commercial sites. This inspection form will define priority sites, frequency of inspections, and record retention.

3. List the categories of BMPs that address your construction site stormwater runoff control program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories,** hit the tab key after the last line to generate a new row.

Established BMP categories	**Measurable goals and timeframes**
Site Plan Review ☐	*The Engineering department provides plan review (all public and private development sites) and inspection services for projects that disturb one acre or more. Building department staff conducts plan reviews and regular site inspections on all permitted residential/commercial sites of 5,000 square feet to less than one acre. The city will continue to use checklists to review plans to ensure the stormwater issues are addressed.*
Site Inspections and Enforcement ☐	*The City of Columbia Heights will inspect construction sites, in accordance to the State's Construction Stormweter permit and the City's stormwater ordinances. Any infractions will be enforced by the procedures described in the City's enforcement policy.*

BMP categories to be implemented	Measurable goals and timeframes

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

E. MCM 5: Post-construction stormwater management

1. The Permit (Part III.D.5.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a post-construction stormwater management program. Describe your current program:

   Stormwater Management Plans are reviewed and approved by the Engineering Department to ensure that they meet the City's ordinance in regards to post-construction requirements. In addition, the city inspects and reviews drainage issues in post construction instances, working to resolves these issues.

2. Have you established written procedures for site plan reviews that you will conduct prior to the start of construction activity? ☒ Yes ☐ No

3. Answer **yes** or **no** to indicate whether you have the following listed procedures for documentation of post-construction stormwater management according to the specifications of Permit (Part III.D.5.c.):

   a. Any supporting documentation that you use to determine compliance with the Permit (Part III.D.5.a), including the project name, location, owner and operator of the construction activity, any checklists used for conducting site plan reviews, and any calculations used to determine compliance? ☒ Yes ☐ No

   b. All supporting documentation associated with mitigation projects that you authorize? ☐ Yes ☒ No

   c. Payments received and used in accordance with Permit (Part III.D.5.a.(4)(f))? ☐ Yes ☒ No

   d. All legal mechanisms drafted in accordance with the Permit (Part III.D.5.a.(5)), including date(s) of the agreement(s) and names of all responsible parties involved? ☐ Yes ☒ No

   If you answered **no** to any of the above permit requirements, describe the steps that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

   The City of Columbia Heights will devlop a written process for recording payments received and legal mechanisms drafted that will meet the requirements of the permit within 12 months from the approval of the City's Swppp.

4. List the categories of BMPs that address your post-construction stormwater management program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
Long-term Operation and Maintenance of BMPs ☐	*The City of Columbia Heights will maintain and operate of the long term BMPs owned by the City for the term of the permits. The City will inspect and monitor the BMP to attempt to evaluate the effectiveness of the BMPs.*
Redevelopment Post-Construction Ordinance	*The City will continue to review construction plans to ensure the compliance of plans meeting the Post Construction requirements within the city ordinances.*

BMP categories to be implemented	Measurable goals and timeframes

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

F. MCM 6: Pollution prevention/good housekeeping for municipal operations

1. The Permit (Part III.D.6.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement an operations and maintenance program that prevents or reduces the discharge of pollutants from the permittee owned/operated facilities and operations to the small MS4. Describe your current program:

   The City currently inspects all Structual Pollution Control Devices, Outfalls, and Ponds each year. City owned and operated stockpiles, storage areas, and material handling areas at the public works facility are inspected for potential non-stromwater discharges on a routine basis. The City sweeps public streets a minimum of two times a year, until snow fall each fall. City staff began evaluating the use of road salt for winter road maintenance activities to reduce chorides entering our waterways. Numerous Public Works employees have participated in pollution prevention workshops/ training programs that were offerred by the watershed districts and public works city staff.

2. Do you have a facilities inventory as outlined in the Permit (Part III.D.6.a.)? ☒ Yes ☐ No

3. If you answered **no** to the above permit requirement in question 2, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

4. List the categories of BMPs that address your pollution prevention/good housekeeping for municipal operations program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. For an explanation of measurable goals, refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	**Measurable goals and timeframes**
Employee Training	*Continue to host a minimum of one staff training event per year to discuss stormwater related topics. City staff will develop an annual training schedule, record the employee names, topics covered, and date of each event, annually through the end of the MS4 permit cycle (July 31, 2018).*
Street Sweeping	*The City will continue to conduct street sweeping operations a minimum of twice annually (record the sweeping route and date per occurrence). Review and revise (as needed) the street sweeping policy (including schedule, equipment, and disposal), stormwater quality priority areas, and routes annually through the end of the MS4 permit cycle (July 31, 2018).*
Annual Inspection of All Structural Stormwater BMPs (SSBMP)	*Continue to inspect 100% of all SSBMPs each year of the MS4 permit cycle (July 31, 2018). Record the inspection dates and maintenance completed for each SPCD.*
Inspection of the MS4 Outfalls, Sediment Basins and Ponds	*Continue to inspect all MS4 outfalls until 100% of all MS4 Outfalls and Ponds have been inspected within the MS4 permit cycle (July 31, 2018)*
Inspection Follow-up Including the Determination of Whether Repair, Replacement, or Maintenance Measures are Necessary and the Implementation of the Corrective Measures	*Annually, review all pond, outfall, and SPCD inspection records to determine if maintenance, repair, or replacement is needed. Include a description of the findings and any maintenance, repair, or replacement as a result of the inspection findings.*
Evaluation of SPCD Inspection Frequency	*Review records and evaluate each SPCD's inspection frequency and adjust as needed per MS4 Permit Part III.D.6.e (1.). Evaluate and update inspection records annually through the end of the MS4 permit cycle (July 31, 2018).*

BMP categories to be implemented	**Measurable goals and timeframes**
Continue Improvements at City Work Yard	*The City will continue to analyze possible BMP improvements to the City's rear Public Works yard. The City will make improvements which are economically feasible and provide water quality improvements. If BMP's projects are found that are cost effective and provide water quality improvement, the city will work to make the improvements based on city council approval.*
Pond Sediment Excavation and Removal Projects	*The City will develop a reporting component for pond sediment removal projects within 12 months from the date MS4 permit coverage is extended to the City. Reporting will consist of*

	documenting the date, pond ID, project limits/construction plans, volume of sediment removed, test results (if any), and disposal location. Begin reporting in 2015.
Stockpiles, Storage and Material Handling Area Inspections	*Conduct quarterly written inspections of all stockpile, storage and material handling areas (per the 2014 facility inventory), through the end of the MS4 permit cycle (July 31, 2018).*
Update Public Works MS4 Program	*Update existing BMPs to coincide with new/revised MS4 permit requirements (refer to question #9).*

5. Does discharge from your MS4 affect a Source Water Protection Area (Permit Part III.D.6.c.)? ☒ Yes ☐ No

   a. **If no**, continue to 6.

   b. If **yes**, the Minnesota Department of Health (MDH) is in the process of mapping the following items. Maps are available at http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm. Is a map including the following items available for your MS4:

      1) Wells and source waters for drinking water supply management areas identified as vulnerable under Minn. R. 4720.5205, 4720.5210, and 4720.5330? ☒ Yes ☐ No

      2) Source water protection areas for surface intakes identified in the source water assessments conducted by or for the Minnesota Department of Health under the federal Safe Drinking Water Act, U.S.C. §§ 300j – 13? ☐ Yes ☒ No

   c. Have you developed and implemented BMPs to protect any of the above drinking water sources? ☐ Yes ☒ No

6. Have you developed procedures and a schedule for the purpose of determining the TSS and TP treatment effectiveness of all permittee owned/operated ponds constructed and used for the collection and treatment of stormwater, according to the Permit (Part III.D.6.d.)? ☐ Yes ☒ No

7. Do you have inspection procedures that meet the requirements of the Permit (Part III.D.6.e.(1)-(3)) for structural stormwater BMPs, ponds and outfalls, and stockpile, storage and material handling areas? ☐ Yes ☒ No

8. Have you developed and implemented a stormwater management training program commensurate with each employee's job duties that:

   a. Addresses the importance of protecting water quality? ☒ Yes ☐ No

   b. Covers the requirements of the permit relevant to the duties of the employee? ☒ Yes ☐ No

   c. Includes a schedule that establishes initial training for new and/or seasonal employees and recurring training intervals for existing employees to address changes in procedures, practices, techniques, or requirements? ☐ Yes ☒ No

9. Do you keep documentation of inspections, maintenance, and training as required by the Permit (Part III.D.6.h.(1)-(5))? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements listed in **Questions 5 – 9**, then describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

   The City of Columbia Heights will work to update the above permit requirement within 12 months of permit coverage and the updates will meet the requirements of the permit. The City of Columbia Heights will update city requirements develop and implement BMPs to protect above drinking water sources. The city will develop procedures to determine the TSS and TP treatment effectiveness of owned /operated ponds. The city with create a written inspection procedure for structural stormwater BMPs, pond/outfalls and stockpiles, storage and material handling areas. In addition the city will create a schedule for training employees.

10. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

    Engineering Tech, Stormwater Specialist

VI. Compliance Schedule for an Approved Total Maximum Daily Load (TMDL) with an Applicable Waste Load Allocation (WLA) (Part II.D.6.)

A. Do you have an approved TMDL with a Waste Load Allocation (WLA) prior to the effective date of the Permit? ☒ Yes ☐ No

   1. If **no**, continue to section VII.

2. If **yes**, fill out and attach the MS4 Permit TMDL Attachment Spreadsheet with the following naming convention: *MS4NameHere_TMDL*.

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

VII. Alum or Ferric Chloride Phosphorus Treatment Systems (Part II.D.7.)

A. Do you own and/or operate any Alum or Ferric Chloride Phosphorus Treatment Systems which are regulated by this Permit (Part III.F.)? ☐ Yes ☒ No

1. If **no**, this section requires no further information.
2. If **yes**, you own and/or operate an Alum or Ferric Chloride Phosphorus Treatment System within your small MS4, then you must submit the Alum or Ferric Chloride Phosphorus Treatment Systems Form supplement to this document, with the following naming convention: *MS4NameHere_TreatmentSystem*.

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

VIII. Add any Additional Comments to Describe Your Program

STORMWATER MANAGEMENT IMPLEMENTATION PLAN						
No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
1-A	Develop Written Partnership Agreements - Provide mutually beneficial partnerships to address MS4 permit requirements of providing educational opportunities, illicit discharge detection and elimination, and maintenance of the city conveyance systems. Agreements will be pursued between the City of Columia Heights and the Rice Creek Watershed District.	✓	✓			Engineering
1-B	Education Activity Implementation Plan - The City will provide stormwater education and outreach programs for residents within the City. The City will complete an outline of the education program and implementation schedule for the upcoming permit cycle.	✓	✓	✓		Engineering
1-C	Education Program: The City or its designee will raise awareness to the audience involved by providing information on stormwater pollution prevention, effects of illicit discharges, best management practices, components of the SWPPP and outside entity resources available to City residents and business owners.	✓	✓	✓		Engineering
1-D	City Website - The City updates their web page by providing information on high priority stormwater pollution prevention topics and effects of illicit discharge to City residents and business owners. The goal will be to add new material as it becomes available and record the number of website hits annually.	✓		✓		Engineering
1-E	City Newsletter - City staff will develop then distribute stormwater related articles in the City newsletter. This goal will be met by distributing a minimum of two stormwater related articles in the City newsletter each year.	✓		✓		Public Works
1-F	Coordination of Education Program - The City will collaborate and coordinate the development and implementation of the City's educational activities schedule with all three of the City's Watershed Management Commissions.	✓	✓	✓		Public Works
2-A	Comply with Public Notice Requirements - Provide public notice of meeting to provide input on the SWPPP in accordance with City public hearing notification requirements.	✓		✓		Engineering

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
2-B	Annual Meeting - Hold annual public meeting combined with City Council Meeting or other public participation/involvement event to solicit public input on the SWPPP, discuss its effectiveness, or amendments. Explore new venues and enhance meeting effectiveness and participation. Effectiveness will be evaluated based upon the amount of resident feedback received.	✓	✓	✓		Engineering
2-C	Public Input Consideration and Response Procedures - City staff will respond to all public comments and statements received from the public meeting, and document any proposed changes to the SWPPP for final approval by the City Engineer (if applicable). The goal of this BMP will be met by documenting all written and oral input into the record of decision and submitted in conjunction with the annual report to the MPCA.	✓	✓	✓		Engineering
2-D	Online Availability of Stormwater Pollution Prevention Program Document - Provide an electronic document of the SWPPP document to allow viewing anytime and easier access to these documents.	✓	✓	✓		Engineering
3-A	Storm Sewer System Mapping - Update storm sewer map to meet the requirements of Part II.D.4. of the MS4 General Permit. Identify outfalls, including unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. Update pond inventory and submit to MPCA.	✓	✓	✓		Engineering
3-B	Illicit Discharge Detection and Elimination (IDDE) and Enforcement Ordinance/Rules - Review ordinance annually to ensure that ordinance continues to meet the needs of the City and legal requirements.	✓	✓	✓		Engineering
3-C	Illicit Discharge Detection and Elimination (IDDE) Program - Develop written program and implement it as defined in City SWPPP to meet requirements of Part III.D.3.c.h. of the MS4 General Permit. Include procedures to meet permit requirements for the following items: -Inform Public about illicit discharges -Employee Training Program (maintain 2 annual training events in spring and fall) -IDDE Inspections -IDDE Investigations and elimination	✓	✓	✓	✓	Engineering

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
3-D	IDDE Program Updates - Develop written procedures for illicit discharge inspections, investigations, and response actions. Develop a process to document information as described in the Permit (Part III.3.h.) within 12 months following the date permit coverage is extended.	✓	✓	✓	✓	Engineering
3-E	Illicit Discharge Inspections - In year 1, the City will map out areas that are identified as high-priority outfalls and around high-risk establishments (fast food restaurants, dumpsters, car washes, mechanics, and oil changes). In years 2-5, the City will integrate those sites into its annual MS4 inspection activities.	✓	✓	✓	✓	Engineering/Public work
3-F	Illicit Discharge Investigation - As needed, City staff or a consultant will be used to televise a section of the sewer system, collect grab samples or perform other effective testing procedures to find illicit connection identified in the system.	✓	✓	✓	✓	Public Works
3-G	Standard Operating Procedures (SOPs) - Develop SOPs for IDDE within 12 months of the date of permit coverage	✓	✓	✓		Engineering
4-A	Construction Site Stormwater Runoff Ordinance - Review the recently updated (December 19, 2011) ordinance to ensure it meets the requirements of Part III.D.4.a.(1)-(8) of the MS4 General Permit and that it is at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity.	✓	✓	✓		Engineering
4-B	Construction Site Implementation of Erosion and Sediment Control BMPs - Review and evaluate the efficacy of construction site erosion control plans through regular (weekly to monthly) inspections for construction sites to ensure compliance with City ordinances. Document all inspections and enforcement actions (public and private) and keep on file at City.	✓		✓		Engineering

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
4-C	Waste Control BMP's for Construction Site Operators - Maintain established guidelines, inspection criteria, and enforcement procedures for the management of construction site waste. Continue to inspect construction sites for compliance with waste control ordinances for materials that include discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality.	✓		✓		Engineering
4-D	Construction Site Plan Review - The City will require every applicant for a building permit, to meet the requirements for erosion and sediment control for the applicant's project.	✓		✓		Public Works
4-E	Receipt and Consideration of Non-Compliance for Construction Site Stormwater Controls - The City will establish a procedure for the public to report potential construction site erosion control and waste disposal infractions. The goal of this BMP will be achieved by completing the timeline/implementation.	✓	✓	✓		Engineering
4-F	Stormwater Compliance Inspections - Develop written procedures, checklist and responsible persons to ensure that at least 10% of inspections conducted annually are performed at deemed high priority inspection sites (e.g., near sensitive receiving waters, projects larger than 5 acres)	✓	✓	✓		Engineering
4-G	Standard Operating Procedures (SOPs) - Complete an annual review of SOPs for site inspections and site plan reviews by evaluating checklists and existing guidelines to ensure they are up-to-date to reflect MPCA's current construction general permit requirements.	✓	✓	✓		Engineering
4-H	Develop Enforcement Response Procedures (ERPs) - Establish/outline Enforcement Response Procedures for Construction Site Activities.	✓	✓	✓		Engineering
4-I	Permit Update - Update the City Grading, Building, and ROW permits and Contraction Site Stormwater Runoff ordinance to meet the new permit requirements within 12 month following the date permit coverage is extended.	✓	✓	✓		Public Works
4-J	Prioritize Inspections - The City will develop a process to determine the frequency for inspecting high priority inspection sites (e.g. near sensitive receiving waters, projects larger than 5 acres).	✓	✓	✓		Public Works

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
4-K	Permit Application System - Develop procedures to integrate construction site stormwater runoff review and inspection documents into permit tracking program.	✓	✓	✓		Engineering
5-A	Site Plan Review Program - The City will review and revise (if necessary, during the plan review process) permanent BMP designs and criteria for post-construction stormwater management associated with new development and redevelopment projects of one acre or more. The City will also actively look for non-structural opportunities where prudent and feasible. The goal of this BMP will be met if the City conducts plan reviews on new development and redevelopment projects of one acre or more.	✓	✓	✓	✓	Engineering and Planning
5-B	Update Ordinance to Meet New Permit Requirements - Complete Ordinance updates for post-construction runoff from new development and redevelopment within 12 months of extension of permit coverage.	✓	✓	✓		Engineering
5-C	SOPs - In addition to existing stormwater management design guidelines and standards the City will develop SOPs within 12 months of the date of permit coverage to strengthen Post Construction Stormwater Management	✓	✓	✓		Engineering
5-D	Document Pertinent Project Information - Maintain all related documents pertaining to each new or redevelopment project in more user-friendly filing system for better records management. Implement within 12 months of the date of permit coverage.	✓	✓	✓		Engineering
6-A	Parking Lots & Street Cleaning - Sweep City maintained streets 2 times per year	✓		✓		Street Maintenance
6-B	Storm Sewer Inspection Program - Conduct one inspection of all City-owned ponds and outfalls prior to expiration date of the MS4 General Permit. Annually inspect 100% of structural pollution control devices.	✓	✓	✓		Street Maintenance
6-C	Inspection of All Exposed Stockpile, Storage and Material Handling Areas - Based on storm sewer inspection findings determine if repair, replacement, or maintenance measures are necessary to ensure proper function and treatment effectiveness.	✓	✓	✓		Street Maintenance

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
6-D	Structural Stormwater BMP Maintenance Program - Develop written program to utilize results from storm sewer inspection findings to determine if repair, replacement, or maintenance measures are necessary to ensure structures proper function and treatment effectiveness. Document annually the number of structures repaired or scheduled for maintenance. Annually inspect 20% of known public outfalls, sediment basins and ponds each year on a rotating basis	✓	✓	✓		Engineering / Street Maintenance
6-E	Asset Management System for Record Reporting and Retention - The City will retain all records of inspection, maintenance, and corrective actions of the City's stormwater system. The goal of this BMP will be met if the City retains these records for a period of three years past the expiration of this permit.	✓		✓	✓	Engineering
6-F	Evaluation of Inspection Frequency - Develop written procedures to modify the frequency of inspections, if after two years of inspections patterns develop warranting a reduction or increase in the frequency of inspection.			✓		Public Works/ Engineering
6-G	Landscaping and Lawn Care - Develop written program to track roadside mowing and maintenance on all City roads twice annually (June and Sept) and seven year tree trimming rotation for all City trees.			✓	✓	Public Works/ Parks
6-H	Road Salt Application Review - The City will record the annual activates of the salt distribution program and adjust current practices as necessary.			✓	✓	Public Works
6-I	Evaluation of Proposed Stormwater Infiltration Projects for Impacts on Source Water - The City will prohibit the construction of the infiltration area or incorporate specific BMPs to reduce pollutants from infiltrating within vulnerable DWSMA's.			✓	✓	Public Works
6-J	Park and Open Space Training - Develop written procedures for the existing program to train full-time and seasonal employees on proper use and application of fertilizers and pesticides for maintenance of City lands.	✓	✓	✓	✓	Public Works/ Parks
6-K	Fleet and Building Maintenance Training Program - Training focused on automotive maintenance program (automotive inspections and washing), spill cleanup training, hazardous materials training, building leak prevention and inspection training.	✓	✓	✓	✓	Public Works

No.	Project Description	MS4 Permit Requirement	Initial 12 Month Requirement	Annual Requirement	Projects, Programs, & Studies	Responsible Position
6-L	Stormwater Systems Maintenance Training Program - Training focused on parking lot and street cleaning, storm drain systems cleaning, road salt materials management.	✓	✓	✓	✓	Public Works
6-M	Spill Prevention & Control Plans for Municipal Facilities - Ensure that plans describing spill prevention and control procedures are consistent among all departments. Conduct annual spill prevention and response training sessions to all municipal employees. Distribute education materials to each municipal facility by the end of year 2.	✓	✓	✓		Engineering
6-N	Facility Inventory - Develop facilities inventory to include potential pollutants at each site. Create a map of all identified facilities.	✓	✓	✓		Engineering
6-O	Pond Assessment Procedures & Schedule - In year 1, develop procedures for determining TSS and TP treatment effectiveness of city owned ponds use for treatment of stormwater. Implement schedule in year 2-5.	✓	✓	✓	✓	Engineering
7-A	TMDL Review & Implementation - Columbia Heights will work cooperatively with the Minnesota Pollution Control Agency and other outside organizations to develop and implement all future TMDL implementation plan(s) for impaired waters designated under Section 303(d), receiving MS4 discharges from within or adjacent to the City.	✓	✓	✓	✓	Engineering

BMP PAGE

Implementation Table

Unique Identifying Number: 1-A

Permit Requirements Addressed by this BMP:

Part II.D.1.						

BMP Title: Develop Written Partnership Agreements

BMP Description:

Provide mutually beneficial partnerships to address MS4 permit requirements of providing educational opportunities, illicit discharge detection and elimination, and maintenance of the city conveyance systems. Agreements will be pursued between the City of Columbia Heights and the Rice Creek Watershed District.

Measurable Goals:

Determine if this partnership beneficial in the educational, training, and/or enforcement aspects of the MS4 program.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 1-B

Permit Requirements Addressed by this BMP:

Part III.D.1.	Part III.D.1.	Part III.D.1.	Part III.D.1.	Part III.D.1.		

BMP Title: Education Activity Implementation Plan

BMP Description:

The City will provide stormwater education and outreach programs for residents within the City. The City will complete an outline of the education program and implementation schedule for the upcoming permit cycle.

Measurable Goals:

The City will document the number of publications and households served by publication.
The effectiveness of this BMP will be measured by the number of articles and brochures published in newsletters, distributed via City mailings/website and RCWD workshops, and visits to the City's website.
Success of this BMP is defined as developing then implementing the educational activities schedule and distributing/hosting a minimum of four educational materials, workshops, or presentations per year.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 1-C

Permit Requirements Addressed by this BMP:

Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | |

BMP Title: Education Program

BMP Description:

The City or its designee will raise awareness to the audience involved by providing information on stormwa

Measurable Goals:

The City will document the number of publications and households served by publication.
The effectiveness of this BMP will be measured by the number of articles and brochures published in newsletters, distributed via City mailings/website and RCWD workshops, and visits to the City's website.
Success of this BMP is defined as developing then implementing the educational activities schedule and distributing/hosting a minimum of four educational materials, workshops, or presentations per year.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 1-D

Permit Requirements Addressed by this BMP:

Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | |

BMP Title: City Website

BMP Description:

The City updates their web page by providing information on high priority stormwater pollution prevention topics and effects of illicit discharge to City residents and business owners. The goal will be to add new material as it becomes available and record the number of website hits annually.

Measurable Goals:

Track website hits to the stormwater documents available. Track the comments left by community members about the stormwater program.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 1-E

Permit Requirements Addressed by this BMP:

Part III.D.1.	Part III.D.1.	Part III.D.1.	Part III.D.1.			

BMP Title: City Newsletter

BMP Description:

City staff will develop then distribute stormwater related articles in the City newsletter. This goal will be met by distributing a minimum of two stormwater related articles in the City newsletter each year.

Measurable Goals:

Track the number of newsletters that were distributed.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 1-F

Permit Requirements Addressed by this BMP:

Part II.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1.

BMP Title: Coordination of Education Program

BMP Description:

The City will collaborate and coordinate the development and implementation of the City's educational activities schedule with all three of the City's Watershed Management Commissions.

Measurable Goals:

Track the number of community members who give input and attend the educational activities.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 2-A

Permit Requirements Addressed by this BMP:

Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | | |

BMP Title: Comply with Public Notice Requirements

BMP Description:

Provide public notice of meeting to provide input on the SWPPP in accordance with City public hearing notification requirements.

Measurable Goals:

Make sure the notice for the public is posted within the acceptable timeframe for public input. The effectiveness of this BMP will be measured by the number of public notices posted.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 2-B

Permit Requirements Addressed by this BMP:

Part III.D.2.	Part III.D.2.	Part III.D.a.	Part III.D.2.	Part III.D.2.		

BMP Title: Annual Meeting

BMP Description:

Hold an annual public meeting combined with a City Council meeting or other public participation/involvement event to solicit public input on the SWPPP, discuss its effectiveness, or make amendments to current SWPPP. Explore new venues and enhance meeting effectiveness and participation.

Measurable Goals:

Document attendance and record minutes at the public meeting, record statements and written comments and document changes made to the SWPPP. Effectiveness will be evaluated based upon the amount of resident feedback is received.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Idenifying Number: 2-C

Permit Requirements Addressed by this BMP:

Part III.D.2.	Part III.D.2.	Part III.D.2.	Part III.D.2.	Part III.D.2.		

BMP Title: Public Input Consideration and Response Procedures

BMP Description:

The City will conduct a public meeting and host a web page on the City's Storm Water Pollution Prevention Program. City staff will respond to all public comments and statements received from the public meeting, and document any proposed changes to the SWPPP for final approval by the City Engineer (if applicable).

Measurable Goals:

The goal of this BMP will be met by documenting all written and oral input into the record of decision and submitted in conjunction with the annual report to the MPCA.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 2-D

Permit Requirements Addressed by this BMP:

Part III.D.2.	Part III.D.2.	Part III.D.2.				

BMP Title: Online Availability of Stormwater Pollution Prevention Program Document

BMP Description:

Provide an electronic document of the SWPPP document to allow viewing anytime and easier access to these documents.

Measurable Goals:

The effectiveness of this BMP will be measured by tracking the number of website hits to the SWPPP and the amount of public input submitted electronically.

Responsible Person:

Name:	Kathy Young
Title:	Asst. City Engineer
Phone:	(763) 706-3704
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BMP PAGE

Implementation Table

Unique Identifying Number: 3-A

Permit Requirements Addressed by this BMP:

Part II.D.4. | Part III.C.1. | Part III.D.3. | Part III.D.3. | | | |

BMP Title: Storm Sewer System Mapping

BMP Description:

Update storm sewer map to meet the requirements of Part II.D.4. of the MS4 General Permit. Identify outfalls, including unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. Update pond inventory and submit to MPCA.

Measurable Goals:

The effectiveness of this BMP will be defined as mapping all storm sewer conveyances 12" or greater that are owned by the City. The success of this BMP will be measured by annually updating all City owned storm sewer conveyances equal to or greater than 12".

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 3-B

Permit Requirements Addressed by this BMP:

Part III.D.3.	Part III.D.3.	Part III.D.3.				

BMP Title: Illicit Discharge Detection and Elimination (IDDE) and Enforcement Ordinance/Rules

BMP Description:

Review ordinance annually to ensure that ordinance continues to meet the needs of the City and legal requirements. Elements of this ordinance will include, but are not limited to, defining allowable discharges, setting policy as it pertains to violations and penalties, and mitigation requirements.

Measurable Goals:

The effectiveness of this BMP will be measured by the number of enforcement actions issued annually. Success will be defined as the review of existing ordinances or amendments made to the illicit discharge ordinance.

Responsible Person:

Name:	Kevin Hansen
Title:	Public Works Director
Phone:	(763) 706-3705
Email:	khansen@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 3-C

Permit Requirements Addressed by this BMP:

Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. |

BMP Title: Illicit Discharge Detection and Elimination (IDDE) Program

BMP Description:

Develop written program and implement it as defined in City SWPPP to meet requirements of Part III.D.3.c.h. of the MS4 General Permit. This BMP includes providing information on recycling options, services, and programs within the City. The City will also review the current educational activities undertaken by its staff to eliminate illicit discharges from general City operations.

Measurable Goals:

The City will continue to annually review the educational content of printed literature for adequacy and update as necessary. BMP effectiveness will be measured by the number of calls to the City regarding illegal dumping or illicit discharges. Also, success will be defined by providing educational material to the City staff a minimum of one time annually.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 3-D

Permit Requirements Addressed by this BMP:

Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | | |

BMP Title: IDDE Program Updates

BMP Description:

Develop written procedures for illicit discharge inspections, investigations, and response actions. Develop a process to document information as described in the Permit (Part III.3.h.) within 12 months following the date permit coverage is extended. Elements of this ordinance will include, but are not limited to, defining allowable discharges and mitigation requirements.

Measurable Goals:

The effectiveness of this BMP will be measured by the number of enforcements actions issued annually.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 3-E

Permit Requirements Addressed by this BMP:

Part III.D.3.	Part III.D.3.	Part III.D.3.	Part III.D.3.			

BMP Title: Illicit Discharge Inspections

BMP Description:

In year 1, the City will map out areas that are identified as high-priority outfalls and around high-risk establishments (fast food restaurants, dumpsters, car washes, mechanics, and oil changes). In years 2-5, the City will integrate those sites into its annual MS4 inspection activities. The City will notify the MPCA state duty officer of any hazardous material spills or discharges.

Measurable Goals:

The effectiveness of this BMP will be measured by:
1. Annually documenting the number of miles covered by trash and debris collection,
2. Annually documenting all reported non-stormwater discharges occurring on City owned land, private property, and right-of-way, as well as any remedial actions taken (if applicable).

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 3-F

Permit Requirements Addressed by this BMP:

Part III.D.3.	Part III.D.3.	Part III.D.3.	Part III.D.3.			

BMP Title: Illicit Discharge Investigation

BMP Description:

As needed, City staff or a consultant will be used to televise a selection of the sewer system, collect grab samples, or perform other effective testing procedures to find illicit connection identified in the system.

Measurable Goals:

All non-stormwater discharges (as defined in Part III.D.3.f.) were evaluated and determined to be insignificant sources of pollutants to the MS4.

Responsible Person:

Name:	Lauren McClanahan
Title:	Utilities
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BMP PAGE

Implementation Table

Unique Identifying Number: 3-G

Permit Requirements Addressed by this BMP:

Part III.A. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3.

BMP Title: Standard Operating Procedures (SOPs)

BMP Description:

Develop SOPs for IDDE within the initial 12 months of the beginning date of permit coverage.

Measurable Goals:

The effectiveness of this BMP and the SOPs for IDDE will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-A

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4.

BMP Title: Construction Site Stormwater Runoff Ordinance

BMP Description:

Review the City's ordinance to ensure it meets the requirements of Part III.D.4.a.(1)-(8) of the MS4 General Permit and that it is at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity.

Measurable Goals:

The City will annually review and update as necessary the City's erosion control ordinances. This BMP effectiveness will be calculated by tracking the compliance issues with construction sites.

Responsible Person:

Name:	Kevin Hansen
Title:	Public Works Director
Phone:	Engineering
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BMP PAGE

Implementation Table

Unique Identifying Number: 4-B

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4.

BMP Title: Construction Site Implementation of Erosion and Sediment Control BMPs

BMP Description:

Review and evaluate the efficacy of construction site erosion control plans through regular (weekly to monthly) inspections for construction sites to ensure compliance with City ordinances. Document all inspections and enforcement actions (public and private) and keep on file at City. As part of the City's permit approval standards, BMPs must be implemented in accordance with the NPDES permit.

Measurable Goals:

Success of this BMP will be determined by site inspections per NPDES Phase II requirements and City permit approvals.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-C

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

BMP Title: Waste Control BMPs for Construction Site Operations

BMP Description:

Maintain established guidelines, inspection criteria, and enforcement procedures for the management of construction site waste. Continue to inspect construction sites for compliance with waste control ordinances for materials that include discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality.

Measurable Goals:

The effectiveness of this BMP will be measured by the annual recorded number of remedial actions against construction site operations. Success of this BMP will be defined as operator compliance to the City's Waster and Material Disposal, 1350.06 ordinance and NPDES Phase II permit regulations.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-D

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4.

BMP Title: Construction Site Plan Review

BMP Description:

Every applicant for a city permit to allow land disturbing activities is required to submit a project specific stormwater management plan (if applicable) and/or erosion control plan to the City for review and approval. Construction permits will be required to meet MPCA NPDES Phase II guidelines for erosion and sediment control and all applicable City ordinances and codes.

Measurable Goals:

No City permit to allow land disturbing activities shall be issued until approval of a stormwater management plan (if applicable) and/or erosion control plan, or waiver of the approval requirement has been obtained. Success will be defined as enforcing the permit's submittal requirement.

Responsible Person:

Name:	Kathy Young
Title:	Asst. City Engineer
Phone:	(763) 706-3704
Email:	kyoung@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 4-E

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4.

BMP Title: Receipt and Consideration of Non-Compliance for Construction Site Stormwater Controls

BMP Description:

The City will establish a phone line and website contact information through which the public may report potential construction site erosion control and waste disposal infractions. Reported incidents will be inspected within 24 hours of receipt or on the next scheduled work day by the City. Hazardous material spills or discharges will be reported to the MPCA State Duty Officer within 24 hours.

Measurable Goals:

The City will establish contact information for receipt of construction site violations. The City will record:
- The number of calls and emails related to SWPPP issues.
- The number of illicit discharge and construction site complaints.
- The number of clean-up activities or SWPPP changes resulting from calls or emails.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-F

Permit Requirements Addressed by this BMP:

Part III.D.3. | Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

BMP Title: Stormwater Compliance Inspections

BMP Description:

Construction site operators must conform to all NPDES construction permit standards and City ordinances pertaining to construction site erosion control and waste disposal. Inspection procedures consist of NPDES Phase II inspection requirements and violations reported by the public as defined in BMP Summary Sheets 3-C and 4-E.

Measurable Goals:

The City will begin to annually evaluate the effectiveness of site inspections and enforcement procedures via enforcement actions taken annually. Additional and/or revised procedures will be added (if applicable) when deemed necessary or found non-conforming to NPDES Phase II requirements.

Responsible Person:

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Title:	Stormwater Specialist
Phone:	Engineering
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BMP PAGE

Implementation Table

Unique Identifying Number: 4-G

Permit Requirements Addressed by this BMP:

Part III.A. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

BMP Title: Standard Operating Procedures (SOPs)

BMP Description:

Complete an annual review of SOPs for site inspections and site plan reviews by evaluating checklists and existing guidelines to ensure they are up-to-date to reflect MPCA's current construction general permit requirements.

Measurable Goals:

The effectiveness of this BMP and the SOPs for IDDE will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-H

Permit Requirements Addressed by this BMP:

Part III.B.1. | Part III.B.2. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

BMP Title: Develop Enforcement Response Procedures (ERPs)

BMP Description:

Establish/outline enforcement response procedures (ERPs) for construction site activities that enforce the standard operating procedures and permit requirements.

Measurable Goals:

The effectiveness of this BMP will be measured by the amount of violations and enforcement actions taken place throughout each year within the City.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-I

Permit Requirements Addressed by this BMP:

Part III.D.4.	Part III.D.4.	Part III.D.4.				

BMP Title: Permit Update

BMP Description:

Update the City Grading, Building, and ROW permits and Contraction Site Stormwater Runoff ordinance to meet the new permit requirements within 12 month following the date permit coverage is extended. City staff will review and revise (if applicable) current City ordinances and codes annually for conformance to new or amended NPDES construction permit and/or watershed district erosion control standards.

Measurable Goals:

The City will annually review and update as necessary the City's erosion control ordinances.

Responsible Person:

Name:	Kevin Hansen
Title:	Public Works Director
Phone:	(763) 706-3705
Email:	khansen@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 4-J

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

BMP Title: Prioritize Inspections

BMP Description:

The City will develop a process to determine the frequency for inspecting high priority inspection sites (e.g. near sensitive receiving waters, projects larger than 5 acres). The process will be developed onto a city map that calls out these sensitive areas.

Measurable Goals:

The City will begin to annually evaluate the effectiveness of site inspections and enforcement procedures via enforcement actions taken annually. Additional and/or revised procedures will be added (if applicable) when deemed necessary or found non-conforming to NPDES Phase II requirements.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 4-K

Permit Requirements Addressed by this BMP:

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

BMP Title: Permit Application System

BMP Description:

Develop procedures to integrate construction site stormwater runoff review and inspection documents into permit tracking program. The documents will help to maintain compliance with the MPCA and the City Code on these construction sites.

Measurable Goals:

The effectiveness of this BMP will be determined by the amount of permits applied for and the ease to complete the inspections of the construction sites.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 5-A

Permit Requirements Addressed by this BMP:

Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | | |

BMP Title: Site Plan Review Program

BMP Description:

The City will review and revise (if necessary, during the plan review process) permanent BMP designs and criteria for post-construction stormwater management associated with new development and redevelopment projects of one acre or more. The City will also actively look for non-structural opportunities where prudent and feasible.

Measurable Goals:

The goal of this BMP will be met if the City conducts plan reviews on new development and redevelopment projects of one acre or more. Success of this BMP is defined as annually recording all revised BMP designs and implemented structural and non-structural BMPs on City properties.

Responsible Person:

Name:	Kathy Young
Title:	Asst. City Engineer
Phone:	(763) 706-3704
Email:	kyoung@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 5-B

Permit Requirements Addressed by this BMP:

Part III.D.5.	Part III.D.5.	Part III.D.5.	Part III.D.5.	Part III.D.5.	Part III.D.5.	

BMP Title: Update Ordinance to Meet New Permit Requirements

BMP Description:

Complete Ordinance updates for post-construction runoff from new development and redevelopment within 12 months of extension of permit coverage.

Measurable Goals:

The City will annually review and update as necessary the City's post-construction ordinance and permit requirements.

Responsible Person:

Name:	Kevin Hansen
Title:	Public Works Director
Phone:	(763) 706-3705
Email:	khansen@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 5-C

Permit Requirements Addressed by this BMP:

Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5.

BMP Title: Standard Operating Procedures (SOPs)

BMP Description:

In addition to existing stormwater management design guidelines and standards, the City will develop SOPs within the initial 12 months of the date of permit coverage to strengthen Post Construction Stormwater Management.

Measurable Goals:

The effectiveness of this BMP and the SOPs for post-construction will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 5-D

Permit Requirements Addressed by this BMP:

Part III.D.5.	Part III.D.5.					

BMP Title: Document Pertinent Project Information

BMP Description:

Maintain all related documents pertaining to each new or redevelopment project in more user-friendly filing system for better records management. Implement within 12 months of the date of permit coverage.

Measurable Goals:

The effectiveness of this BMP will be measured by the ability to track records of inspections and maintenance pertaining to this minimal control measure.

Responsible Person:

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Title:	Stormwater Specialist
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Email:	lletsche@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-A

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6.

BMP Title: Parking Lots & Street Cleaning

BMP Description:

The City currently brush or vacuum sweeps City owned streets a minimum of twice per year in an effort to reduce the amount of sediment and trash from reaching the storm sewer system. One street sweeping activity will occur in the spring (April-June) on all streets, and the second activity will occur in the fall (September –November) on selected areas (as determined by the City Administrator).

Measurable Goals:

The City will continue recording the frequency and miles of streets that are annually swept, and quantify the amount of trash/debris removed per sweeping occurrence. Success of this BMP is defined as recording two street sweeping occurrences per year.

Responsible Person:

Name:	Mike O'Riley
Title:	Streets
Phone:	(763) 706-3721
Email:	mo'reilly@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-B

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6.

BMP Title: Storm Sewer Inspection Program

BMP Description:

Conduct one inspection of all City-owned ponds and outfalls prior to expiration date of the MS4 General Permit. Annually inspect of 100% of structural pollution control devices. Newly constructed and rebuild structural pollution control devices will be added to the storm sewer map (BMP summary sheet 3-A) and inspected within one year of post construction.

Measurable Goals:

Maintenance and repair specifications and schedules will be developed and implemented as necessary. Success of this BMP will be defined as annually conducting and documenting inspections, repairs, and maintenance projects of all structural pollution control devices.

Responsible Person:

Name:	Mike O'Riley
Title:	Streets
Phone:	(763) 706-3721
Email:	mo'reilly@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-C

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | |

BMP Title: Inspection of All Exposed Stockpiles, Storage, and Material Handling Areas

BMP Description:

City staff will annually locate and inspect all exposed stockpiles and storage/material handling areas on City owned properties. All existing onsite BMP's will be inspected for conformance to NPDES Phase II permit requirements. Any identified erosion control issues will be corrected and documented.

Measurable Goals:

The effectiveness of this BMP will be measured by the frequency of inspections and corrective actions. Success will be defined as locating and inspecting all exposed stockpiles and storage/material handling on City property a minimum of once each year.

Responsible Person:

Name:	Mike O'Riley
Title:	Streets
Phone:	(763) 706-3721
Email:	mo'reilly@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-D

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6 | | |

BMP Title: Structural Stormwater BMP Maintenance Program

BMP Description:

This plan will consist of (at a minimum) training materials and workshops for City staff to help reduce storm water pollution caused from park maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. Document annually number or structures repaired or scheduled for maintenance.

Measurable Goals:

The effectiveness of this BMP will be measured by City staff annually evaluating conformance to the municipal operations pollution prevention plan, and revising (if necessary) the plan components. Success is defined as developing, implementing, and achieving the goals detailed within the plan by the implantation dates described below.

Responsible Person:

Name:	Lauren Letsche
Title:	Stormwater Specialist
Phone:	(763) 706-3709
Email:	lletsche@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-E

Permit Requirements Addressed by this BMP:

Part III.D.6.	Part III.D.6.					

BMP Title: Asset Management System for Record Reporting and Retention

BMP Description:

The City Administrator will retain all records of inspection, maintenance, and corrective actions of the City's storm water system. Records will be available, by request, to the public upon approval by the City Administrator.

Measurable Goals:

The City will record the number of record requests and distributed materials annually. Success will be defined by the City providing the records or materials as requested.

Responsible Person:

Name:	Lauren Letsche
Title:	Stormwater Specialist
Phone:	(763) 706-3709
Email:	lletsche@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-F

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

BMP Title: Evaluation of Inspection Frequency

BMP Description:

The City will retain the records of inspection results and any maintenance performed or recommended. After two years of inspections, if patterns of maintenance become apparent, the frequency of inspections may be adjusted at the discretion of the City's engineering consultant.

Measurable Goals:

The effectiveness of this BMP will be measured by the annual recording of all inspections completed the previous year. Success of this BMP will be defined as annually reviewing the frequency of inspections to the maintenance completed by the City.

Responsible Person:

Name:	Kathy Young
Title:	Asst. City Engineer
Phone:	(763) 706-3704
Email:	kyoung@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-G

Permit Requirements Addressed by this BMP:

Park III.D.6	Part III.D.6.	Part III.D.6.	Part III.D.6.			

BMP Title: Landscape and Lawn Care

BMP Description:

The City will continue to annually review and, if necessary, adjust its current practices in the use of fertilizer, pesticide and herbicide application, mowing and discharge operations, grass clipping collection, mulching and composting.

Measurable Goals:

The City will continue to annually review and adjust (if necessary) its current methods (as previously specified) of landscaping and lawn care maintenance. The City will annually document the results of the review. Success will be defined as annually reviewing and adjusting current practices (if necessary).

Responsible Person:

Name:	Tim Lund
Title:	Parks Foreman
Phone:	(763) 706-3710
Email:	tlund@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-H

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6.

BMP Title: Road Salt Application Review

BMP Description:

The City will review the practices and policies of road salt applications such as alternative products, calibration of equipment, inspection of vehicles and staff training.

Measurable Goals:

The City will record, review, then adjust (if applicable) its practices in salt distribution. Success will be defined as reviewing and adjusting current practices as necessary.

Responsible Person:

Name:	Mike O'Riley
Title:	Streets
Phone:	(763) 706-3721
Email:	mo'reilly@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-I

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

BMP Title: Evaluation of Proposed Stormwater Infiltration Projects for Impacts on Source Water

BMP Description:

If the proposed infiltration/discharge is determined by the City to potentially affect the local drinking water supply, the City will prohibit the construction of the infiltration area or incorporate the necessary BMPs to minimize the identified pollutant(s) prior to infiltrating the vulnerable portions of the drinking water supply management areas (DWSMAs).

Measurable Goals:

The effectiveness of this BMP will be measured by the reduction on pollutants discharged into protected stormwater.

Responsible Person:

Name:	Lauren Letsche
Title:	Stormwater Specialist
Phone:	(763) 706-3709
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BMP PAGE

Implementation Table

Unique Identifying Number: 6-J

Permit Requirements Addressed by this BMP:

Part III.D.6.	Part III.D.6.	Part III.D.6.				

BMP Title: Park and Open Space Training

BMP Description:

Develop written procedures for the existing program to train full-time and seasonal employees on proper use and application of fertilizers and pesticides for maintenance of City lands.

Measurable Goals:

The effectiveness of this BMP will be maintained by holding the training sessions during times of the year when most seasonal employees are present.

Responsible Person:

Name:	Tim Lund
Title:	Parks Foreman
Phone:	(763) 706-3710
Email:	tlund@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-K

Permit Requirements Addressed by this BMP:

Part III.D.6.	Part III.D.6.	Part III.D.6.	Part III.D.6.			

BMP Title: Fleet and Building Maintenance Training Program

BMP Description:

Training focused on automotive maintenance program (automotive inspections and washing), spill cleanup training, hazardous materials training, building leak prevention and inspection training.

Measurable Goals:

The effectiveness of this BMP will be measured by City staff annually attending appropriate training sessions throughout the year that focus on stormwater management within the fleet and building maintenance.

Responsible Person:

Name:	Steve Synoczynski
Title:	Shop Foreman
Phone:	(763) 706-3715
Email:	ssynoczynski@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-L

Permit Requirements Addressed by this BMP:

Part III.D.6.	Part III.D.6.	Part III.D.6.				

BMP Title: Stormwater Systems Maintenance Training Program

BMP Description:

Training focused on parking lot and street cleaning, storm drain systems cleaning, road salt materials management.

Measurable Goals:

The effectiveness of this BMP will be measured by City staff annually attending appropriate training sessions throughout the year that focus on stormwater management.

Responsible Person:

Name:	Mike O'Riley
Title:	Streets
Phone:	(763) 706-3721
Email:	mo'reilly@columbiaheightsmn.gov

BMP PAGE

Implementation Table

Unique Identifying Number: 6-M

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

BMP Title: Spill Prevention & Control Plans for Municipal Facilities

BMP Description:

Ensure that plans describing spill prevention and control procedures are consistent among all departments. Conduct annual spill prevention and response training sessions to all municipal employees. Distribute education materials to each municipal facility by the end of year 2.

Measurable Goals:

A spill prevention and control plan effectively reduces the risk of surface and ground water contamination. However, to be effective, workers must be trained, materials and cleanup equipment available, and procedures followed.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 6-N

Permit Requirements Addressed by this BMP:

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

BMP Title: Facility Inventory

BMP Description:

The City will develop and maintain an inventory of City-owned facilities that contribute pollutants to stormwater discharges. The inventory will include a map of all identified facilities.

Measurable Goals:

The effectiveness of this BMP will be determined by the reduction of pollutants running off of these sites as well as the usability of the inventory.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 6-O

Permit Requirements Addressed by this BMP:

Part III.D.6.	Part III.D.6.	Part III.D.6.				

BMP Title: Pond Assessment Procedures & Schedule

BMP Description:

In year 1, develop procedures for determining TSS and TP treatment effectiveness of city owned ponds use for treatment of stormwater. Implement schedule in year 2-5. The schedule (which may exceed this permit term) shall be based on measureable goals and priorities established by the City.

Measurable Goals:

The effectiveness of this BMP will be measured by the reduction of TSS and TP discharge into the stormwater systems. Success of this BMP will be defined as conducting and documenting inspections, repairs, and maintenance to the stormwater ponds.

Responsible Person:

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BMP PAGE

Implementation Table

Unique Identifying Number: 7-A

Permit Requirements Addressed by this BMP:

Part III.E.

BMP Title: TMDL Review & Implementation

BMP Description:

Columbia Heights will work cooperatively with the Minnesota Pollution Control Agency and other outside organizations to develop and implement all future TMDL implementation plan(s) for impaired waters designated under Section 303(d), receiving MS4 discharges from within or adjacent to the City.

Measurable Goals:

1. Establish a baseline of information– determine what processes are in place and what has already been accomplished (i.e. TMDL studies underway) that will help meet these permit conditions during this MS4 permit cycle.
2. Prepare a written inventory of all impaired waters within the jurisdictional boundaries of the MS4, as well as those outside these boundaries likely to have an impact as a result of receiving stormwater discharge from the MS4; compile as much detail about the stormwater discharges they receive from the MS4 as is available.
3. Prepare a map that includes all impaired waters that the MS4 discharge may impact, all MS4 discharge points that may impact these water(s), and delineated watershed(s) that may contribute to the impairment.
4. Complete for records a written overview of the conclusions reached through this review, including the decision making process used to determine what SWPPP revisions may be needed.
5. Prepare a projected schedule and timeline to incorporate any necessary changes into the SWPPP

Responsible Person:

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Email:	lletsche@columbiaheightsmn.gov

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

MS4 Pond, Wetland, and Lake Inver

Municipal Separate Storm Sewer Syste

Doc Typ

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees
City of Columbia Heights	12/11/2013	02-79P	Lake	Highland Lake	45.05868
City of Columbia Heights	12/11/2013	62-83P	Lake	Silver	45.04394
City of Columbia Heights	12/11/2013	02-80P	Lake	Sullivan Lake	45.06241
City of Columbia Heights	12/11/2013	02-81P	Lake	Hart lake	45.03679
City of Columbia Heights	12/11/2013	02-686W	Wetland	Clover	45.06065
City of Columbia Heights	12/11/2013	02-687W	Wetland	LaBelle	45.04251
City of Columbia Heights	12/11/2013	1	Pond	Maureen Drive	45.04361
City of Columbia Heights	12/11/2013	2	Pond	Karen Lane	45.04205
City of Columbia Heights	12/11/2013	3	Pond	Huset Park Pond	45.03844
City of Columbia Heights	12/11/2013	4	Pond	Sullivan Park Pond 3	45.06100
City of Columbia Heights	12/11/2013	5	Pond	Sullivan Park Pond 1	45.06123
City of Columbia Heights	12/11/2013	7	Pond	Sullivan Park Pond 2	45.06261
City of Columbia Heights	12/11/2013	8	Pond	Public Safety Pond	45.04734
City of Columbia Heights	12/11/2013	9	Pond	Jackson St. Pond	45.04366
City of Columbia Heights	12/11/2013	10	Pond	Grand Ave Pond	45.05558
City of Columbia Heights	12/11/2013	11	Pond	Ostrander Park Pond	45.04062
City of Columbia Heights	12/11/2013	12	Pond	Kordiak Park Pond 2	45.05701
City of Columbia Heights	12/11/2013	13	Pond	Secondary Pond	45.06134
City of Columbia Heights	12/11/2013	14	Pond	Kordiak Park Pond 1	45.0561
City of Columbia Heights	12/11/2013	16	Pond	Hart Lake Pond 1	45.03583
City of Columbia Heights	12/11/2013	17	Pond	Cleveland St.	45.04469
City of Columbia Heights	12/11/2013	18	Pond	Prestemon Park Pond 1	45.03882
City of Columbia Heights	12/11/2013	19	Pond	Silver Lake Boat Landing	45.04296
City of Columbia Heights	12/11/2013	20	Pond	Silver Lake Park Pond 2	45.04629
City of Columbia Heights	12/11/2013	21	Pond	Silver Lake Park Pond 3	45.04679
City of Columbia Heights	12/11/2013	22	Pond	37th Liquor Store	45.03628
City of Columbia Heights	12/11/2013	23	Pond	Comfort of Home Basin	45.03691
City of Columbia Heights	12/11/2013	24	Pond	Columbia Heights HS	45.0528
City of Columbia Heights	12/11/2013	25	Pond	Taco Bell 2	45.05762
City of Columbia Heights	12/11/2013	26	Pond	Taco Bell 1	45.0573
City of Columbia Heights	12/11/2013	27	Pond	4542 Washington	45.05146
City of Columbia Heights	12/11/2013	28	Pond	3942 Van Buren	45.03953

APPENDIX C

Design Standards

Surface Water Management Design Standards

Engineering Department

City of Columbia Heights

March 2016

Prepared by WSB & Associates

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APPENDICES

1. DESIGN OVERVIEW

The City of Columbia Heights' Stormwater Pollution Prevention Plan (SWPPP) identifies the goals and policies that define the City's stormwater management program, which are implemented via the City's Land Use Ordinance (Chapter 9 – Article I: Zoning and Land Development) and these Surface Water Management Design Standards. Columbia Heights' stormwater requirements were written to meet the City's goals to preserve, protect, and manage its water resources as well as to meet federal, state, and watershed stormwater regulations and to meet the following objectives:

- Minimize increases in stormwater runoff rates from any development in order to reduce flooding, siltation and erosion and in order to maintain the integrity of stream channels,
- Minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality,
- Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime to the maximum extent practicable,
- Ensure that these management controls are properly maintained and pose no threat to public safety, and
- Implement stormwater management controls to help meet current and future total maximum daily load (TMDL) goals, to address the need to improve water quality, and to meet objectives in the Local Surface Water Management Plan.

2. DEFINITIONS

For the purpose of these Surface Water Management Design Standards, the following definitions describe the meaning of the terms used in this manual:

Applicant means a property owner or agent of a property owner who has filed an application for a City Permit.

Applicability means any land disturbing activity requiring a City of Columbia Heights Stormwater Management Plan as defined in City Ordinance Chapter 9: Land Use; Article I: Zoning and Land Development.

Channel means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

***Impervious** Area* means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, gravel, driveways, swimming pools, etc.).

***Land Disturbance** Activity* means any activity that changes the volume or peak discharge rate of stormwater runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity that bares soil or rock or involves the diversion or piping of any natural or fabricated watercourse.

Maintenance Agreement means document recorded against the property which provides for long-term maintenance of stormwater treatment practices.

Nonpoint Source Pollution means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

Off-Site Facility means a stormwater management measure located outside the subject property boundary described in the permit application for land development activity.

Redevelopment means any construction activity where, prior to the start of construction, the areas to be disturbed have 15 percent or more of impervious surface(s) (*MPCA, Tech Support Document for Post-Construction Stormwater Management)*.

Responsible Party means the entity which will be responsible for ownership and maintenance of Stormwater Treatment Practices.

Stop Work Order means an order which requires that all construction activity on a site be stopped.

Stormwater Management means the use of structural or non-structural practices that are design to reduce stormwater runoff pollutant loads, discharge volumes, and/or peak discharge rates.

Stormwater Management Plan means a set of drawings or other documents submitted by a person as a prerequisite to obtaining a stormwater management approval, which contains all of the required information and specifications pertaining to Stormwater Management.

Stormwater Reviews means any site that either increases impervious surface by greater than 1 acre or redevelops 1 acre or greater of impervious. The review will be completed to evaluate compliance with NPDES permit requirements. For sites either creating or redeveloping less than 1 acre of impervious the City will work with the applicant to determine if water quality practices can be incorporated into the site. Sites less than 1 acre will also not be allowed their drainage to negatively impact downstream properties (or water bodies).

Stormwater Runoff means flow on the surface of the ground, resulting from precipitation.

Stormwater Treatment Practices (STPs) means measures, either structural or nonstructural, that are determined to be the most effective and practical means of preventing or reducing point source or nonpoint-source pollution inputs to stormwater runoff and waterbodies.

Water Quality Volume (WQ_v) means that runoff storage volume needed to treat the specified phosphorus loading as determined in Columbia Heights' Surface Water Management Design Guidelines.

Watercourse means a permanent or intermittent stream or other body of water, either natural or fabricated, which gathers or carries surface water.

Watershed means the total drainage area contributing runoff to a single point.

3. PROCEDURE FOR REVIEWING STORMWATER MANAGEMENT PLANS

All projects either creating or disturbing 1 acre or greater of new impervious will require the submittal of a Stormwater Management Plan. In lieu of preparation of a Stormwater Management Plan projects disturbing less than 1 acre and down to 10,000 square feet or will result in more than 500 cubic yards of cut or fill are only required to develop an erosion control plan addressing the requirements of Section 6 of these guidelines.

The general review process, from the submittal of the concept and final plans to the issuance of the Stormwater Management Plan approval, is summarized in the following nine steps:

1) Determine what stormwater management provisions apply (stormwater management, erosion control, buffers, floodplain management).

2) What permits, or approvals, are required for the project site, and what waivers and/or exemptions are applicable (COE, DNR, MPCA, Watershed District/Management Organization, WCA, etc.)
3) Determine if the project falls within the Rice Creek Watershed District (RCWD) or the Mississippi Watershed Management Organization (Mississippi WMO).
4) Are the selected practices appropriate for this site?
5) Are the practices designed to meet the minimum performance criteria?
6) Does the Plan meet other resource protection requirements as specified in the City of Columbia Heights Code?
7) Did the applicant submit a letter of credit or cash escrow to cover the estimated cost of site restoration prior to approval? The letter of credit or cash escrow shall be based on $10,000 per acre of gross lot area with $5,000 minimum.
8) Are provisions for long-term maintenance adequate, including access and methods for maintenance defined?
9) Did the applicant install or construct all stormwater management facilities necessary to manage increased runoff so that the two-, ten- and one hundred- year storm peak discharge rates existing before the proposed land alteration shall not be increased and accelerated. Channel erosion shall not occur as a result of the proposed land disturbing or development activity.

4. SUBMITTAL REQUIRMENTS

Requirements for Stormwater Management Plan Approval

Stormwater Management Plan Required

No building or grading permit will be approved unless it includes a Stormwater Management Plan detailing how runoff and associated water quality impacts resulting from the development will be controlled or managed (note the exceptions in Section 3.). This plan must indicate whether stormwater will be managed on-site or off-site and, if on-site, the general location and type of practices.

The Stormwater Management Plan must be signed by a licensed professional engineer in the State of Minnesota, who will verify that the design of all stormwater management practices meet the submittal requirements outlined in the Submittal Checklist found in Appendix A. No building permit, grading permit, or subdivision approval shall be issued until a satisfactory final Stormwater Management Plan, or a waiver thereof, shall have undergone a review and been approved by the City after determining that the plan waiver is consistent with the requirements of this manual.

Stormwater Management Conceptual Plan Requirements (Optional)

A stormwater management concept plan submittal is optional, but highly encouraged. A concept plan identifies basic site information, locations of proposed development features, and preliminary locations and sizing of STPs. The concept submittal has a greater chance of identifying major obstacles and can facilitate alternative stormwater management arrangements in a timely fashion and at the onset of project planning. If a concept plan is submitted for review, it should include sufficient information (e.g., maps, basic hydrologic and water quality calculations etc.) to evaluate the environmental characteristics of the project site. This information should show the potential impacts of all proposed development of the site, both present and future, on the water resources, and show the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The intent of this conceptual planning process is to determine the type of stormwater management of stormwater runoff form future development, and to identify major issues prior to completing final plans. The concept plan is less time consuming and more efficient to evaluate proposed development plans with this step of the review process.

The final plan provides more detailed design information for the proposed STPs, and includes much more detail in terms of hydrologic conditions and site features.

For redevelopment an applicant should include within a concept plan measures for controlling existing stormwater runoff discharges and water quality from the site in accordance with the standards of this Manual. After review of the concept plan and modifications are made to that plan as deemed necessary by the City, a final Stormwater Management Plan may be submitted for approval.

Stormwater Management Plan Requirements (Required)

Record drawings are required for all projects that impact wetlands and/or the floodplain, require water quality ponding, have significant grade changes, and/or have other unusual circumstances. Record drawings must be certified by a professional land surveyor or civil engineer. (Record drawings should not include temporary erosion control measures.)

1. Plan Details

- ☐ north arrow, street names, and lot and block numbers for property or subdivision
- ☐ location of benchmark, based on the City/County benchmark system
- ☐ key with all line types, symbols, shading, and cross-hatching denoted
- ☐ illustration key showing symbols for all information pertaining to lot and building design, including grades, easements, lot and block, setbacks, etc…
- ☐ plan scale (shown graphically on a bar scale) of: 1 inch = 20 feet, 1 inch = 30 feet, 1 inch = 40 feet, or 1 inch = 50 feet. Plans in other scales will not be reviewed.

- ☐ total area of subject property, with subtotals of disturbed **and** undisturbed areas (tabulation permitted)
- ☐ subject property's boundary lines, lot lines and right of way lines
- ☐ all existing and proposed drainage and utility easements
- ☐ all man-made features, including existing and proposed buildings, structures, and paved areas
- ☐ all existing storm sewer facilities within 150 feet of the subject parcel
- ☐ all proposed storm sewer facilities (include grades and size of structures)
- ☐ all existing and proposed natural features including, but not limited to, significant trees and tree lines, wetlands, ponds, lakes, streams, drainage channels, floodplain, etc…
- ☐ show setbacks and buffers for wetlands, ponds, lakes, streams, and floodplains
- ☐ all adjacent plats, parcels, rights-of-way, section lines, extended a minimum of 100 feet (50 feet for single family home construction) beyond the subject parcel in all directions
- ☐ A delineation of all streams, rivers public waters and wetlands located on and immediately adjacent to the site, including any classification given to the water body or wetland by the Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency and/or the United States Army Corps of Engineers.
- ☐ A description of the soils of the site, including a map indicating soil types of areas of critical erosion to be disturbed as well as a soil report containing information on the suitability of the soils for the type of development proposed and describing any remedial steps to be taken by the developer to render the soils suitable.

2. Topography

- ☐ topography details in a minimum of two-foot contour intervals with existing contours as **dashed lines** and proposed contours as dark, **solid lines**, labeled at each edge of the plan and at other appropriate locations
- ☐ standard lot benching detail, where appropriate (maximum slopes: 3:1)
- ☐ direction arrows indicating swales and lot drainage patterns (show percent grades along drainage swales on plan)

3. Elevation Information

- ☐ proposed top of curb elevations at lot corners and driveway or entrances
- ☐ finished spot elevations at all high and low points
- ☐ proposed elevations at garage and lowest floor for proposed buildings
- ☐ proposed finished ground elevations around home for final grading

4. Temporary Erosion Control Best Management Practices (BMPs)

Show location of all structural erosion control measures (with standard detail plates and maintenance information for each), including, but not limited to:

- ☐ temporary rock entrance/exit for all vehicle access points (show on plan and provide detail)
- ☐ perimeter silt fence; silt fence and/or bale checks should also be placed along swales or slopes greater than 50 feet in length (flare ends of silt fence up slope)
- ☐ storm sewer inlet filters (indicate type and show graphically on plan at each location)
- ☐ temporary sediment basins
- ☐ erosion control mats, fiber blankets, netting, temporary seed, or temporary mulch. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
- ☐ soil stockpile areas (indicate temporary stabilization measures)
- ☐ **Street Sweeping Required**

Plans must include a note indicating that all adjacent streets will be swept daily, or as directed by the City, to remove all accumulated materials. Failure to perform any street sweeping within six hours of notice by the City will result in the work being performed by the City and all associated costs billed. The City also requires removal of accumulated materials on streets during winter.

5. Final Stabilization

New resident construction requires vegetated stabilization from the front curb line to the back of the structure for the entire width of the lot. Show seeding and/or turf establishment locations and specifications, including:

- ☐ type of seeding (permanent, temporary, dormant)
- ☐ seed type and application rate
- ☐ fertilizer type and application rate
- ☐ mulch type, application rate, and method of anchoring
- ☐ specifications for installation and maintenance of erosion control mats, blankets, or netting
- ☐ note requiring seeding/restoration to be completed within 48 hoursof final grading
- ☐ location of all areas to be vegetated

6. Tree Preservation

Show the following standards when trees are shown for removal or preservation.

- ☐ Identify, tally, and locate all significant trees on site (tally and show graphically on plan).
- ☐ Identify, tally, and locate all significant tree removals on site (tally and show graphically on plan).
- ☐ Show location of all tree preservation fencing required by ordinance specifications (heavy-duty silt fence can also be used for tree protection).

5. LIST OF ACCEPTABLE PRACTICES

In the development of the STP appropriate for the development or redevelopment, infiltration (water quality volume) is foremost in importance to apply in the design. Filtration is warranted when site conditions do not allow for an effective infiltration facility. For flooding or rate control, detention systems are typically the preferred practice. Low Impact Design (LID) practices are encouraged when they can be functionally incorporated into the design. Alternative practices may be approved at the discretion of the City Engineer. For when infiltration is not feasible the STPs proposed shall meet the performance identified in the *Minnesota Stormwater Manual*:

Volume Control Systems:

- Infiltration trench
- Infiltration basin
- Raingarden
- Underground storage
- Reuse
- Green Roofs
- Trees/Tree Planters

Filtration Systems:

- Surface sand filter
- Underground sand filter
- Perimeter sand filter
- Organic filter
- Bioretention system
- Raingarden with underdain
- Pervious pavement with underdrain
- Underground storage with underdrain

- Tree trench

Detention Systems:

- Wet pond
- Stormwater re-use systems
- Multiple pond systems
- Extended detention basin
- Micro-pool extended detention basin
- Dry detention ponds
- Underground storage
- Other, as approved by the City of Columbia Heights

Wetlands:

- Shallow wetland
- Pond/wetland systems

Open Channel Systems:

- Dry swale
- Wet swale
- Grass swale
- Natural channel, or stream

6. CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

1. Erosion Control

1. The Permittee must plan for and implement appropriate construction phasing vegetative buffer strips, horizontal slope grading, and other construction practices to minimize erosion. All areas not to be disturbed shall be marked (e.g. with flags, stakes, signs, silt fence etc.) on the project site before any work begins.
2. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
3. Additional BMPs together with enhanced runoff controls are required for discharges to special waters and impaired waters. The BMPs identified for each special or impaired water are required for those areas of the project draining to a

discharge point on the project that is within one mile of a special or impaired water and flows to that water.

4. The permittee must stabilize the normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connecting to a surface water or property edge.
5. Pipe outlet must have temporary or permanent energy dissipation before connecting to surface water.
6. When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.
7. All areas disturbed during construction must be restored as detailed in these requirements. The type of permanent restoration shall be clearly shown on the plans including but not limited to sod, seed, impervious cover and structures. A minimum of 6 inches of topsoil must be installed prior to permanent restoration. Areas in which the top soil has been placed and finish graded or areas that have been disturbed and other grading or site building construction operations are not actively underway must be temporary or permanently restored as set forth in the following requirements.
    1) Areas with slopes that area less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.
    2) Areas with slopes that area greater or equal to 3:1 must be seeded and erosion control blanket placed within 14 days of the area not being actively worked.
    3) All seeded area must be either mulched and disc anchored, hydro- mulched, or covered by erosion control blanket to reduced erosion and protects the seed. Temporary or permanent mulch must be disc anchored and applied at a uniform rate of 2 tons per acre and have 90% coverage.
    4) If the disturbed area will be re-disturbed within a six month period, temporary vegetative cover shall be required consisting of an approved seed mixture and application rate.
    5) If the disturbed area will not be re-disturbed within a six month period, permanent vegetative cover shall be required consisting of an approved seed mixture and application rate.
    6) All areas that will not have maintenance done such as mowing as part of the final design shall be permanently restored using an approved seed mixture and application rate.
    7) Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.

8. All erosion control measures must be maintained for the duration of the project until final stabilization has been achieved in accordance with Section 1.7. If construction operations or natural events damage or interfere with any erosion control measures, they shall be restored to serve their intended function.
9. Additional erosion control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements

2. <u>Sediment Control Practices</u>

1. Sediment control practices must be established on all down gradient perimeters before any upgradient land disturbing activities begin. These practices must remain in place until final stabilization has been achieved.
2. If down gradient treatment system is overloaded additional up gradient sediment control practices must be installed to eliminate overloading. The SWPPP must be amended to identify the additional practices.
3. All storm drain inlets must be protected by approved BMPs during construction until all potential sources for discharge have been stabilized. These devices must be maintained until final stabilization is achieved. Inlet protection may be removed if a specific safety concern (street flooding/freezing) has been identified.
4. Temporary stockpiles must have silt fence or other effective sediment controls on the down gradient side of the stockpile and shall not be placed at least twenty five (25) feet from any road, wetland, protected water, drainage channel, or storm water inlets. Stockpile left for more than fourteen (14) days must be stabilized with mulch, vegetation, tarps or other approved means.
5. Vehicle tracking of sediment from a project shall be minimized by approved BMPs. These shall be installed and maintained at the City approved entrances. Individual lots shall each be required to install and maintain entrances throughout the construction building until a paved driveway is installed.
6. Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.
7. Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.
8. Silt fence or other approved sediment control devices shall be required along the entire curb line, except for approved opening where construction entrance will be installed or drainage flows away from curb. This device must be maintained until final stabilization is achieved. Ditch checks shall be required in ditch bottoms. Spacing for the check must be as followed:[***Height in feet*** (of the sediment device used)] ***X 100 / Slope Gradient***

9. Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.
10. Flows from diversion channels or pipes (temporary or permanent) must be routed to sedimentation basins or appropriate energy dissipaters to prevent the transport of sediment to outflow or lateral conveyors and to prevent erosion and sediment buildup when runoff flows into the conveyors.
11. A concrete washout shall be installed on projects that require the use of concrete. All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A sign must be installed adjacent to each washout facility to inform operators to utilize the proper facilities.
12. All sediment control measures shall be used and maintained for the duration of the project until final. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.
13. Additional sediment control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements.
14. Restrict clearing and grading within 20 feet of an existing wetland boundary to provide for a protective buffer strip of natural vegetation.

3. Waterway and Watercourse Protection

1. A temporary stream crossing must be installed and approved by the local government unit and regulating agency if a wet watercourse will be crossed regularly during construction.
2. The watercourse channel shall be stabilized before, during, and within 24 hours after any in-channel work.
3. No in-water work shall be allowed in Public Waters during the MnDNR's work exclusion dates.
4. Prior to placement of any equipment into any waters, all equipment must be free of aquatic plants and non-native animals.
5. All on-site stormwater conveyance channels designed according to the criteria outlined in this document. Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels is required.

4. Temporary Sediment Basins

1. A temporary sediment basin (or permanent) shall be provided when 10 or more acres of disturbed soil drain to a common location prior to the runoff leaving the

site or entering surface waters. The Permittee is also encouraged, but not required to install temporary sediment basins in areas with steep slope or highly erodible soils even if the area is less than ten (10) acres and it drains to one common area. The basins shall be designed and constructed according to the following requirements.

1) The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2-year, 24-hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1,800 cubic feet of storage below the outlet pipe from each acre drained to the basin.
2) Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin shall be provided where attainable until final stabilization of the site.
3) Temporary basin outlets will be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.
4) Temporary (or permanent) basins must be constructed and made operational concurrent with the start of soil disturbance that is up gradient of the area and contributes runoff to the pond.
5) Where the temporary sediment basin is not attainable due to site limitations, equivalent sediment controls such as smaller sediment basins, and/or sediment traps, silt fences, vegetative buffer strips or any appropriate combination of measures are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. In determining whether installing a sediment basin is attainable, the Permittee must consider public safety and may consider factors such as site soils, slope, and available area on site. This determination must be documented in the SWPPP.
6) The Permittee shall maintain the sedimentation basins and will remain functional until an acceptable vegetative cover is restored to the site, resulting in a pre-development level rate of erosion. The city will not issue building permits for lots containing sediment basins until they have been removed or relocated based on the projects restoration progress.
7) Basins designed to be used for permanent stormwater management shall be brought back to their original design contours prior to acceptance by the City.

5. Dewatering and Basin Draining

1. If water cannot be discharged into a sedimentation basin before entering a surface water it must be treated with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners. The Permittee must make sure discharge points are appropriately protected from erosion and scour. The discharge must be dispersed over riprap, sand bags, plastic sheeting or other acceptable energy dissipation measures. Adequate sediment control measures are required for discharging water that contains suspended soils.
2. All water from dewatering or basin draining must discharge in a manner that does not cause nuisance conditions, erosion in receiving channels, on down slope properties, or inundation in wetlands causing significant adverse impact to wetlands.

6. Inspections and Maintenance

1. The Permittee shall be responsible for inspecting and maintenance of the BMPs
2. The Permittee must routinely inspect the construction project once every seven (7) days during active construction and within 24-hours of a rainfall event of 0.5 inches or greater in 24-hours.
3. All inspections and maintenance conducted during construction must be recorded in writing and must be retained with the SWPPP. Records of each inspection and maintenance activity shall include:
    1) Date and time of inspection.
    2) Name of person(s) conducting the inspections.
    3) Findings of inspections, including recommendations for corrective actions.
    4) Corrective actions taken (including dates, times, and the party completing the maintenance activities).
    5) Date and amount of all rainfall events 0.5 inches or greater in 24-hours.
    6) Documentation of changes made to SWPPP.
4. Parts of the construction site that have achieved final stabilization, but work continues on other parts of the site, inspections of the stabilized areas can be reduced to once a month. If work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs or prior to resuming construction, which ever happens first.
5. All erosion and sediment BMPs shall be inspected to ensure integrity and effectiveness. All nonfunctional BMPs shall be repaired, replaced or supplemented with a functional BMP. The Permittee shall investigate and comply with the following inspection and maintenance requirements.

6. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/2 of the height of the fence. These repairs shall be made within 24-hours of discovery, or as soon as field conditions allow access.
7. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72-hours of discovery, or as soon as field conditions allow access.
8. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The Permittee shall remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The Permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization shall take place within 7 calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work.
9. Construction site vehicle exit locations shall be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment shall be removed from all off-site paved surfaces, within 24 hours of discovery, or if applicable, within a shorter time.
10. The Permittee is responsible for the operation and maintenance of temporary and permanent water quality management BMPs, as well as all erosion prevention and sediment control BMPs, for the duration of the construction work at the site. The Permittee is responsible until another Permittee has assumed control over all areas of the site that have not been finally stabilized or the site has undergone final stabilization, and a NOT has been submitted to the MPCA.
11. If sediment escapes the construction site, off-site accumulations of sediment shall be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in streets could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).
12. All infiltration areas shall be inspected to ensure that no sediment from ongoing construction activities is reaching the infiltration area and these areas are protected from compaction due to construction equipment driving across the infiltration area.

7. Pollution Management Measures/Construction Site Waste Control

1. The Permittee must implement the following pollution prevention management measures on the site.
    1) Solid Waste – Collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with MPCA disposal requirements.
    2) Hazardous Materials such as oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas shall be provided to prevent vandalism. Storage and disposal of hazardous waste shall be in compliance with MPCA regulations.
    3) External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff shall be contained and waste properly disposed of. No engine degreasing is allowed on site.
    4) The City of Columbia Heights prohibits discharges of any material other than stormwater, and discharges from dewatering or basin draining activities. Prohibited discharges include but are not limited to vehicle and equipment washing, maintenance spills, wash water, and discharges of oil and other hazardous substances.
    5) The Permittee must comply with all other pollution prevention/good housekeeping requirements of the MPCA NPDES Construction General Permit.

8. <u>Final Stabilization</u>

1. The Permittee must ensure final stabilization of the project. Final stabilization can be achieved in one of the following ways.
2. All soil disturbing activities at the site have been completed and all soils will be stabilized by a uniform perennial vegetative cover with a density of at least 70 percent over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;
    1) All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion; and
    2) All temporary synthetic, and structural erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization; and
    3) The Permittee must clean out all sediment from conveyances and from temporary sedimentation basins that are to be used as permanent water quality management basins. Sediment must be stabilized to prevent it from washing back into the basin, conveyances or drainage ways discharging off-site or to

surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

3. For residential construction only, final stabilization has been achieved when:
   1) Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner.
   2) The Permittee must distribute the MPCA "homeowner factsheet" to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

9. Training

1. The SWPPP must provide a chain of command showing who prepared the SWPPP, who is responsible for the management of the construction site and inspections.
2. The training shall consist of a course developed by a local, state or federal agency, professional organization, water management organization, or soil and water conservation district and must contain information that is related to erosion prevention, sediment control, or permanent stormwater management and must relate to the work that you are responsible for managing.

7. GUIDANCE ON STORMWATER TREATMENT PRACTICES (STPS)

Designers are expected to follow the requirements of this section to meet volume control, water quality, and water quantity requirements of the City of Columbia Heights. Designs should meet the stormwater design standards of these Surface Water Management Design Guidelines and the *Minnesota Stormwater Manual*. Deviations from recommended guidance in the *Minnesota Stormwater Manual* will require detailed written explanation. Approval of any deviation from the *Minnesota Stormwater Manual* guidance will be at the discretion of the City.

8. BASIC SIZING CRITERIA

Proposed Stormwater Management Plans must incorporate Volume Control, Water Quality Control, and Rate Control as the basis for stormwater management in the proposed development plan. The City of Columbia Heights, as a permitted MS4, requires for new development projects to have a no net increase from pre-project conditions of total volume, TSS, and TP; in addition, for redevelopment projects within the city, it is required to have a net reduction from pre-project conditions of total volume, TSS and TP.

1. Volume Control Requirements

Volume control measures are required on projects to meet the water quality criteria of the Mississippi WMO and RCWD's Surface Water Management Plan and Rules, and to meet the requirements of the City of Columbia Heights' MS4 Permit obligations. Volume control shall be required for proposed net new impervious areas greater than 1 acre. If an applicant can demonstrate that the volume control standard has been met, then the water quality sizing criteria shall be considered satisfied.

[For specific RCWD volume control requirements, please refer to the RCWD website.

The RCWD requires a stormwater management permit for subdivision of an area exceeding one acre. A permit is also required for development, other than Public Linear Projects, that creates or reconstructs 10,000 square feet or more of impervious surfaces. For Public Linear Projects, a permit is required to create or reconstruct 10,000 square feet or more of impervious surface through multiple phases or connected actions of a single complete project, as defined by the RCWD, within a Resource of Concern Drainage Area.

2. Volume Control Calculations

Depending on applicability, a proposed development shall capture and retain on site 1.0 inches of runoff from the net new impervious surfaces in post-construction conditions and at a minimum as per the requirements of the NPDES Construction General Permit. For projects less than 1 acre the City encourages applicants to incorporate volume control or the water quality provisions to the extent feasible. For linear projects not increasing the extent of the impervious the goal is to reduce the runoff rate, water quality loadings, and volume.

The RCWD requires water quality treatment volume for all projects, except Public Linear Projects.

For projects where it is not feasible to meet the volume reductions requirements it will be required to meeting the water quality requirements of these engineering guidelines.

Infiltration is infeasible when:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under and NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
- Where vehicle fueling and maintenance occur.
- 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.
- Where high levels of contaminant in soil or groundwater will be mobilized by the infiltrating stormwater.

For areas where infiltration is prohibited the applicant shall consider alternative volume reduction BMPs and the water quality volume must be treated by a wet sedimentation basin, filtration system, regional ponding or similar method prior to the release of stormwater to surface water.

For linear projects with lack of right-of-way, easements or other permissions from property owners to install treatments systems that are capable of treating the total water quality volume on site, the project must maximize treatment through other methods or combination of methods before runoff is released to nearby surface waters. Alternative treatment options include: grassed swales, filtration systems, smaller ponds, or grit chambers. In all circumstances, a reasonable attempt must be made to obtain right-of-way during the project planning and all attempts of infeasibility must be recorded.

The City may restrict the use of infiltration features to meet post-construction requirements for stormwater management, without higher engineering review, if the infiltration techniques will be constructed in the following areas where:

- Soils are predominately Hydrologic Soil Group D (clay) soils.
- Drinking Water Supply Management Areas are present, as defined by Minn. R. 4720.51000, subp.13, unless precluded by a local unit of government with an MS4 permit.
- Soil infiltration rates are more than 8.3 inches per hour unless soils are amended to flow the infiltration rate below 8.3 inches per hour.

In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the City may authorize lesser volume control for the following situations:

- If the project meets one of the limitations outlined above; and
- If the permittee implements to the maximum extent possible other volume reduction practices, besides infiltration, on the site but may not meet the requirements for post-construction stormwater management.

3. Water Quality Control

The water quality control standard shall be considered satisfied if the volume control standard has been satisfied. In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the proposed STP will need to maintain the TSS and TP loading for new development, and for redevelopment the goal is to reduce the TSS and TP loadings (MS4 Permit).

Under certain circumstances, some construction projects cannot meet the TSS and/or TP reduction requirements for new or redevelopment projects on the site of the original construction. All methods must be exhausted prior to considering alternative locations where TSS and TP treatment standards can be achieved. After all methods have been exhausted, the permittee will be required to identify alternative locations where TSS and TP treatment standards can be achieved. Mitigation projects will be chosen in the following order of preference:

- Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
- Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity
- Locations in the next adjacent DNR catchment area up-stream
- Locations anywhere within the City of Rosemount
- Mitigation projects shall involve the establishment new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP.
- Previously required routine maintenance of structural stormwater BMPs cannot be considered mitigation.
- Mitigation projects must be finished within 24 months after the original construction activity begins.

- A maintenance agreement specifying the responsible party for long-term maintenance shall be identified.
- Payments in lieu of the construction project meeting the TSS and TP treatment standards will be accepted; however, the monies received must be applied to a public stormwater project. The amount of monetary contribution shall be based on $XX.XX per square foot of total impervious surface area (existing & proposed) on the subject property.

4. Rate Control

1. At a minimum, detention basins should maintain existing flow rates for the 2, 10, and 100-year 24-hour rainfalls in accordance to the Atlas14 data as shown in the table below:

Event	Rainfall/Snowmelt Depth (inches)
2-year, 24 hour	2.84
10-year, 24 hour	4.25
100-year, 24 hour	7.38
100-year, 10 day snowmelt	10.1

2. Detention basins shall be designed with capacity for the critical 100-year event, which is defined as the 100-year event that produces the highest water level among a 24 hour rainfall event or the 10-day snowmelt runoff event.
3. The maximum duration for rainfall critical event analysis shall be 24-hours except in cases where basins are landlocked, where back to back 24-hour events and the 10-day snowmelt runoff event shall also be used. In all cases a hydrograph method of analysis should be used. For the 24-hour rainfall event, or back to back 24-hour rainfall events, an SCS Type II distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.
4. All drainage system analyses and designs shall be based on proposed full development land use patterns.
5. Development adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):
    1) Three feet above the HWL determined by modeling back to back 100-year, 24-hour events,
    2) Three feet above the highest known water level, or
    3) Five feet above the HWL determined by modeling a single 100-year, 24-hour event.

6. When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey.
7. For basins with a suitable outlet, freeboard will be 2-feet above the HWL determined by modeling the 100-year critical event. Emergency overflows a minimum of 1.5 feet below lowest ground elevation adjacent to a structure should also be provided.
8. Adjacent to channels, creeks, and ravines freeboard will also be 2-feet to the 100-year critical event elevation.
9. A Type II 24-hour rainfall distribution with average antecedent moisture conditions should be utilized for runoff calculations.
10. The recommended minimum outlet diameter is 6 inches due to plugging susceptibility and may supersede the rate control requirement for the 2-year event.
11. City standard detail plates should be utilized for pond outlet structures. Outlet structures should be designed in three phases with primary outlet structure and secondary overflow structure routed to the storm sewer and a defined emergency overflow as the tertiary outlet structure.

5. Freeboard

Elevation separations of buildings with respect to ponds, lakes, streams, and stormwater features shall be designed as follows:

1. At least two feet of vertical separation is required from the low opening elevation above the 100-year high water elevation and DNR Ordinary High Water level (if applicable) for the area providing the structure is flood proofed in accordance with Chapter 13 of the City Code. If the structure is not flood proofed in accordance with the requirements of the RCWD then the freeboard requirements will be set by the low floor elevation. In areas where this separation is not or cannot be provided, additional analysis is required showing that the 100-year back-to-back storm event does not affect adjacent homes.
2. Drainage easements and outlots for ponds, lakes, wetlands, streams, etc., shall encompass an area to the calculated two foot above the 100-year HWL.

6. Floodplain Management

The City prohibits filling activities within the 100-Year floodplain the will cause an increase in the stage of the 100-year or regional flood or cause in increase in the flood damages in the reach affected unless compensatory storage is provided and/or channel improvement is provide that will not result in the flood stage. Filling within the floodway is prohibited unless the filling meets FEMA, DNR, and Watershed

District/Management Organization requirements. Applications proposing to alter the floodplain shall submit the following:

1) Cut/fill diagrams along with calculations demonstrating that the filling or alteration of the floodplain is not resulting in a reduction in the flood stage/storage.

7. Buffers

Buffers are required adjacent to wetlands and encouraged adjacent to streams and lakes for projects requiring a stormwater management plan.

1. The following standards shall guide the creation or restoration of buffers to achieve the goals and policies of the RCWD's Surface Water Management Plan. The Administrator may modify or waive standards depending on each project Site and goals for the wetland.
2. The buffers zones are as follows:
   a. Stream (measured from top of bank) – 25 feet
   b. Lakes (measured from delineated OHWL)
      i. Natural environment lake - 100 feet
      ii. Recreational development lake – 50 feet
      iii. General development lake – 25 feet
   c. Wetlands: Buffers based on a MnRAM classification or similar classification system will be as follows (measured from the delineated wetland edge):
      i. Preserve – 75 feet average and minimum of 50 feet
      ii. Manage 1 – 50 feet average and minimum of 30 feet
      iii. Manage 2 or 3 – 25 feet average and a minimum of 15 feet
   d. The use of a meandering buffer strip to maintain a natural appearance is encouraged in areas of flat topography.
   e. An access corridor, not to exceed 20 feet in width or 20 percent of the buffer edge, whichever is less, is permitted.
   f. Accessory structures intended to provide access to Wetlands such as stairways and docks are permitted in the access corridor.
   g. The buffer may be placed in a conservation easement.
   h. Monuments identifying the conservation easement, designed in accordance with City standards, should be placed every 100 feet to delineate the buffer edge and at intersections with property lines.
   i. Buffer strip vegetation should be appropriate to the goals for the water body. Where acceptable natural vegetation exists in buffer strip areas, the retention of such vegetation in an undisturbed state is preferred. The Minnesota PCA's manual "Plants for Stormwater Design: Species Selection for the Upper Midwest" provides guidance on buffer plant selection.

8. Shoreland Management

The City of Columbia Heights has an established adopted shoreland management (Ordinance No. 1550: Shoreland Management). The City code has established setbacks for placement of structures and impervious and also requirements for shoreland alterations. The City also encourages the following for work occurring within the shoreland zone:

1. Encourage the use of natural vegetation or bioengineering techniques for the stabilization of shorelines.
2. Use materials such as granite or fieldstone for shoreline stabilization project where hard armoring is necessary.
3. Encourage the use of techniques that will minimize runoff and improve water quality associated with new development and redevelopment. When possible use existing natural drainage ways, wetlands, and vegetated soil surfaces to convey, store, filter, and retain stormwater runoff before discharge to public waters. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference shall be given to designs using surface drainage, vegetated filter strips, bioretention areas, rainwater gardens, enhanced swales, off-line retention areas, and natural depressions for infiltration rather than buried pipes and human-made materials and facilities (*MnDNR Alternative Shoreland Standards, 2005)*.

9. Long Term Inspection and Maintenance of Stormwater Facilities

1) No private stormwater facilities may be approved unless a maintenance plan is provided that defines how access will be provided, who will conduct the maintenance, the type of maintenance and the maintenance intervals. At a minimum, all private stormwater facilities shall be inspected annually and maintained in proper condition consistent with the performance goals for which they were originally designed and as executed in the stormwater facilities maintenance agreement.
2) Access to all stormwater facilities must be inspected annual and maintained as necessary. The applicant shall obtain all necessary easement or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the City of Columbia Heights.
3) All settled materials including settled solids, shall be removed from ponds, sumps, grit chambers, and other devices, and disposed of properly.

9. STORMWATER TREATMENT PRACTICE DESIGN STANDARDS

1. Storm Sewers

1. Manhole spacing shall not exceed 400 feet.
2. Where more than one pipe enters a structure, a catch basin/manhole shall be used.
3. Storm sewer pipe should match top of pipe on top of pipe unless grade constraints prevent this. In that case, hydraulic calculations will be necessary to verify that excessive surcharging will not occur.
4. Stormwater pipes shall be designed utilizing the Rational Method. Channel design shall be hydrograph method only. All methods are subject to the City Engineer's approval.
5. Lateral systems shall be designed for the 10-year rainfall using the Rational Method. State Aid roadway storm sewer shall be designed per the State Aid requirements.
6. The minimum full flow velocity within the storm sewer should be 3 feet per second (fps). The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to 6fps.
7. Trunk storm sewer should be designed at a minimum to carry 100-year pond discharge in addition to the 10-year design flow for directly tributary areas. The following table shall be used for the calculation of peak rates using the Rational Method:

Cover Type	10-Year Runoff Coefficient
Single-family Residential	0.4
Multi-family Residential	0.5
Commercial	0.7
Industrial	0.7
Parks, Open Space	0.2
Ponds, Wetlands	1.0

8. For storms greater than the 10-year event, and in the case of plugged inlets, transient street ponding will occur. For safety reasons, the maximum depth in streets should not exceed 1.5 feet at the deepest point.
9. To promote efficient hydraulics within manholes, manhole benching shall be provided to 1/2 diameter of the largest pipe entering or leaving the manhole.
10. Vaned grate (3067V) catch basin castings shall be used on all streets.
11. The maximum design flow at a catch basin for the 10-year storm event shall be three (3) cubic feet per second (cfs), unless high capacity grates are provided.

Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.

12. All structures located in the street are to be a minimum of four feet deep (rim to invert) and a minimum of three feet deep elsewhere. Two-by-three catch basins are to be four (4) feet deep.

2. Outlet and Inlet Pipes

1. Inlet pipes of stormwater ponds shall be extended to the pond normal water level whenever possible.
2. Outfalls with velocities greater than 4 fps into channels, where the angle of the outfall to the channel flow direction is greater than 30 degrees, requires energy dissipation or stilling basins.
3. Outfalls with velocities of less than 4 fps, that project flows downstream into a channel in a direction 30 degrees or less from the channel flow direction, generally do not require energy dissipaters or stilling basins, but will require riprap protection.
4. In the case of discharge to channels, riprap shall be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. Riprap shall be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate though the riprap and reduce its stability. Riprap shall be placed to a thickness at least 2.5 times the mean rock diameter to ensure that it will not be undermined or rendered ineffective by displacement. If riprap is used as protection for overland drainage routes, grouting may be recommended.
5. Discharge velocity into a pond at the outlet elevation shall be 6 fps or less. Riprap protection is required at all inlet pipes into ponds from the NWL to the pond bottom.
6. Where outlet velocities to ponds exceed 6 fps, the design should be based on the unique site conditions present. Submergence of the outlet or installation of a stilling basin approved by the City is required when excessive outlet velocities are experienced.
7. Submerged outlet pipes from ponds are not allowed.

3. Channels and Overland Drainage

1. Overland drainage routes where velocities exceed 4 fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.
2. Open channels and swales are recommended where flows and small grade differences prohibit the economical construction of an underground conduit.

Open channels and swales can provide infiltration and filtration benefits not provided by pip.

3. The minimum grade in all unpaved areas shall be 2%.
4. Maximum length for drainage swales shall be 400 feet.
5. Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable.
6. Riprap shall be provided at all points of juncture, particularly between two open channels and where storm sewer pipes discharge into a channel.
7. Open channels should be designed to handle the expected velocity from a 10-year design storm without erosion. Riprap may need to be provided.
8. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels shall be designed to allow easy access for equipment.

4. Ponds

1. The following should be considered minimum design criteria for ponds. Where on site water quality detention basins are provided copies of the calculations determining the design of the basins must be provided. The size and design considerations will be dependent on the receiving water body's water quality category, the imperviousness of the development and the degree to which on site infiltration of runoff is encouraged. Design of on-site detention basins, as described in the site's runoff water management plan, shall incorporate recommendations from the nationwide urban runoff program (NURP) and "Protecting Water Quality In Urban Areas", published by the Minnesota pollution control agency, as adopted by the city, or the applicable publications, as adopted by the city. The following design considerations are for on-site water quality detention basins based on the receiving water's water quality category. These designs include permanent detention for water quality treatment; extended detention designs may be substituted provided that they provide treatment equivalent to the requirements of this section.
2. A permanent pool (dead storage) volume below the normal outlet shall be greater than or equal to the runoff from a two and one-half inch (2.5") 24-hour storm over the entire contributing drainage area assuming full development.
3. Maximum allowable pond slopes above the outlet elevation are 4:1.
4. All constructed ponds and wetland mitigation areas shall have an aquatic or safety bench around their entire perimeter. The aquatic bench is defined as follows:
    a. Cross-slope no steeper than 10:1.
    b. Minimum width 10 feet.
    c. Located from pond outlet elevation to one foot pond outlet elevation.

5. All constructed ponds shall be provided a maintenance access from an adjacent roadway. The maintenance access shall be provided in the form of an easement no narrower than 20 feet. The maintenance access shall have a longitudinal slope no steeper than 6:1 and minimal cross slope. Maintenance access routes, due to their extra width, also serve well as emergency overflow (EOF) routes.
6. All constructed ponds and wetland mitigation areas shall have a maintenance access bench around sufficient perimeter to provide access to all inlets and outlets. The maintenance bench shall be located within a designated outlot or within a permanent easement. The maintenance bench shall extend from the outlet elevation to one foot above the outlet elevation and its cross slope shall be no steeper than 10:1. The maintenance bench shall connect to the maintenance access.
7. Maximum pond wet volume depth is 8 feet.
8. Mean depth for wet ponds shall be a minimum of 4 feet. If the pond is smaller than 3 acre-feet in volume, mean depths of 3 to 4 feet may be used. Mean depth is defined as the area at outlet elevation divided by the wet volume.
9. All ponds shall be graded to one foot below design bottom elevation. This "hold down" allows sediment storage until site restoration is complete.
10. The top berm elevation of ponds shall be a minimum of one foot above the 100-year pond HWL.
11. Grading shall not block or raise emergency overflows from adjoining properties unless some provision has been made for the runoff that may be blocked behind such an embankment.
12. All ponds shall have a protected EOF that is a minimum of 2 feet below the lowest building opening.

5. <u>Infiltration/Filtration Practices</u>

1. Sizing of filtration/infiltration practices, or STPs, shall be in conformance with the volume control requirements of this manual and the *Minnesota Stormwater Manual*.
2. When designing an infiltration practice for volume control and water quality management, on-site testing and detailed analysis are strongly encouraged in order to determine the infiltration rates of the proposed infiltration facility. Documented site-specific infiltration or hydraulic conductivity measurements (double-ring infilitrometer) completed by a licensed soil scientist or engineer is required. In the absence of a detailed analysis, the saturated infiltration rates listed in the Infiltration Rates for Infiltration STPs table found on the *Minnesota Stormwater Manual* shall be used. A piezometer shall be installed in order to ascertain the level of the local groundwater table and demonstrate at least three feet of separation between the bottom of the proposed facility and the

groundwater. The soil boring is required to go to a depth of at least five feet below the proposed bottom of the STP. The soils shall be classified using the Unified Soil Classification system. The least permeable soil horizon will dictate the infiltration rate. Infiltration practices shall be designed to infiltrate the required runoff volume within 48 hours.

3. Pretreatment, in the form of ponds, forebays, filter strips, or other approved methods, shall be provided for all infiltration areas. Pretreatment upstream of volume management practices is a key element in the long-term viability of infiltration areas. The level of pretreatment varies largely depending on the STP and drainage area RCWD, Mississippi WMO, City staff, and *Minnesota Stormwater Manual* recommendations shall be utilized for determining the appropriate level of pretreatment on a case-by-case basis.
4. The infiltration practice shall not be used within fifty feet of a municipal, community or private well, unless specifically allowed by an approved wellhead protection plan.
5. The infiltration practice shall not be used for runoff from fueling and vehicle maintenance areas and industrial areas with exposed materials prosing contamination risk, unless the infiltration practice is designed to allow for spill containment.
6. The infiltration practice shall not be used in Hydrologic Soil Group (HSG) D soils without soil corrections.
7. Vegetation of infiltration/filtration practices shall be as shown in the City of Columbia Heights Standard Details. A plan for management for vegetation shall be included in the Stormwater Pollution Prevention Plan.
8. If soils are unsuitable for infiltration, then filtration may be used with drain tile, provided in accordance with the City of Columbia Heights Standard Details.
9. Subgrade soils for infiltration/filtration practices shall be as presented in the City of Columbia Heights Standard Details. Assume a 40% void ratio for clean washed rock and 20% for construction sand for the purposes of volume calculations.
10. Rock storage beds shall be constructed using crushed angular granite that has been thoroughly washed to remove all fine particles that could result in clogging of the system.
11. For infiltration benches adjacent to ponds, benches shall have slopes no steeper than 5:1 over the proposed infiltration zone. A slope of 10:1 is preferred. The *Minnesota Stormwater Manual* cites concerns with locating infiltration features immediately adjacent to ponds. To address this, benches shall be located to maintain hydraulic separation from the saturated zone of the pond in order to minimize the loss of infiltration potential over time.

6. **Emergency Overflow Paths**
    1. Emergency Overflows (EOFs) shall be sized with a minimum bottom width of five feet and 4:1 side slopes.
    2. The maximum flow depth in EOFs shall be less than equal to one foot as calculated for a 100-year back-to-back storm event.

10. DESIGN EXAMPLES

The design process for each of the acceptable Stormwater Treatment Practices is detailed in the *Minnesota Stormwater Manual*, http://stormwater.pca.state.mn.us/index.php/Main_Page.

11. STORMWATER TREATMENT PRACTICE DETAIL DRAWINGS

Please refer to the City of Columbia Heights' Engineering Details for the following:

- Bioretention
- Media Filter System
- Vegetative Filter System
- Infiltration Trench
- Infiltration Basin
- Stormwater Pond/Wetland

12. CONSTRUCTION SPECIFICATIONS

Construction specifications and details are found in the *Minnesota Stormwater Manual* for each of the acceptable STPs, unless otherwise restricted by this manual.

13. CHECKLISTS

Refer to Appendix A & B

- Checklists for Construction Inspection and Operation & Maintenance
- Construction Inspection and Operation & Maintenance Checklists for each of the approved Stormwater Treatment Practices are available in the *Minnesota Stormwater Manual*.

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

APPENDIX E

APPENDIX F

APPENDIX G

APPENDIX D

MWMO Standards

3.1.3 THE MWMO'S STANDARDS LANGUAGE

1. **Stormwater Management Standards**
   a. Any project creating greater than one acre of land disturbance is subject to the standards below.
   b. The MWMO's Standards, or higher, must be adopted by local units of government and incorporated into their stormwater ordinance or other regulatory control.
   c. In order to reduce regulatory complexity, a member may request the MWMO to allow stormwater rules set forth by adjacent watershed management organizations to govern development so long as they can be shown to be substantially equal to or greater than the level of protection afforded by the MWMO Standards.
   d. Road mill and overlay project activities need only to comply with MWMO erosion and sediment control standards.
   e. See the land disturbance definition for activities that shall not be considered land disturbance for the purposes of determining permanent stormwater management requirements.

2. **Rate Control**
   Runoff rates for the proposed activity shall meet the member cities and MS4's runoff rate control requirements, using the member cities' and MS4's required critical storm events (as defined by Atlas 14 Volume 8 and/or subsequent revisions). Runoff rates for the proposed activity and pre-development shall be determined using an Atlas 14-based (nested, regional, state) rainfall distribution using NRCS-approved methodology.

   All area contributing to the practice shall be accounted for in the design of the rate control practice. This includes areas off site and beyond the public right-of-way that will be contributing to the practice.

3. **Water Quality / Volume Control**
   a. For nonlinear projects, without limitations, that disturb one or more acre of land, 1.1 inches of runoff from the new and fully reconstructed impervious surfaces shall be captured and retained on site.
   b. For linear projects on sites, without limitations, that disturb one or more acre of land, the larger of the following shall be captured and retained on site:
      i. 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
      ii. 1.1 inches of runoff from the net increase in impervious area
   c. For projects on sites with limitations, the MWMO Design Sequence Flow Chart (Appendix Q) or a MWMO-approved alternative shall be used to identify a path to compliance through Flexible Treatment Options.
      i. The MWMO will develop a MOU with individual member cities and MS4's to address flexible treatment option #3 off site mitigation conditions.

4. **Volume Control Guidance (recommended procedures for volume control projects)**
   a. Infiltration volumes and facility sizes shall be calculated using the appropriate hydrologic soil group classification, ASTM Unified Soil Class Symbol, and design infiltration rate from Table B. Select the design infiltration rate from Table B based on the least permeable soil horizon within the first five feet below the bottom elevation of the proposed infiltration management practice. The information provided in Table B is intended to be used in the following manner:

i. For preliminary design purposes, refer to the NRCS soil survey to identify the hydrologic soil groups found on site. This information provides a preliminary indication of the infiltration capacity of the underlying soils.
ii. After volume control/infiltration practices have been located on the grading plans, perform soil borings in the exact location of the proposed practices and in the quantity as described in the Minnesota Stormwater Manual Wiki (Minnesota Pollution Control Agency, 2014) as amended. Soil borings should be logged using the USDA Soil Textural Classification System and the ASTM Unified Soil Class Symbol.
iii. The combination of all the aforementioned information will allow the designer to identify the appropriate design infiltration rate. As the Minnesota Stormwater Manual States, "these infiltration rates represent the long-term infiltration capacity of a constructed infiltration practice and are not meant to exhibit the capacity of the soils in the natural state". A permit applicant can submit field measurements and revised rates (using the correction factors provided in the Minnesota Stormwater Manual) if there is reason to believe the long-term infiltration rates will be other than the design infiltration rates provided in Table B.

b. A geotechnical investigation shall be performed in the location of the proposed volume control practices to confirm or determine underlying soil types, the depth to the seasonally high groundwater table, and the depth to bedrock or other impermeable layer.
c. Infiltration BMPs shall drawdown in the time specified in the Minnesota Stormwater Manual Wiki for that BMP, or less if required by another entity with jurisdiction. Drawdown time and maximum ponding depths are defined in the Minnesota Stormwater Manual Wiki.
d. Infiltration stormwater management practices must be designed to include adequate pretreatment measures before discharge of runoff to the primary infiltration area, consistent with the Minnesota Stormwater Manual Wiki.
e. Design and placement of infiltration stormwater management practices shall be done in accordance with the Minnesota Department of Health guidance called "Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas." (Final version to govern)
f. Specific site conditions may make infiltration difficult, undesirable, or impossible. Some of these conditions are listed in Table A. A more comprehensive list is provided in the MWMO Design Sequence Flow Chart in Appendix Q.

Table A: Site Conditions Considered Undesirable for Infiltration Stormwater Management Practices

Type	Specific Site Conditions	Submittal Requirements
Potential Contamination	Potential Stormwater Hotspots (PSHs)	PSH locations and flow paths, Remediation Alternatives Considered
	Contaminated Soils	State Permitted Brownfield Documentation, Soil Borings, Remediation Alternatives Considered, Site design alternatives considered
Physical Limitations	Low Permeability (Type D Soils)	Soil Borings
	High Permeability (soils infiltrating greater than	Soil Borings

	8.3 inches/hour)	
	Bedrock within 5 vertical feet of bottom of infiltration area	Soil Borings
	Potential Adverse Hydrologic Impacts (e.g., impacting perched wetland)	Documentation of Potential Adverse Hydrologic Impacts
	Seasonal High Groundwater within 5 vertical feet of bottom of infiltration area	Soil Borings
	Karst Areas	Soil Borings
	Steep Slopes	Steep Slope Determination
Land Use Limitations	Utility Locations	Site Map, Alternatives considered
	Zoning or Land Use Limitations (Parking, Density, Setbacks, etc.)	Alternatives considered, Documentation of Infeasibility
	Adjacent Wells within 200 feet or inside Wellhead Protection Area or Drinking Water Supply Management Areas (DWSMA)	Well Locations or DWSMA
	Building Foundation	Ten (10) feet

Source: Modified from Minnesota Pollution Control Agency Minimal Impact Design Standards Design Sequence Flow Chart, December 5, 2013

Note: the most recent version of the Minnesota Stormwater Manual should be used; Table A is provided as optional guidance to the cities

Table B. Design Infiltration Rates

Hydrologic Soil Group	Soil Textures[1]	ASTM Unified Soil Class Symbols	Rate
A	Gravel, sandy gravel, silty gravel	GW, GP, GM, SW	1.63 in/hr
	Sand, loamy sand, sandy loam	SP	0.80 in/hr
B	Loam, silt loam	SM	0.45 in/hr
		MH	0.30 in/hr
C	Sandy clay loam	ML	0.20 in/hr
D	Clay, clay loam, silty clay loam, sandy clay, silty clay	CL, CH, OH, OL, GC, SC	0.06 in/hr

Source: Minnesota Stormwater Manual Wiki, October 2014

Note: Design infiltration rates from the most recent version of the Minnesota Stormwater Manual should be used

1 Adapted from the U.S. Department of Agriculture, Natural Resources Conservation Services, 2005. National Soil Survey Handbook, title 430-VI.

5. **Maintenance**
   a. Practices must continue to perform as approved. Owners must follow an inspection and maintenance schedule that has been approved by the permitting entity and correct any post-construction performance issues that arise.
   b. All stormwater management structures and facilities, including volume reduction stormwater management practices, shall be maintained to assure that the structures and facilities function as originally designed. The maintenance responsibilities must be assumed by either the municipality's acceptance of the required easements dedicated to stormwater management purposes, or by the applicant executing and recording a maintenance agreement, or by another enforceable means acceptable to the LGU. If used, the recordable executed agreement must be submitted to the municipality prior to issuance of the project approval from the city." Public developments will require a maintenance agreement in the form of a Memorandum of Agreement or an approved Local Water Management Plan or in compliance with an MS4 Permit that details the methods, schedule, and responsible parties for maintenance of stormwater management facilities for permitted development. A single Memorandum of Agreement for each local government unit may be used to cover all stormwater management structures and facilities required herein, including volume reductions management practices, within the LGU's jurisdiction. This maintenance plan shall address snow management.

6. **Drainage Alterations**
   No person shall alter stormwater flows (resulting in an increase in stormwater flows or a change in existing flow route) at a property boundary by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet, without first obtaining any necessary permits from the city..

7. **Bounce and Duration Control**
   a. The project must meet hydroperiod standards adapted from "Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands," (Minnesota Stormwater Advisory Group, June 1997), as follows:
      i. Wetland Susceptibility Class = Highly Susceptible; Permit Storm Bounce = Existing; Inundation Period for 2-Year event = Existing; Inundation Period for 10-year or Greater Event = Existing
      ii. Wetland Susceptibility Class = Moderately Susceptible; Permit Storm Bounce = Existing plus 0.5 feet; Inundation Period for 2-Year event = Existing plus 1 days; Inundation Period for 10-year or Greater Event = Existing plus 7 days
      iii. Wetland Susceptibility Class = Slightly Susceptible; Permit Storm Bounce = Existing plus 1.0 feet; Inundation Period for 2-Year event = Existing plus 2 days; Inundation Period for 10-year or Greater Event = Existing plus 14 days
      iv. Wetland Susceptibility Class = Least Susceptible; Permit Storm Bounce = No Limit; Inundation Period for 2-Year event = Existing plus 7 days; Inundation Period for 10-year or Greater Event = Existing plus 21 days

8. **Flood Control**
   Flood control for the proposed activity shall meet the member cities or MS4's flood control requirements. Member cities and MS4's flood control requirements should minimize property damage due to excess water.

9. Erosion and Sediment Control

a. Erosion and sediment control measures shall meet the standards for the General Permit Authorization to Discharge Stormwater Associated with Construction Activity Under the National Pollutant Discharge Elimination System/State Disposal System Permit Program, Permit MN R100001 (NPDES General Construction Permit), issued by the Minnesota Pollution Control Agency, except where more specific requirements are required.

b. Activity shall be phased to minimize disturbed areas subject to erosion at any one time.

c. All construction site waste—such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site—shall be properly managed and disposed of so they will not have an adverse impact on water quality.

d. If silt fence is installed it shall conform to sections 3886.1 and 3886.2, Standard Specifications for Construction, Minnesota Department of Transportation (2005 ed.), as it may be amended.

MWMO DESIGN SEQUENCE FLOW CHART

Conduct Site Review:
- Aerial Photos and Topographic Maps
- County Soil Surveys and other Soil Information as Available
- County Geologic Atlas
- Local Groundwater Levels
- DWSMA and Wellhead Protection Maps
- FEMA and Local Floodplain Maps
- Soil Borings and Site Survey
- MPCA Listing of Potentially Contaminated Sites
- Phase 1 and 2 Environmental Site Assessments
- TMDLs and Local Water Quality Standards
- Wetland Delineations, MNRAM Assessments, and Wetland Classifications
- Proposed Conditions, Conceptual/Preliminary Site Design
- Local zoning and land use requirements/ordinances, including stormwater rate control requirements
- Communication with Local Landowners, LGU, or Others Knowledgeable about the Site
- Site Inspection

Define Performance

Development and redevelopment projects: Retain on site a volume of 1.1" from impervious surfaces

Linear projects: Retain on site the larger of 1.1" from all new, or .55" from all new and fully reconstructed (D) impervious surfaces.

Does the project disturb one acre or more?
- No → MWMO performance goal does not apply
- Yes →

Is the project linear?
- Yes → Are there restraints due to lack of available ROW, off site drainage and/or rate control requirements? (F)
  - Yes → Is FTO Alternative No. 2 feasible?
    - Yes →
      - Select FTO Alternative No. 2
      - Provide documentation of offsite run on to project area
      - Provide documentation of lack of ROW.
    - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - No →
- No →

Are there zoning and land use requirements (density, parking, setbacks, etc.) that make the Performance Goal not feasible? (G)
- Yes → Is BMP relocation feasible?
  - No → Is FTO Alternative No. 1 feasible?
    - Yes →
      - Select FTO Alternative No. 1
      - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal.
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - Yes →
- No →

Is the site located in a DWSMA, wellhead protection area, or within 200 feet of a drinking well?
- Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater?
  - No →
    - Select FTO Alternative No. 2
    - No infiltration practices allowed
    - Explore non-infiltration volume reduction practices
    - Provide DWSMA or well location map
  - Yes →
- No →

Are there existing or proposed structures or infrastructure (e.g., rate control BMPs, utilities, buildings, roadway, easements) that make the Performance Goal not feasible? (G)
- Yes → Is BMP relocation feasable?
  - No → Is FTO Alternative No. 1 feasible?
    - Yes →
      - Select FTO Alternative No. 1
      - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - Yes →
- No →

Are active karst areas within 1000 feet up-gradiant or 100 feet downgradiant of the BMP location?
- Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater?
  - No → Is BMP relocation onsite to a location without karst feasible?
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - No infiltration practices allowed
        - Explore non-infiltration volume reduction practices
        - Provide soil borings or report from a professional geologist or geotechnical engineer.
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
    - Yes →
  - Yes →
- No →

Is shallow groundwater or shallow bedrock present on site?
- Yes → Conduct detailed site investigation (i.e., borings, excavations, consultation with a professional geologist).
  - → Is there >5 feet of soil depth (> 10 feet is preferred) from bottom of BMP to bedrock and groundwater?
    - No → Is BMP relocation onsite to avoid shallow groundwater and bedrock feasible?
      - No → Can BMP be raised?
        - Yes → Raise BMP enough to ensure 5 feet (preferably 10 feet) of soil between bottom of BMP and top of bedrock and groundwater.
        - No → Is FTO Alternative No. 2 feasible?
          - Yes →
            - Select FTO Alternative No. 2
            - No infiltration practices allowed
            - Explore non-infiltration volume reduction practices
            - Provide soil borings or report from a professional geologist or geotechnical engineer.
          - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
      - Yes →
    - Yes →
- No →

Is there presence of contaminated soils and/or groundwater, or hotspot runoff? (H)
- Yes → Can hotspot or contamination be isolated or remediated to mitigate risk of increased contamination?
  - No →
    - Select FTO Alternative No. 2
    - No infiltration practices allowed
    - Explore non-infiltration volume reduction practices
    - Provide Phase I or II ESAs, or other documentation of potential contamination or hotspot runoff
    - Provide documentation of extent of contamination and remediation alternatives considered
  - Yes →
- No →

Are there very low infiltrating soils (<0.2 inches per hour)?
- Yes → Is BMP relocation onsite to a higher-infiltrating location feasible?
  - No → Can BMP be sized to drain dry within 48 hours (24 hours in locations that are tributary to trout streams)?
    - No → Provide soil boring or infiltration test results documenting low-infiltrating soils.
      - → Is FTO Alternative No. 1 (lower volume control standard) feasible, allowing the BMP to drain within 48 hours (24 hours in locations that are tributary to trout streams)?
        - Yes →
          - Select FTO Alternative No. 1
          - Provide soil boring or infiltration test results documenting high-infiltrating soils.
        - No →
          - Select FTO Alternative No. 2
          - No infiltration practices allowed
          - Explore non-infiltration volume reduction practices
          - Provide soil boring or infiltration test results documenting low infiltration rates.
    - Yes →
  - Yes →
- No →

Are there very high infiltrating soils (>8.3 inches per hour)? (E)
- Yes → Is BMP relocation onsite to a lower-infiltrating location feasible?
  - No → Can subgrade be modified to slow the rate of infiltration to less than 8.3 inches per hour?
    - No →
      - Select FTO Alternative No. 2
      - No infiltration practices allowed
      - Explore non-infiltration volume reduction practices
      - Provide soil boring or infiltration test results documenting high-infiltrating soils.
    - Yes →
  - Yes →
- No →

Are there adverse surface water hydrologic impacts from infiltration practices (e.g., impacting perched wetland)?
- Yes → Can the BMP be relocated onsite to avoid adverse hydrologic impacts?
  - No → Would BMP accommodating FTO Alternative No. 1 avoid adverse hydrologic impacts?
    - No →
      - Select FTO Alternative No. 2
      - Maximize infiltration BMPs to treat up to the 0.55 inch goal, if possible.
      - Explore non-infiltration volume reduction practices
      - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.
    - Yes →
      - Select FTO Alternative No. 1
      - Maximize infiltration BMPs to treat more than 0.55 inch goal, if possible.
      - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.
  - Yes →
- No →

Complete Design Using Performance Goal
(As modified by FTO Alternatives, if applicable)

MWMO Project Flexible Treatment Options (FTO)

The Flexible Treatment Options (FTO) alternatives presented here should be employed when the Performance Goal is not feasible and/or allowed. The designer should document the reasons why the Performance Goal and rejected FTO Alternatives are not feasible and/or allowed.

FTO 1
Applicant attempts to comply with the following conditions:
1.a. Achieve at least 0.55" volume reduction goal, and
1.b. Remove 75% of the annual TP load, and
1.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site

FTO #2
Applicant attempts to comply with the following conditions:
2.a. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
2.b. Remove 60% of the annual TP load, and
2.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

FTO #3
The MWMO will develop a Memorandum of Understanding with individual member cities and MS4s to address off-site mitigation conditions.

Off-site mitigation (including banking or cash or treatment on another project, as determined by the Local Authority) will be equivalent to the volume reduction Performance Goal.

Notes:
A. Volume reduction techniques considered shall include infiltration, rainwater harvesting & reuse, bioretention, permeable pavement, tree boxes, grass swales and/or additional techniques included in the MIDS calculator or the Minnesota Stormwater Manual.
B. Applicant shall document the flexible treatment options decision sequence, following the order of alternatives presented here.
C. For Alternative #2, the applicant is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.
D. Fully reconstructed impervious surfaces: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/ replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed.
E. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.
F. A reasonable attempt must be made to obtain ROW during the project planning process.
G. Other, this is not an exhaustive list.
H. Hotspots includes any portion of a facility where infiltration is prohibited under an NPDES/ SDS industrial stormwater permit issued by the MPCA.

Adapted from MIDS Design Sequence Flow Chart, December 2013

APPENDIX E

RCWD Permitting Rules

RICE CREEK WATERSHED DISTRICT RULES

BOARD APPROVED: DECEMBER 14, 2016
EFFECTIVE DATE: JANUARY 1, 2017

CERTIFICATION OF
REVISED WATERSHED DISTRICT RULES

I, Michael J. Bradley, Secretary of the Rice Creek Watershed District Board of Managers, certify that the attached is a true and correct copy of the Rules of the Rice Creek Watershed District as revised and adopted by the Board of Managers on December 14, 2016, and effective January 1, 2017.

Dated: 12-14-2016

Michael J. Bradley, Secretary

ACKNOWLEDGEMENT

State of Minnesota
County of Anoka

This instrument was acknowledged before me on December 14, 2016, by Michael J. Bradley, as Secretary of the Rice Creek Watershed District Board of Managers.

THERESA M. STASICA
NOTARY PUBLIC
MINNESOTA
My Commission Expires January 31, 2020

Notary Public

GENERAL POLICY STATEMENT

The Rice Creek Watershed District (District) is a political subdivision of the State of Minnesota, established under the Minnesota Watershed Law. The District is also a watershed management organization as defined under the Minnesota Metropolitan Surface Water Management Act, and is subject to the directives and authorizations in that Act. Under the Watershed Law and the Metropolitan Surface Water Management Act, the District exercises a series of powers to accomplish its statutory purposes. The District's general statutory purpose is to conserve natural resources through development planning, flood control, and other conservation projects, based upon sound scientific principles.

As required under the Metropolitan Surface Water Management Act, the District has adopted a Watershed Management Plan, which contains the framework and guiding principles for the District in carrying out its statutory purposes. It is the District's intent to implement the Plan's principles and objectives in these rules.

Land alteration affects the rate, volume, and quality of surface water runoff which ultimately must be accommodated by the existing surface water systems within the District. The watershed is large, 186 square miles, and its outlet, Rice Creek, has limited capacity to carry flows. Flooding problems already occur in urbanized areas along Lower Rice Creek and other localized areas.

Land alteration and utilization also can degrade the quality of runoff entering the streams and waterbodies of the District due to non-point source pollution. Lake and stream sedimentation from ongoing erosion processes and construction activities reduces the hydraulic capacity of waterbodies and degrades water quality. Water quality problems already exist in many of the lakes and streams throughout the District.

Projects which increase the rate or volume of stormwater runoff can aggravate existing flooding problems and contribute to new ones. Projects which degrade runoff quality can aggravate existing water quality problems and contribute to new ones. Projects which fill floodplain or wetland areas can aggravate existing flooding by reducing flood storage and hydraulic capacity of waterbodies, and can degrade water quality by eliminating the filtering capacity of those areas.

In these rules the District seeks to protect the public health and welfare and the natural resources of the District by providing reasonable regulation of the modification or alteration of the District's lands and waters to reduce the severity and frequency of flooding and high water, to preserve floodplain and wetland storage capacity, to improve the chemical, physical and biological quality of surface water, to reduce sedimentation, to preserve waterbodies' hydraulic and navigational capacity, to preserve natural wetland and shoreland features, and to minimize public expenditures to avoid or correct these problems in the future.

The District rules include certain rules adopted to implement area-specific Comprehensive Wetland Protection and Management Plans (CWPMP) as provided under the Wetland Conservation Act (WCA). CWPMPs are designed to achieve identified wetland resource management needs within specific drainage areas of the watershed. These rules (within Rule F) apply to a delineated geographic area. Accordingly, a property owner intending an activity subject to District permitting requirements first should determine whether the activity will be governed by the CWPMP rule.

RELATIONSHIP OF RICE CREEK WATERSHED DISTRICT TO MUNICIPALITIES

The District recognizes that the primary control and determination of appropriate land uses is the responsibility of the municipalities. Accordingly, the District will coordinate permit application reviews involving land development with the municipality where the land is located.

The District intends to be active in the regulatory process to ensure that its water resources are managed in accordance with District goals and policies. Municipalities have the option of assuming a more active role in the permitting process after adoption of a local water management plan approved by the District and adoption and implementation of local ordinances consistent with the approved plan.

The District will also review projects sponsored or undertaken by municipalities and other governmental units, and generally will require permits for governmental projects impacting water resources of the District. These projects include but are not limited to, land development, road, trail, and utility construction and reconstruction.

The District desires to serve as technical advisor to the municipalities in their preparation of local surface water management plans and the review of individual development proposals prior to investment of significant public or private funds. To promote a coordinated review process between the District and the municipalities, the District encourages the municipalities or townships to contact the District early in the planning process.

RULE A: DEFINITIONS

For the purposes of these rules, the following words have the meanings set forth below.

References in these rules to specific sections of the Minnesota Statutes include any amendments, revisions or recodification of those sections.

As Constructed and Subsequently Improved Condition (ACSIC): the geometry of the public drainage system as constructed, including all subsequent legal repairs and alterations.

Beds of Protected Waters: all portions of public waters and public waters wetlands located below the ordinary high water level.

Best Management Practices (BMPs): measures taken to minimize the negative effects on water resources and systems as referenced in the Minnesota Construction Site Erosion and Sediment Control Planning Handbook (BWSR, 1988), Protecting Water Quality in Urban Areas (MPCA, 1989) and the Minnesota Stormwater Manual (MPCA, 2006) or similar guidance documents.

Better Site Design (BSD): an approach to managing runoff that seeks to attain post development hydrology which mimics the undeveloped condition in terms of volume, rate and timing of runoff. The goals of Better Site Design include reducing the amount of impervious cover, increasing the amount of natural lands set aside for conservation, using pervious areas for more effective stormwater treatment, innovative grading and drainage techniques and through the review of every aspect of the project site planning process. Better Site Design involves techniques applied early in the design process to reduce impervious cover, conserve natural areas and use pervious areas to more effectively treat stormwater runoff and promote a treatment train approach to runoff management.

Bridge: a road, path, railroad or utility crossing over a waterbody, wetland, ditch, ravine, road, railroad, or other obstacle.

Bridge Span: the clear span between the inside surfaces of a bridge's terminal supports.

Channel: a perceptible natural or artificial depression, with a defined bed and banks that confines and conducts water flowing either continuously or periodically.

Comprehensive Wetland Protection and Management Plan (CWPMP): a locally developed comprehensive wetland protection and management plan approved by the Minnesota Board of Soil and Water Resources, pursuant to Minnesota Rules 8420.0830.

Criteria: specific details, methods and specifications that apply to all permits and reviews and that guide implementation of the District's goals and policies.

Critical Duration Flood Event: the 100-year precipitation or snow melt event with a duration resulting in the maximum 100-year return period water surface elevation. The critical duration flood event is generally either the 100-year, 24-hour rainfall event as found in NOAA Atlas 14 or the ten-day snow melt event assumed to be 7.2 inches of runoff occurring on frozen ground (CN=100); however, other durations (e.g., 6-hour) may result in the maximum 100 year return period water surface elevation.

CWPMP Contributing Drainage Area: the areas tributary to CWPMP jurisdictional areas from which banked or off-site wetland replacement credits may be used to replace wetland impacts under Rule F.6(c). Figure 4 illustrates the Contributing Drainage Area; however, the precise boundary will be determined on a hydrologic basis at the time of permitting.

Detention Basin: any natural or man-made depression that stores stormwater runoff temporarily.

Development: any land-disturbing activity resulting in creation or reconstruction of impervious surface including, but not limited to, municipal road construction. Normal farming practices part of an ongoing farming operation shall not be considered development.

District: the Rice Creek Watershed District established under the Minnesota Watershed Law, Minnesota Statutes Chapter 103D.

Drainage System: a system of open channel, pipe or tile, to drain property, including laterals, improvements, and improvements of outlets, which may or may not be a public system under the jurisdiction of the District under Minnesota Statutes Chapters 103B, 103D, or 103E.

Effectively Drained Wetland: an area whose natural hydrology has been altered to the point that it is no longer considered wetland.

Emergency Overflow (EOF): a primary overflow to pass flows above the design capacity around the principal outlet safely downstream without causing flooding.

Excavation: the displacement or removal of soil, sediment or other material.

Floodplain: the areas adjoining a waterbody that are inundated during the 100-year flood.

Floodway: the channel of a watercourse, the bed of waterbasins and those portions of adjoining floodplains that must be kept free of encroachment to accommodate the 100-year flood.

Floodway Fringe: the area between the floodway and the boundary of the 100-year flood.

Flood Management Zone: land within the Rice Creek Watershed District draining to and entering Rice Creek downstream from the outlets of Baldwin Lake and Golden Lake.

Freeboard: vertical distance between the 100-year flood elevation or emergency overflow elevation of a waterbasin or watercourse and the elevation of the regulatory elevation of a structure.

Governmental Project: projects sponsored or paid for by a governmental agency.

High Quality Wetland: an existing wetland reflecting a score of “high/high” for the functional indicators “outlet condition” and “vegetative quality”, respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

Impervious Surface: a compacted surface or a surface covered with material (i.e., gravel, asphalt, concrete, Class 5, etc.) that increases the depth of runoff compared to natural soils and land cover. Including but not limited to roads, driveways, parking areas, sidewalks and trails, patios, tennis courts, basketball courts, swimming pools, building roofs, covered decks, and other structures.

Infiltration: water entering the ground through the soil.

Land-Disturbing Activity: any disturbance to the ground surface that, through the action of wind or water, may result in soil erosion or the movement of sediment into waters, wetlands or storm sewers or onto adjacent property. Land-disturbing activity includes but is not limited to the demolition of a structure or surface, soil stripping, clearing, grubbing, grading, excavating, filling and the storage of soil or earth materials. The term does not include normal farming practices as part of an ongoing farming operation.

Landlocked Basin: a waterbasin lacking an outlet at an elevation at or below the water level produced by the critical duration flood event, generally the 10-day snowmelt event.

Local Government Unit (LGU): the public body responsible for implementing the Minnesota Wetland Conservation Act, as defined at Minnesota Statutes §103G.005, subdivision 10e.

Low Entry Elevation: the elevation of the lowest opening in a structure.

Low Floor Elevation: the elevation of the lowest floor of a habitable or uninhabitable structure, which is often the elevation of the basement floor or walk-out level.

Major Watercourse: any watercourse having a tributary area of 200 acres or more.

Marginally Degraded Wetland: an existing wetland reflecting a score of "high/low" or "low/high" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

Mill, Reclamation and Overlay: removal of the top layer(s) of an impervious surface (e.g. roadway, parking lot, sport court) by mechanical means, followed by the placement of a new layer of impervious surface, without exposure of the underlying native soil.

Moderately Degraded Wetland: an existing wetland reflecting a score of "medium/medium" or "low/medium" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

Municipal Separate Storm Sewer System (MS4): the system of conveyances owned or operated by the District and designed or used to collect or convey storm water, and that is not used to collect or convey sewage.

Municipality: any city or township wholly or partly within the Rice Creek Watershed District.

Native Vegetation: plant species that are indigenous to Minnesota or that expand their range into Minnesota without being intentionally or unintentionally introduced by human activity and that are classified as native in the Minnesota Plant Database.

NPDES Permit: general permit authorization to discharge storm water associated with construction activity under the National Pollutant Discharge Elimination System (NPDES), issued by the Minnesota Pollution Control Agency.

Non-Degraded Wetland: an existing wetland reflecting a score of "high/medium" or "medium/high" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

Non-Invasive Vegetation: plant species that do not typically invade or rapidly colonize existing, stable plant communities.

NURP: Nationwide Urban Runoff Program.

100-Year Flood Elevation: the elevation of water resulting from the critical duration flood event.

Ordinary High Water Level (OHW): the highest water level elevation that has been maintained for a sufficiently long period of time to leave evidence upon the landscape. The OHW is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. If an OHW has been established for a waterbody by the Minnesota Department of Natural Resources, it will constitute the OHW under this definition.

Parcel: a lot of record in the office of the county recorder or registrar or that otherwise has a defined legal existence.

Person: any natural person, partnership, unincorporated association, corporation, limited liability company, municipal corporation, state agency, or political subdivision of the State of Minnesota.

Political Subdivision: a municipality, county, town, school district, metropolitan or regional agency, or other special purpose district of Minnesota.

Pollutant: Anything that causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind. (This definition is for the purpose of Rule H only and is incorporated from the U.S. EPA model ordinance.)

Public Linear Project: a project involving a roadway, sidewalk, trail or utility not part of an industrial, commercial, institutional or residential development.

Public Waters: waters identified as public waters under Minnesota Statutes section 103G.005, Subdivision 15.

Public Waters Wetlands: all wetlands identified as public waters wetlands under Minnesota Statutes section 103G.005, subdivision 15a.

Reconstruction: removal of an impervious surface such that the underlying structural aggregate base is effectively removed and the underlying native soil exposed.

Resource of Concern: lakes classified as Tier I, Tier II, Tier III and Tier IV within Table 4-6 of the District's 2010 Watershed Management Plan and subsequently amended Watershed Management Plans approved by BWSR. If an area within the jurisdictional boundary of the District drains to a location outside the District without reaching an ROC, the District will identify the receiving water outside of the District that is the ROC for the purpose of the permit.

Resource of Concern Drainage Area: Land draining to a Resource of Concern. The Resource of Concern drainage area excludes lands draining first to an upstream Resource of Concern.

Seasonal High Water Table: The highest known seasonal elevation of groundwater as indicated by redoximorphic features such as mottling within the soil.

Severely Degraded Wetland: an existing wetland reflecting a score of "medium/low" or "low/low" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

Site: All contiguous lots of record on which activity subject to any District rule is proposed to occur or occurs, as well as all other lots of record contiguous to any such lot under common ownership at the time of the permitted activity. Linear right of way does not disturb contiguity. For public linear projects not occurring in conjunction with land development, the term means the portion of right-of-way defined by the project work limits.

Storm Sewer: a pipe system for stormwater conveyance.

Stormwater Pond: Constructed basins placed in the landscape to capture stormwater runoff.

Structure: a building with walls and a roof, excluding structures such as pavilions, playgrounds, gazebos, and garbage enclosures.

Subdivision, Subdivide: the legal separation of an area, parcel, or tract of land under single ownership into two or more parcels, tracts, lots.

Technical Evaluation Panel (TEP): The body described in Minnesota Rules 8420.0240.

Upland Habitat Area: A non-wetland area that is contiguous with an existing, restored, or created wetland and scores “C” or better using the Natural Heritage Ranking methodology.

Waterbasin: an enclosed natural depression with definable banks capable of containing water.

Waterbody: a waterbasin, watercourse or wetland as defined in these Rules.

Watercourse: a channel that has definable beds and banks capable of conducting confined runoff from adjacent land.

Wetland: area identified as wetland under Minnesota Statutes section 103G.005, subdivision 19.

Wetland Management Corridor (WMC): A contiguous corridor encompassing high priority wetland resources identified at a landscape scale in Figure F1 and refined at the time of individual project permitting at a site level as provided for in Rule F, section 6.

RULE B: PROCEDURAL REQUIREMENTS

1. **APPLICATION AND NOTICE OF INTENT REQUIRED.** Any person undertaking an activity for which a permit is required by these rules must obtain the required permit prior to commencing the activity that is subject to District regulation. Applications for permit must be submitted to the District in accordance with the procedures described in this rule. Required exhibits are specified for each substantive rule below. Applicants are encouraged to contact District staff before submission of an application to review and discuss application requirements and the applicability of specific rules to a proposed project. When the rules require a criterion to be met, or a technical or other finding to be made, the District makes the determination except where the rule explicitly states otherwise. The landowner or, in the District's judgment, easement holder, must sign the permit application and will be the permittee or a co-permittee. For governmental projects, the selected contractor may sign the application on behalf of the governmental applicant.

2. **FORMS.** A District permit application or notice of intent, and District checklist of permit submittal requirements, must be submitted on the forms provided by the District. Applicants may obtain forms from the District office or website at http://www.ricecreek.org/permits.

3. **ACTION BY BOARD OF MANAGERS.** The Board of Managers shall act within sixty days of receipt of a complete permit application. A complete permit application includes all required information, exhibits, and fees. An application will not be ready for Board consideration unless all substantial technical questions have been addressed and all substantial plan revisions resulting from staff review have been accomplished. Permit decisions will be made by the Board except as delegated to the Administrator by written resolution.

4. **ISSUANCE OF PERMITS.** The permit will be issued only after applicant has satisfied all requirements and conditions for the permit, has paid all required District fees, and the District has received any required surety.

5. **CONDITIONAL APPROVAL PENDING RECEIPT OF CHANGES (CAPROC).** The District may conditionally approve an application, but such approval does not result in the issuance of a permit until all conditions precedent to the approval have been resolved. All conditions must be satisfied within twelve (12) months of the date of conditional approval. If a permit is not obtained within the 12-month period, the applicant will be required to reapply for a permit and pay applicable permit fees.

6. **PERMIT TERM.** Permits are valid for an eighteen-month period from the date of issuance unless otherwise stated within the permit, suspended or revoked. To extend a permit, the permittee must apply to the District in writing, stating the reasons for the extension. Any plan changes, and related project documents must also be included in the extension application. The District must receive this application at least thirty (30) days prior to the permit expiration date. The District may impose different or additional conditions on a renewal or deny the renewal in the event of a material change in circumstances. On the first renewal, a permit will not be subject to change because of a change in District rules. An extended stormwater management permit for phased development may be issued pursuant to Rule C.13.

7. PERMIT ASSIGNMENT. A permittee must be assigned when title to the property is transferred or, if the permittee is an easement holder, in conjunction with an assignment of the easement. The District must approve a permit assignment and will do so if the following conditions have been met:

(a) The proposed assignee in writing agrees to assume all the terms, conditions and obligations of the permit as originally issued to the permittee;

(b) The proposed assignee has the ability to satisfy the terms and conditions of the permit as originally issued;

(c) The proposed assignee is not changing the project as originally permitted;

(d) There are no violations of the permit conditions as originally issued; and

(e) The District has received from the proposed assignee a substitute surety to secure performance of the assigned permit.

Until assignment is approved, the permittee of record as well as the current title owner will be responsible for permit compliance.

8. PERMIT FEES. The District will charge applicants permit fees in accordance with a schedule that will be maintained and revised from time to time by the Board of Managers to ensure that permit fees cover the District's actual costs of administrating and enforcing permits. The current fee schedule may be obtained from the District office or the District website at http://www.ricecreek.org/permits. An applicant must submit the required permit fee to the District at the time it submits its permit application. No permit fee will be charged to the federal government, the State of Minnesota or a political subdivision of the State of Minnesota.

9. PERFORMANCE SURETY.

(a) POLICY. It is the policy of the Board of Managers to conserve the District's water resources by assuring compliance with its rules. The District ensures compliance by requiring a bond or other surety to secure performance of permit conditions and compliance with District rules, as well as protection of District water resources in the event of noncompliance with permit conditions and/or rules. A project for which the applicant is the federal government, the State of Minnesota or a political subdivision of the State of Minnesota is exempt from surety requirements.

(b) PERFORMANCE SURETY REQUIREMENT. A surety or sureties, when required, must be submitted in a form acceptable to the District. When a cash escrow is used, it will be accompanied by an escrow agreement bearing the original signature of the permittee and the party providing the escrow, if not the permittee. The District will require applicants to submit a surety or sureties in accordance with a schedule of types and amounts that will be maintained and revised from time to time by the Board of Managers. The current schedule of surety amounts and acceptable forms and sources as well as surety agreement may be obtained from the District office or the District website at http://www.ricecreek.org/permits.

An applicant may submit a bond or an irrevocable letter of credit to the District to secure performance of permit conditions for activities for which the required surety amount as determined above is in excess of $5,000; however, the first $5,000 of any performance surety must be submitted to the District as a cash escrow. The bond or letter of credit must be submitted before the permit is issued.

(c) FORM AND CONTENT OF BOND OR LETTER OF CREDIT.

(1) The bond or irrevocable letter of credit must be in a form acceptable to the District and from a surety licensed to do business in Minnesota.

(2) The bond or irrevocable letter of credit must be in favor of the District and conditioned upon the performance of the party obtaining the bond or letter of credit of the activities authorized in the permit, and compliance with all applicable laws, including the District's rules, the terms and conditions of the permit and payment when due of any fees or other charges required by law, including the District's rules. The bond or irrevocable letter of credit must provide that if the bond conditions are not met, the District may make a claim against the bond or letter of credit.

(d) RELEASE OF PERFORMANCE SURETY. Upon written notification from permittee of completion of the permitted project, the District will inspect the project to determine if it is constructed in accordance with the terms of the permit and District rules. If the project is completed in accordance with the terms of the permit and District rules and the party providing the performance surety does not have an outstanding balance of money owed to the District for the project, including but not limited to unpaid permit fees, the District will release the bond or letter of credit, or return the cash surety if applicable. Final inspection compliance includes, but is not limited to, confirmation that all erosion and sediment control BMPs and stormwater management features have been constructed or installed as designed and are functioning properly, and completion of all required monitoring of wetland mitigation areas. The District may return a portion of the surety if it finds that a portion of the surety is no longer warranted to assure compliance with District rules.

RULE C: STORMWATER MANAGEMENT PLANS

1. **POLICY.** It is the policy of the Board of Managers to manage stormwater and snowmelt runoff on a local, regional and watershed basis; to promote natural infiltration of runoff throughout the District to preserve flood storage and enhance water quality; and to address the unique nature of flooding issues within the Flood Management Zone, through the following principles:

(a) Maximize water quality and flood control on individual project sites through Better Site Design practices and stormwater management.

(b) Minimize land use impacts and improve operational and maintenance efficiency by siting stormwater BMPs, when needed, regionally unless local resources would be adversely affected.

(c) Treat stormwater runoff before discharge to surface waterbodies and wetlands, while considering the historic use of District water features.

(d) Ensure that future peak rates of runoff are less than or equal to existing rates.

(e) Reduce the existing conditions peak rate of discharge along Lower Rice Creek and the rate of discharge and volume of runoff reaching Long Lake, to preserve the remaining floodplain storage volume within Long Lake and mitigate the historic loss of floodplain storage.

(f) Preserve remaining floodplain storage volume within the Rice Creek Watershed to minimize flood potential throughout the District.

2. **REGULATION.** A permit incorporating an approved stormwater management plan is required under this rule for development, consistent with the following:

(a) A permit is required for subdivision of an area exceeding one acre. This includes subdivision for single-family residential, multi-unit residential, commercial, industrial, or institutional development.

(b) A permit is not required for single-family residential construction on an individual lot of record. If the lot is within a development previously approved by the District, the construction must conform to the previous approval.

(c) A permit is required for development, other than Public Linear Projects, that creates or reconstructs 10,000 square feet or more of impervious surface. This threshold is cumulative of all impervious surface created or reconstructed through multiple phases or connected actions of a single complete project, as defined by the District, on a single parcel or contiguous parcels of land under common ownership, development or use.

(d) For Public Linear Projects, a permit is required to create 10,000 square feet or more of impervious surface through multiple phases or connected actions of a single complete project, as defined by the District, within a Resource of Concern Drainage Area.

(e) Rule C requirements do not apply to sidewalks and trails 10 feet wide or less that are bordered down-gradient by vegetated open space or vegetated filter strip with a minimum width of 5 feet.

(f) Rule C requirements do not apply to Bridge Spans and Mill, Reclamation & Overlay projects.

(g) Rule C.6 requirements do not apply to single family residential subdivisions creating

seven or fewer lots that:

(1) Establish no new public roadway; and

(2) Include no private roadway/driveway serving three or more lots.

Rate control provisions of Rule C.7 still apply.

3. STORMWATER MANAGEMENT PLAN REQUIRED. A stormwater management plan shall be submitted with the permit application for a project equaling or exceeding the threshold of Section 2. The stormwater management plan shall fully address the design and function of the project proposal and the effects of altering the landscape relative to the direction, rate of discharge, volume of discharge and timing of runoff.

4. MODELING REQUIREMENTS FOR STORMWATER MANAGEMENT PLANS.

(a) A hydrograph method or computer program based on NRCS Technical Release #20 (TR-20) and subsequent guidance must be used to analyze stormwater runoff for the design or analysis of discharge and water levels within and off the project site. The runoff from pervious and impervious areas within the model shall be modeled separately.

(b) In determining Curve Numbers for the post-development condition, the Hydrologic Soil Group (HSG) of areas within construction limits shall be shifted down one classification for HSG B (Curve Number 74) and ½ classification for HSG A (Curve Number 49) to account for the impacts of grading on soil structure unless the project specifications incorporate soil amendments in accordance with District Soil Amendment Guidelines. This requirement only applies to that part of a site that has not been disturbed or compacted prior to the proposed project.

(c) The analysis of flood levels, storage volumes, and discharge rates for waterbodies and stormwater management basins must include the NOAA Atlas 14 values, as amended, for the 2 year, 10 year and 100 year return period, 24-hour rainfall events and the 10-day snowmelt event (Curve Number 100), in order to identify the critical duration flood event. The District Engineer may require analysis of additional precipitation durations to determine the critical duration flood event. Analysis of the 10-day snowmelt event is not required for stormwater management detention basins with a defined outlet elevation at or below the 100 year return period, 24-hour rainfall event elevation.

5. STORMWATER MANAGEMENT PLAN FRAMEWORK.

(a) When an existing regional BMP is proposed to manage stormwater runoff, the applicant shall show that the BMP was designed and constructed to manage the stormwater runoff from the project site, the applicant has permission to utilize any remaining capacity in the BMP, the BMP is subject to maintenance obligations enforceable by the District, and it is being maintained to its original design.

(b) A combination of Stormwater BMPs may be used to meet the requirements of section(s) 6, 7, and 8.

(c) A local surface water management plan or ordinance of the local land use authority may contain standards or requirements more restrictive than these rules. The stormwater management plan must conform to the local surface water management plan or ordinance of the local land use authority.

(d) The proposed project must not adversely affect off-site water levels or resources supported by local recharge, or increase the potential for off-site flooding, during or after construction.

(e) A landlocked basin may be provided an outlet only if it:

(1) Conforms with District Rule F, as applicable.

(2) Provides sufficient dead storage volume to retain the runoff resulting from back-to-back 100-year, 24-hour rainfall events.

(3) Does not create adverse downstream flooding or water quality conditions as a result of the change in the rate, volume or timing of runoff or a change in drainage patterns.

(f) A municipality or public road authority may prepare a comprehensive stormwater management plan setting forth an alternative means of meeting the standards of sections 6 and 7 within a defined subwatershed. Once approved by the District and subject to any stated conditions, the plan will apply in place of those sections.

6. WATER QUALITY TREATMENT.

(a) Development creating or reconstructing impervious surface shall apply Better Site Design (BSD) techniques as outlined in Chapter 4 of the MPCA Minnesota Stormwater Manual as amended (www.stormwater.pca.mn.us). A BSD guidance document and checklist is available on the District's website.

(b) Sediment shall be managed on-site to the maximum extent practicable before runoff resulting from new or reconstructed impervious surface enters the off-site drainage system.

(c) WATER QUALITY TREATMENT STANDARD.

(1) The required water quality treatment volume standard for all projects, except Public Linear Projects, is determined as follows:

Required Water Quality Treatment Volume (ft^3) = Area of New or Reconstructed Impervious Surface (ft^2) x 1.1 (in) ÷ TP Removal Factor from Table C1 ÷ 12 (in/ft)

(2) The required water quality treatment volume standard for Public Linear Projects is determined as follows:

Required Water Quality Treatment Volume (ft^3) = Area of New Impervious Surface (ft^2) x 0.75 (in) ÷ 12 (in/ft)

(3) For alternative Stormwater BMPs not found in Table C1 or to deviate from TP Removal Factors found in Table C1, the applicant may submit a TP Removal Factor, expressed as annual percentage removal efficiency, based on supporting technical data, for District approval.

(4) Stormwater runoff treated by the BMP during a rain event will not be credited towards the treatment requirement.

TABLE C1. TP REMOVAL FACTORS FOR PROPERLY DESIGNED BMPS.

BMP	BMP Design Variation	TP Removal Factor *
Infiltration **	Infiltration Feature	1.00
Water Reuse **	Irrigation	1.00
Biofiltration	Underdrain	0.65
Filtration	Sand or Rock Filter	0.50
Stormwater Wetlands	Shallow Wetland	0.40
	Pond/Wetland	0.55
Stormwater Ponds ***	Wet Pond	0.50
	Multiple Pond	0.60

Source: Adapted from Table 7.4 from the Minnesota Stormwater Manual, MPCA.
* Refer to MPCA Stormwater Manual for additional information on BMP performance. Removal factors shown are average annual TP percentage removal efficiencies intended solely for use in comparing the performance equivalence of various BMPs.
** These BMPs reduce runoff volume.
*** Stormwater ponds must also provide 2.5" of dead storage as required by Section 9(d)(2).

(d) BMP LOCATIONAL SITING.

(1) BMPs shall be located either on-site to treat runoff at the point of generation, or regionally within the Resource of Concern Drainage Area.

(2) If infiltration is feasible on site (see Table C2), on-site or regional BMPs must provide volume control to meet the standard of subsection 6(c). If infiltration is not feasible, any BMP may be used.

(3) Off-site and/or regional BMPs must be sited in the following priority order:

(i) In a downstream location that intercepts the runoff volume leaving the project site prior to the Resource of Concern.

(ii) Anywhere within the same Resource of Concern Drainage Area (see Figures C1A-C1E) that results in no greater mass of Total Phosphorus reaching the resource of concern than on-site BMPs.

TABLE C2. SPECIFIC CONDITIONS THAT MAY RESTRICT INFILTRATION.

Type	Specific Project Site Conditions	Required Submittals
Potential Contamination	Potential Stormwater Hotspots (PSH)	PSH Locations and Flow Paths
	Contaminated Soils	Documentation of Contamination Soil Borings
Physical Limitations	Low Permeability Soils (HSG C & D)	Soil Borings
	Bedrock within three vertical feet of bottom of infiltration area	Soil Borings
	Seasonal High Water Table within three vertical feet of bottom of infiltration area	Soil Borings High Water Table
	Karst Areas	Soil Borings
Land Use Limitations	Utility Locations	Site Map
	Nearby Wells (Private and/or Municipal) *	Well Locations

* Refer to Minnesota Stormwater Manual or the Minnesota Department of Health for setback requirements.

(e) Stormwater runoff from all new and reconstructed impervious surface must be treated for total phosphorus if feasible. Notwithstanding, runoff from undisturbed site impervious surface may be treated in lieu of treating new or reconstructed impervious surface, provided the runoff from that surface drains to the same Resource of Concern as the new/reconstructed surface not being treated. Except for Public Linear projects, the area not treated for phosphorus may not exceed 15 percent of all the new or reconstructed impervious surface. For all untreated surface, TSS must be removed to the maximum extent practicable.. Total water quality treatment volume for the project must be provided in aggregate pursuant to subsections 6(c) and 6(d).

(f) For single-family residential development, the runoff from impervious surface other than parking or driving surface that, in the District's judgment, cannot reasonably be routed to a stormwater BMP is considered effectively treated for water quality if:

(1) The length of the flow path across the impervious surface is less than the length of the flow path across the pervious surface to which it discharges; and

(2) The pervious surface is vegetated and has an average slope of five percent or less.

(g) Banked "volume control" credits and debits established by public entities for Public Linear Projects with the RCWD prior to the effective date of this rule will continue to be recognized and enforced until all credits are used or all debits are fulfilled. Existing credits and debits may be used and fulfilled, respectively, anywhere within the applicant's jurisdiction.

7. PEAK STORMWATER RUNOFF CONTROL.

(a) Peak stormwater runoff rates for the proposed project at the project site boundary, in aggregate, must not exceed existing peak runoff rates for the 2-year, 10-year and 100-year, 24-hour rainfall events, or a different critical event duration at the discretion of the District Engineer. Notwithstanding, peak runoff may be controlled to this standard in a regional facility consistent with paragraph 7(b). Aggregate compliance for all site boundary discharge will be determined with respect to runoff not managed in a regional facility.

(b) Any increase in a critical duration flood event rate at a specific point of discharge from the project site must be limited and cause no adverse downstream impact. Table C3 shows the maximum curve numbers that may be utilized for existing condition modeling of those project site areas not covered by impervious surface.

(c) Within the Flood Management Zone only (see Figure C2), the applicant shall provide peak rate control for the 2, 10 and 100 year 24-hour rainfall events beyond the existing condition peak rate of runoff by reducing the peak rate to ≤80% of the existing condition. This requirement does not apply if the project is a Public Linear Project.

TABLE C3. CURVE NUMBERS FOR EXISTING CONDITION PERVIOUS AREAS.

Hydrologic Soil Group	Runoff Curve Number *
A	39
B	61
C	74
D	80

* Curve numbers from NRCS Technical Release #55 (TR-55).

TABLE C4. HYDROPERIOD STANDARDS.

Wetland Susceptibility Class	Permitted Storm Bounce for 2-Year and 10-Year Event *	Inundation Period for 2-Year Event *	Inundation Period for 10-Year Event *
Highly susceptible	Existing	Existing	Existing
Moderately susceptible	Existing plus 0.5 ft	Existing plus 1 day	Existing plus 7 days
Slightly susceptible	Existing plus 1.0 ft	Existing plus 2 days	Existing plus 14 days
Least susceptible	No limit	Existing plus 7 days	Existing plus 21 days

Source: Adapted from: Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands.
* Duration of 24-hours for the return periods utilizing NOAA Atlas 14.

8. BOUNCE AND INUNDATION PERIOD.

(a) The project must meet the hydroperiod standards found in Table C4 with respect to all down-gradient wetlands.

(b) Wetland Susceptibility Class is determined based on wetland type, as follows:

(1) Highly susceptible wetland types include: sedge meadows, bogs, coniferous bogs, open bogs, calcareous fens, low prairies, coniferous swamps, lowland hardwood forests, and seasonally flooded waterbasins.

(2) Moderately susceptible wetland types include: shrub-carrs, alder thickets, fresh (wet) meadows, and shallow & deep marshes.

(3) Slightly susceptible wetland types include: floodplain forests and fresh wet meadows or shallow marshes dominated by cattail giant reed, reed canary grass or purple loosestrife.

(4) Least susceptible wetland includes severely degraded wetlands. Examples of this condition include cultivated hydric soils, dredge/fill disposal sites and some gravel pits.

9. DESIGN CRITERIA.

(a) Infiltration BMPs must be designed to provide:

(1) Adequate pretreatment measures to remove sediment before runoff enters the primary infiltration area;

(2) Drawdown within 48-hours or 72-hours from the end of a storm event, for surface or sub-surface features, respectively. Soil infiltration rates shall be based on the appropriate HSG classification and associated infiltration rates (see Table C5). The least permeable layer of the soil boring column must be utilized in BMP calculations (see Design Criteria (e). Alternate infiltration rates based on a recommendation and certified measurement testing from a licensed geotechnical engineer or licensed soil scientist will be considered. Infiltration area will be limited to horizontal areas subject to prolonged wetting;

(3) A minimum of three feet of separation from the Seasonal High Water Table; and

(4) Consideration of the Minnesota Department of Health guidance document Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas. Documentation shall be submitted to support implementation of this guidance document and will be accepted at the discretion of the District Engineer.

(b) Water Reuse BMPs must conform to the following:

(1) Design for no increase in stormwater runoff from the irrigated area or project site.

(2) Required design submittal packages for water reuse BMPs must include:

(i) An analysis using Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Irrigation Constant Demand' spreadsheet for irrigation practices or 'Water Balance Too Non-Irrigation Constant Demand' Spreadsheet for non-irrigation practices. The tools are available for download at: http://www.metrocouncil.org/wastewater-water/planning/water-supply-planning/studies-projects-workgroups-(1)/completed-studies-projects/stormwater-reuse-guide.aspx;

(ii) Documentation demonstrating adequacy of soils, storage system, and delivery system; and

(iii) Operations plan.

(3) Approved capacity of an irrigation practice will be based on:

(i) An irrigation rate of 0.5 inches per week over the irrigated pervious area(s) or the rate identified through the completion of the Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Irrigation Constant Demand' Spreadsheet (whichever is less); or as approved by the District; and

(ii) No greater than a 26 week (April 15th to October 15th) growing season.

An additional water quality treatment capacity beyond 0.5 inches per week may be recognized under a subsection C.5(f) plan or a C.13 phased development permit based on a three-year average of monitoring records of volume irrigated.

(4) Approved capacity of a non-irrigation practice shall be based on the rate identified through the completion of the Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Non-Irrigation Constant Demand' spreadsheet, or as approved by the District.

(c) Biofiltration/filtration BMPs must be designed to provide:

(1) Adequate pretreatment measures to remove sediment before runoff enters the primary biofiltration area;

(2) Drawdown within 48-hours or 72-hours from the end of a storm event, for surface or sub-surface features, respectively;

(3) A minimum of 12-inches of organic material or sand above the rock trench or draintile system; and

(4) Drain tile system must be designed above the Seasonal High Water Table.

TABLE C5. SOIL TYPE AND INFILTRATION RATES.

Hydrologic Soil Group	Soil Textures	Corresponding Unified Soil Classification		Infiltration Rate (in/hr)
A	Gravel Sandy Gravel Silty Gravels	**GW**	Well-graded gravels, sandy gravels	**1.63**
		GP	Gap-graded or uniform gravels, sandy gravels	
		GM	Silty gravels, silty sandy gravels	
		SW	Well-graded gravelly sands	
	Sand Loamy Sand Sandy Loam	**SP**	Gap-graded or uniform sands, gravelly sands	**0.8**
B	Loam Silt Loam	**SM**	Silty sands, silty gravelly sands	**0.45**
		MH	Micaceous silts, diatomaceous silts, volcanic ash	**0.3**
C	Sandy Clay Loam	**ML**	Silts, very fine sands, silty or clayey fine sands	**0.2**
D	Clay Loam Silty Clay Loam Sandy Clay Silty Clay Clay	**GC**	Clayey gravels, clayey sandy gravels	**0.06**
		SC	Clayey sands, clayey gravelly sands	
		CL	Low plasticity clays, sandy or silty clays	
		OL	Organic silts and clays of low plasticity	
		CH	Highly plastic clays and sandy clays	
		OH	Organic silts and clays of high plasticity	

Source: Adapted from the “Design infiltration rates” table from the Minnesota Stormwater Manual, MPCA, (January 2014).

(d) Stormwater ponds must be designed to provide:

(1) Water quality features consistent with NURP criteria and accepted design standards for average and maximum depth;

(2) A permanent wet pool with dead storage at least equal to the runoff volume from a 2.5-inch rainfall over the area tributary to the pond;

(3) An outlet structure capable of preventing migration of floating debris and oils for at least the one-year storm;

(4) An identified emergency overflow spillway sufficiently stabilized to convey flows greater than the 100-year critical storm event; and

(5) An outlet structure to control the 2-year, 10-year & 100-year frequency events.

(e) Soil borings (utilizing ASTM D5921 and D5879, as amended) shall be considered for design purposes, and provided to the District, for each proposed BMP. The soil borings must be taken to a depth of at least 5 feet below the bottom of the proposed feature.

(f) An outfall structure discharging directly to a wetland, public water or public water wetland must incorporate a stilling-basin, surge-basin, energy dissipater, placement of ungrouted natural rock riprap or other feature to minimize disturbance and erosion of natural shoreline and bed resulting from stormwater discharges. Where feasible, outfall structures are to be located outside of the natural feature.

TABLE C6. LOW FLOOR AND LOW ENTRY FREEBOARD REQUIREMENTS.

Freeboard	Regional Flood Elevations		Detention Basins , Wetlands & Stormwater Ponds		Infiltration and Biofiltration Basins			Rain Gardens*
	100-yr	EOF	100-yr	EOF	Bottom	100-yr	EOF	EOF
Low Floor	2.0 ft	1.0 ft	0.0 ft	NA	0.0 ft	NA	NA	NA
Low Entry	NA	NA	2.0 ft	1.0 ft	NA	2.0 ft	1.0 ft	0.5 ft

(g) All new residential, commercial, industrial and other habitable or non-habitable structures, and all stormwater BMPs, must be constructed so that the lowest floor and lowest entry elevations comply with Table C6.

The low entry freeboard criterion of Table C6 may be deemed met when the structure does not have the required vertical separation, but is protected from surface flooding to the required elevation by a berm or other natural or constructed topographic feature capable of providing flood protection.

Within a landlocked basin, minimum low floor elevations must be at least one foot above the surveyed basin run out elevation. Where a structure is proposed below the run out elevation of a land-locked basin, the low floor elevation will be a minimum of two feet above the highest water level of either the 10-day snowmelt event or back-to-back 100-year, 24-hour rainfalls. Aerial photos, vegetation, soils, and topography may be used to derive a "normal" water elevation for the purpose of computing the basin's 100-year elevation.

(h) All stormwater management structures and facilities must be designed for maintenance access and be properly operated and maintained in perpetuity to assure that they continue to function as designed. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District. Regional ponds owned by public entities that are only used to meet the rate control requirements of the District rule do not need a maintenance agreement with the District.

(i) The permittee must use construction best practices so that the facility as constructed will conform to design specifications and the soil and surrounding conditions are not altered in a way adverse to facility performance.

(j) Before work under the permit is deemed complete, the permittee must submit as-built plans demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications. If at any time the District finds that the stormwater facility is not performing as designed, on District request the permittee must undertake reasonable investigation to determine the cause of inadequate performance.

10. EASEMENTS.

(a) Before permit issuance, the permittee must, submit a copy of any plat or easement required by the local land use authority establishing drainage or flowage over stormwater management facilities, stormwater conveyances, ponds, wetlands, on-site floodplain up to the 100-year flood elevation, or any other hydrologic feature.

(b) Before permit issuance, the permittee must convey to the District an easement over the public drainage system specifying a District right of maintenance access over the following minimum widths:

(1) For tiled/piped systems, 66 feet wide perpendicular to the direction of flow, centered on the tile line or pipe;

(2) For open channel systems, a variable width perpendicular to the direction of flow, to include the open channel itself and all areas within 16.5 feet from the top of the ditch bank.

(c) Public Linear Projects are exempt from the public drainage system easement requirement of Section 10(b).

(d) For projects within the District's Comprehensive Wetland Protection and Management Plan (CWPMP) areas, the Wetland Management Corridor (WMC) boundary delineation, buffer and easement requirements found at Rule F.6 apply. As stated in Rule F.5(e), Public Linear Projects are not subject to the requirements of Rule F.6.

11. REQUIRED EXHIBITS. The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

(a) An erosion & sediment control plan and, for projects that require an NPDES permit, a Storm Water Pollution Prevention Plan.

(b) Property lines and delineation of lands under ownership of the applicant.

(c) Delineation of the subwatershed contributing runoff from off-site, proposed and existing subwatersheds onsite, emergency overflows, and drainageways.

(d) Geotechnical analysis including soil borings at all proposed stormwater management facility locations utilizing ASTM D5921 and D5879, as amended.

(e) Proposed and existing stormwater facilities' location, alignment and elevation.

(f) Delineation of existing on-site wetland, marshes and floodplain areas.

(g) Identification of existing and proposed normal, ordinary high and 100-year water elevations on-site.

(h) Identification of existing and proposed contour elevations within the project site related to NAVD 88.

(i) Construction plans and specifications of all proposed stormwater management facilities, including design details for outlet control structures.

(j) Stormwater runoff volume and rate analyses for the 2- 10- and 100-year critical events, existing and proposed conditions utilizing NOAA Atlas 14.

(k) All hydrologic, water quality and hydraulic computations completed to design the proposed stormwater management facilities.

(l) Narrative including a project description, discussion of BMP selection, and revegetation plan for the project site.

(m) Other project site-specific submittal requirements as may be required by the District.

12. EXCEPTIONS.

(a) Rate control criteria of Section 7 may be waived if the project site discharges directly to a water body with large storage capacity (such as a public water), the volume discharged from the project site does not contribute to a downstream flood peak, and there are no downstream locations susceptible to flooding.

(b) Section 6 and Section 7 are waived for a portion of a project that paves a gravel roadway if the right-of-way ditch is maintained and does not discharge a concentrated flow directly to a wetland or another sensitive water body.

13. EXTENDED PERMIT TERM AND REGIONAL FACILITIES FOR NON-RESIDENTIAL PHASED DEVELOPMENT.

(a) The following definitions apply to this section:

(1) “Area Development Permit” (ADP) means a District stormwater management permit for non-residential development that includes construction of a stormwater management facility explicitly intended to serve compliance requirements for a parcel other than that on which the facility is located.

(2) “Phased Development Permit” (PDP) means a District stormwater management permit for non-residential development that includes construction of a stormwater management facility explicitly intended to serve compliance requirements not just

for development under the permit, but also for subsequent development on that parcel or a contiguous parcel under common ownership.

(b) If an off-site stormwater management facility approved under a prior ADP cannot be used for compliance due to a rule change occurring since the date of ADP approval, the District nevertheless by permit will approve its use, subject to the following:

(1) The applicant must demonstrate that the facility was built in compliance with the ADP, that the ADP identified the development site as one that may use the facility, and that the requirements of subsection 5(a), above, are met.

(2) If the current rule requires a level of peak flow or volume control, or of water quality treatment, beyond that provided by the off-site facility, the applicant must provide for the additional treatment. This does not disallow use of an existing facility on the ground that it does not meet a sequencing requirement with respect to the BMP location or type.

The protection against rule change provided by this subsection 13(b) does not apply if the District makes written findings, on the basis of new knowledge or information, that use of the facility would have a material adverse impact on a water quality, flood management or other specific public interest, or if the approval date of the development permit is more than 10 years after the date of ADP approval.

(c) The District may issue a PDP with a permit term of up to 10 years.

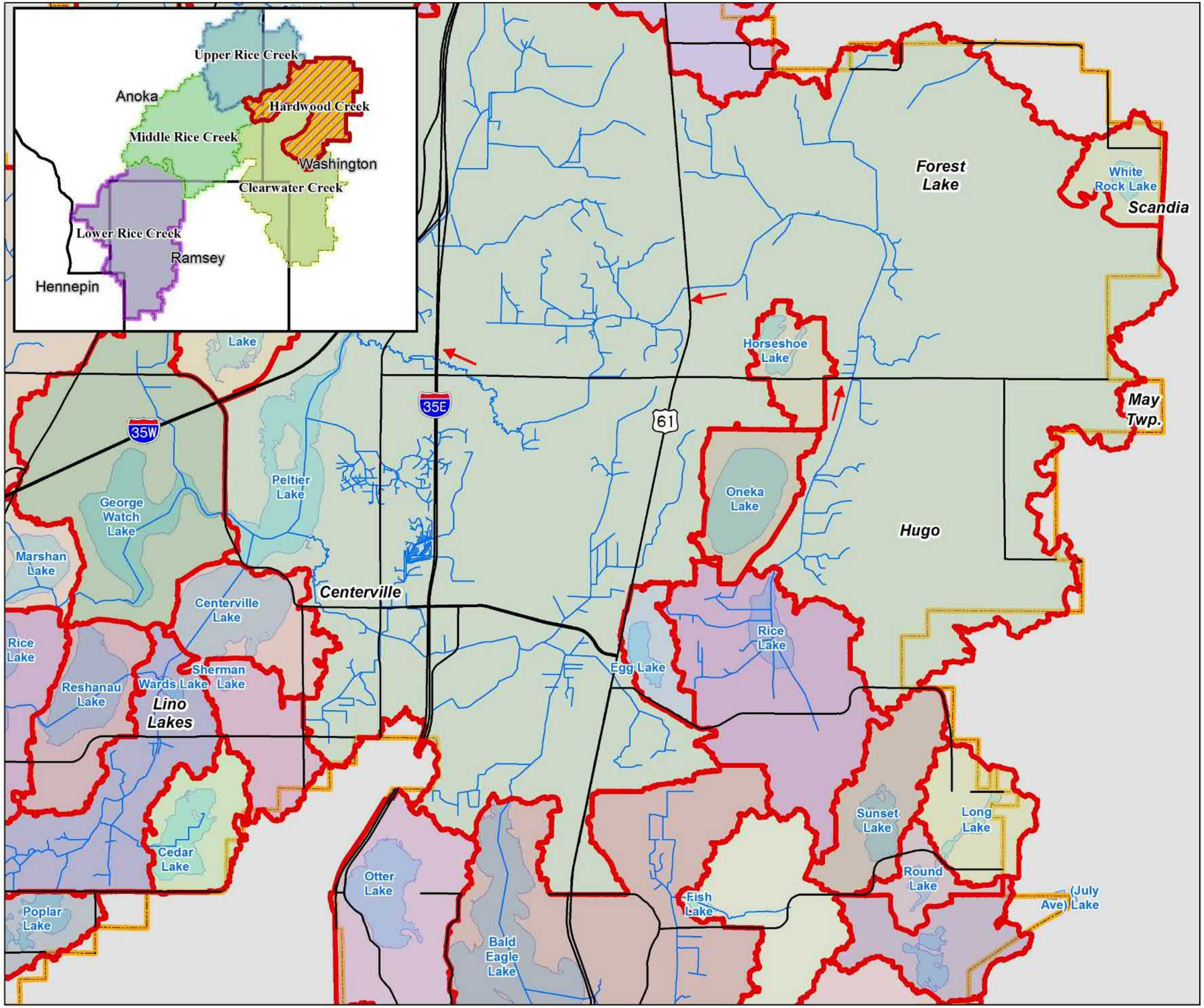
(1) During the permit term, development using the stormwater management facilities approved under the PDP will not be subject to a rule change occurring after the date of PDP approval, provided the PDP states the design criteria to which subsequent development will conform and the proposed development meets those criteria.

(2) If a PDP is in effect as of December 1, 2014**,** on request the District will extend the permit expiration date in accordance with this subsection 13(c). In such a case, the requirement that the permit state design criteria is relaxed. However, the applicant must demonstrate the design and constructed capacity of the facilities and the capacity allocated to the proposed development.

(3) If a PDP was approved after December 1, 2004 but has expired, an application for a subsequent development phase may be considered under the terms of subsection 13(b), above.

(d) This section does not apply to an ADP or a PDP approved before December 1, 2004.

Rice Creek Watershed District



- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

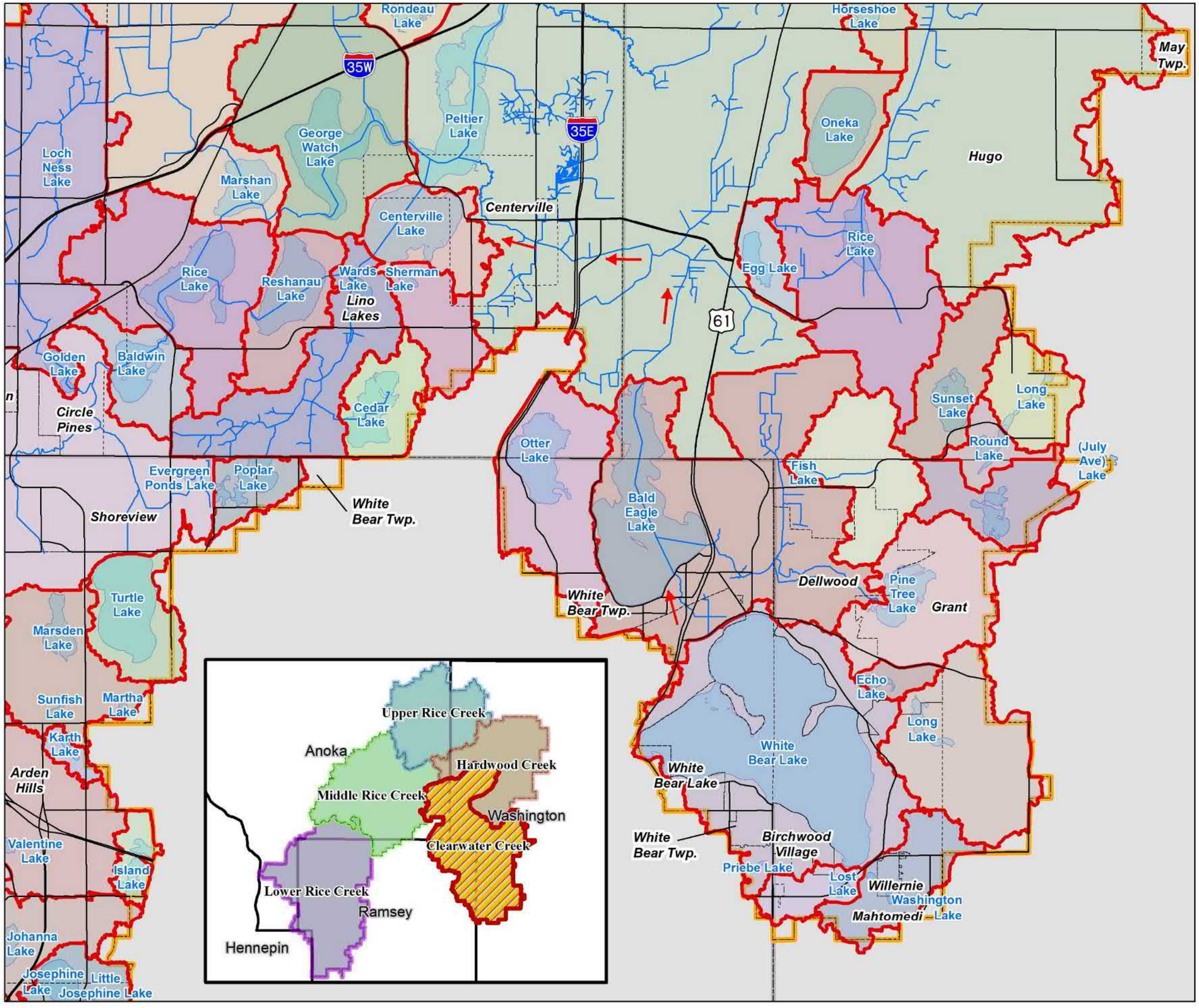
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C1A: Resources of Concern Drainage Area of Hardwood Creek

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District



- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

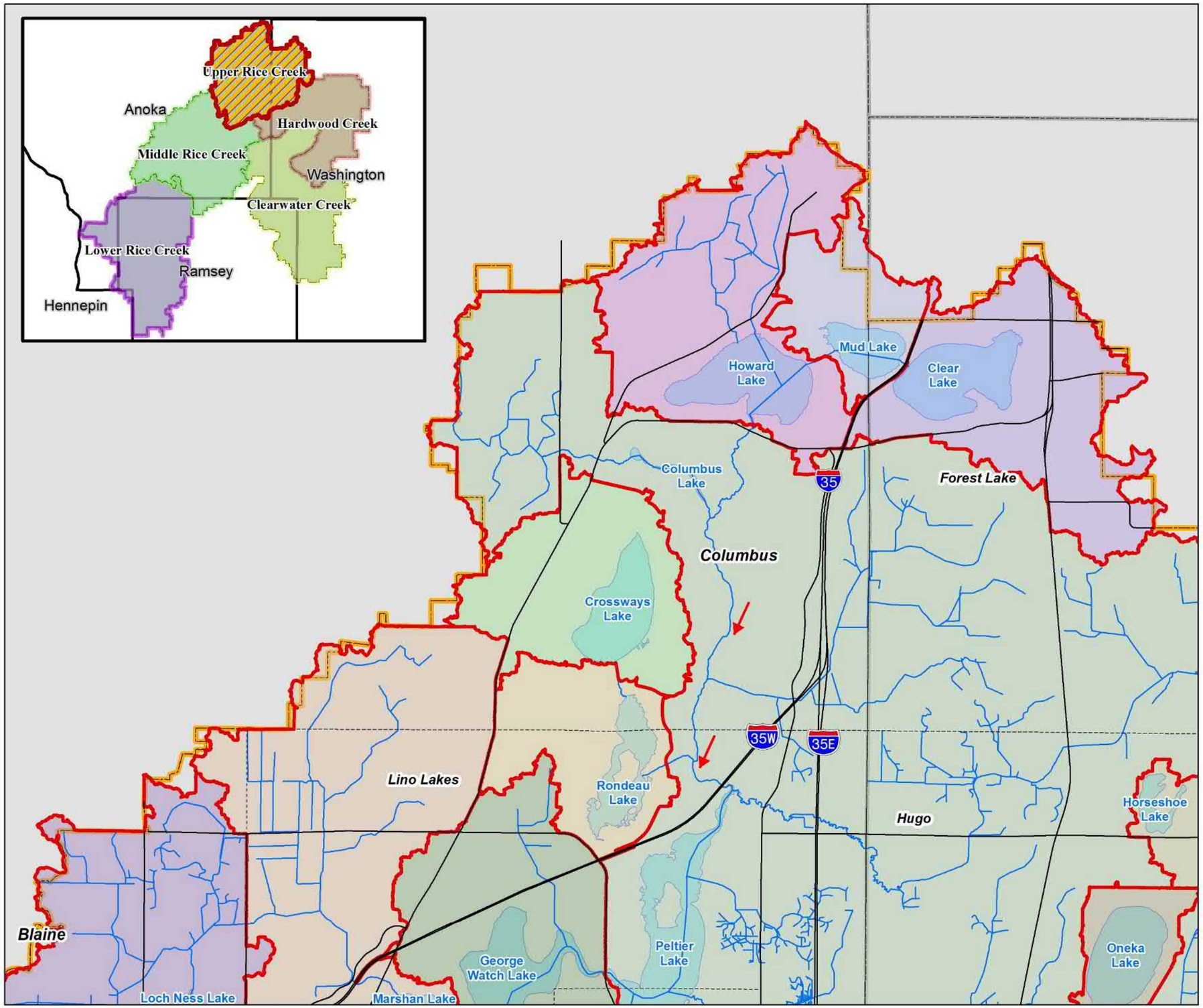
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C1B: Resources of Concern Drainage Area of Clearwater Creek

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District



Flow Direction
RCWD Watercourses
Lakes
RCWD Legal Boundary
Resource of Concern Drainage Area
Transportation System
Cities
Counties

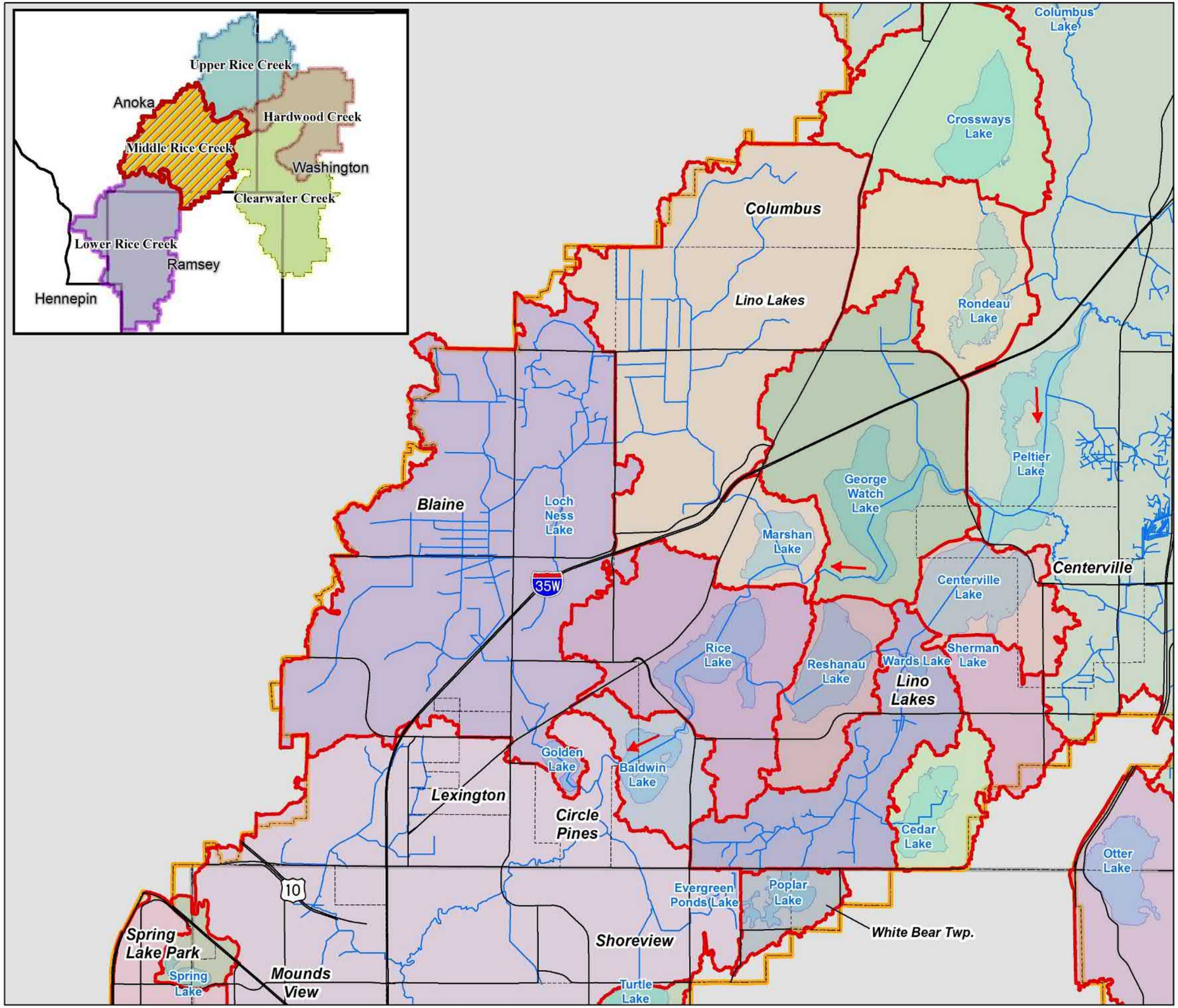
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C1C: Resources of Concern Drainage Area of Upper Rice Creek

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District



- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

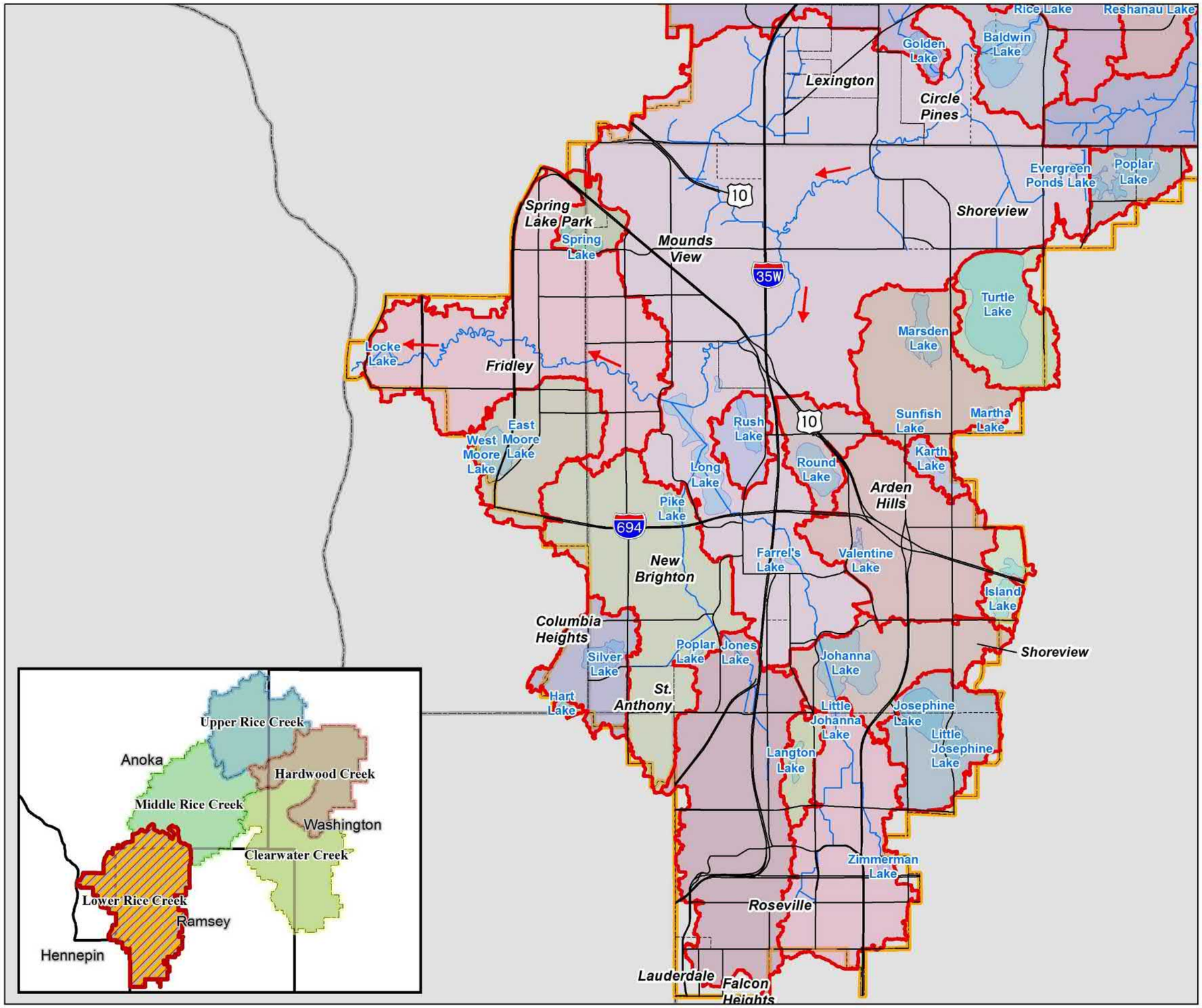
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C1D: Resources of Concern Drainage Area of Middle Rice Creek

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District



- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

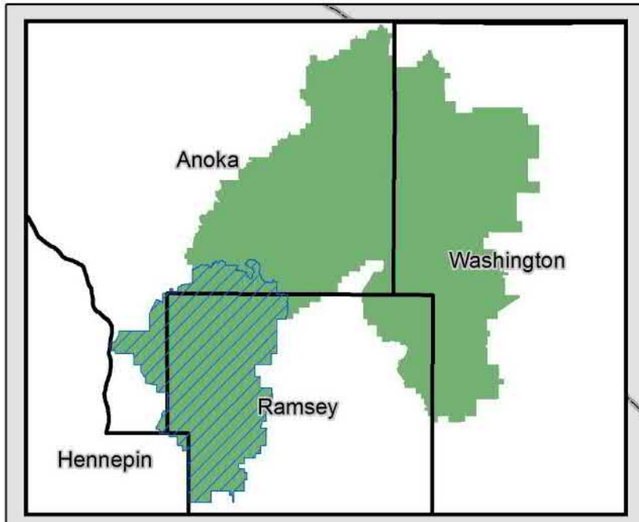
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C1E: Resources of Concern Drainage Area of Lower Rice Creek

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District



Flood Managment Zone (below Baldwin Lake)

Rice
Reshanau
Circle Pines
Lexington
Golden
Baldwin
Evergreen Ponds
Poplar
Shoreview
Turtle
Spring Lake Park
Spring
Mounds View
Marsden
Arden Hills
Locke
Fridley
West Moore
East Moore
New Brighton
Bush
Sunfish
Martha
Round
Karth
Long
Pike
Farrel's
Valentine
Island
Columbia Heights
Silver
Poplar
Johanna
Little Johanna
Josephine
Hart
St. Anthony
Little Jshephine
Langton
Zimmerman
Roseville
Lauderdale
Falcon Heights

101ST AVE NE · COUNTY ROAD 52 · LEXINGTON AVE NE · NORTH RD · BIRCH ST · NAPLES ST NE · LAKE DR · HODGSON RD · 85TH AVE NE · 85TH AVE · ASH ST W · LEXINGTON AVE N · HAMLINE AVE N · SHERWOOD RD · COUNTY ROAD I · COUNTY ROAD I W · LONG LAKE RD · 10 · 35W · 73RD AVE NE · CENTRAL AVE NE · COUNTY ROAD H · COUNTY ROAD H W · HIGHWAY 8 · MISSISSIPPI ST NE · RICE CREEK RD · COUNTY ROAD 96 W · 10TH ST NW · COUNTY ROAD F W · SILVER LAKE RD NW · 8TH AVE NW · NEW BRIGHTON BLVD · COUNTY ROAD E · LAKE JOHANNA BLVD · COUNTY ROAD E · SILVER LN · 37TH AVE NE · CLEVELAND AVE N · COUNTY ROAD C W · COUNTY ROAD B W · ROSELAWN AVE W · EUSTIS ST · FULHAM ST

RCWD Watercourses
Lakes
Flood Management Zone
RCWD Legal Boundary
Transportation System
Cities
Counties

0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

C2: Flood Management Zone

RCWD
RICE CREEK WATERSHED DISTRICT

RULE D: EROSION AND SEDIMENT CONTROL PLANS

1. POLICY. It is the policy of the Board of Managers to prevent erosion of soil into surface water systems by requiring erosion and sediment control for land-disturbing activities.

2. REGULATION.

(a) An erosion and sediment control plan must be submitted, and a permit received from the District, for:

(1) Surface soil disturbance or removal of vegetative cover on one acre or more of land;

(2) Surface soil disturbance or removal of vegetative cover on 10,000 square feet or more of land, if any part of the disturbed area is within 300 feet of and drains to a lake, stream, wetland or public drainage system; or

(3) Any land-disturbing activity that requires a District permit under a rule other than Rule D.

(b) A person disturbing surface soils or removing vegetative cover on more than 5,000 square feet of land, or stockpiling on-site more than fifty (50) cubic yards of earth or other erodible material, but not requiring a permit under the criteria of this rule, must submit a notice in advance of disturbance on a form provided by the District and conform the activity to standard best practices established by and available from the District.

(c) Rule D does not apply to normal farming practices that are part of an ongoing farming operation.

(d) Rule D does not apply to milling, reclaiming or overlay of paved surfaces that does not expose underlying soils.

3. DESIGN CRITERIA FOR EROSION CONTROL PLANS. The applicant must demonstrate that the standards of Rule C, subsections 7(a) and (b), are met. In addition, Erosion and Sediment Control Plans must comply with the following criteria:

(a) Natural project site topography and soil conditions must be specifically addressed to reduce erosion and sedimentation during construction and after project completion.

(b) Site erosion and sediment control practices must be consistent with the Minnesota Pollution Control Agency document “Protecting Water Quality in Urban Areas” (1994), as amended, and District-specific written design guidance and be sufficient to retain sediment on-site.

(c) The project must be phased to minimize disturbed areas and removal of existing vegetation, until it is necessary for project progress.

(d) The District may require additional erosion and sediment control measures on areas with a slope to a sensitive, impaired or special water body, stream, drainage system or wetland to assure retention of sediment on-site.

(e) The plan must include conditions adequate to protect facilities to be used for post-construction stormwater infiltration.

4. REQUIRED EXHIBITS. The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

(a) An existing and proposed topographic map which clearly indicates all hydrologic features and areas where grading will expose soils to erosive conditions. The Plan must also indicate the direction of all project site runoff.

(b) Tabulation of the construction implementation schedule.

(c) Name, address and phone number of party responsible for maintenance of all erosion and sediment control measures.

(d) Quantification of the total disturbed area.

(e) Clear identification of all temporary erosion and sediment control measures that will remain in place until permanent vegetation is established. Examples of temporary measures include, but are not limited to, seeding, mulching, sodding, silt fence, erosion control blanket, and stormwater inlet protection devices.

(f) Clear identification of all permanent erosion control measures such as outfall spillways and riprap shoreline protection, and their locations.

(g) Clear Identification of staging areas, as applicable.

(h) Documentation that the project applicant has applied for the NPDES Permit from the Minnesota Pollution Control Agency (MPCA), when applicable.

(i) A stormwater pollution prevention plan for projects that require an NPDES Permit.

(j) Delineation of any floodplain and/or wetland area changes.

(k) Other project site-specific submittal requirements as may be required by the District.

5. CONSTRUCTION ACTIVITY REQUIREMENTS. Any activity subject to a permit under this rule must conform to the standards of the NPDES construction general permit, as amended, regarding construction-site erosion and sediment control.

6. INSPECTIONS.

(a) The permittee shall be responsible for inspection, maintenance and effectiveness of all erosion and sediment control measures until final soil stabilization is achieved or the permit is assigned (see Rule B), whichever comes first.

(b) The District may inspect the project site and require the permittee to provide additional erosion control measures as it determines conditions warrant.

7. FINAL STABILIZATION.

(a) Erosion and sediment control measures must be maintained until final vegetation and ground cover is established to a density of 70%.

(b) Temporary erosion and sediment control BMPs will be removed after disturbed areas have been permanently stabilized.

RULE E: FLOODPLAIN ALTERATION

1. POLICY. It is the policy of the Board of Managers to:

(a) Utilize the best information available in determining the 100-year flood elevation.

(b) Preserve existing water storage capacity within the 100-year floodplain of all waterbodies and wetlands in the watershed to minimize the frequency and severity of high water.

(c) Enhance floodplain characteristics that promote the natural attenuation of high water, provide for water quality treatment, and promote groundwater recharge.

(d) Preserve and enhance the natural vegetation existing in floodplain areas for aquatic and wildlife habitat.

2. REGULATION. No person may alter or fill land within the floodplain of any lake, stream, wetland, drainage system, major watercourse, or public waters without first obtaining a permit from the District. Shoreline/streambank restoration or stabilization, approved in writing by the District and/or County Conservation District as necessary to control erosion and designed to minimize encroachment and alteration of hydraulic forces, does not require a permit under this Rule.

3. CRITERIA FOR FLOODPLAIN ALTERATION.

(a) Fill within a designated floodway is prohibited.

(b) Fill within the floodplain is prohibited unless compensatory floodplain storage volume is provided within the floodplain of the same water body, and within the permit term. If offsetting storage volume will be provided off-site, it shall be created before any floodplain filling by the applicant will be allowed.

(c) Any structure or embankments placed within the floodplain will be capable of passing the 100-year flood without increasing the elevation of the 100-year flood profile.

(d) Compensatory floodplain storage volume is not required to extend an existing culvert, modify an existing bridge approach associated with a Public Linear Project, or place spoils adjacent to a public or private drainage channel during channel maintenance, if there is no adverse impact to the 100-Year Flood Elevation.

(e) Compensatory floodplain storage volume is not required for a one-time deposition of up to 10 cubic yards of fill, per parcel, if there is no adverse impact to the 100-Year Flood Elevation. The one-time deposition does not include public linear projects.

(f) Floodplain alteration is subject to the District's Wetland Alteration Rule F, as applicable.

(g) Structures to be built within the 100-year floodplain will have two feet of freeboard between the lowest floor and the 100-year flood profile.

4. DRAINAGE EASEMENTS.

(a) Before permit issuance, the permittee must submit a copy of any plat or easement required by the local land use authority establishing drainage or flowage over stormwater

management facilities, stormwater conveyances, ponds, wetlands, on-site floodplain up to the 100-year event, or any other hydrological feature.

(b) Before permit issuance, the permittee must convey to the District an easement over the public drainage system specifying a District right of maintenance access over the following minimum widths:

(1) For tiled/piped systems, 66 feet wide perpendicular to the direction of flow, centered on the tile line or pipe;

(2) For open channel systems, a variable width perpendicular to the direction of flow, to include the open channel itself and all areas within 16.5 feet from the top of the ditch bank.

(c) Public Linear Projects are exempt from the public drainage system easement requirement of Section 4(b).

5. REQUIRED EXHIBITS. The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

(a) Site plan showing property lines, delineation of the work area, existing elevation contours of the work area, ordinary high water elevations, and 100-year flood elevations. All elevations must be reduced to NAVD 1988 datum.

(b) Grading plan showing any proposed elevation changes.

(c) Determination by a professional engineer or qualified hydrologist of the 100-year flood elevation before and after the project.

(d) Computation of change in flood storage capacity resulting from proposed grading.

(e) Erosion and sediment control plan in accordance with District Rule D.

(f) Other project site-specific submittal requirements as may be required by the District.

RULE F: WETLAND ALTERATION

1. POLICY. It is the policy of the Board of Managers to:

(a) Maintain no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands.

(b) Increase the quantity, quality, and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands.

(c) Avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality, and biological diversity of wetlands.

(d) Replace wetland values where avoidance of activity is not feasible or prudent.

(e) Accomplish goals of the adopted Comprehensive Wetland Protection and Management Plans (CWPMPs).

2. REGULATION. No person may fill, drain, excavate or otherwise alter the hydrology of a wetland without first obtaining a permit from the District.

(a) The provisions of the Minnesota Wetland Conservation Act (WCA), Minnesota Statutes §§103G.221 through 103G.2372, and its implementing rules, Minnesota Rules 8420, apply under this Rule and govern District implementation of WCA as well as District regulation of non-WCA wetland impacts, except where the Rule provides otherwise.

(b) This rule does not regulate alteration of incidental wetlands as defined in Minnesota Rules chapter 8420, as amended. An applicant must demonstrate that the subject wetlands are incidental.

(c) An activity for which a No-Loss decision has been issued under Minnesota Rules chapter 8420 is subject to the applicable requirements of chapter 8420 but not otherwise subject to this Rule.

(d) Clearing of vegetation, plowing or pasturing in a wetland as part of an existing and ongoing farming operation is not subject to this rule unless the activity results in draining or filling the wetland.

3. LOCAL GOVERNMENT UNIT. The District intends to serve as the "Local Government Unit" (LGU) for administration of the Minnesota Wetland Conservation Act (WCA), except where a particular municipality in the District has elected to assume that role in its jurisdictional area or a state agency is serving as the local government unit on state land. Pursuant to its regulatory authority under both WCA and watershed law, when the District is serving as the LGU it will require wetland alteration permits for wetland-altering activities both as required by WCA and otherwise as required by this Rule.

4. CRITERIA.

(a) When the District is serving as the LGU, it will regulate wetland alterations that are not subject to WCA rules and do not qualify for an exemption at Minnesota Rules 8420.0420 or do not meet the “no-loss” criteria of Minnesota Rules 8420.0415 according to the rules and procedures of WCA, except as specifically provided in this Rule. Alteration under

this paragraph requires replacement at a minimum ratio of 1:1 to ensure no loss of wetland quantity, quality or biological diversity. Replacement activities will be credited consistent with the actions eligible for credit in Minnesota Rules 8420.0526.

(b) A wetland alteration not subject to WCA that does not change the function of a wetland and results in no net loss of wetland quantity, quality or biological diversity is exempt from the replacement requirement in Section 4(a) of this Rule.

(c) The wetland replacement exemptions in Minnesota Rules 8420.0420 are applicable under this Rule, except as modified within CWPMP areas under Section 6.

(d) Alterations in wetlands for the purposes of wildlife enhancement must be certified by the local Soil and Water Conservation District as compliant with the criteria described in Wildlife Habitat Improvements in Wetlands: Guidance for Soil and Water Conservation Districts and Local Government Units.

5. ADDITIONAL DISTRICT REQUIREMENTS. In addition to the wetland replacement plan components and procedures in WCA, the following more specific requirements will apply to the District's review of WCA and, except as indicated, non-WCA wetland alterations:

(a) Applicants must adequately explain and justify each individual contiguous wetland alteration area in terms of impact avoidance and minimization alternatives considered.

(b) Where the wetland alteration is proposed in the context of land subdivision, on-site replacement wetland and buffer areas, as well as buffers established undersection 6(e), must:

(1) Be located within a platted outlot.

(2) Be protected from future encroachment by a barrier (i.e. stormwater pond, infiltration basin, existing wetland, tree line, fence, trail or other durable physical feature).

(3) Have boundaries posted with signage approved by the District identifying the wetland/buffer protected status. On installation, the applicant must submit a GIS shapefile, or CADD file documenting sign locations.

(c) The upland edge of new wetland creation must have an irregular and uneven slope. The slope must be no steeper than 8:1 over the initial 25 feet upslope from the projected wetland elevation contour along at least 50 percent of the upland/wetland boundary and no steeper than 5:1 along the remaining 50 percent of the boundary.

(d) The District will not allow excess replacement credits to be used for replacement on a different project unless the credits were designated for wetland banking purposes in the original application in accordance with WCA rules and have been deposited into the WCA wetland banking system.

(e) Within the boundary of a District developed and BWSR approved CWPMP (see Figure F1), Rule F and WCA are further modified to include Section 6. Public Linear Projects located in a CWPMP jurisdictional area and not part of an industrial, commercial, institutional or residential development are not subject to Section 6 of this Rule.

6. COMPREHENSIVE WETLAND PROTECTION AND MANAGEMENT PLANS. All District Comprehensive Wetland Protection and Management Plans (CWPMPs) are incorporated into this Rule. The specific terms of Rule F will govern, but if a term of Rule F is susceptible to more than one interpretation, the District will apply the interpretation that best carries out the intent and purposes of the respective CWPMP.

(a) PRE-APPLICATION REVIEW.

(1) In cases where wetland fill, excavation or draining, wholly or partly, is contemplated, the applicant is encouraged to submit a preliminary concept plan for review with District staff and the Technical Evaluation Panel (TEP) before submitting a formal application. The following will be examined during pre-application review:

(i) Sequencing (in accordance with WCA and Federal Clean Water Act requirements, reducing the size, scope or density of each individual proposed action, and changing the type of project action to avoid and minimize wetland impacts).

(ii) Wetland assessment.

(iii) Applying Better Site Design principles as defined in Rule A.

(iv) Integrating buffers and other barriers to protect wetland resources from future impacts.

(v) Exploring development code flexibility, including conditional use permits, planned unit development, variances and code revisions;

(vi) Reviewing wetland stormwater susceptibility (see Rule C.8) and coordinating Wetland Management Corridor (WMC) establishment with existing adjacent WMCs.

(2) At the pre-application meeting, the applicant shall provide documentation sufficient to assess project alternatives at a concept level and such other information as the District specifically requests.

(3) On receipt of a complete application, the District will review and act on the application in accordance with its procedural rules and WCA procedures.

(4) The TEP shall be consulted on decisions related to replacement plans, exemptions, no-loss, wetland boundaries and determination of the WMC.

(b) WETLAND MANAGEMENT CORRIDORS.

(1) At the time of permitting, the preliminary Wetland Management Corridor (WMC) boundary (see Figure F1) will be adjusted in accordance with subsections F(6)(b)(2) and (3), below. Notwithstanding, within the Columbus CWPMP, commercial/Industrial zoned areas within Zone 1 will remain outside of the WMC (see Figure F2).

(2) The applicant must delineate the site level WMC when wetland impacts are proposed:

(i) Within the Preliminary WMC; or

(ii) Within 150 feet of the Preliminary WMC and greater than the applicable *de minimis* exemption amount, per Minnesota Rules 8420.0420;

If the proposed project does not meet criterion (b)(2)(i) or (b)(2)(ii), above, an applicant may accept the Preliminary WMC boundary on the project site, as made more precise on a parcel basis by the use of landscape-scale delineation methods applied or approved by the District and need not comply with Section 6(b)(3) and 6(b)(4).

(3) The applicant shall complete a wetland functional analysis using MnRAM 3.4 (or most recent version) when defining the site level WMC boundary.

(i) The WMC boundary will be expanded to encompass any delineated wetland lying in part within the preliminary WMC and any wetland physically contiguous with (not separated by upland from) the landscape-scale WMC.

(ii) The District, in its judgment, may retract the WMC boundary on the basis of site-level information demonstrating that the retraction is consistent with the associated CWPMP and does not measurably diminish the existing or potential water resource functions of the WMC. In making such a decision, the District may consider relevant criteria including wetland delineation, buffer and floodplain location, WMC connectivity, protection of surface waters and groundwater recharge, and whether loss would be reduced by inclusion of compensating area supporting WMC function.

(iii) If the site level functional analysis shows the presence of Non-degraded or High Quality wetland within 50 feet of the site level WMC, the WMC will be expanded to the lateral extent of the Non-degraded or High Quality wetland boundary plus the applicable buffer as defined in section 6(e).

(iv) If the WMC lies within or contiguous to the parcel boundaries of the project, the lateral extent of the final WMC may be increased by the applicant to include all wetland or other action eligible for credit contiguous with the site level WMC. The extended WMC boundary must connect property to the WMC boundary on adjacent properties and reflect local surface hydrology.

(4) A map of the final WMC boundary must be prepared and submitted to the District for approval. The map will reflect any change to the boundary as a result of the permitted activity. A GIS shapefile or CADD file of the final WMC boundary shall be submitted to the District.

(5) A variance from a requirement of Section 6(b) otherwise meeting the criteria of District Rule L may be granted if the TEP concurs that the wetland protection afforded will not be less than that resulting from application of standard WCA criteria.

(c) WETLAND REPLACEMENT.

(1) The wetland replacement exemptions in Minnesota Rules 8420.0420 are not applicable within CWPMP areas, except as follows:

(i) The agricultural, wetland restoration, utilities, *de minimis* and wildlife habitat exemptions found at Minnesota Rules 8420.0420, subparts 2, 5, 6, 8 and 9, respectively, are applicable, subject to the scope of the exemption standards found at Minnesota Rules 8420.0420, subpart 1.

(ii) The drainage exemption, Minnesota Rules 8420.0420, subpart 3, is applicable if the applicant demonstrates, through adequate hydrologic modeling, that the drainage activity will not change the hydrologic regime of a CWPMP-mapped high quality wetland (see Figure F3) within the boundary of a WMC. Wetland and plant community boundaries will be field-verified.

(iii) Buffer and easement requirements of Section 6(e) and 6(f) do not apply to wetland alterations that qualify for one of the exemptions listed in Section 6(c)(1)(i), unless the project of which the wetland alteration is a part is subject to Rule C.10(d).

(2) Replacement plans will be evaluated and implemented in accordance with Minnesota Rules 8420.0325 through 8420.0335, 8420.0500 through 08420.0544 and 8420.0800 through 8420.0820, except that the provisions of this Rule will apply in place of Minnesota Rules 8420.0522, and 8420.0526. The foundation of the CWPMPs is to limit impact to, and encourage enhancement of, high-priority wetlands and direct unavoidable impact to lower-priority wetlands in establishing the WMC. In accordance with Minnesota Rules 8420.0515, subpart 10, this principle will guide sequencing, replacement siting, WMC boundary adjustment and other elements of replacement plan review. The District will use the methodology of Minnesota Rules 8420.0522, subpart 2 to determine wetland replacement requirements for partially drained wetlands.

(3) A replacement plan must provide at least one replacement credit for each wetland impact acre, as shown in Table F1. The replacement methods must be from the actions listed in Table F2 or an approved wetland bank consistent with Section 6(d)(1).

(4) Acres of impact and replacement credit are determined by applying the following two steps in order:

(i) Multiply actual wetland acres subject to impact by the ratios stated in Table F1.

(ii) Calculate the replacement credits by multiplying the acreage for each replacement action by the percentage in Table F2. All replacement areas that are not within the final WMC will receive credit based on a replacement location outside the final WMC. However, when the replacement area is within the parcel boundaries of the project and there is no Preliminary WMC within those boundaries, and there is no opportunity to extend the WMC boundary from adjacent parcels of land, then the mitigation area will be credited as replacement inside the final WMC. If an applicant intends replacement also to fulfill mitigation requirements under Section 404 of the Clean Water Act, then the applicant may elect replacement credit based on a replacement location outside the final WMC.

(5) The replacement plan must demonstrate that non-exempt impacts will result in no net loss of wetland hydrological regime, water quality, or wildlife habitat function through a wetland assessment methodology approved by BWSR pursuant to the Wetland Conservation Act, Minnesota Statutes §103G.2242.

TABLE F1. WETLAND REPLACEMENT RATIOS FOR CWPMP AREAS.

Wetland Degradation Type	Anoka County		Washington County	
	Outside WMC	Inside WMC	Outside WMC	Inside WMC
Moderately or Severely Degraded Wetland	1:1	2:1	2:1	3:1
Marginally or Non-Degraded Wetland	1.5:1	2.5:1	2.5:1	3.5:1
High Quality Wetland and/or hardwood, coniferous swamp, floodplain forest or bog wetland communities of any quality	2:1	3:1	3.5:1	4:1

TABLE F2. ACTIONS ELIGIBLE FOR CREDIT FOR CWPMP AREAS.

Actions Eligible for Credit	Inside of the Final WMC	Outside of the Final WMC
Wetland Restoration		
Hydrologic and vegetative restoration of moderately and severely degraded wetland	up to 75% Determined by LGU and TEP	up to 50% Determined by LGU and TEP
Hydrologic and vegetative restoration of effectively drained, former wetland	100%	75%
Wetland Creation		
Upland to wetland conversion	50%	50%
Wetland Protection & Preservation		
Protection via conservation easement of wetland previously restored consistent with MN Rule 8420.0526 subpart 6	up to 75% Determined by LGU and TEP	up to 75% Determined by LGU and TEP
Columbus CWPMP Only: Preservation of wetland or wetland/upland mosaic (requires a 3rd party easement holder and other matching action eligible for credit)	25% Determined by LGU and TEP	12.5% Determined by LGU and TEP
Restoration or protection of wetland of exceptional natural resource value consistent with MN Rule 8420.0526, subpart 8	Up to 100% Determined by LGU and TEP	Up to 100% Determined by LGU and TEP
Buffers		
Non-native, non-invasive dominated buffer around other action eligible for credit, consistent with Section 6(e)	10%	10%
Native, non-invasive dominated buffer around other action eligible for credit, consistent with Section 6(e)	25%	25%
Upland habitat area contiguous with final WMC wetland (2 acre minimum), as limited by Rule F.6(e)(5)	100%	NA
Vegetative Restoration		
Positive shift in MnRAM assessment score for “Vegetative Integrity” from “Low” to “Medium” or “High”	Up to 50% Determined by LGU and TEP	NA

(6) The location and type of wetland replacement will conform as closely as possible to the following standards:

(i) No wetland plant community of high or exceptional wildlife habitat function and high or exceptional vegetative integrity, as identified in the required wetland assessment, may be disturbed.

(ii) No replacement credit will be given for excavation in an upland natural community with Natural Heritage Program rank B or higher, or with identified Endangered, Threatened or Special Concern species.

(7) In the Columbus CWPMP only, preservation credit can be used for up to 50% of the wetland replacement required. The remaining 50% must be supplied by a non-preservation replacement action as shown within Table F2. Additionally:

(i) All other eligible actions for credit within this rule must be considered before preservation is approved as an action eligible for credit.

(ii) The Technical Evaluation Panel must find that there is a high probability that, without preservation, the wetland area to be preserved would be degraded or impacted and that the wetland meets the criteria of Minnesota Rules 8420.0526 subpart 9.A through 9.D.

(iii) Non-degraded, High Quality, and Moderately Degraded wetland is eligible for Preservation Credit within Zone 1 (see Figure F2).

(iv) Non-degraded and High Quality wetland is eligible for Preservation Credit within Zone 2 (see Figure F2).

(v) Wetland ranked "Low" for "vegetative integrity" is not eligible for replacement credit through Preservation.

(vi) Banked preservation credit may be used only within the Columbus CWPMP area (see Figure F1).

(8) Replacement credit for Wetland Protection and Preservation (see Table F2) requires that a perpetual Conservation Easement be conveyed to and accepted by the District. The easement must encompass the entire replacement area, and must provide for preservation of the wetland's functions by the fee owner and applicant. The applicant must provide a title insurance policy acceptable to the District, naming the District as the insured. The fee owner and the applicant also must grant an access easement in favor of the District, the local government unit and any other state, local or federal regulatory authority that has authorized use of credits from the mitigation site for wetland replacement. The fee owner must record or register these easements on the title for the affected property.

(9) Replacement credit for Vegetative Restoration (see Table F2) may be granted only for wetland communities scoring "Low" for Vegetative Integrity. The TEP must find that there is a reasonable probability for restoration success.

(10) Unless a different standard is stated in the approved replacement or banking plan, the performance standard for upland and wetland restored or created to generate credit is establishment, by the end of the WCA monitoring period, of a medium or high quality plant community ranking with 80% vegetative coverage consisting of a native, non-invasive species composition.

(11) Notwithstanding any provision in this rule to the contrary, for wetland impacts resulting from public drainage system repairs undertaken by the Rice Creek Watershed District that are exempt from Clean Water Act Section 404 permit requirements but are not exempt from replacement under Section 6(c)(1) of this Rule, replacement may occur subject to the following priority of replacement site sequencing:

(i) Within bank service areas 6 or 7 or with the concurrence of governing board of the local county or watershed district, within any county or watershed district whose county water plan, watershed management plan, or other water resource implementation plan contains wetland restoration as a means of implementation.

(ii) Throughout the state in areas determined to possess less than 80% of pre-settlement wetland acres.

(12) A variance from a requirement of Section 6(c) otherwise meeting the criteria of District Rule L may be granted if the TEP concurs that the wetland protection afforded will not be less than that resulting from application of standard WCA criteria.

(d) WETLAND BANKING.

(1) Replacement requirements under Section 6(c) of this Rule may be satisfied in whole or part by replacement credits generated off-site within any CWPMP area, but not by credits generated outside of a CWPMP area except as provided in Section 6(d)(5).

(2) The deposit of replacement credits created within a CWPMP area for banking purposes and credit transactions for replacement will occur in accordance with Minnesota Rules 8420.0700 through 8420.0745. Credits generated within a CWPMP area may be used for replacement within or outside of a CWPMP area.

(i) The District will calculate the amount of credit in accordance with the standard terms of WCA. This measure of credit will appear in the BWSR wetland banking account.

(ii) The District also will calculate the amount of credit in accordance with Section 6(c) of this rule. The District will record this measure of credit internally within the CWPMP's wetland bank accounting. The District will adjust this internal account if the BWSR account is later debited for replacement outside of a CWPMP area. Where credits are used for replacement within a CWPMP area, the District will convert credits used into standard WCA credits so that the BWSR account is accurately debited.

(3) To be recognized, bank credit from Preservation in the Columbus CWPMP (see Table F2) must be matched by an equal amount of credit from a non-Preservation replacement action.

(i) Credit derived from Preservation as the replacement action may be used only within the Columbus CWPMP boundary.

(ii) If the matching non-Preservation credit is used outside of the Columbus CWPMP area, the Preservation credit within the Columbus CWPMP wetland bank account will be debited in the amount of the matching non-Preservation credit.

(5) Banked wetland credit created outside of the CWPMP areas, but within the CWPMP Contributing Drainage Area, may be used to replace impact within the CWPMP areas. An applicant proposing to use credits under this paragraph must field verify at the time of application that the banked wetlands are located within the CWPMP Contributing Drainage Area.

(6) Credits generated under an approved wetland banking plan, inside a CWPMP or its contributing drainage area (See Figure F4), utilized to replace impact within a CWPMP area will be recognized in accordance with the approved banking plan.

(e) **VEGETATED BUFFERS.** Vegetated buffers are required to be established adjacent to wetlands within CWPWP areas as described below.

(1) Wetland buffer will consist of non-invasive vegetated land; that is not cultivated, cropped, pastured, mowed, fertilized, used as a location for depositing snow removed from roads, driveways or parking lots, subject to the placement of mulch or yard waste, or otherwise disturbed except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, or other actions to maintain or improve buffer or habitat area quality, each as approved in writing by District staff. The application must include a vegetation management plan for District approval. For public road authorities, the terms of this subsection will be modified as necessary to accommodate safety and maintenance feasibility needs.

(2) Buffer adjacent to wetland within the final WMC must average at least 50 feet in width, measure at least 25 feet at all points, and meet the average width at all points of concentrated inflow. For private projects dedicating

public right of way, the buffer requirement may be reduced based on compelling need and a TEP recommendation to the District in support that the wetland protection afforded is reasonable given the circumstances.

(3) Buffer adjacent to wetland restored, created or preserved for replacement credit, not within the final WMC, must meet the minimum width standards as described in MN Rule 8420.0522, subpart 6.

(4) Buffer adjacent to High Quality Wetland, or to replacement wetland adjacent to High Quality Wetland, must be at least 50 feet wide at all points. For private projects dedicating public right of way, the minimum width may be reduced based on compelling need and a District finding that the wetland protection afforded is reasonable given the circumstances. In making this finding, the District will give substantial weight to the TEP recommendation.

(5) The area of buffer for which replacement credit is granted must not exceed the area of the replacement wetland except and specific to when the buffer is to meet the 50- foot requirement of Sections 6(e)(2) and 6(e)(4) and is further limited to the buffer area required to encapsulate another action eligible for credit.

(6) Buffer receiving replacement credit as upland habitat area contiguous with the final WMC must be at least two acres in size.

(7) No above- or below-ground structure or impervious surface may be placed within a buffer area permanently or temporarily, except as follows:

(i) A structure may extend or be suspended above the buffer if the impact of any supports within the buffer or habitat area is negligible, the design allows sufficient light to maintain the species shaded by the structure, and the structure does not otherwise interfere with the function afforded by the buffer.

(ii) A public utility, or a structure associated with a public utility, may be located within a buffer on a demonstration that there is no reasonable alternative that avoids or reduces the proposed buffer intrusion. The utility or structure shall minimize the area of permanent vegetative disturbance.

(iii) Buffer may enclose a linear surface for non-motorized travel no more than 10 feet in width. The linear surface must be at least 25 feet from the wetland edge. The area of the linear surface will not be eligible for replacement credit. For projects proposing non-motorized travel no more than 10 feet in width, the linear surface may be reduced to less than 25 feet from the wetland edge based on compelling need and a TEP recommendation to the District in support that the wetland protection afforded is reasonable given the circumstances.

(iv) A stormwater features that is vegetated consistent with Section 6(e)(1), including NURP ponds, may be located within buffer and count toward buffer width on site-specific approval.

(8) Buffer area is to be indicated by permanent, freestanding markers at the buffer edge, with a design and text approved by District staff in writing. A marker shall be placed at each lot line, with additional markers placed at an interval of no more than 200 feet and as necessary to define variation in a meandering boundary. If a District permit is sought for a subdivision, the monumentation requirement will apply to each lot of record to be created. On public land or right-of-way, the monumentation requirement may be satisfied by the use of markers flush to the ground, breakaway markers of durable material, or a vegetation maintenance plan approved by District staff in writing.

(9) As a condition of permit issuance under this Rule, a property owner must file on the deed a declaration in a form approved by the District establishing a vegetated buffer area adjacent to the delineated wetland edge within the final WMC and other wetland buffers approved as part of a permit under this Rule. The declaration must state that on further subdivision of the property, each subdivided lot of record shall meet the monumentation requirement of Section 6(e)(8). On public land or right-of-way, in place of a recorded declaration, the public owner may execute a written maintenance agreement with the District. The agreement will state that if the land containing the buffer area is conveyed to a private party, the seller must file on the deed a declaration for maintenance in a form approved by the District.

(10) Buffer may be disturbed to alter land contours or improve buffer function if the following criteria are met:

(i) An erosion control plan is submitted under which alterations are designed and conducted to expose the smallest amount of disturbed ground for the shortest time possible, fill or excavated material is not placed to create an unstable slope, mulches or similar materials are used for temporary soil coverage, and permanent vegetation is established as soon as possible after disturbance is completed.

(ii) Wooded buffer and native riparian canopy trees are left intact;

(iii) When disturbance is completed, sheet flow characteristics within the buffer are improved; average slope is not steeper than preexisting average slope or 5:1 (horizontal: vertical), whichever is less steep; preexisting slopes steeper than 5:1 containing dense native vegetation will not require regrading; the top 18 inches of the soil profile is not compacted, has a permeability at least equal to the permeability of the preexisting soil in an uncompacted state and has organic matter content of between five and 15 percent; and habitat diversity and riparian shading are maintained or improved. Any stormwater feature within the buffer will not have exterior slopes greater than 5:1.

(iv) A re-vegetation plan is submitted specifying removal of invasive species and establishment of native vegetation suited to the location.

(v) A recorded Declaration or, for a public entity, maintenance agreement is submitted stating that, for three years after the project site is stabilized, the property owner will correct erosion, maintain and replace vegetation, and remove invasive species to establish permanent native vegetation according to the re- vegetation plan.

(vi) Disturbance is not likely to result in erosion, slope failure or a failure to establish vegetation due to existing or proposed slope, soil type, root structure or construction methods.

(11) Material may not be excavated from or placed in a buffer, except for temporary placement of fill or excavated material pursuant to duly-permitted work in the associated wetland, or pursuant to paragraph 6(e)(10) of this Rule.

(f) **EASEMENT.** The property owner must convey to the District and record or register, in a form acceptable to the District, a perpetual, assignable easement granting the District the authority to monitor, modify and maintain hydrologic and vegetative conditions within the WMC wetland and buffer adjacent to WMC wetland, including the authority to install and maintain structural elements within those areas and reasonable access to those areas to perform authorized activities. The WMC shall be identified and delineated as part of the recorded easement.

(g) **PARTIAL ABANDONMENT.** As a condition of permit issuance, the District may require a property owner to petition the District for partial abandonment of a public drainage system pursuant to Minnesota Statutes §103E.805. A partial abandonment under this Section may not diminish a benefited property owner's right to drainage without the owner's agreement.

7. **REQUIRED EXHIBITS.** The following exhibits must accompany a permit application for both WCA and non-WCA wetland alterations.

(a) **SITE PLAN.** An applicant must submit one full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version of a site plan showing:

(1) Property lines and delineation of lands under ownership of the applicant.

(2) On-site location of all public and private ditch systems

(3) Existing and proposed elevation contours, including the existing run out elevation and flow capacity of the wetland outlet, and spoil disposal areas.

(4) Area of wetland to be filled, drained, excavated or otherwise altered.

(b) **WETLAND DELINEATION REPORT.** An applicant must submit one hard copy and one electronic copy of a wetland delineation report conforming to a methodology authorized for WCA use and otherwise consistent with Minnesota Board of Water & Soil Resources guidance. The following requirements and clarifications apply to submittals of wetland delineation reports to the District and supplement the approved methodology and guidance:

(1) Wetland delineations should be conducted and reviewed during the period of May 1 - October 15. The District may accept delineations performed outside this time frame on a case-by-case basis. The District will determine if there is sufficient information in the report and visible in the field at the time to assess the three wetland parameters (hydrophytic vegetation, hydric soils, hydrology) in relation to the placement of the wetland delineation line. If proper assessment of the delineation is not possible, the District may consider the application incomplete until appropriate field verification is possible.

(2) An applicant conducting short- or long-term wetland hydrology monitoring for the purpose of wetland delineation/determination must coordinate with the District prior to initiating the study.

(3) For a project site with row-cropped agricultural areas, the wetland delineation report must include a review of Farm Service Agency aerial slides (if available) for wetland signatures per Guidance for Offsite Hydrology/Wetland Determinations (July 1, 2016), as amended, and Section 404 Clean Water Act or subsequent State-approved guidance. This review is to be considered along with field data and other pertinent information, and is not necessarily the only or primary basis for a wetland determination in an agricultural row-cropped area.

(4) The wetland delineation report must follow current BWSR/ACOE Guidance for Submittal of Delineation Reports, and include:

(i) Documentation consistent with the 1987 Corps of Engineers Wetlands Delineation Manual and Northcentral and Northeast Regional Supplement.

(ii) National Wetland Inventory (NWI) map, Soil Survey Map, and Department of Natural Resources (DNR) Protected Waters Map of the area being delineated.

(iii) Results of a field investigation of all areas indicated as potential wetland by mapping sources including: NWI wetlands, hydric soil units, poorly drained or depressional areas on the Soil Survey Map, and DNR Protected Waters or Wetlands.

(iv) Classifications of each delineated wetland using the following systems:

- Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)
- Fish and Wildlife Service Circular 39 (Shaw and Fredine 1971)
- Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers & Reed, 3rd Edition, 2011)

(v) A survey map (standard land survey methods or DGPS) of delineated wetland boundaries.

(5) As a condition of District approval of any wetland delineation, applicants shall submit X/Y coordinates (NAD 83 state plane south coordinate system) and a GIS shapefile of the delineated wetland boundaries. All data shall be collected with a Trimble Geoexplorer or equivalent instrument with sub-meter accuracy.

(c) **WETLAND REPLACEMENT PLAN APPLICATION.** An applicant submitting a plan involving a wetland alteration requiring replacement must submit five copies of a replacement plan application and supporting materials conforming to WCA replacement plan application submittal requirements and including the following additional documents:

(1) Plan sheet(s) clearly identifying, delineating, and denoting the location and size of each wetland impact area and all replacement actions for credit.

(2) Plan sheet(s) with profile views and construction specifications of each replacement wetland including proposed/estimated normal water level, proposed/estimated boundary of replacement wetland, topsoiling specifications (if any), grading specifications, and wetland/buffer seeding specifications.

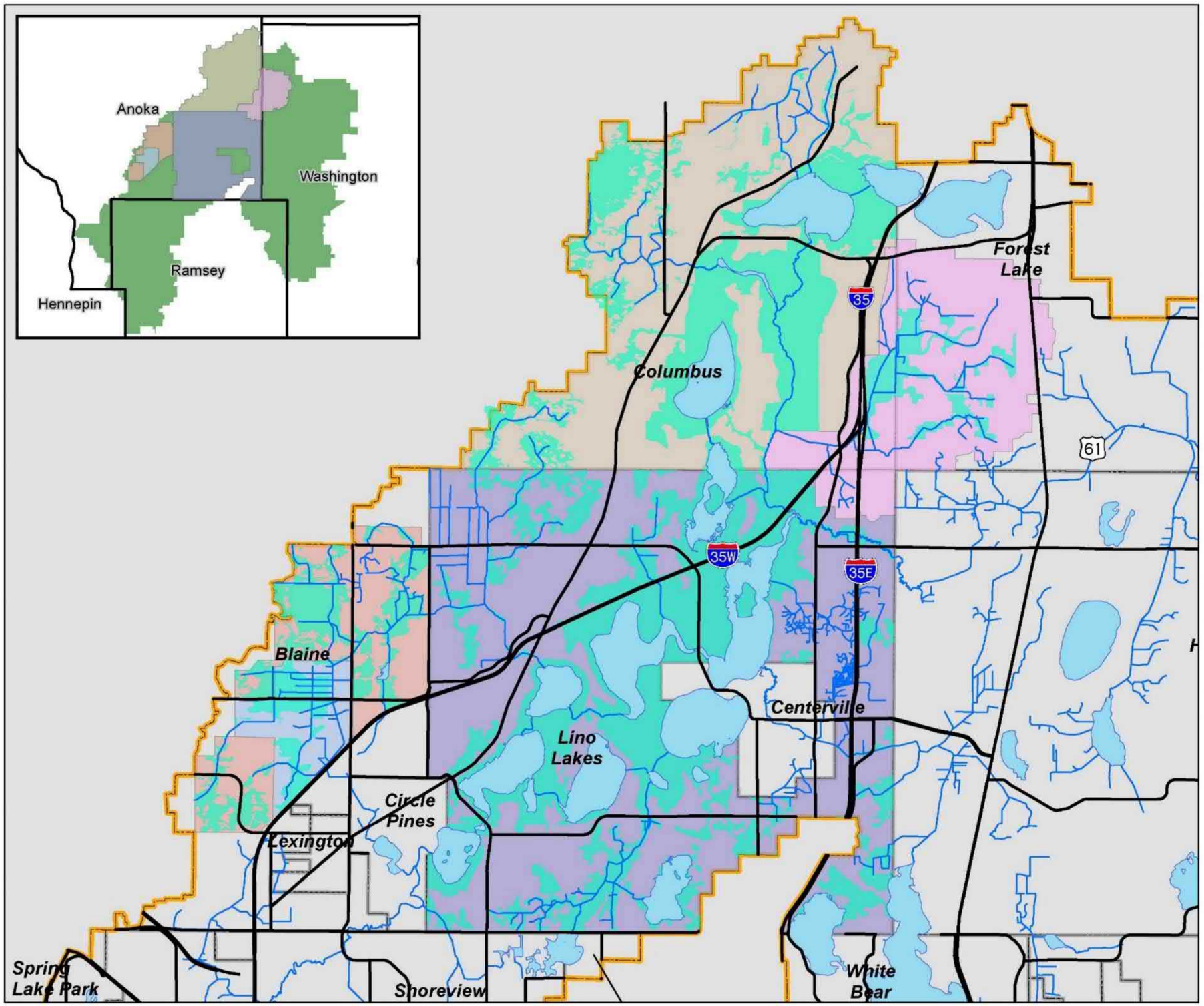
(d) **FUNCTIONS AND VALUES ASSESSMENT.** An applicant must submit a before-and-after wetland functions and values assessment using a WCA-accepted methodology for a project in a CWPMP area or otherwise involving at least one acre of wetland impact requiring replacement.

(e) Erosion and sediment control plan in accordance with District Rule D.

(f) On District request, the applicant will conduct an assessment of protected plant or animal species within the project site, where such assessment is not available from existing sources.

(g) Other project site-specific submittal requirements as may be required by the District.

Rice Creek Watershed District



- Major Roads
- RCWD Watercourses
- Lakes
- Wetland Management Corridor
- Cities
- RCWD Legal Boundary
- Counties

CWPMPs

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP

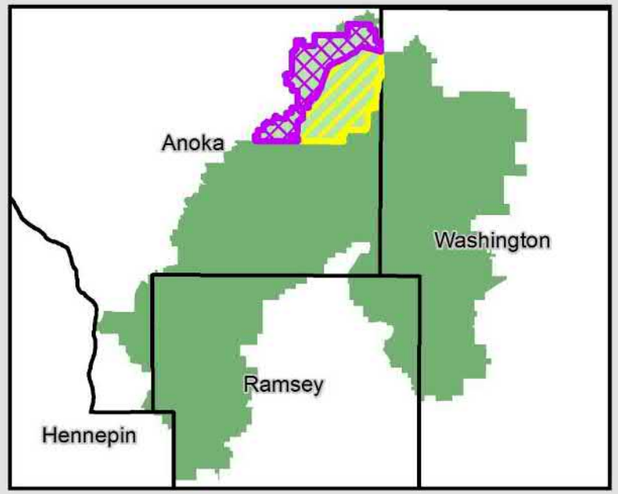
0 0.5 1 2 Miles

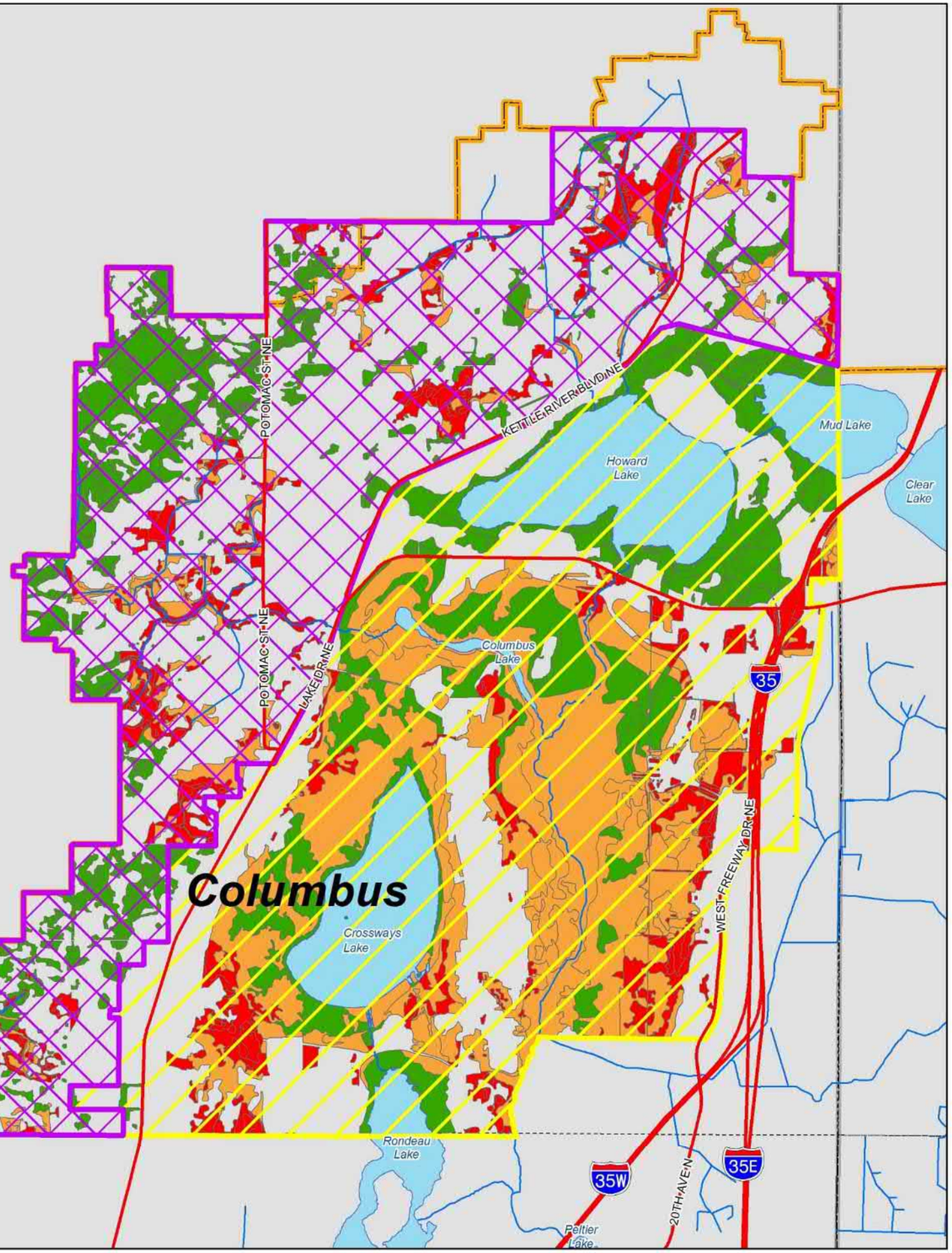
Sources: RCWD, TLG, MN DOT
Date Saved: 8/30/2016 1:04:23 PM

F1: Comprehensive Wetland Protection and Management Plan Boundaries and Wetland Management Corridor

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District





- Transportation System
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Cities
- Counties

WMC Adjustment Zones

- Zone I
- Zone II

Wetland Degredation Status

- Non-Degraded
- Moderately
- Severely

0 0.25 0.5 1 Miles

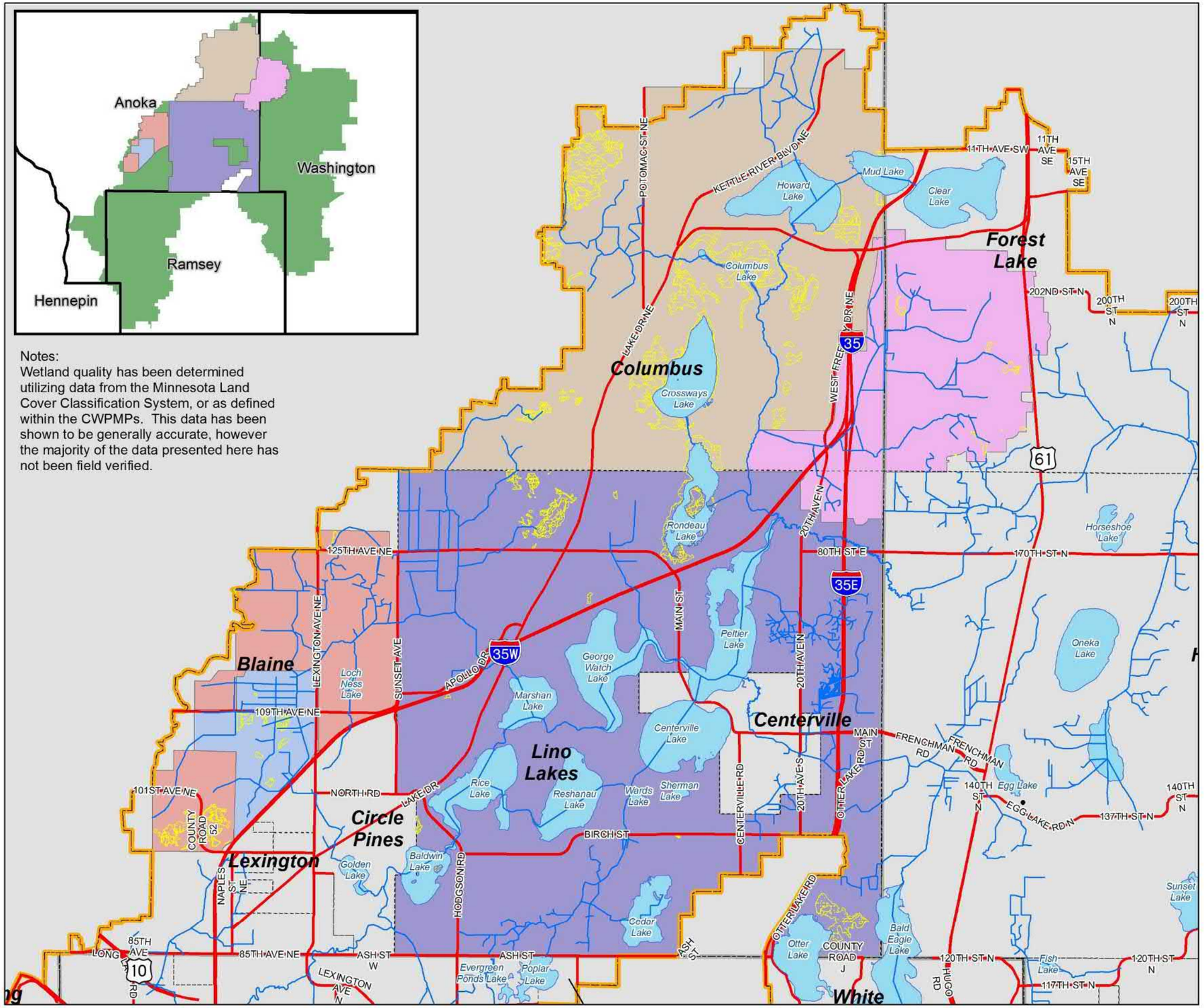
Sources: RCWD, TLG, MN DOT

F2: Columbus Commerical/Industrial Zoned Areas and Wetland Degredation Status

RCWD
RICE CREEK WATERSHED DISTRICT

Rice Creek Watershed District

Notes:
Wetland quality has been determined utilizing data from the Minnesota Land Cover Classification System, or as defined within the CWPMPs. This data has been shown to be generally accurate, however the majority of the data presented here has not been field verified.



- RCWD Watercourses
- Lakes
- High Quality Wetland (see Notes)
- RCWD Legal Boundary
- Transportation System
- Cities
- Counties

CWPMPs

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP

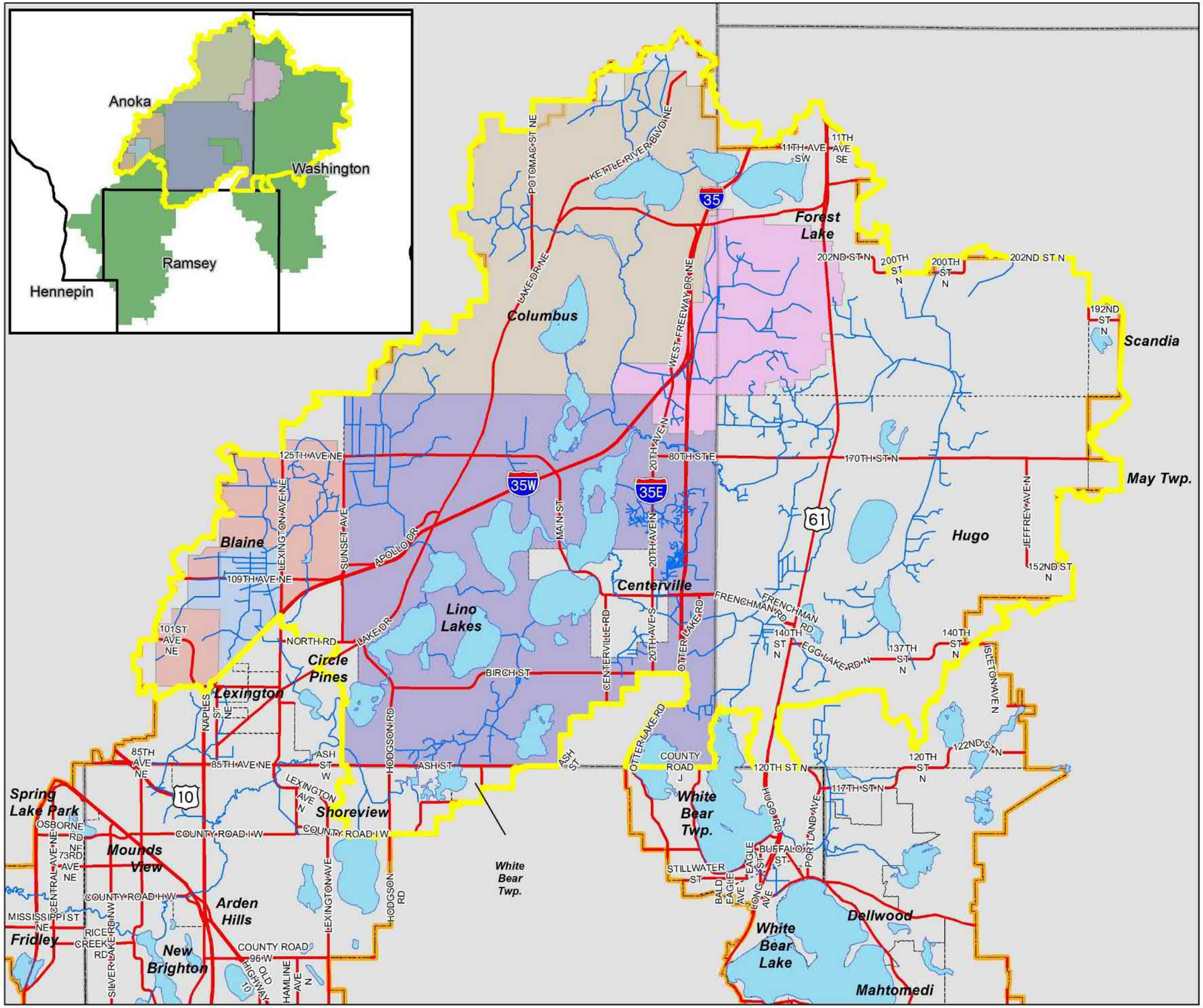
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

F3: High Quality Wetlands Within CWPMPs

RCWD
RICE CREEK WATERSHED DISTRICT

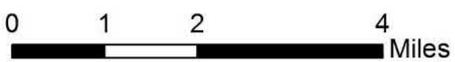
Rice Creek Watershed District



- Contributing_Drainage_Area_to_CWPMP
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Transportation System
- Cities
- Counties

CWPMPs

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP



Sources: RCWD, TLG, MN DOT

F4: Contributing Drainage Area to CWPMPs

RCWD
RICE CREEK WATERSHED DISTRICT

RULE G: CROSSINGS OF NATURAL & ARTIFICIAL CONVEYANCE SYSTEMS

1. **POLICY.** It is the policy of the Board of Managers to preserve the capacity of the present drainage systems to accommodate future needs.

2. **REGULATION.** No person may construct, improve, repair or alter the hydraulic characteristics of a utility, bridge or culvert structure (i.e., crossing) on a creek, public drainage system or major watercourse in the District, without first obtaining a permit from the District.

3. **CRITERIA.** A permit application for a crossing of a public drainage system will not obligate the District, in its function as drainage authority, to investigate or hold proceedings to establish the As Constructed and Subsequently Improved Condition (ACSIC) of the drainage system. Permit issuance is not a warranty and the crossing owner will remain responsible should the crossing at any time be found to be an obstruction or subject to future modification or replacement under the drainage law. In addition, a crossing must:

(a) Preserve existing design hydraulic capacity or, if on a public drainage system, hydraulic capacity conforming to the drainage right of benefited lands consistent with existing drainage proceedings.

(b) Retain existing navigational capacity.

(c) Not adversely affect water quality.

(d) Be designed to allow for future erosion, scour, and sedimentation considerations.

(e) Be designed for maintenance access and be maintained in perpetuity to continue to meet the criteria of Section 3. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District.

4. **SUBSURFACE CROSSINGS.** A crossing beneath a creek, public drainage system or major watercourse must maintain adequate vertical separation from the bed of the watercourse. The District will determine adequate separation by reference to applicable guidance and in view of relevant considerations such as soil condition, the potential for upward migration of the utility, and the likelihood that the bed elevation may decrease due to natural processes or human activities. The District also will consider the feasibility of providing separation and the risks if cover diminishes. Nothing in this paragraph diminishes the crossing owner's warranty or responsibility under Section 3, above. The applicant must submit a record drawing of the installed utility.

5. **REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

(a) Construction details showing:

(1) Size and description of structure including existing and proposed flow line (invert) elevations.

(2) Existing and proposed elevations of utility, bridge or culvert.

(3) End details with flared end sections or other appropriate energy dissipaters.

(4) Emergency overflow elevation and route.

(b) Narrative describing construction methods and schedule

(c) Erosion and sediment control plan in accordance with District Rule D.

(d) Computations of watershed area, peak flow rates and elevations, and discussion of potential effects on water levels above and below the project site.

6. **EXCEPTION.** Criterion 3(a) may be waived if the applicant can demonstrate with supporting hydrologic calculations the need for an increase in discharge rate in order to provide for reasonable surface water management in the upstream area and that the downstream impacts of the increased discharge rate can be reasonably accommodated and will not exceed the existing rate at the municipal boundary.

RULE H: ILLICIT DISCHARGE AND CONNECTION

1. POLICY. It is the policy of the Board of Managers to:

(a) Regulate the contribution of pollutants to the District's Municipal Separate Storm Sewer System (MS4) by any user;

(b) Prohibit Illicit Connections and Discharges to the District's MS4;

(c) Carry out inspection and monitoring procedures necessary to ensure compliance with this Rule under statutory and related authority.

2. PROHIBITION. No person shall discharge or cause to be discharged into a public drainage system within the District any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater.

3. EXCEPTIONS. The commencement, conduct or continuance of any illegal discharge to the waters of the District is prohibited except as described as follows:

(a) The following discharges are exempt from discharge prohibitions established by this rule:

(1) Water line flushing or other potable water sources

(2) Landscape irrigation or lawn watering

(3) Diverted stream flows

(4) Rising ground water

(5) Ground water infiltration to storm drains

(6) Uncontaminated pumped ground water

(7) Foundation and footing drains

(8) Firefighting activities

(b) Discharges specified in writing by the District, or other federal, state or local agency as being necessary to protect the public health and safety.

(c) Dye testing is an allowable discharge, but requires a verbal notification to the District prior to the time of the test.

(d) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

4. ILLICIT CONNECTIONS PROHIBITED

(a) The construction, use, maintenance or continued existence of illicit connections to the public drainage system is prohibited.

(b) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(c) A person is considered to be in violation of this rule if the person connects a line conveying sewage to the public drainage system, or allows such a connection to continue.

RULE I: DRAINAGE SYSTEMS

1. **POLICY.** It is the policy of the Board of Managers to regulate new construction, improvement or repair of drainage systems (open and tiled) for the following purposes:

(a) To preserve the capacities of drainage systems to accommodate future needs.

(b) To improve water quality and prevent localized flooding.

(c) To prevent the loss of drainage.

2. **REGULATION.** No drainage system may be altered, constructed, improved or repaired without first obtaining a permit from the District. The permit is in addition to any formal procedures or District approvals that may be required under Minnesota Statutes Chapter 103E or other drainage law. The Board of Managers may waive the requirement of a permit under this rule for repair to a drainage system if the applicant proposes to repair a tiled system of less than fifty feet in length, and where such repair would not alter the invert of the system.

3. **CRITERIA.** A project proposing to alter, construct, improve or repair a drainage system must:

(a) Comply with orders or findings issued by the District or a previous Drainage Authority.

(b) Comply with all Federal, State and District wetland protection rules and regulations.

(c) Demonstrate that such activity will not adversely impact upstream and/or downstream water quality or quantity.

(d) Provide stable channel and outfall.

(e) Demonstrate concurrence with regional pond or subdivision drainage plans approved by the District, if applicable.

(f) Conform to District Rule F (Wetland Alteration), as applicable.

(g) If drainage system is proposed to outlet a landlocked basin, provide sufficient dead storage volume to retain back-to-back 100-year, 24-hour rainfalls and runoff.

(h) Be designed for maintenance access and be maintained in perpetuity to avoid constituting an obstruction and otherwise to continue to meet the criteria of Section 3. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District.

4. **REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches).

(a) Map showing location of project and tributary area.

(b) Existing and proposed cross sections and profile of affected area.

(c) Description of bridges or culverts required.

(d) Narrative and calculations describing wetland impacts and effects on water levels above and below the project site.

(e) Erosion and sediment control plan in accordance with District Rule D.

(f) Hydrologic and hydraulic analysis of the proposed project.

RULE J: APPROPRIATION OF PUBLIC WATERS

1. **POLICY.** It is the policy of the Board of Managers to regulate the appropriation of public waters as follows.

2. **REGULATION.** A permit from the District is required for the appropriation of water from:

(a) A public waterbasin or wetland that is less than 500 acres and is wholly within Hennepin or Ramsey County.

(b) A protected watercourse within Hennepin or Ramsey County that has a drainage area of less than 50 square miles.

3. **CRITERIA.** A permit applicant for appropriation of public waters as described above must complete and submit to the District an appropriation checklist. The appropriation checklist form may be obtained from the District office.

RULE K: ENFORCEMENT

1. **VIOLATION OF RULES IS A MISDEMEANOR.** Violation of these rules, a stipulation agreement made, or permit issued by the Board of Managers under these rules, is a misdemeanor subject to a penalty as provided by law.

2. **DISTRICT COURT ACTION.** The District may exercise all powers conferred upon it by Minnesota Statutes Chapter 103D in enforcing these rules, including criminal prosecution, injunction, or action to compel performance, restoration or abatement.

3. **ADMINISTRATIVE ORDER.** The District may issue a cease and desist or compliance order when it finds that a proposed or initiated project presents a serious threat of soil erosion, sedimentation, or an adverse effect upon water quality or quantity, or violates any rule or permit of the District.

RULE L: VARIANCES

1. **VARIANCES AUTHORIZED.** The Board of Managers may hear a request for variance from a literal provision of these rules where strict enforcement would cause undue hardship or practical difficulty because of circumstances unique to the property under consideration. The Board of Managers may grant a variance if an applicant demonstrates that such action will be in keeping with the spirit and intent of these rules and in doing so may impose conditions on the variance as necessary to find that it meets the standards of section 2, below. A variance request must be addressed to the Board of Managers as part of a permit application and must address each of the four criteria listed in the standard.

2. **STANDARD.** In order to grant a variance, the Board of Managers must determine that:

   (a) Special conditions apply to the structures or lands under consideration that do not apply generally to other land or structures in the District.

   (b) Because of the unique conditions of the property involved, undue hardship or practical difficulty to the applicant would result, as distinguished from mere inconvenience, if the strict letter of the rules were applied. Economic considerations alone do not constitute undue hardship or practical difficulty if any reasonable use of the property exists under the terms of the District's rules.

   (c) The proposed activity for which the variance is sought will not adversely affect the public health, safety or welfare; will not create extraordinary public expense; and will not adversely affect water quality, water control or drainage in the District.

   (d) The intent of the District's rules is met.

3. **PRACTICAL DIFFICULTY DEFINED.** In evaluating practical difficulty, the Board of Managers will consider the following factors:

   (a) How substantial the variation is from the rule provision;

   (b) The effect of the variance on government services;

   (c) Whether the variance will substantially change the character of watershed resources or be a substantial detriment to neighboring properties;

   (d) Whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance;

   (e) How the practical difficulty occurred, including whether the landowner created the need for the variance; and

   (f) In light of all of the above factors, whether allowing the variance will serve the interests of justice.

4. **TERM.** A variance expires on expiration of the CAPROC approval or permit associated with the variance request.

5. **VIOLATION.** A violation of any condition set forth in a variance is a violation of the District permit that it accompanies and automatically terminates the variance.

APPENDIX F

Subwatershed Data

Hydrologic Data

Subwatershed	Area (ac)	% Impervious	Pond Name	Downstream Subwatershed	Outlet Type
A1	118	65%	LaBelle Pond	A2	Weir Structure w/24" BCCMP
A2	302	73%		A4	60" RCP
A3	122	81%	Jackson Pond	A2	42" BCCMP & 60" BCCMP
A4	112	81%		A5	54" RCP
A5	47	76%		A6	48" RCP
A6	401	78%		Fridley	78" RCP
B1	14	55%	Clover Pond	B2	12" RCP w Flared End
B2	134	66%		B4	30" RCP & 42" RCP
B3	134	80%		B4	42" RCP & 42" RCP
B4	130	76%	Sullivan Lake	B5	Weir Structure w/48" RCP
B5	64	84%		Fridley	48" RCP
C1	197	60%	Highland Lake	C2	Weir structure w/18" RCP
C2	9	53%	Secondary Pond	C3	24" RCP w/flared end
C3	77	45%	Tertiary Pond	None	No outlet
D1	102	52%		Silver Lake	30" RCP & 21" RCP
D2	28	79%	Hart Lake	D3	18" CMP w/apron
D3	155	65%		Silver Lake	48" RCP
E1	55	70%		Minneapolis	36" RCP
E2	22	64%		Minneapolis	12" RCP
E3	14	67%		Minneapolis	18" RCP
E4	9	50%		Minneapolis	7" RCP
F1	27	86%		Minneapolis	30"
G1	234	84%		Minneapolis	48"
H1	90	83%		Fridley	54"