

Appendix A

BCWMC Monitoring Plan

BCWMC Monitoring Plan - DRAFT

Bassett Creek Monitoring Programs

Detailed Chemical Water Quality Monitoring

Monitoring Plan ID: BC-WQ

Planned Interval: 3 years (Priority I management classification)
5 years (Priority II management classification)

Description:

Samples shall be collected from one or two (depending on the lake) lake sampling stations representing the deepest location(s). Lakes shall be monitored on six occasions from April through September. Details follow:

1. One sample shall be collected within two weeks after ice out
2. One sample shall be collected in mid-June
3. One sample shall be collected in mid-July
4. Two samples shall be collected in August, biweekly, during 1st and 3rd weeks
5. One sample shall be collected during the first week of September

To insure the safety of staff collecting the samples, two individuals must be present in the boat and collect the samples during each sample event.

Table 1 Parameters measured and depth interval

Parameter	Sample Depth (Meters)	Sampled or Measured During Each Sample Event
Dissolved Oxygen	Surface to bottom (1-meter intervals)	X
Temperature	Surface to bottom (1-meter intervals)	X
Specific Conductance	Surface to bottom (1-meter intervals)	X
pH	Surface to bottom (1-meter intervals)	X
Oxidation Reduction Potential (ORP)	Surface to bottom (1-meter intervals)	X
Secchi Disc	Measured from surface	X
Total Phosphorus	0-2 Meter Composite Sample; Above Thermocline Sample; Below Thermocline Sample; 0.5 meters above bottom	X
Soluble Reactive Phosphorus	0-2 Meter Composite Sample	X
Total Nitrogen	0-2 Meter Composite Sample	X
Chlorophyll <i>a</i>	0-2 Meter Composite Sample	X
Chloride	0-2 Meter Composite Sample	X

Dissolved oxygen, temperature, specific conductance, pH, Oxidation Reduction Potential (ORP), and Secchi disc transparency shall be measured in the field at depths shown in Table 1. Water samples will be collected for laboratory analysis for total phosphorus, soluble reactive phosphorus, total nitrogen, chlorophyll *a*, and chloride at depths as specified in Table 1. Analytical details for phosphorus, nitrogen, and chlorophyll *a* analyses are presented in Table 2. All analyses shall attain the MDL, MRL, DUP RPD, Matrix Spike %R and RPD, and Blank Spike %R and RPD shown in Table 2.

Table 2 Analytical Method Details

Method	Analyte	MDL	MRL	Units	DUP	Matrix Spike		Blank Spike	
					RPD	%R	RPD	%R	RPD
EPA 351.2	Total Kjeldahl Nitrogen	0.17	0.50	mg/L	20	90-110	20	90-110	20
EPA 365.3	Orthophosphate as P	0.0005	0.0060	mg/L	20	75-125	20	80-120	20
EPA 365.3	Phosphorus, Total as P	0.0007	0.010	mg/L	20	75-125	20	80-120	20
SM 10200H	Chlorophyll <i>a</i> -Pheophytin	0.50	0.50	µg/L	20	75-125	20	80-120	20
SM4500 NO3F	Nitrate + Nitrite as N	0.0069	0.020	mg/L	20	75-125	20	80-120	20

Zooplankton and Phytoplankton Monitoring

Monitoring Plan ID: ZOO

Planned Interval: 3 years (Priority I management classification)
5 years (Priority II management classification)

Description:

Lakes shall be monitored on six occasions from April through September concurrent with water quality sampling events. Phytoplankton will be sampled as a single 0-2 meter composite sample at the location of water quality sampling. Zooplankton will be sampled using a bottom to surface tow with a zooplankton net at the location of water quality sampling.

Phytoplankton analyses shall be completed using the inverted microscope procedure of Utermohl as described by Lund et al. (1958). Subsamples shall be settled in a 5 milliliter inverted microscope settling chamber for approximately 24 hours prior to counting. Replicate fields of view located in a transect across the center of the counting chamber shall be enumerated at a magnification of at least 500 times until the entire transect has been enumerated or at least 500 algal units have been counted. An algal unit is 1 single cell, 1 colony, or 1 filament. Results shall be expressed as units per milliliter. Algal units shown in Table 3 shall be identified to the species level and other algal units in the samples shall be identified to the genus level.

Table 3 Algal Units Identified to the Species Level

Chlorophyta (Green Algae)	Cyanophyta (Blue-Green Algae)	Bacillariophyta (Diatoms)	Other Algae
<i>Actinastrum Hantzschii</i>	<i>Anabaena affinis</i>	<i>Asterionella formosa</i>	<i>Dinobryon sociale</i>
<i>Ankistrodesmus Brauni</i>	<i>Anabaena flos-aquae</i>	<i>Cocconeis placentula</i>	<i>Cryptomonas erosa</i>
<i>Ankistrodesmus falcatus</i>	<i>Anabaena spiroides v. crassa</i>	<i>Fragilaria capucina</i>	<i>Ceratium hirundinella</i>
<i>Chlamydomonas globosa</i>	<i>Aphanizomenon flos-aquae</i>	<i>Fragilaria crotonensis</i>	<i>Peridinium cinctum</i>
<i>Chlamydomonas pseudopertyi</i>	<i>Coelosphaerium Naegelianum</i>	<i>Gomphonema olivaceum</i>	
<i>Coelastrum microporum</i>	<i>Cylindrospermopsis raciborski</i>	<i>Melosira granulata</i>	
<i>Crucigenia quadrata</i>	<i>Lyngbya limnetica</i>	<i>Stephanodiscus Hantzschii</i>	
<i>Dictyosphaerium Ehrenbergianum</i>	<i>Merismopedia tenuissima</i>	<i>Synedra acus</i>	
<i>Elakatothrix gelatinosa</i>	<i>Microcystis aeruginosa</i>	<i>Synedra ulna</i>	
<i>Oocystis parva</i>	<i>Microcystis incerta</i>		
<i>Pandorina morum</i>	<i>Oscillatoria Agardhii</i>		
<i>Pediastrum Boryanum</i>	<i>Oscillatoria limnetica</i>		
<i>Pediastrum duplex v. clathratum</i>	<i>Phormidium mucicola</i>		
<i>Rhizoclonium hieroglyphicum</i>			
<i>Scenedesmus dimorphus</i>			
<i>Scenedesmus quadricauda</i>			
<i>Selenastrum minimum</i>			
<i>Schroederia Judayi</i>			
<i>Sphaerocystis Schroeteri</i>			
<i>Tetraedron minimum</i>			
<i>Tetraedron muticum</i>			
<i>Treubaria setigerum</i>			

Zooplankton analyses shall be completed using the Sedgwick Rafter procedure described in Standard Methods. Zooplankton shown in Table 4 shall be identified to the species level and other zooplankton shall be identified to the genus level. Results shall be expressed as number of zooplankton per square meter.

Table 4 Zooplankton Identified to the Species Level

Cladocera	Rotifera
<i>Bosmina longirostris</i>	<i>Asplanchna priodonta</i>
<i>Chydorus sphaericus</i>	<i>Keratella cochlearis</i>
<i>Daphnia galeata mendotae</i>	<i>Keratella quadrata</i>

Cladocera	Rotifera
<i>Daphnia pulex</i>	<i>Kellicottia bostoniensis</i>
<i>Daphnia retrocurva</i>	<i>Polyarthra vulgaris</i>
<i>Diaphanosoma leuchtenbergianum</i>	<i>Trichocerca cylindrica</i>
	<i>Trichocerca multicornis</i>

Aquatic Plant (Macrophyte) Monitoring

Monitoring Plan ID: PLANT

Planned Interval: 3 years (Priority I management classification)
5 years (Priority II management classification)

Description:

The BCWMC will perform qualitative macrophyte surveys of lakes classified as Priority I every 3 years and lake classified as Priority II every 5 years (in the same year as detailed BCWMC water quality monitoring). Each lake shall be surveyed twice, in June and August.

The surveys shall consist of visual boat surveys, accompanied by sample collection as needed, to identify the macrophyte species present in the lake and create a map showing species locations and estimated abundance for each sample date. The estimated abundance shall be on a scale of 1 through 3 with 1 indicating light density, 2 indicating moderate density, and 3 indicating heavy density. Aquatic invasive plant species will be noted, when applicable.

Stream Biotic Monitoring (Invertebrate Monitoring)

Monitoring Plan ID: BIO

Planned Interval: 3 years (Priority I streams)

Description:

Benthic macroinvertebrate samples were collected from Plymouth Creek and Bassett Creek (North Branch, Main Stem, and Sweeney Lake Branch) during 2012 on the dates indicated below. The sampling locations are identified as follows (Figure 1):

- Plymouth Creek at Industrial Park Boulevard in Plymouth
- North Branch of Bassett Creek at 32nd Avenue North and Adair Avenue in Crystal
- Main Stem of Bassett Creek at Rhode Island Avenue in Golden Valley
- Main Stem of Bassett Creek east of Zane Avenue in Golden Valley
- Main Stem of Bassett Creek at Dresden Lane in Golden Valley
- Main Stem of Bassett Creek at Irving Avenue in Minneapolis

- Sweeney Lake Branch of Bassett Creek at Turner's Crossroad in Golden Valley

At each sample location, macroinvertebrate samples will be collected from riffle areas (areas with fast-moving water) where the substrate is composed of gravel and small stones. Samples will be collected by disturbing the creek bottom and allowing dislodged macroinvertebrates to drift into a D-frame aquatic net positioned downstream. Rocks and other substrate materials will also be examined for macroinvertebrates. Macroinvertebrates will be collected for 30 minutes at each sample location and later identified in the laboratory.

Analysis will include the calculation of a Macroinvertebrate Index of Biological Integrity (MIBI) at each sampling location. Due to the use of the Hilsenhoff Biotic Index (HBI) and Invertebrate Community Index (ICI) during past monitoring events (prior to the development of the MIBI), HBI and ICI values will also be calculated for comparison the historical record.

Stream Water Quality Monitoring

Monitoring Plan ID: SWQ

Planned Interval: 2 consecutive years of monitoring initiated every 6 years (Priority streams)

Description:

The BCWMC will initiate a stream water quality monitoring program to monitor the chemical water quality of its priority streams. The exact monitoring locations will be determined based on the feasibility of installing automated samplers, but will be consistent with biotic monitoring locations, where possible.

Automated samplers will be installed and operated for two consecutive years (from snowmelt of year 1 through ice-in of year 2). Continuously monitored parameters will include temperature, dissolved oxygen, pH, conductivity, and stage. Automated samplers will collect water quality samples in periods of high flow (i.e., snowmelt and after storm events) and during periods of baseflow. Parameters analyzed will include chloride, fecal coliform, total suspended solids, total phosphorus, and chlorophyll a.

Other Monitoring Programs

Three Rivers Park District Medicine Lake Water Quality

Monitoring Plan ID: TRPD

Planned Interval: Annually in Medicine Lake – Main Basin
3 year intervals in Medicine Lake – Southwest Basin

Description:

The Three Rivers Park District (TRPD) performs chemical water quality monitoring in the main basin of Medicine Lake annually. Sampling is performed approximately every two weeks beginning in early May and extending through September. Profiles of dissolved oxygen, temperature, specific conductance, and pH are measured at 1 meter increments. Total nitrogen, chlorophyll a, and Secchi disc transparency are

measured from the surface. Total phosphorus and soluble reactive phosphorus are measured at the surface and at depths of 6 meters and 12 meters.

At three year intervals, the BCWMC will request that the TRPD perform additional sampling and analysis in the southwest basin of Medicine Lake. This sampling and analysis will be performed consistent with the TRPD's protocol for monitoring the main basin.

Metropolitan Council Citizen Assisted Monitoring Program (CAMP)

Monitoring Plan ID: CAMP

Planned Interval: Annually in Priority I and Priority II waterbodies between detailed monitoring events

Description:

The Metropolitan Council's Citizen Assisted Monitoring Program (CAMP) has been collecting water quality data on a number of Twin Cities metropolitan area lakes since 1980. On a bi weekly basis (April - October), citizen volunteers collect a surface water sample for laboratory analysis of total phosphorus, total Kjeldahl-nitrogen, and chlorophyll-a, obtain a Secchi transparency measurement, and provide some user perception information about each lake's physical and recreational condition. Laboratory analysis of collected samples will be performed consistent with CAMP protocols, as determined by the Metropolitan Council Environmental Services.

The BCWMC will fund the inclusion of Priority I and Priority II waterbodies in CAMP during years when detailed water quality monitoring performed by the BCWMC is not planned.

Metropolitan Council Watershed Outlet Monitoring Program

Monitoring Plan ID: WOMP

Planned Interval: Annually on the Main Stem of Bassett Creek

Description:

The Watershed Outlet Monitoring Program (WOMP) is coordinated by the Metropolitan Council Environmental Services (MCES) and consists of a network of monitoring stations located throughout the Metro Area. The Bassett Creek WOMP site is located at Irving Avenue, one-fourth mile upstream of the storm sewer tunnel that runs beneath downtown Minneapolis to the Mississippi River.

The Bassett Creek station shelter is equipped with electricity, heat, and telephone modem. The station measures stage using a bubbler and pressure transducer which is connected to a Campbell data logger. The data logger records and calculates the conversion of stage readings into discharge using a rating curve polynomial. The data are averaged over 15-minute intervals and are downloaded via modem.

The Bassett Creek station also uses an ultrasonic transducer, mounted under a bridge to measure stage. The station is equipped with a non-heated tipping bucket rain gauge. An automatic sampler equipped with 1L sample bottles is also housed at the station. When stream stage increases to a chosen trigger

depth the data logger controls and activates flow pacing to the sampler. The sampler collects up to 96 flow-weighted samples per storm. Conductivity and temperature are continually recorded

During runoff events the individual flow paced samples are collected and combined into one large sample. Grab samples were taken monthly all year during baseflow conditions. To comply with holding times water quality parameters were selected for analysis based on the elapsed time since the end of sample collection. The samples are analyzed in the MCES laboratory for water quality parameters including total suspended solids, total phosphorus, chloride, and other parameters.

The BCWMC will fund the continued operation of the Bassett Creek WOMP station.

Minneapolis Parks and Recreational Board (Wirth Lake Monitoring)

Monitoring Plan ID: MPRB

Planned Interval: Annually in Wirth Lake

Description:

The Minneapolis Parks and Recreational Board (MPRB) monitors Wirth Lake annually. Monitoring includes one winter sample, on sample in March or April, two samples per month from May through September, and one sample in October. Total Phosphorus, nitrogen, and Secchi depth are measured during all monitoring events. Additional chemical parameters are assessed with less frequency.

All physical measurements and water samples for chemical analyses are obtained from a point directly over the deepest point in Wirth Lake. A multiprobe is used to record temperature, pH, conductivity, and dissolved oxygen profiles at 1 meter intervals. Secchi disk transparency is determined with a black and white 20-cm diameter disk on the shady side of the boat.

Composite surface water samples are collected using a stoppered 2-m long, 2-inch diameter white PVC tube and combined in a white plastic bucket. Water from this mixed sample is decanted into appropriate bottles for analysis. Chlorophyll-a samples are stored in opaque bottles for analysis. Total phosphorus, soluble reactive phosphorus, total nitrogen, and chlorophyll-a concentrations are determined from the surface composite sample for all sampling trips.

Phytoplankton samples are collected each sampling trip April through October for Wirth Lake. Phytoplankton are collected from the 0-2 m surface composite sample and stored in an opaque plastic container with a 25% glutaraldehyde preservative solution. Vertical zooplankton tow samples are taken at the sampling station for each lake once per month during the growing season. Zooplankton are collected using a Wisconsin vertical tow net. Samples are preserved 90% denatured histological ethanol to a mix of approximately 50% sample 50% ethanol.

BCWMC Draft Monitoring Plan

Water- body Type	BCWMC Management Classification	Waterbody Name	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake	Priority 1 Deep	Medicine Lake	TRPD	TRPD PLANT ZOO	TRPD	TRPD	TRPD PLANT ZOO	TRPD	TRPD	TRPD PLANT ZOO	TRPD	TRPD	TRPD PLANT ZOO
		Parkers Lake	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP
		Sweeney Lake	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP
		Twin Lake	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP
		Wirth Lake	MPRB	MPRB	MPRB	MPRB PLANT	MPRB	MPRB	MPRB PLANT	MPRB	MPRB	MPRB PLANT	MPRB
	Priority 1 Shallow	Northwood Lake	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO
		Westwood Lake	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP
	Priority II Shallow	Crane Lake	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP	BC-WQ PLANT ZOO
		Lost Lake	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP
		Turtle Lake	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP
		Cavanaugh Pond	CAMP	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP	CAMP	CAMP	CAMP	BC-WQ/CAMP PLANT ZOO	CAMP
Stream	Priority 1 Stream	Main Stem Bassett Creek	BIO WOMP	WOMP	WOMP	BIO SWQ WOMP	SWQ WOMP	WOMP	BIO WOMP	WOMP	WOMP	BIO SWQ WOMP	SWQ WOMP
		North Branch Bassett Creek	BIO	--	--	BIO SWQ	SWQ	--	BIO	--	--	BIO SWQ	SWQ
		Plymouth Creek	BIO	--	--	BIO SWQ	SWQ	--	BIO	--	--	BIO SWQ	SWQ
		Sweeney Branch Bassett Creek	BIO	--	--	BIO SWQ	SWQ	--	BIO	--	--	BIO SWQ	SWQ

Notes:

TRPD Detailed water quality monitoring performed by Three Rivers Park District of Medicine Lake

BC-WQ Detailed water quality monitoring performed by BCWMC (or contracted party)

CAMP Surface water quality monitoring by Metropolitan Council's Citizen Assisted Monitoring Program (CAMP), or equivalent program

MPRB Detailed water quality and phytoplankton/zooplankton monitoring performed by Minneapolis Park and Recreation Board

ZOO Zooplankton/phytoplankton monitoring performed by BCWMC

PLANT Aquatic plant survey performed by BCWMC twice per monitoring season (June and August)

BIO Invertebrate monitoring and biotic index analysis performed by the BCWMC

SWQ Automated water quality monitoring of stream locations performed by BCWMC (or contracted party)

WOMP Watershed Outlet Monitoring Program facilitated by Metropolitan Council Environmental Services

Appendix B

BCWMC Education and Outreach Plan

DRAFT

----- Education & Outreach Plan -----

Bassett Creek Watershed Management Commission

September 2014

I. Main planning document that supports EOP:

Bassett Creek Watershed Management Commission – Watershed Management Plan – XXX 2015

II. Executive Summary:

The Bassett Creek Watershed Management Commission's (BCWMC) Education and Outreach Plan provides key messages and a guide for disseminating the information in order to educate watershed residents, businesses, policymakers, city staff, educators, students and other interested parties. In particular, the BCWMC aims to change behaviors toward more water-friendly practices and to keep audiences apprised of the following:

- The background, projects, and responsibilities of the BCWMC;
- The water resources of the watershed, their condition, and expectations for future conditions;
- Pollutants, their sources and best management practices necessary to protect and improve water resources;
- Volunteer opportunities related to monitoring or improving water resources;
- Importance of broad input and participation on BCWMC projects, plans, goals, policies, and community outreach methods; and
- Importance of public involvement and understanding of all proposed capital projects and new regulations.

The BCWMC will use its annual operating budget along with collaboration with other entities and possibly grant funding to implement its Education and Outreach Plan. Each year, the Commission's Education Committee will recommend to the Commission a detailed plan of implementation (including timing and tasks) as well as a budget. The Commission's Education Committee, volunteers, and staff will be the primary Plan implementers. The BCWMC will also seek collaborative groups and partners to help achieve the goals set out in the plan. Some of the partners include Metro Blooms, West Metro Watershed Alliance, Metropolitan Council, Metro WaterShed Partners, various schools, and Hennepin County. Many of the activities will be designed to meet member city MS4 education & outreach and citizen participation goals.

III. CORE AUDIENCE

The core audience for each of the education topics and messages below includes several key groups:

- a. Watershed residents
- b. Elected and appointed officials in the watershed
- c. Businesses in the watershed
- d. Recreational water body users in the watershed.
- e. Educators and students in the watershed
- f. Environmental and special interest groups, lake associations, etc.
- g. Local government staff working in the watershed

IV. CORE AVENUES of DISSEMINATING INFORMATION

There are many ways and venues in which to disseminate educational materials to the various audiences. The primary of these that will be used most frequently include:

- a. BCWMC website
- b. Press releases
- c. Articles in city newsletters or newsletters of other entities
- d. Traveling exhibits and displays
- e. Watershed map, brochures, pamphlets and other written material
- f. Presentations to groups, organizations, and city councils or commissions
- g. Open houses, tours, meetings, workshops, trainings
- h. Permanent educational signs
- i. Participation in member city events (such as Plymouth Yard and Garden Expo, Golden Valley Days, etc.)
- j. Social media
- k. Broadcast or local radio or television spots

V. TOPICS, KEY MESSAGES, IMPLEMENTATION

Topic: BCWMC Background, history, responsibilities and projects
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Audience: Core audience + residents or entities affected by proposed or existing projects of the BCWMC

Key Messages:

- a. Location of the watershed and list of cities in the BCWMC
- b. Location and description of the lakes, streams, and wetlands in the BCWMC
- c. The purpose of the BCWMC along with its history, governance, goals, work program, events, partners, primary contacts, and funding
- d. Information on proposed or existing projects of the BCWMC including renderings and information on expected future conditions and aesthetics (vegetation, sight lines, etc.)

Implementation:

Core avenues of disseminating information +

- a. Maintain BCWMC website with information including:
 - Water resources, monitoring results, TMDL reports
 - Watershed map
 - Annual reports of the BCWMC
 - Budgets and funding
 - BCWMC list of contacts
 - BCWMC capital projects including feasibility studies, designs, opportunities for citizen input
 - Links to helpful websites and partnering organizations
- b. Provide mechanism (open houses, public meetings, site meetings, etc.) for residents or entities to learn about proposed BCWMC projects and provide input early and throughout planning and implementation process
- c. Maintain standard messaging/marketing/branding materials for BCWMC correspondence and displays including:
 - Introduction letter/packet about the BCWMC for new Commissioners and others
 - BCWMC logo
 - BCWMC letterhead with succinct mission statement
 - Standard BCWMC identifying paragraph (to be used in every news release and communication vehicle)
 - Traveling educational display (to be used at fairs, special events, etc. with related focus)
 - Summary of BCWMC annual report (brief.
 - One page fact sheet about the watershed

Topic: The water resources of the watershed, their condition, and expectations for future conditions

Audience: Core audience + focus on residents who live on lakes, streams, and wetlands

Key Messages:

- a. Definition of a watershed and the importance of water resources in the community.
- b. Location of significant water resources in BCWMC (streams, lakes, wetlands)
- c. Data and general information on condition of waterbodies (if known) with water quality trends (if available)
- d. Information on impaired waters and TMDLs
- e. Information on blue green algae and aquatic invasive species
- f. Information on effect of improved water clarity on aquatic plants
- g. General limnological information including algae-zooplankton-fish interactions and phosphorus release from hypolimnion
- h. Information on different streambank restoration techniques and the pros/cons of each method

Implementation:

Core avenues of disseminating information +

- a. Include water monitoring reports and TMDL documents on BCWMC website
- b. Develop fact sheets or less technical reports with monitoring results (for website and dissemination elsewhere)
- c. Install stream identification road signs at stream crossings

Topic: Pollutants, their sources and best management practices necessary to protect and improve water resources

Audience: Core audience + focus on residents who live on lakes, streams, and wetlands and businesses that have a potential for impact on water (lawn care companies, developers, engineers, consultants, etc.)

Key Messages:

- a. Information on types of pollutants with emphasis on nutrients, chlorides, sediment, pesticides, and bacteria
- b. Information on differences between sanitary and storm sewers
- c. Information on importance of soil testing and how/where to use soil tests
- d. Information on how everyday activities from every property can effect water quality
- e. Effects of high nutrients on water quality including elevated possibilities for blue green algae blooms
- f. Major sources of pollutants include:
 - Grass clippings, leaves and fertilizers in street
 - General stormwater runoff and increased volume from hard surfaces
 - Runoff and associated pollutants from parking lots, driveways, rooftops
 - Eroding streambanks
 - De-icing materials
 - Industrial/commercial sites (spills, leaks, waste, vehicles, materials handling)
 - Direct runoff from lawns adjacent to lakes, streams
 - Pet waste, geese, wildlife
 - Trash
- g. Aquatic invasive species can significantly degrade habitat quality and recreational suitability
- h. Best management practices are everyone's responsibility (if we all do a little we can do a lot)
 - Sweeping grass clipping, leaves, and extra deicers from driveways, sidewalks, streets
 - Using environmentally friendly practices around yard and home
 - Installing raingardens, rain barrels, infiltration swales

- Picking up trash and pet waste
- Installing buffers along streams, lakes, wetlands
- Monitoring for aquatic invasive species and remaining vigilant

Implementation:

Core avenues of disseminating information +

- a. Collaborate with West Metro Water Alliance
 - Develop educational materials including best practices brochures and Commercial Property Guidebook
 - Develop water quality problem or violations reporting form for use by residents
 - Develop interactive clean water curriculum for students and present in classrooms upon request
- b. Collaborate with Metro Blooms and Blue Thumb to provide workshops and trainings rain garden installations, native gardens, buffers, rain barrels, etc.
- c. Support Metro WaterShed Partners' Clean Water MN media campaign
- d. Support storm drain stenciling projects
- e. Support installation of storm drains and manhole covers with subwatershed identification and key messages

Topic: Volunteer opportunities related to monitoring or improving water resources

Audience: Recruit volunteers from core audience + focus on residents who live on lakes, streams, and wetlands

Key Messages:

- a. Volunteers are needed to help monitor water quality through the Citizen Assisted Monitoring Program and River Watch and other programs
- b. Volunteers are encouraged to participate on BCWMC committees
- c. Volunteers are needed for BCWMC participation in community events
- d. BCWMC Commissioners and Alternate Commissioners are noted as valuable volunteers
- e. Volunteers are respected and highly regarded by the BCWMC

Implementation:

- a. Support and work with Met Council's Citizen Assisted Monitoring Program for lake monitoring, Hennepin County's River Watch program for teachers and students monitoring streams, Hennepin County's Wetland Health Evaluation Program for wetland monitoring, storm drain stenciling projects, and other programs.
- b. Recruit volunteers through various events, venues and publications (core avenues)
- c. Annually recognize and thank volunteers with thank you notes and recognition in press releases

- d. Recognize retiring Commissioners or Alternate Commissioners with resolution and certificate
- e. Provide training for volunteer activities, as needed
- f. Support or coordinate clean up events, creek walks, or other events and activities to involve the public

Topic: Importance of broad input and participation on BCWMC projects, plans, goals, policies, and community outreach methods

Audience: Core audience

Key Messages:

- a. The BCWMC values citizen input and needs citizen participation and support to balance interests and protect the watershed
- b. Residents are encouraged to attend BCWMC meetings to be informed and lend comments
- c. Lake associations, civic groups, environmental groups and others are encouraged to be informed and involved with the BCWMC
- d. Local elected officials are encouraged to understand the BCWMC 's Joint Powers Agreement and well as its goals, funding and governance and to lend input

Implementation:

- a. Maintained and updated website
- b. Broad dissemination of BCWMC meeting agendas/materials
- c. Written and verbal communication with residents, elected officials, and groups encouraging participation in meetings and events

Topic: Importance of public involvement and understanding of all proposed capital projects and new regulations

Audience: Core audience + residents, member cities and stakeholder groups potentially affected by a proposed project or regulation

Key Messages:

- a. Information on the location, layout, landscape changes, and effect of proposed projects
- b. Information on the effects and potential costs of proposed regulations

Implementation:

Core avenues of disseminating information +

- a. Notices to lakeshore groups, homeowner associations, boat owners and others directly affected by proposals/projects
- b. Notices to builders/developers and businesses directly affected by proposals/projects
- c. Public hearings prior to policy/project adoption with opportunities for citizen input and questions
- d. Presentations to city officials and key staff
- e. “Before” and “after” photos (or photo renderings) of proposed projects
- f. Policy/project fact sheet to send upon request and distribute at meetings

VI. EVALUATION

The BCWMC will evaluate its success at relaying key messages. Evaluation could take the following forms:

- a. Number of copies of watershed maps, brochures, or written materials that are disseminated.
- b. Approximate number of people attending or contacted through events, tours, open houses, public meetings, etc.
- c. Surveys to test public’s awareness, knowledge, use, and perception of water resources and their use of best practices. Surveys can be implemented in conjunction with cities or other entities or done through the BCWMC
- d. Program/workshop evaluations submitted by participants
- e. Number of volunteers

Appendix C

Gaps Analysis

Memorandum

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

This document, referred to as the Gaps Analysis, includes a list of issues and/or topic areas and subsequent discussion of those issues/topic areas as they relate to the existing 2004 Bassett Creek Watershed Management Commission (BCWMC) Watershed Management Plan (2004 Plan). The Gaps Analysis will guide development of the new Plan by identifying new issues and existing topics from the 2004 Plan that may warrant updating in light of new data, priorities, or regulations. The issues discussed in the Gaps Analysis generally follow the organization of the 2004 Plan, although additional issues not discussed in the 2004 Plan are also included.

Source Documents Reviewed

Several regulatory and BCWMC documents were used to identify issues and potential gaps. Publicly available documents used in this analysis include:

- Minnesota Pollution Control Agency (MPCA) *Draft 2012 MS4 Permit*
- MPCA *Minnesota Stormwater Manual* (2008)
- MPCA National Pollution Discharge Elimination System (NPDES) Construction Stormwater Permit (2008)
- MPCA Minimal Impact Design Standards (MIDS)
 - Memoranda published from 2010 through 2012
- Watershed District and Watershed Management Organization documents
 - BCWMC *Watershed Management Plan* (2004 Plan) (2004)
 - BCWMC *Requirements for Improvements and Development Proposals* (Requirements document) (2008)
 - Shingle Creek Watershed Management Commission *Rules and Standards* (2009)

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 2
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

- Elm Creek Watershed Management Commission *Watershed Management Plan – Appendix F – Standards* (2008)
 - Minnehaha Creek Watershed District (MCWD) *Regulatory Rules* (2011)
- MPCA Total Maximum Daily Load (TMDL) studies and implementation plans for:
 - Sweeney Lake (2011)
 - Wirth Lake (2010)
 - Medicine Lake (2011)
- National Oceanographic and Atmospheric Administration (NOAA) Rainfall Atlas 14 – Draft (known as the TP-40 update) (October 2012)

Additional information solicited by the BCWMC and used to identify potential gaps includes:

- Comments in response to the BCWMC's notice of Watershed Management Plan update (June 2012) from:
 - Minnesota Board of Soil and Water Resources (BWSR) (letter dated 8/26/2012)
 - Minnesota Department of Natural Resources (MDNR) (letter dated 8/31/2012)
 - Metropolitan Council (letter dated 7/10/2012)
 - Three Rivers Park District (letter dated 9/4/2012)
- Issues identified by the Technical Advisory Committee (TAC) and summarized in a memorandum dated February 8, 2012
- Comments/suggestions solicited from the BCWMC Commissioners and heard at the September 24, 2012 and October 22, 2012 Steering Committee meetings.

Analysis of Gaps by Topic Area

This Gaps Analysis is organized according to the topic areas of the 2004 Plan. Topic areas within this document include Water Quality, Flooding and Rate Control, Erosion and Sediment Control, Stream and Lake Management, Wetland Management, Groundwater, Public Ditches, Public Education and Involvement, and Administration and Implementation. The Stream and Lake Management section of this document approximates the Stream Restoration section of the 2004 Plan, but includes stream and lake management topics not addressed within the 2004 Plan. While issues addressed in this document are categorized into one of the preceding sections, many of the issues have implications for other topic areas.

1.0 Water Quality

Section 4.0 of the 2004 Plan discusses water quality topics in the Bassett Creek watershed, including BCWMC goals and policies, management plans for key waterbodies, and the capital improvement plan

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 3
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

(CIP) for water quality projects. The policies in this section address waterbody classification, monitoring, and project implementation. This section also references Level I water quality treatment standards and non-degradation standards for redevelopment, which are described in section 6.0 of the BCWMC *Requirements for Improvements and Development Proposals* (Requirements document). Level I standards and non-degradation standards for redevelopment are applicable to projects triggering BCWMC review; Level I standards include design criteria for BCWMC-approved BMPs.

Current Status	Identified Gap	Possible Outcome
<p><u>Level I Standards</u></p> <p>The BCWMC's Level I standards (Policy 4.2.2.4-A) are based on Nationwide Urban Runoff Program (NURP) design criteria. These standards are similar to member cities and surrounding WMOs. The water quality attained using Level I standards is based on comparison of post-project site conditions with and without BMPs. The BCWMC's non-degradation policy requires no increase in TP for redevelopment projects that result in increased impervious area.</p>	<p>The BCWMC's policy is not as stringent as the MPCA draft MS4 permit with respect to new development or redevelopment. The MPCA draft MS4 permit requires no net increase in total phosphorus (TP), total suspended solids (TSS), and volume; a reduction is required for redevelopment projects (regardless of the change in impervious area). The MPCA's draft MS4 permit requirements consider comparison of pre-project and post-project conditions, unlike Level I standards.</p>	<p>The TAC cited the importance of establishing quantifiable goals and methods to achieve them, especially with respect to water quality (see Attachment A). The BCWMC may use the planning process to consider changes to its water quality standards for new development and redevelopment, possibly to more closely align them with the MPCA draft MS4 permit. This change would likely require much discussion and therefore a higher level of effort. Changes to the BCWMC water quality standards would require changes to the Plan policy and Requirements document.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 4
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Approved BMPs</u></p> <p>The Requirements document includes a list of approved BMPs that meet Level I standards. Other BMPs may be used with the approval of the Commission.</p>	<p>This list does not explicitly consider “green infrastructure” BMPs such as green roofs, rainwater harvesting and reuse, etc., listed in the MPCA draft MS4 Permit and described in the MPCA’s MIDS documentation. MIDS documents provide additional detail regarding BCWMC-approved BMPs that is not present in the Requirements document (e.g., vegetated versus unvegetated infiltration basins).</p>	<p>The BCWMC may consider expanding its list of acceptable BMPs, or citing the MPCA draft MS4 permit and/or MIDS. Revisions to BCWMC water quality standards (see above) may affect this gap. Such changes may require a moderate level of effort from city/BCWMC staff to define the list. Adding BMPs would require revision to the Requirements document, but may not require changes in Plan policies.</p>
<p><u>Infiltration</u></p> <p>The 2004 Plan and Requirements document include infiltration as an approved BMP for stormwater management. However, neither document <u>requires</u> infiltration or prioritizes infiltration as a preferred method for improving water quality or reducing stormwater volume. When infiltration methods are used, the BCWMC's Level I standards require infiltration of the first 0.5 inches of runoff from impervious surfaces.</p>	<p>The MPCA draft MS4 Permit requires permittees to develop stormwater management programs that prioritize “green infrastructure” techniques, including infiltration. MIDS recommends infiltration of the first 1.1 inches of runoff from impervious surfaces (greater than the BCWMC’s 0.5 inches). Minnetonka, St. Louis Park, and Plymouth require infiltration (or other retention) as a means of volume control, and the cities of Crystal, Golden Valley, and Minneapolis encourage infiltration. The MDNR comment letter recommends that the BCWMC evaluate the need for infiltration/abstraction standards.</p>	<p>The BCWMC may use the planning process to determine the level to which infiltration should be required. Encouraging infiltration represents a smaller level of effort, but will require changes to the Plan and Requirements document. Developing and implementing a quantitative infiltration requirement (e.g., 1.1 inches) will require more discussion and a greater level of effort. The TAC identified "encouraging responsible infiltration" as a key role of the BCWMC, but expressed mixed opinions on whether the BCWMC should establish an infiltration or abstraction requirement to address water quality (see Attachment A).</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 5
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Redevelopment</u></p> <p>The 2004 Plan includes a redevelopment policy (Policy 4.2.2.4-A) that cites the importance of maximizing the amount of stormwater treatment obtained at the time of development, to avoid costly retrofitting in the future.</p>	<p>The BWSR and MDNR comment letters emphasize the importance of maximizing redevelopment and retrofit opportunities, as well as reduced imperviousness, in order to improve water quality. Because the Bassett Creek watershed is near full development, most opportunities to improve water quality will be through redevelopment projects. The 2004 Plan policy only applies to redevelopment projects that increase impervious area, potentially missing opportunities.</p>	<p>The planning process will allow the BCWMC to identify ways to find and take advantage of redevelopment opportunities, including land use plans and TMDL implementation plans. The BCWMC may consider funding additional treatment provided by redevelopment projects (e.g., performance beyond city standards or X-percent reduction below existing conditions). This will require a moderate to high level of effort, depending on the extent of policy changes (e.g., regarding funding methods).</p>
<p><u>TMDLs</u></p> <p>The 2004 Plan includes policies regarding general BCWMC participation in TMDL studies, but is vague regarding the roles and responsibilities the BCWMC will assume.</p>	<p>Since the development of the 2004 Plan, TMDLs have been approved for Sweeney Lake, Wirth Lake, and Medicine Lake, with specific roles and responsibilities assigned to the BCWMC. There is also the potential for increased watershed monitoring (e.g., watershed loading to Medicine Lake) stemming from these TMDLs. Future TMDLs will include Northwood Lake and Bassett Creek. Three Rivers Park District identified the Medicine Lake TMDL implementation plan as a priority for the BCWMC in its comment letter. The TAC cited a need for more clarity regarding how water quality issues are being addressed (e.g., TMDLs) and identification of the responsible party or program (see Attachment A).</p>	<p>The Plan will need to be revised to reflect the BCWMC's current roles in existing TMDLs and position the BCWMC for future roles. The planning process is an opportunity for the BCWMC to clarify responsible parties for non-TMDL water quality issues. Inclusion of existing roles in the Plan will require a moderate level of effort; greater discussion (and therefore a higher level of effort) will be required to define roles related to future TMDLs and non-TMDL water quality issues.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 6
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Water Quality Project Maintenance</u></p> <p>The 2004 Plan provides limited detail regarding the BCWMC's maintenance responsibility for water quality projects. The BCWMC uses the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund ("Channel Maintenance Fund") to finance the portion of a stream project that provides BCWMC benefits (including water quality); this definition has limited applicability (see also Flooding and Rate Control).</p>	<p>There is lack of understanding regarding the breakdown of maintenance responsibilities between the BCWMC and member cities for water quality projects.</p>	<p>The TAC recommends that the planning process address maintenance responsibilities for water quality management facilities constructed as part of the BCWMC CIP. This will require much discussion regarding policy and funding, and is therefore a high level of effort.</p>
<p><u>Water Quality Monitoring</u></p> <p>The 2004 Plan states that the BCWMC will coordinate with others to monitor water quality within the watershed.</p>	<p>There may be missed opportunities to enhance monitoring, education, or other water quality-related programs. In addition, there may be duplication of effort between multiple parties.</p>	<p>The TAC recommends that the BCWMC explore water quality programs and partnerships that build on the existing schedule of rotating monitoring efforts (see Attachment A). As part of the planning process, the BCWMC may develop a list of ongoing monitoring and other water quality programs (by BCWMC and others) to evaluate or prioritize coordination efforts. Generating this list will require a moderate level of effort. Developing coordination will require greater discussion and a high level of effort.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 7
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

2.0 Flooding and Rate Control

Section 5.0 of the 2004 Plan addresses flooding and rate control within the watershed, but focuses on the Bassett Creek trunk system (defined in the 2004 Plan). This section includes description of past flooding, the Bassett Creek Flood Control Project, and other flood mitigation projects. The 2004 Plan includes policies regarding floodplain management, as well as policies specifically related to the Bassett Creek Flood Control Project. Section 5.0 of the BCWMC Requirements document includes floodplain regulations applicable to development within the Bassett Creek watershed.

Current Status	Identified Gap	Possible Outcome
<p><u>Atlas 14 (TP-40 Update)</u></p> <p>The 2004 Plan references storm events based on recurrence interval (e.g., 10-year event); these are commonly referred to as “design storms”. Table 3.2 lists TP-40 precipitation totals. Section 5.3.1 describes past flooding events with reference to TP-40 recurrence intervals. Several policies in Sections 5.2.2.1 and 5.2.2.2 related to flood protection refer to the 100-year event.</p>	<p>The draft rainfall Atlas 14 (the TP-40 update) includes updated precipitation frequency estimates for Midwestern states, including Minnesota. Although still preliminary, the results include increases in storm event precipitation totals for some storm event. For example, at the Minneapolis-St. Paul Airport, 100-yr 24-hour storm event increases from 6.0 to 7.9 inches. Member city and BCWMC stormwater management policies reference storm events that may be outdated. These changes may affect:</p> <ul style="list-style-type: none"> - Member city rate controls and other standards - Stormwater infrastructure design criteria - BCWMC policies related to the BCWMC Flood Control Project, trunk system, and floodplain management - Floodplain delineation (FEMA and BCWMC) 	<p>The planning process is an opportunity for the BCWMC to determine how it wishes to address changes to precipitation totals presented in Atlas 14. This will require a high level of effort, as the changes have broad (and potentially costly) implications to both the BCWMC and member cities. Incorporation of Atlas 14 will require updates to Plan text and tables, and possibly revised Plan policies. The BCWMC’s consideration of rate control requirements (see Rate Control gap) may also be affected by changes in rainfall amounts.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 8
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Rate Control</u></p> <p>The 2004 Plan specifies that member cities must require “rate control in conformance with the flood control project system” (Policy 5.2.2.2-E).</p>	<p>The existing rate control requirement is vague and has limited scope. The Shingle Creek WMC, Elm Creek WMC, and Minnehaha Creek Watershed District limit post-development runoff rates to pre-project conditions for storm events of specific return intervals. Crystal, Medicine Lake, Minnetonka, and Plymouth require no increase in 2-yr, 10-yr, and 100-yr flow rates (Minneapolis requires no increase in rate from the 5-yr and 100-yr storm events). The TAC recommends that the BCWMC consider strengthening or quantifying policies regarding rate and volume control.</p>	<p>The planning process is an opportunity for the BCWMC to develop quantitative rate control requirements, if desired. Such requirements would necessitate edits to policies in the Plan and the Requirements document. This would require a high level of effort if Atlas 14 results are to be considered in the rate controls (see Atlas 14 / TP-40 Update gap).</p>
<p><u>Flood Protection</u></p> <p>The 2004 Plan cites flood protection as a goal of the BCWMC (Section 5.2.1). The TAC feels that modification to the existing flood control project is not a high priority, and that current methods are working.</p>	<p>The TAC recommends that the BCWMC monitor opportunities to incorporate flood control objectives into other projects (see Attachment A).</p>	<p>The BCWMC may consider policies encouraging the consideration or incorporation of flood control objectives into all projects. This would likely require a moderate level of effort and result in changes to the Plan policies.</p>
<p><u>Flood Elevations</u></p> <p>The 2004 Plan includes 100-year flood elevations for many locations within the Bassett Creek watershed (Table 5-3).</p>	<p>Differences exist between BCWMC-determined 100-yr flood elevations and Federal Emergency Management Agency (FEMA) 100-yr flood elevations. The TAC recommends the BCWMC continue to monitor differences between BCWMC and FEMA 100-yr flood elevations (see Attachment A).</p>	<p>The BCWMC may consider policies to specify how conflicts between FEMA and BCWMC flood levels will be identified and resolved. This would likely require a moderate level of effort and result in changes to the Plan policies.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 9
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

3.0 Erosion and Sediment Control

Section 6.0 of the 2004 Plan focuses on erosion and sediment control and includes applicable BCWMC policies. The BCWMC reviews projects for compliance with erosion and sediment control standards. Requirements for developers are included in Section 7.0 of the BCWMC Requirements document and reference the MPCA's NPDES Construction Stormwater Permit and *Protecting Water Quality in Urban Areas* (superceded by the Minnesota Stormwater Manual).

Current Status	Identified Gap	Possible Outcome
<p><u>NPDES Construction Stormwater Permit</u></p> <p>The Requirements document references the current NPDES Construction Stormwater Permit (MPCA, 2008)</p>	<p>The current NPDES Construction Stormwater Permit is scheduled to be updated in 2013 and will likely include new monitoring requirements consistent with federal regulations (more information pending December 17 MPCA informational meeting). This schedule, if it lags, may make it difficult to align the new BCWMC Plan with the permit changes, if desired.</p>	<p>The BCWMC may revise language in the Plan and Requirements document to generally require compliance with the NPDES Construction Stormwater Permit with limited specificity. This will require a moderate level of effort.</p>
<p><u>Erosion Control Thresholds</u></p> <p>BCWMC sediment and erosion control standards are triggered by greater than 200 cubic yards of cut or fill or disturbed area greater 10,000 square feet.</p>	<p>Member city thresholds for sediment and erosion control standards are similar to or more stringent than the BCWMC. Similar triggers provide potential opportunity for coordinating inspection efforts with member cities.</p>	<p>The planning process is an opportunity for the BCWMC to revise its erosion and sediment control triggers, if desired. This will require a high level of effort and will require revisions to the Plan policies and Requirements document.</p>
<p><u>Sediment Deltas</u></p> <p>The 2004 Plan includes policies describing the use of the Channel Maintenance Fund, which includes removal of accumulated sediment within the trunk system. However, the Plan but does not address sediment accumulation in lakes.</p>	<p>Sediment deltas have accumulated in lakes within the Bassett Creek watershed. Roles, responsibilities and funding sources for addressing sediment accumulation are not defined.</p>	<p>The TAC recommends that the planning process address roles, responsibilities and funding sources for removing these sediment deltas (see Attachment A). This will require a moderate level of effort and will include revisions to Plan policies.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 10
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<u>Erosion Control Inspections</u> Member cities and the BCWMC both perform erosion control inspections of development projects.	This process provides BCWMC oversight and helps maintain consistency among all members, but may represent a duplication of effort.	The TAC recommends that the planning process review the purpose and responsibilities for conducting erosion control inspections (see Attachment A). This will require a high level of effort and will include revisions to Plan policies.

4.0 Stream and Lake Management

Section 7.0 of the 2004 Plan addresses stream restoration and includes policies regarding the establishment and use of a Creek and Streambank Trunk System Maintenance, Repair, and Sediment Removal Fund (“Channel Maintenance Fund”). The 2004 Plan and later member city inventories identify areas of bank erosion and sedimentation within Bassett Creek. Other policies emphasize the preservation of habitat and aesthetics. Requirements for streambank erosion and streambed degradation control measures are listed in Section 8.0 of the BCWMC Requirements document. Elements of lake management not directly associated with water quality or flooding are not addressed in the 2004 Plan.

Current Status	Identified Gap	Possible Outcome
<u>Stream Restoration</u> <u>Prioritization Factors</u> The 2004 Plan includes factors for prioritization of stream restoration projects, such as severity of erosion, stability of the site, quantity and quality of affected resources, cost, water quality benefits, and input from member cities.	The MDNR comment letter suggests specific prioritization factors representing a more holistic, ecological approach, including (but not limited to): extent to which the project addresses a systemic problem, breadth of benefits (e.g., habitat, water quality, and channel evolution), location within the watershed, and potential for controversy.	The planning process is an opportunity for the BCWMC to reassess factors for prioritization of stream restoration projects. This will require a moderate level of effort and may result in changes to Plan policies.

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 11
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Stream Stabilization Methods</u></p> <p>The 2004 Plan does not require or encourage specific methods for stream stabilization.</p>	<p>The MNDR comment letter discourages the use of “highly-engineered, hard-control solutions” for stream stabilization (e.g., riprap, checkdams) in favor of methods that promote natural functions and reduce maintenance requirements (MDNR draft restoration guidelines are available from Nick Proulx).</p>	<p>The planning process is an opportunity for the BCWMC to encourage natural methods for stream restoration. This will likely require a moderate level of effort and may require changes in Plan policy.</p>
<p><u>Aquatic Invasive Species (AIS)</u></p> <p>The 2004 Plan does not address AIS. The role of the BCWMC in AIS management is limited to curlyleaf pondweed control.</p>	<p>The MDNR comment letter identifies aquatic invasive species (AIS) as a significant threat to Minnesota’s lakes and rivers. The Three Rivers Park District comment letter also cites this issue. The Association of Medicine Lake Area Citizens (AMLAC) has also requested BCWMC support of AIS management efforts. The role of the BCWMC in addressing AIS is not well defined.</p>	<p>The planning process provides an opportunity for the BCWMC to define its role with respect to AIS. Roles of the BCWMC could include:</p> <ul style="list-style-type: none"> - Continued monitoring of waterbodies - Public education and outreach - Financial sponsorship of other groups’ efforts - Management of AIS to preserve or improve recreational uses - Capital projects incorporating AIS control or prevention elements <p>This will require a high level of effort and may require changes to Plan policies.</p>
<p><u>Rare and Endangered Species</u></p> <p>Section 3.7 of the 2004 Plan generally describes rare and endangered species within the Bassett Creek watershed.</p>	<p>Protection of rare and endangered species is not addressed within the policies of the 2004 Plan. The MDNR comment letter recommends including goals and policies to address how these resources will be protected.</p>	<p>The planning process is an opportunity for the BCWMC to define policies aimed at the protection of rare and endangered species. This will likely require a moderate level of effort.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 12
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

5.0 Wetland Management

Section 8.0 of the 2004 Plan describes wetland management in the Bassett Creek watershed. Member cities act as the local governmental units (LGUs) responsible for administering the wetland conservation act (WCA) with the exceptions of Medicine Lake, Robbinsdale, and St. Louis Park; for those communities, the BCWMC acts as the LGU. The BCWMC Requirements document does not explicitly include requirements for wetlands other than requiring compliance with WCA and “other wetland regulations” (e.g., member city standards).

Current Status	Identified Gap	Possible Outcome
<u>Buffer Widths</u> The 2004 Plan does not include a minimum wetland buffer policy or requirement. The 2004 Plan requires member cities to include a buffer policy in local water management plans.	The Shingle Creek WMC, Elm Creek WMC, and MCWD have created buffer policies for wetlands. In some cases, specific buffer widths are defined for individual waterbodies. Buffer widths vary amongst the BCWMC member cities.	The planning process is an opportunity for the BCWMC to evaluate support for, and the benefits of, a watershed-wide buffer policy for wetlands and other resources (e.g., lakes and Bassett Creek) (see Attachment A). This will require a moderate amount of effort and changes to Plan policies and the Requirements document.
<u>Wetland Regulation</u> Section 8.0 of the 2004 Plan describes BCWMC’s role in wetland management. The BCWMC acts as the LGU for administering WCA in three member cities.	The TAC identified concerns regarding the adequacy of existing regulatory controls and programs.	The TAC recommends that the planning process evaluate the BCWMC’s role regarding wetland issues (see Attachment A). Reassessment of BCWMC’s role will require a moderate level of effort, and may require changes to Plan policies.

6.0 Groundwater

Section 9.0 of the 2004 Plan addresses groundwater issues in the Bassett Creek watershed. The policies in this section require the use of liners or other engineering controls to prohibit undesirable infiltration from detention ponds, but otherwise avoid being prescriptive. The BCWMC reviews all MDNR groundwater appropriation permits within the BCWMC. The BCWMC Requirements document indirectly addresses groundwater protection via design criteria for water quality BMPs.

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 13
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Groundwater Management Role</u></p> <p>The 2004 Plan encourages actions by member cities, Hennepin County, and state agencies, but assigns few roles to the BCWMC regarding groundwater management. The 2004 Plan describes the role of other agencies in limited detail.</p>	<p>The BWSR comment letter identifies groundwater as a subject of increasing concern. The BCWMC's role in groundwater management is vague.</p>	<p>The planning process presents an opportunity for the BCWMC to assess and define its role in groundwater management, especially as related to the interaction of groundwater and surface water resources. Roles for the BCWMC could include:</p> <ul style="list-style-type: none"> - Groundwater level monitoring - Cooperation and coordination with other regulatory entities (e.g., Hennepin County) - Establishing requirements through policies. <p>The TAC recommends that the planning process review the Hennepin County Groundwater Plan for implications to existing or potential future BCWMC policies (see Attachment A). Assessment of the BCWMC's groundwater management role will require a high level of effort and may require changes to Plan policies.</p>
<p><u>Groundwater Protection/MIDS</u></p> <p>Section 9.0 of the 2004 Plan contains information about state agency roles pertaining to groundwater protection, including the MPCA.</p>	<p>The recent MPCA's Minimal Impact Design Standards (MIDS) project includes information regarding the protection of groundwater resources as related to infiltration practices. This information is not included in the Plan or Requirements document.</p>	<p>The planning process is an opportunity to incorporate (or reference) site considerations and decision-making tools for groundwater protection developed as part of the MIDS project. This will require a moderate level of effort and may require changes to the Plan policies and Requirements document.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 14
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Minnesota Department of Health (MDH) Guidance</u></p> <p>Section 9.3 of the 2004 Plan references the MDH's Wellhead Protection Program.</p>	<p>The MDH addresses groundwater protection through administration of the Wellhead Protection Program, which requires public water suppliers who obtain water from wells to prepare and enforce wellhead protection plans (WHPPs). The MDH provides a guidance document <i>Evaluation Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas</i> (2007); this document is not referenced by the BCWMC Plan.</p>	<p>The planning process provides an opportunity for the BCWMC to evaluate or incorporate MDH guidance regarding groundwater protection and infiltration. This will require a moderate level of effort and may result in changes to Plan policies and the Requirements document (see above Groundwater Protection/MIDS gap and Infiltration gap in Section 1.0).</p>

7.0 Public Ditches

Section 10.0 of the 2004 Plan contains information and policies regarding public ditches within the Bassett Creek watershed. The BCWMC manages public ditches that are part of the trunk system, while member cities are responsible for the management of public ditches within their municipal drainage systems. The BCWMC was asked by Hennepin County to support legislation (passed in 2008) which streamlines the abandonment of public ditches and the transfer of management responsibility.

Current Status	Identified Gap	Possible Outcome
<p><u>Public Ditch Management</u></p> <p>Public ditches within the Bassett Creek watershed remain under the management of Hennepin County, but are not actively managed by the county.</p>	<p>The lack of active management of public ditches by the county results in complications/delays for projects that involve these ditches.</p>	<p>The BCWMC could assume a more active role in the process to abandon these ditches and transfer management authority to the BCWMC and/or member cities. This will require a high level of effort and may result in changes to Plan policies.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 15
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

8.0 Public Involvement and Education

Section 11.0 of the 2004 Plan addresses public involvement and education efforts of the BCWMC. The 2004 Plan focused on goals of conveying information regarding the BCWMC and its role, increasing public involvement in the planning process, and affecting public behaviors with water resource impacts. The 2004 Plan identifies specific key messages related to the aforementioned goals.

Current Status	Identified Gap	Possible Outcome
<u>City Staff Training</u> Section 11.0 of the 2004 Plan cites local governmental staff as a target audience for key BCWMC messages.	The MPCA draft MS4 permit's minimum control measures require permittees to implement and document "employee training" programs. The 2004 Plan does not specify training programs targeted at member city staff.	The BCWMC could consider implementing city staff training programs and recordkeeping practices to educate member city staff regarding significant BCWMC issues and best practices. This will require a moderate level of effort.
<u>Evaluation Metrics</u> The 2004 Plan identifies specific metrics to evaluate success of education and outreach programs, as recommended in the BWSR comment letter.	The 2004 Plan includes many key messages and respective target audiences. Specific metrics are not defined for some educational goals, or may be outdated.	The planning process presents an opportunity to evaluate existing metrics and consider ways the BCWMC can demonstrate to the public that it is operating effectively. This will require a moderate level of effort.
<u>Information Distribution</u> The 2004 Plan identifies media and distribution methods used to distribute information (e.g., BCWMC website, fact sheets, television).	The 2004 Plan does not include recent developments in communication technology and behaviors (e.g., social media, mobile computing).	The planning process is an opportunity to incorporate new technologies or methods of interacting with the public. This will require a moderate level of effort and may include revisions to Plan policies.

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 16
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Project-based Educational Programs</u></p> <p>Section 11.2.2.4 of the 2004 Plan includes some educational policies linked to specific projects (e.g., before and after project photos, signage at projects). Most educational policies, however, are not linked to specific projects or types of projects.</p>	<p>The BWSR comment letter strongly recommends implementing education and public involvement efforts in support of real actions or projects.</p>	<p>The BCWMC may consider methods to identify and take advantage of public education opportunities associated with specific projects. This will require a moderate amount of effort and may require changes to Plan policies.</p>
<p><u>Educational Program Topics</u></p> <p>Section 11.0 of the 2004 Plan identifies several “key messages” and educational topics that the BCWMC prioritized for public broadcast, although the list is not exhaustive.</p>	<p>The TAC expressed interest in expanding education programs subject to available funding (see Attachment A). The TAC suggested educational efforts to address issues including TMDLs, citizen concerns regarding the value of studies versus projects, and concerns of citizens living near low priority waterbodies.</p>	<p>The planning process is an opportunity to identify topics not adequately addressed in the current education program. This will require a moderate level of effort and may require changes to the Plan policies.</p>
<p><u>Joint Education Programs</u></p> <p>Policy 11.2.2.4-A of the 2004 Plan addresses the use of joint education/outreach programs and partnerships</p>	<p>The TAC believes there are greater opportunities for partnership between the BCWMC and member cities in developing educational materials, but recommended more clarity of BCWMC and member city roles regarding education and public involvement.</p>	<p>The planning process is an opportunity to reassess potential partnership opportunities and define roles for educational efforts. Identifying opportunities will require a moderate level of effort. Creating partnerships with defined roles may require a high level of effort.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 17
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

9.0 Administration and Implementation

Section 12.0 of the 2004 Plan describes administration of the BCWMC and presents the BCWMC implementation program. This section identifies the responsibilities of the BCWMC, including the trunk system, review of improvements, development proposals, and other permits, intercommunity planning and design, and dispute resolution. This section also describes the roles of the member cities and other agencies.

Current Status	Identified Gap	Possible Outcome
<u>Performance Goals</u> The 2004 Plan includes many quantifiable goals and policies (especially those related to water quality, flood control, and public education).	Many goals and policies in the 2004 Plan are presented without a corresponding strategy to quantify performance. The BWSR and Metropolitan Council comment letters cite the need for quantifiable goals and policies related to all water management topics (in addition to water quality).	The TAC suggests that the planning process should explore the need for and purpose of quantifiable goals for water management topics outside of water quality (see Attachment A). This will require a high level of effort.
<u>Financial Impacts of Regulatory Controls</u> BCWMC member cities are subject to regulatory controls stemming from the MPCA draft MS4 permit, WMO requirements, and other agency requirements.	Regulatory controls applicable to BCWMC member cities have financial impacts. The financial impact of such regulation is not adequately defined.	The TAC supports analyzing the financial impact of regulatory controls on member cities (see Attachment A). This will require a high level of effort by the BCWMC and member cities.

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 18
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Flood Control Project Inspection and Maintenance</u></p> <p>The BCWMC's <i>Operation and Maintenance Manual for the Bassett Creek Flood Control Project</i> (O&M Manual) requires annual inspection of the flood control project. The BCWMC performs inspections of the flood control project, but member cities are responsible for MS4 reporting.</p>	<p>The MPCA draft MS4 permit includes revised inventory, inspection, and maintenance requirements for stormwater systems. Although the BCWMC is not an MS4, the BCWMC O&M Manual generally satisfies the requirements of the draft MS4 permit. Alignment of the O&M Manual with MS4 requirements may reduce member city inspection efforts. Revisions to the O&M Manual may be required to incorporate elements of the pond assessment included in the draft MS4 permit. The TAC also cited a need for more clarity regarding maintenance policies (see Attachment A).</p>	<p>The planning process is an opportunity for the BCWMC to assess opportunities for streamlining inspections and add clarity regarding maintenance responsibilities. These actions will require a high level of effort and coordination between the BCWMC and member cities.</p>
<p><u>Flood Control Project Replacement</u></p> <p>The BCWMC Flood Control Project is aging. Portions of the project may need to be replaced in the future. Funding mechanisms currently exist for maintenance of the Flood Control Project.</p>	<p>It is unclear whether existing funding mechanisms (e.g., Long Term Fund) will be adequate to address increased maintenance and/or eventual replacement of the Flood Control Project system components in the future.</p>	<p>The planning process is an opportunity to re-evaluate the financial considerations for maintenance and replacement for the flood control project. These actions will require a high level of effort and coordination between the BCWMC and member cities, especially if additional funding mechanisms are deemed necessary.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 19
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Minnesota Statute 103B</u></p> <p>The 2004 Plan references Minnesota Statute 103B, which describes the regulatory process for the development and revision (amendment) of watershed management plans.</p>	<p>Minnesota Statute 103B has been revised since the 2004 Plan; the 2004 Plan contains outdated information regarding the Plan amendment process.</p>	<p>The planning process should reference the updated statute and revised plan review process. This will require a minor level of effort.</p>
<p><u>Member City Responsibilities</u></p> <p>Section 12.1.2 of the 2004 Plan lists responsibilities for member cities. Section 12.4.2 describes BCWMC review of local water management plans, but does not describe any auditing process.</p>	<p>BWSR requires watershed management plans to clearly define the roles of WMOs and member cities and recommends a “mandatory checklist” for member cities. The TAC cites a need for more clarity regarding the division of responsibilities between the BCWMC and member cities (see Attachment A).</p>	<p>BWSR recommends that the BCWMC develop a defined auditing process for “spot-checking” municipalities for compliance, as well as assessing implementation of local water management plans. This will require a moderate level of effort.</p>
<p><u>Multi-City Issues</u></p> <p>Sections 12.1.1.2 and 12.1.1.3 of the 2004 Plan describe the BCWMC’s role regarding intercommunity stormwater planning and dispute resolution, respectively. Section 12.4 of the 2004 Plan states that the BCWMC will review changes to an intercommunity stormwater system that are inconsistent with a city’s approved plan or the BCWMC Plan.</p>	<p>The TAC cited a need for more clarity in determining whether an issue is a BCWMC issue versus member city issue, but expressed little support for expanding the responsibility and oversight of the BCWMC (see Attachment A). Policy changes may be necessary to address multi-city water management issues.</p>	<p>The planning process is an opportunity for the BCWMC to examine multi-city issues and assess whether the BCWMC is the best entity to resolve inter-governmental issues. This will require a moderate level of effort by the BCWMC and member cities.</p>

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 20
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

Current Status	Identified Gap	Possible Outcome
<p><u>Project Review Triggers</u></p> <p>The BCWMC's thresholds and triggers for project review are similar to surrounding WMOs, although Minnehaha Creek Watershed District's threshold is lower.</p>	<p>Within the BCWMC, Crystal and Minnetonka have lower thresholds for review. There may be opportunities to revise review and inspection processes to avoid duplication of efforts, while maintaining an appropriate level of oversight.</p>	<p>The planning process provides an opportunity for the BCWMC to assess whether its existing triggers for project review are appropriate. This will require a moderate level of effort from the BCWMC and member cities.</p>
<p><u>Cooperative Resource Protection</u></p> <p>The 2004 Plan does not address ecological corridor, open space or greenway preservation (outside of Bassett Creek itself).</p>	<p>The BWSR comment letter recommends collaboration with other WMOs to pursue programs using bonds for purchasing of ecological corridors, resource protection, easement acquisition or other water management purposes.</p>	<p>The planning process represents an opportunity to analyze and recommend opportunities to maximize cooperative relationships with other regulatory agencies, including adjacent WMOs. Identification of opportunities will require a moderate level of effort.</p>
<p><u>CIP Oversight</u></p> <p>Section 4.0 of the 2004 Plan includes policies related to CIP implementation, but is limited to water quality projects. The recently completed CIP process flow chart adds clarity to the existing project implementation process, including Commission oversight.</p>	<p>Section 12.0 of the 2004 Plan does not include policies regarding CIP implementation or funding of BCWMC projects outside of water quality projects. The TAC expressed strong support for an annual review of the CIP and process documentation (see Attachment A).</p>	<p>The planning process is an opportunity to evaluate and refine procedures for inclusion and subsequent implementation of projects in the CIP, including the level of Commission oversight during the process. This will require a moderate level of effort.</p>

Outcomes and Next Steps

Changes in regulations, available data, BCWMC priorities, agency expectations and public perceptions all affect the next generation planning process. This document identifies gaps between the 2004 Plan and the drivers to be resolved in the next generation planning process. The issues described herein should be considered during subsequent steps in the next generation planning process. The Gaps Analysis has identified these issues, but does not contain the necessary information to resolve them. Instead, this

To: BCWMC Next Generation Plan Steering Committee
From: Karen Chandler and Greg Williams
Subject: DRAFT Gaps Analysis Document (Revised)
Date: December 13, 2012
Page: 21
Project: 23/27-0051.33-2012-404
c: BCWMC Commission

document should guide discussion by the next generation plan steering committee, commissioners, or other groups during the plan update process.

Attachment A

Technical Advisory Committee Identified Issues

The Technical Advisory Committee (TAC) completed five questionnaires addressing several topics between August 2010 and February 2012. A Barr Engineering memorandum dated February 8, 2012 and presented to the BCWMC at its February 16, 2012 meeting describes the results of those questionnaires. This section provides a summary of those results, listing items that warrant consideration by the BCWMC in the planning process. This list is not comprehensive; additional detail regarding each topic is available in the original memo.

Public Education and Involvement

- Existing programs are working, but there is support for expanding programs subject to funding availability
- There are opportunities for increased partnership between the BCWMC and member cities; greater clarity of city roles is needed

Erosion and Sediment Control

- The new Plan should address roles, responsibilities and funding for removal of sediment deltas in Bassett Creek and lakes
- The BCWMC should review the function and responsibilities for conducting erosion inspections

Flooding and Rate Control

- The BCWMC should monitor opportunities to incorporate flood control objectives into other projects
- Differences between BCWMC and FEMA floodplain elevations should continue to be monitored
- The new Plan should consider strengthening or quantifying policies regarding rate and volume control

Funding

- There is support for analyzing the financial impact of regulatory controls on member cities

Groundwater

- A key role of the BCWMC is to encourage responsible infiltration
- The BCWMC should review the Hennepin County Groundwater Plan for implications on existing or potential future BCWMC policies.

Attachment A

Planning Process

- More clarity is needed on what defines a BCWMC issue versus member city issue
- There is strong support for an annual review of the CIP (and process documentation)
- The planning process should explore the need for and purpose of quantifiable goals for water management topics outside of water quality

Water Quality

- More clarity is needed regarding how water quality issues are being managed and who or what process is responsible for addressing them
- The planning process should address quantifiable water quality goals and methods to achieve them
- The new Plan should address maintenance responsibilities for water quality projects

Wetlands

- The BCWMC's role regarding wetland issues should be considered in the planning process
- The BCWMC should assess whether there is support for stronger buffer requirements

BCWMC/City Evaluation, Accountability, and Enforcement

- There is agreement that the BCWMC and member cities cooperate to establish quantifiable goals and policies for each topic area and monitor them for success

BCWMC/City Responsibilities

- More clarity is needed regarding the division of responsibilities
- There is little support for increasing the responsibility and oversight by the BCWMC

New Issues (Identified since June 2010)

- More clarity is needed regarding maintenance policies
- Opinions are mixed on whether the BCWMC should establish an infiltration or abstraction requirement to address water quality

Appendix D

Results of Public Involvement during Plan Development

Appendix D

2014 Plan Outreach and Public Involvement Summary

The BCWMC gathered input from the residents, elected and appointed officials, city staff, state agencies and other partners through its Watershed Assessment and Visioning Exercise (WAVE) process. The WAVE process included a professionally written press release for local news organizations, soliciting input via an online survey (which resulted in 174 responses), and hosting a series of 11 small group meetings. The small group meetings were held with city councils, city commissions, lake associations, neighborhood associations, and other resident groups at different locations within the watershed in spring 2013.

The results of the survey and workshops were presented at a “summit” meeting in June 2013, attended by the public, lake associations and representatives of the member cities. The outcome of the summit was a prioritized list of issues facing the BCWMC. BCWMC Commissioners, TAC members, partnering organizations and review agencies also prioritized the issues at a subsequent plan development workshop. All of this input was considered in the development of Plan.

Items presented in Appendix D include:

- Watershed Assessment & Visioning Exercise (WAVE) flyer
- Professionally written press release to engage, inform and solicit public input
- List of small group meetings and resulting list of issues
- Results of online survey
- Results of issues ranking through June 2013 Watershed Summit
- Results of issues ranking through Plan Development Workshop

Appendix D

2014 Plan Outreach and Public Involvement Summary

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- Results of issues ranking through Plan Development Workshop



SPEAK FOR THE CREEK

Help set a course for **cleaner waters**

Make a difference in your watershed's future two ways:

1. Take the survey

Ten minutes of your time will help us shape ten years of direction for the future of Bassett Creek, Medicine Lake, Parkers Lake, Sweeney/Twin Lakes, Wirth Lake and many other waterbodies in the Bassett Creek watershed. Go to: <http://www.bassett-creekwmo.org> and let your voice be heard.

2. Attend the Bassett Creek Watershed Summit

Join the conversation and tell us what's important to you. Engage public officials, city planners, engineering staff, lake association members and others in a hands-on **Watershed Assessment Visioning Exercise**. This kind of WAVE is a public participation forum that will help us craft a watershed plan that best addresses the concerns and values of watershed stakeholders...like you.



BASSETT CREEK WATERSHED SUMMIT*

Thursday, June 13, 2013 at 7:00 pm

Plymouth City Hall, 3400 Plymouth Blvd.

*Pre-registration is requested but not required. Email bcra@barr.com or contact Laura Jester at 952-270-1990 for more information.

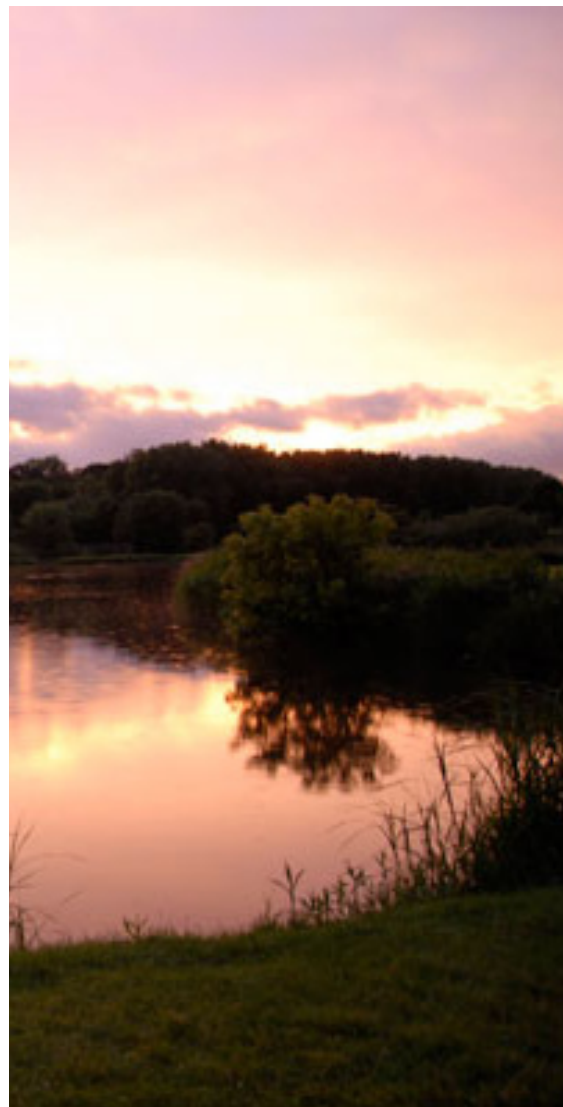


Photo credit: Dan Johnson, Crystal, MN

The Bassett Creek Watershed Management Commission is a local governing body tasked with managing flood control and water quality within the Bassett Creek watershed. The watershed encompasses portions of nine west metro cities including Crystal, Golden Valley, Medicine Lake, Minneapolis, Minnetonka, New Hope, Plymouth, Robbinsdale and St. Louis Park. Learn more about the Bassett Creek Watershed Management Commission at <http://www.bassettcreekwmo.org>.



PRESS RELEASE: For immediate release

February 18, 2013

Contact: Laura Jester 952-270-1990; laura.jester@keystonewaters.com

Wanted: Your Thoughts and Ideas for Lakes and Streams in the Bassett Creek Watershed By Judy Arginteanu

Suffering from insomnia? Read this for a quick cure: Stormwater runoff. Infiltration. Watershed management .

Yawn, right? Feeling sleepy now?

OK, now try this: Shrinking back yards. Stinky creeks. Flooded basements.

Kind of wakes you up again, doesn't it?

That's why the Bassett Creek Watershed Management Commission wants to hear from you. The commission is made up of ordinary residents like you who focus on improving water quality and preventing flooding – issues that affect all of us – in the 40-square-mile Bassett Creek watershed. Every 10 years the commission updates its management plan for protecting and improving the watershed, which includes Medicine, Parkers and Sweeney lakes, Wirth Park, and, of course, Bassett Creek. The commission is starting to update its plan for the next 10 years and needs input from you. Residents and businesses can air their thoughts and concerns through a quick and easy online survey at www.bassettcreekwmo.org, at meetings in their communities, or at a Bassett Creek Watershed Summit scheduled for 7 p.m., June 13, 2013, at the Plymouth City Hall.

If you think your voice won't make a difference, Terrie Christian knows otherwise. When she bought her property on Medicine Lake in the mid-'80s, she found "a very, very sick lake," filling with sediment and full of algae blooms that turned the lake into a smelly mess and drove away walleye and other game fish — not to mention swimmers.

Some 25 years later, through the commission, Christian and other lake-area residents have seen their concerns not only heard, but acted on. While the lake still faces some issues, it's in far better health. The commission needs to hear from people like Terrie on the front lines, who serve as the commission's eyes and ears, says commissioner Ginny Black. "We need people to tell us what they're seeing. We can't be everywhere, all the time." And you don't have to live on a lake, or even take regular walks by a stream, either. For example, you may find your backyard is slipping away because of erosion – caused by what's happening upstream. Or you might have a strong opinion about the importance of green corridors and

parks, says state conservationist Brad Wozney, because how land is used directly affects the quality of water resources.

Citizen input is also a good way to help direct where your tax dollars are going, he says. Plus, he notes, a well-drafted plan – which includes adequate citizen input so the commission can be as specific as possible – can help local governments get state grants for projects, which in turn help local dollars go further toward improvements.

Since the Bassett Creek watershed is mostly developed, the commission focuses on opportunities to retrofit best management practices into the landscape and restore degraded areas along streams. Improving water quality and reducing flooding are the main goals of the Commission. Additional areas of focus come through feedback from people like you.

Those goals are important to people like Deacon Warner, who says he never knew about Bassett Creek until he and his family moved to Minneapolis' Harrison neighborhood (and later to Bryn Mawr). Now he, his wife, and their two kids, 8 and 12 years old, spend much of their time near the creek – walking, kayaking, even skiing along it in winter. “Bassett Creek is like a test microcosm of how we want to treat nature. It's had an incredible history – it used to be incredibly polluted, it was treated as a sewer, it was buried. It seems so important that we don't turn our backs on nature even in our urban environment. We have choices about how we want to treat it,” says Warner.

Terrie Christian would agree. The point, she says, is to speak up: “Citizen input is really important. And it can be really powerful.”

The Bassett Creek watershed covers parts or all of Crystal, Golden Valley, Medicine Lake, Minneapolis, Minnetonka, New Hope, Plymouth, Robbinsdale and St. Louis Park. To see a map of the watershed, find out more about the watershed planning process, answer survey questions, or find out how you can get involved, visit the Bassett Creek Watershed Management Commission's website at www.bassettcreekwmo.org, attend the Bassett Creek Watershed Summit on June 13, or contact their administrator, Laura Jester, at laura.jester@kestonewaters.com or 952-270-1990.

Invitation to the Bassett Creek Watershed Summit

Join us in a conversation about the watershed. Learn the results of the survey, visit with other residents of the watershed, and help us prioritize watershed issues!

**Thursday June 13, 2013
7– 9 p.m.
Plymouth City Hall**

Registration is requested but not required.
Register with bcra@barr.com

Provide Input on the Bassett Creek Watershed

Visit www.bassettcreekwmo.org to complete a survey about your thoughts on water resources in your community!

**BCWMC Watershed Assessment and Visioning Exercise
Small Group Meetings with Member Cities**

SCHEDULE OF MEETINGS:

Date	City/Group	Facilitator
March 8, 2013	Minnetonka City Staff	Linda Loomis, Plan Steering Committee Chair
March 12, 2031	Golden Valley Council Manager Meeting w/ Commission Chairs invited	Linda Loomis, Plan Steering Committee Chair
March 18, 2013	New Hope Council Work Session	Linda Loomis, Plan Steering Committee Chair
March 25, 2013	Crystal Council Work Session	Dan Johnson, BCWMC Commissioner
March 30, 2013	Minneapolis Neighborhoods Public Meeting w/ MPRB	Michael Welch, BCWMC Commissioner & Lisa Goddard, BCWMC Alternate Commissioner
April 10, 2013	Plymouth Environmental Quality Commission w/ Lake Association Presidents invited	Ginny Black, Chair, BCWMC Commission
April 11, 2013	St. Louis Park Staff	Justin Riss, BCWMC Alternate Commissioner
April 18, 2013	Robbinsdale Planning Commission	Linda Loomis, Plan Steering Committee Chair
April 18, 2013	City of Medicine Lake Planning Commission	Ted Hoshal, BCWMC Commissioner
April 25, 2013	Association of Medicine Lake Area Citizens (AMLAC)	Dan Johnson, BCWMC Commissioner
June 18, 2013	Friends of Northwood Lake	Linda Loomis, Plan Steering Committee Chair

RESULTS:

Question 1: What are the indicators of healthy waterbodies?
Wildlife and Plants
1. Abundant and diverse wildlife in and around water
2. Abundant birds, wading birds and waterfowl present, including swans
3. Abundant and diverse vegetation
4. Little or no aquatic vegetation (weeds in water)
5. Healthy fishery, including minnows; that provides good fishing opportunities
6. Natural shoreline with good wildlife habitat
7. Amphibians present
8. Macroinvertebrates (bugs) present
9. No Eurasian watermilfoil or other invasive species present
10. Native species thrive

Water Quality
1. Lack of algae; not slimy
2. No odor
3. Unpolluted
4. Good water clarity
5. Good water temperatures (not too warm)
6. Nice water color
7. Non-oily or greasy
8. Fishable and swimmable (meeting standards)
Physical Aspects of Waterbodies
1. Not clogged with leaves
2. Bottom is not mucky
3. Deep
4. No trash in or along water
5. Nice aesthetics
6. Less streambank or shoreline erosion; shorelines are vegetated
7. No sedimentation
8. No direct stormwater runoff reaching waterbody
9. Not as much flooding
10. No stagnant water, streams are flowing
11. Less flashy
12. Stable water levels in lakes
13. Good oxygen levels in water
Public Enjoyment and Practices
1. Visible public use
2. People enjoying swimming; good swimming beach
3. Includes access for walking and hiking
4. Peaceful
5. Sustainably used by people
6. Residents keep yard fertilizers out of lake
7. Year-round access to lakes (due to consistent water levels)

Question 2: What concerns do you have regarding the waterbodies in your community?
Effects of Individuals
1. Too much trash
2. Too many motorboats
3. Too much pet waste
4. Runoff from yards and streets
5. Too much groundwater consumption
6. Lack of infiltration or diversion in lawns
7. Lack of sense of responsibility and respect/lack of attention from residents and businesses
Development/Infrastructure
1. Salt use
2. Lightrail – encroachment in wetlands
3. Stormwater runoff without filtration or treatment, more treatment ponds needed

4. Concentration of impervious surfaces
5. Chemical and pollutant inputs from runoff
6. Modifications to waterbodies due to development
7. Runoff from older commercial/industrial areas
8. Construction site erosion
9. Effects of housing developments
10. Leaks and spills from railroads
11. Aging infrastructure
12. Effects of dredging
Biology
1. Too many weeds
2. Non-natural shorelines
3. Aquatic invasive species, including rough fish
4. Terrestrial invasive species
5. Too much algae
6. Too many geese
7. Lack of wildlife diversity
8. Lack of buffers
9. Fish consumption advisories
10. Loss of thousands of ash trees in watershed
Physical/Chemical Aspects of Waterbodies
1. Lack of public access and well maintained access
2. Non-consistent water levels
3. Sediment build-up
4. Streambank erosion
5. Increased rainfall events
6. Too much total phosphorus, including internal loading
7. Low water clarity
8. Low water levels on Medicine Lake
9. Bassett Creek south of Glenwood is “terrible”
10. Flooding
11. Groundwater quality and quantity in wells in Medicine Lake
12. Abundance of cattails in ponds resulting in flooding problems
Funding/Governance/Societal
1. Lack of funding
2. Commitment from all 9 cities
3. Lack of education
4. Not enough benefit to not enough people (projects?)
5. Need better prioritization of projects
6. Apathy of public; need to change behavior, actions, habitats of residents
7. Not enough projects in Northwood Lake subwatershed
8. Lack of city-implemented projects like raingardens
9. Need better sources of information
10. Need more tax incentives for better projects
11. Expectations that water quality problems can be solved quickly with a silver bullet
12. Need more land acquisition for flood easements
13. Balance management of recreational lakes vs. scenic ponds
14. Pond management before lake management

15. Balancing habitat with recreation
16. Need to fully study effects of Medicine Lake's possible water level manipulation on the floodplain, water quality, water temperatures, and overall lake health

Question 3: What are the barriers to improving water quality?
Physical
1. Poorly drained soils
2. Flooding
3. Lack of space for water quality projects
4. Zebra mussels
5. Too many weeds
Government
1. Lack of funding and resources
2. Lack of education and knowledge
3. Time
4. Lower priority for decision makers
5. Science of water quality is still young
6. Lack of consensus and common ground on what it takes to improve water quality
7. Government inefficiency
8. Inability to identify the problem and install correct project in correct location
9. Push for development
10. Government agency restrictions
11. Not being willing to dredge
Public
1. Too many motorboats
2. Angry residents
3. Unwillingness to change, self interests
4. Disconnection of public from natural resources
5. Property rights
6. Stigma of environmental issues, in general
7. Public unwilling to give more funding

Question 4: How can we address the barriers to improving water quality?
Information and Education
1. More education, information, outreach to residents
2. Education of children; involve schools
3. Educational signage
4. Public service announcements
5. Neighborhood outreach
6. Sponsorship by companies that make water-related products (boats, motors, etc)
7. Newsletters
8. City celebrations
9. Citizen monitoring programs (CAMP, WHEP)
10. National Night Out as a venue for education and outreach
11. Consistent message among watershed organizations
12. Labeling stormdrains

13. Focused volunteer efforts; organize stakeholder volunteer group
14. City Park and Rec programs focused on water; summer camps
15. Coordinated clean ups among all cities
16. Use natural constituencies and existing groups
17. All 9 cities working together on education and outreach
18. Sponsor events linking water quality to water use
19. Show visual impacts
20. Install paths near projects
21. More trails along creek
22. Start Bassett Creek Farmers Market near creek
Government
1. Streamline permitting; more uniform regulations
2. Be a watershed management organization; not a watershed district
3. Transparency of actual costs
4. Look regionally vs. jurisdictionally
5. Need more scientific proof of negative impacts
6. Reward good behavior
7. Provide small grants



Bassett Creek Watershed Management Commission

SURVEY RESULTS

Thank you to everyone who answered the survey as part of the Watershed Assessment and Visioning Exercise! These answers helped to outline important issues and activities where the Bassett Creek Watershed Management Commission can focus its work over the next ten years. The Commission looks forward to partnering with communities, organizations and residents in continuing to improve and protect the water resources throughout the watershed.

Although the survey is closed, please always feel free to contact the Commission with your thoughts and ideas! Thank you.

A NOTE ABOUT THE SURVEY RESULTS:

- This online survey was available through the Bassett Creek Watershed Management Commission's website for approximately 3 ½ months from the end of February 2013 to mid-June 2013.
- 174 people completed the survey.
- The results below include answers to the open ended questions but all personal or identifying information was removed from the responses so that individuals remain anonymous.

Bassett Creek Watershed Management Commission

7800 Golden Valley Road | Golden Valley, MN 55427 | www.bassettcreekwmo.org | Established 1968

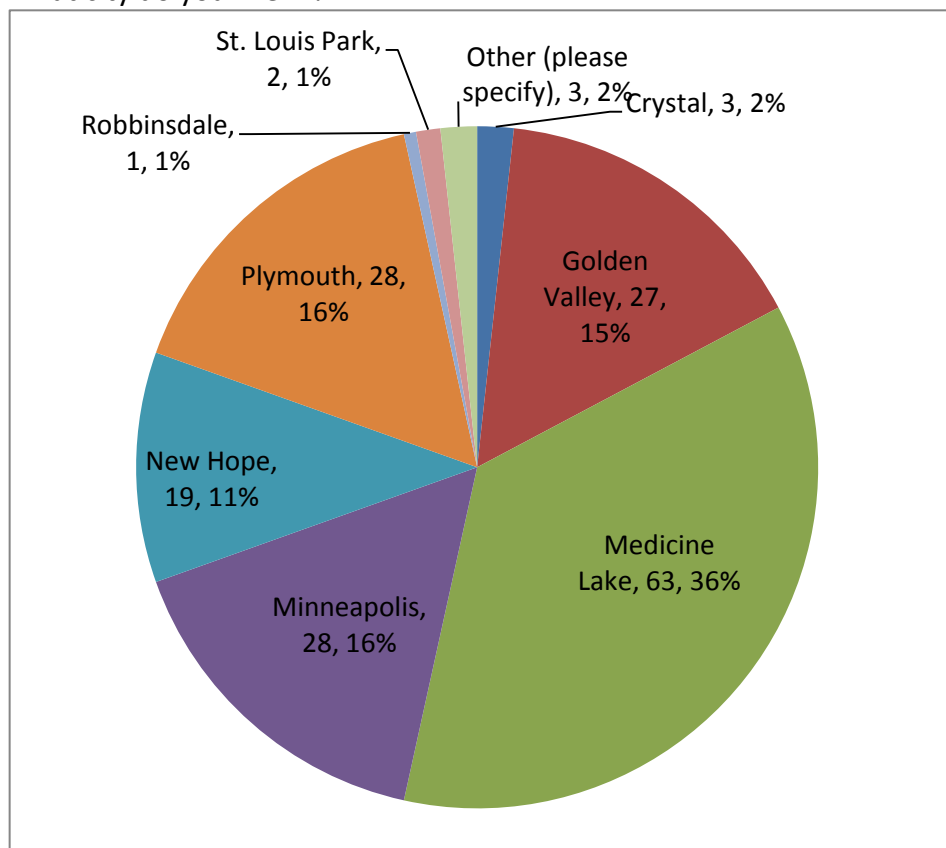
Crystal | Golden Valley | Medicine Lake | Minneapolis | Minnetonka | New Hope | Plymouth | Robbinsdale | St. Louis Park

Bassett Creek Watershed Management Commission

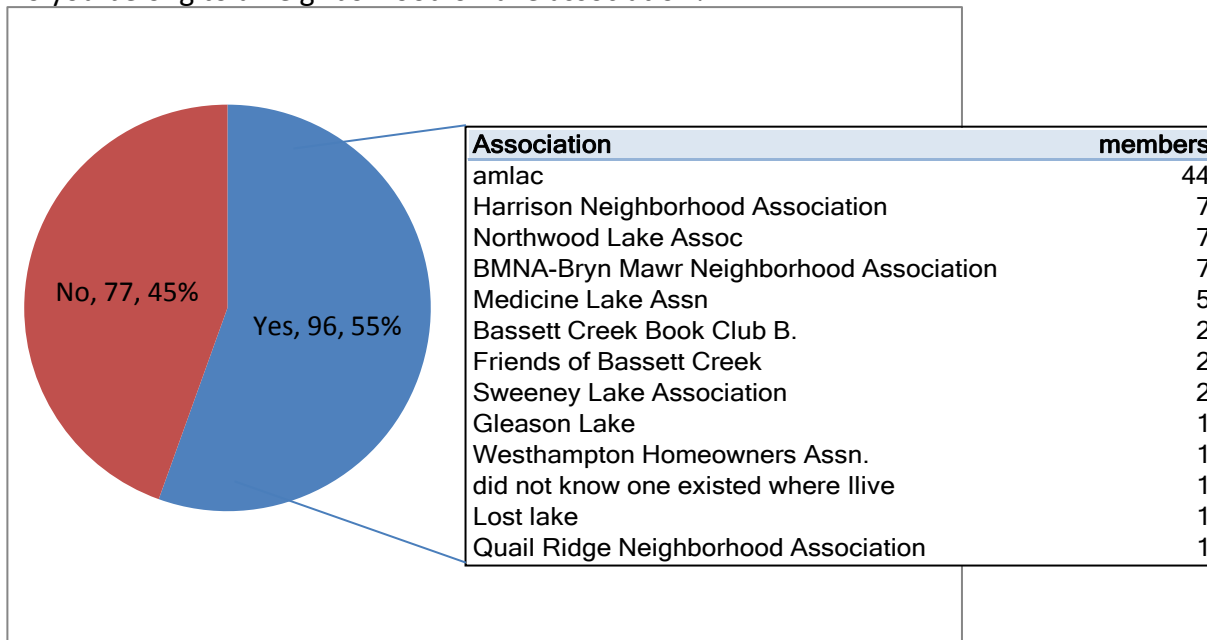
Watershed Assessment and Visioning Exercise (WAVE) Survey

FINAL RESULTS: 6/24/2013 (174 responses)

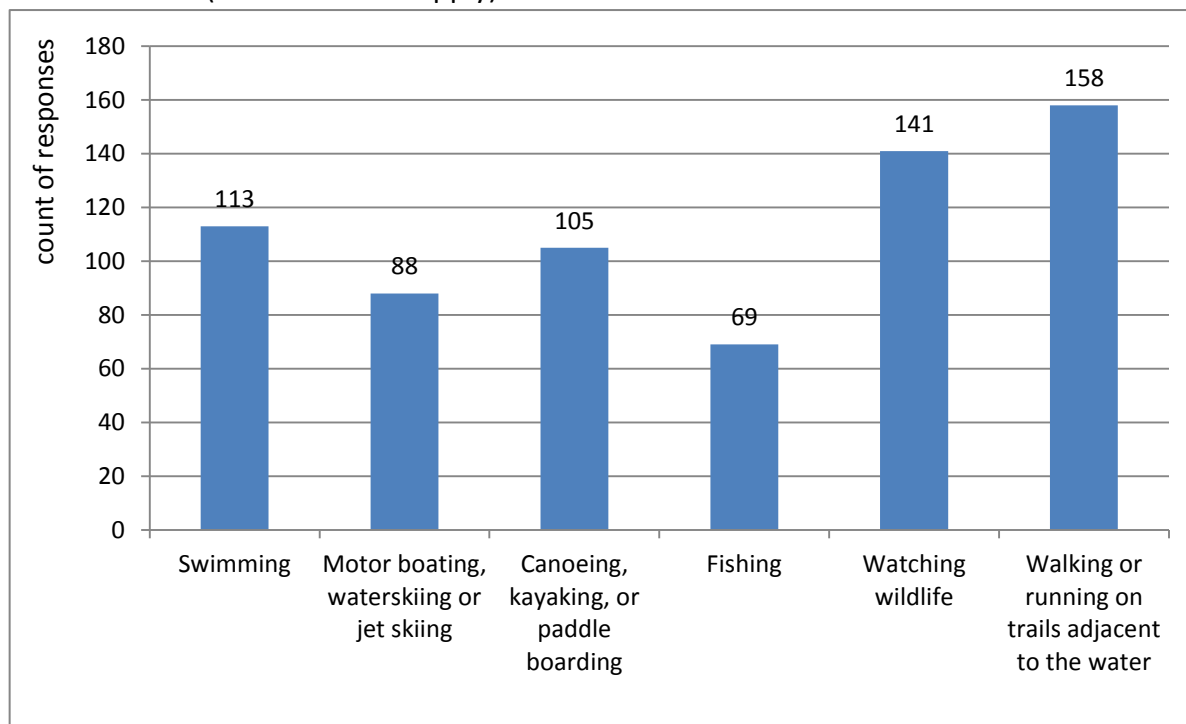
1. What city do you live in?



2. Do you belong to a neighborhood or lake association?

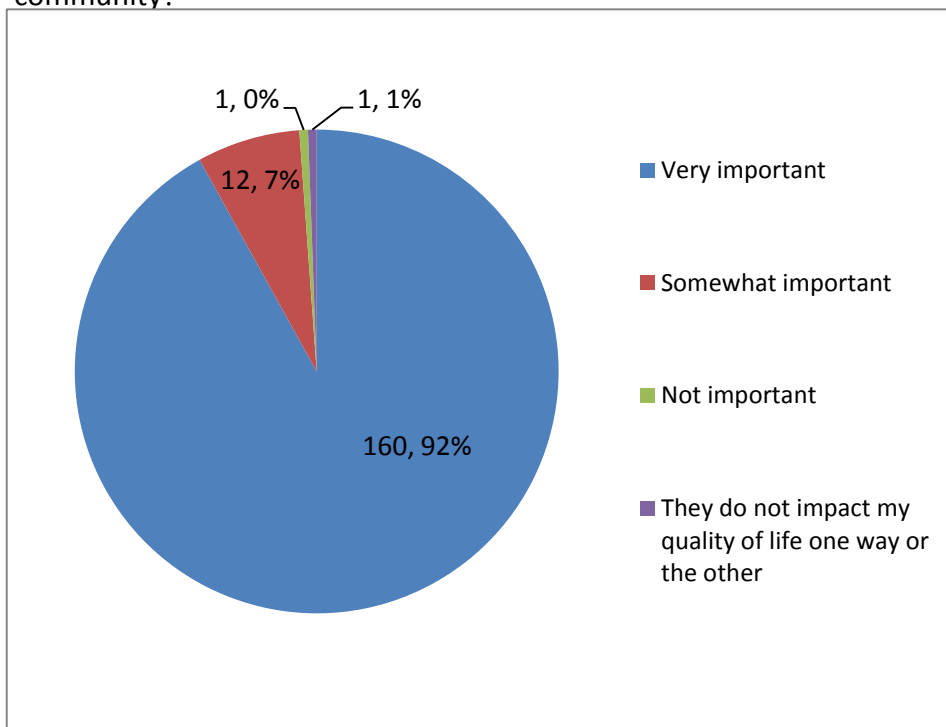


3. How do you use the lakes, streams, ponds and wetlands in your community or surrounding communities? (Choose all that apply)



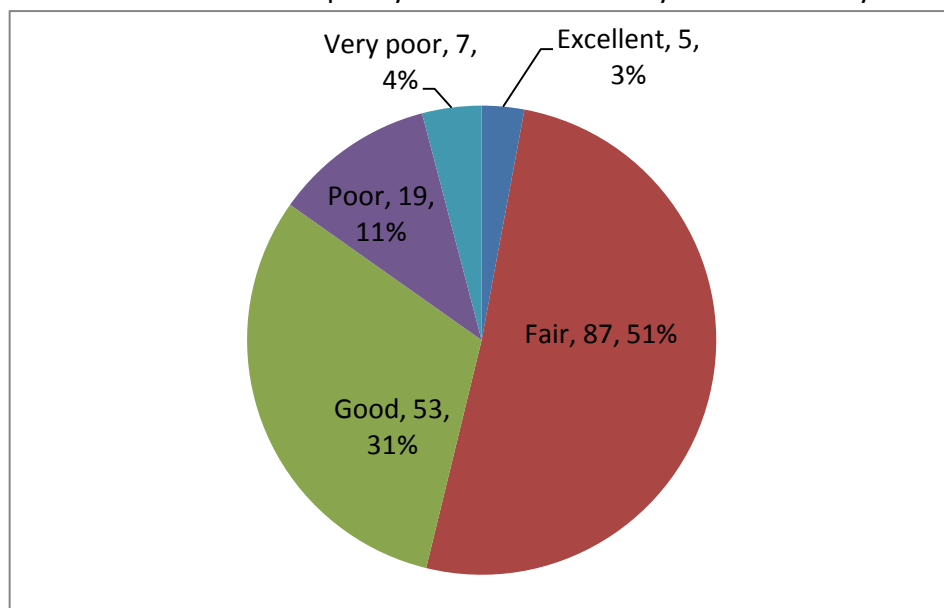
see narrative report (page 6) for "In what other ways do you use water resources in your community"

4. How important are the lakes, streams, ponds and wetlands to your quality of life in your community?



see narrative report (page 7) for "HOW do the water resources impact life in your community"

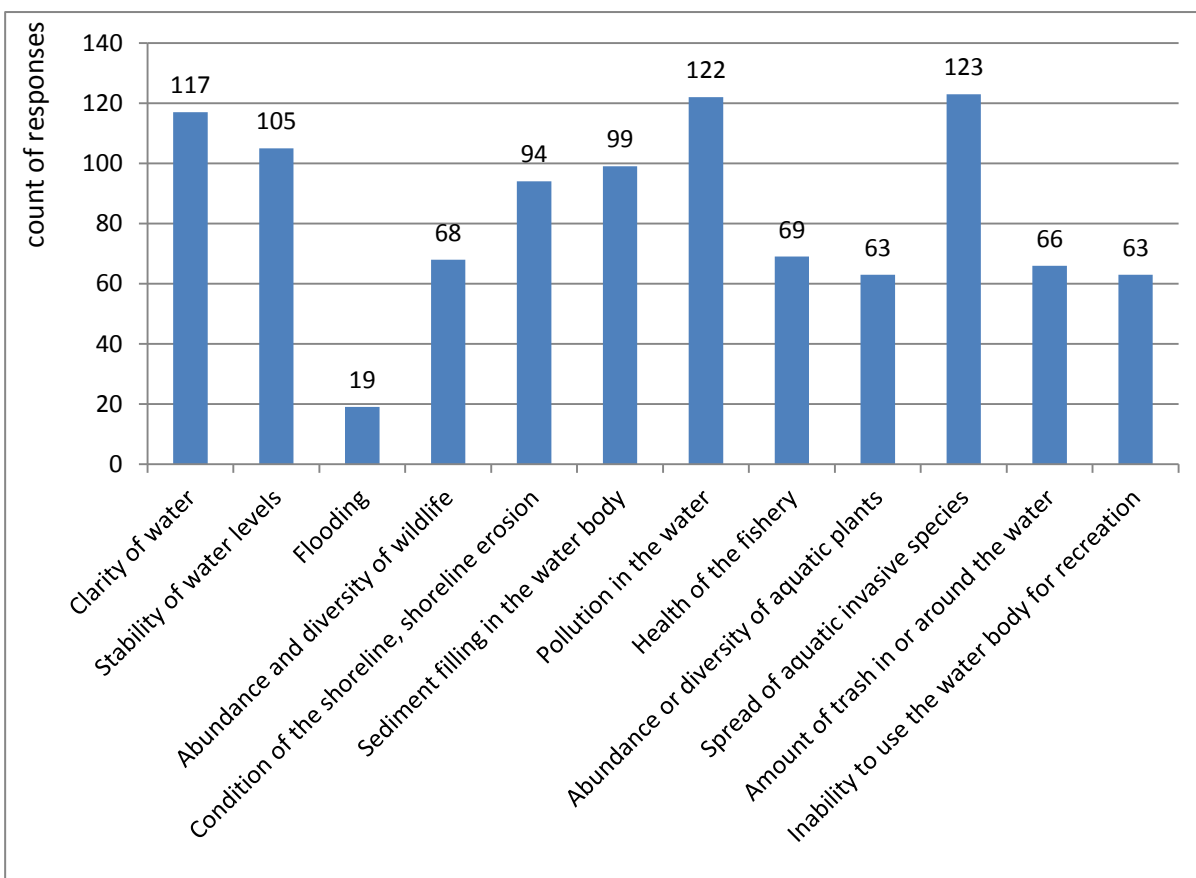
5. Please rank the overall quality of water bodies in your community.



see narrative report (page 11) for "5a. Why do you believe the water resources currently have this quality?"

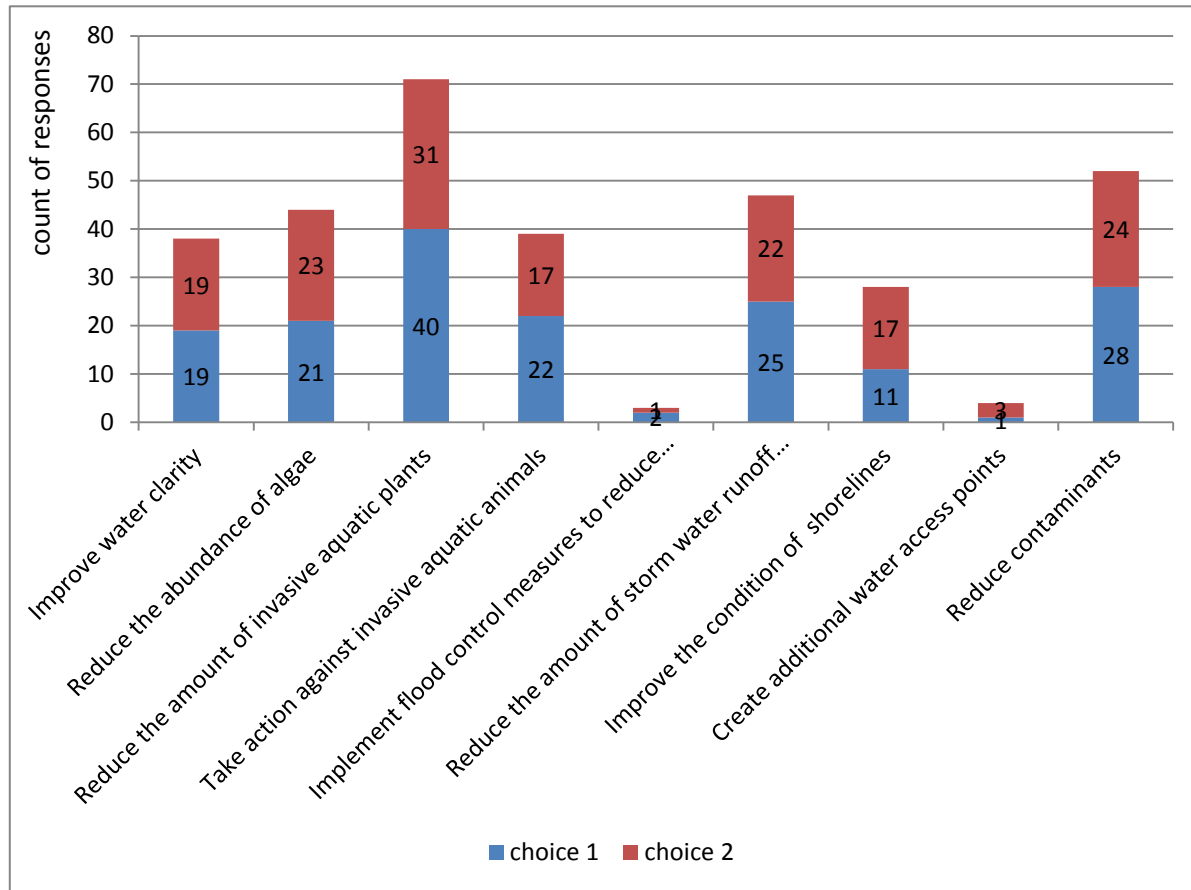
see narrative report (page 16) for "5b. Are there one or two water bodies that stand out?"

6. What concerns you about the condition of the lakes, streams, ponds and wetlands in your community? (Choose all that apply)

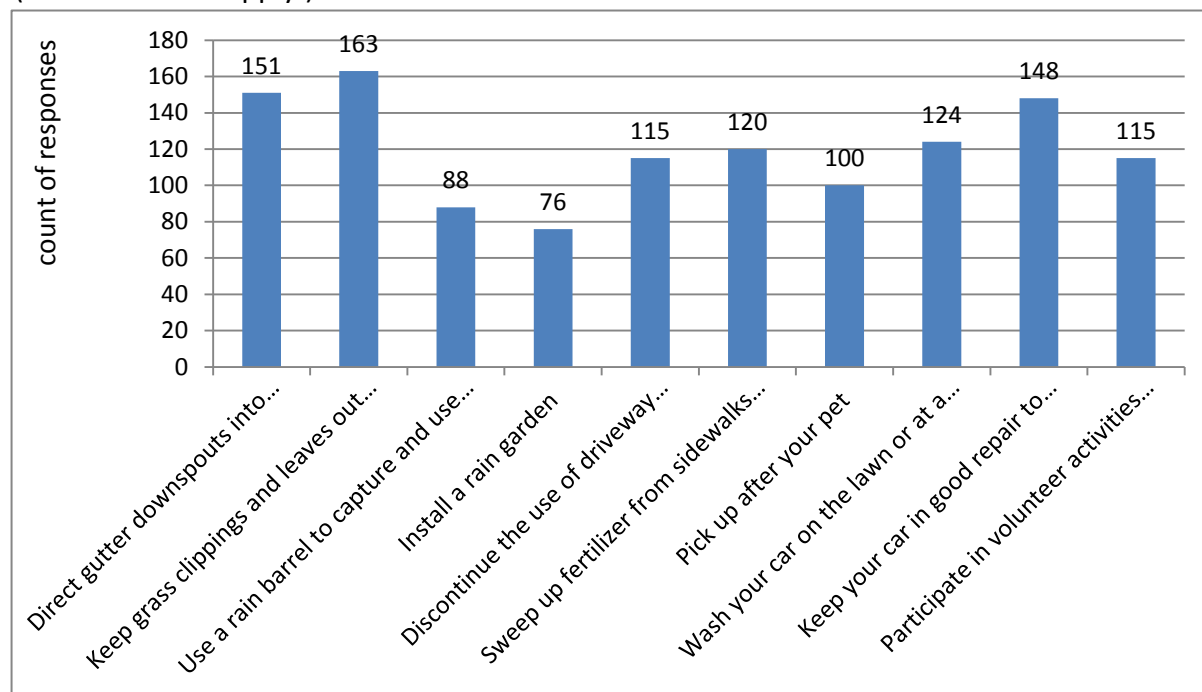


see narrative report (page 19) for additional open ended responses to this question

7. What results will make the biggest difference in the overall quality of water bodies in your community? (Choose two)



8. What actions are you willing to take around your home and yard to improve water quality? (Choose all that apply.)



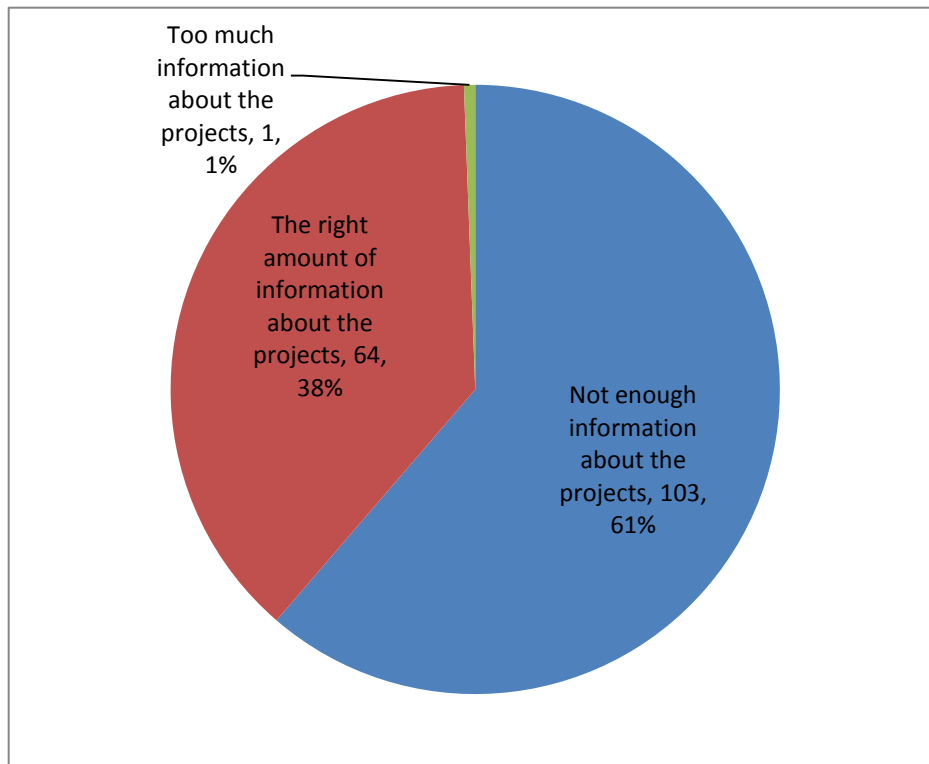
9. If you had a question or concern about the water bodies in your community, who would you contact? - Open-Ended Response

see narrative report (page 20)

10 How do you learn about water projects going on in your community? - Open-Ended Response

see narrative report (page 23)

11 Do you feel that in terms of information about water projects being done in your community you receive:



12 How would you like to receive information about water projects going on in your community? - Open-Ended Response

see narrative report (page 26)

13 Considering the water bodies in your community, what are your major concerns or issues that should be addressed? - Open-Ended Response

see narrative report (page 29)

14 What actions should be taken to address your issues and who should take those actions? - Open-Ended Response

see narrative report (page 34)

15 Other comments about water resources - Open-Ended Response

see narrative report (page 39)

**3. How do you use the lakes, streams, ponds and wetlands in your community or surrounding communities?
(Choose all that apply) - In what other ways do you use water resources in your community?**

Narrative responses - how you use the lakes, streams, ponds and wetlands

Bassett Creek is in my back yard, it is a landscape feature and plays an important role in my everyday life. I sit by the creek all summer listening to the babbling brook and loving it.

biking

Biking around the lakes also

biking around trails adjacent

Biking on the bike trail

Cross country skiing adjacent to creeks and lakes and on frozen lakes

Cross country skiing in winter

cross-country skiing

drinking water - well

Education

Enjoyment of nature

I also introduce friends to these resources

I breath the atmosphere with water vapor in it as well as pine tree resins when those are available for breathing

I enjoy the recreational value of the ice in winter, and in general enjoy the view!

Ice skating and skiing

It just soothes the soul.

Operate the aeration system on Sweeney Lake, and live on the lake since 1965.

photography, education of youth, religious experiences

playing at shore

private wells

Runs through our property

sailing

Sailing at French Lake Park

Sailing, picnics

serenity and peacefulness of the natural resource of the water itself

snorkeling,

snowmobiling

Snowshoeing in winter

the creek and pond are important to me as a chance to connect with the beauty of nature.

the view

We live on the Peninsula and it is harder each year to boat and enjoy the lake (even the view) with the amount of lake weed and low levels of the lake

Well- Drinking water

Winter xc skiing, snow shoeing and dog walks

Xc skiing and ice skating

(blank)

water lawn

Biking on those same trails, too.

I live on the lake with 170 feet of lakeshore

sailing (small 16 ft) sailboat

Biking, Rollerblading, Ice skating, sailing

4. How important are the lakes, streams, ponds and wetlands to your quality of life in your community? - If you chose "Very Important" or "Somewhat Important", describe HOW do the water resources impact life in your community?

Narrative responses - HOW water resources impact life in your community

a significant criteria to our livability and property values

Access to minimally impaired lakes, rivers, and creeks sets my community apart from others and is a fundamental component of our high quality of life.

Adds to the beauty of the area

As a lake-shore owner, I am always concerned about the health of the lake. It is a constant point of neighborhood gatherings year round.

As a property owner on Medicine Lake of 28 years I have a knowledge, experience and vested interest in the Bassett Creek Watershed.

attract wildlife

Bassett Creek is very important to my quality of life in my community because it adds beauty, draws wildlife, and provides nourishment for the trees and plants. It adds to the value of our property. It is so important for all animals -- including humans -- to have fresh, flowing water nearby as it nourishes all of us..

Bassett Creek runs right along the edge of my yard, with the wetlands behind it. We are VERY, VERY concerned about the impact of the light rail line (D1 locally preferred alternative) on the wetlands and water quality of the creek. This line will run RIGHT THRU the wetlands adjacent to the existing Northern rail line which will be moved 25 feet closer to our property. This MAJOR construction project can only do harm to our existing watershed. Numerous neighbors will support your efforts, so please keep us in mind. Nothing good can come of this for the wetlands area in GV. Please keep me posted: . Thanks.

Beauty, part of my identity, interest, naturalize the urban landscape

Bodies of water are vibrant eco systems that support wildlife and promote safe clean living. Water resources make me aware of how precious and fragile our eco systems are in supporting our lifestyles that rely on constant access to water supplies and sewer/waste disposal providing healthy living.

Clean water resources make my community a much more desirable place to live because of their natural beauty, the wildlife they attract, and recreational opportunities.

critical

Drinking water, Wildlife, outdoor recreation, home value improvement, quality of life.

Effects our quality of life.

Environmentally and economically important for both our and future generations.

From when I rise in the AM to when I go to sleep it is a part of my life. The watershed plays a huge part in my mental and physical well being. The sites, sounds, and wildlife help to form my life.

Having the ability to go out back door and enjoy such a wonderful natural resource is a wonderful privilege. We have definitely noticed a difference in the lake since moving here 16 years ago. Low lake levels and increasing weeds are the two biggest concerns.

I live next to one of Golden Valley's ponds, and it provides a natural area adjacent to my home.

I live on Medicine lake and am impacted daily by use and the views. I want the lake to be usable for many years for the next generations

I live on the creek. I love the wildlife, the moving water and the feel of being in a park preserve while being 15 minutes from downtown.

I love to be in nature. Woods, water, and wildlife are essential to my wellbeing. I don't belong to a gym (and I don't enjoy that environment). I prefer to walk on wooded trails and kayak on lakes, streams, and rivers.

I swim every morning before work in Medicine Lake. I canoe or kayak on the lake. I love to canoe down Bassett Creek.

impacts our decisions on recreation

In all seasons the lake dominates our view, and activities. If the levels are low, that impacts. If the level is high it impacts. Ice allows a whole different set of activities.

it allows education to youth, quality of life and relaxing to take away stress of daily life.

It brings neighbors together. In Medicine Lake we have a strong sense of community that would not exist without the lake.

Narrative responses - HOW water resources impact life in your community

It's sad to see all the algae and to talk with my kids about how the poor choices are negatively impacting the local wildlife

lakefront beauty recreational opportunities

Living near a watershed is extremely important to me. Living in MN means almost certainly being near a body of water of some kind, so living near a well managed watershed is extremely gratifying. Being a responsible steward of the environment is a value I have, and to be rewarded by living in a neighborhood dense with wildlife is an immediate reward and inspiration to continue to have those values.

Look at it all day and every day. I started the aeration by neighbors in 1973 and still do it with 10 air compressors around the lake shore.

Maintenance of a good water level in Medicine Lake is most important to me. I do not want to see our lake start to dry out like other lakes in the Metro area. Greater study of the impact of the silt ponds and the height of the dam needs to be accomplished. Furthermore, the boat launch at French regional park needs to be improved - it is almost too shallow to use during the later summer months.

Markedly improve the quality of my life in physical fitness and happiness. We moved to MN to enjoy these resources.

Medicine Lake is integral to the city I live in (Medicine Lake) and the surrounding areas, it is one of the things that ties our community together, it is critical for recreation, relaxation, bonding with family and friends, and the trails around the lake are great for biking, walking and running. The lake is the main reason we live here.

Medicine Lake unites residents of the surrounding communities for recreation and a healthy lifestyle. It is a refuge for an enormous amount of wildlife, both year round and migratory.

My children and their friends played in Bassett Creek all summer long. Our neighborhood has group picnics on the banks, the creek plays a major role as a beautiful gathering place for all. Both Rice Lake and Bassett Creek are hubs for wildlife that enrich our lives. We have huge snapping turtles, crayfish, and otters, deer and fox come to drink and great birds such as woodpeckers, owls and eagles abound. The local wildlife in and around the creek & lakes taught my children not only the names of the birds and animals but also to love and respect nature.

My family and friends love boating, water skiing, and just playing in the water. These activities greatly contribute to our quality of life.

natural amenity

oasis from the daily drive, rush and tasks. oasis from development, from concrete, from road vehicles, from people in a nervous, dangerous hurry.

Open space

Our family enjoys spending time in the water or near the water. I don't want to live in a place where there are not outdoor spots like lakes, streams, and wetlands because I enjoy accessing this places regularly.

Our recreation centers around the lake. We ice skate and cross country ski on it in the winter. In the summer we boat on it and use the bike trails to travel around it. It is enjoyable in all seasons and for many reasons.

people swim in Wirth Lake and fish pretty much wherever they can. we walk along the creek and lake

Property value!!!!!!

Property values and quality of life

Provide respite from urbanization, important for the wildlife and fish, silent sports

Recreation, relaxation, sense of peace when viewing

Sailing and motorboating are important hobbies for our family. And closer to home, lakes, streams and trails are central to our enjoyment of the outdoors, especially the amenities around Wirth Lake.

The bodies of water make my community unique in beauty and restorative qualities for a happy life, thus I am more productive and useful to the community.

The City of Medicine Lake exists as a lake community. Nearly every resident lives on the lake and uses the lake in both summer and winter. The lake is a major reason most residents moved to this city.

The recreational use of Medicine lake greatly enhances my family life but allowing us great opportunities to spend time as a family and with friends. It also gives us the opportunity to teach our children water safety and respect for the environment.

The secretary for Bassett Creek is proposing to get or already is getting \$50,000.00 for this work and I think that while green jobs are a good thing this is excessive financial gain without true return. I look at the trees that were cut down around Theo Wirth as an example of this unchecked activity that has its costs and is unaccounted for in your reports and "visioning processes".

The streams and lakes add value to my life as a nearby retreat or piece of beauty

The wildlife that I have seen along Bassett creek. The wild plants along the creek and pond. Taking my grandkids for nature walks. They have seen big turtles in the creek and egrets nesting near by. The quiet beauty.

Narrative responses - HOW water resources impact life in your community

They are a HUGE reason we live here. Mental, physical, and spiritual health are all easier to maintain when we're kayaking, swimming, or walking/hiking/running along a body of water. And the wetlands provide habitat for wildlife that we also really appreciate.

They provide beautiful views, appealing walks, and cover for local wildlife.

This clean water resource keeps some wildlife close to us even in the inner city making waking along the creek relaxing, interesting and even educational.

Usable Water resources are the reason we were drawn to the community.

Water features are beautiful and make people happy!

Water is my backyard....we do not go away on vacations....this IS our vacation.

Water quality, invasive plant species, or excessively low water level can make it difficult to get out on to the lake from shore. Excessively high water level can damage our lakeshore, especially when combined with the wave action from boats.

Way to enjoy being outdoors; exercising.

We bought our home on the basis of it being near the Medicine Lake and love "lake life"

We live on Bassett Creek Drive and having the creek enriches our lives everyday.

We live on Bassett Creek and enjoy the wildlife it brings. Periodically the creek floods and we are concerned about the water quality.

We live on Med Lake and love all the opportunities it provides.

we live on the lake so the water resources impact us daily

We moved here in 1968. I rent out boats plus provide space for people to keep their own boats at the lake through a conditional use permit with the City of Plymouth.

We purchased our home with Bassett Creek running through our back yard specifically because of tranquility it offered us. My husband has had many surgeries over the last 3 years. With our home bordering on the park wetlands and having the creek view has been very therapeutic for his slow and difficult recovery,

We use them almost daily, esp. in the Spring and Summer.

(blank)

Everything is about the water

Water clarity and quality

It encourages people to be more active and spend time near the water. It creates nice places to run or walk. Having nature makes a place seem better.

They provide breaks in the patterned residential areas, calming traffic. They help control flooding. They support wildlife. They protect from loss, and give purpose to, walking/biking trails.

having recreational water near by our home is important.

wildlife habitat redwing blackbirds, frogs, turtles, swifts, herons major flood control

We pay high taxes to live on the lake. It provides 365 days a year of joy of some kind whether it be using the lake, looking at the lake, watching the wildlife in and around the lake. It makes paying high taxes worth it. We're financially invested! Watching the lake level drop every summer certainly puts stress on the lakeshore owners who only get 4 solid months per year to enjoy using their boats and lake toys of all kinds.

We have lived on Medicine Lake for over 20 years. The lake is a Major asset to our family, the City of Plymouth and the nearby communities. The water level has struggled to maintain an adequate level the past few years which has caused the lake to be much less usable for the tax payers that take advantage of it.

I believe there are only two in New Hope and I do not live within walking distance of either.

since I live on Medicine Lake, my family, friends, children, neighbors, all use the lake daily year around. It is a resource we use year around.

Personally, they are very important, as we live on the lake. And as a community they are even more important. We have wonderful public access to Medicine Lake and I think it's important that it stays this way. However, I often see boaters who aren't familiar with our shallow lake speed through our bay (which can fall to 2-3 ft depth) and either hit their props at full speed, or be surprised when they wipe out skiing and realize they are in hip-deep water.

Quality of life; utilize the lake 100%; water level is an issue and need to raise level of the dam

They provide an important environmental service, as well as aesthetics and recreation to enjoy.

To play in for me, my family and my golden retrievers

I have lived or have friends who live on various points of the Bassett Creek Watershed -- Westwood Lake, Plymouth, Bryn Mawr. The access to the natural beauty, flora and fauna was a major reason in choosing to live where I do -- I walk by the Creek or lake daily.

I live on Medicine Lake and am fortunate to see the lake every day, in every season. We must take very good care of our resources; they are greatly impacted by our actions.

Narrative responses - HOW water resources impact life in your community

The aesthetic and environmental qualities of waters profoundly affect property owners' quality of life. Clean water provides wildlife, recreation opportunities and an environment generally that improves property values and makes living in a particular community more fun.

Green living things are healthy to humans. Studies have shown benefits include healing cancer, healing mental health. Suicide prevention. Okay ... strange studies I have read, but they are just healthy to our well-being. (partly why businesses rent plants.)

property taxes are higher on a lake, that helps everyone but the value is not there. Now to answer your question it the best thing God and Man has done your the betterment of person health,life, for all ages.

The resources provide entertainment, relaxation, and pure enjoyment of our surroundings

Northwood Lake in New Hope is a hidden gem. When I moved here 41 years ago, every house on the lake owned and used a canoe. But in the years since, thanks to community growth to the west of us, it has become dirty, silted, weedy and smelly and shallow. I still love to sit and enjoy the solitude and privacy it affords. I watch blue herons, egrets, Canadian geese, all kinds of other waterfowl, muskrats, turtles, American bald eagles, and birds too numerous to mention. This lake had added value to my neighborhood and I would love to see it improved to its former condition.

Life style

For gathering and creating a family atmosphere around the lake.

The lake, trails and water-adjacent parks provide a sense of community and also lead to healthier lifestyles.

Attraction to liveing near water has been characteristic of my family for many years. Water is a visibly active part of the environment which I find attractive. As well as an integral part of natural cycles.

We are on or by the water every day. We would never have moved here if it weren't for the lakes and adjacent trails and amenities.

They help to keep the civil in civilization. The water is there for all people, animals and plants to enjoy and use. I find the water to be a calming influence. It is, however, disturbing to see the water covered with a green algae film.

Provide areas for wildlife, increase aesthetics, recreation

It's a critical natural resource, not only for us (humans) to enjoy, but that wildlife depends on too. We need to do a better job protecting it.

We use the local lakes such as Medicine lake as backgroud scenery for our walks

I do a lot of kayaking in the local lakes and streams- including Bassett Creek. I also do a lot of swimming in the lakes. And, I really like to swim in and kayak on clean, clear,non-polluted and natural water with a good natural habitat of native plants, fish, and other stream and lake denizens.

habitat for wildlife, recreation, beauty

5a. Why do you believe the water resources currently have this quality? - Open-Ended Response

Narrative Response - WHY this water quality

accumulated run off from yards as the creek flows into and through the lake. invasive species are a growing factor.
low water levels
Attention is paid to water quality. More restoration is required for wildlife, water quality.
Bassett Creek (and Bassett Creek Park) has not been maintained. Renovation is needed.
Bassett creek is clear but some lakes on route are impaired. Eloise Butler has been 'de-watered' by 394 construction.
Bassett creek seems to be neglected when compared with other creeks like minnehaha.
BCWC does not have a good handle on pollution and water level control on Medicine Lake at all.
Boaters bring in invasive species from other lakes. Medicine Lake is also optimized for boating, not fish and wildlife.
Check our property taxes.
Clarity of water and stability of water levels would be top two concerns.
Commercial and housing construction has been allowed to continue without proper consideration for wetlands. Developers have been allowed to skirt laws by trading wetlands leading to concentrations of building without proper drainage. Antiquated highway drainage continues to flow directly into our waterways.
Community members try to care for the water resources. A few years ago a group was formed to monitor Rice Lakes and we put out news letters and raised money to have Alum (sp?) treatments to reduce algae. The city of Golden Valley newsletter also has helpful hints to help keep our water safe & healthy.
Control of lawn fertilizers with phosphorus, shore-landscaping with more native lake plants, neighbors not dumping caustic materials in storm drains, better watershed management
Curly pond weed
Development has greatly degraded water over the years
don't know what the water quality is.
Effort and attention on the part of the community
Friends of Bassett Creek have had a significant influence in obtaining resources and volunteers to keep the creek alive and well.
From 1950 to today, the water quality has improved for numerous reasons, however the largest was due to the discontinued usage of sewer systems and septic systems drainage into the lake. Improvement in out/in board motors. Community awareness. Retention ponds etc.
Government agencies have NOT coordinated between themselves to control Medicine Lake water quality.
Heavily used and inundated by runoff from roads that have been heavily salted in winter and yards that are over fertilized in summer. Additionally a lack of commitment and leadership from most politicians to ask for money to maintain quality resources.
Human Impact, and mainly our collective ignorance on the environment and how our behaviors drive this.
I assume it is lack of resources to care for the creek and ponds.
I believe that water quality is the result of a complex mix of nature (climate cycles, plant and animal fluctuations) and human interaction (treatment programs, water level mgmt, runoff filtration, recreational use, etc.), and it's all continuously evolving.
I did not select an option- (please a "do not know" to the survey, or change the question to be "what do you perceive the water quality to be?" I am not sure of the quality of Bassett Creek and the lake, so I left it blank.
I have a concern about the spread of invasive weeds in Medicine Lake. It is to the point that we worry about our grand children accidentally falling in the lake off our dock and getting so tangled in the weeds that they drown.
I have been swimming in the lake since 1965, and never had a swimmer's skin problems of any kind.
I have seen a lot of cutting down of beautiful pine trees that were not destroyed by the tornado. While this had some indirect results, the clearing will have more ongoing effects. There is a cement flow control device that would be interesting to review the dynamics of in relation to rainfall.
I smell after swimming in the lakes.
I think people are paying more attention. Concern about property values.
I think the planners did a fair job in providing places for runoff to accumulate from the roads and buildings. The artificial ponds keep salt, grime, and silt out of the natural streams and lakes where I live. I do think people in general respect the bodies of water as they use or visit them. I also believe there are groups who care enough to spend time and treasure to preserve them.
in the summer we see the lake daily and "use" the lake many times each week

Narrative Response - WHY this water quality

It seems to me there has been a lot of progress. But I'd like people to be confident eating fish caught in urban lakes, & would really like to see Basset Creek opened up. Farther out of town, Lake Minnetonka is under fire from pollution and invasive species.

Lakeshore and stream-side residents have been especially resistant to naturalizing shore line. We have done this for half of our shoreline. The difference between the side that we naturalized and that which we didn't is remarkable. The shore and lake directly adjacent to it are much firmer and stable. The un-naturalized portion continues to erode and the shore line is still mucky. Having clear criteria for naturalizing the remaining shore would be very helpful. We had the other portion naturalized through a Plymouth program 6+ years ago.

Low lake levels and weed growth

Low water levels due to dam that feeds basset creek. Mil foil and algae growth have drastically increased in the last few years.

Low water levels I believe is due to the Basset Creek dam having been lowered years ago.

Low water levels, weedy, murky water

Measures taken to prevent or address pollution sources.

Medicine Lake is what it is, as the Indians refereed to the lake as Lake of Medicine

Medicine Lake level is low!! Difficult for me to access the lake without a 200ft dock!!!!

Medicine Lake water quality is improving. Winter activities and runoff are the biggest problem I see holding back the lake. Salt runoff going into the lake and Basset creek is likely a major issue. Storm sewer exits to the lake have salt water influxes onto the lake throughout winter.

more cam be - and should have been done to protect Medicine Lake

Most of our waters have fair to poor water quality but are improving

N/A

Not always the best looking. If we develop right up to the edge some landscaping is going to be in order. Some tree trimming to make them last longer. Some brush clearing maximizing for wildlife habitat.

Not sure if I've ever seen fish in the part of the creek I live near. Should there be more birds and other critters along the creek? Parts of the creek are contained in walls. But I think the Glenwood spring probably supplies some nice clean water and keeps the creek from getting too bad. Wirth Lake - have you seen the goose poop on the boardwalk?? That can't be good for swimming.

Observation of water areas, and knowledge of local efforts to keep the water clean etc.

pollution and runoff, inability to keep the level high as the dam lets so much water out after rains.

Pollution.

Pollution/runoff causes bacteria in our lakes/streams

pollution

Proper management. Rice Lake, however, has been greatly affected by the phosphorous run off and natural high levels in the soil.

Reasonable clarity and (most of the time) modest traffic

recent work around Medicine Lake to create basins to catch ruboff and polutants

road run off and no erosion control

Run off

Run off from yards, highways, etc

Runoff, Lack of Shoreline Buffers and other strategies to filter the water prior to entering the waterbodies. Overall Development

Runoff

Runoff continues to be an issue. Invasive species are a constant threat. As a completely developed lake in a city, it is ultimately going to suffer, but it could be cleaner and clearer.

Runoff from streets and property

Runoff from streets and yards affects water. Trash accumulates, especially in public areas. Some residents maintain grass at the creek's edge instead of providing a margin of water filtering vegetation.

Run-off.

Sometimes they are green and don't look so nice

still recovering from years of abuse. Poor bottom quality. Heavy phosphorus levels

Studies have been done in the lake and have been successful....but due to funding and grant monies we end up with more vegetation and more issues.....like zebra mussels issue

Sweeny, Wirth, Bassett Creek and Medicine lake are all impaired. Sweene is list on the DNR lakefinder as Non-Supported for recreational (swimming) use

the dead fish we see, the amount of algae

Narrative Response - WHY this water quality

the holding pond area that feeds sweeney lake (schaper park) is full of debris and garbage, generally all spring/summer/fall. the filtering cattails that die are never harvested. on the other side of that creek entry to sweeney lake (north of the rr tracks) debris enters and washes up on shorelines. that area really should be dredged.

The holding ponds have been great but like with anything they take years to make changes. However I have seen several, Cleaner water and not fast water level changes after a rains storm.

The life cycle of Medicine Lake and the Bassett Creek dam water level management that reduces the water level on Medicine Lake and stops water movement on Bassett Creek from August through the spring. Bassett Creek typically only has water movement for 4 months of the year from April through July.

The weeds and water clarity issues need more effort.

They are not horribly polluted, and there are many areas near our home where we can go swimming, hiking, and so forth. However, many of the ponds and lakes near my home do not have many native plant species and are clogged with cattails. I have purchased the "Lake Phalen Shoreland Restoration: Walking Tour and Plant Guide, 2nd Edition" by Haley Elvecrog and Bill Bartodziej, 2008. (Ramsey-Washington Metro District; www.rwmwd.org). I wish that more ponds and lakes in our area could have shorelines and prairies restored with native plant life. This would be good for the water quality and for the native animal species (butterflies, birds, etc.) that depend on native plants.

They have been monitored in recent years and improved in some ways but we are still concerned about some weed growth and the need to keep out zebra mussels and milfoil.

They seem fairly clean for being in the city, but can always be improved upon. Also, too many people litter, which really ruins them.

They're fair up from very poor because of the work of AMLAC and the City of Plymouth but there is a long way to go. Prevention of AIS, especially zebra mussels and worse, is of the highest priority. The sand bars that have resulted from runoff from 169 should be dredged out. The water level seems to have dropped and so the height of the dam on Bassett Creek must be raised.

This summer while walking along Bassett Creek, I have seen fish, frogs, turtles, clams, and snails in abundance. Animals like this are sensitive to poor water quality (low oxygen, pollution) and could only flourish in a healthy creek.

Too many non residence launching boats with little care for spreading invasive species

Too many water born plants.

too many weeds sediment/muck in bay areas making them too shallow water level drops too low - need to reinvent the dam on Medicine Lake to keep water in the lake

Too many WEEDS and low water levels

Too much algae growth in summer.

Too much fertilizer use, run-off directly into streams, wetland areas surrounding bodies of water have been drained

...

Too much run off from development in Plymouth.

Too much runoff over the years. Everybody needs the perfect lawn.

Total guess. I'd like more info on what the quality is.... That is, should I be swimming in Wirth Lake?

Toxic runoff from pollutants as rain water falls and runs into the creek, bringing pollutants with it.

Trash in the creek

unfiltered run-off, excess fertility, hardscapes, not spring or groundwater fed

Up until about the last 5-10 yrs, there has been little concern about stormwater runoff.

usable and enjoyable, safe to be in and around

water management activities (e.g. control of point and non-point contaminant sources and reconstruction of key areas along the water bodies)

Water skiing disrupting shoreline, birds, turtles.... All of the wildlife!!!!

We are very concerned about the potential impact of basett creek as the met council wants to put light rail through the near by wet lands. Of course we dont want the lrt in the nature area since it affects the frequency of the life

We do not (yet) have zebra mussels and the water clarity has been improving.

We estimate that at least 1/4 of Medicine Lake is now useless to recreationists because of massive weed issues or low levels.

We have been trying to educate about the importance of clean water in our lakes

We live in a big city with lots of pollutants.

Narrative Response - WHY this water quality

We love the lake, but there is critical work that needs to be done. The water level in Medicine Lake is too low, especially late in the summer and early Fall, and it seems like this is true every year since the new dam was built at the outlet to Bassett Creek. Something is faulty with the design of the dam and it lets out water too quickly and to too low a level. Perhaps a "V" shape in the dam would be better so as the lake level decreases the flow is reduced to let water levels decline gradually after rains. The low level makes boating more dangerous and makes it very difficult to take my boat out at the end of the season as sometimes the water level is so low it is almost impossible to reach the ramps. The second big issue is aquatic invasive species. When they are treated it is great, but the treatment seems inconsistent from year to year. It would also be nice to see the water quality and clarity improve, and sediment be removed from the lake. I really appreciate all the efforts to improve the lake through the building of detention ponds.

We use Medicine Lake primarily. We thoroughly enjoy it but it could be improved by raising/maintaining the water level and better addressing weed infestations.

Weeds and danger of invasive species

Weeds and lack of consistent funding for treatment plus very low water levels in the summer.

Weeds and low water levels

Weeds in the lake(Medicine), are becoming a significant problem/concern.

(blank)

Too many weeds

Fertilizer run off.

Poor clarity and milfoil so thick it mills yje jet skis

The quality is definitely better than some places, but it could still be improved.

The various waters in Basset Creek Park are full of garbage and just generally dirty and gross. The goose feces all over the park does not help.

In the Spring and early Summer, I would choose 'Excellent.' But by early Summer, algae has taken over many bodies of water, lowering their quality and their scenic value.

Run-off and poor water filtration and water-edge planting design.

Medicine Lake is amazing. The lake is under huge pressure though. The lake levels are consistently lower the past few years, the lake needs to be dredged in key areas that are filling in with silt, and the weeds are getting worse every year.

Occasionally you hear of a beach being closed due health issues.

need more buffering capacity and settlement ponding

Medicine Lake is getting cleaner year by year as retention ponds start to work and communities are educated on lawn care and proper disposal of toxic and harmful items. However there are the concerns of invasive species that could seriously impact lake quality on multiple levels.

we have used them for storm water ponds for 60+ years, so all of the pollutant from streets and lawns have gone into the water bodies untreated. Before development agricultural chemicals went into those same waterbodies.

Pollution from run-off, lake is very weedy, water quality is good in spring but progressively gets worse. Something needs to be done about the weeds and low lake level in nearly anytime except spring.

In regards to Medicine Lake the water clarity has improved over the years much to the credit of the holding ponds that have been constructed in the area.

Medicine lake gets very weedy and green by late summer due to phosphorous run-off and low water level.

• shallow depth • invasive weeds • citizen and public run-off (sediment, fertilizers, etc) • low water level creates stagnant water for last couple months of the summer

Good today due to the water level in Medicine Lake; need to raise height of the dam to maintain

I believe that Minneapolis and its watersheds are making several great efforts to maintain water quality and clean and keep them from pollution, but I do think that a: efforts have been inequitably dispersed (Calhoun vs. Bassett vs. Powderhorn), b: there are a lot of stormwater runoff problems, and c: cities are willing to make certain sacrifices regarding pollutants in the name of industry, or if not cities, the agricultural communities surrounding them.

Clean, but if less weeds it would be excellent.

We live on the creek. When we first moved in: fish splashed upstream in spring; dogs could play w/out stinking; water did not get yellow foam; no muck to disturb when you waded in. I think the quality is poor but have been told it is better then it was?????

Weedy/algae chemical buildup

Not enough education to all of us about the watershed and our ability to influence the water quality. I only knew about the watershed by googling Bassett Creek.

A lot of money is being spent for some large bodies of water like Medicine Lake but lakes like Northwood Lake in New Hope gets very little attention.

Narrative Response - WHY this water quality

too much fertilizer flowing into lakes, poor maintenance of Bassett Creek's banks between Fruen Mill and where it has been taken underground.

Ongoing education of lakeshore owners has improved water quality by limiting fertilizers and septic systems. More must be done to delay invasive species.

Minnesota has a strong conservation ethic that has been supported by local government (through regulation and water-improvement work) and citizens' efforts to ensure protection of water resources. That said, water quality could be better.

Murky water, algae growth, 'stinky' at times

no throughflow

City of New Hope is not wheeling to set-up and clean up the lakes, they wait for an commutiy to do something and than attach their problems to the total watershed issues.

Because they have been protected and monitored

Lack of funding, infrequent effort

Lack of oversight by community leaders, etc.as communities developed nearby, sending runoff containing salt, trash, sand etc. into our lake.

Clear, non smell

Lots of runoff in Medicine Lake plus lack of weed control creates a dirty and congested lake.

Through lots if hard work, lobbying and collaboration to make improvements.

Proximity to large population that acts in ways deletrious to waters.

Because of the efforts of the DNR, Lake associations and cities to improve and maintain water standards through education, water and runoff management.

cloudy, silt, weedy, dead fish

Too much sediment from storm sewers; too many chemicals from human actions.

Generally feel there is a commitment to maintaining water quality in this area.

Water clarity is poor, and I am VERY concerned about the invasive species threats, and increasing milfoil. I'm very worried it will destroy Medicine Lake. I'm also VERY worried about the low water levels the past several years. It's not natural (water is being taken from the lake) and it's hurting the ecosystem.

They seem poor and also Medicine lake in particular seems to dry up late in summer and becomes asethically unpleasing[unsightly and less than pleasing aromas] seems like the water disappears in the late summer the swimming beaches look suspect although I don't swim.

I think we could do more to create and maintain a more natural habitat for native plants, fish and other creatures.

runoff from the inlet into Gleason Lake - the inlet stream flows through back yards which are heavily fertilized in Plymouth

5b. Are there one or two water bodies that stand out as having very good or very poor water quality? If so, which ones? - Open-Ended Response

Narrative responses - 1 or 2 water bodies that stand out

Again, I don't know.

Basset Creek see 5a

basset creek as low water quality.

Basset Creek is treated much like a natural storm sewer. Spring time and during rain events it is full and fall and dry times it is dry. Unfortunately it fills up with trash and is not a priority for cleanup. Canoeing down the creek can be very enjoyable, but the amount of trash in the creek is discouraging

Basset Creek very poor

Bassett Creek has very poor water quality in the Theodore Wirth Park area. Extremely reactive body of water . . .

Bassett Creek I think still has relatively poor water quality near where I live. I would very much like to see it improve!

Bassett Creek runs through Golden Valley and is poorly protected

Bassett Creek, Wirth Lake (the water is extremely clean, and cleanest in the chain of lakes)

Bassett Creek: Poor; Medicine Lake: Poor; Lake Minnetonka: Poor to good depending on location.

Bassetts Creek seems like there's trash in it.

Cedar Lake -- Good

Cedar Lake is pretty clean, and we usually have no problems swimming there. On the other hand, Bassett's Creek seems quite polluted, and some of the surrounding lowland areas (e.g. in Wirth Park) are just full of trash. Lake of the Isles seems pretty scummy a lot of the time as well.

Christmas Lake good

Hidden Lake is very good. Sweeney is poor.

hidden valley pond, medicine lake

I am extremely concerned about the condition of Medicine Lake. It has been a recreational lake for my family going back generations, but the weed condition is getting so bad I can see a future where we do not use it except for boating and winter activities. No water skiing or tubing with the children and grandchildren because of the poor water clarity and over abundance of nasty weeds.

I am only intimately familiar with Medicine Lake and Basset Creek. Both these waterways have been used as unlimited storm run off depositories allowing silt to build up. The water levels of both bodies of water are under constant pressure and need to be managed more efficiently. The Basset Creek Dam should be augmented with an adjustable spillway to allow for the retention of water during the rainy season and allow for Basset Creek to be metered out so the waterway does not dry up.

I am really only familiar with the water quality of Medicine Lake. Since it is the largest lake in the watershed with by far the most recreational use it seems that it should be a very high priority.

I cannot rate any.

I only use Medicine Lake

Lake Minnetonka has pockets of horrible algae blooms and now, invasive species.

Lake Minnetonka is choked in some areas with invasive species. Medicine Lake is threatened

Lake Minnetonka=very good Lake Magda = poor

Medicine is getting worse, water disappearing faster than it is being replenished. Is it the next White Bear lake?

Medicine Lake and surrounding wetlands, bassett creek in and out of the lake.

Medicine Lake can be very good to very poor with respect to levels in the summer and weed growth.

Medicine Lake- fair Basset Creek- Good

Medicine Lake has "Fair" water quality when there is water movement through Bassett Creek which is April through July.. Bassett Creek has "Very poor" water quality by having no water movement from August until April most years.

Medicine Lake has at best fair water quality.

Medicine lake has definitely lost the clarity of the water that we had when we moved here 40 years ago. We have interesting photos of our children swimming in the 60's and 70's, big difference!

Medicine Lake is poor.

Medicine Lake is the 2nd largest lake in Hennepin County, however, all attention and monies for R&D are spent on Minnetonka

Medicine Lake is where we live and the basis for these comments.

Narrative responses - 1 or 2 water bodies that stand out

Medicine lake should be looked at alot closer. The spraying of invasives has killed almost all native species of weeds and does not control millfoil at all. You are failing at helping the residents that live around the lake. You won't even look at the water level problems and/or haven't even noticed the problems in this body of water that have been going on over the last 10 years.

Medicine Lake. Water level fluctuation

Mid-summer, the water level is to low...!

my focus is Medicine lake as a lifetime resident

NA

NO

No, I have not seen any that hit the extremes on either side, though I do have some concern that the loss of artificial reservoirs to catch run off will allow pollutants and salts from our roadways get into the larger bodies and ruin them. These artificial reservoirs seem to be filling in with plant material and sand/silt. I do not believe they can accomodate surging storm water of the spring thaw runoff as they once could. I also believe that newer homes built in the lower areas will be xposed to flooding as a secondary result of the loss of resevior capacity.

None good by the standards I was used to in Michigan. Medicine Lake is particularly disappointing for such a large body of water used by so many people

Northwood Lake in New Hope has very poor water quality

Not in the Bassett Creek Watershed. But Lake Charolotte, near Hanover, stands out has having very clear water.

Not one in particular stands out. We spend most of our time on Medicine Lake and sometime on Minnetonka

Of course medicine lake!

Poor- Medicine Lake

Poor Wirth Lake Poor Basset Creek near Wirth Golf Course Medicine Lake Good Exept invasive plants really only familiar with the water quality of Medicine Lake which is where we live.

Rice Lake in the Mary Hill park is getting worse.

Sweeney would be better is it did not have to treat so much storm water

The creek back waters north of Hwy 55 get stagnant and fill with algae.

the nature area on Bassett creek Drive near Dresden. It is so clogged with plant life and dirty.

The pond at Bassett Creek Park in Crystal collects a lot of trash.

The twin to Sweeney

Theodore Wirth is disgusting, so is Lake Calhoun.

Wirth Lake looks pretty clean, but I wouldn't say 'very good' just ok. Bassett Creek I haven't used, but would like to know that it is safe to swim or tube on. Would be a fun adventure.

(blank)

Medicine lake is very bad

Very poor-Medicine Lake

None of them are good. We'll see how things look after the work on the creek is completed.

I haven't spent time on lakes outside of Medicine Lake to be able to comment.

White bear lake has very good water quality. Medicine Lake, the lake I live on, has very poor water quality.

Medicine lake is probably on the poor side, as Parker lake is a little better.

Christmas Lake Not sure of others in our area

Medicine Lake is extremely poor when the water levels are down; need to increase height of the dam to maintain water level

Basset pond and Basset creek from Duluth St. to Hwy 100 are all I know.

Wirth Lake gets weed filled (milfoil and algae) as the summer progresses; it is very heavily used by residents in this region of Minneapolis.

Basset is near me, so I'm most familiar with it, and it seems to be holding steady, though is sometimes full of visible pollution (trash, grass clippings, etc.) after big rains. Wirth Lake is pretty good

Medicine lake? Not sure

Norhtwood Lake

Medicine Lake seems to have good water qualities with the exception of the weeds

Northwood Lake, very poor

Twin Lake in Golden Valley is quite clean I understand. I dont feel qualified to jusdge hence next 2 questions skipped.

Medicine, Sweeney

Right now with all the rain, Northwood lake looks good- but I know the water testing rates it very poor.

Not sure if it is an issue of water quality, but Medicine Lake often smells badly in high heat.

Medicine Lake, see above comment.

Narrative responses - 1 or 2 water bodies that stand out

Medicine is the most noticeable

I like swimming in Twin Lake because it is so clean. I like kayaking on Bassett Creek but I do not think it is in very good natural condition for native habitat.

poor - Gleason Lake, especially north pond

Grand Total

**6. What concerns you about the condition of the lakes, streams, ponds and wetlands in your community?
(Choose all that apply) - Other (please specify)**

Narrative responses - concerns about conditions

Abundance or diversity of shoreline plants.

AIS is very worrisome, esp. Zebra mussels closing in .

Because of the Dam level, there are a number of times when using a boat is impractical or impossible

Clarity of water and stability of water levels are a priority. The effective use of retention ponds has reduced the water levels from spiking. Prior to retention ponds, the lake spiked two inches for every inch of rain. Currently, the spike is one inch for every inch of rain.

Development plans related to the Bottineau Transitway are my greatest concern.

heavy runoff - sediments, salt, fertilizer, etc

Hopefully they can handle rain run off and hold their levels.

I am very concerned about Asian Carp and their potential impact on water skiing and tubing.

I am very concerned with the LRT impacts to Bassett Creek

I note that you do not list stability of water levels in number 7 below - I think that would get the most hits.

I think it is being handled with the gradual improvements as funds are available to BCWMC

I would like to see the dam level raised about 2 inches.

invasive Buckthorn growth

Lake level is to low Mid-Summer, late Fall

Lake Level on Medicine Lake is about 6" to 12" below where it should be.

loss of some good planning and spending when these parks and reources were constructed = waste

low water level of medicine lake durning late summer months!

my primary desire is to see the wildlife and green areas flourish.

Preventing the water level on Medicine Lake from declining to too low a level

runoff mitigation

The forestation around the water.

water lever too low at time to even get our boat in or keep it at our dock.

Zebra Mussel infestation should be a priority. The DNR has come late to the game and more stringent measures should be adopted to stop the spread of this invasive species.

(blank)

when too many weeds are present- the lake is too dangerous to swim. low water levels in summer inhibit boats from safe boating.

Medicine Lake water level is a concern that can be addressed easier than many of the issues, which require ongoing and widespread effort.

Water levels; need to raise the dam

The old Glenwood plant is an eyesore at the most beautiful point of Bassett Creek, next to the little falls/rapids. The stream bank has eroded here. Why can't this abandoned property be converted to some extraordinary use on this idyllic site?

Inability to swim in the lake due to weeds.

Bassett creek is a wonderful resource that is completely under-used as it goes through MPLS

Odor of the water

Geese Droppings

Weeds are increasing in severity, and water levels are so low that we often can't even use the lake in late summer!

I have heard that the water levels impact boat usage but dont know if this is true

Please do all you can to reduce runoff into the streams and lakes. This will help control flooding and help to keep the water bodies clean.

9. If you had a question or concern about the water bodies in your community, who would you contact? - Open-Ended Response

Narrative responses - who would you contact

?
??
AMLAC
amlac officials, city officials
AMLAC or Basset Creek Watershed committee
AMLAC or DNR
amlac or the City Council
amlac or the parks director
AMLAC representative
Basset Creek Watershed
BCWMC
BCWMC website first
Bruce Larson
City
City Council
City Council member, public works department, BCWMC rep
City Hall or internet
city of crystal
City of Golden Valley
city of Golden Valley or associated watershed group
City of Golden Valley Public Works Dept.
city of medicien lake and AMLAC
City of Medicine Lake or AMLAC
City of Plymouth
city of plymouth, BCWMC, hennipen county
City official
city staff
City staff like Jeff Oliver and Jeannine Clancy
contact our mayor to find out who to call
Current Dam Structure Lowers Lake Level
Derek Asche - City of Plymouth
Derek Ashe
DNR
don't know
Don't know. That is the problem!
Gary holster
GV city council.
Hennepin County Board member
Hennipen Co or DNR
I do not know.. one thing to contact another is to get results
I don't know.
I would search on line "water quality, Bassett Creek" and go from there.
I'm not sure--probably the watershed district or I would search the Plymouth Gov website.
I'm on the AMLAC board,soI'd bring up my concerns to them.
Linda Loomis
LMCD, the City?
Local officials and BCWMC
Mayor
Mayor of New Hope
medicine lake assn
Medicine Lake City Council
Medicine Lake City Council and AMLAC
medicine Lake mayor
Medicine Lake's BCWMC rep

Narrative responses - who would you contact

minneapolis park board
Minneapolis Parks and Recreation
Minneapolis Water Resources
Mpls park board
My Neighbor, who is on the BC watershed committee
My neighborhood association
my public works director and Bassett Creek WMD representatives
neighborhood association
Not really sure. Google.com I suppose.
Not sure
Our Bassett Creek representative (Ted Hoshal)
Our BCWMC rep, Hoshal
Our Major
Our Mayor or Amlac representative
our mayor, city concil members or basset creek rep.
Public Works
Someone on the city council
Start with AMLAC or Ted Hoshal
Ted Hoschal - Basset Creek Watershed Commisioner
Ted Hoschel
Ted Hoshal
Ted Hoshal-
The City or the watershed.
The conditions at Bassett Creek Park have been discussed recently, and we weren't sure who to contact.
The local municipality (who BTW are ignorant of which watershed their constituents belong to...)
The Mayor of Medicine Lake or one of the fine City Council members..!
the town of Plymouth
watershed district
Why bother BCWC does not care about the low lake level - so start to care
(blank)
ted hosel
city of medicine lake
you or Lake Minnetonka watershed
I would look on the city website and find someone in charge of natural resources
I'd have to know more about the specific problem to answer.
City Engineer
park or street department
member of bassett Cr watershed commission
Gary Hoelter
Local government or DNR
I wouldn't know. I would guess the City of Plymouth?
City of New Hope
usually the city council gets the first call
AMLAC; maintaining water levels is not an option on # 7; clearly an indication no one is listening to concerns!
Watershed district?
unknown
I have called the Watershed Mgmnt
Don't know.
Jenny black
The city officials
Michael Welch for Bassett Creek, MPLS parks otherwise
City of Plymouth, AMLAC, DNR
Watershed, MPRB, city.
start with a call to the city
Medicine Lake council and Bassett Creek Watershed
I'd probably search internet (for answer/contact)
Algae--algae---algae---algae--algae

Narrative responses - who would you contact

Bassett Creek or Medicine Lake Association (they would direct me to Bassett Creek)

bob white

Friends of Northwood, Mayor Hemken, Council member Elder and Guy Johnson

depends on issue. Often a friend who is more knowledgeable.

Lake association

AMLAC, BCWSD

this commission, New Hope city manager, John Elder,

I have no idea

Good question - who should I contact?

10. How do you learn about water projects going on in your community? - Open-Ended Response

Narrative responses - how do you learn

?

active look-up on websites

AMLAC

AMLAC and city of medicine lake

AMLAC and Medicine Laker

amlac and plymouth mailer

AMLAC and the cities of Medicine Lake and Plymouth

AMLAC newsletter

AMLAC newsletter and Medicine Lake newspaper

AMLAC Newsletter and Web site

BCWMC

Bryn Mawr Bugle and Southwest Journal

city

City Council

City Council Meetings

City news

City News Letter

City News letter, AMLAC

City newsletter

City newsletter and AMLAC newsletter

city newsletter and public papers

City newsletter.

City of Golden Valley newsletter

city of golden valley, sweeney lake association

city of plymouth, BCWMC, hennipen county newsletters

City Representative

City web site

City, AMLAC

Communication from AMLAC and City of Medicine Lake

Community leaders, local newsletter

community news letter

DNR

don't recall

email / newsletters, council meetings

EPC

Former BCWC commissioner

From active citizens more informed than me

from Derek (I am a Plymouth EQC member) and from the city of Plymouth newsletter

from my mom reading the sun post online. i would gladly subscribe to an e-newsletter

Golden Valley Parks & Rec, our sailing club, minneapolis brochures.

GV city council minutes sent to me via e-mail sign-up

GV Community newsletter

Harrison Neighborhood Assoc, Mpls Park and Rec

Harrison Neighborhood meetings.

HNA

i don't - i have to seek them out - i don't think there are any

I don't - there's not much gong on in this area. I participated in some open houses relating to a study for daylighting the creek east of Cedar Lake Rd, but there hasn't been much else.

I don't ;)

I rarely know about them.

In the Pipeline of the Sun Post Newspaper this website

internet

Internet and mailings

Local newspapers and newsletters

Medicine Lake "The Laker" and "City News" emails sent out by mayor

Narrative responses - how do you learn

medicine lake assn or city of Plymouth

Medicine Lake City Council

Medicine Lake City Newsletter

Medicine lake news, amalac

Medicine Lake newsletter

Medicine Lake village notices, and other notices by mail regarding the water bodies in my area

Medicine Laker

Medicine laker and amlac newsletters and meetings

My neighborhood association

Neighbor

Neighborhood Assoc.

neighborhood monthly newsletter: The Medicine Laker and the Sun Sailor

neighborhood newsletter or online research prior to swimming

Neighborhood newspaper - Bryn Mawr Bugle

news

News letter

No

not sure how to learn about water projects, could be different sources, city websites and watershed

Not sure, can I be put on an emailing list?

Our City keeps us informed

Paper and online

park board

Planning Commission

Plymouth newspaper and Ted

Plymouth Sun and Medicine laker

postcard in the mail

Southwest Journal, BMNA Newsletter The Bugle, news reports.

talk to Nathan Campeau at Barr

Ted hosahl

The City of Medicine has a monthly news letter and E-News

The City of Medicine Lake has 2 forms; 1 the Laker, 2 City News "e-mailed" as needed

the laker

There aren't many so primarily town newspaper.

Thinking of joining our local, Medicine Lake Association

through AMLAC (since most water projects are through City of Plymouth)

usually see them when on my bike or walking

Usually through communication from GV city hall, or Post newspaper

Via Medicine Laker and our city officials.

web

what water projects?

word of mouth If I'm lucky.

word of mouth.

(blank)

Aflac / newspaper

newspaper

Golden Valley newsletter

Crystal Newsletter

"The Crystal Connection" publication

Local newsletter.

don't know

monthly newsletter

City of Med Lk Monthly Newsletter

News paper

Through the AMFLAC newsletter, neighbors, and meetings over the years

City of New Hope

City website

Narrative responses - how do you learn

Haven't much. Do read Bryn Mawr Bugle; SW Journal, Strib. Feel like Minnehaha and other watersheds get more coverage.

Plymouth city newsletter

Not much information is available to the public about water projects.

Next door Bryn Mawr/ Bryn Mawr Bugle
email

thru the lake association emails

City of Medicine Lake

I'd probably search internet (for answer/contact) or ask Bob White who to contact

Northwood Lake Association

unsure

Email from Northwood Lake Assoc generally

Through our Friends of Northwood Lake association.

friends of northwood lake

not sure, erratic

Lake Association and City of Plymouth

Our Friends of Northwood Association and the city Pipeline Newsletter

Activities such as the walkabout

I heard about this website as I was hiking near Medicine lake and AMLAC was having an event

Mas

From Joe Harty for Medicine Lake or from City of Bloomington

Usually just by word of mouth.

12. How would you like to receive information about water projects going on in your community? - Open-Ended Response

Narrative responses - how you would like to receive information

AMLAC and Medicine Laker
 AMLAC Newsletter
 Both email and printed literature.
 by mail
 By regular mail.
 City News Letter
 City newsletter and emails from BCWMD
 City newsletter or emails
 Could Golden Valley include this information with the water/sewer bills? Since they are mailed and many people prefer printed material, it could be included with no additional mailing costs or impact.
 Direction to this website or by emails. New Hope's website
 e mail
 E mail alerts
 e mails
 electronic newsletter
 email or link to
 Email
 E-mail
 e-mail City E-News
 email i would like to host something for our neighborhood
 email and local paper. we have a golden valley news.
 Email and the "Medicine Laker", our city's newsletter
 email and/or online news
 e-mail blast
 Email or electronic newsletters such as the Golden Valley Common Place and community newsletters (print).
 Email or newsletters.
 email or newsletter
 Email or on line
 E-mail or print media
 Email would be great!
 email, social media
 Email.
 E-mail.
 emails
 emails and through direct mail.
 emails or website
 Emails would be welcome!
 Emails, articles in the local paper, or easier access on the website.
 How about forgetting about flood plain stuff and take careful wildlife habitats?????
 I like E-newsletters or home mailings.
 I would like to have more connectivity and more specific GIS, or addressing to various concentrations of hot spots, or sources from commercial business of the state county and city. The smart spreading concepts need to be explained better.
 I'd like toknow what's going on in Plymouth and in Bassett Creek via email
 It's probably easy to get information but sometimes hard to get simple, usable info that we can act on without making a huge commitment. I'm not sure what the remedy is for that--there's a watershed learning curve that's hard to deny.....
 mail or email
 Medicine Laker
 More in the paper
 mostly online. postcard is nice on occasion
 neighborhood association newsletters, email
 Neighborhood newspaper
 neighborhood newsletter

Narrative responses - how you would like to receive information

Newsletter

newsletter or email

Newsletters or mailings

on line

One or two simple fliers that clearly tell me how to get online information or updates specifically targeted to my concerns.

our city newspaper, emails

Plymouth newspaer

Post plans in plain English, publish where plans can be found on-line.

postal mailings or email

Postings to the neighborhood list-serve, facebook page, and HNA home page.

regular mail

see #10

Some Email and the well done and informative Golden Valley city newsletteer

Summarized.

The newsletter is excellent; a specific web page on the city web site would be good.

through city council and bassett creek water shed reps

through HNA

Through neighborhood newspapers or neighborhood emails.

U. S. Mail

via the Laker

Website

What water projects are going on?

yes

Yes. Especially how the water level at Bassett Creek Dam can be managed to maintain flow for Bassett Creek and to keep water movement and the lake level up in Medicine Lake.

(blank)

In medicine laker

City

newspaper

Printed info, suggestions of ways to get involved, additional information available online

Newsletter.

Continue publishing in "The Crystal Connection" and on the city web pages. News items in the Sun-Post newspaper.

Create an email list and send our updates to that list

golden valley city website

City newsletter

Vis standard mail or email would be fine

I would like to continue to receive information about water projects through the "In the Pipeline" City of New Hope community newsletter.

e-mails and articles in the Plyouth paper would be sufficient.

email or mail

Medicine Laker is sufficient for me.

as done now...newsletter

Bryn Mawr Bugle. Email

Plymouth city newsletter

emails, local news papers

same way but more info

Plymouth newsletter should have more information on improving water quality and reducing invasive species/prevention.

Email; self-initiated web research

Word of mouth from lake association or e-mail.

E-mail is find , what ever is least cost savings to spend on improvements

Through association meetings or direct mailings.

City Web page

Via web sites and email directing me to them.

Narrative responses - how you would like to receive information

Some good handouts for our Association members. More continuing information in city publishing venues.

In city brochure/newsletters or by email

Please take REAL MEASURES to stop syphoning water out of Medicine Lake! We also need to be more vigilant about milfoil and other invasive species. The future of our lake is at stake.

Bohannon neighborhood news

In City monthly bulletin (with water bill) and city newsletter (quarterly?)

email ---

Maybe by being on an email updating list.

13. Considering the water bodies in your community, what are your major concerns or issues that should be addressed? - Open-Ended Response

Narrative responses - major concerns or issues to be addressed

1. shoreline and trail repair on the west side of Bassett Creek between Glenwood and Penn 2. buckthorn removal in the woods, west side of Bassett Creek between Glenwood and Chestnut

1. Weed control 2. Water clarity

Access to Bassett Creek south of Glenwood though the park.

AIS is my major concern--both plants and animals. Medicine Lake is a very vulnerable lake. It took just two years for Eurasian water milfoil to make its way into Medicine Lake after it was found in Lake Minnetonka. Zebra mussels are now in Lake Minnetonka. We need aggressive action by the cities of Plymouth and Medicine Lake and BCWC and the state to keep zebra mussels from contaminating this lake. I also see what has happened at White Bear Lake could happen in medicine Lake. Lake level must be addressed.

algae

Algae in Medicine Lake Garbage in and on the banks of the Mississippi River

Aquatic weeds

As specified above: 1. Prevent the water level on Medicine Lake from declining too low--figure out a way to modify the dam at the outlet to Bassett Creek using a "V" shape or some other method to variably control how fast water levels decline. 2. Reduce the aquatic invasive species, and do more to prevent and invasion of zebra mussels or other invasive species. 3. Continue to improve water quality through detention ponds and evaluating dredging out some of the silt that has built up around inlets.

Basset Creek- shoreline and water level

Bassett Creek (and Bassett Creek Park) is behind the houses across the street from me (on Vincent Av, south of Glenwood Av). We all love the trails along the shore and through the woods. But the woods are currently overgrown with buckthorn, and the shoreline has eroded (especially across the creek from the old grain mill). These conditions make walking on the trails hazardous. We would love to have this remedied.

Clarity and flooding

clarity, weed control

Concern for the light rail being planned for construction through the wetlands off Bassett Creek and Sochacki Park / Mary Hills.

Consistant lake water levels in Medicine lake. The number of boat allowed on Medicine lake through French Park. The aggrement with Hennipen Parks is a joke... They keep expanding the boat access program.

Contamination Rice Lake Algae

contamination and erosion of bassett creek

control invasive plants improve water levels improve water clarity

covered already - protect Medicine lake water quality and importantly water levels!

Current prevention and interception methods for AIS are not working well enough. I am also concerned about the potentially deadly amoeba, Naegleria fowleri.

Currently the bridge is too low and by the end of July, beginning of August we cannot enjoy the water or boats. The water level gets so low that the boats hit the bottom and make it hard to even get out and enjoy the lake that we pay a small fortune to live at. The fishing has really gone down hill also. Seems as though the fish size and quantity have decreased. Something is very wrong.

Density of homes and streets will continue to add problems. We need to keep watch. City streets are very well engineered so they craack little and stand up well. Thanks to Jeff Oliver's good designs

dredge the artificial reserviors to capture runoff from roads.... they are key as buffers to the greater natural bodies

erosion control and road runoff

fixing the dam! We need to address the ability to regulate the water level. Medicine Lake is the second largest body of water in Hennepin County but we do not get any attention as such. The boat traffic has increased over the years and is almost to a stand still later in the summer because the water level drops. Lake residents cannot even get their boats off the lake at times!

garbage, pollution, continued attentive care of the water bodies.

I am concerned that the urban wetland areas in the vicinity of Bassett Creek will be developed for a light rail project.

I am concerned with the changes to the wetlands and impacts to Bassett Creek from the proposed Bottineau Light Rail line.

I do not have enough information to select the major concerns. E.g. previous question asked, What do I think would make the most impact. I was unable to select two top items.

I guess maintaining current water quality or improving it if there are issues.

Narrative responses - major concerns or issues to be addressed

I know street run off is being addressed. I would like to see more public education and recommendations for landowners on/near the water.

I would like to see the lake level stabilized at a higher level. I would like to see a clearer lake

Increasing / maintaining the water level of Medicine Lake and potentially reducing invasive plant infestations.

ineffective and inequitable programs despite multiple agencies and high taxation

Install a rough fish barrier on the Bassett Creek dam. Control the contaminants entering medicine Lake.

Invasive algae and clarity of water

Invasive plant life

invasive species

Invasive water plants

Keep out invasive species, limit boat traffic on busy days, keep water clean enough for swimming without getting rashes, lifeguards on public beaches

keeping lake free of contaminants and invasive weeds

Lake levels too low and lack of concern by city political leaders of Plymouth and Medicine Lake. As long as it is wet they are happy.

Level and clarity of Medicine Lake needs to be addressed

Look at ways to treat storm water run off before it enters the waterbodies. Not as concerned about the volume of water as long as it is treated to reduce the amount of phosphorus entering the waterbodies.

Low water levels on Medicine Lake must be addressed. Invasive weeds hinder lake use.

Low water levels, invasive plants.

Maintain or increase water levels

Major concerns at present include low water level and invasive species.

Major emphasis must be directed towards the Light Rail D1 line running thru GV and Theo Wirth Prk. This is not a benefit to GV and will have a major impact on the environment, mainly the wetlands and Bassett Creek.

Managing the water level at Bassett Creek Dam and protecting against Zebra Mussels.

Medicine Lake gets too low every year. We should dam the flow out so the water stays. I would love to see the whole lake increase at least a foot if we can do it with no damage to homes.

Medicine Lake gets too low for reasonable usage in the summer. we need to raise the dam and preserve the water at a higher level. it affects homeowners and anyone who wants to launch a boat on the lake

Medicine lake low water level

Medicine Lake needs an adjustable dam on the outflow that passes under the bridge on South Shore Drive. We need to be able to maintain a consistent lake level during dry and wet years.

Medicine Lake water level consistency. Keeping Zebra mussels out of the lake. Minimizing sediment entry and stabilizing lakeshore.

Medicine Lake water quality, invasives like Zebra Mussels, water level.

Need filtering ponds for run-off, buffer zones,

Pesticide runoffs from lawns into our local watersheds.

Plants in Medicine Lake - invasive species eliminate usefulness of a large portion of the lake.

Pollution and litter.

pollution and runoff.

Pollution/runoff/contaminants entering the water

Preventing invasive species and maintaining good water quality

preventing zebra mussels. Raising the dam on the south side of the lake to maintain water levels slightly higher.

Raise the level of the Bassett creek dam so the water level remains higher in the fall and late summer.

Raise water level of Medicine Lake - reinvent the dam to keep more water in the lake Low water level limits lake use - can't get boats in or out Harvest/Spray milfoil Bay areas too shallow due to sediment/muck

removal of bordering buckthorn and pet waste

run off into storm drains - people don't realize they need to even get leaves out of gutters

Runoff from yards and streets and contaminants it contains.

Sedimentation and overgrowth of aquatic plants

See answers provided previously - Too many people seem to plant grass right up to the edge of water bodies.

Shoreline restoration, water cleanliness and safety at swimming beaches (no sickness for swimmers), keeping contaminants out of the water, and careful plans for run-off, flooding, and managing waste water.

stop erosion of creek. look at ponds to see if they can be helped. I see where water area in Theodore Wirth park has islands that were not there 15 years ago. It must get the soil erosion from Bassett Creek upstream.

The control of water levels and weed prevention and clean up

The Current dam structure does not allow control of lake level during low lake cycles.

Narrative responses - major concerns or issues to be addressed

The environmental impact of the Theo Wirth Light Rail D1 project that I do not want in the wet lands and near bassett creek.

The lake level. The level is dangerously low in mid to late summer. Should a major emergency event occur on the lake, with low water levels, Plymouth & Medicine Lake Fire along with Hennepin County Water Patrol would and do have major time consuming issues launching. Many lake residents have major issues launching from lifts in low water.

The proposed Bottineau Transitway light rail poses a tremendous threat to beautiful Bassett Creek & Rice Lake. The addition of 2 rail lines into a wildlife area will have consequences that will reduce wildlife, effect the wetlands and detract from the community. I am most concerned about the run off issues of debris during the construction phase and then the likely water runoff from such a large surface area once the tracks are built. The pristine nature areas of Mary Hills and Sochacki Parks with Bassett Creek as its center piece will no longer provide our community with a valuable natural environment.

The spread of invasive species and the reduced water levels.

Those identified in this survey.

Trash in the creek

Water Clarity and Invasive Species. So many issues on the previous list must be addressed to improve water clarity, it will be an effect of addressing other issues.

Water level stability in Medicine Lake

Water level, and invasive species.

Water Quality

Water quality and lake level in Medicine Lake.

Water quality of Medicine Lake, including clarity, invasive species, and consistent water levels

Water quality, building water cells and ponds to allow filtering of the runoff before it enters lakes.

Water quality, lake level of Medicine Lake/Bassett Creek dam

WEEDS in the lake!

Wildlife and natural areas are my primary concerns, as well as the beauty of the lake and surrounding wetlands, creeks etc. Too often attempts to make the human population comfortable are detrimental to the wildlife and their habitat.

Wildlife habitats

Winter runoff and recreation. We need to significantly reduce the use of salt on the roads/sidewalks in winter. We need to cleanup recreation on the lake through education and potential additional regulation. For example not allowing cars to drive on the lake. Cars allow too easy of access to the lake which results in more trash being brought out and left on the lake and salt dropping from cars directly onto the lake. Regulations need to be made with education to go along with it. One small example: Medicine Lake considered using less salt on the roads in 2013 but then decided to go back to using more salt because "someone complained." The risk of not using salt on a 20mph roadway is not great at all. The cost of using salt so near the lake is great.

With all the use the lakes get can we keep them clean and flowing?

You always have plans up you sleeve as to where you want to be and I do not like the financial budget proposed. Too much of this spreading and visioning is not healthy. We need to preserve trees, but somehow this did not happen on the corner of Theo Wirth and Glenwood.

Zebra Mussels

Zebra mussels prevention. Do everything that is possible to keep them out of Medicine and other lakes.

(blank)

Too many weeds. And water clarity. And keep lake lever a bit higher.

Lake needs to be dredged.

Clarity Invsive plants. Water levels

Pollution, in the form of run off and trash near the water. I believe that promoting plant, fish, and animal life is also important but it makes more sense to make sure the water is clean first.

Poor citizen behavior

Pollution runoff. Water capture and retention in private and public landscaping design.

Medicine Lake is too shallow. The lake level doesn't stay at a "healthy" level long enough. I am concerned we are not keeping the depth managed properly and it impacts the usability of the lake. This is further enhanced by a concern that sediment is filling in and we should dredge the lake.

I live across from Lion's Park and watch the baseball field dirt run off into the storm sewer.

increase holding capacity of pond bordering Canadian Pacific RR tracks and 36 th ave no runoff from RR tracks enters pond with considerable sediment

Limit the amount of water being let out of Medicine Lake. In other words, rise the outlet dam.

Narrative responses - major concerns or issues to be addressed

Stormwater runoff

Water quality in Medicine lake. it is the largest lake in the 494/694 loop and used by hundreds of people each day. the water quality is poor. The level of the lake is also kept low, especially in August, which leads to the clarity and temp issues affecting the algae blooms.

My biggest concern with Medicine Lake would be the water level. It is often low to very low.

Lead levels in drinking water

I think protecting the lakes from invasive plants and animals(mussels) along with increasing the water levels in the lakes through the summer months to reduce danger for swimming and boating.

• Zebra Mussel invasion • Water level on Medicine Lake is too low during most of the summer. Once the water stops running the lake drops quickly • There's a bridge right by the dam on Medicine Lake, along South Shore Drive... just to the south of the bridge, there was a pile of rocks dumped over some insulation panels (I believe to help protect some underground piping) This has created a pond area under the bridge and up to the dam. Once the water stops running over the dam, hundreds of fish are trapped and die in this area. Last year it was the most awful smell – someone did come clean it up, but I'm assuming the problem will reoccur. Also, some of the insulation panels are uncovered now.

Maintaining water levels by raising the dam!

Water quality and Prevention of Ice fishermen leaving garbage on the lake.

Reduce the runoff from the Highway department on Duluth St. Discuss the clearing of trees and brush from the watershed area with homeowners

Pollution control access and shoreline retention

Improved water quality in order to improve fishery --- big outlet for low income families here. Reimagine old Glenwood plant site.

water quality and garbage in our lakes when we get major rain.

Zebra mussels are not yet in Medicine Lake. However, Plymouth has left the West Medicine Lake Park gate open for uncontrolled/monitored access for more than 4 weeks, 24/7. This is totally unnecessary and poses a severe risk of introducing zebra mussels into the lake. The French Park boat ramp is monitored by the DNR; the WML access is not monitored at all, and fishing boats have been using that ramp for over a month without inspection. Also, boat trailers are parked in the lot day & night.

Mitigation of the impacts of various land use, especially runoff from hard surface, and aquatic invasive species.

storm drain run-off from yards and driveways

Absolutely need to keep more water in Medicine Lake especially in the fall to ensure a longer season of enjoying water activities and prevent damage to watercraft being put away for the winter. Last year was HORRIBLE Algae. - Property Values - Note the bigger the value the more taxes to pay to help the community.

On our lake, Medicine Lake, the water levels seem to get too low too soon resulting in difficulty for everyone. I would like to see the "Dam", or lack thereof, addressed

Water clarity, odor, amount of aquatic plants

If the current condition of the lake continues, we will be able to walk across it. The lake should be dredged again, as it was many years ago. In the alternative, the lake should be temporarily drained so that the invasive weeds and algae die.

Geese, polution

Water level of Medicine Lake.

Water levels in Medicine Lake. Keeping Zebra Mussels out of all lakes they haven't already infected.

It would be beneficial to the Medicine Lake community to have and controlled outlet weir to keep more water in medicine lake late in the season and during dryer times.

elevate dam on Medicine lake to elevate water level to increase use of shallow areas

The amount of pollutants coming from Plymouth into Northwood Lake. Water quality. The amount of sand coming from new Hope city streets. Northwood is a shallow lake as it was a man-made widening of Bassett's Creek- so the sand build-up makes using a canoe very difficult.

Water stability levels apparently need addressing to prevent low levels during high heat or at the end of summer.

1. be more aggressive about getting on top of the milfoil (and other invasive weeds) problem. I think we have been too complacent. 2. STOP the syphoning off of water from Medicine Lake. There is NO good reason this is being done, and it's hurting the lake ecosystem, and rendering the lake unusable when levels get too low.

LOW Water level of Medicine Lake

Businesses need to consider and implement better alternatives to lawn, especially those areas adjacent to drainage sites/ponds. I see a large amounts of lawn that have no use around businesses. I see parking lot drainage sites/ponds, some with VERY steep banks, being mowed to the water's edge (SE corner of Winnetka & 36th).

Narrative responses - major concerns or issues to be addressed

Water level of Medicine Lake

I am concerned mainly about the water quality and maintaining a good natural habitat for native aquatic biota.

14. What actions should be taken to address your issues and who should take those actions? - Open-Ended Response

Narrative response - what actions should be take and who

A dam at the place where the creek exits the lake that can be adjusted to manage lake levels Heightened efforts to educate shoreline owners

Adjacent landowners should know what to do, and the city should use practices (like salt alternatives) that will improve water quality.

All efforts should be put in place to stop the construction of the Bottineau Light railway through wetlands and park land. Community members have voiced concerns at public meetings. The Bassett Creek Watershed Management commission should step in and protect our water. Our community needs your help to stop consideration of the D1 line. Please help us - we need larger, bigger voices to protect nature areas. all who want to protect the beauty of Bassett creek .

Although the residents have long lobbied for further consideration of increasing the water level (modification of the damn structure), this repeatedly seems to fall on deaf ears. This really should be remedied.

Amend the dam structure to allow for water retention during low rain fall.

at least acknowledgement that increased work is needed.

Bassett Creek should partner with the other governing bodies to do an actual study of the dam height and whether putting in either an adjustable dam or an higher dam cut out would cause any increase in the flood plain. The important recreational value of Medicine Lake is not being properly served because of the absolute lack of real knolwedge on this subject.

BCWMC for water level consistency. Three Rivers for Zebra mussel monitoring at boat landing and heavy education component on part of cities. Cities should continue to work on sediment infiltration. Incentives to naturalize shoreline and add rain gardens along roadways might really help.

BCWMC needs to have representation at the upcoming charette being held jointly by the Mpls Park Board and the County to make sure that their interests are considered with station area planning.

BCWMC should take the proactive lead in resolving the dam elevation. Agency stakeholders must cooperate in resolving weed related management.

Better legislation and enforcement of AIS laws is needed. Also, more research is needed for detection, control, and eradication of AIS and Naegleria fowleri. All agencies currently involved should take more action (MN DNR, lawmakers, CDC, etc.).

Buckthorn removal and shoreline repair. Ideally, this would be done by professionals.

cities should take initiative

City of Plymouth and Medicine Lake. They have the most to lose. Plymouth now allows a sail club a French Park eventhough when this agreement was proposed "no boat docks power or sailing was to exist...

City, via public information, should encourage and teach homeowners how to install and maintain rain gardens. The city, itself, should construct rain garrdens on city property where applicable. An organization, such as Metro Blooms, should be brought in to help lead the program. Homeowners should receive credits or sometype of financial incentive to construct rain gardens such as , I believe, Lake Minnetonka Watershed District. .

Collaboration - lake association, watershed, cities, three rivers parks, county, state A natural resource is for everyone - everyone must work together to protect it.

Community/city should work together

consider changing the Basset Creek Dam level to retain more water in lake

Consider options for managing the water level at the Bassett Creek Dam the same as they do with on Lake Minnetonka with Minnehaha Creek. Consider options for inspecting incoming boats at French Park.

Control at access points.

control the loss of water through the dam on Medicine lake

coordinated invasive plant control- chemical or machine. It is so bad our jet ski stalls because the intake gets clogged. Water levels get so so I can not even get my boat off the lift- raise the dam height

Do not know.

Don't know enough

don't know who should take the actions?????

Dredging and contol of weed frowth

Dredging and plant control (whatever the most effective research-based methods currently are) including weed harvesting. Joint cost sharing with government and householders to accomplish this.

Encourage plantings other than grass along shorelines. The City or watershed district should try to educate adjacent land owners and/or try to provide incentives.

Narrative response - what actions should be take and who

French Park should monitor the boats going on as it is the only public launch and the source by which Medicine Lake is being infected.

Have a representative attend meeting on LRT with information on how it will impact the wetlands and Bassett Creek.

Have one (1) government agency be the lead agency for lake issues.

Hennin Co. Park board, City of Plymouth park and Rec, Henn Co sheriff water patrol

I believe the Bassett Creek watershed commission should address the water level, and the other issues should be addressed jointly by the commission in conjunction with the cities of Plymouth and Medicine Lake, with the guidance of AMLAC as I think that organization has a very good understanding of Medicine Lake.

I don't know,

i don't know. education, volunteer efforts, rezoning all come to mind.

I envision that there will be large nordic skiing events around the area, and there will be not enough parking of having tents up for prolonged periods, etc. and other structures and such conditions that go with density fluctuations in events. You need to plan to use the permanent structures and be forward looking with insider info about big events so that everybody can help adapt the landscape better. You need to build a ski/pedestrian bridge around the par 3 golf course like the one near the clubhouse. I used to ski when it was free, so I think that the park board should make an exception to poor people without the disposable income.

I have been a vocal opponent of the proposed route of the Bottineau Transitway and encourage all organizations with an interest in protecting the watershed to be vocal as well.

I think the BCWMC is doing good work.

I will leave that decision to the professionals.

I would like to see a comprehensive weed control plan in place not just for Medicine Lake but for all the recreational lakes in the metropolitan area. I would like educational programs to explain to people the importance of rain gardens, rough strips of lawn between the fertilized yard and the lake shore and picking up dog feces around their yards and streets. All of those can impact lake quality. I would like our elected officials to show they care about preserving this wonderful water heritage we have in Minnesota for our children and grandchildren.

Keep the information at the fore front. If everybody knows they can help in their own small ways.

lawn fertilizer restrictions on lake shore and remove the invasive weeds and/or species

local Cities that border the water bodies, County and State

Make it illegal to use certain chemicals on lawns. If you can't eat it, it shouldn't go on the lawn. Have checks to see if people have dog poop bags - many people don't and shouldn't be allowed to use shared spaces if they won't keep it clean for all.

monitors at boat launch. Raise dam level

More and better organized funding to cover treatment for curly leaf and milfoil. Full time monitors for French Park Launch and supervised special needs launching at West Beach in the spring and fall. Install a water flow system at Bassett Creek outlet.

more education - in neighborhoods and communities - at the city level - i can't even get a curb cut easily for a rain garden. i want more promotion of rain gardens - would love to put one in - can't afford it

More education. Not sure how to get residents' attention. ' Since the watershed spans many communities, it makes sense to have a unifying body, but info from a watershed district is not exactly on the best seller's list. We don't have a terribly active neighborhood association, but we like each other. Maybe if a few neighbors hosted a picnic with a guest who could give short talk on what I do individual homeowners could do and what group projects might be undertaken to help our neighborhood and other popular locations - like neighboring parks. What about National Night Out? We have good turnout for this event.

More projects to capture and treat runoff--

Need to establish a group who is passionate about making a change to drive the tactics through.

Needs to happen at a local level with education on a one to one basis...

Not sure how to address this issue?

Permitting process, awards highlighting actions, create volunteer opportunities.

Prevention of AIS is key. The state, the commissions, and the cities MUST work together to put forward a comprehensive plan for taking care of the lakes and rivers in our state.

Narrative response - what actions should be take and who

Put in a controlable dam at the out flow of medicine lake. Have a 6" gate that closes when the water level is 2" from the bottom of the outflow mouth of the dam. If it crests the 6" level open the dam up totally. Keep the control gate open from Nov 1. to May 1 to prevent any flooding. The outflow was planked up to the top of the dam when plymouth/MET council did the sewer work under the creek and it DID NOT FLOOD ANYONE. I went and looked for flooding in the city of medicine lake and low area on the street by the north arm (mushroom house) and the water wasn't on the street! By mid summer we can't use our boatlifts because the water is too shallow, in times of drought why are we letting water out? I have lived on the lake for 40 plus years. Holding ponds are great and I understand why they were put in and they do help water quality but when they dry out it takes a lot of water to fill them and then flow into medicine lake. Since they have been installed the water level has been slowly dropping every year. Since the new dam was put in the lake level has not been the same. SEE WHAT IS GOING ON IN FRONT OF YOU. You want me to help with water quality issues, I do. I have volunteered my time cleaning up medicine lake long before any of you had anything to do with your organization. You are suppose to lead to change that helps our body of water so do that, put in an adjustable dam on medicine lake, it is an easy fix, other metro lakes with holding pond/water problems are doing the same. Thank you.

raise dam to keep more water in lake during late summer

Raise the dam or have a system that can be raised or lowered at different times of water depths as other lakes have, especially of our size.

raise the dam, or at least notch it to hold more water in the lake longer. City of Plymouth, DNR, Army Corp. of Engrs. Bassett Creek Watershed

Raise the outlet- like Lake Minnetonka

Raising the Basset Creek Dam that runs off of Medicine Lake. Not sure what the options are for invasive plants, harvesting possibly.

reduce amount of fertilizer and other contaminants entering the lake - homeowners control invasive species - ???

Regulation and education

Remove the trash - unknown - perhaps a public cleanup day

Requiemetns for boat inspections should be upgraded with significant fines for spreading invasive species or for attemptin to thwart boat inspections. The timeframes for launching boats should be compressed so that inspections for invasive species can be performed. Upgrade the Basset Creek dam to allow for controlled water runoff.

Restrict outflow of water via outlet dam. BCWMC seems to be the body charged with lake usability issues

Same answer as 13.

SIMPLE..... Change from fixed dam height to "Adjustable" adding one foot.

Someone must take this important issue to the Met Council, GV city council, parks and /rec, State and Federal agencies, such as the FTA, senators and congress people. Let's not pave paradise and invite more commercialization to this wonderful natural area.

Someone should take action! All the rules and sciene are obviously not working. Last year and the year before we were trying to save all the fish that got caught in a death trap at the bridge!! It was not only painful to watch them all die, but the smell was awful!

start a dredging program around important bodies 1 every year... residents could help to fund this if made to care

State and local agencies that have the knowledge to know what is effective. Communicate to home owners and businesses a set of recommendations regarding what they can do individually.

state legislation that would eliminate all current governance and establish a modern unified regulatory system with high accountability, minimal administrative expenditures, and optimal delivery of needed water quality improvement programs.

Stop the flood control and look at the wildlife!,,,,,,,,,,,,,

storm water management reduce road salt poisoning of water bodies

The appropriate taxpayer funded organization should reduce the amount of water released from the lake, especially early in the season, to maintain higher water levels through the summer.

the City drains road runoff into the creek it should all go into detention ponds

The dam should be constructed and paid for by some mix of Plymouth, Medicine Lake, Hennepin County, and the state of Minnesota.

the dam should be raised by a reasonable amount. even 6 inches would make a major difference whoever has authority, probably the DNR or state of Mn

The light rail should be directed through areas which would be best served and where the population is high. The Broadway route was much better suited and would have less environmental and waterway impact.

Narrative response - what actions should be take and who

There should be a bigger push to get neighborhoods (as groups) to invest in shoreline and prairie restoration closer to their homes. The state government and local watersheds/cities should create strong laws and ordinances to protect our natural resources from harmful run-off and pollution.

Those on the list in this survey.

Treatment prior to discharge. Should be a colaborative effort between the City and the Watershed District because both agencies collect funds for this work.

Use of porous pavements. Regulated by the city

we all need to participate through tax dollars to fix these issues

We must all work to guard against invasive species. It only takes 1 careless person. Water clarity must be a community wide effort, I would like to see more regulation of fertilizers and runoff from lawns and farms.

Whoever controls the damn on Basset Creek at the lake outlet needs to consider raising the level so as to level off the fluctuations in lake levels...

Wildlife and natural areas should be a top priority of local gov'ts. I do not approve of slaughtering geese, killing or trapping, or laws restricting the feeding of wildlife. Dead trees should be kept as long as possible to provide cavity nesting areas.

(blank)

Raise dam by 2 or 3 inches.

People need to take more responsibility. I'm not sure how to do that. Maybe a campaign that shows people how much of an effect their actions have?

Apply for public/private funds for a free rain barrel program and rain garden education.

I think we are letting too much water out of the lake at the dam. I also feel that we need to start a multi-year process of dredging the lake to stay ahead of this issue.

there should be some retaining ponds built by the ball fields.

install rip-rap from tracks to pond pond has not been dredged in 40 years build up of sediment has reduced ability of pond to act as a settling basin and flood control function watershed commission should look into this

Use bmp's to reduce/treat runoff

Raise the level of the lake to its spring levels all year.

I believe the dam at basset creek could/should be built up a bit to keep the water level in the lake higher for longer periods of time.

Continue to publish water safety results and how to mitigate excess lead levels. I appreciate the water maintenance organization publications that go out to New Hope residents.

I personally think the dam on Medicine Lake should be higher to let less water flow out of the lake during the summer. There have been deaths due to swimmers getting caught in weeds and numerous boat motors hitting rocks due to the low water levels.

- increase the height of the Medicine Lake Dam a few inches, or install a way to adjust the level of the dam. In my opinion it could be a few inches higher all the time, with the exception of a flood environment where it could be lowered to increase the release of water. In six years, I haven't seen the water ever be too high, but I'm sure it can happen. Unfortunately we seem to be maintaining a low level every year.

Raise the dam

Unknown, actually.

Send out a flyer to homwowners on the creek regarding how they should manage their watershed property. Ask the Highway Dept to put in a drainage pond of some sort.

Shoreline buildup algae removal pollution prevention

Watershed should work w/cities and local community newspapers to create a "from Plymouth to Minneapolis" awareness. Make the website and the focus of the Watershed district about what we love-- the great variety of birds found along the streams and lakes, the wildlife reliant on the watershed, a focus on increasing the fisheries. Educate the residents of our community regarding water quality and the causes of poor water quality.

Close the gate for all boat launching; French Park can easily accommodate all boats. Use the gate only during ice fishing season.

BCWMC should adopt and implement a more robust set of regulatory controls, in conjunction with the cities in the watershed. The legislature should provide the Department of Natural Resources with the necessary funding to work with local governmental units to implement rigorous inspection and decontamination programs to prevent and manage the spread of invasive species.

freq public service articles addressing each household's responsibility

Have a controlled outlet weir

Narrative response - what actions should be take and who

Get started NOW do not wait for Federal monies The cities are always looking 5-10-20 years down the road. I say stop kicking these improvements into the future. We want better stuff than find a way to take this issue go away now by taxing everyone thats just not lake property owner thru property taxes.. Everyone enjoys the waterways,wetlands,parks and everyone contriubtes to the problems so look at the rainy day funds or general funds a than take action. Do wait, you can not please everyone ,but everyone enjoys the water bodies so make them pay for quailty. .

I would like to see a moveable "Weir" or gate where the present fixed level dam is so that the water could be kept in the lake for wildlife, recreation, etc... It gets very difficult to use the lake the way it was meant to be when the lake levels get too low and I beleive much of that water could be kept in the body of water once a moveable gate or weir is installed

Not a water body specialist, I have no idea. Licensed personnel who understand what they're doing and why, and how it impacts the rest of the community.

See above.

Cleanouts. Treatment. City or watershed

Water level should be raised a few inches to account for the lack of rain which we've had the past few summers. Without rain the lake becomes unusable.

Review on the dam weir. I'm not sure who's responsible - Army Corp of Engineers? DNR?

Put a adjustable weir on the medicine lake outflows

raise dam, BCWMC

I know money is always an issue- but keep working. (Especially for Watershed NB07.) We appreciate the commissions work.

Designate resources to organizations that can take on this work. I'm not sure which organizations would do this.

1. be more aggressive about getting on top of the milfoil (and other invasive weeds) problem. I think we have been too complacent. 2. STOP the syphoning off of water from Medicine Lake. There is NO good reason this is being done, and it's hurting the lake ecosystem, and rendering the lake unusable when levels get too low.

I think maybe BCWMC is the organization that should take action. I dont know how they would address the issues, Maybe they have engineers that could work on the issue?

Cities or whatever appropriate body needs to educate businesses on being good environmental citizens.

Landscape/lawn care companies need to be part of the solution.

Dam inlet to raise the water level of the lake.

I am thinking a lot of rain gardens should be installed all over the watershed to help reduce runoff pollution and siltation of the creeks and lakes. Strong enforcement of permanent runoff control issues with new construction. And strong enforcement and monitoring of temporary runoff issues during construction projects

~ encourage lawn removal, which involves installing native plants ~ discourage use of lawn fertilizers while educating home owners on alternatives

15. Other comments about water resources - Open-Ended Response

Narrative responses - Other comments

.....

BCWMC has been unresponsive to constituent pressure to resolve the low water elevation issue resulting from an inappropriate dam design. It is embarrassing when public agencies funded by taxes conduct public outreach in a manner such as Bassett Creek does business.

Clearing and building always go with development, but the kinds of development that are the worst are the hidden kind that surprises without warning and proper vetting. I missed the visioning exercise, and would like to read the minutes of what was indeed envisioned. The overflow parking and the archery area will not be preserved when the development demands start, and we need to understand the long range plan whether it is olympics or whatever sports commercial interests are at stake. Rebuilding a course for kyacks out of the creek is something that may be possible. All serious future plans need to be public.

Do something.

Educate, EDUCATE,! educate all

Elected/appointed officials that do not live on the water ways making decisions that effect owner of water ways and not them. I've lived on Medicine Lake since 1950's. Much has happen to the lake that should not have happened..! To many directives brought on by non lake residents have grossly affect the impact on/in in the lake. (Hwy 169 run off / French Park / Ryerson Steel and the industrial hard surface run off, Ice fishing and the trash they forget to take with them and so on)

Establish rules/guidelines about removing water from the lake - irrigation systems.

Has the BCWMC been involved in the plans to construct an LRT line through Wirth Park, immediately adjacent to Bassett Creek?

Here today.....hopefully..... not gone tomorrow.

I am against lake residents removing water from the lake to water their lawns. Water like the rest of the residents on odd even days. Ratchet down on irresponsible lawn mowing, intentionally sending their grass out into the street and then right into the storm sewer and then right into the lake.

I don't know if this directly affects us, but the car wash on Hwy 55 and West Medicine Lake Road uses artificial coloring in their wash and it can't be necessary. Also, maybe we could pressure them to be better stewards of water-using less and using non-toxic chemicals. I know there are other car washes that do it.

I have a wet basement, as do many of my neighbors, so every year, I worry about flooding.

I have been interested in diversifying the plant life along the shoreline of Rice Lake near my home. If the BCWMC were interested in such a project, I would happily donate or volunteer.

I know my comments are pretty specific to where I live, and less about water quality (which I know little about) than about enhancing enjoyment of using the trails and space alongside Bassett Creek. I apologize if this is not the right forum for these comments, but I think they are a piece of the overall picture. Thanks for considering,

I support the widest possible public recreational use of Medicine Lake. Given the shape and size of the lake, what are the practical limits to the number of canoes, kayaks, wind surfers, speed (tow) boats, fishing boats, sail boats, pontoons, that can enjoy the lake at any given time? Could the use load be better modulated?

I would like to help.

I would love to attend a rainbarrel workshop or a raingarden workshop.

In addition to MaryHills & Sochacki parks - the construction and disruption to Theodore Wirth Park also needs to be considered as a detriment to our nature areas. Bassett Creek will suffer greatly.

it is unfortunate that the Basset Creek Commission is not responsive to constituent input as a public authority.

Keep the control of BCWMC in local hands and don't merge it into a regional group

Love the new holding ponds at east and west beaches. Need further inforcement on Phosphorous and lawn chemicals.

Love'm!

Maintain lake level higher, if possible and feasible.

MN Highway Department (DOT) should be involved, if they are not currently, to discuss the damage that highway 169 runoff does to lakes like Medicine Lake.

Much opportunity to utilize rainwater storage for residential watering.

People don't realize how important they are to our lives, but only when they are not safe or they can't use them do they. I'm not sure how to educate people.

Provide more access points along the creek for recreation.....Clear to allow navigation.

rain barrel education and promotion

Scary how much we "invest" in our lawns, only to have it run-off into our creeks and lakes.

Take a lesson from Lake Minnetonka!

Narrative responses - Other comments

thank you!

The water is getting so bad the kids do not even want to swim in the lake.

There wasn't any option on the question about results tht would be most beneficial on managing the level of the lake differently or I would have chosen it.

thhnaks for asking

Too many people move into watery areas and then try to destroy species they don't like, and make the land and water conform to their uses .People should be encouraged to adjust their properties , kids, pets, garbage disposal etc to the local land and wildlife, or move to more human-populated areas..

Water is what makes Minnesota a special place to live.

Water resources are one of the things that make our community and Minnesota special, and they are worth investing in, improving and protecting!

We have so very few water resources that they should be protected with vigilance. As a society we tend to treat our water resources as a never ending supply which I fear will end during our lifetime.

Would like to have bassett creek for recreational paddling. At the moment, I have never thought to try. Water seems too low.

(blank)

I understand concerns about flooding and down-stream impacts of different lake levels. No amount of research will properly validate things on either side. I suggest we make a temporary & cost-contained change to the dam for 2 years and then observe any impacts. We need to do something.

Raise the dam and control aquatic growth

Water level of Medicine Lake concerns me also.

I want to thank you for promoting this survey

Water has a mesmerizing quality about it. Everyone is drawn to it. Minnesota is known for its lakes and rivers and should be in the best condition possible for our use and enjoyment. Everyone should be able to canoe safely without getting caught in weeds or subjected to a foul smell.

Less sand down the drains.

Water ressources are important to our city and state lets take care of them to the best of our ability. Maybe if we took better care of our local lakes people wouldnt pollute the air so much driving to cleaner waters uo North.

I do not think we should consider dredging in-stream ponds in the creeks. Let the creek maintain a stable natural habitat for native plants, fish and other critters. Do much to keep silt out of the stream in the first place.

Bassett Creek Watershed Summit

June 13, 2013

Results of Prioritization Exercise

(+ Northwoods Lake Small Group Meeting Ranking June 18, 2013)

Rank (Tally of points)	Broader Topics Ranked	Examples of specific issues identified through public input process related to the topic
		X – indicates specific issue marked as high priority by Summit participant
#2 (42 pts)	Degraded Habitats & Lack of Biodiversity	Too many weeds
		Non-natural shorelines
		XX Aquatic invasive species
		Terrestrial invasive species
		Too many geese
		Lack of wildlife diversity
		Lack of buffers
		Fish consumption advisories
		Loss of thousands of ash trees in watershed
		X Sediment build-up
		XXX Streambank erosion
		Light rail impacts to Bassett Creek, wetlands and natural areas
		Abundance of cattails in ponds resulting in flooding problems
#6 (12 pts)	Lack of Education & Information	Lack of education and knowledge among residents about condition of water and how to improve water quality
		X Need better sources of information
		Disconnection of public from natural resources
		X Lack of volunteer opportunities
#5 (18 pts)	Recreation Needs	X Lack of public access
		Unmaintained public access sites
		No obstructions for kayaking/canoeing
		Too many weeds can be dangerous for swimming and boating
		Need to balance recreation with habitat
#4 (19 pts)	Degraded Water Quality	X Chemical pollutants in water
		Too much algae
		Too much phosphorus
		X Low water clarity
#3 (31 pts)	Effects of Stormwater Runoff and Development	Runoff from yards, streets, highways
		Lack of infiltration or diversion in lawns
		Salt use
		Runoff without filtration or treatment, more treatment needed
		X Concentrated areas of impervious surfaces
		X Chemicals and pollutants in runoff
		Runoff from older commercial/industrial areas
		Construction site erosion
		Effects of developments on waterbodies, wetlands, and water quality
		Leaks and spills from railroads
		Aging infrastructure
		Effects of dredging
		Stormwater ponds filling in, not enough storage to be effective

#7 (8 pts)	Water Quantity, Water Levels, Flooding (aside from Medicine Lake)	XXX Fluctuating water levels
		X Flooding
		Need more land acquisition for flood easements
#1 (87 pts)	Medicine Lake Water Levels	XXXXXX Low water levels on Medicine Lake
		Need to study effects of Medicine Lake's possible water level manipulation on floodplain, water quality, water temperatures, overall lake health
#9 (4 pts)	Actions by Individuals	Too much trash
		Too many motorboats, water skiing, jet skiing
		Too much pet waste
		Too much lawn irrigation using lake water
		Mowing to edge of water, not leaving buffer
		Lack of sense of responsibility
		X Need behavior change, change of habits by individuals and businesses
		Expectations that problems can be solved quickly with silver bullet
#8 (5 pts)	Governance, Management & Funding	Lack of funding
		Requires commitment of all 9 member cities in watershed
		Projects don't benefit enough of the population
		Lack of commitment and leadership from politicians to seek more funding to improve natural resources
		Better prioritization of projects
		Lack of city-implemented projects
		Need more tax incentive for better projects
		Need to balance management of recreational lakes vs. scenic ponds
		Pond management before lake management
		Cities make sacrifices for industry
		X Need incentives or grants for homeowners to install raingardens and restore shorelines
#10 (3 pts)	Groundwater	Groundwater quality and quantity in wells in Medicine Lake
		Lack of structure and collaboration among agencies with groundwater management responsibilities
		Need better data on impacts of groundwater usage on surface water
		Lead levels in drinking water
		Too much groundwater consumption

Bassett Creek Watershed Management Commission Workshop
 Results of Prioritization Exercise with Commissioners, Alternates, TAC and Technical Partners (TRPD,
 BWSR, Met Council) ~ June 24, 2013

Rank (Tally of points)	Broader Topics to be Ranked	Examples of specific issues identified through small group meetings, online survey, Gaps Analysis (GA), and self-assessment
#5 (25)	Degraded Streams and Shorelines	Non-natural shorelines
		Lack of buffers
		Sediment build-up
		Streambank erosion
		Address roles, responsibilities, funding for removing sediment deltas GA9
		Reassess factors for prioritization of stream restoration projects GA10
		Encourage or set standards for natural shoreline restoration methods GA11
		Consider watershed-wide buffer policy for wetlands, lakes, creek GA12
#8 (13)	Lack of Biodiversity	Too many weeds
		Aquatic invasive species – need to define BCWMC role in issue GA11
		Terrestrial invasive species
		Too many geese
		Lack of wildlife diversity
		Loss of thousands of ash trees in watershed
		Define policies aimed at protection of rare and endangered species GA11
		Identify opportunities to maximize cooperative resource protection with agencies GA20
#9 (5)	Wetlands	Light rail impacts to Bassett Creek, wetlands and natural areas
		Abundance of cattails in ponds resulting in flooding problems
		Consider watershed-wide buffer policy for wetlands, lakes, creek GA12
		Evaluate BCWMC role in wetland issues GA12
#6 (21)	Lack of Education & Information; Need for Behavior Change (Actions by Individuals)	Lack of education and knowledge among residents about condition of water and how to improve water quality
		Need better sources of information
		Disconnection of public from natural resources
		Lack of volunteer opportunities
		Too much trash
		Too many motorboats, water skiing, jet skiing
		Too much pet waste
		Too much lawn irrigation using lake water
		Mowing to edge of water, not leaving buffer
		Expectations that problems can be solved quickly with silver bullet
		Implement city staff training programs GA15
		Develop ways to demonstrate BCWMC success (evaluation metrics) GA15
		Develop new ways (using technology) to interact with public GA15
		Take advantage of education opportunities associated w/ projects GA16
		Assess and redefine roles and partnerships in educational efforts GA16
		Identify topics not adequately addressed in current education program GA16

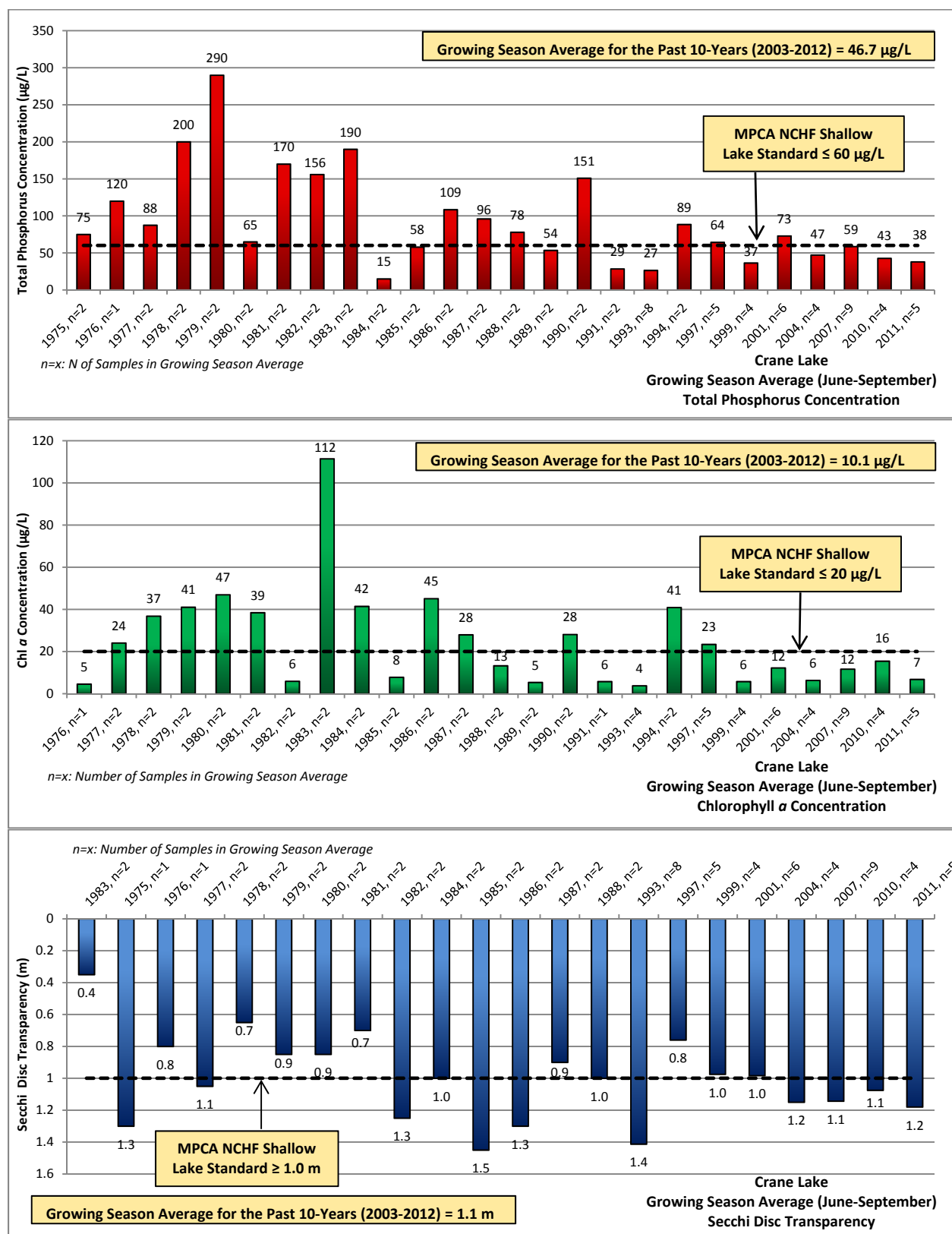
#9 (5)	Recreation Needs	Lack of public access
		Unmaintained public access sites
		No obstructions for kayaking/canoeing
		Too many weeds can be dangerous for swimming and boating
		Need to balance recreation with habitat
#3 (35)	Water Quality	Chemical pollutants in water
		Too much algae; too much phosphorus
		Low water clarity
		Fish consumption advisories
		Need to establish quantifiable water quality standards (Level I standards) GA3
		Expand/revisit list of approved BMPs GA4
		Consider infiltration requirements GA4
		Find ways to take advantage of redevelopment GA5
		Clarify roles in TMDLs GA5
		Address maintenance responsibilities for WQ management facilities GA6
		Revisit water quality monitoring programs and partnerships GA6
		Address impaired waters with CIP projects and other programs – Self Assessment (some projects not implemented)
#1 (42)	Effects of Stormwater Runoff and Development	Runoff from yards, streets, highways
		Lack of infiltration or diversion in lawns
		Salt use
		Runoff without filtration or treatment, more treatment needed
		Concentrated areas of impervious surfaces
		Chemicals and pollutants in runoff
		Runoff from older commercial/industrial areas
		Construction site erosion
		Effects of developments on waterbodies, wetlands, and water quality
		Leaks and spills from railroads
		Aging infrastructure
		Effects of dredging
		Stormwater ponds filling in, not enough storage to be effective
		Revise Plan language to require compliance with NPDES GA9
		Consider revising erosion and sediment control triggers GA9
		Evaluate existing project review triggers GA20
		Review purpose and responsibilities for erosion control inspections GA10
#2 (37)	Water Quantity, Water Levels, Flooding (including Medicine Lake)	Fluctuating water levels
		Flooding
		Need more land acquisition for flood easements
		Low water levels on Medicine Lake
		Need to study effects of Medicine Lake's possible water level manipulation on floodplain, water quality, water temperatures, overall lake health
		Address possible rate control requirements GA8
		Consider flood control objectives in all projects GA8
		Consider policies to handle conflicts betw FEMA & BCWMC flood levels GA8
#8 (13)	Flood Control Project GA18	Flood control project inspection/maintenance – streamline inspections, clarify responsibilities GA18
		Flood control project replacement – consider finances for maintenance and replacement GA18

#7 (18)	Governance, Management & Funding	Lack of funding
		Requires commitment of all 9 member cities in watershed
		Projects don't benefit enough of the population
		Lack of commitment and leadership from politicians to seek more funding to improve natural resources
		Better prioritization of projects
		Lack of city-implemented projects
		Need more tax incentive for better projects
		Need to balance management of recreational lakes vs. scenic ponds
		Pond management before lake management
		Cities make sacrifices for industry
		Need incentives or grants for homeowners to install raingardens and restore shorelines
		Develop process to evaluate cities for compliance and implementation of local water management plans GA19
		Determine if BCWMC is best entity to resolve inter-governmental issues GA19
		Refine procedures for choosing and implementing CIP projects GA20
#4 (32)	Groundwater	Groundwater quality and quantity in wells in Medicine Lake
		Lack of structure and collaboration among agencies with groundwater management responsibilities
		Need better data on impacts of groundwater usage on surface water
		Lead levels in drinking water
		Too much groundwater consumption
		Assess and define a BCWMC role in groundwater management GA13
		Incorporate MIDS site considerations and tools for GW protection GA13
		Evaluate/incorporate Dept. of Health guidance for GW protection GA14

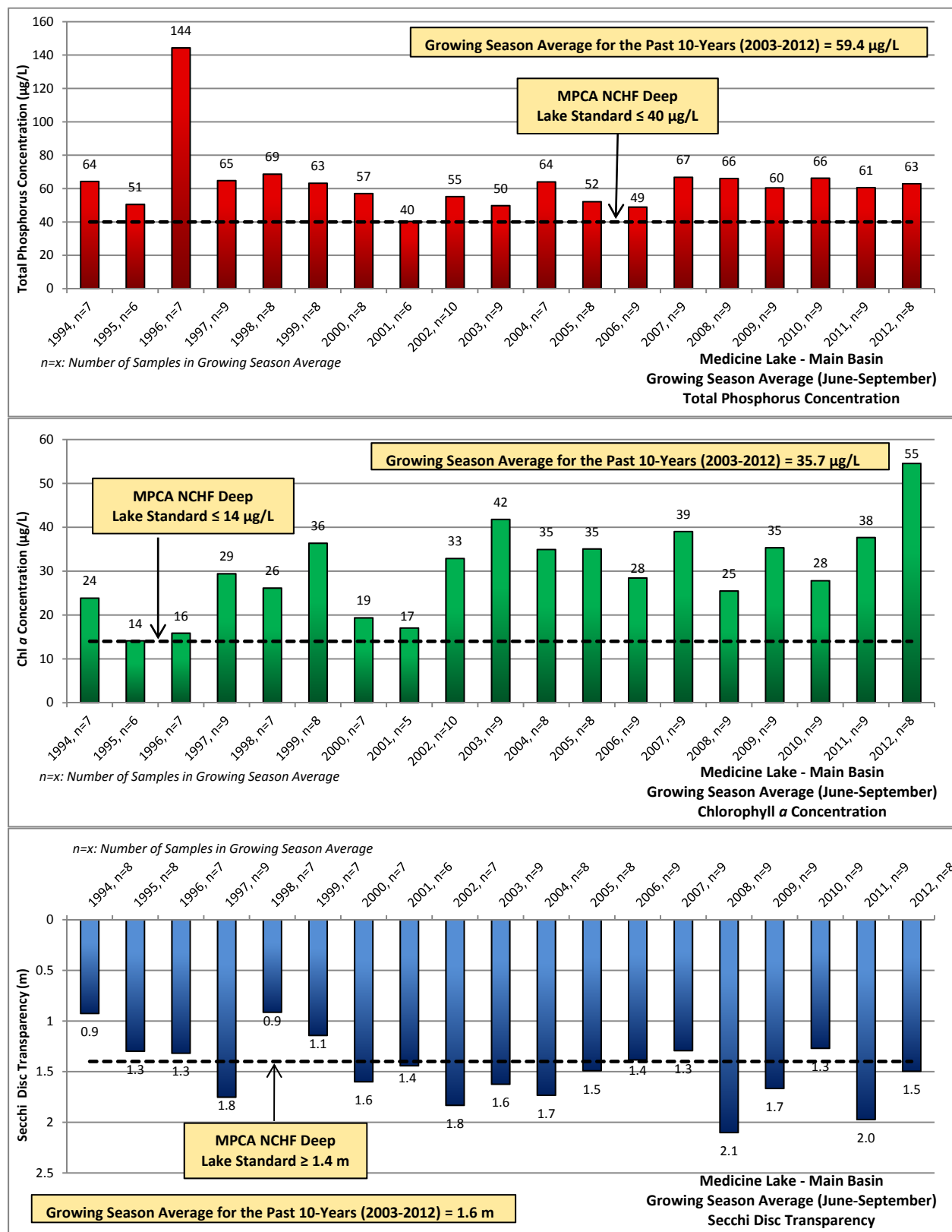
Appendix E

Water Quality Summary

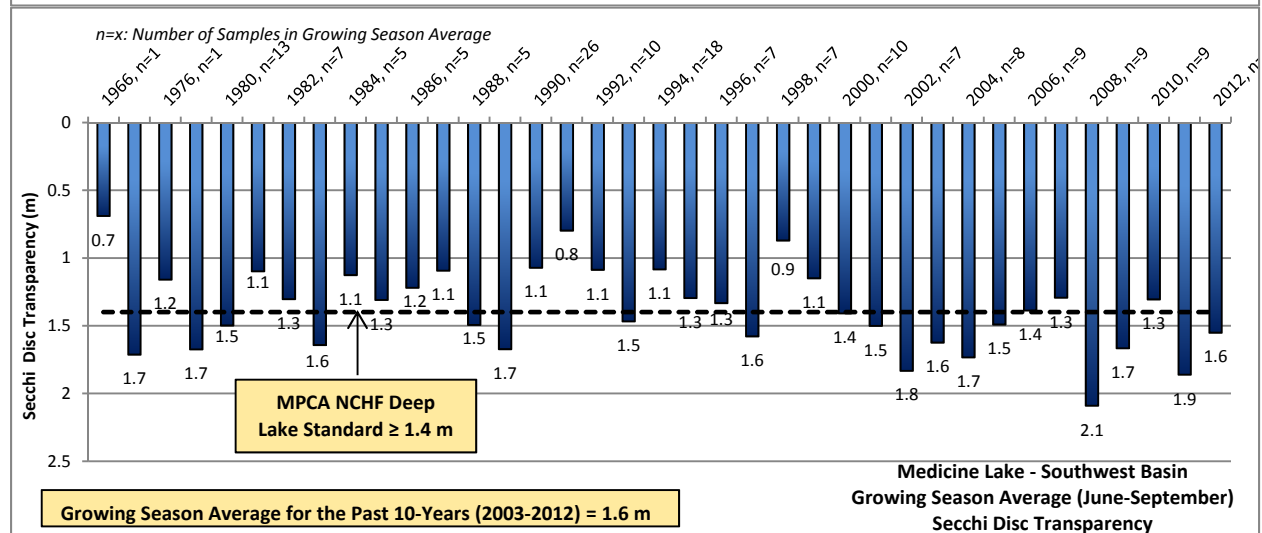
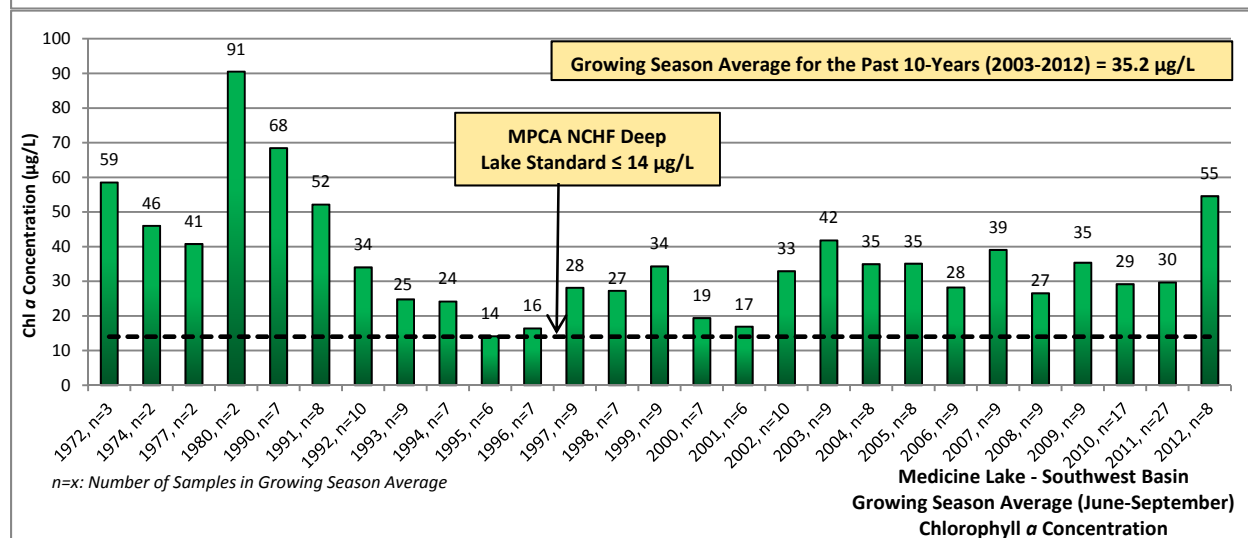
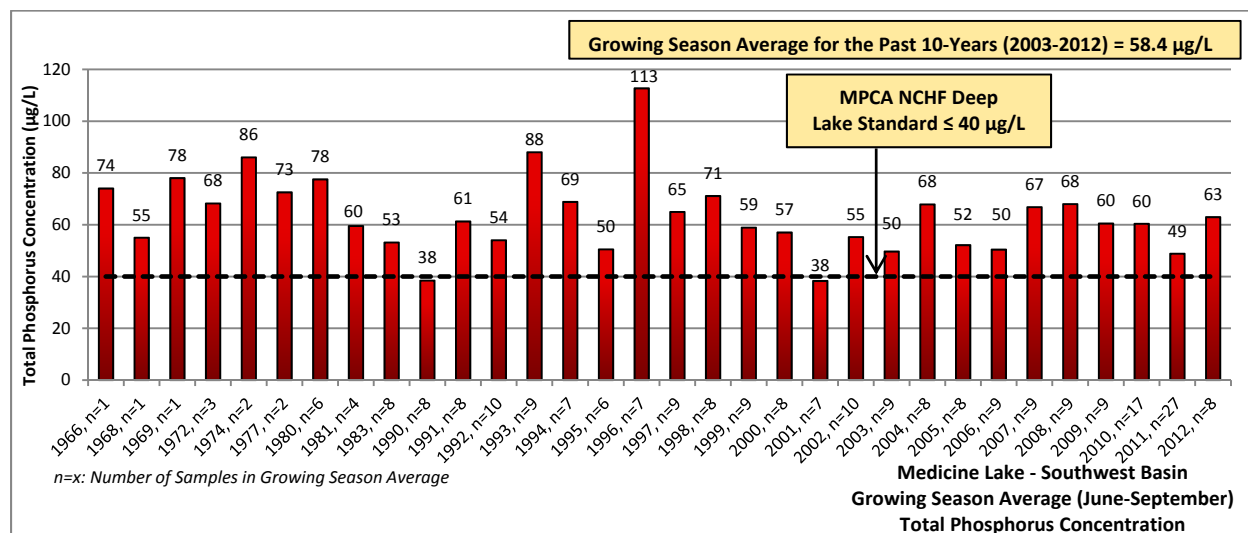
CRANE LAKE



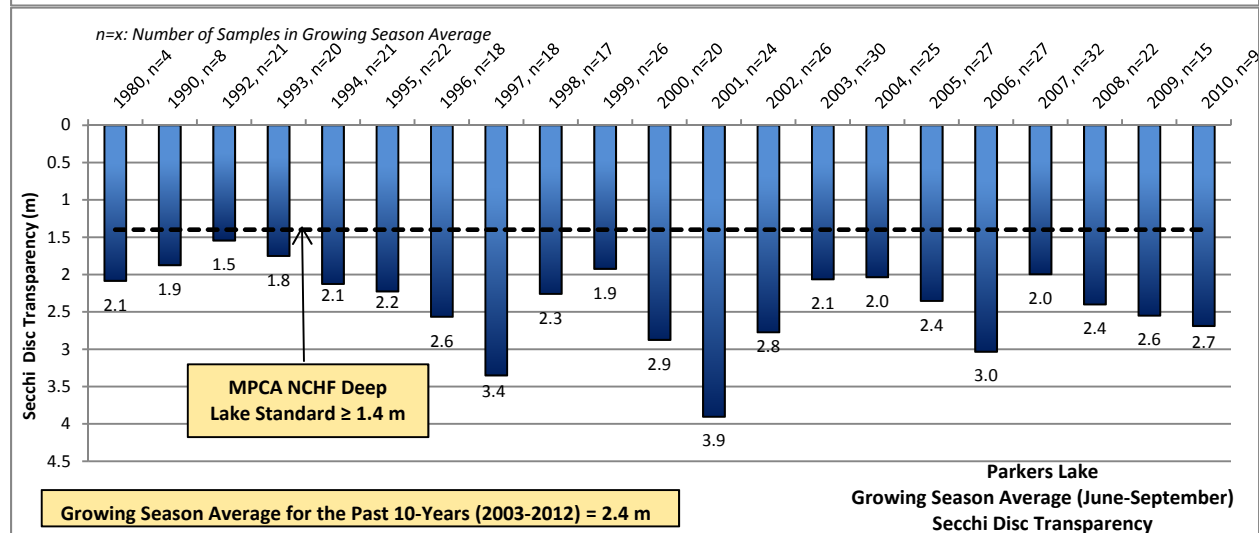
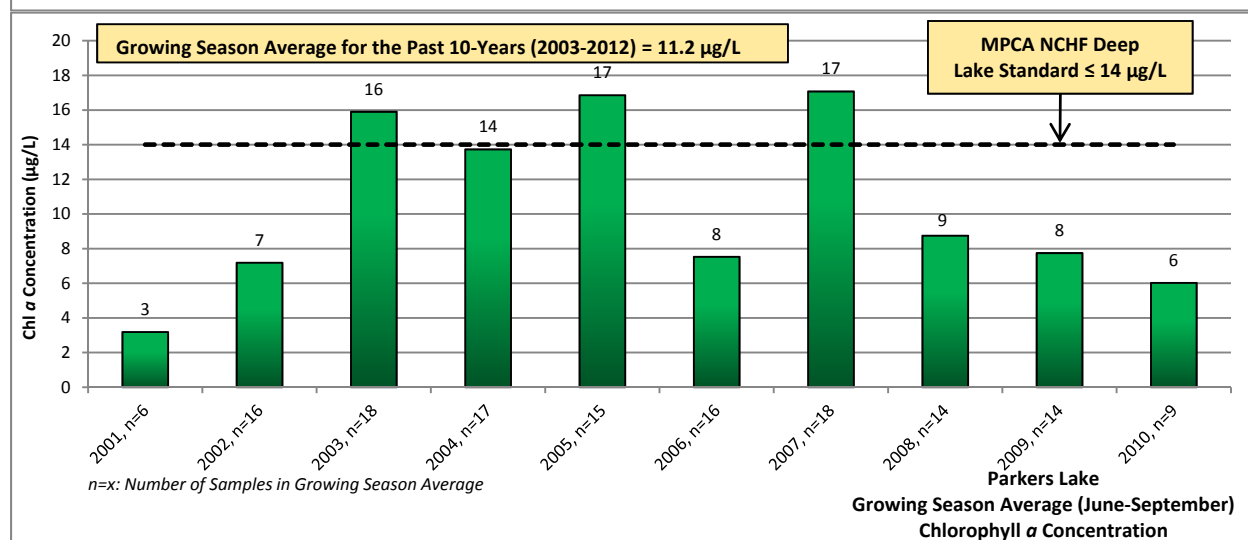
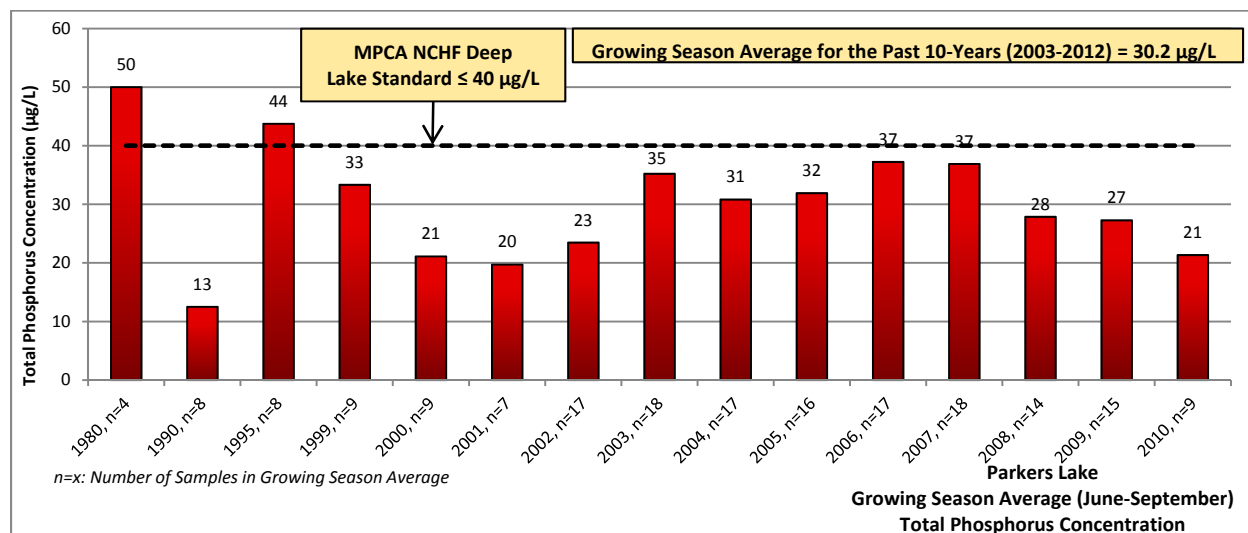
MEDICINE LAKE – Main Basin (23-0104-00-208)



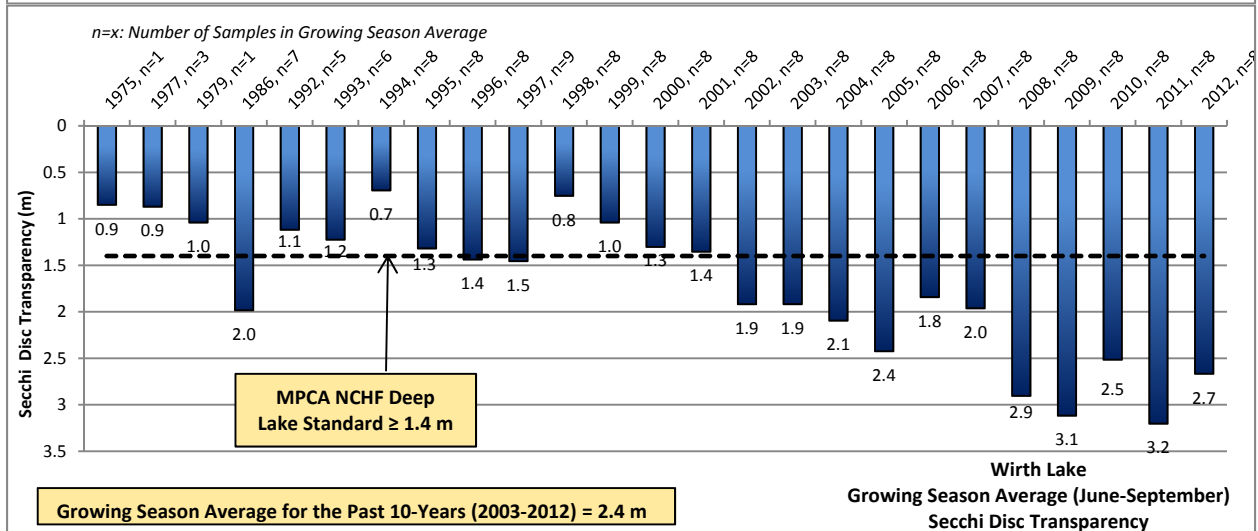
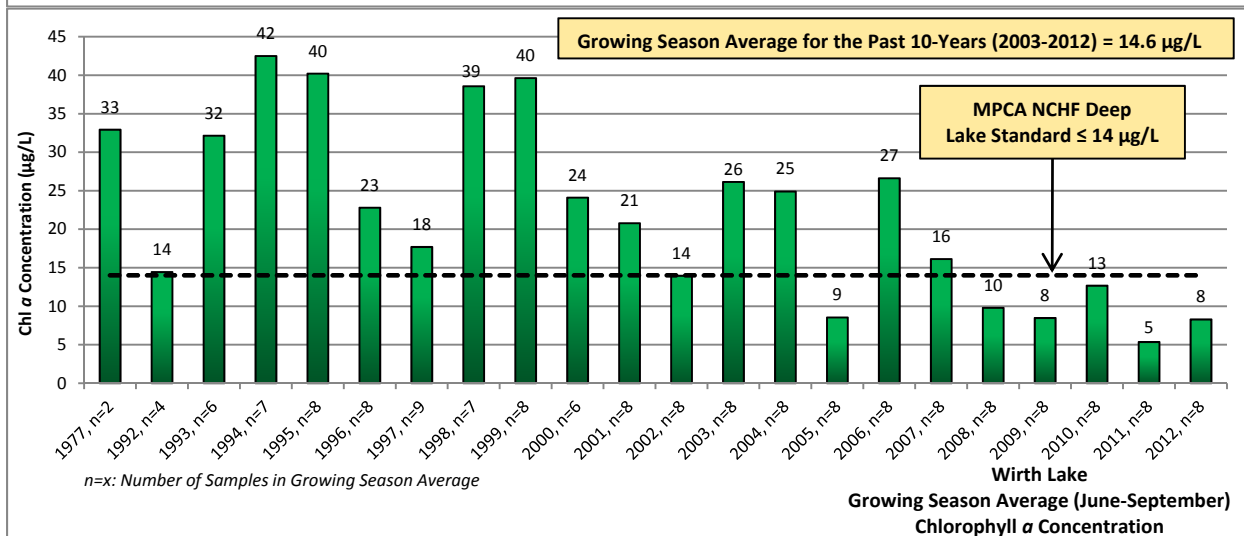
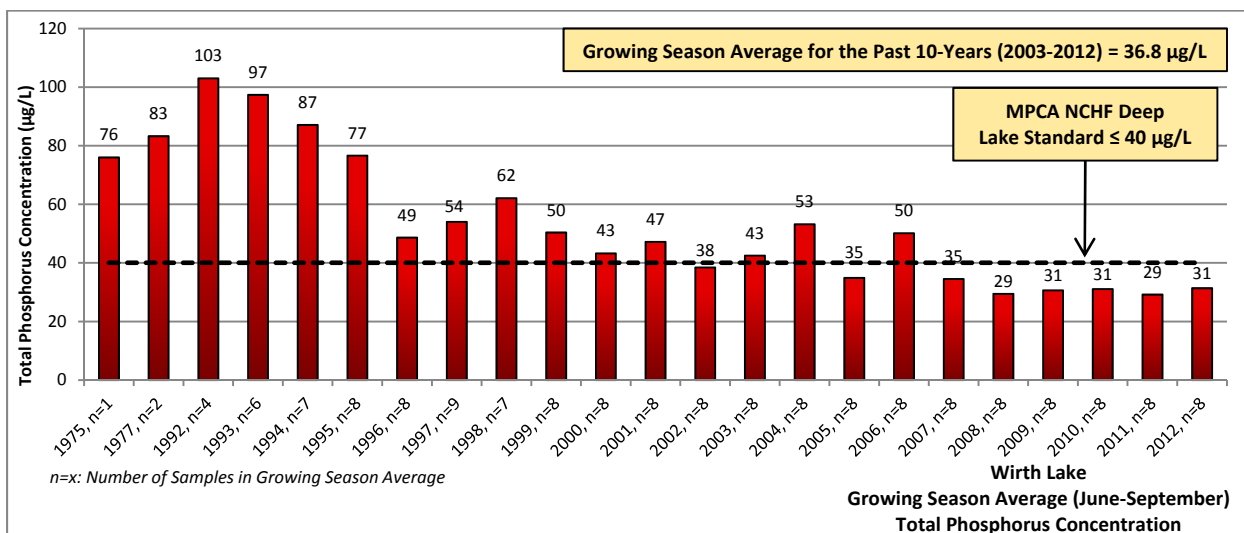
MEDICINE LAKE – Southwest Basin (23-0104-00-115)



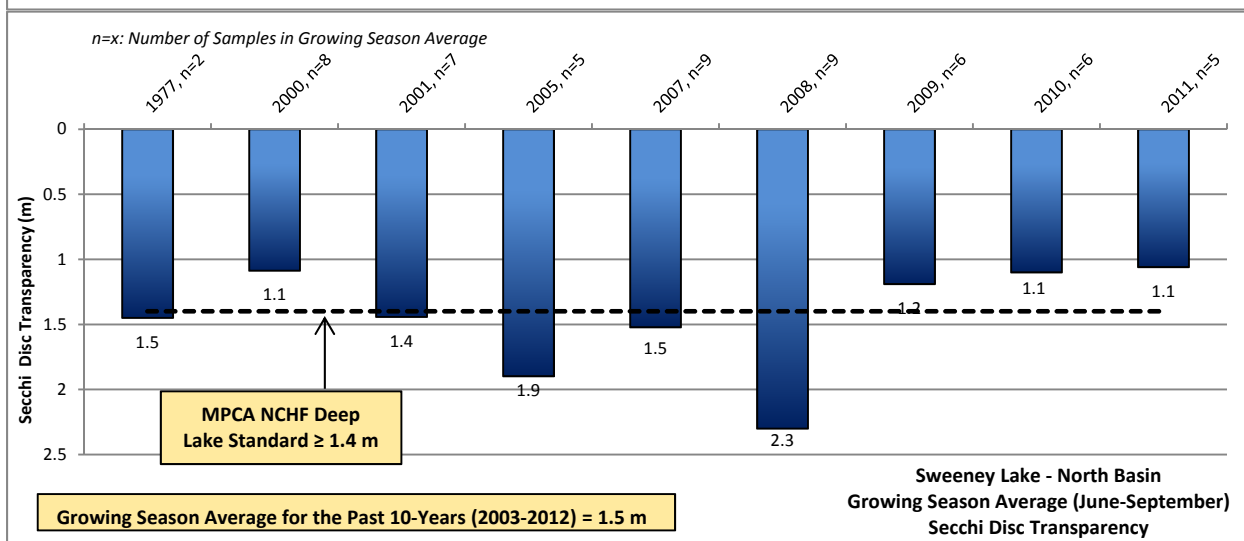
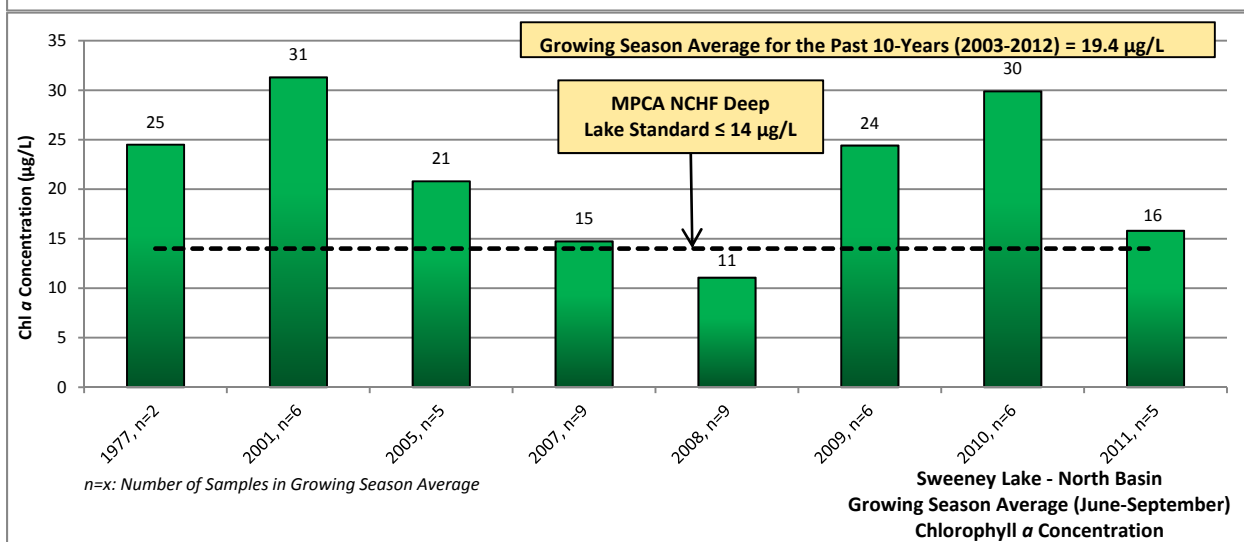
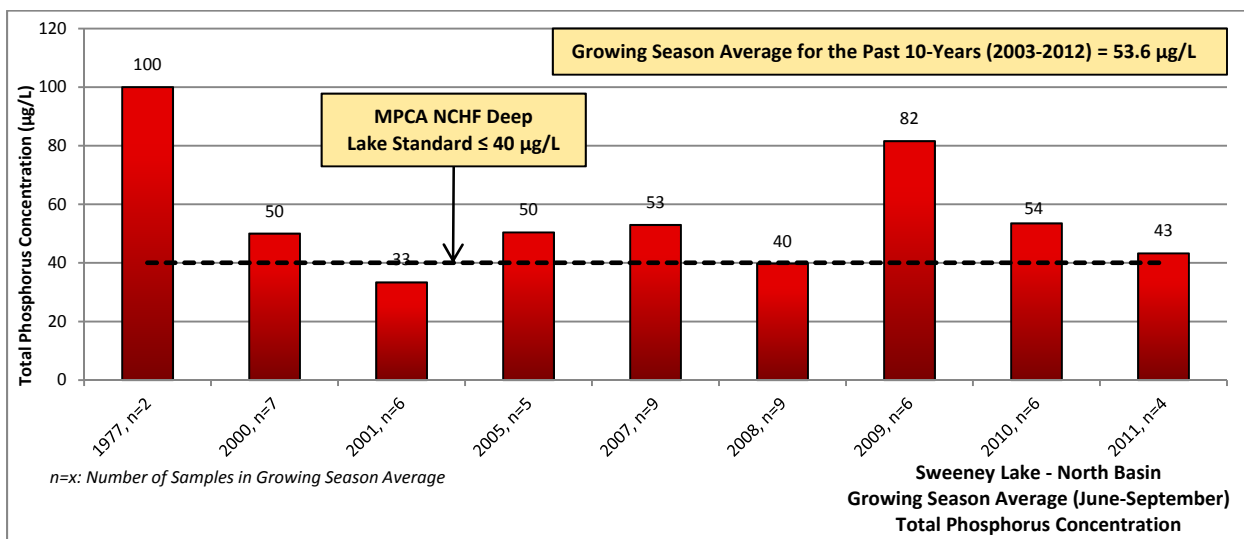
PARKERS LAKE



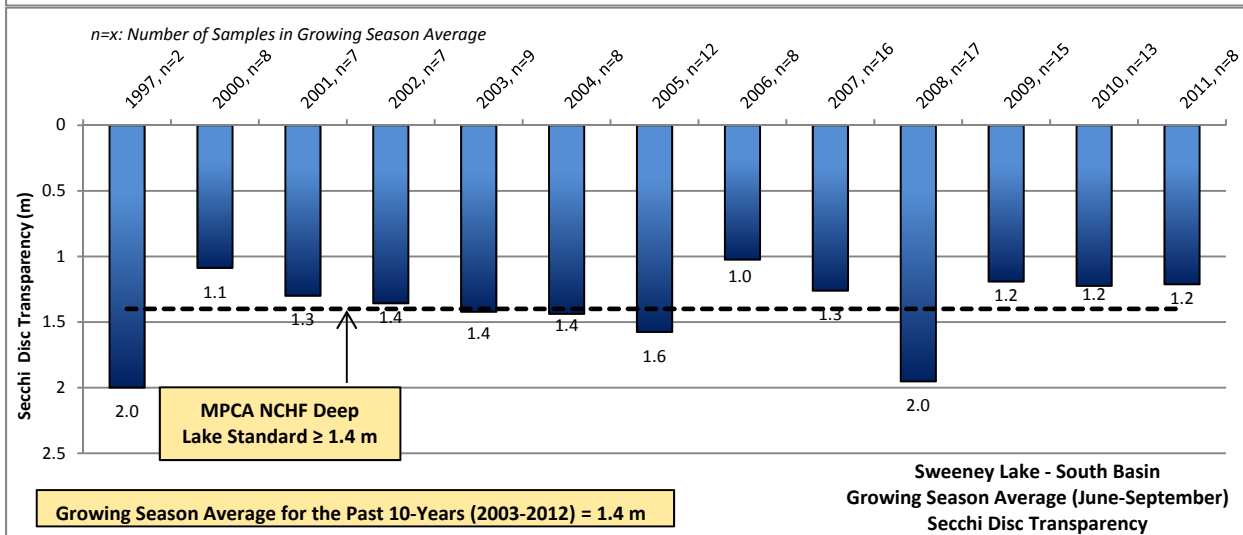
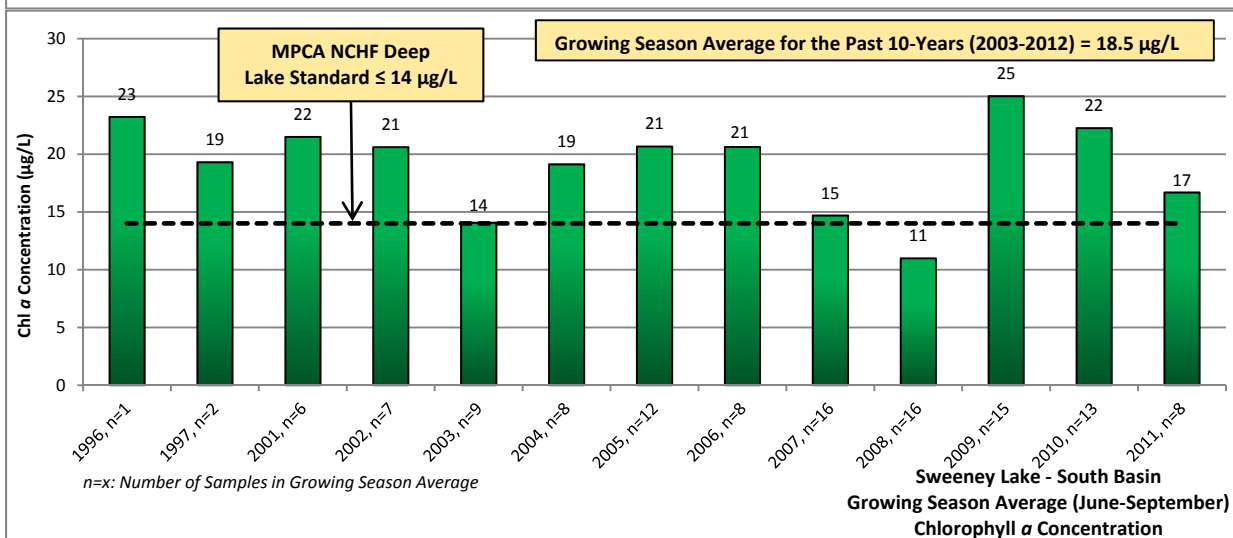
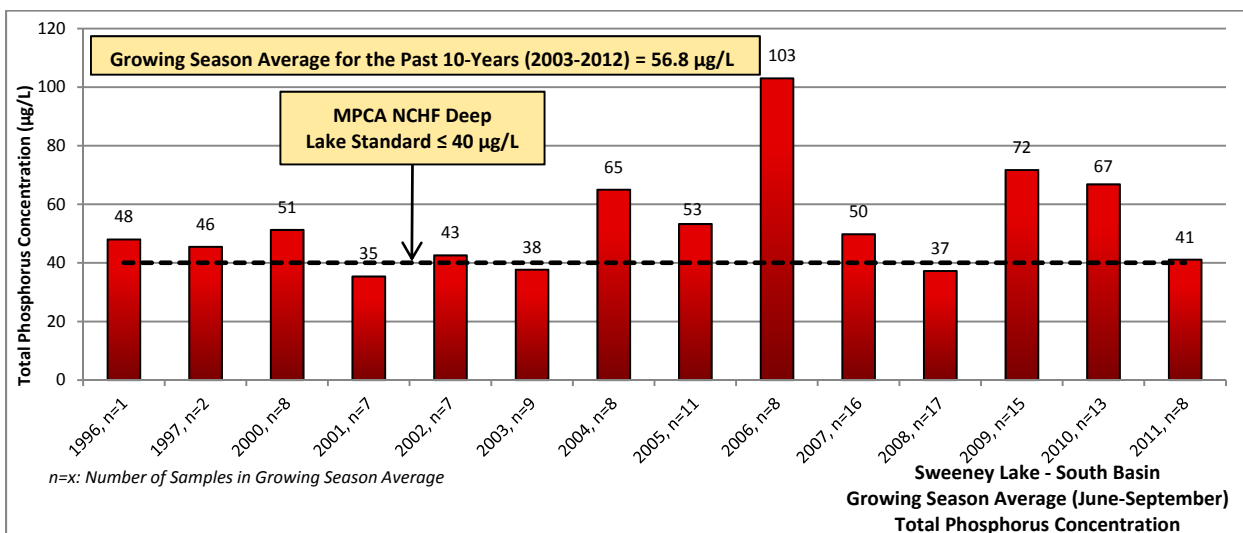
WIRTH LAKE



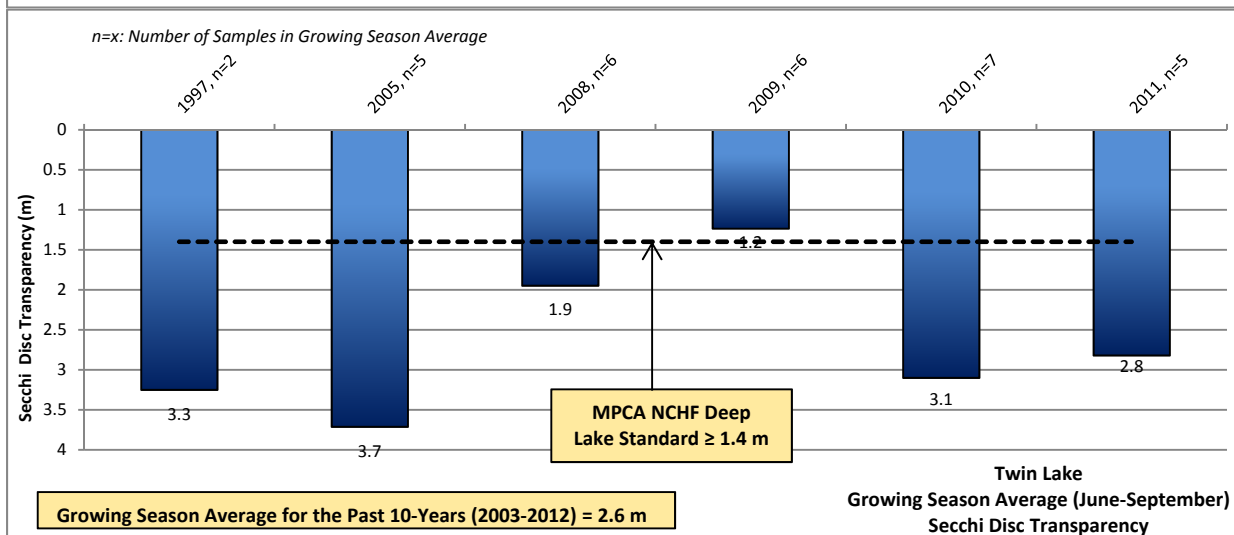
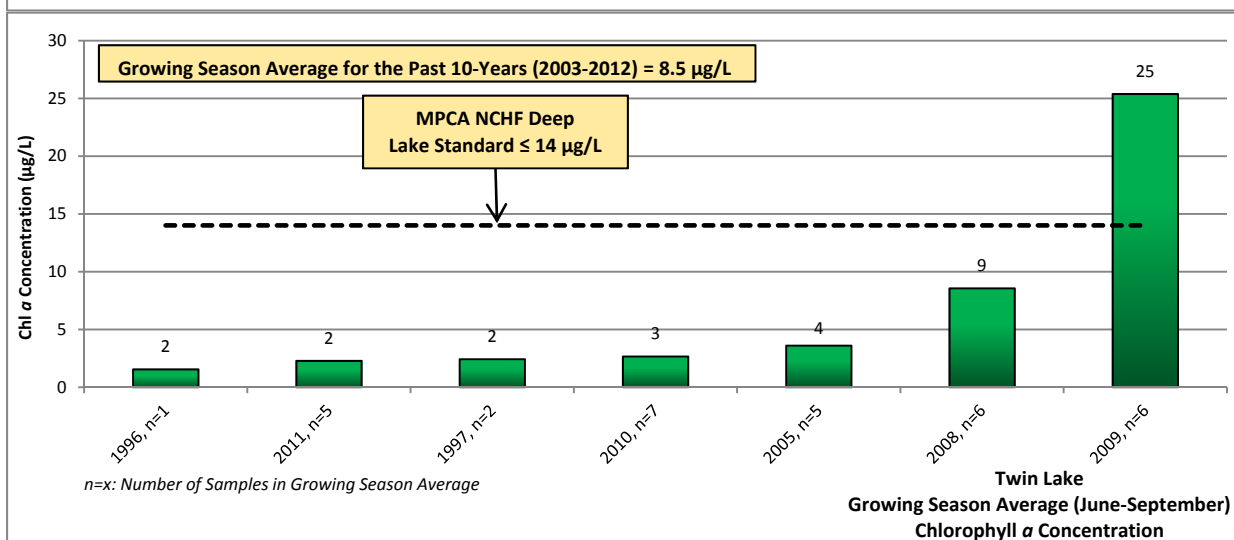
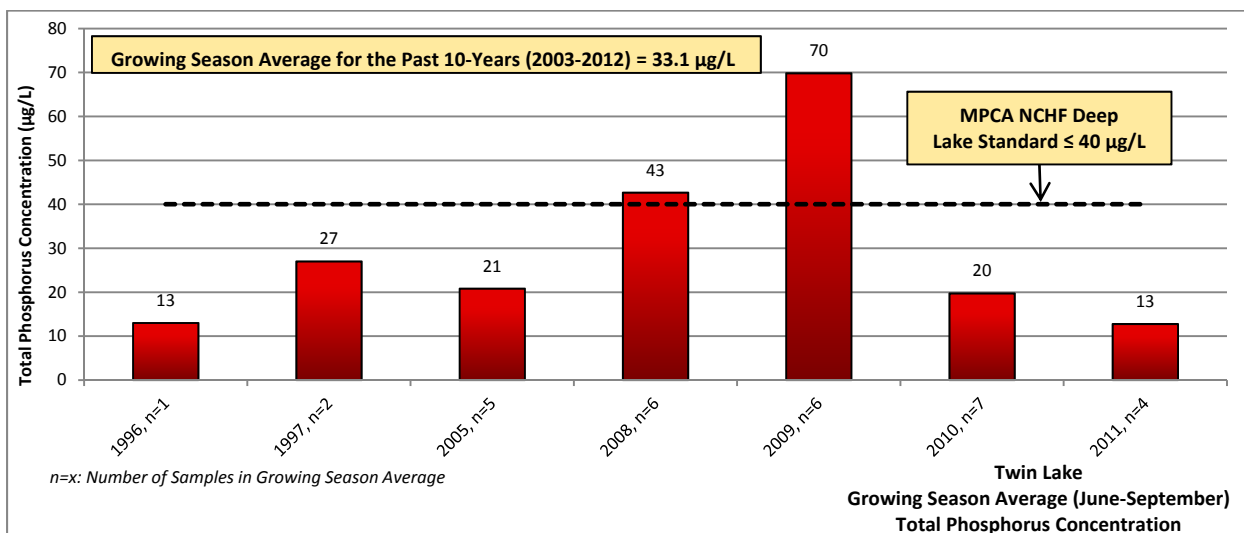
SWEENEY LAKE – North Basin (27-0035-01-201)



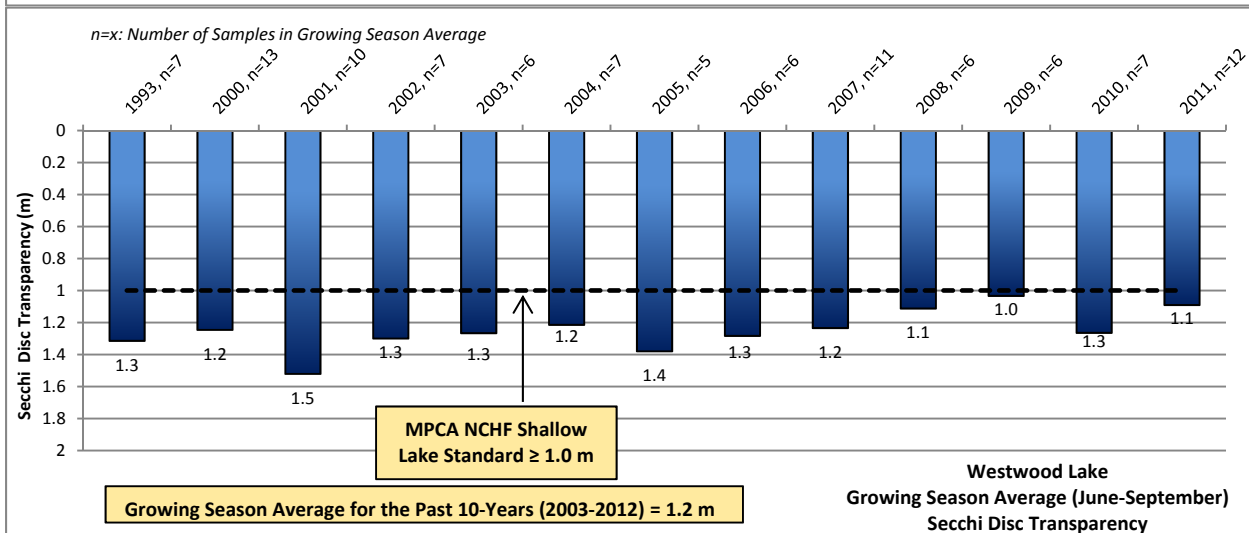
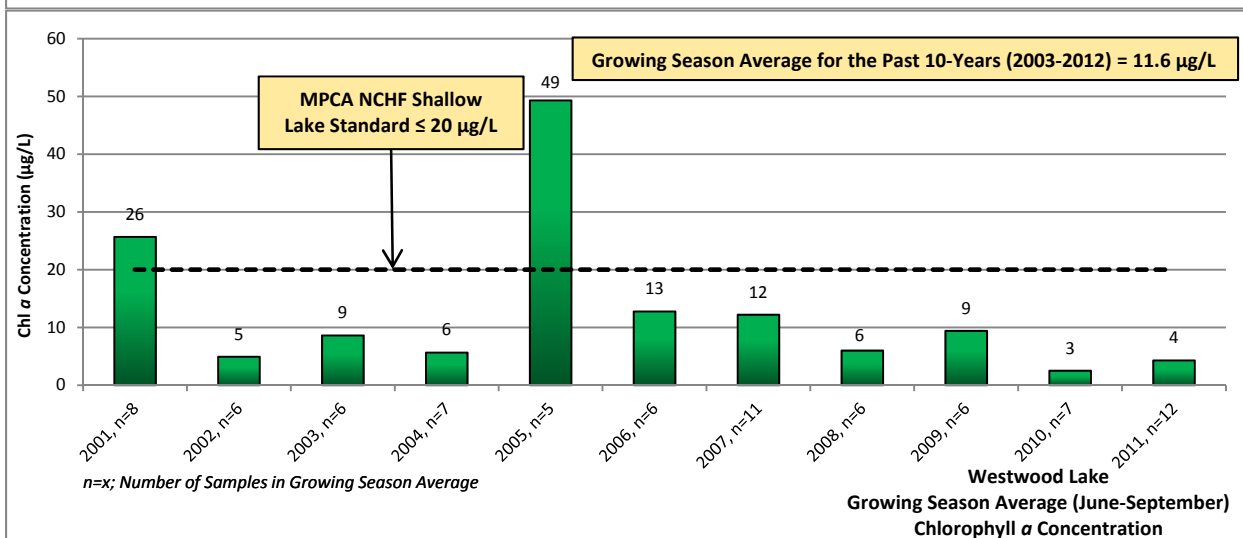
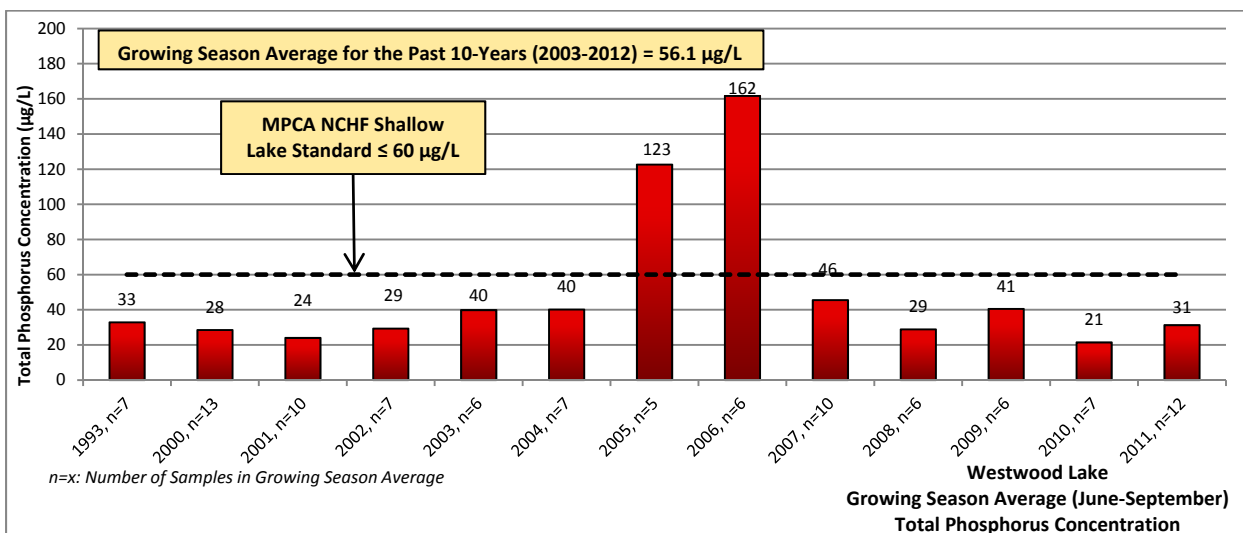
SWEENEY LAKE – South Basin (27-0035-01-101)



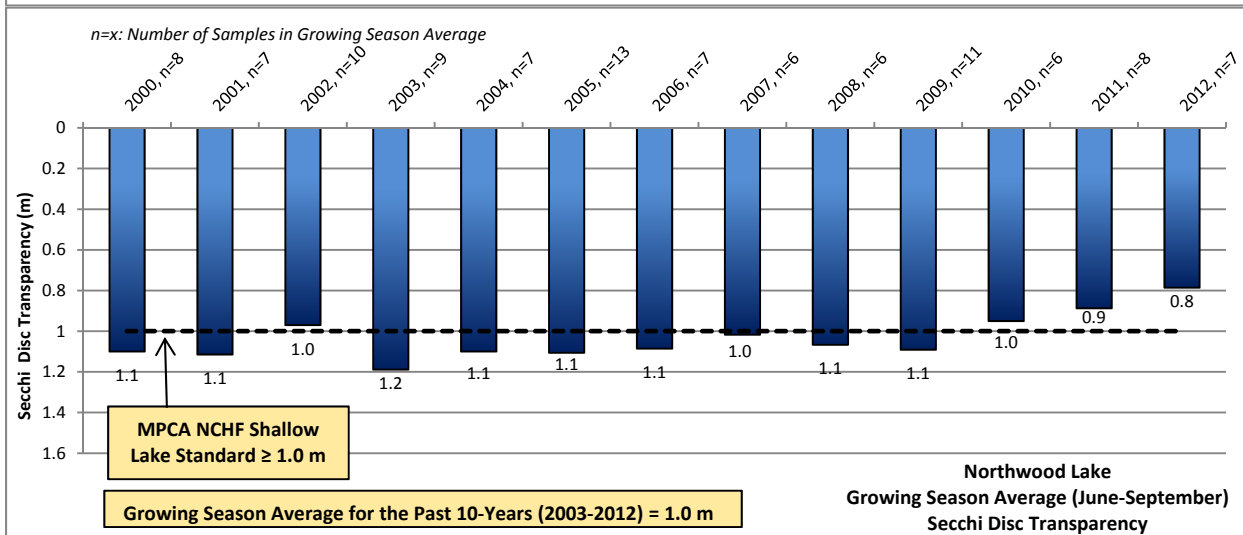
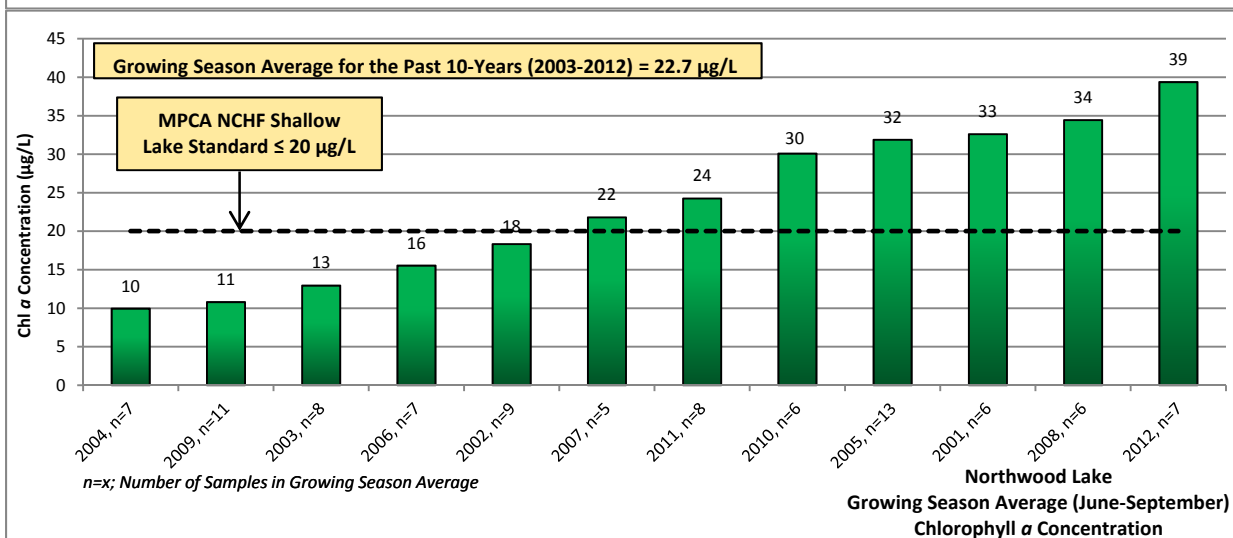
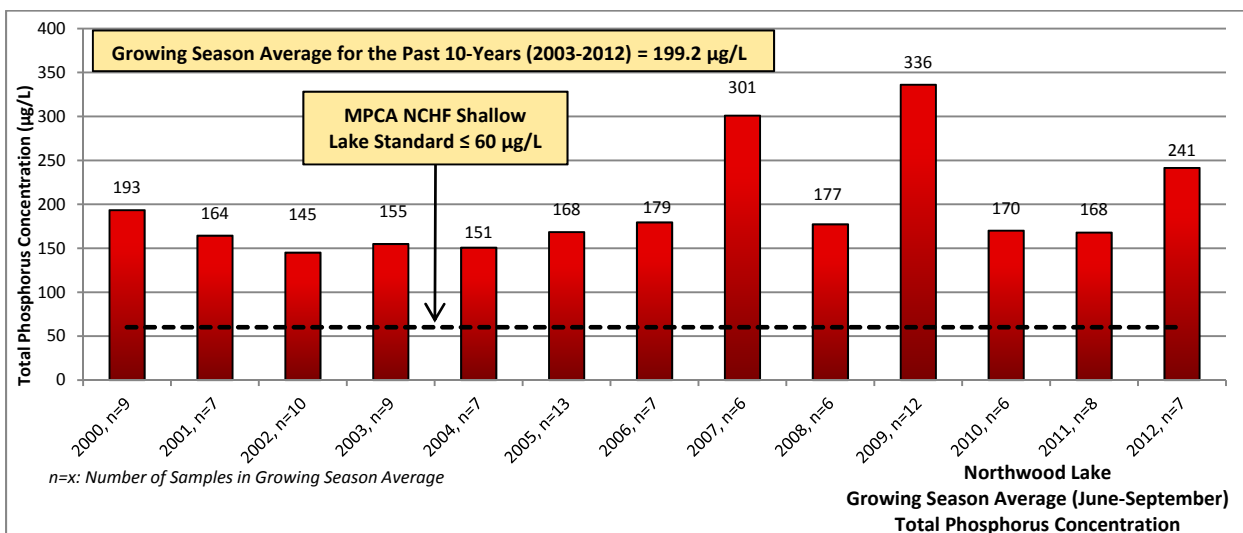
TWIN LAKE



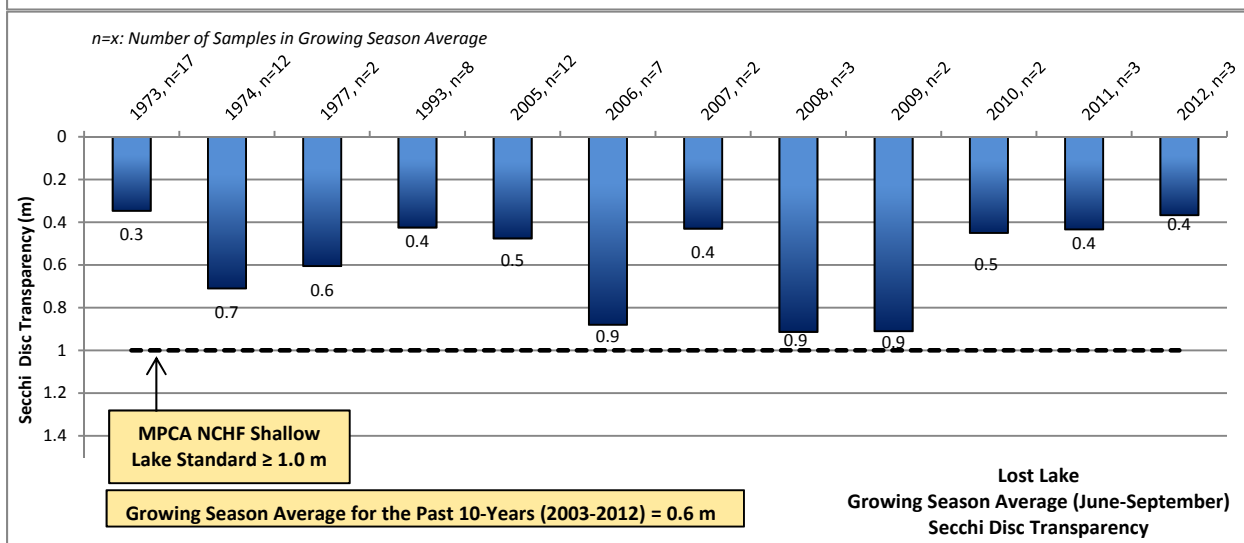
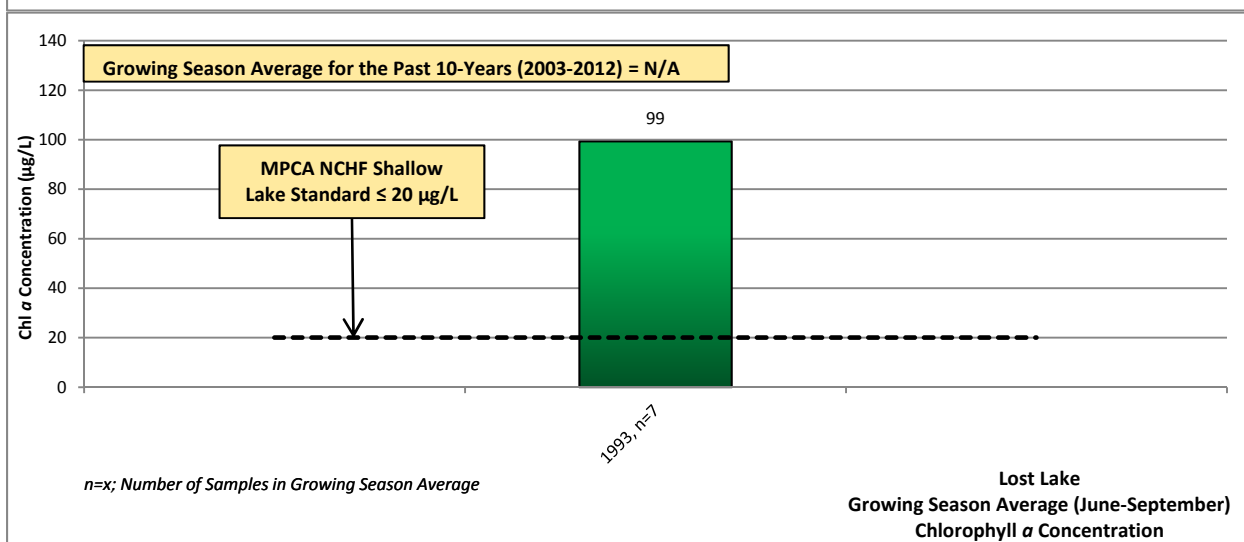
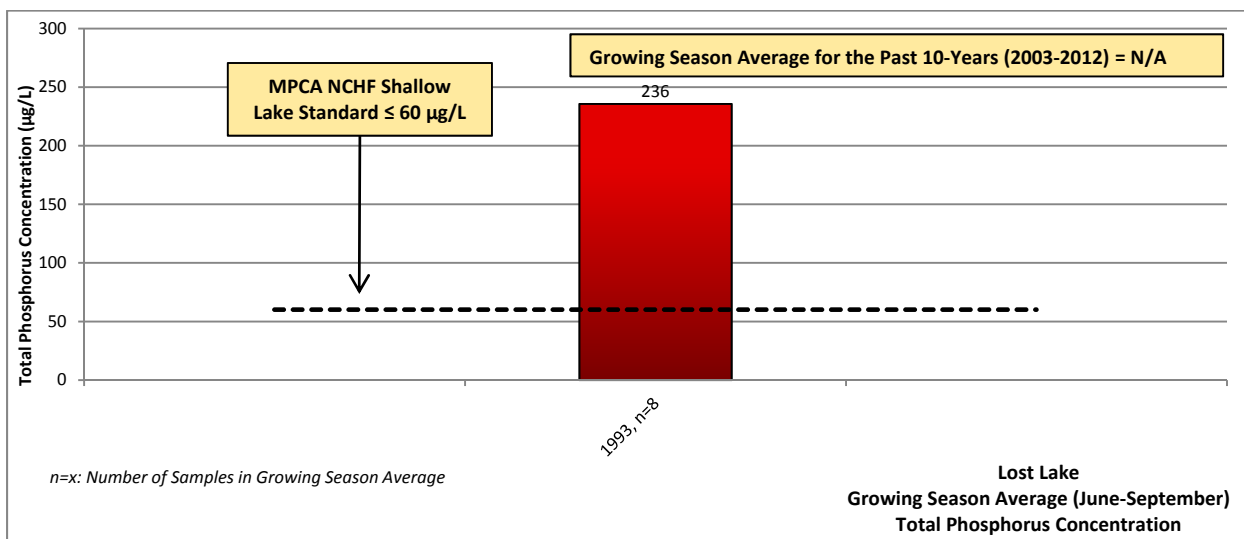
WESTWOOD LAKE



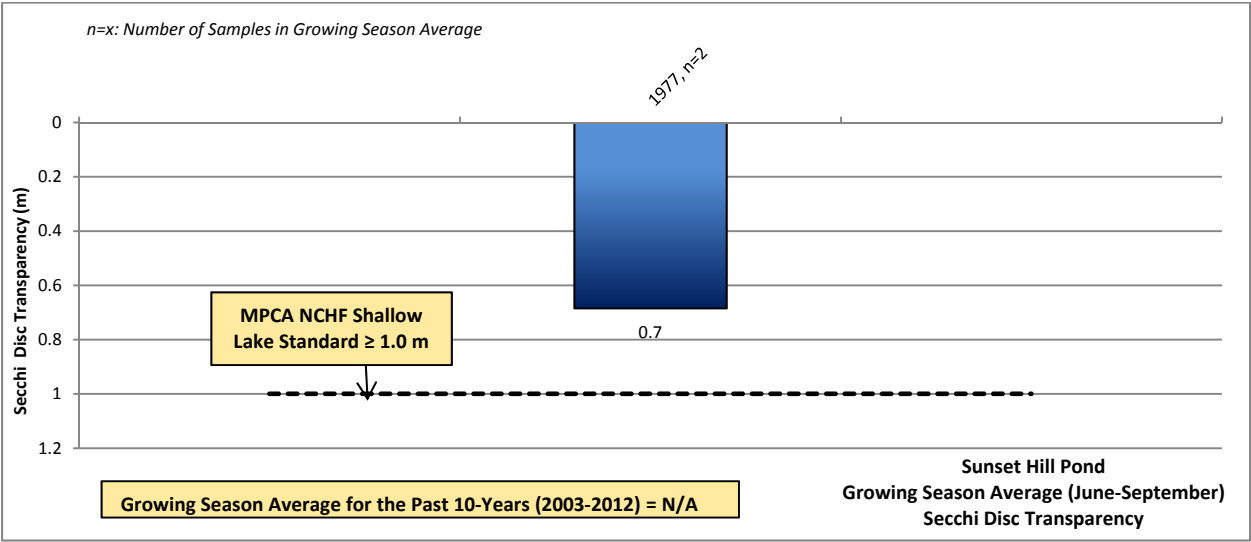
NORTHWOOD LAKE



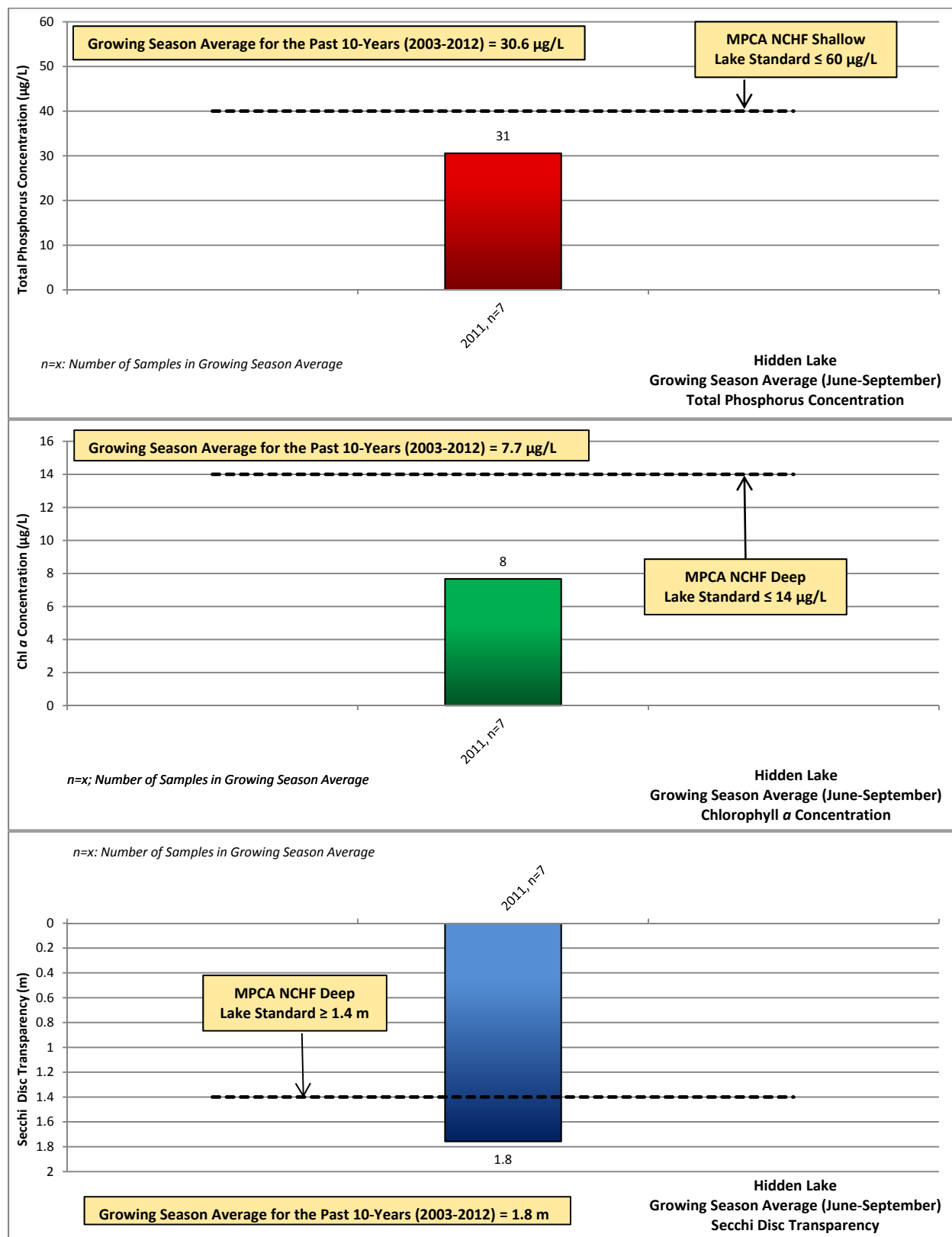
LOST LAKE



SUNSET HILL POND



HIDDEN LAKE



Appendix F

Joint Powers Agreement

**AMENDED JOINT AND COOPERATIVE AGREEMENT FOR THE
ESTABLISHMENT OF A BASSETT CREEK WATERSHED MANAGEMENT
ORGANIZATION TO PLAN, CONTROL AND PROVIDE FOR THE
DEVELOPMENT OF BASSETT CREEK**

PREFACE

In 1968, the nine cities with land in the Bassett Creek watershed entered into a joint powers agreement which established the Bassett Creek Flood Control Commission. For the past 25 years the Commission, consisting primarily of citizen volunteers and city staff members who have volunteered their time, have worked long and hard to achieve the goals set forth when the commission was established. An overall watershed management plan was prepared and approved after public hearings. The Commission has received technical advice from the United States Army Corps of Engineers in their planning and has obtained the support and aid of all United States Senators and Congressional Representatives representing the member cities. In 1976 the Commission and the Corps of Engineers were successful in having Bassett Creek included in the 1976 Water Resources Development Act (Section 173 Public Law 94-587). The Board of Engineers for Rivers and Harbors submitted a favorable report to the Secretary of the Army on March 30, 1977. The Secretary of the Army has by letter under date of June 19, 1978 notified the U.S. Congress of the approval of the Chief of Engineers.

The Bassett Creek Flood Control Commission has participated with the Minnesota Department of Transportation, the Federal Highway Administration, the City of Minneapolis and the Corps of Engineers in the planning and construction of a deep tunnel in Minneapolis which is designed to carry Bassett Creek under a portion of the City of Minneapolis. The Commission has held hearings and approved and ordered upstream construction in the cities of Golden Valley, Plymouth, Minneapolis, and

Crystal. The local share of these costs is being paid by the nine member communities pursuant to an agreement consistent with the funding requirements set forth in Articles VII and VIII of the joint powers agreement which has been in effect from 1968 to 1993. The prior joint powers agreement contained the following "Statement of Intent":

STATEMENT OF INTENT REGARDING
AGREEMENT

"Bassett Creek leaves Medicine Lake and flows generally eastward through the Village of Medicine Lake, Plymouth, Golden Valley and into the City of Minneapolis. In Minneapolis, the creek is channeled into a conduit and runs underground to the Mississippi River to its eventual outfall. As the creek runs through the aforementioned communities it collects storm waters and in effect acts as the storm sewer for a large densely populated area and large unpopulated area. It also carries waters channeled to it or naturally flowing to it from the Villages of Minnetonka and New Hope and the Cities of Crystal, Robbinsdale, and St. Louis Park.

For a long time the improvement and development of this creek to carry the increased quantity of storm water has been needed to allow for the orderly planning and development of the up-stream communities who must rely on the creek as the outfall for storm waters collected or naturally flowing from areas within these communities. As the communities contributing water to the creek have grown, and the lands naturally draining into the creek have been covered with buildings and hard surfaced areas, the ability of the creek and its appurtenant facilities to accommodate the water has diminished. Studies have been conducted by the municipalities both individually and collectively and a study has been made by the United States Army Corps of Engineers. The threat of flood damage increases each year with the increased use of land in the watershed area.

The nine member communities have been meeting over a number of years in an effort to solve the storm water problems in the watershed drained by Bassett Creek. Each year it becomes more apparent that solutions must be sought to allow for a more orderly and efficient planning of the area and to allow the individual communities to plan storm sewer facilities which must be constructed to serve lands within the individual communities. It is also apparent to all nine municipalities that planning and construction to control the Bassett Creek cannot be done on the basis of each community looking at its individual problems. The creek downstream must be improved to accommodate the waters which will eventually be channeled and diverted to the outfall. To determine the downstream improvements it is necessary to know how much water will be contributed by the individual communities upstream and how much storm water will be retained in ponding areas upstream and the area of lands within the watershed which will be controlled by the individual communities as "open lands" and which will not contribute as much storm water as lands which are developed residentially, commercially, or for industrial purposes.

All of the nine communities within the Bassett Creek watershed recognize the aforestated problems. In seeking solutions to the overall drainage problem it becomes apparent that the only way the problems can be solved is by joint planning, joint cooperation, joint financing and a sincere desire on the part of each community to solve the overall drainage problem within the watershed. This means that some agency, commission, district, corporation, political subdivision, or other vehicle must be found to plan and finance improvements to and to control the development of lands within the watershed. Chapter 112 of the Minnesota Statutes provides for the formation of a watershed district with the powers and duties of conserving and controlling water and watercourses within a watershed. The creation of such a district creates a new political subdivision with the power to sue or be sued, to incur debts, liabilities and obligations, to exercise the powers of eminent domain, to provide for assessments, to borrow money and issue bonds and to do all other acts necessary to carry out the powers vested in the district by said Chapter 112. The managers of the district would be appointed by the Minnesota Water Resources Board and subsequent appointments would be by the Board of County Commissioners of Hennepin County. It is the belief of the parties to this agreement that the creation of such a district would remove control one step further from the electorate and the residents of this watershed area who ultimately would pay the costs of the aforesaid improvements. It would also create another political subdivision which would have to plan and work with the individual parties to this agreement to solve the storm water and drainage problems within the watershed.

The purpose of this statement of intent regarding the agreement is to clarify and establish for any court of review or any arbitrator or for the elected successors to the representatives who have entered into this agreement, the reasons and purposes for this joint and cooperative agreement. The parties to this agreement realize that the success or failure of the Bassett Creek Flood Control Commission created by this agreement is dependent upon the sincere desire of each member community to cooperate in the exercise of a joint power to solve a joint problem. Each party to this agreement pledges this cooperation."

It is the intent of this amended agreement to carry forward the same purposes as aforestated and to revise the Joint Powers Agreement to meet the mandates of Minnesota Statutes, Sections 103B.201 through 103B.251 and Minnesota Rules Chapter 8410 relating to "Metropolitan Area Local Water Management". This amended agreement shall continue the existence of a Watershed Management Organization in accordance with the provisions of the Metropolitan Surface Water Management Act as set forth in Minnesota Statutes 1992 Sections 103B.201 to and including 103B.251. The organization hereby created shall have all of the powers and

responsibilities set forth in said statutes for the Bassett Creek Watershed. The purpose of the organization shall be to assist the 9 member communities to preserve and use natural water storage and retention systems to:

1. Protect, preserve, and use natural surface and groundwater storage and retention systems;
2. Minimize public capital expenditures needed to correct flooding and water quality problems;
3. Identify and plan for means to effectively protect and improve surface water and groundwater quality;
4. Establish more uniform local policies and official controls for surface water and groundwater quality;
5. Prevent erosion of soil into surface water systems;
6. Promote groundwater recharge;
7. Protect and enhance fish and wildlife habitat and water recreational facilities;
8. To secure other benefits associated with the proper management of surface water.
9. To promote and encourage cooperation among member cities in coordinating local surface water and groundwater plans and to be aware of their neighbor's problems and to protect the public health, safety, and general welfare.
10. To continue the work of the Bassett Creek Water Management Commission and to carry out the plans, policies and programs developed by said Commission from 1968 to 1993.

JOINT AND COOPERATIVE AGREEMENT

The parties to this Agreement are governmental units of the State of Minnesota, all of which have lands which drain surface water into Bassett Creek and all of which have power to construct, reconstruct, extend and maintain storm water management facilities. This agreement is made pursuant to the authority conferred upon the parties by Minnesota Statutes 1992, Sections 471.59 and 103B.201 to and including Section 103B.251.

NAME

I.

The parties hereto create and establish the Bassett Creek Watershed Management Commission.

GENERAL PURPOSE

II.

The general purpose of this agreement is to provide an organization which can investigate, study, plan and control the construction of facilities to drain or pond storm waters, to alleviate damage by flood waters; to improve the creek channel for drainage; to assist in planning for land use; to repair, improve, relocate, modify, consolidate or abandon, in whole or in part, drainage systems within the watershed area; and to do whatever is necessary to assist in water conservation and the abatement of surface water and groundwater contamination and water pollution. In addition to the aforestated purposes, the organization hereby created shall serve as the organization for the Bassett Creek watershed and shall carry out all of the duties and responsibilities outlined in Minnesota Statutes, Section 103B.201 through 103B.251, both inclusive.

DEFINITIONS

III.

For the purposes of this agreement, the terms used herein shall have the meanings as defined in this article.

Subdivision 1. "Commission" means the organization created by this agreement, the full name of which is "Bassett Creek Watershed Management Commission." It shall be a public agency of its members.

Subdivision 2. "Board" means the Board of commissioners of the Commission, consisting of one commissioner or one alternate commissioner from each of the governmental units which is a party to this agreement and which shall be the governing body of the Commission.

Subdivision 3. "Council" means the governing body of a governmental unit which is a member of this Commission.

Subdivision 4. "Governmental Unit" means any city, county, or town.

Subdivision 5. "Member" means a governmental unit which enters into this agreement.

Subdivision 6. "Bassett Creek Watershed" means the area contained within a line drawn around the extremities of all terrain whose surface drainage is tributary to Bassett Creek and within the mapped areas delineated on the map filed with the Board of Water and Soil Resources originally filed pursuant to Minnesota Statutes, 473.877 Subd. 2 and as now amended by Minnesota Statutes, Chapter 103B.

MEMBERSHIP

IV.

The membership of the Commission shall consist of all of the following governmental units as shall elect, through resolution or

ordinance adopted by their respective Councils, to become members:

City of Crystal

City of Golden Valley

City of Medicine Lake

City of Minneapolis

City of Minnetonka

City of New Hope

City of Plymouth

City of Robbinsdale

City of St. Louis Park

(The foregoing list is intended to include all governmental units which are presently partially or entirely within the Bassett Creek Watershed.)

No change in governmental boundaries, structure or organizational status shall affect the eligibility of any governmental unit listed above to be represented on the Commission, so long as such governmental unit continues to exist as a separate political subdivision.

BOARD OF COMMISSIONERS

V.

Subdivision 1. The governing body of the Commission shall be its Board. Each member shall be entitled to appoint one representative on the Board, and one alternate who may sit when the representative is not in attendance and said representative or alternate representative shall be called a "Commissioner".

Subdivision 2. The council of each member shall determine the eligibility or qualification of its representative on the Commission but the terms of each Commissioner shall be as established by this agreement.

Subdivision 3. The term of each Commissioner and Alternate

Commissioner appointed by each member shall be three years and until their successors are selected and qualify and shall commence on February 1, except that the terms of the Commissioners first appointed shall commence from the date of their appointment and shall terminate as follows:

- a. The Commissioners appointed by the Cities of Crystal, Golden Valley, and Medicine Lake shall terminate on February 1, 1994.
- b. The Commissioners appointed by the Cities of Minneapolis, Minnetonka, and New Hope shall terminate on February 1, 1995.
- c. The Commissioners appointed by the Cities of Plymouth, Robbinsdale, and St. Louis Park shall terminate on February 1, 1996.

Any vacancy shall be filled for the unexpired term of any Commissioner by the council of the governmental unit of the member who appointed said Commissioner. The Commission shall notify the Board of Water and Soil Resources of member appointments and vacancies within 30 days after the Commission is notified by a member. Each member agrees to publish a notice of vacancies resulting from the expiration of a Commissioner's or Alternate Commissioner's term or where a vacancy exists for any reason. Publication and notice shall be in accordance with Minnesota Statutes, Section 103B.227, Subds. 1 and 2, as they now exist or as subsequently amended.

Subdivision 4. The council of each member agrees that its representative commissioner will not be removed from the Board prior to the expiration of the Commissioner's term, unless said Commissioner consents in writing or unless said council has presented the Commissioner with charges in writing and has held a public hearing after reasonable notice to

the Commissioner. A member may remove a Commissioner or an Alternate Commissioner for just cause or for violation of a Code of Ethics established by the Commission or by the Member City or for malfeasance, nonfeasance, or misfeasance. Said hearing shall be held by the Member City Council who appointed the Commissioner. A Commissioner or Alternate Commissioner who is an elected officer of a Member City who is not reelected may be removed by the appointing Member City at the appointing Member's discretion. Any decision by a Member to remove a Commissioner or Alternate Commissioner may be appealed to the Board of Water and Soil Resources. A certified copy of the Council's Resolution removing said Commissioner shall be filed with the Secretary of the Board of Commissioners and shall show compliance with the terms of this section.

Subdivision 5. Each member shall within 30 days of appointment file with the Secretary of the Board of Commissioners a record of the appointment of its Commissioner and Alternate Commissioner. The Commission shall notify the Board of Water and Soil Resources of Member appointments and vacancies within 30 days after receiving notice from the Member. Members shall fill all vacancies within 90 days after the vacancy occurs.

Subdivision 6. Commissioners shall serve without compensation from the Commission, but this shall not prevent a governmental unit from providing compensation for its Commissioner for serving on the Board, if such compensation is authorized by such governmental unit and by law. Commission funds may be used to reimburse a Commissioner or Alternate Commissioner for expenses incurred in performing Commission business and if authorized by the Board.

Subdivision 7. At the first meeting of the Board and in February

of each year thereafter, the Board shall elect from its Commissioners a Chair, a Vice Chair, a Secretary, a Treasurer, and such other officers as it deems necessary to conduct its meetings and affairs. At the organizational meeting or as soon thereafter as it may be reasonably done, the Commission shall adopt rules and regulations governing its meetings. Such rules and regulations may be amended from time to time at either a regular or a special meeting of the Commission provided that a ten day prior notice of the proposed amendment has been furnished to each person to whom notice of the Board meetings is required to be sent; a majority vote of all eligible votes of the then existing members of the Commission shall be sufficient to adopt any proposed amendment to such rules and regulations.

The Board shall notify each Member City of the location and time of regular and special meetings called by the Board. A meeting shall be held at least annually, and all meetings shall be called and open to the public pursuant to Minnesota Statutes, Section 471.705, or as amended.

POWERS AND DUTIES OF THE BOARD

VI.

Subdivision 1. The Commission, acting by its duly appointed Board of Commissioners, shall as it relates to flood control, water quality, ground water recharge and water conservation or in its construction of facilities and other duties as set forth in Minnesota Laws have the powers and duties set out in this article.

Subdivision 2. It may employ such persons as it deems necessary to accomplish its duties and powers. Any employee may be on a full time, part time or consulting basis as the Board determines.

Subdivision 3. It may contract for space and for material and supplies to carry on its activities either with a member or elsewhere.

Subdivision 4. It may acquire necessary personal property to carry out its powers and its duties.

Subdivision 5. It shall develop an overall plan containing a capital improvement program within a reasonable time after qualifying, and said plan shall meet all of the requirements as established in Minnesota Statutes, Chapter 103B. Said overall plan shall establish a comprehensive goal for the development of Bassett Creek and shall establish a proposed procedure for accomplishing the purposes of the organization as set forth in Article II.

In preparing the overall plan, the Board may consult with the engineering and planning staff of each member governmental unit. It may consult with the Metropolitan Council and other public and private bodies to obtain and consider projections of land use, population growth, and other factors which are relevant to the improvement and development of the Bassett Creek watershed.

Said overall plan shall include the location and adequacy of the outlet or outfall of said Bassett Creek. The plan shall include the quantity of storage facilities and the sizing of an adequate outlet for all branch lateral storm sewers within the Bassett Creek watershed. The plan shall comply with state statutes and regulations promulgated and adopted by the Board of Water and Soil Resources.

Upon completion of the overall plan, or amendments thereto, the Board shall supply each member with a copy of the proposed plan and shall submit the plan for review and comment to Hennepin County, all soil and water conservation districts in Hennepin County and to all statutory and home rule charter cities having territory within the watershed. All governmental units which expect that substantial amendment of its local

comprehensive plan will be necessary in order to bring their local water management into conformance with the Commission's watershed plan shall describe as specifically as possible, the amendments to the local plan which it expects will be necessary. The Commission shall hold a public hearing after 60 days mailed notice to the clerk of each member governmental unit. The mailed notice of the hearing shall be sent at the same time the plan is submitted to the members and to other governmental agencies. After such public hearing, the Board shall prescribe the overall plan which shall be the outline for future action by the Commission.

The Commission shall then submit the plan, any comments received and any appropriate amendments to the plan to the Board of Commissioners of Hennepin County. The County shall approve or disapprove projects in the capital improvement program which may require the provision of county funds pursuant to Minnesota Statutes Sections 103B.251 or 103D.901. The County shall have 60 days to complete its review. If the County fails to complete its review within 60 days the plan and capital improvement programs shall be deemed approved.

After completion of the review by Hennepin County, the plan and capital improvement program shall be submitted to the Metropolitan Council for its review. After completion of the review by the Metropolitan Council pursuant to Minnesota Statutes, Section 103B.231, Subd. 8, the Commission shall submit the plan to the Minnesota Commissioner of Natural Resources and the Minnesota Pollution Control Agency for review and comment on the consistency of the plan with state laws and rules relating to water and related land resources and to the Board of Water and Soil Resources for review as provided in Minnesota Statutes, Section 103B.231, Subd. 9.

After return of the plan, the Commission shall submit to each of its

members a copy of the plan and all comments of the reviewing authorities. The Commission shall wait for at least 30 days for comments from the members.

The Commission shall adopt the overall plan within 120 days after approval of the plan by the Board of Water and Soil Resources. The Commission shall then implement the approved plan and approved capital improvement program by resolution of the Commission as hereinafter set forth. The adoption of said overall plan shall be only upon a favorable vote of a majority of all eligible votes of the then existing members of the Commission. A copy of the adopted plan shall be filed with the clerk of each member governmental unit. Upon notice and hearing as provided for in adopting the overall plan, said plan may be amended by the Board on its own initiative or on the petition of any member governmental unit.

The review provisions set forth in this section are those required by Minnesota Statutes, Section 103B.231. If the law is amended, approvals shall be as required by law and the provisions contained in this section shall be amended accordingly.

Subdivision 6. It shall make necessary surveys or utilize other reliable surveys and data and develop projects to accomplish the purposes for which the Commission is organized.

Subdivision 7. It may cooperate or contract with the State of Minnesota or any subdivision thereof or federal agency or private or public organization to accomplish the purposes for which it is organized.

Subdivision 8. It may order any member governmental unit or units to construct, clean, repair, alter, abandon, consolidate, reclaim or change the course or terminus of any ditch, drain, storm sewer, or water course, natural or artificial, within the Bassett Creek watershed.

Subdivision 9. It may order any member governmental unit or units to acquire, operate, construct or maintain dams, dikes, reservoirs and appurtenant works or other improvements necessary to implement the overall plan.

Subdivision 10. It shall regulate, conserve and control the use of storm and surface water and groundwater within the Bassett Creek watershed.

Subdivision 11. It may contract for or purchase such insurance as the Board deems necessary for the protection of the Commission.

Subdivision 12. It may establish and maintain devices for acquiring and recording hydrological and water quality data within the Bassett Creek watershed.

Subdivision 13. It may enter upon lands within or without the watershed to make surveys and investigations to accomplish the purposes of the Commission. The Commission shall be liable for actual damages resulting therefrom but every person who claims damages shall serve the Chairman or Secretary of the Board of Commissioners with a Notice of Claim as required by Chapter 466.05 of the Minnesota Statutes.

Subdivision 14. It shall provide any member governmental unit with technical data or any other information of which the Commission has knowledge which will assist the governmental unit in preparing land use classifications or local water management plans within the watershed.

Subdivision 15. It may provide legal and technical assistance in connection with litigation or other proceedings between one or more of its members and any other political subdivision, commission, Board or agency relating to the planning or construction of facilities to drain or pond storm waters or relating to water quality within the Bassett Creek

watershed. The use of commission funds for litigation shall be only upon a favorable vote of a majority of the eligible votes of the then existing members of the Commission.

Subdivision 16. It may accumulate reserve funds for the purposes herein mentioned and may invest funds of the Commission not currently needed for its operations, in the manner and subject to the laws of Minnesota applicable to statutory cities.

Subdivision 17. It may collect monies, subject to the provisions of this agreement, from its members, Hennepin County and from any other source approved by a majority of its Board.

Subdivision 18. It may make contracts, incur expenses and make expenditures necessary and incidental to the effectuation of these purposes and powers and may disburse therefor in the manner hereinafter provided.

Subdivision 19. It shall cause to be made an annual audit by a certified public accountant or the state auditor of the books and accounts of the Commission and shall make and file a report to its members at least once each year including the following information:

- a. the approved budget;
- b. a reporting of revenues;
- c. a reporting of expenditures;
- d. a financial audit report or section that includes a balance sheet, a classification of revenues and expenditures, an analysis of changes in final balances, and any additional statements considered necessary for full financial disclosure;
- e. the status of all Commission projects and work within the

watershed; and

- f. the business transacted by the commission and other matters which affect the interests of the commission.

Copies of said report shall be transmitted to the clerk of each member governmental unit.

Subdivision 20. Its books, reports and records shall be available for and open to inspection by its members at all reasonable times.

Subdivision 21. It may recommend changes in this agreement to its members.

Subdivision 22. It may exercise all other powers necessary and incidental to the implementation of the purposes and powers set forth herein and as outlined and authorized by Minnesota Statutes, Sections 103B.201 through 103B.251.

Subdivision 23. It shall cooperate with the State of Minnesota, the Commissioner of Natural Resources and the Director of the Division of Waters, Soils and Minerals of the Department of Natural Resources in obtaining permits and complying with the requirements of Chapter 103G of the Minnesota Statutes.

Subdivision 24. Each member reserves the right to conduct separate or concurrent studies on any matter under study by the Commission.

Subdivision 25. It shall establish a procedure for establishing citizen or technical advisory committees and to provide other means for public participation.

METHOD OF PROCEEDING

VII.

Subdivision 1. The procedures to be followed by the Board in carrying out the powers and duties set forth in Article VI, Subdivisions 5,

6, 7, 8, 9, and 10, shall be as set forth in this article.

Subdivision 2. The Commissioners shall be the same as those serving as Commissioners and Alternate Commissioners for the predecessor Bassett Creek Water Management Commission. The Board shall immediately proceed to revise the overall plan as set forth in Article VI, Subdivision 5 or as required by state statute. Upon adoption of said overall plan, the Board shall proceed to implement said plan, and this implementation may be ordered by stages.

Subdivision 3. The Bassett Creek Watershed Management Commission shall be the successor to the Bassett Creek Water Management Commission as constituted under the prior Joint Powers Agreement. All personal property, money, bank accounts, records or any other thing of value and on hand with the Bassett Creek Water Management Commission shall be transferred to the Bassett Creek Watershed Management Commission.

Subdivision 4. The location and adequacy of the outlet for Bassett Creek shall be determined and the Commission shall then prepare plans which will provide capacity to outlet the surface waters which will be collected within the Bassett Creek watershed. In determining the necessary capacity for said outlet, the Commission shall take into consideration the quantity of land within the watershed which each member governmental unit has to pond or act as a reservoir for surface waters. It shall consider only lands which are under public ownership or under public control and that will be perpetually dedicated to acting as a reservoir for surface waters. The commission may require from each member governmental unit a commitment in writing of the lands which shall be so dedicated, including a legal description of the gross area and the capacity in acre feet of water storage. No project which will channel or divert additional

waters to Bassett Creek shall be commenced by any member governmental unit prior to approval of the Board of the design of an adequate outlet or of adequate storage facilities. The adequacy of said outlet shall be determined by the Board after consultations with its professional engineers.

Subdivision 5. All construction, reconstruction, extension or maintenance of Bassett Creek including outlets, lift stations, dams, reservoirs, or other appurtenances of a surface water or storm sewer system which involve construction by or assessment against any member governmental unit or against privately or publicly owned land within the watershed shall follow the statutory procedures outlined in Chapter 429 of the Minnesota Statutes except as herein modified. The Board shall secure from its engineers or some other competent person a report advising it in a preliminary way as to whether the proposed improvement is feasible and as to whether it shall best be made as proposed or in connection with some other improvement and the estimated cost of the improvement as recommended and the proposed allocation of costs between members.

The Board shall then hold a public hearing on the proposed improvement after mailed notice to the clerk of each member governmental unit within the watershed. The Commission shall not be required to mail or publish notice except by said notice to the clerk. Said notice shall be mailed not less than 45 days before the hearing, shall state the time and place of the hearing, the general nature of the improvement, the estimated total cost and the estimated cost to each member governmental unit. The Board may adjourn said hearing to obtain further information, may continue said hearing pending action of the member governmental units or may take such other action as it deems necessary to carry out the purposes of this

Commission.

To order the improvement, in accordance with the powers and duties established in Article VI, Subdivisions 7, 8 and 9, a resolution setting forth the order for a capital improvement project shall require a favorable vote by two-thirds of all eligible votes of then existing Board of the Commission. In all cases other than for capital improvement projects, a majority vote of all eligible members of the Board shall be sufficient to order the work. The order shall describe the improvement, shall allocate in percentages the cost allocation between the member governmental units, shall designate the engineers to prepare plans and specifications, and shall designate the member who will contract for the improvement in accordance with Subdivision 7 of this Article.

After the Board has ordered an improvement or if the hearing is continued while the member governmental units act on said proposal, it shall forward said preliminary report to all member governmental units with an estimated time schedule for the construction of said improvement. The Board shall allow an adequate amount of time, and in no event less than 45 days, for each member governmental unit to conduct hearings, in accordance with the provisions of the aforestated Chapter 429 or the charter requirements of any city, or to ascertain the method of financing which said member governmental unit will utilize to pay its proportionate share of the costs of the improvement. Each member governmental unit shall ascertain within a period of 90 days the method it shall use to pay its proportionate share of the costs.

If the Commission proposes to utilize Hennepin County's bonding authority as set forth in Minnesota Statutes, Section 103B.251, or if the Commission proposes to certify all or any part of a capital improvement to

Hennepin County for payment, then and in that event all proceedings shall be carried out in accordance with the provisions set forth in said Section 103B.251.

The Board shall not order and no engineer shall prepare plans and specifications before the Board has adopted a resolution ordering the improvement. The Board may order the advertising for bids upon receipt of notice from each member governmental unit who will be assessed that it has completed its hearing or determined its method of payment or upon expiration of 90 days after the mailing of the preliminary report to the members.

Subdivision 6. Any member governmental unit being aggrieved by the determination of the Board as to the allocation of the costs of said improvement shall have 30 days after the commission resolution ordering the improvement to appeal said determination. Said appeal shall be in writing and shall be addressed to the Board asking for arbitration. The determination of the member's appeal shall be referred to a Board of Arbitration. The Board of Arbitration shall consist of three persons; one to be appointed by the Board of Commissioners, one to be appointed by the appealing member governmental unit, and the third to be appointed by the two so selected. In the event the two persons so selected do not appoint the third person within 15 days after their appointment, then the Chief Judge of the District Court of Hennepin County shall have jurisdiction to appoint, upon application of either or both of the two earlier selected, the third person to the Board of Arbitration. The third person selected shall not be a resident of any member governmental unit and if appointed by the Chief Judge said person shall be a registered professional engineer. The arbitrators' expenses and fees, together with the other expenses, not

including counsel fees, incurred in the conduct of the arbitration shall be divided equally between the Commission and the appealing member. Arbitration shall be conducted in accordance with the Uniform Arbitration Act, Chapter 572 of the Minnesota Statutes.

Subdivision 7. Contracts for Improvements. All contracts which are to be let as a result of the Board's order to construct, repair, alter, reclaim or change the course or terminus of any ditch, drain, storm sewer, or watercourse, or to acquire, operate, construct or maintain dams, dikes, reservoirs or their appurtenances or to carry out any of the other provisions of the plan as authorized by Minnesota Statutes, and for which two or more member governmental units shall be responsible for the costs, shall be let in accordance with the provisions of Section 429.041 of the Minnesota Statutes. The bidding and contracting of said work shall be let by any one of the member governmental units, as ordered by the Board of Commissioners, after compliance with the statutes. All contracts and bidding procedures shall comply with all the requirements of law applicable to contracts let by a statutory city in the State of Minnesota.

The Commission shall not have the authority to contract in its own name for any improvement work for which a special assessment will be levied against any private or public property under the provisions of Chapter 429 or under the provisions of any City charter. These contracts shall be awarded by action of the council of a member and shall be in the name of a member governmental unit. This section shall not preclude the Commission from proceeding under Minnesota Statutes, Section 103B.251.

Subdivision 8. Contracts with Other Governmental Bodies. The Commission may exercise the powers set forth in Article VI, Subdivision 7, but said contracts for a capital improvement shall require a favorable vote

of two-thirds majority of the eligible votes of the then existing members of the Commission.

Subdivision 9. Supervision. All improvement contracts awarded under the provisions of Subdivision 7 of this Article shall be supervised by the member governmental unit awarding said contract or said member governmental unit may contract or appoint any qualified staff member or members of the Commission to carry out said supervision, but each member agrees that the staff of this Commission shall be authorized to observe and review the work in progress and the members agree to cooperate with the Commission staff in accomplishing the purposes of this Commission. Representatives of the Commission shall have the right to enter upon the place or places where the improvement work is in progress for the purpose of making reasonable tests and inspections. The staff of this Commission shall report and advise and recommend to the Board on the progress of said work.

Subdivision 10. Land Acquisition. The Commission shall not have the power of eminent domain. The member governmental units agree that any and all easements or interest in land which are necessary will be negotiated or condemned in accordance with Chapter 117 of the Minnesota Statutes by the unit wherein said lands are located, and each member agrees to acquire the necessary easements or right of way or partial or complete interest in land upon order of the Board of Commissioners to accomplish the purposes of this agreement. All reasonable costs of said acquisition shall be considered as a cost of the improvement. If a member governmental unit determines it is in the best interests of that member to acquire additional lands, in conjunction with the taking of lands for storm and surface drainage or storage, for some other purposes, the costs of said acquisition will not be

included in the improvement costs of the ordered project. The Board in determining the amount of the improvement costs to be assessed to each member governmental unit may take into consideration the land use for which said additional lands are being acquired and may credit the acquiring municipality for said land acquisition to the extent that it benefits the other members of this agreement. Any credits may be applied to the cost allocation of the improvement project under construction or the Board if feasible and necessary may defer said credits to a future project.

If any member unit refuses to negotiate or condemn lands as ordered by the Board, any other member may negotiate or condemn outside its corporate limits in accordance with the aforesaid Chapter 117. All members agree that they will not condemn or negotiate for land acquisition to pond or drain storm and surface waters within the corporate boundaries of another member within the Bassett Creek watershed except upon order of the Board of this Commission.

The Commission shall have authority to establish land acquisition policies as a part of the overall plan. The policies shall be designed to equalize costs of land throughout the watershed. Said policy is contained in the existing watershed management plan and may be continued in any revised overall plan required by Minnesota Statutes.

Subdivision 11. Pollution Control and Water Quality. The Commission shall have the authority and responsibility to protect and improve water quality in the watershed as this is one of the main purposes set forth in the Surface Water Management Act. All member governmental units agree that they will refuse to allow the drainage of sanitary sewage or industrial wastes onto any land or into any watercourse or storm sewer draining into Bassett Creek. The Board may investigate on its own

initiative and shall investigate upon petition of any member all complaints relating to pollution of surface water or groundwater draining into or affecting Bassett Creek or its tributaries. Upon a finding that the creek or surface waters or groundwater are being polluted, the Board shall order the member governmental unit to abate this nuisance and each member agrees that it will take all reasonable action available to it under the law to alleviate the pollution and to assist in protecting and improving the water quality of surface water and groundwater in the watershed.

Subdivision 12. Local Water Management Plans. The Commission shall have power and authority to review the members' local water management plans, capital improvement programs and official controls required by Minnesota Statutes Section 103B.235 and/or by rules promulgated and adopted by the Board of Water and Soil Resources. The members also understand that the overall plan and capital improvement program required for the entire watershed must consist of the local parts in the plan and therefore every effort shall be made by the Commission to coordinate the local plans with the watershed's overall plan. The members further understand and agree that upon completion and approval of the overall plan required by Minnesota Statutes 103B.231, each member will be required to present their local management plan to the Commission as required by Minnesota Statutes, Section 103B.235. It is therefore important that each member provide the Commission with their best effort to coordinate and plan for the individual member's local plan at the same time the watershed overall plan is being assembled.

FINANCES

VIII.

Subdivision 1. The Commission funds may be expended by the Board

in accordance with this agreement and in accordance with the procedures as established by law and in the manner as may be determined by the Board. The Board shall designate one or more national or state bank or trust companies, authorized by Chapters 118 and 427 of the Minnesota Statutes to receive deposits of public moneys and to act as depositories for the Commission funds. In no event shall there be a disbursement of Commission funds without the signature of at least two Board members, one of whom shall be the Treasurer or his Authorized Deputy Treasurer. The Treasurer shall be required to file with the Secretary of the Board a bond in the sum of at least \$10,000 or such higher amount as shall be determined by the Board. The Commission shall pay the premium on said bond.

Subdivision 2. The members agree to contribute all cash, bank deposits, and other assets held by the Bassett Creek Water Management Commission to the new Bassett Creek Watershed Management Commission to carry out the purposes of the Commission. Each member governmental unit has contributed its proportionate share of said funds based on the net tax capacity and area of all taxable property within the Bassett Creek watershed.

Subdivision 3. Each member agrees to contribute each year to a general fund, said fund to be used for general administration purposes including, but not limited to: salaries, rent, supplies, development of an overall plan, insurance, and bonds, and to purchase and maintain devices to measure hydrological and water quality data. Said funds may also be used for normal maintenance of the facilities, but any extraordinary maintenance or repair expense shall be treated as an improvement cost and processed in accordance with Subdivision 4 of this Article. The annual contribution by each member shall be based fifty percent (50%) on the net

tax capacity of all property within the Watershed and fifty percent (50%) on the basis of the total area of each member within the boundaries of the Watershed each year to the total area in the Bassett Creek watershed. In no event shall any assessment require a contribution to exceed one-half of one percent of the net tax capacity within the watershed.

Subdivision 4.

(a) An improvement fund shall be established for each improvement project instituted under Article VII, Subdivision 3. Each member agrees to contribute to said fund its proportionate share of the engineering, legal and administrative costs as determined by the amount to be assessed against each member as a cost of the improvement. The Board shall submit in writing a statement to each member, setting forth in detail the expenses incurred by the Commission for each project.

Each member agrees to pay to or contract with the member governmental unit awarding said contract for the improvement, its proportionate share of the cost of the improvement in accordance with the determination of the Board under Article VII, Subdivision 5. The member awarding the contract shall submit in writing copies of the engineer's certificate authorizing payment during construction and the member being billed agrees to pay its proportionate share of said improvement costs within 30 days after receipt of the statement. The member awarding the contract shall advise other contributing members of the tentative time schedule of the work and the estimated times when the contributions shall be necessary.

(b) Notwithstanding the provisions of paragraph (a) of this subdivision, the Commission may by a vote of 2/3rds of all eligible votes of the then existing members of the Commission decide to proceed to fund all or

any part of the cost of a capital improvement contained in the capital improvement program of the plan pursuant to the authority and subject to the provisions set forth in Minnesota Statutes, Section 103B.251. The Commission and Hennepin County may establish a maintenance fund to be used for normal and routine maintenance of an improvement constructed in whole or in part with money provided by Hennepin County pursuant to Minnesota Statutes, Section 103B.251. The levy and collection of an ad valorem tax levy for maintenance shall be by Hennepin County based upon a tax levy resolution adopted by a majority vote of all eligible members of the Commission and remitted to the County on or before the date prescribed by law each year. If it is determined to levy for maintenance, the Commission shall be required to follow the hearing process established by Minnesota Statutes, Section 103D.915 and 103D.921 and acts amendatory thereof and in addition thereto. Mailed notice shall be sent to the Clerk of each member municipality at least 30 days prior to the hearing.

Subdivision 5. On or before July 1 of each year, the Board shall adopt a detailed budget for the ensuing year and decide upon the total amount necessary for the general fund. Budget approval shall require a favorable vote by a majority of all eligible votes of the then existing members of the Board.

The Secretary of the Board shall certify the budget on or before July 1 to the clerk of each member governmental unit together with a statement of the proportion of the budget to be provided by each member.

The Council of each member agrees to review the budget, and the Board shall upon notice from any member received prior to August 1, hear objections to the budget, and may, upon notice to all members and after a hearing, modify or amend the budget, and then give notice to the members of

any and all modifications or amendments.

Each member agrees to provide the funds required by the budget and said determination shall be conclusive if no member enters objections in writing on or before August 1. If no objections are submitted to the Board, each member agrees to provide the funds approved by the Board, after the Board has conducted the aforementioned hearing. Modifications or amendments to the original budget require a favorable vote by a majority of all eligible voters of then existing members of the Board.

The budget shall not in any event require any member to contribute in excess of one-half of one percent of the net tax capacity of all taxable property within the watershed and within said members corporate boundaries.

The schedule of payments by the members shall be determined by the Board in such a manner as to provide for an orderly collection of the funds needed.

Upon notice and hearing, the Board by a favorable vote of a majority of all eligible votes of then existing members may adopt a supplemental budget requiring additional payments by the members within 60 days of its adoption but in no event shall the budget require any member to contribute in excess of one-half of one percent of the net tax capacity of all taxable property within the watershed or within any member's corporate boundaries in any one calendar year.

Members' attention is drawn to Minnesota Statutes, Section 103B.245, which authorizes a Watershed Management Tax District to be created within each member City to pay the costs of planning and for the purpose of paying capital costs and/or normal and routine maintenance of facilities.

Subdivision 5. Cost Allocation. All capital costs incurred by the Commission shall be apportioned to the respective members on either (1), (2), or (3) of the following bases:

(1) A negotiated amount to be arrived at by the members who have lands in the subdistrict responsible for the capital improvement.

(2) (a) Fifty percent of all capital costs or the financing thereof shall be apportioned to each member on the basis of the real property valuation net tax capacity of each member within the boundaries of the watershed each year to the total real property valuation net tax capacity in the Bassett Creek watershed area governed by this Agreement.

(b) Fifty percent of all capital costs or the financing thereof shall be apportioned to each member on the basis of the total area of each member within the boundaries of the watershed each year to the total area in the Bassett Creek watershed area governed by this Agreement.

(c) Capital costs allocated under the 50% area/50% net tax capacity formula herein set forth may be varied by the Commission by a 2/3rds vote if:

(1) any member community receives a direct benefit from the capital improvement which benefit can be defined as a lateral

- as well as a trunk benefit, or
- (2) the capital improvement provides a direct benefit to one or more members which benefit is so disproportionate as to require in a sense of fairness a modification in the 50/50 formula.
- (d) Credits to any member for lands acquired by said member to pond or store storm and surface water shall be allowed against costs set forth in Subsections (a), (b), and (c) of this Section.
- (3) If the project is constructed and financed pursuant to Minnesota Statutes, Section 103B.251, the members understand and agree that said costs will be levied on all taxable property in the watershed as set forth in the statute.

MISCELLANEOUS PROVISIONS

IX.

Subdivision 1. The Commission shall not have the power to issue certificates, warrants or bonds.

Subdivision 2. The Commission shall not have the power of eminent domain and shall not own any interest in real property. All interests in lands shall be held in the name of the corporate member wherein said lands are located.

Subdivision 3. The Commission shall not have the power to levy a special assessment upon any privately or publicly owned land. All such assessments shall be levied by the member wherein said lands are located. It shall have the power to require any member to contribute the costs

allocated or assessed according to the other provisions of this agreement.

Subdivision 4. Each member agrees that it will not directly or indirectly collect or divert any additional surface water to the Mississippi River or its tributaries from any subdistrict or subtrunk without a permit from the Board of Commissioners. Permits may be granted by the Board for a member to proceed with the construction or reconstruction of improvements within the individual corporate members' boundaries and at its sole cost upon a finding:

- (a) that there is an adequate outlet; and
- (b) that said construction is in conformance with the overall plan; and
- (c) that the construction will not adversely affect other members of this agreement.

Subdivision 5. Any member who is more than 60 days in default in contributing its share to the general fund shall have the vote of its Board member suspended pending the payment of its proportionate share.

Any member who is more than 60 days in default in contributing its proportionate share of the cost of any improvement to the contracting member shall upon application of the contracting member have the vote of its Board member suspended, pending the payment of its proportionate share.

Any Board member whose vote is under suspension shall not be considered as an eligible member as such membership affects the number of votes required to proceed on any matter under consideration by the Board.

DURATION

X.

Subdivision 1. Each member agrees to be bound by the terms of this agreement until January 1, 2015, and it may be continued thereafter at the

option of the parties.

Subdivision 2. This agreement may be terminated prior to January 1, 2015, by the unanimous consent of the parties. If the agreement is to be terminated, a notice of the intent to dissolve the Commission shall be sent to the Board of Water and Soil Resources and to Hennepin County at least 90 days prior to the date of dissolution.

Subdivision 3. In addition to the manner provided in Subdivision 2 for termination, any member may petition the Board to dissolve the agreement. Upon 90 days notice in writing to the clerk of each member governmental unit and to the Board of Water and Soil Resources and to Hennepin County, the Board shall hold a hearing and upon a favorable vote by a majority of all eligible votes of then existing Board members, the Board may by Resolution recommend that the Commission be dissolved. Said Resolution shall be submitted to each member governmental unit and if ratified by three-fourths of the councils of all eligible members within 60 days, said Board shall dissolve the Commission allowing a reasonable time to complete work in progress and to dispose of personal property owned by the Commission.

DISSOLUTION

XI.

Upon dissolution of the Commission, all property of the Commission shall be sold and the proceeds thereof, together with monies on hand, shall be distributed to the eligible members of the Commission. Such distribution of Commission assets shall be made in proportion to the total contribution to the Commission as required by the last annual budget.

EFFECTIVE DATE

XII.

This agreement shall be in full force and effect upon the filing of a certified copy of the resolution approving said agreement by all nine members. Said resolution shall be filed with the Chair of the existing Bassett Creek Watershed Management Commission (presently W. Peter Enck of the City of New Hope), who shall notify all members in writing of its effective date and shall set the date for the next meeting to be conducted under this amended Joint Powers Agreement.

IN WITNESS WHEREOF, the undersigned governmental units, by action of their governing bodies, have caused this agreement to be executed in accordance with the authority of Minnesota Statutes Sections 103B.211 and 471.59.

Approved by the City Council
November 16, 1993.

Approved by the City Council
September 7, 1993.

Approved by the City Council
July 6, 1993.

Approved by the City Council
August 2, 1993.

Approved by the City Council
September 13, 1993.

Approved by the City Council
June 14, 1993.

Approved by the City Council
JUL 16 1993, 1993.

Approved by the City Council
July 6, 1993.

Approved by the City Council
July 6, 1993.

CITY OF CRYSTAL

By Peter E. Mainsterra

Attest Darlene George

CITY OF GOLDEN VALLEY

By Leroy A. Bepko

Attest Shirley G. Nelson

CITY OF MEDICINE LAKE

By Thomas G. Schroder

Attest Julie Deitte

CITY OF PLYMOUTH

By Mayor

Attest Laurie Ravenhorst
City Clerk

Countersigned John Moir
City Comptroller-Treasurer Finance Officer

CITY OF MINNETONKA

By Timothy M. Rognstad

Attest Elizabeth R. Horton

CITY OF NEW HOPE

By Sam Stevens

Attest Barrie Leone

CITY OF MINNEAPOLIS

By Steve Day

Attest Mark Gustafson

ASST. CITY CLERK
CITY OF ROBBINS PARK

By David D. Haglund

Attest Lynne J. Johnson

CITY OF ST. LOUIS PARK

By Lyle W. Harker

Attest Burke Flanagan

Appendix G

Requirements for Improvements and Development Proposals

Requirements for Improvements and Development Proposals

July 17, 2008



Requirements for Improvements and Development Proposals

Table of Contents

1.0	Introduction.....	1
2.0	Review Process	2
2.1	Procedure for BCWMC Review	2
2.2	Required Exhibits	3
2.3	Variance Procedure.....	4
3.0	Types of Projects to be Submitted for Review	6
3.1	Floodplains	6
3.2	Floodplain Storage Sites.....	6
3.3	Lakes, Streams, and Wetlands	6
3.4	Water Resources	6
3.5	Diversion of Surface Water Runoff.....	7
3.6	Land Use Changes	7
3.7	Appropriations.....	7
3.8	Utility Crossings	7
3.9	Department of Natural Resources (DNR) Permit Applications.....	7
3.10	Development/Redevelopment.....	7
3.11	Road Construction	7
4.0	General Guidelines for Developments/Redevelopment.....	8
4.1	Projects Not Requiring BCWMC Review	8
4.2	Projects Requiring Construction Erosion and Sediment Control Plan	8
4.3	Projects Requiring Treatment to Level I Standards.....	8
4.4	Nondegradation Policy for Redevelopment Projects.....	9
4.5	Site Expansion/Addition Projects	9
4.6	Road Projects	10
5.0	Floodplain Policies.....	11
6.0	Level I Standards	13
6.1	Infiltration Systems.....	15
6.1.1	Infiltration Basin Design and Maintenance Requirements	15
6.1.1.1	Description	15
6.1.1.2	Site Analysis.....	15
6.1.1.3	General Design Considerations	16
6.1.1.3.1	Design Volume	16
6.1.1.3.2	Off-line Placement.....	16
6.1.1.3.3	Pretreatment.....	16
6.1.1.3.4	Infiltration Rate.....	17
6.1.1.3.5	Duration of Ponding	17

6.1.1.3.6	Maximum Depth	17
6.1.1.3.7	Basin Slopes.....	18
6.1.1.3.8	Basin Shape	18
6.1.1.3.9	Plants	18
6.1.1.3.10	Inflow/Bypass	18
6.1.1.3.11	Overflow	18
6.1.1.3.12	Groundwater Mounding.....	19
6.1.1.4	Sequencing and Construction.....	19
6.1.1.5	Maintenance	19
6.2	Filtration Systems	21
6.2.1	Surface Sand Filter Design and Maintenance Requirements	21
6.2.1.1	Description	21
6.2.1.2	Design Requirements	21
6.2.1.2.1	Design Volume	21
6.2.1.2.2	Pretreatment.....	21
6.2.1.2.3	General Principles and Sizing.....	22
6.2.1.2.4	Basic Components	23
6.2.1.2.5	Sand Specification	23
6.2.1.2.6	Under-Drain Systems.....	24
6.2.1.2.7	Impermeable Liners	24
6.2.1.2.8	Slopes and Siting	25
6.2.1.3	Sequencing and Construction.....	25
6.2.1.4	Maintenance	25
6.2.2	Bioretention System Design and Maintenance Requirements	27
6.2.2.1	Description	27
6.2.2.2	Site Analysis.....	27
6.2.2.3	General Design Considerations.....	28
6.2.2.3.1	Design Volume	28
6.2.2.3.2	Pretreatment.....	28
6.2.2.3.3	Maximum Depth.....	28
6.2.2.3.4	Duration of Ponding	28
6.2.2.3.5	Basin Slopes.....	28
6.2.2.3.6	Planting Soil Bed	29
6.2.2.3.7	Plants	29
6.2.2.3.8	Inflow/Bypass	29
6.2.2.3.9	Overflow	30
6.2.2.4	Sequencing and Construction.....	30
6.2.2.5	Maintenance	30
6.3	Detention Systems	32
6.3.1	Water Quality Pond Design and Maintenance Requirements.....	32
6.3.1.1	Description	32

6.3.1.2	Site Analysis.....	32
6.3.1.3	Design Requirements	33
6.3.1.3.1	Design Volume	33
6.3.1.3.2	Average Depth	33
6.3.1.3.3	Emergency Overflow	34
6.3.1.3.4	Basin Side Slopes	34
6.3.1.3.5	Short-Circuiting	34
6.3.1.3.6	Flood Pool (Live Storage)	34
6.3.1.3.7	Pond Shape	34
6.3.1.3.8	Multi-Stage Outlets.....	34
6.3.1.3.9	Extended Detention	34
6.3.1.3.10	Stormwater Outfalls.....	35
6.3.1.3.11	Outlet Structure (Skimming)	35
6.3.1.3.12	Pretreatment.....	35
6.3.1.3.13	Flow Conveyance Capacity	35
6.3.1.4	Sequencing and Construction.....	35
6.3.1.5	Maintenance	36
6.3.2	Underground Wet Vault Design and Maintenance Requirements.....	37
6.3.2.1	Description	37
6.3.2.2	General Design Requirements.....	37
6.3.2.2.1	Design Volume	37
6.3.2.2.2	Average Depth	37
6.3.2.2.3	Vault Inlet Structures and Pipes.....	38
6.3.2.2.4	Short-Circuiting and the Promotion of Plug Flow	38
6.3.2.2.5	Flood Pool (Live Storage)	39
6.3.2.2.6	Outlet Structure (Skimming)	39
6.3.2.2.7	Pretreatment.....	39
6.3.2.2.8	Flow Conveyance Capacity	39
6.3.2.2.9	Vault Structures	39
6.3.2.3	Sequencing and Construction.....	39
6.3.2.4	Maintenance	40
7.0	Requirements for Construction Erosion and Sediment Control Plans	41
8.0	Streambank Erosion and Degradation Control	44
9.0	Regulatory Agencies.....	45
9.1	Minnesota Department of Natural Resources (DNR).....	45
9.2	Minnesota Pollution Control Agency (MPCA).....	45

List of Appendices

Appendix A	Application Form
Appendix B	Water Quality Definitions
Appendix C	General Review Requirements

1.0 Introduction

This document was prepared to assist developers and consultants in designing and managing projects that conform with the policies of the *Bassett Creek Watershed Management Plan* (Plan) (September 2004). The Plan, as adopted by the Bassett Creek Watershed Management Commission (BCWMC), may be reviewed or obtained from the BCWMC website at <http://www.bassettcreekwmo.org/>.

This document outlines the requirements designed to achieve the BCWMC's water quality, rate control and other goals. It gives a complete listing of the development requirements, water quality control standards and design criteria that have been adopted by BCWMC and includes:

1. *Review Process*

- The nature of the review process and procedures
- Required submittals/exhibits
- Variance procedures
- Application form

2. *Types of projects that require a submittal for review*

3. *Development/redevelopment guidelines*

4. *Policies, standards and requirements*

- Floodplain requirements
- A description of approved best management practices (BMPs) that meet the BCWMC's Level I standards. BMP descriptions have been organized into the following categories: (1) infiltration systems, (2) filtration systems, and (3) detention systems.
- Requirements for construction erosion and sediment control plan
- Other requirements

2.0 Review Process

2.1 Procedure for BCWMC Review

The BCWMC established the following procedures for review of improvements and development proposals:

1. The BCWMC will review the applicant's submittal only after the project has received preliminary review by the municipality indicating general compliance with existing local watershed management plans prepared pursuant to 103B.235.
2. The BCWMC meetings are generally held the third Thursday of each month. In order for a proposed project to be included on the agenda, plans must be submitted to the BCWMC engineer by the last Friday of the month, prior to the meeting date. Complex projects may require additional review time. However, not all projects are presented at the BCWMC meeting for review and approval. All submittals involving floodplains, Bassett Creek trunk system, appropriations, variances, and underground wet vaults or other alternative BMPs are presented at the BCWMC meetings. BCWMC engineer review and approval are generally provided for submittals that are designed in accordance to the BCWMC policies outlined in this document.
3. Upon receipt of a submittal, the BCWMC engineer will review the submittal and prepare recommendations to the BCWMC. A memorandum describing each project and the engineer's recommendations will be sent to the BCWMC approximately one week before each meeting. Note: the BCWMC engineer will send a letter with comments directly to the municipality and to the applicant for projects that do not require review at the BCWMC meeting.
4. The BCWMC will review and comment upon the submittal at its regularly scheduled meeting. The BCWMC will approve, conditionally approve, or reject the submittal. A letter with comments, including a list of deficiencies or required modifications, will be sent to the municipality and to the applicant. This step is not necessary for projects approved by the BCWMC engineer.
5. The applicant must provide a revised submittal addressing each deficiency, required modifications, or comment. A letter of approval will be sent to the municipality and to the applicant after comments have been satisfactorily addressed.
6. Emergency work performed by cities (utility repair, emergency traffic issues, health and safety issues, etc.) and maintenance projects (seal coating and pavement overlays, sediment and debris removal from crossings and water quality ponds, etc.) are exempt from BCWMC review. Cities shall inform the BCWMC regarding emergency work, as soon as practical, in cases that would have required an application under non-emergency conditions.

2.2 Required Exhibits

The applicant shall submit an application form, project review fee, and two sets of plans and supporting documentation for BCWMC review. The application form must be signed by City staff. The required exhibits are listed on the application form and further discussed as follows:

1. Completed Application form signed by applicant and City staff
2. Project review fee. Submit project review fee in accordance with the fee schedule
3. Wetland fee (if applicable): Submit wetland fees for projects resulting in BCWMC review of wetland issues. BCWMC is the local government unit (LGU) administering the Wetland Conservation Act for the cities of Medicine Lake, Robbinsdale, and St. Louis Park. Contact the BCWMC engineer regarding wetland review fee.
4. Project plans: Submit two copies of project plans (full size and 11-inch x 17-inch sheets), including at least:
 - a. A scale drawing of the site showing property lines and delineation of lands under ownership of the applicant
 - b. Proposed and existing stormwater facilities location, alignment, and elevation
 - c. Existing and proposed site contour elevations related to NGVD, 1929 datum, or other datum used by municipality
 - d. Construction plans and specifications of all proposed stormwater management facilities
5. A runoff water quality management plan and computations, signed by a registered professional engineer, and meeting the minimum requirements described in these standards. BMP sizing and average depth calculations for water quality ponds must also be provided. A runoff water quality management plan shall include the following items:
 - a. Delineation of the subwatersheds tributary runoff from offsite, and proposed and existing subwatersheds onsite
 - b. Delineation of existing onsite wetlands, marshes, and/or floodplain areas.
 - c. Existing and proposed post-development normal, 5-year ,and 100-year stormwater elevations for the site
 - d. Stormwater runoff volume and rate analyses for existing and proposed conditions for 5-year and 100-year storm events
 - e. All hydrologic, hydraulic, and other computations necessary to design the proposed stormwater quality management facilities

- f. Documentation indicating conformance with an existing municipal local watershed management plan. If a municipal plan does not exist, documentation indicating that the municipality has reviewed the project.
- 6. A final erosion control plan meeting the requirements of these standards.
- 7. A checklist of BMPs provided as part of the application form must be submitted demonstrating that, to the maximum extent practical, the plan has incorporated the structural and non-structural BMPs, as described in the referenced documents.
- 8. Other items required to support the proposed project.

2.3 Variance Procedure

The BCWMC has established the following variance procedures:

- a. Applications for variances shall be filed with the City where the property is being developed, redeveloped, or retrofitted and shall state the exceptional conditions of the property and the peculiar and practical difficulties claimed as a basis for a variance. The applicant shall state on the application the reasons for requesting the variance, in accordance with all of the requirements set forth in section (c) below.
- b. The City shall refer all applications for variances from the BCWMC requirements to the BCWMC engineer, and such applications shall be reviewed by the BCWMC. In reviewing the application, the BCWMC shall take into consideration the criteria, standards, and goals for maintaining and improving the quality of the watershed's water resources.

To address the applicant's hardship or special situation, the BCWMC may grant the variance, contingent upon conditions that the BCWMC may set forth. Alternatively, the BCWMC may deny the request and set forth reasons for the denial.

- c. In granting variances, the BCWMC shall make a finding showing that all of the following conditions exist:
 - (1) There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of its land.
 - (2) The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.
 - (3) The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

- (4) In applications relating to a use in the 100-year floodplain set forth in Table 5-3 of the Plan, the variance shall not allow a lower degree of flood protection than the current flood protection.
- (5) The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

3.0 Types of Projects to be Submitted for Review

All persons, municipalities, or other agencies proposing improvements or developments within the Bassett Creek watershed shall submit sufficient information to the BCWMC to determine the effect that their proposal may have on the water resources of the watershed within the following guidelines. The types of improvements and development proposals that must be submitted to the BCWMC for review include:

3.1 Floodplains

Any proposal which would consist of a major alteration of existing structures, erection of new structures, filling, floodway encroachment, activities considered incompatible with acceptable floodplain uses or be subject to damage by the 100-year flood, and is located below the 100-year floodplain elevation included in the Plan (Table 5-3) must be submitted for BCWMC review. This section shall apply to structures such as bridges, footbridges, culverts, and pipe crossings of any nature, including sanitary sewer, water supply and electrical and telephone lines. Specific floodplain policies are included in Section 5.0.

3.2 Floodplain Storage Sites

Any proposal within the limits of the proposed floodplain storage sites (inundation areas) established by the BCWMC Plan (Table 5-3, Figure 15) that may be in conflict with the minimum requirements as outlined in the Plan shall be submitted for BCWMC review.

3.3 Lakes, Streams, and Wetlands

Proposals that may affect the water surface elevation, outlet storage capability, shoreline or streambank, or be incompatible with existing or proposed land use around the lakes, streams, and wetlands in the Bassett Creek watershed shall be submitted for BCWMC review. The BCWMC will defer wetland issues in cases where the municipality acts as the local government unit (LGU) for administering the Wetland Conservation Act, unless its involvement is requested by the municipality.

3.4 Water Resources

Proposals that would alter water resources in the watershed, involve the discharge of industrial or other waste to any watercourse or storm sewer, require extensive land alteration, are directly tributary to the watercourses of the watershed, or may otherwise affect the existing water quality shall be submitted for BCWMC review. In addition, the BCWMC shall be informed of the proposed application of chemicals or other treatments to lakes and ponds in the watershed.

3.5 Diversion of Surface Water Runoff

Proposals to provide intra- or inter-watershed diversion which may affect flood levels, lake levels, and minimum streamflows in the watershed shall be submitted for BCWMC review.

3.6 Land Use Changes

Proposed changes in land use, zoning, and local watershed management plans which may require modification of the BCWMC Plan shall be submitted for BCWMC review.

3.7 Appropriations

Ground or surface water appropriations which may temporarily or permanently alter the existing ground and surface water levels in the watershed shall be submitted for BCWMC review.

3.8 Utility Crossings

The construction of utilities through or paralleling the defined trunk creek system which require disturbance of the bed or banks of the creek or the diversion of the creek shall be submitted for BCWMC review.

3.9 Department of Natural Resources (DNR) Permit Applications

Permit applications to the DNR for work in public waters, including supporting documentation, shall be submitted for BCWMC review.

3.10 Development/Redevelopment

Proposals that will result in more than 200 cubic yards of cut or fill or more than 10,000 square feet of grading shall be submitted for BCWMC review. Requirements for erosion control plans are included in Section 7.0. Projects requiring water quality treatment are described in Section 4.0.

3.11 Road Construction

Road construction or reconstruction proposals which result in more than 1.0 acre of grading shall be submitted for BCWMC review. Proposals for review include projects resulting in complete removal of the road surface, exposing the base, and/or removal of the vegetated surface within the road right-of-way. Examples include road widening projects, ditch work, road replacement, and utility installation. Road overlay projects and road resurfacing projects which do not disturb the road base will not be covered by the requirements of this policy. Requirements for erosion control plans are included in Section 7.0. Note: road construction or reconstruction projects resulting in more than 5.0 acres of grading require review at a BCWMC meeting. The BCWMC engineer will review and provide comments directly to the municipality for road projects between 1.0 and 5.0 acres.

4.0 General Guidelines for Developments/Redevelopment

Following is a description of project “triggers” for development/redevelopment proposals that describe the level of BCWMC involvement and required treatment. The table in Appendix C summarizes the treatment requirements for development/redevelopment projects.

4.1 Projects Not Requiring BCWMC Review

New projects which result in less than 200 cubic yards of cut and fill or less than 10,000 square feet of grading do not require BCWMC review. Note other review triggers in Section 3.0.

4.2 Projects Requiring Construction Erosion and Sediment Control Plan

When construction is proposed that will result in more than 200 cubic yards of cut or fill or more than 10,000 square feet of grading, an application, fee, and grading, drainage, and erosion control plan must be submitted for BCWMC review. Requirements for construction erosion and sediment control plans are included in Section 7.0.

4.3 Projects Requiring Treatment to Level I Standards

The BCWMC Plan (Section 4.2.2.4, Policy A) requires treatment of all BCWMC-regulated stormwater from new development to Level I Standards. The BCWMC’s rationale for this policy is that obtaining the maximum amount of stormwater treatment at the time of development will help ensure that water quality objectives are achieved throughout the watershed and avoid costly retrofit projects in the future. A project must be designed in accordance with Level I standards of the water quality policy, when the proposed site meets one of the following development or redevelopment criteria:

- a. *A commercial, industrial, institutional, or public development* involving a parcel of more than 0.5 acres of land where there is no existing commercial, industrial, institutional, or public development. *A commercial, industrial, institutional or public expansion/addition* involving a site that was partially developed prior to adoption of the BCWMC’s Water Quality Policy (September 14, 1994) and involves grading more than 0.5 acres of land. *A commercial, industrial, institutional, or public redevelopment* involving a site of more than 5 acres of land where the commercial, industrial, institutional, residential, or public development currently exists (see also Section 4.4).
- b. *A residential development* involving a parcel of more than 2 acres and which contains four or more proposed living units. *A residential redevelopment* involving more than 10 acres where there are four or more existing living units.

- c. A road construction or reconstruction project involving a site of more than 1.0 acre of land for which the site runoff is not currently directed to an onsite or regional treatment facility (see also Section 4.6).
- d. If the BCWMC has approved a local watershed management plan pursuant to 103B.235, or a subwatershed plan within a municipality; the requirements of this policy which are met by the local watershed management plan shall be deemed satisfied upon showing compliance with the local plan.

Section 6.0 of this document outlines design criteria consistent with Level 1 standards for various water quality enhancement features.

4.4 Nondegradation Policy for Redevelopment Projects

All redevelopment projects that result in an increase in impervious area (except as noted below) must meet the requirements of Policy A, Section 4.2.2.4 of the BCWMC Plan, which requires implementation of BMPs to prevent an increase in phosphorus loading from the site. As an alternative, the entire parcel shall be developed/redeveloped in accordance to Level 1 Standards.

The following are exemptions from the nondegradation policy (Policy A 4.2.2.4) for redevelopment projects:

1. Single family homes (not part of an overall residential development/redevelopment involving a site of more than two acres and which contains four or more proposed living units)
2. Project sites (parcel) less than 0.5 acres
3. Sites described within the following table:

Parcel size (acres)	Exemption applies if added impervious surface area is no more than:
0.5 – 1.0	1,000 square feet
1.0 – 5.0	2,000 square feet
Over 5.0	10,000 square feet

4.5 Site Expansion/Addition Projects

For *commercial, industrial, institutional, or public expansion/addition* projects, the BCWMC realizes that existing development may limit the type of BMPs that can be implemented for the entire site. The most desirable BMP reduces pollutants to the maximum extent practicable and reduces runoff. At a minimum, a wet detention basin or other approved BMP must be constructed to serve the expansion/addition and, if applicable, the increase in tributary drainage area of the basin. Other appropriate BMPs will be required for the existing development if wet detention for the increased

tributary drainage area is not practical. The BCWMC will work with the project applicant to assist with determining the appropriate temporary and permanent BMPs to implement for the project.

4.6 Road Projects

BMPs must be considered to improve the quality of stormwater runoff from *road construction and reconstruction* projects. The most desirable BMP reduces pollutants to the maximum extent practicable and reduces runoff. The BCWMC realizes that existing development and right-of-way constraints will limit the type of BMPs that can be implemented. At a minimum, temporary measures will be required to address erosion and sediment control during construction. The BCWMC will work with the project applicant to assist with determining the appropriate temporary and permanent BMPs to implement for the project. The project applicant must submit a description of the evaluation process used to identify feasible BMPs to be implemented on the project.

5.0 Floodplain Policies

The BCWMC adopted the following policies regarding floodplain regulation within the Bassett Creek watershed (see policies in Section 5.2.2.2 of the Plan):

1. The floodplain of Bassett Creek is defined as that area lying below the 100-year flood elevations as shown in Table 5-3 of the Plan, or as subsequently revised due to channel improvement, storage site development, or requirements established by appropriate state or federal governmental agencies. *(Policy F)*
2. Land use types that would be damaged by flood waters or that would result in increased flooding are not permitted within the floodplain. *(Policy G)*
3. Allowable types of land use that are consistent with the floodplain include: recreation areas, parking lots, excavations and storage areas, public utility lines, agriculture, and other open space uses. Permanent storage piles, fences, and other obstructions which would collect debris or restrict flood flows are not allowed. *(Policy G)*
4. Filling will generally not be allowed within the floodplain. Proposals to fill within the established floodplain must obtain BCWMC approval and must provide compensating storage and/or channel improvement so that the flood level shall not be increased at any point along the trunk system due to the fill. *(Policy H)*
5. Expansion of existing non-conforming land uses within the floodplain will be prohibited unless they are fully flood-proofed in accordance with existing codes and regulations. *(Policy I)*
6. The lowest floor of all permanent structures must be at least 2 feet above the established 100-year floodplain elevation. *(Policy J)*
7. Project applicants must apply BMPs to reduce the volume of stormwater runoff, to the maximum practical extent. Examples of stormwater runoff volume reduction methods include: *(Policy D)*
 - Reducing the amount of planned impervious surface (as areas develop)
 - Reducing the amount of impervious surface (during redevelopment)
 - Promoting infiltration

8. Economic considerations alone will not be a sufficient reason to alter the floodplain.
(Policy L)
9. The BCWMC will not approve any diversions of surface water within, into, or out of the watershed that may have a substantial adverse effect on stream flow or water levels at any point within the watershed. Plans for intra- or inter-watershed diversions must include an analysis of the effects of the diversion on flooding, water quality, and aesthetic quality along the creek. The BCWMC will review diversion plans to determine the effect of the proposal on the Bassett Creek watershed and such plans will be subject to BCWMC approval. If it is necessary to divert surface water runoff to another watershed, every effort must be made to ensure that there is no fish migration from one watershed to another. *(Policy O)*

6.0 Level I Standards

The Plan (see Section 4.2.2.4, Policy A) requires that development proposals must be designed to meet the BCWMC's Level I water quality standard (Level I standards). Design criteria for several BMPs that meet the BCWMC's Level I standards have been adopted by the BCWMC. Except as noted, the BCWMC-approved BMPs include:

Infiltration Systems

- **Infiltration Basin:** An infiltration basin is a stormwater runoff impoundment designed to capture and hold stormwater runoff and infiltrate it into the ground over a period of days. It does not retain a permanent pool of water. Generally, infiltration basins are suitable for sites with gentle slopes, permeable soils, relatively deep groundwater levels, and a small tributary watershed area (less than two acres, ideally).

Filtration Systems

- **Surface Sand Filter:** A surface sand filter consists of a pretreatment basin, a water storage reservoir, flow spreader, and under-drain piping. A basin liner may also be needed if the treated runoff cannot be allowed to infiltrate into the soil underlying the filtration basin because of groundwater concerns. Sand filters are adaptable, and have few site constraints. They can be applied in areas with thin soils, high evaporation rates, low soil-infiltration rates, and limited space.
- **Bioretention Basin:** A bioretention basin is a shallow, landscaped depression that receives stormwater runoff. Stormwater flows into the bioretention basin, ponds on the surface, and gradually filtrates into the soil bed. Filtered runoff is collected by an under-drain system and discharged to the storm sewer system or directly to receiving waters. Bioretention basins should usually be used on sites with tributary areas less than two acres. Bioretention basins can be applied in almost any soils, since runoff percolates through an engineered soil bed.

Detention Systems

- **Water Quality Pond:** A water quality pond (also known as wet pond, detention basin, water quality basin, or "NURP" pond [if the pond incorporates specific design parameters]), is a constructed stormwater pond that retains a permanent pool of water. Water quality ponds are appropriate for sites where there are no space restrictions.
- **Underground Wet Vault:** A wet vault is an underground structure designed to provide temporary and permanent storage for stormwater runoff from a specified storm event. Wet vaults have a permanent pool of water which dissipates energy and improves the settling of particulate stormwater pollutants. Wet vaults are typically used for commercial, industrial, or roadway projects if there are space limitations precluding the use of other treatment BMPs.

All proposed wet vaults must also be reviewed and approved by the BCWMC at its monthly meeting.

Note: Sections 6.1 – 6.3 present the design and maintenance requirements for the BCMWC approved BMPs. These design requirements were developed from the following documents:

1. Bassett Creek Watershed Management Commission, *Watershed Management Plan* (Plan) (September 2004). <http://www.bassettcreekwmo.org/2nd%20Generation%20Plan/Final%20Plan%20September%202004/TOC.htm>
2. *Minnesota Urban Small Sites BMP Manual* Metropolitan Council, July 2001 (*Minnesota BMP Manual*) <http://www.metrocouncil.org/environment/water/BMP/manual.htm>
3. *State of Minnesota Stormwater Manual*, MPCA, November 2005 (*Minnesota Stormwater Manual*). <http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html>
4. *Protecting Water Quality in Urban Areas*, MPCA, March 1, 2000. <http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html>
5. *Plants for Stormwater Design, Species Selection for the Upper Midwest*. MPCA, July 2003. <http://proteus.pca.state.mn.us/publications/manuals/stormwaterplants.html>

6.1 Infiltration Systems

6.1.1 Infiltration Basin Design and Maintenance Requirements

6.1.1.1 Description

An infiltration basin is a stormwater runoff impoundment designed to capture and hold stormwater runoff and infiltrate it into the ground over a period of days. It does not retain a permanent pool of water. A key feature of an infiltration basin is its vegetation. It is important to vegetate the bottom of the basin with deep-rooted plants to increase the infiltration capacity of the basin.

For infiltration basins to perform as designed, pretreatment of stormwater must be provided to remove as many of the suspended solids from the runoff as possible before the water enters the infiltration basin.

Infiltration basins have limited capabilities for controlling peak discharge from storms greater than the design storm. Because infiltration basins will not significantly affect peak discharges of runoff, they must be used in conjunction with other BMPs to meet peak runoff rate control requirements.

6.1.1.2 Site Analysis

Before an infiltration system can be designed, a site sensitivity analysis must be performed. This evaluation may eliminate an infiltration practice from consideration because of soil characteristics or potential effects on groundwater. Because of varying geologic settings, a site evaluation needs to be tailored to the specific site conditions.

The suitability of using infiltration basins on a site depends on numerous site factors, including soils, slope, depth to water table, depth to bedrock or impermeable layer, tributary watershed area, land use, proximity to wells, surface waters, foundations, and others. Generally, infiltration basins are suitable for sites with gentle slopes, permeable soils, relatively deep groundwater levels, and a small tributary watershed area (less than two acres, ideally).

When performing a site evaluation, the following items must be considered:

- **Geology:** A site with highly sensitive geology, such as one with a surficial sand aquifer, may eliminate this practice from consideration.
- **Groundwater:** The seasonally high water table must be far enough below the bottom of the infiltration basin to allow the structure to function hydraulically and to allow trapping and treatment of pollutants by the soil. Specifically, the seasonally high groundwater table is recommended to be at least 3 feet from the bottom of the infiltration basin. Basins should be located at least 150 feet away from drinking water sources to limit the possibility of groundwater contamination, and should be situated at least 10 feet downgradient and 100 feet upgradient from building foundations to avoid potential seepage problems.

- **Soils:** Sites with clayey soils may not be appropriate for infiltration basins. If the infiltration rate of the site's soils is not acceptable, the filtration family of BMP systems should be considered (see Section 6.2).
- **Drainage Area:** Generally, the tributary drainage area to any individual infiltration basin must be restricted to two acres or less.
- **Wetlands:** Wetland issues must be assessed to ensure the BMP conforms to the Wetland Conservation Act and other wetland regulations.

6.1.1.3 General Design Considerations

6.1.1.3.1 Design Volume

The infiltration basin design volume must be no less than 0.5 inches of runoff from the tributary impervious surfaces, while the remaining runoff bypasses the infiltration basin.

6.1.1.3.2 Off-line Placement

The purpose of the basin is to temporarily store surface runoff and allow it to infiltrate through the bottom and sides of the basin. A flow splitter or weir is typically used to divert runoff into an off-line infiltration basin. Infiltration basins provide total peak discharge, runoff volume, and water quality control for all storm events equal to or less than the design storm. Storm events greater than the design storm simply continue down the larger conveyance system, bypassing the infiltration basin.

6.1.1.3.3 Pretreatment

Pretreatment devices such as proprietary environmental stormwater treatment systems, grit chambers, grass swales with check dams, filter strips, or sediment forebays/traps are a fundamental component of any BMP system relying on infiltration and must be incorporated into the design. It is recommended that pretreatment devices be designed to remove at least 25-30% of sediment loads.

- Sediment forebays/traps for pretreatment should be sized to treat a minimum of 25% of the design volume.
- Grit chambers for pretreatment should be designed and sized to provide theoretical settlement of a 0.3-mm grit particle in still water at 10°C (based on Stoke's Law) and provide sufficient storage volume for the settled particles consistent with the maintenance schedule.
- Grass filter strips, should be at least 20 feet long for new sites and at least 10 feet long for retrofits.

6.1.1.3.4 Infiltration Rate

Infiltration volumes and facility sizes shall be calculated using the appropriate hydrological soil group classification and design infiltration rate from Table 1. The design infiltration rate shall be selected from Table 1 based on the least permeable soil horizon within the first five feet below the bottom elevation of the proposed infiltration basin. Soil horizon must be classified under direction of a licensed soil scientist, geologist, or engineer.

Table 1 Design Infiltration Rates

Soil Group	Rate	Soil Textures	ASTM Unified Soil Class Symbols
A	1.60 in/hr	Gravel, sandy gravel, or silty gravel	GW, GP, GM, SW
	0.80 in/hr	Sand, loamy sand, or sandy loam	SP
B	0.60 in/hr	Silt loam	SM
	0.30 in/hr	Loam	MH
C	0.20 in/hr	Sandy clay loam	ML
Source: <i>Minnesota Stormwater Manual</i> , November 2005.			
D	0.03 in/hr	Clay loam, silty clay loam, sandy clay, silty clay, or clay	GC, SC, CL, OL, CH, OH
Source: <i>Minnesota BMP Manual</i> , July 2001			

As an alternative, the applicant may complete double-ring infiltrometer test measurements at the proposed bottom elevation of the infiltration BMP to the requirements of ASTM D3385. The measured infiltration rate shall be divided by the appropriate correction factor selected from the *Minnesota Stormwater Manual*. This test must be completed under the direction of a licensed soil scientist, geologist, or engineer.

6.1.1.3.5 Duration of Ponding

The drawdown time for infiltration basins shall be 48 hours (or up to 72 hours if justification can be provided) from the peak water level in the infiltration basin. The depth and area of the infiltration basin must be adjusted accordingly. Certain types of vegetation will require shorter ponding duration to survive storm events.

6.1.1.3.6 Maximum Depth

After the infiltration rate of the soil has been determined, the maximum depth of the infiltration basin is calculated with the following equation:

$$d_{\max} = (f) * (T_p)$$

Where: d_{\max} = maximum design depth (inches),

f = soil infiltration rate (in/hr), and

T_p = design ponding time (hours).

The maximum depth and ponding time of the infiltration area must promote the survival of vegetation. The maximum depth shall be calculated from Table 1 and shall be no greater than 2 feet unless justification for increased depth can be provided.

6.1.1.3.7 Basin Slopes

The bottom of the basin must be graded as flat as possible (1% or less is recommended) to provide uniform ponding and infiltration of the runoff across the floor. The side slopes of the basin should be no steeper than 3H:1V (flatter slopes are preferred) to allow for proper stabilization and maintenance.

6.1.1.3.8 Basin Shape

The length and width of the basin should be determined by the characteristics of the site in question (topography, size and shape). A desirable length-to-width ratio for an infiltration basin is 3:1 or greater.

6.1.1.3.9 Plants

Plants are an important component of an infiltration basin. Plants remove water through evapotranspiration and remove pollutants and nutrient through uptake. It is important to vegetate the bottom of the basin with deep-rooted plants to increase the infiltration capacity of the basin. The plant species selected for a infiltration basin must be designed to survive frequent periods of inundation during runoff events and drying during inter-event periods.

The bottom and side slopes of the basin must be stabilized within seven days following construction. Vegetative buffers around the perimeter of the basin are recommended for erosion control and additional sediment and nutrient removal. A diversity of plant species is recommended to allow for best survivability. Plants that are tolerant of both wet weather and drought must be used.

Plant recommendations based on different site conditions are included in *Plants for Stormwater Design, Species Selection for the Upper Midwest* (MPCA, July 2003).

6.1.1.3.10 Inflow/Bypass

If runoff is delivered by a storm drain pipe or along the main conveyance system, the infiltration basin should be designed as an off-line system to convey high flows around the basin. This will necessitate the construction of a flow splitter upstream of the basin.

To prevent incoming flow velocities from reaching erosive levels and scouring the basin floor, inlet channels to the basin should be designed to terminate in a broad apron, which spreads the runoff more evenly over the basin surface to promote better infiltration.

6.1.1.3.11 Overflow

All infiltration basins should have an emergency spillway capable of passing runoff from large storms without damage to the impounding structure.

6.1.1.3.12 Groundwater Mounding

Calculations to determine groundwater mounding may be necessary in cases where slope stability is a concern and/or a high water table is encountered.

6.1.1.4 Sequencing and Construction

- Prior to construction, the area of infiltration basin must be protected by silt fence, construction fence, or other method to prevent construction equipment from compacting the underlying soils.
- To the extent possible, the infiltration basin must be constructed after the remaining site and tributary area has been graded and stabilized.
- To the extent possible, excavation must be performed by equipment with tracks exerting relatively light pressures to prevent the basin floor from being compacted, which reduces the infiltration capacity.
- After final grading, the basin floor must be tilled to a depth of at least six inches to provide a well-aerated, porous surface texture. Six inches of compost must be tilled in at this time.
- The bottom and side slopes of the basin must be stabilized within seven days following construction

6.1.1.5 Maintenance

Maintenance is required for the proper operation of infiltration basins. The city must ensure that a maintenance agreement and maintenance plan is prepared for operation of infiltration basins. Following are maintenance requirements from the *Minnesota Stormwater Manual* (MPCA, November 2005) and the *Minnesota BMP Manual* (Metropolitan Council, July 2001):

- The plan must identify owners, parties responsible for maintenance, and an inspection and maintenance checklist and schedule.
- Pretreatment devices for basins must be inspected and cleaned at least twice a year.
- Inspections must occur after every rainfall greater than 0.5-inches in the first year after construction to ensure proper stabilization and function. Attention must be paid to how long water remains standing in the basin after a storm; water standing within the basin more than 48 hours after a storm indicates that the infiltration capacity may have been overestimated. Factors responsible for clogging (such as upland sediment erosion and excessive compaction of soils) must be repaired immediately. Also, the newly-established vegetation must be inspected to determine if any remedial actions (reseeding, irrigation, etc.) are necessary.
- Thereafter, the infiltration basin must be inspected at least twice per year. Important items to check include: differential accumulation of sediment, erosion of the basin floor, condition of

riprap and the health of the vegetation. Eroded or barren spots must be replanted immediately after inspection to prevent additional erosion and accumulation of sediment.

- Sediment removal within the basin must be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor to prevent smearing of the basin floor.
- The surface of the infiltration basin may become clogged with fine sediment over time. Core aeration or cultivating of non-vegetated areas may be required to ensure adequate infiltration.
- Light equipment, which will not compact the underlying soil, must be used to remove the top layer of sediment. The remaining soils must be decompacted by tilling and revegetated as soon as possible.
- Vegetation must be maintained to control weed growth and maintain the health of the vegetation in the basin. Weeding once monthly is required during the first two growing seasons. Weeding two or three times per growing season is required after the first two growing seasons.
- Adequate access for appropriate equipment and vehicles must be provided for inspection, maintenance and landscaping upkeep.
- Snow storage is encouraged outside of the infiltration area.
- It is recommended that the maintenance agreement between the city and applicant be filed against the property with the county.
- Additional general maintenance activities and schedules are provided in the *Minnesota Stormwater Manual*, and the *Minnesota BMP Manual*.

6.2 Filtration Systems

6.2.1 Surface Sand Filter Design and Maintenance Requirements

6.2.1.1 Description

Surface sand filters consist of a pretreatment basin, a water storage reservoir, flow spreader, and under-drain piping. A basin liner may also be needed if the treated runoff cannot be allowed to infiltrate into the soil underlying the filtration basin because of groundwater concerns.

The two basic components of a sand filter design are the pretreatment basin and the sand filter. The pretreatment basin reduces the amount of sediment that reaches the sand filter and helps ensure that stormwater reaches the sand filter as sheet flow.

Drainage areas directed to each sand filter must be less than five acres in size. Sand filters are adaptable, and have few site constraints. They can be applied in areas with thin soils, high evaporation rates, low soil-infiltration rates, and limited space.

Sand filters are most effective when designed as offline BMPs; they are intended primarily for quality control, not quantity control. A diversion structure, such as a flow splitter or weir, must be provided to route the “first flush” of runoff into the sand filter, while the remainder continues on to a stormwater-quantity-control BMP.

6.2.1.2 Design Requirements

6.2.1.2.1 Design Volume

The filtration basin design volume must be no less than 1.0 inches of runoff from the tributary impervious surfaces, while the remaining runoff bypasses the filtration basin.

6.2.1.2.2 Pretreatment

Pretreatment devices such as proprietary environmental stormwater treatment systems, grit chambers, grass swales with check dams, filter strips, or sediment forebays/traps are a fundamental component of any BMP system relying on infiltration and must be incorporated in the design. It is recommended that pretreatment devices be designed to remove at least 25-30% of sediment loads.

- Sediment forebays/traps for pretreatment should be sized to treat a minimum of 25% of the design volume.
- Grit chambers for pretreatment should be designed and sized to provide theoretical settlement of a 0.3-mm grit particle in still water at 10°C (based on Stoke’s Law) and provide sufficient storage volume for the settled particles consistent with the maintenance schedule.
- Grass filter strips should be at least 20 feet long for new sites and at least 10 feet long for retrofits.

6.2.1.2.3 General Principles and Sizing

- The sand filter design is based on Darcy's law:

$$Q = KiA = VA \text{ (since } V = Ki\text{)}$$

where Q = WQ design flow (cfs)

K = hydraulic conductivity (fps)

A = surface area perpendicular to the direction of flow (sf)

i = hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = (h + l) / l$$

where h = average depth of water above filter (ft), defined for this design as $d/2$

d = maximum storage depth above filter (ft)

l = thickness of sand media (typically 1.5 ft)

When water is flowing into the ground, V is commonly called the filtration rate. It is ordinarily measured in a percolation test. The filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design. Table 2 shows values of V for different water depths d (remember, $d = 2h$), assuming a media thickness of 1.5 feet and a hydraulic conductivity of 1 inch per hour.

Unlike the filtration rate V , the hydraulic conductivity K does not change with head, nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. The hydraulic conductivity of 1 inch per hour (2.315×10^{-5} fps) used in this design is based on bench-scale tests of conditioned rather than clean sand. This design hydraulic conductivity represents a typical sand-bed condition as silt is captured and held in the filter bed. The designer must determine the correct hydraulic conductivity based on the actual sand used for the filter bed.

Table 2 Sand Filter Design Parameters

	Sand Filter Design Parameters					
Facility ponding depth d (ft)	1	2	3	4	5	6
Filtration rate V (in/hr) *	1.33	1.67	2.00	2.33	2.67	3.0
$1/V$ (min/in)	44	36	30	26	26	20
* Note: The filtration rate is not used directly but is provided for information. V equals the hydraulic conductivity K times the hydraulic gradient i . The hydraulic conductivity used is 1 in/hr. The hydraulic gradient = $(h + l) / l$, where $h = d / 2$ and l = the sand depth (1.5 ft).						

Source: King County, Washington Surface Water Design Manual, 1988 (revised 2005)

- For a basic sand filter design, it is recommended that the filter must be sized to completely empty (drawdown time) the design-storm volume in 24 hours or less (or up to 48 hours if justification can be provided). Water depth above the filter must be no more than 4 feet (or up to 6 feet if acceptable to the city). A minimum of 1-foot of freeboard is recommended when establishing the BMP depth.

6.2.1.2.4 Basic Components

- Surface sand filters generally include the following layers, from top to bottom: sand, geotextile, and an under-drain system.
- The seasonally high water table must be far enough below the bottom of the sand filter to allow the structure to function hydraulically and to allow trapping and treatment of pollutants by the filter.
- Runoff discharging to the sand filter must be pretreated (via a presettling basin, for example) to remove debris and other gross solids and any oil from high-use sites. (The type of pretreatment device must depend on the type of pollutants present.) The recommended length-to-width ratio of the presettling basin is 3:1 and the depth should be 3 to 6 feet.
- Inlet structures (such as flow spreaders, weirs, or multiple orifice openings) must be designed to minimize turbulence to spread the flow uniformly across the surface of the filter media.
- Stone riprap or other dissipation devices must also be installed to prevent gouging of the sand media and promote uniform flow. Offline outlet structures are typically sized for the 15-minute peak flow of a 2-year, 24-hour storm.
- An impermeable liner (clay, geomembrane, or concrete) is required under the filter to protect groundwater where soil contamination is present.

6.2.1.2.5 Sand Specification

The sand in a filter must consist of a medium sand meeting the size gradation (by weight) given in Table 3. The designer must obtain a grain-size analysis from the supplier to certify that the No. 100 and No. 200 sieve requirements are met. A laboratory analysis to determine the sand's hydraulic conductivity K is also highly recommended. The designer must then adjust this number to account for conditioning of the sand during operation.

Table 3 Medium Sand Specification

U.S. Sieve Number	Percent Passing
4	95 – 100
8	70 – 100
16	40 – 90
30	25 – 75
50	2 – 25
100	<4
200	<2

6.2.1.2.6 Under-Drain Systems

Several types of under-drains may be used: a central collector pipe (with lateral feeder pipes or a geotextile drain strip in an 8-inch gravel backfill or drain rock bed) or a longitudinal pipe in an 8-inch gravel backfill or drain rock with a collector pipe at the outlet end.

- Hydraulically, the system is typically sized for the 15-minute peak flow from a 2-year, 24-hour storm, with 1 foot of head above the invert of the upstream end of the collector pipe. Local sizing requirements must be used when available.
- Under-drain pipes are recommended to have internal diameters with a minimum of 6 inches and two rows of half-inch holes spaced 6 inches apart longitudinally (max.), with the rows 120 degrees apart (laid with holes downward). The recommended maximum perpendicular distance between two feeder pipes is 10 feet.
- The recommended minimum grade of the under-drain piping is 1.0 percent and the recommended minimum grade of the main collector pipe is 0.5 percent.
- A geotextile fabric should be used between the sand layer and drain rock or gravel and placed so that one inch of drain rock or gravel is above the fabric. Drain rock is recommended to be 1.5- to 0.75-inch rock or gravel backfill, washed free of clay and organic material.
- Cleanout wyes with caps or junction boxes are recommended to be provided at both ends of the collector pipes. Cleanouts must extend to the surface of the filter. A valve box should be provided for access to the cleanouts.

6.2.1.2.7 Impermeable Liners

Impermeable liners (clay, concrete, geomembrane, etc.) are required when nonconventional soluble pollutants such as metals and organics are present and where the underflow could cause problems with structures or groundwater.

6.2.1.2.8 Slopes and Siting

- An access ramp with a slope not to exceed 7:1 (horizontal:vertical) or equivalent is recommended for maintenance purposes at the inlet and the outlet of a surface filter.
- Side slopes for earthen or grass embankments are recommended not to exceed 3:1 (horizontal:vertical) to facilitate mowing/maintenance.
- Some cities may require perimeter fencing or benching to reduce safety hazards.
- High groundwater may damage underground structures or affect the performance of filter under-drain systems. Sufficient clearance (at least 3 feet is recommended) between the seasonal high groundwater level and the bottom of the BMP is necessary to obtain adequate drainage.
- Maximum longevity of the sand filter may be achievable by limiting its use only to runoff from impervious areas to minimize clogging by organic material from turfed surfaces.

6.2.1.3 Sequencing and Construction

- The sand filter is recommended to be constructed after the remaining site and tributary area has been graded and stabilized.
- To the extent possible, excavation must be performed by equipment with tracks exerting relatively light pressures to prevent basin floor from being compacted, which reduces the filtration capacity.
- Sand must be placed uniformly to prevent formation of voids that could lead to short-circuiting (particularly around penetrations for under-drain cleanouts) and to prevent damage to the underlying under-drain system. To the extent possible, voids between the trench walls and the geotextile fabric must be avoided.
- Mechanical compaction of the sand filter should be avoided. The sand bed can be stabilized by wetting the sand periodically, allowing it to consolidate, and then adding extra sand. This process can be repeated until consolidation is complete.
- The bottom and side slopes of the sand filter must be stabilized within seven days following construction.

6.2.1.4 Maintenance

Maintenance is required for the proper operation of sand filters. The city must ensure that a maintenance agreement and maintenance plan is prepared for operation of sand filters. Following are maintenance requirements from the *Minnesota Stormwater Manual* (MPCA, November 2005) and the *Minnesota BMP Manual* (Metropolitan Council, July 2001):

- The plan must identify owners, parties responsible for maintenance, and an inspection and maintenance checklist and schedule.
- Adequate access to the sand filter must be provided for inspection and maintenance.
- Sand filters must be inspected after every rainfall greater than 0.5-inches in the first year after construction; thereafter, the sand filter must be inspected at least twice per year. Maintenance for sand filters consists of removing the first two or three inches of discolored sand and replacing it with new sand.
- Silt and sediment is recommended to be removed from the surface of the filter when an accumulation of one inch has occurred or when the drawdown time increases beyond 20 percent of design value.
- Sediment removal within the sand filter must be performed when the sediment is dry enough so that it is cracked and readily separates from the surface to prevent smearing of the filter.
- Vegetation must be maintained as needed. Devices with healthy vegetation tend not to clog. The use of flood- and drought-resistant varieties will minimize maintenance needs.
- To insure proper performance, sediment, trash, and debris must be removed from the sand filter and pretreatment basin on a regular basis.
- Snow storage is encouraged outside of the sand filter.
- It is recommended that the maintenance agreement between the city and applicant be filed against the property with the county.
- Additional general maintenance activities and schedules are provided in the *Minnesota Stormwater Manual*, and the *Minnesota BMP Manual*.

6.2.2 Bioretention System Design and Maintenance Requirements

6.2.2.1 Description

In general, bioretention systems can be described as shallow, landscaped depressions commonly located in parking lot islands or within small pockets in residential areas that receive stormwater runoff. Stormwater flows into the bioretention basin, ponds on the surface, and gradually infiltrates into the soil bed. Pollutants are removed by a number of processes including adsorption filtration, volatilization, ion exchange and decomposition (*Design Manual for Bioretention in Stormwater Management*, Prince George's County, MD, 1993). Filtered runoff is collected by an under-drain system and discharged to the storm sewer system or directly to receiving waters. Runoff from larger storms is generally diverted past the area to the storm drain system.

6.2.2.2 Site Analysis

Before a bioretention basin can be designed, site conditions must be considered to ensure that a bioretention basin is the appropriate BMP for the site.

- **Drainage area:** Bioretention basins should usually be used on sites with tributary areas less than two acres. When used to treat larger areas, they tend to clog. In addition, it is difficult to convey flow from a large area to a bioretention basin. For larger sites, multiple basins should be used to treat runoff.
- **Available area for the bioretention basin:** It is recommended the surface area of the bioretention basin should be between 5% and 10% of the impervious area draining to it, with a minimum of 200 square feet for small sites.
- **Soils:** Bioretention basins can be applied in almost any soils, since runoff percolates through an engineered soil bed and is returned to the stormwater system.
- **Groundwater:** The seasonally high water table must be far enough below the bottom of the bioretention basin to allow the structure to function hydraulically and to allow trapping and treatment of pollutants by the soil. Specifically, the seasonally high groundwater table is recommended to be at least 3 feet from the bottom of the bioretention basin.
- **Under-Drain:** An under-drain is a perforated pipe in a gravel bed, installed along the bottom of a soil bed that collects and removes filtered runoff, directing it to a storm drain system.
- **Wetlands:** Wetland issue must be assessed to ensure the BMP conforms to the Wetland Conservation Act and other wetland regulations.

6.2.2.3 General Design Considerations

6.2.2.3.1 Design Volume

The bioretention basin design volume must be no less than 1.0 inch of runoff from the tributary impervious surfaces, while the remaining runoff bypasses the bioretention basin.

6.2.2.3.2 Pretreatment

Pretreatment devices such as proprietary environmental stormwater treatment systems, grit chambers, grass swales with check dams, filter strips, or sediment forebays/traps are a fundamental component of any BMP system relying on infiltration and must be incorporated in the design. It is recommended pretreatment devices be designed to remove at least 25-30% of sediment loads.

- Sediment forebays/traps for pretreatment should be sized to treat a minimum of 25% of the design volume.
- Grit chambers for pretreatment should be designed and sized to provide theoretical settlement of a 0.3-mm grit particle in still water at 10°C (based on Stoke's Law) and provide sufficient storage volume for the settled particles consistent with the maintenance schedule.
- Grass filter strips should be at least 20 feet long for new sites and at least 10 feet long for retrofits.

6.2.2.3.3 Maximum Depth

The maximum depth and ponding time of the bioretention basin must promote the survival of vegetation. Where feasible the bioretention basin must be designed to pond 6 to 9 inches (the maximum pooling depth may be up to 2 feet if justification for increased depth can be provided).

6.2.2.3.4 Duration of Ponding

Where feasible, the drawdown time for bioretention basins shall be 48 hours (or up to 72 hours if justification can be provided) from the peak water level in the bioretention basin. The depth and area of the bioretention basin must be adjusted accordingly. Certain types of vegetation will require shorter ponding duration to survive storm events.

6.2.2.3.5 Basin Slopes

The bottom of the basin must be graded as flat as possible (1% or less is recommended) to provide uniform ponding and filtration of the runoff across the floor. The side slopes of the area should be no steeper than 3H:1V (flatter slopes are preferred) to allow for proper stabilization and maintenance.

6.2.2.3.6 Planting Soil Bed

The planting soil bed provides water and nutrients to support plant life in the bioretention basin. Stormwater filters through the planting soil bed where pollutants are removed by the mechanisms of filtration, plant uptake, adsorption, and biological degradation.

- A well-blended, homogenous mixture of 50-60% sand, 20-30% top soil, and 20-30% organic leaf compost is recommended to provide a soil medium with a high infiltration/filtration capacity.
 - **Sand**—Provide clean sand, free of deleterious materials. AASHTO M-6, ASTM C-33 or MnDOT 3126F with grain size of 0.02-0.04 inches, to the extent possible.
 - **Top Soil**—Sandy loam, loamy sand, or loam texture per USDA textural triangle with less than 5% clay content.
 - **Organic Leaf Compost**—MnDOT Grade 2 Compost (provided by vendor approved by MnDOT's Turf Establishment and Erosion Prevention Unit)
- The recommended minimum depth of the prepared soil is 30 inches. However, if large trees are preferred in the design, a soil depth of 48 -52 inches is recommended to accommodate the root depth of the proposed trees.

6.2.2.3.7 Plants

Plants are an important component of a bioretention system. Plants remove water through evapotranspiration and remove pollutants and nutrient through uptake. Plant roots enhance the infiltration capacity of the soil, providing conduits for percolation. The plant species selected for a bioretention basin must be designed to survive frequent periods of inundation during runoff events and drying during inter-event periods.

The bottom and side slopes of the basin must be stabilized with appropriate plants within seven days following construction. Vegetative buffers around the perimeter of the basin are recommended for erosion control and additional sediment and nutrient removal. A diversity of plant species is recommended to allow for best survivability. Plants that are tolerant of both wet weather and drought must be used.

Plant recommendations based on different site conditions are included in *Plants for Stormwater Design, Species Selection for the Upper Midwest* (MPCA, July 2003).

6.2.2.3.8 Inflow/Bypass

- If runoff is delivered by a storm drain pipe or along the main conveyance system, the bioretention basin should be designed as an off-line system to convey high flows around the basin. This will necessitate the construction of a flow splitter upstream of the basin.

- To prevent incoming flow velocities from reaching erosive levels and scouring the basin floor, inlet channels to the basin must be designed to terminate in a broad apron, which spreads the runoff more evenly over the basin surface to promote better filtration.

6.2.2.3.9 Overflow

All bioretention basins should have an emergency spillway capable of passing runoff from large storms without damage to the impounding structure.

6.2.2.4 Sequencing and Construction

- Prior to construction, the area of the bioretention basin must be protected by silt fence, construction fence or other method to prevent construction equipment from compacting the underlying soils.
- To the extent possible, the bioretention basin must be constructed after the remaining site and tributary area has been graded and stabilized.
- To the extent possible, excavation must be performed by equipment with tracks exerting relatively light pressures to prevent the basin floor from being compacted, which reduces the infiltration capacity.
- After final grading, the bioretention basin floor must be tilled to a depth of at least 6 inches to provide a well-aerated, porous surface texture. Six inches of compost must be tilled in at this time.
- The bottom and side slopes of the basin must be stabilized with appropriate plants within seven days following construction

6.2.2.5 Maintenance

Maintenance is required for the proper operation of bioretention basins. The city must ensure that a maintenance agreement and maintenance plan is prepared for operation of bioretention basins. Following are maintenance requirements from the *Minnesota Stormwater Manual* (MPCA, November 2005) and the *Minnesota BMP Manual* (Metropolitan Council, July 2001):

- The plan must identify owners, parties responsible for maintenance, and an inspection and maintenance checklist and schedule.
- Pretreatment devices for bioretention basins must be inspected and cleaned at least twice a year.
- Inspections must occur after every rainfall greater than 0.5-inches in the first year after construction to ensure proper stabilization and function. Attention must be paid to how long water remains standing in the basin after a storm; water standing within the basin more than

48 hours after a storm indicates that the filtration capacity may have been overestimated. Factors responsible for clogging (such as upland sediment erosion and excessive compaction of soils) must be repaired immediately. Also, the newly-established vegetation must be inspected to determine if any remedial actions (reseeding, irrigation, etc.) are necessary.

- Thereafter, the bioretention basins must be inspected at least twice per year. Important items to check include: differential accumulation of sediment, erosion of the floor, condition of riprap and the health of the vegetation. Eroded or barren spots must be replanted immediately after inspection to prevent additional erosion and accumulation of sediment.
- The surface of the ponding area may become clogged with fine sediment over time. Core aeration or cultivating of non-vegetated areas may be required to ensure adequate filtration.
- Sediment removal within the bioretention basin must be performed when the sediment is dry enough so that it is cracked and readily separates from the floor to prevent smearing of the floor.
- Light equipment, which will not compact the underlying soil, must be used to remove the top layer of sediment. The remaining soils must be tilled and revegetated as soon as possible.
- Vegetation must be maintained to control weed growth and maintain the health of the vegetation in the basin. Weeding once monthly is recommended during the first two growing seasons. Weeding two or three times per growing season is recommended after the first two growing seasons.
- Adequate access for appropriate equipment and vehicles must be provided for inspection, maintenance, and landscaping upkeep.
- Snow storage is encouraged outside of the bioretention basin.
- It is recommended that the maintenance agreement between the city and applicant be filed against the property with the county.
- Additional general maintenance activities and schedules are in the *Minnesota Stormwater Manual* and the *Minnesota BMP Manual*.

6.3 Detention Systems

6.3.1 Water Quality Pond Design and Maintenance Requirements

6.3.1.1 Description

Water quality ponds (also known as wet ponds, detention basins, water quality basins, or “NURP” ponds [if the pond incorporates specific design parameters]), are constructed stormwater ponds that retain a permanent pool of water. Water quality ponds are generally on-line, end-of-pipe BMPs. The primary pollutant removal mechanism in a water quality pond is sedimentation. Significant loads of suspended pollutants, such as metals, nutrients, sediments, and organics, can be removed by sedimentation. Water quality ponds have a moderate to high capacity for removing most urban pollutants, depending on how large the volume of the permanent pool is in relation to the runoff from the surrounding watershed. Removal efficiency is primarily dependent on the length of time that runoff remains in the pond, which is known as the pond’s hydraulic residence time (HRT)

Water quality ponds can also be constructed using multiple cells to enhance removal efficiency, incorporate skimming and provide accessible maintenance.

6.3.1.2 Site Analysis

- **Treatment Standard:** Natural or excavated low areas shall be used for the water quality ponds. Generally accepted reservoir routing procedures using critical duration runoff events shall be used for design of these areas and outlets. Based on the BCWMC Plan, all regulated stormwater must be treated to Level I standards throughout the watershed.
- **Alternatives to Onsite Ponds:** Alternative water quality management features may be used where onsite ponds are not feasible. Alternative features must be designed to provide water quality benefits that equal or exceed design criteria outlined in existing BCWMC policies.
- **Bedrock:** As with other stormwater BMPs, soils depth to bedrock and depth to water table must be investigated before designing a water quality pond. At sites where bedrock is close to the surface, high excavation costs may make water quality ponds infeasible. If the soils on the site are relatively permeable or well-drained, it will be difficult to maintain a permanent pool. It may be necessary to line the bottom of the water quality pond to reduce infiltration.
- **Wetlands:** Wetland issues must be assessed to ensure the BMP conforms to the Wetland Conservation Act and other wetland regulations.

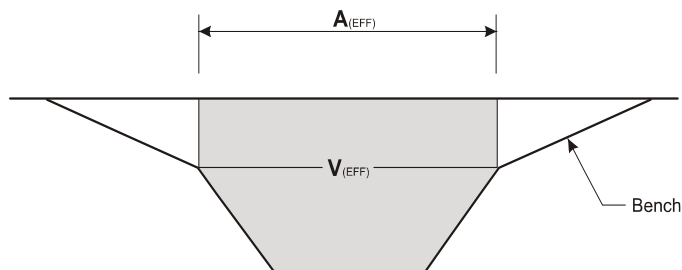
6.3.1.3 Design Requirements

6.3.1.3.1 Design Volume

- The permanent pool (dead storage) volume below the principal spillway (normal outlet) must be greater than or equal to the runoff volume from a 2.5-inch, 24-hour storm over the project site, assuming full development. The project site includes all tributary area draining to the pond.
- The dead storage volume must be calculated separately from impervious and pervious surfaces to prevent artificially low volumes due to composite curve numbers.
- The entire tributary drainage area must be considered in computing the dead storage volume, assuming full development of the drainage area. For design purposes, the water quality volume must be considered an instant flow to the pond, not an inflow-outflow calculation. In other words, this volume must be considered to arrive at the pond all at once, rather than over the course of several hours or days. The assumption of instant runoff is conservative, but it accounts for a great deal of the variability that occurs in both storm events and runoff conditions.

6.3.1.3.2 Average Depth

The permanent pool average depth (basin volume/basin surface area) shall be ≥ 4 feet, with a maximum depth of ≤ 10 feet. For small ponds (less than 3 acre-feet in volume) average depth shall be ≥ 3 feet, with a maximum depth of ≤ 10 feet. An “effective average depth” (“effective volume”/“effective surface area”) may be calculated for ponds that include benches. The “effective volume” and “effective surface area” are computed by extending the basin side slopes below the basin bench vertically to the water surface.



6.3.1.3.3 Emergency Overflow

An emergency overflow (emergency outlet) must be in place and adequately designed to accommodate the 100-year frequency critical duration rainfall event.

6.3.1.3.4 Basin Side Slopes

Basin side slopes above the normal water level should be no steeper than 3:1, and preferably flatter, to allow for proper stabilization and maintenance. A basin bench with a minimum width of 10 feet and 1-foot deep below the normal water level is recommended to enhance wildlife habitat, reduce potential safety hazards, and improve access for long-term maintenance. Slopes that extend below the bench to the bottom of the pond must be at a stable slope, usually no steeper than 3:1.

6.3.1.3.5 Short-Circuiting

To prevent short-circuiting, the distance between the major inlets and normal outlet must be maximized.

6.3.1.3.6 Flood Pool (Live Storage)

The flood pool (live storage) volume above the principal spillway shall be such that the peak discharge rate from the 5-year and 100-year frequency, critical duration storms do not exceed the peak discharge for similar storms under predevelopment conditions.

6.3.1.3.7 Pond Shape

To maximize stormwater contact and residence time in the pool, a length-to-width ratio of 3:1 is recommended. A minimum pool surface area of 0.25 acres is recommended. Performance of the water quality pond may be enhanced by enlarging the surface area to increase volume, as opposed to deepening the pool. However, average depth criteria must be achieved.

6.3.1.3.8 Multi-Stage Outlets

Water quality ponds may be designed with a multi-stage outlet structure to control discharges from different size storms. Usually the pond is designed to control multiple design storms (e.g., 2- and 10-year storms) and safely pass the 100-year storm event. However, the design storm may vary depending on local conditions and requirements.

6.3.1.3.9 Extended Detention

Extended detention of runoff from the more frequent (1-year to 5-year) storms is recommended by designing a principal spillway which includes a perforated vertical riser, small orifice outlet, or a compound weir.

6.3.1.3.10 Stormwater Outfalls

The design must include effective energy dissipation devices that reduce outlet velocities to 4 fps or less. These outlets shall consist of stilling basins or other such devices that prevent erosion at all stormwater outfalls into the water quality pond, and at the basin outlet. Storm sewer outfalls must extend to the water quality pond or other receiving water body and must discharge at or below its normal water elevation.

6.3.1.3.11 Outlet Structure (Skimming)

Trash and floatable debris skimming devices must be placed on the outlet of all onsite water quality ponds to provide treatment up to the critical duration 5-year storm event. Submerged inlets, permanent baffled weirs or similar devices may be employed. Timber baffled weirs are discouraged. To the extent possible, velocities through the devices shall be less than 0.5 fps. The top of submerged inlets shall be at least one foot below the normal water surface.

6.3.1.3.12 Pretreatment

Pretreatment, such as grit chambers, swales with check dams, filter strips, or sediment forebays/traps should be considered to extend the life of the water quality pond.

6.3.1.3.13 Flow Conveyance Capacity

Onsite water quality ponds shall avoid or minimize increases in predevelopment runoff rates to the greatest extent practical. The capacity of the receiving body to convey and/or store the runoff shall also be considered so as to not adversely affect water levels off the site.

6.3.1.4 Sequencing and Construction

- To the extent possible, water quality ponds must be constructed in the initial phases of a development project in order to treat site runoff during construction.
- If the water quality pond is used as a sediment trap during construction, all sediment deposited during construction must be removed before normal operation begins.
- During construction of the basin, discharge of waterborne sediments to downstream water bodies must be prevented, to the extent possible.
- The side slopes of the water quality pond must be stabilized within seven days following construction.

6.3.1.5 Maintenance

Maintenance is required for the proper operation of water quality ponds. The city must ensure that a maintenance agreement and maintenance plan is prepared for operation of water quality ponds. Following are maintenance requirements from the *Minnesota Stormwater Manual* (MPCA, November 2005) and the *Minnesota BMP Manual* (Metropolitan Council, July 2001):

- The plan must identify owners, parties responsible for maintenance, and an inspection and maintenance checklist and schedule.
- Water quality ponds must be inspected after every rainfall greater than 0.5-inches in the first year after construction.
- Thereafter, water quality ponds must be inspected at least twice per year during the growing season to ensure that they are operating as designed. Potential problems that must be checked include: subsidence, erosion, cracking or tree growth on the embankment, damage to the emergency spillway; sediment accumulation around the outlet; and erosion within the basin and banks. Any necessary repairs must be made immediately. During inspections, changes to the water quality pond or the tributary watershed must be noted, as these may affect basin performance.
- Accumulated trash and debris must be removed from the side slopes, embankment, emergency spillway, weirs, and trash grates as often as needed (at least twice during the growing season). Accumulated sediment in the forebay must be inspected at the same time.
- Sediment must be removed from the pond, as necessary. The frequency of sediment removal depends on the years of sediment accumulation that were incorporated into the design volume of the water quality pond's permanent pool and forebay and on the occurrence of any high-loading events.
- Sediment removal from water quality ponds and disposal is currently regulated by the MPCA. Sediment testing, disposal and permitting may be required and shall be investigated on an individual site basis. Sediments must be tested for toxicants in compliance with current disposal requirements as required by local, state, or federal laws or regulations.
- Adequate access for appropriate equipment and vehicles must be provided for inspection, maintenance and landscaping upkeep.
- It is recommended that the maintenance agreement between the city and applicant be filed against the property with the county.
- Additional general maintenance activities and schedules are in the *Minnesota Stormwater Manual* and the *Minnesota BMP Manual*.

6.3.2 Underground Wet Vault Design and Maintenance Requirements

6.3.2.1 Description

An underground wet vault is an underground structure designed to provide temporary and permanent storage for stormwater runoff from a specified storm event. Wet vaults have a permanent pool of water which dissipates energy and improves the settling of particulate stormwater pollutants. Wet vaults are typically on-line, end-of-pipe BMPs.

Pollutant removal mechanisms for particulate pollutants in wet vaults are similar to water quality ponds. The primary pollutant removal mechanism in a wet vault is sedimentation. Significant loads of suspended pollutants, such as metals, nutrients, sediments, and organics, can be removed by sedimentation. However, in a wet vault, the permanent pool of water is covered by a lid which blocks sunlight from entering the facility, limiting light-dependent biological activity. Consequently, biological pollutant removal mechanisms that function in the surface water quality ponds are not a part of stormwater treatment in a wet vault.

Wet vaults are typically used for commercial, industrial, or roadway projects if there are space limitations precluding the use of other treatment BMPs.

6.3.2.2 General Design Requirements

6.3.2.2.1 Design Volume

- The permanent pool (dead storage) volume below the principal spillway (normal outlet) must be greater than or equal to the runoff volume from a 2.5-inch, 24-hour storm over the project site, assuming full development. The project site includes all tributary area draining to the structure.
- The “dead storage” volume shall be calculated separately from impervious and pervious surfaces to prevent artificially low volumes due to composite curve numbers.
- The entire tributary drainage area must be considered in computing the dead storage volume, assuming full development of the drainage area. For design purposes, the water quality volume must be considered an instant flow to the wet vault, not an inflow-outflow calculation. In other words, this volume must be considered to arrive at the wet vault all at once, rather than over the course of several hours or days. The assumption of instant runoff is conservative, but it accounts for a great deal of the variability that occurs in both storm events and runoff conditions.

6.3.2.2.2 Average Depth

The permanent pool average depth (vault volume/vault surface area) shall be ≥ 4 feet, with a maximum depth of ≤ 10 feet.

6.3.2.2.3 Vault Inlet Structures and Pipes

- To the extent possible, the inlet to the wet vault shall be submerged with the inlet pipe invert a minimum of 3 feet from the vault bottom and the top of the inlet pipe shall be submerged at least 1 foot. The submerged inlet is intended to dissipate energy of the incoming flow. The distance from the bottom is intended to minimize resuspension of settled sediment. Alternative inlet designs that accomplish these objectives are acceptable.
- Unless designed as an off-line facility, it is recommended the capacity of the outlet pipe and available head above the outlet pipe should be designed to convey flows larger than the water quality design flow for developed site conditions without overtopping the vault. The available head above the outlet pipe is recommended to be a minimum of 6 inches.
- A gravity drain for maintenance is recommended if grade allows. Gravity drains should be as low as the site situation allows; however, the invert shall be no lower than the average sediment storage depth to prevent plugging.
- Wet vaults may be constructed using arch culvert sections provided the top area at the normal water surface is, at a minimum, equal to that of a vault with vertical walls designed with an average depth of 6 feet. This is to prevent decreasing the surface area available for oxygen exchange.
- Galvanized materials shall be prohibited.
- Adequate vents in the vault or other provisions must be included to ensure the water in the vault does not become “stagnant” resulting in anoxic conditions and the release of phosphorus in the water column. Lockable grates instead of solid manhole covers are recommended to increase air contact with the wet pool.
- Operational access to the valve that controls the gravity drain must be provided to the finished ground surface.

6.3.2.2.4 Short-Circuiting and the Promotion of Plug Flow

To prevent short-circuiting, water must be forced to flow, to the extent practical, to all potential available flow routes, avoiding “dead zones” (corners, etc.) and maximizing the time that water stays in the vault during the active part of a storm. Design features that encourage plug flow and avoid dead zones are:

- Providing a broad surface for water exchange across cells rather than a constricted area.
- Maximizing the distance between the major inlets and normal outlet.
- The ratio of flowpath length to width from the inlet to the outlet is recommended to be at least 3:1.

- To the extent possible, all inlets must enter the first cell. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.
- Flow rates must be uniform to the extent possible and not increased between cells.

6.3.2.2.5 Flood Pool (Live Storage)

The flood pool (live storage) volume above the principal spillway shall be such that the peak discharge rate from the 5-year and 100-year frequency, critical duration storm does not exceed the peak discharge for a similar storm under predevelopment conditions.

6.3.2.2.6 Outlet Structure (Skimming)

Trash and floatable debris-skimming devices shall be placed on the outlet of all wet vaults to provide treatment up to the critical-duration 5-year storm event. Submerged inlets, permanent baffled weirs, or similar devices may be employed. Timber baffled weirs are discouraged. To the extent possible, velocities through the devices shall be less than 0.5 fps. The top of submerged inlets shall be at least one foot below the normal water surface.

6.3.2.2.7 Pretreatment

Pretreatment, such as grit chambers, swales with check dams, filter strips, or sediment forebays/traps should be considered to extend the maintenance frequency of the wet vault.

6.3.2.2.8 Flow Conveyance Capacity

Onsite wet vaults shall avoid increases in predevelopment runoff rates to the greatest extent practical. The capacity of the downstream receiving body to convey and/or store the runoff shall also be considered so as to not adversely affect water levels off the site.

6.3.2.2.9 Vault Structures

Detailed examples of wet vault structures are provided in the following document:

- *Minnesota BMP Manual* (Metropolitan Council, July 2001)
<http://www.metrocouncil.org/environment/water/BMP/manual.htm>

6.3.2.3 Sequencing and Construction

- Wet vaults may be constructed in the early phases of a development project in order to treat site runoff during construction.
- Sediment that has accumulated in the wet vault must be removed after the remaining site and tributary area has been graded and stabilized.

6.3.2.4 Maintenance

Maintenance is required for the proper operation of wet vaults. The city must ensure that a maintenance agreement and maintenance plan is prepared for operation of wet vaults. Following are maintenance requirements from the *Minnesota Stormwater Manual* (MPCA, November 2005) and the *Minnesota BMP Manual* (Metropolitan Council, July 2001):

- The plan must identify owners, parties responsible for maintenance, and an inspection and maintenance checklist and schedule.
- Following construction, the underground wet vault must be inspected after every rainfall greater than 0.5-inches in the first year after construction. Thereafter, wet vaults must be inspected at least annually.
- Structural inspection shall be performed every 5-years by a registered professional engineer.
- Accumulated trash, floating debris and petroleum products must be removed as necessary, but at least annually from the wet vault, forebay/pretreatment area, emergency spillway, weirs, and trash grates. The frequency of sediment removal depends on the years of sediment accumulation that were incorporated into the design volume of the wet vault's permanent pool and forebay and on the occurrence of any high-loading events.
- Sediment removal and disposal from underground wet vaults may currently be regulated by the MPCA. Sediment testing, disposal, and permitting may be required and shall be investigated on an individual site basis. Sediments must be tested for toxicants in compliance with current disposal requirements as required by local, state, or federal laws or regulations.
- Vault maintenance procedures must meet OSHA confined space entry requirements, which include clearly marking entrances to confined space areas.
- Adequate access for appropriate equipment must be provided for inspection, maintenance, and landscaping upkeep.
- It is recommended that the maintenance agreement between the city and applicant be filed against the property with the county.
- Additional general maintenance activities and schedules are in the *Minnesota Stormwater Manual* and the *Minnesota BMP Manual*

7.0 Requirements for Construction Erosion and Sediment Control Plans

1. For construction projects that involve more than 200 cubic yards of cut or fill, or disturb more than 10,000 square feet, an Erosion and Sediment Control Plan shall be prepared that meets the standards given in the NPDES Permit for Construction Activity (MPCA) and *Protecting Water Quality in Urban Areas* (MPCA, 1989).
2. Erosion and sediment control plans submitted for BCWMC review shall show the proposed methods of retaining waterborne sediments onsite during the period of construction, and shall specify methods and schedules to determine how the site will be restored, covered, or revegetated after construction.
3. In addition, the project proposer shall:
 - a. Provide specific measures to control erosion based on the grade and length of the slopes on the site, as follows:
 - (1) Silt fences or other erosion control features shall be placed along the toe of the slopes that have a grade of less than 3 percent and are less than 400 feet long from top to toe. The silt fences shall be supported by sturdy metal or wooden posts at intervals of 4 feet or less.
 - (2) Flow lengths up-slope from each silt fence shall not exceed 400 feet for slopes that have a grade of less than 3 percent.
 - (3) Silt fences or other erosion control features shall be placed along the toe of the slopes that have a grade of 3 to 10 percent and are less than 200 feet long from top to toe. These fences shall be supported by sturdy metal or wooden posts at intervals of 4 feet or less.
 - (4) Flow lengths up-slope from each silt fence shall not exceed 200 feet for slopes that have a grade of 3 to 10 percent.
 - (5) Diversion channels or dikes and pipes shall be provided to intercept all drainage at the top of slopes that have a grade of more than 10 percent and are less than 100 feet long from top to toe. Silt fence shall be placed along the toe of said slopes, and shall be supported by sturdy metal or wooden posts at intervals of 4 feet or less.
 - (6) Diversion channels or dikes and pipes shall be provided to intercept all drainage at the top of slopes that have grades of more than 10 percent. Also, diversion channels or diked terraces and pipes shall be provided **across** said slopes if needed to ensure that the maximum flow length does not exceed 100 feet. Silt fence shall be placed

along the toe of said slopes, and shall be supported by sturdy metal or wooden posts at intervals of 4 feet or less.

- (7) Other erosion control practices such as erosion logs, compost blankets, and compost filter berms, and other practices should also be considered for construction site erosion control.
- b. Require that silt fences, silt socks, or approved inlet protection devices be installed around each catch basin inlet on the site and that this barrier remain in place until pavement surfaces have been installed and/or final turf establishment has been achieved.
- c. Ensure that flows from diversion channels or pipes are routed to sedimentation basins or appropriate energy dissipators in order to prevent transport of sediment to outflow conveyors and to prevent erosion and sedimentation when runoff flows into the conveyors.
- d. Provide that site-access roads be graded or otherwise protected with silt fences, diversion channels, or dikes and pipes to prevent sediment from leaving the site via the access roads. Vehicle tracking of sediment from the construction site (or onto streets within the site) must be minimized by installing rock construction entrances (with a minimum height of 2 feet above the adjacent roadway and with maximum side slopes of 4:1), rumble strips (mud mats), wood chips, wash racks, or equivalent systems at each site access.
- f. Require that soils tracked from the site by motor vehicles be cleaned daily (or more frequently, as necessary) from paved roadway surfaces throughout the duration of construction.
- g. Assure that silt fences and diversion channels or dikes and pipes be deployed and maintained for the duration of site construction. If construction operations interfere with these control measures, the silt fences, diversion channels or dikes and pipes may be removed or altered as needed but shall be restored to serve their intended function at the end of each day.
- h. Specify that all exposed soil areas must be stabilized as soon as possible, but in no case later than 14 days after the construction activity has temporarily or permanently ceased. A schedule of significant grading work will be required as part of the erosion and sedimentation control plan.
- i. Require that temporary or permanent mulch be uniformly applied by mechanical or hydraulic means and stabilized by disc-anchoring or use of hydraulic soil stabilizers.
- j. Provide a temporary vegetative cover consisting of a suitable, fast-growing, dense grass-seed mix spread at 1.5 times the usual rate per acre. If temporary cover is to remain in

place beyond the present growing season, two-thirds of the seed mix shall be composed of perennial grasses.

- k. Provide a 4-foot wide sod buffer along the curb line of all streets adjacent to the site and along all property boundaries where runoff could leave the site.
- l. Specify a permanent vegetation cover consisting of sod, a suitable grass-seed mixture, or a combination thereof. Seeded areas shall be either mulched or covered by fibrous blankets to protect seeds and limit erosion.
- m. Provide temporary on-site sedimentation basins when 10 or more acres of disturbed area drain to a common location. Install temporary sediment basins where appropriate in areas with steep slopes or highly erodible soils drain to one area. On-site detention basins shall be designed to achieve pollutant removal efficiencies equal to or greater than those obtained by implementing the criteria set forth by the NPDES Permit for Construction Activity (MPCA, 2008) and *Protecting Water Quality in Urban Areas* (MPCA, 1989).

8.0 Streambank Erosion and Degradation Control

Streambank erosion and streambed degradation control measures must:

- a. Be employed whenever the net sediment transport for a reach of stream is greater than zero or whenever the stream's natural tendency to form meanders directly threatens damage to structures, utilities, or natural amenities in public areas.
- b. Include effective energy dissipation devices or stilling basins to prevent streambank or channel erosion at all stormwater outfalls. Specifically:
 - i. Outfalls with outlet velocities of less than 4 fps that project flows downstream into the channel in a direction of 30° or less from the normal flow direction generally shall not require energy dissipators or stilling basins, but they may need some riprap protection.
 - ii. Energy dissipators shall be sized to provide an average outlet velocity of no more than 6 fps. If riprap is also used, the average outlet velocity may be increased to 8 fps.
 - iii. Riprap stilling basins shall not be used where outlet velocities exceed 8 fps.
- c. Specify riprap consisting of natural angular stone suitably graded by weight for the anticipated velocities.
- d. Provide riprap to an adequate depth below the channel grade and to a height above the outfall or channel bottom so as to ensure that the riprap will not be undermined by scour or rendered ineffective by displacement.
- e. Specify that riprap be placed over a suitably graded filter material or filter fabric to ensure that soil particles do not migrate through the riprap and reduce its stability.

Streambank stabilization and streambed degradation control structures must be submitted to the BCWMC for review. The review will consider the need for the work, the adequacy of design, unique or special site conditions, energy dissipation, the potential for adverse effects, contributing factors, preservation of natural processes, and aesthetics.

9.0 Regulatory Agencies

9.1 Minnesota Department of Natural Resources (DNR)

Any project constructed below the ordinary high water mark (OHW) which alters the course, current, or cross-section of state public waters or public waters wetlands is subject to the regulatory jurisdiction of the DNR. This includes filling, excavation, construction of structures, water level control, and drainage projects.

Questions concerning the DNR's role in water resource management should be directed to the DNR Division of Waters, Metro Region, 1200 Warner Road, St. Paul, Minnesota 55106 (651) 772-7910, <http://www.dnr.state.mn.us/waters/index.html>.

9.2 Minnesota Pollution Control Agency (MPCA)

An NPDES/SDS General Stormwater Permit for Construction Activity is required from the MPCA for projects which disturb one acre or more of soil.

As part of the permitting process, the owner and operator must create a stormwater pollution prevention plan (SWPPP) that explains how stormwater will be controlled. After a SWPPP has been completed, site owners and their construction operators may apply for the permit by submitting an Application for General Stormwater Permit for Construction Activity (MN R100001) to the MPCA.

Questions concerning the construction stormwater permit program and MPCA's role in water resource management should be directed to the MPCA, 520 Lafayette Road, St. Paul, MN 55155, (651) 206-6300 <http://www.pca.state.mn.us/water/index.html>.

Appendix A

Application Form



www.bassettcreekwmo.org

Obtain City staff signature and send application,
check for fee, and submittals to:
Bassett Creek Watershed Management Commission
4700 W 77th Street, Minneapolis, MN 55435-4803

A.F. # _____

Application Form for Development Proposals

If you have questions about this application, contact Jim Herbert at 952-832-2784 or Len Kremer at 952-832-2781.

Complete by City Staff

This application is being submitted to the Bassett Creek Watershed Management Commission for review purposes by the City of _____, by _____

City Staff Signature

Date
Note:

the contents of the application are solely the responsibility of the applicant.

Complete by Applicant

General Information:

(Name of development or description of project)

(City/¼ Section)

(Location of work—Reference major streets and highways, and attach legal description)

Name of Applicant (owner): _____

Telephone _____ E-mail _____

Address _____

City, State, Zip _____

Name of Agent (project contact): _____

Telephone _____ E-mail _____

Address _____

City, State, Zip _____

Submittals:

Requirements for each submittal are provided in the document *Requirements for Improvements and Development Proposals*. The required fee is shown on the Commission's Fee Schedule attached to this application.

Enclosed is the following required information for review:

- ☐ Project review fee
- ☐ Wetland fee (if applicable)
- ☐ Project plans
- ☐ Runoff water quality plan and computations
- ☐ Erosion control plan
- ☐ Applicant has completed checklist of BMPs attached to this application.
- ☐ Other:
- ☐ Other:
- ☐ Variance Request

Project Information:

Nature of work: _____

Plat area: _____ Area to be graded: _____

Existing total impervious area: _____ Proposed total impervious area: _____

Land use proposed: _____

(Industrial, commercial, multiple residential, single residential, utility, public)

Number and type of units: _____

Authorized Signature (Applicant)

Date

**Proposed Best Management Practices (BMPs)
to be implemented on project for water quality protection**

Description of BMP	Was BMP used in project?	Location used or basis for nonusage:
DISCHARGE ELIMINATION BMPs		
1. Reduce area of impervious surface (pavement, roofs, etc.)		
2. French drains and subsurface drains		
3. Infiltration trench and dry well		
4. Exfiltration trench		
5. Porous pavement		
6. Retention (infiltration) basin		
STORMWATER BMPs		
7. Detention basin with outlet protection		
8. Extended detention basin		
9. Wetland treatment area		
10. Parking lot/rooftop runoff storage with outlet protection		
11. Grit chambers/manholes		
12. Diversion channel		
FLOATABLE/OIL REMOVAL BMPs		
13. Floatable skimmer		
14. Parking lot oil/grease separators		
SEDIMENT CONTROL BMPs		
15. Riprap or other storm drain outlet protection		
16. Storm drain inlet protection		
17. Slope stabilization and erosion control measures		
18. Vegetated swale		
NONSTRUCTURAL BMPs		
19. Street sweeping		
20. Fertilizer manager		
21. Other (describe):		

Fee Schedule

Project Review Fees ^{1, 2}

Single Family Lot.....	\$300
Single Family Residential Development, density less than 3 units per acre	
Total Parcel Size <15 acres	\$1,300
Total Parcel Size 15 to 29.99 acres	\$1,600
Total Parcel Size ≥30 acres	\$2,000
All Other Development	
Total Parcel Size <5 acres	\$1,500
Total Parcel Size 5 to 19.99 acres	\$2,000
Total Parcel Size ≥20 acres	\$3,000
Variance Escrow	\$2,000
Street Highway/Utility Project/Public Agency Projects	\$1,000

Note: Total site area includes wetland, buffer, right-of-way and other nondeveloped areas.

Wetland Fees ¹	Minimum Fee ³
Wetland Delineation Review	\$300
Wetland Replacement Plan	\$1,500
Monitoring and Reporting	\$1,500
Wetland Replacement Escrow	Varies

¹Include check for project review fee or wetland fee with application form. Check must be made payable to Bassett Creek WMO.

²Project review fee based on total parcel size (not disturbed area) including wetlands, buffer, right-of-way, and other nondeveloped areas.

³Will be billed at actual cost.

Appendix B

Water Quality Definitions

Appendix B

Water Quality Definitions¹

BCWMC: Bassett Creek Watershed Management Commission

Best management practices (BMPs): the structural, non-structural, and institutional controls used to improve the quality of stormwater runoff. Additional BMPs may be found in *Protecting Water Quality in Urban Areas* (MPCA, 1989), *Minnesota Urban Small Sites BMP Manual* (Metropolitan Council, July 2001), *State of Minnesota Stormwater Manual*, (MPCA, November 2005)

Better site design: the application of non-structural practices at residential and commercial sites to reduce impervious cover, conserve natural areas, and use pervious areas to more effectively treat stormwater runoff

Bioretention: a soil- and plant-based stormwater management best management practice (BMP) used to filter runoff

Catch basin insert: device that attaches to the entrance of a catch basin or mounts inside the catch basin. Catch basins inserts are designed to improve stormwater quality by either preventing debris and pollutants from entering the basin, or by retaining or treating the water in the basin.

Check dam: a small temporary or permanent dam constructed across a drainage ditch, swale, or channel to lower the speed of concentrated flows for a certain design range of storm events, reducing erosion

Commercial, industrial, institutional or public development/redevelopment projects: typically result in larger areas of impervious surface, typically in the range of 60 to 80 percent imperviousness. Examples of these developments include shopping malls, stores, schools, hospitals, and warehouses.

Commercial, industrial, institutional or public expansion/addition projects: additions to existing projects for which approval of the existing project was obtained prior to adoption of this water quality policy (September 14, 1994). Examples of such projects include parking lot expansions/additions and building expansions/additions.

Complex projects: include projects that are 40 acres or more, controversial, involve more than one property owner, require detailed hydrologic or hydraulic modeling, require vast changes to infrastructure (such as stormwater systems), include many wetland impacts, require extensive environmental review, or involve many different land uses within the same development project

Construction sequencing: a specified work schedule that coordinates the timing of land-disturbing activities and the installation of erosion-protection and sedimentation-control measures

Critical duration runoff: generally accepted reservoir routing procedures using critical duration runoff events refer to the hydrologic methods—usually computer models—used to determine flowrates and flood levels resulting from stormwater runoff events. The event which results in the highest flood level or flowrate is the critical duration event. Examples of such methods include TR-20, Hydrocad, SWMM, HEC-1, and other approved watershed models.

Curve number: an index combining hydrologic soil group, land use factors, treatment, and hydrologic condition. Used in a method developed by the Soil Conservation Service (SCS)/Natural Resources Conservation Service (NRCS)* to determine the approximate amount of runoff from a rainfall event in a particular area.

Dead storage: the permanent storage volume in a pond

Detention time: the theoretical calculated time that a small amount of water is held in a settling basin

Disturbed area: total graded area as part of a commercial industrial, institutional, public, residential, or road project

Emergency spillway: a stable channel or other structure used to convey excess flood flows from a treatment device, typically for 100-year or greater flood flows

Erosion control: any efforts to prevent the wearing or washing away of the soil or land surface

Extended detention: designed to receive and detain stormwater runoff for a prolonged period of time

Filter bed: a sand- or gravel-bottomed treatment used to filter stormwater

Filter strip: vegetated areas that are intended to treat sheet flow from adjacent impervious areas

First flush: the majority of pollutants carried in urban runoff are carried in the first ½ inch of runoff from a site.

Floodplain: land adjacent to a water body which is inundated when the discharge exceeds the conveyance capacity of the normal channel. Often described in the regulatory sense as the extent of the 100-year flood.

Flood pool: live storage, or storage above the principal outlet that is used to temporarily store stormwater runoff

* Natural Resources Conservation Service (NRCS): division of the United States Department of Natural Resources, formerly known as Soil Conservation Service (CSC)

Soil Conservation Service (CSC): division of the United States Department of Agriculture, currently known as the Natural Resources Conservation Service (NRCS)

Flow control: controlling the rate and volume of water leaving a site

Flow splitter: device that is used to divert a portion of a flow (from a pipe or channel) to an offline treatment device such as an infiltration basin

Flow spreader: device use distribute water evenly over a surface such as an infiltration basin or a sand filter

Forebay: an extra storage space or small basin located near the inlet to settle out incoming sediments before water moves on into a pond or detention area

Grade breaks: point where the ground slope changes

Grit chamber: tanks designed to slow down the flow so that solids will settle out of the water

Ground water mounding: the localized rise in water table or potentiometric surface caused by the addition of water at an infiltration basin

Hydrologic soils groups (HSG): an NRCS designation given to different soil types to reflect their relative surface permeability and infiltrative capability. Rankings range from high infiltration rates in Group A to very low infiltration rates in Group D.

Impervious surface: a surface in the landscape that impedes the infiltration of rainfall and results in an increased volume of surface runoff

Infiltration basin: stormwater runoff impoundment designed to capture and hold stormwater runoff and infiltrate it into the ground over a period of days. This impoundment does not retain a permanent pool of water.

Low impact development (LID): the application of non-structural practices at residential and commercial sites to reduce impervious cover, conserve natural areas, and use pervious area to more effectively treat stormwater runoff

Media filters: filtration of stormwater through a variety of different filtering materials whose purpose is to remove pollution from runoff

Nondegradation: results in no increase in pollutant loads from a redevelopment site

Offline practice: a practice that does not receive all the stormwater flow from a conveyance system such as a pipe or channel, but rather only a portion of the flow as the result of a flow splitter or other diversion device

Onsite or regional treatment facility: a stormwater treatment basin designed to treat the stormwater runoff generated from either the project site (onsite) or an area larger than the project site (regional)

Peak flow control: controlling the timing and magnitude of the largest flow either leaving the site or flowing through the watershed, utilizing stormwater management techniques to avoid flooding or damage downstream

Perimeter control: activities or practices designed to contain sediments on a project site

Permanent storage pool: the volume in a pond or reservoir below the lowest outlet level, designed to settle out particles and nutrients for water quality treatment purposes.

Pollutant load: the product of flow volume times pollutant concentration

Proprietary devices: stormwater treatment devices which are privately developed and owned

Rate control: controlling the rate that stormwater is released from localized holding areas into larger conveyance systems

Residential development/redevelopment projects: typically result in smaller areas of impervious surface, typically in the range of 25 to 60 percent imperviousness. Examples of these projects include single family home construction, townhome construction, and apartment building construction.

Retention: the permanent or temporary storage of stormwater to prevent it from leaving the development site

Retrofit: the introduction of a new or improved stormwater management element where it either never existed or did not operate effectively

Road construction or reconstruction projects: include any project which results in the complete removal of the road surface, exposing the base, and/or removal of the vegetated surface within the road right-of-way. Examples include road widening projects, ditch work, road replacement and utility installation. Road overlay projects and road resurfacing projects which do not disturb the road base will not be covered by the requirements of this policy.

Runoff or stormwater runoff: under Minnesota Rule 7077.0105, subpart 41b, stormwater “means precipitation runoff, stormwater runoff, snow melt runoff, and any other surface runoff and drainage.” (according to the Federal Code of Regulations under 40 CFR 122.26 [b][13], “stormwater means stormwater runoff, snow melt runoff and surface runoff and drainage.”). Stormwater does not include construction site dewatering.

Seasonally high water table: the highest level the water table reaches during a given year or the highest level it has reached in the recent past as indicated by soil mottling or color changes. Methods for determining the seasonal high water table are given in Minnesota Rule part [7037.3300](#), subpart 5.

Sediment control: The methods employed to prevent sediment from leaving the development site.

Sediment control practices include silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, other appropriate measures, and temporary or permanent sedimentation basins.

Short circuiting: occurs when an inlet and outlet from a pond or other device are very close to each other and the treatment capacity of the device is reduced

Silt fence: fence constructed of wood or steel supports and either natural or synthetic fabric stretched across an area of non-concentrated flow during site development to trap and retain on-site sediment due to rainfall runoff

Skimmer: device used to take up or remove floating matter from the water's surface

Soil amendment: tilling and composting of new lawns and open spaces with a development site to recover soil porosity and bulk density, and reduce runoff

Source water protection area: an identified area with restricted or modified land use practices designed to protect public drinking water supply from the introduction of contaminants

Stormwater (management) facilities: include storm sewer pipes, ditches, ponds, infiltration basins, etc.

Surface sand filter: consists of a pretreatment basin, a water storage reservoir, a flow spreader, and underdrain piping that treats stormwater runoff via filtration

Temporary protection (measure): short-term methods employed to prevent erosion. Examples of such protection include straw, mulch, erosion control blankets, wood chips, and erosion netting.

Thermal protection: techniques and practices such as infiltration and shading which act to preserve and protect the ambient temperatures of streams and waterbodies from temperature-raising effects of stormwater runoff

Trunk system: The trunk creek system is the responsibility of the BCWMC and includes the Main Stem of Bassett Creek from Medicine Lake to the box culvert/tunnel; the North Branch from upstream of Co. Rd P to its junction with the Main Stem; the Sweeney Lake Branch from its source in Section 5, T117N, R21W to its junction with the Main Stem downstream of Sweeney Lake; and Plymouth Creek from the point where it intersects with Highway 55 in Section 17, T118N, R33W, to Medicine Lake.

Under drain: an underground drain or trench with openings through which the water may percolate from the soil or ground above

Water quality pond: a collection area with a permanent pool of water for treating incoming stormwater runoff

Water quality volume: the permanent pool in a water detention pond

Wetland: defined in Minn. R. 7050.0130, subp. F and includes those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state; to be a wetland the area must meet wetland criteria for soils, vegetation, and hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.

Wet detention basin: a collection area with a permanent pool of water for treating incoming stormwater runoff. See water quality pond.

Wet vault: a vault stormwater management device with a permanent water pool generally 3 to 5 feet deep used to treat stormwater runoff

¹ – Some definitions taken directory from the *Minnesota Stormwater Manual*

Appendix C

General Review Requirements

Table C
General Review Requirements

Review Trigger	BCWMC Review Required	Erosion and Sediment Control Required	Level 1 Standards	Nondegradation Standards
All Projects (except road construction/road reconstruction)				
<200 cubic yards cut/fill or < 10,000 sq. ft. grading	No	No	No	Maybe ¹
>200 cubic yards cut/fill or > 10,000 sq. ft. grading	Yes	Yes	Maybe ¹	Maybe ¹
Commercial, Industrial, Institutional or Public Development (where there is no existing commercial, industrial, institutional or public development)				
Parcel ≥ 0.5 acres	Yes	Yes	Yes	No
Commercial, Industrial, Institutional or Public Expansion/Addition (site that was partially developed prior to adoption of the Commission's Water Quality Policy - September 14, 1994)				
New disturbed area ≥ 0.5 acres	Yes	Yes	Yes ²	No
Commercial, Industrial, Institutional or Public Redevelopment (where the commercial, industrial, institutional, residential or public development currently exists) ³				
Parcel size < 0.5 acres and >200 cubic yards cut/fill or > 10,000 sq. ft. grading	Yes	Yes	No	No
Parcel size 0.5 to 1.0 acres and impervious surface increases by at least 1,000 sq. ft	Yes	Yes	No	Yes
Parcel size >1.0 ac. to 5.0 acres and impervious surface increases by at least 2,000 sq. ft	Yes	Yes	No	Yes
Parcel size > 5.0 acres and impervious surface increases by at least 10,000 sq. ft	Yes	Yes	Yes	Yes ³
Disturbed area ≥ 5.0 acres	Yes	Yes	Yes ⁴	Yes ³
Residential Development				
Parcel > 2 acres and which contains four or more proposed living units	Yes	Yes	Yes	No
Residential Redevelopment				
Parcel >2 acres to 10 acres which contains four or more proposed living units	Yes	Yes	No	Yes ^{3,5}
Parcel > 10 acres where there are four or more existing living units	Yes	Yes	Yes ³	Yes ³
Road Construction/Road Reconstruction (which the site runoff is <u>not</u> currently directed to an onsite or regional treatment facility)				
Disturbed Area ≥ 1 acre	Yes	Yes	Recommended	Recommended

¹ See following requirements

² Level 1 standards required to serve the expansion/addition

³ Redeveloping the entire parcel to Level 1 standards provides acceptable treatment to Nondegradation Standards

⁴ Level 1 standards required to serve the disturbed area

⁵ See nondegradation exemptions

< less than

> greater than

≥ greater than or equal to

Appendix H

Boundary Change and Related Legal Documentation



470 Pillsbury Center
200 South Sixth Street
Minneapolis MN 55402
(612) 337-9300 telephone
(612) 337-9310 fax
<http://www.kennedy-graven.com>

CHARLES L. LEFEVERE
Attorney at Law
Direct Dial (612) 337-9215
email: clefevere@kennedy-graven.com

September 6, 2000

Mr. Joe Biernat, Chair
Middle Mississippi River Watershed Management Commission
c/o Tom Frame
Room 401
250 South 4th Street
Minneapolis MN 55415

RE: Boundary Change

Dear Mr. Biernat:

I represent the Basset Creek Watershed Management Commission as legal counsel.

As you know, the Basset Creek and Middle Mississippi River commissions have agreed to a change in the boundary between the two organizations. I understand that the agreement between the two commissions and the City of Minneapolis has been executed and that the only remaining step to make the boundary change effective is the filing of an amended map or legal description with the Board of Water and Soil Resources.

Attached is a proposed letter jointly signed by the chairs of the two organizations to the Board of Water and Soil Resources notifying the Board of the boundary change and specifying the new boundary. If the letter is acceptable, please sign it and return a copy of the executed letter to me. The original letter should be forwarded to BWSR in the enclosed envelope.

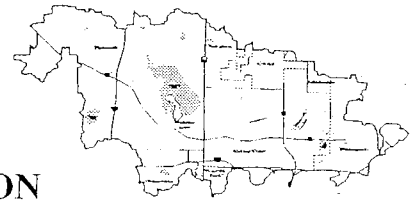
If you have any questions, please give me a call.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Charles L. LeFevere".

Charles L. LeFevere
CLL:lh
Enclosure

cc: Mr. Michael Welch (with enclosure)
Mr. Lee Gustafson (with enclosure)
Mr. Len Kremer (with enclosure)



BASSETT CREEK WATER MANAGEMENT COMMISSION

• Crystal • Golden Valley • Medicine Lake • Minneapolis • Minnetonka • New Hope • Plymouth • Robbinsdale • St. Louis Park

August 30, 2000

Ron Harnack, Executive Director
Minnesota Board of Water and Soil Resources
One West Water Street, Suite 200
St. Paul, MN 55107

**Re: Change in Boundary Between Bassett Creek Watershed Management Commission and
Middle Mississippi River Watershed Management Organization**

Dear Mr. Harnack:

The Bassett Creek Watershed Management Commission and Middle Mississippi River Watershed Management Organization previously requested comments from the Board of Water and Soil Resources (BWSR) on a proposed boundary change in accordance with Minnesota Statutes, §103B.211, subdivision 2. By letter from Mr. Douglas Snyder to Mr. Gustafson, Chair of the Bassett Creek Commission, dated July 28, 2000, BWSR indicated its agreement that the proposed boundary change was appropriate.

Based on this comment from BWSR, the Bassett Creek and Middle Mississippi River organizations have executed a joint powers agreement for the boundary change. Under this agreement, the boundary change will be effective upon filing the revised map or legal description with BWSR.

Accordingly, the Bassett Creek Watershed Management Commission and the Middle Mississippi River Watershed Management Organization hereby jointly submit the amended description of the boundary between the jurisdictions of the two organizations for filing with BWSR.

If you have any questions relating to the legal description, please contact the engineer of the Bassett Creek Watershed Management Commission, Mr. Len Kremer of Barr Engineering at (952) 832-2781. Other questions relating to the boundary change may be directed to the attorney for the Bassett Creek Commission, Mr. Charlie LeFevre (612) 337-9215.

Thank you.

Very truly yours,

Lee Gustafson, Chair
Bassett Creek Watershed Management Commission

Joe Biernat, Chair
Middle Mississippi River Watershed Management Organization

219484

Lee Gustafson, Chairman
City of Minnetonka
14600 Minnetonka Boulevard
Minnetonka, MN 55345
952-939-8239
952-939-8244 (fax)

Charlie LeFevre, Attorney
Kennedy & Graven
470 Pillsbury Center
Minneapolis, MN 55402
612-337-9215
612-337-9310 (fax)

Leonard Kremer, Engineer
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435
952-832-2600
952-832-2601 (fax)

ATTACHMENT C

LEGAL DESCRIPTION OF AREA TO BE TRANSFERRED FROM BASSETT WMO TO MIDDLE MISSISSIPPI WMO

Commencing at the intersection of 4th Av N and Russell Av N; then N on Russell Av N to 8th Av N; then E on 8th Av N to Queen Av N; then N on Queen Av N to 12th Av N; then W on 12th Av N to Russell Av N; then N on Russell Av N to Plymouth Av N; then E on Plymouth Av N to Queen Av N; then N on Queen Av N to 14th Av N; then E on 14th Av N to Girard Av N; then S on Girard Av N to Plymouth Av N; then SWly on Plymouth Av N to Humboldt Av N; then S on Humboldt Av N to 12th Av N; then E on 12th Av N to Fremont Av N; then N on Fremont Av N to Plymouth Av N; then E on Plymouth Av N to Bryant Av N; then S on Bryant Av N to 12th Av N; then E on 12th Av N to the point midway between Bryant Av N and Aldrich Av N; then S from this point to 7th St N; then SEly on 7th St N to Interstate Highway 94; then S along Interstate Highway 94 to the point due W of Holden St; then E along this line to E Lyndale Av N; then N on E Lyndale Av N to 3rd Av N; then E on 3rd Av N to Border Av N; then N on Border Av N to 7th St N; then NWly on 7th St N to E Lyndale Av N; then NEly along E Lyndale Av N to Interstate Highway 94; then NEly along Interstate Highway 94 to Plymouth Av N; then E along Plymouth Av N to the W bank of the Mississippi River; then SEly along the W bank of the Mississippi River to 3rd Av N; then SWly along 3rd Av N to 3rd St N; then NWly along 3rd St N to 4th Av N; then SWly along 4th Av N to 4th St N; then SEly along 4th St N to 3rd Av N; then SWly along 3rd Av N to Holden St; then W along Holden St to 11th St N; then SWly parallel with CNWRR right-of-way to Currie Av N; then S parallel with 12th St N to Chestnut Av; then W along Chestnut Av and the line extending therefrom to Market St; then N on Market St to 2nd Av N; then W on 2nd Av N to Cedar Lake Rd; then SWly on Cedar Lake Rd to 2nd Av N; then NWly/W on 2nd Av N to Gramercy Av; then N/NEly on Gramercy Av to 3rd Av N; then W on 3rd Av N to Logan Av N; then N on Logan Av N to 4th Av N; then W on 4th Av N to the point of beginning and there terminating.

Appendix I

BCWMC Legal Description

Bassett Creek Watershed Boundary

June 27, 2003

The Bassett Creek boundary is defined by the following legal description^{1 2}.

City of Plymouth

Commencing at the point of intersection along the south line of Sec. 34, T118N, R22W (which is also the border between the City of Plymouth and the City of Minnetonka), and the centerline of Plymouth Road³ thence northerly along the centerline of Plymouth Road to the east extension of the south line of Lot 19, Greer's Orchard Tracts, thence westerly along the south line of said Lot 19 to a point 50 feet east of the west line thereof, thence northerly along a line 50 feet east of and parallel to the west line of said Lot 19 to a point 150 feet north of the south line of said Lot 19, thence easterly along a line 150 feet north of and parallel to the south line of said Lot 19 to the east line thereof, thence northerly along said east line to a point 267 feet north of the south line of said Lot 19, thence westerly along a line 267 feet north of and parallel to the south line of said Lot 19 to a point 59 feet east of the west line of Lot 19, thence northerly along a line 59 feet east of and parallel to the west line of Lot 19 to the centerline of County Road No. 15;

Thence westerly along the centerline of County Road No. 15 in Secs. 34 and 33, T118N, R22W to a point 138.6 feet east of the west line of Lot 16, Block 1, Glen Grove Acres, thence northerly along a line 138.6 feet east of and parallel to the west line of said Lot 16 to the north line of said Lot 16, thence westerly along the north lines of Lots 16 and 17, Block 1, Glen Grove Acres, to the west line of said Lot 17, thence westerly on the north line of Lot 4, Block 1, Juneau Acres, extended, to the west line of said Lot 4, thence southerly along said west line to the north line of Lot 18, Block 2, Glen Grove Acres, thence westerly along said north line and the north line of Lot 19, Block 2, Glen Grove Acres, to the west line of said Lot 19, thence southerly along said west line of Lot 19 to the north line of R.L.S. No. 219, thence southwestly along said north line to the east line of Lot 17,

¹ Common boundary between Bassett Creek watershed and Mississippi Watershed (Formerly Middle Mississippi River Watershed) was obtained from *Middle Mississippi River Watershed Management Organization Legal Description*, May 1985 and *Attachment C Legal Description of area to be transferred from Bassett WMO to Middle Mississippi WMO*, May 2003)

² Common boundary between Bassett Creek watershed and Minnehaha Creek Watershed was from Minnehaha Creek Watershed District boundary (April 28, 1993) obtained from BWSR.

³ Boundary is also the boundary between the Bassett Creek and Minnehaha Creek watersheds.

Block 2, Christiansen's Parker's Lake Second Addition, thence northerly along said east line of Lot 17 and the east line of Lot 18, Block 2, Christiansen's Parker's Lake Second Addition, to a point 35 feet south of the north line of Lot 18, thence generally westerly along a line 35 feet south of and parallel to the north line of said Lot 18 extended, to the centerline of Lakewood Lane, thence southerly along the centerline of Lakewood Lane to the north line of Lot E, R.L.S. No. 219, extended, thence westerly along said north line to the east line of R.L.S. No. 296, thence southerly along said east line, extended, to the centerline of County Road No. 15, thence westerly along said centerline to the centerline of Niagara Lane;

Thence southerly along the centerline of Niagara Lane to the south line of Sec. 33, T118N, R22W, which is also the border between the City of Plymouth and the City of Minnetonka, thence westerly along said south line of Sec. 33 to the most southeasterly corner of Lot 3, Block 1, Cedar View Estates, thence northerly along the east lines of said Lot 3 and Lot 2, Cedar View Estates, to the north line of said Lot 2, thence westerly along said north line to the northwest corner of said Lot 2, thence generally southerly along the west line of said Lots 2 and 3 to the most westerly corner of said Lot 3, thence southeasterly along the southwesterly line of said Lot 3 to the south line of Sec. 33, T118N, R22W, thence westerly along said south line of Sec. 33 to the centerline of Ranchview Lane;

Thence northerly along the centerline of Ranchview Lane to the south line of the NW 1/4 of the SW 1/4 of said Sec. 33, thence 200 feet westerly along said south line of the NW 1/4 of the SW 1/4, thence 220 feet northerly along a line 200 feet west of and parallel to the east line of said NW 1/4 of the SW 1/4, thence 200 feet easterly along a line 220 feet north of and parallel to the south line of said NW 1/4 of the SW 1/4 to the east line of said NW 1/4 of the SW 1/4, thence northerly along said east line to the northeast corner of the South 1/2 of said NW 1/4 of the SW 1/4, thence westerly along the north line of said South 1/2 of the NW 1/4 of the SW 1/4 to the west line of Lot 1, Block 3, Homedale Manor First Addition, thence northerly along said west line to the centerline of Fifth Avenue North, thence easterly along said centerline to the east line of Lot 5, Block 2, Homedale Manor First Addition, extended, thence northerly along said east line to the north line of said Lot 5, thence westerly along said north line and the north line of Lot 4, Block 2, Homedale Manor First Addition to the east line of Lot 6, Block 1, Homedale Manor, thence northerly along said east line, extended, to the north line of Sixth Avenue North;

Thence easterly along the north line of Sixth Avenue North to the west line of Ranchview Lane, thence northerly along said line to the centerline of 7th Avenue North, thence westerly along said

centerline to the centerline of Shenandoah Lane, thence northerly along said centerline, extended, to the south line of Lot 8, Block 1, Vicksburg Forest First Addition, thence westerly along said south line to the west line of said Lot 8, thence northerly along said west line to the north line of Block 1, Vicksburg Forest First Addition, thence westerly along said north line to the centerline of Vicksburg Lane, thence northerly along the centerline of Vicksburg Lane which is also the west line of Sec. 33, Sec. 28 and Sec. 21, T118N, R22W, to the north line of Lot 2, Block 2, Playhouse Industrial Park, extended, thence easterly along said line to the east line of Lot 3, Block 1, Playhouse Industrial Park, extended, thence northerly along said east line to the north line of said Lot 3, thence generally northwesterly along said north line of Lot 3, extended, to the centerline of Vicksburg Lane, thence northerly along said centerline to the north line of said Sec. 21;

Thence westerly along the, south line of Sec. 17, T118N, R22W, to the west line of the SE 1/4 of the SE 1/4 of said Sec. 17, thence northerly on said west line to the north line of said SE 1/4 of the SE 1/4, thence westerly on the north line of the SW 4 of the SE 4 of said Sec. 17 to the east line of the West 1/2 of said SW 1/4 of the SE 1/4, thence southerly 208.7 feet on said east line of the West 1/2, thence westerly 208.7 feet on a line 208.7 feet south of and parallel to the north line of said SW 1/4 of the SE 1/4 of Sec. 17, thence northerly 208.7 feet on a line 208.7 feet west of and parallel to said east line of the West 1/4, thence westerly on the north line of said SW 1/4 of the SE 1/4 to the west line thereof, thence southerly on the west line of the SE 1/4 of said Sec. 17 to a point 247.5 feet north of the south line of said Sec. 17, thence westerly 264 feet on a line 247.5 feet north of and parallel to the south line of said Sec. 17, thence southerly on a line 264 feet west of and parallel to the east line of the SW 1/4 of said Sec. 17 to the north line of State Highway No. 55, thence southeasterly on said north line to the centerline of Dunkirk Lane;

Thence southerly along the centerline of Dunkirk Lane in Sec. 20, T118N, R22W, extended, to the south line of County State Aid Highway No. 24, thence generally southwesterly along said south line to the point of intersection of said south line and the following described line:

commencing at a point in the west line of the east 1030 feet of the NW 1/4 of Sec. 20, T118N, R22W, a distance of 351.58 feet north from the southwest corner thereof, thence south 81 degrees east a distance of 358.36 feet, thence deflect left 97 degrees 46 minutes 18 seconds a distance of 372.85 feet, thence northerly along a curve to the left having a radius of 348.68 feet a distance of 138.16 feet, thence northwesterly tangent to said curve 196.66 feet, thence northerly along a curve to the right having a radius of 433.48 feet a distance of 119.25 feet, thence northwesterly tangent to said curve 124.62 feet, thence northerly along a curve to the left having a radius of

262.35 feet a distance of 80.13 feet, thence northwesterly tangent to said curve to the south line of County State Aid Highway No. 24;

thence southerly along said described line to the north line of Lot 6, Block 1, Seven Ponds East, thence generally southeasterly on said north line and the east line of said Lot 6 and the north line of Lot 7, Block 1, Seven Ponds East to the northeast corner of said Lot 7, thence generally southwesterly on the east line of said Lot 7 and the east line of Lot 8, Block 1, Seven Ponds East to the south line of said Lot 8, thence westerly on said south line of Lot 8 to the west line of Seven Ponds East, thence southerly along said west line to the south line of Lot 10, Block 1, Seven Ponds East, thence deflect right 97 degrees, 46 minutes, 18 seconds a distance of 358.36 feet, northwesterly, to a point on the east line of Seven Ponds;

Thence southerly on the east line of Seven Ponds to the south line of 32nd Avenue North, thence northwesterly along said south line to the southeast line of Holly Lane, thence generally southwesterly on the southeast line of Holly Lane to the northwesterly line of Lot 5, Block 2, Seven Ponds, thence southwesterly on said northwesterly line to the west line of said Lot 5, thence southerly on said west line to the north line of the SW 1/4 of Sec. 20, T118N, R22W;

Thence westerly on said north line of the SW 4 of Sec. 20 to the east line of Lot 14, Block 1, Shiloh, thence southerly on said east line to the south line of said Lot 14, thence westerly on said south line of Lot 14, extended, to the centerline of Jewel Lane, thence southerly on the centerline of Jewel Lane to the south line of Lot 11, Block 1, Shiloh, extended, thence generally westerly on said south line of Lot 11 and on the south line of Lot 8, Block 1, Shiloh, extended, to the centerline of Kimberly Lane, thence southerly on said centerline, extended, to the north line of Lot 3, Block 3, Shiloh, thence westerly on said north line and the north line of Lot 2, Block 3, Shiloh, to the west line of said Lot 2, thence southwesterly on said west line to the north line of Lot 2, Block 1, Fairfield Estates, thence westerly on said north line to the west line of said Lot 2, thence southeasterly on said west line of Lot 2, extended, to the north line of Lot 8, Block 2, Fairfield Estates, thence westerly on said north line of Lot 8 to the west line of said Lot 8, thence generally southerly on said west line of Lot 8 and the east line of Lot 6, Block 2, Fairfield Estates, to the south line of said Lot 6, thence southwesterly on said south line of Lot 6 to the west line of Sec. 20, T118N, R22W;

Thence southerly on the west line of Sec. 20 to the south line of Lot 10, Block 1, Candlelight Terrace, located in Sec. 19, T118N, R22W, thence southwesterly on said south line of Lot 10, extended, to the centerline to 28th Avenue North, thence southerly on said centerline to the north line

of Lot 16, Block 5, Candlelight Terrace, extended, thence westerly on said north line to the west line of said Lot 16, thence southwesterly on said west line of Lot 16, extended, to the south line of 27th Avenue North, thence northwesterly on said south line to the east corner of Lot 22, Block 5, Candlelight Terrace, thence southwesterly on the southeast line of Lot 22 to the south corner of said Lot 22, thence generally northwesterly on the southwest and west lines of said Lot 22 and the west line of Lot 21, Block 5, Candlelight Terrace, to the north line of said Lot 21, thence easterly on said north line of Lot 21 to the east line of Lot 8, Block 5, Candlelight Terrace, thence northwesterly on said east line, extended, to the north line of 28th Avenue North, thence generally southwesterly on said north line of 28th Avenue North to the southwest line of Lot 2, Block 1, Candlelight Terrace, thence northwesterly on said southwest line to the southwest corner of said Lot 2 on the east line of State Highway No. 101, thence northwesterly from said point to the southeasterly corner of Lot 6, Block 1, Meadowood;

Thence northwesterly on the south line of Lot 6, Block 1, Meadowood, extended, to the centerline of Ranier Lane, thence generally westerly along the centerline of Ranier Lane to the intersection of a line bearing S45DEG E from a point in the northeasterly line of Lot 10, Meadowood a distance of 41.36 feet southwesterly of the northerly corner thereof and the centerline of Ranier Lane, thence northwesterly along said line to the northeasterly line of Lot 10 Meadowood, thence northeasterly along said line and the northeasterly line of Lot 9, Meadowood to the north line thereof, thence easterly on said north line to the east line of Lot 4, Block 3, Greentree Addition, thence northerly on said east line of Lot 4 to the south line of 30th Avenue North;

Thence westerly on the south line and northerly on the west line of said 30th Avenue North to the centerline of 30½ Avenue North, thence generally westerly on said centerline to the centerline of Urbandale Lane, thence northwesterly on said centerline to the south line of Lot 2, Block 5, Greentree Forest, extended, thence westerly on said south line of Lot 2 to the west line of said Lot 2, thence northerly on said west line to the south line Lot 11, Block 5, Greentree Forest, thence southwesterly on said south line to the west line of Lot 11, thence northwesterly on said west line, extended, to the centerline Walnut Grove Lane, thence southwesterly on said centerline to the southwest line, extended, of Lot 13, Block 1, Greentree Forest, thence northwesterly on said southwest line and the southwest line of Lot 12, Block 1, Greentree Forest, to the west line of Greentree Forest, thence northerly on said west line to the centerline of Hennepin County State Aid Highway No. 24;

Thence easterly on the centerline of County State Aid Highway No. 24 to the east line, extended, of Lot 4, Block 3, Amber Woods, thence northerly on said east line to the south line of Lot 4, Block 1, Amber Woods, thence westerly on said south line to the west line of said Lot 4, thence northerly on said west line to the north line of said Lot 4, thence easterly on said north line to the west line of Lot 6, Block 1, Amber Woods, thence northerly on said west line of Lot 6 to the south line of 32nd Avenue North, thence generally northeasterly on said south line of 32nd Avenue North to the south line of Lot 17, Block 1, Amber Woods, thence easterly on said south line to the southeast line of said Lot 17, thence northeasterly on said southeast line to the southwest line of Lot 16, Block 1, Amber Woods, thence northwesterly on said southwest line to the west line of said Lot 16, thence northerly on said west line to the south line of 33rd Avenue North, thence generally northerly on said line, being a circle, to the east line of Lot 21, Block 1, Amber Woods, thence northerly on said east line of Lot 21, extended, to the south line of Lot 17, Block 6, Amber Woods, thence easterly on said south line to the east line of said Lot 17, thence northwesterly on said east line of Lot 17 to the south line of Vagabond Place, being a circle, thence generally northwesterly on said south line to the south line of Lot 14, Block 6, Amber Woods, thence westerly on said south line to the west line of said Lot 14, thence northerly on said west line of Lot 14 to the south line of Lot 9, Block 6, Amber Woods, thence westerly on said south line to the southwest corner of said Lot 9, thence westerly to the southeast corner of Lot 17, Block 5, Amber Woods, thence westerly on the south line of said Lot 17 to the west line thereof, thence northerly on said west line to the north line of Lot 16, Block 5, Amber Woods, thence generally northwesterly on said north line of Lot 16 and the north lines of Lots 15 and 14, Block 5, Amber Woods, to the west line of Amber Woods, thence northerly to the centerline of 34th Avenue north, thence westerly at a right angle with said west line of Amber Woods to the west line of said Sec. 19;

Thence northerly on the west line of said Sec. 19 to the south line of Sec. 18, T118N, R22W, thence easterly on said south line to the southeast corner of the SW 1/4 of said Sec. 18, thence northerly along the east line thereof to the centerline of Medina Road⁴;

Thence southeasterly on the centerline of Medina Road to a point 966.8 feet measured northwesterly along the centerline of Medina Road from the intersection of said road and the east line of the SW 1/4 of the SE 1/4 of said Sec. 18, thence southwesterly at right angles to the centerline of Medina Road a distance of 433 feet, thence southeasterly at right angles a distance of 330 feet, thence

⁴ Starting at this point is the boundary between Bassett Creek and Elm Creek watersheds.

northeasterly at right angles a distance of 466 feet to the north line of Medina Road, thence southeasterly on said north line of Medina Road to a line 290 feet west of and parallel to the east line of the West 1/2 of the SE 1/4 of said Sec. 18, thence northerly on said line to a line 632 feet south of the northeast corner of the South 3/4 of said West 1/2, and at right angles to the east line of the West 1/2 of the SE 1/4 of said Sec. 18, thence easterly 290 feet on said line to the east line of the West 1/2 of the SE 1/4 of said Sec. 18, which line is also the centerline of State Highway No. 101;

Thence northerly on the centerline of State Highway No. 101 in Sec. 18, T118N, R22W, to the northeasterly line of State Highway No. 55, thence northwesterly along said northeasterly line to the northwest line of Lot 4, Block 1, Osier Addition, extended, thence northeasterly on said northwest line to the northeast line of Osier Addition, thence southeasterly on said northeast line of Osier Addition to the east line of the West 1/2 of the NW 1/4 of the NE 1/4 of Sec. 18, T118N, R22W, thence northerly along said east line to the centerline of Hennepin County State Aid Highway No. 9, thence southeasterly along said centerline to the centerline of Peony Lane, thence northerly along said centerline to the north line of Sec. 18, T118N, R22W, thence westerly along said north line to the east line of said Sec. 18;

Thence northerly along the west line of Sec. 8, T118N, R22W to the south line of the NW 1/4 of the SW 1/4 of said Sec. 8, thence easterly along said south line to the east line of said NW 1/4 of the SW 1/4, which is also the centerline of Holly Lane, thence northerly on said centerline to the south line of the Soo Line Railroad right of way, thence northeasterly along said south line to the north line of the NE 1/4 of the SW 1/4 of said Sec. 8, thence easterly along said north line and the north line of the NW 1/4 of the SE 1/4 of said Sec. 8 to the east line of said NW 1/4 of the SE 1/4⁵;

Thence southerly a distance of 220 feet on said east line of the NW 1/4 of the SE 1/4 of Sec. 8, thence easterly on a line parallel to and at a distance of 220 feet south from the north line of the NE 1/4 of the SE 1/4 of said Sec. 8 to the east line thereof, thence southerly along said east line, which is also the center line of Vicksburg Lane, to a point 721 feet south of the north line of the NW 1/4 of the SW 1/4 of Sec. 9, T118N, R22W, thence easterly along a line 721 feet south of and parallel to the north line of said NW 1/4 of the SW 1/4 of Sec. 9 to the east line thereof, thence southerly along said east line to the south line of the NE 1/4 of the SW 1/4 of said Sec. 9, thence easterly along said line the southeast corner thereof, thence northerly to the northwest corner of the south 22.74 acres of the NW 1/4 of the SE 1/4 of Sec. 9, thence easterly along the north line of said

⁵ Starting at this point is the boundary between the Bassett Creek and Shingle Creek watersheds.

south 22.74 acres to the east line of said NW 1/4 of the SE 1/4, thence southerly along said east line of the NW 1/4 of the SE 1/4 to the south line thereof, thence easterly along the south line of the NE 1/4 of the SE 1/4 of said Sec. 9 to the east line thereof, which is the west line of Sec. 10, T118N, R22W;

Thence southerly along the west line of said Sec. 10 to the midpoint of the west line of the North 1/2 of the SW 1/4 of the SW 1/4 of said Sec. 10, thence westerly to the midpoint of the west line of the east 10 acres of said North 1/2, thence southerly on said west line of the east 10 acres to the north line of the South 1/2 of the SW 1/4 of the SW 1/4 of said Sec. 10, thence westerly along said north line to the west line of said Sec. 10, thence southerly along said west line to the north line of Sec. 15, T118N, R22W, thence easterly along said north line to the west line of the East 1/2 of the NW 1/4 of the NW 1/4 of said Sec. 15, thence southerly on said west line to a point 336 feet north of the south line of said East 1/2 of the NW 1/4 of the NW 1/4 of Sec. 15, thence easterly along the north line of the south 336 feet of the West 1/2 of the SE 1/4 of the NW 1/4 of the NW 1/4 of said Sec. 15 to the east line of said West 1/2, thence southerly 336 feet on said east line to the south line of the NW 1/4 of the NW 1/4 of said Sec. 15, thence easterly along said south line and the south line of the NE 1/4 of the NW 1/4 of said Sec. 15, to the southeast corner thereof, thence northerly along the east line thereof to a point 652.56 feet southerly from the northeast corner of the NW 1/4 of the NE 1/4 of Sec. 15 thence easterly along the south line of the north 12 rods of the south 26 acres of the NW 1/4 of the NE 1/4 of said Sec. 15, extended, to the east line of West Medicine Lake Road, thence northerly along said east line in said Sec. 15 and Sec. 10, T118N, R22W to the south line of 47th Avenue North, thence generally easterly along said south line to the east line of Tract F, R.L.S. No. 466, thence southeasterly along said east line to the south line of said R.L.S. No. 466, thence easterly along said south line to the east line of said Sec. 10;

Thence northerly along said east line of Sec. 10, 172.80 feet thence easterly along the north line of Schmidt Lake West, Sec. 11, T118N, R22W, to the southeasterly line of Lot 6, thereof, thence southwesterly on said southeasterly line to the southwesterly line of Lot 7, Block 1, Schmidt Lake West, thence generally southeasterly on said southwesterly line to the south line of said Lot 7, thence easterly on said south line to the east line of Lot 5, Block 1, Schmidt Lake West, thence southerly on said east line to the north line of 47th Avenue North, thence easterly on said north line to the east line of Lot 7, Block 2, Schmidt Lake West, extended, thence southerly on said east line to the south line of Schmidt Lake west, thence easterly along said south line extended to the centerline of Larch Lane thence southerly along the centerline of Larch Lane to the south line of Sec. 11, T118N, R22W;

Thence easterly along said south line of Sec. 11 to the west line of Lot 3, Block 3, Deerwood Meadows, thence northerly on said west line to the northwesterly line of said Lot 3, thence generally northeasterly on said northwesterly line to the northeast line of said Lot 3, thence southeasterly along said northeast line to the west line of Lot 6, Block 3, Deerwood Meadows, thence northerly on said west line to the northwest line of said Lot 6, thence northeasterly on said northwest line to the southwest line of Forestview Lane, which is a circle, thence generally southeasterly along said southwesterly line to the northeast line of Lot 8, Block 3, Deerwood Meadows, thence southeasterly on said northeast line to the east line of said Lot 8, thence southerly on said east line to the south line of Lot 23, Block 3, Deerwood Meadows, thence easterly on said south line to the east line of said Lot 23, thence northerly on said east line to the south line of Deerwood Circle, thence generally northerly along said circle to the northeast line of Lot 21, Block 3, Deerwood Meadows, thence northwesterly on said northeast line to the north line of said Lot 21, thence westerly on said north line to the west line of Lot 14, Block 3, Deerwood Meadows, thence northerly on said west line to the south line of 45th Lane, thence easterly along said south line, extended, to the west line of Lot 3, Block 4, Deerwood Meadows, thence northerly along said west line to the north line of said Lot 3, thence easterly on said north line to the west line of the SE 1/4 of the SE 1/4 of Sec. 14, T118N, R22W;

Thence northerly on said west line of the SE 1/4 of the SE 1/4 and the west line of the NE 1/4 of the SE 1/4 of Sec. 11 to the north line of the South 1/2 of said NE 1/4, of the SE 1/4, thence easterly on said north line to the west line of Zachary Lane, thence northerly along said west line to the centerline of 49th Avenue North, extended, thence easterly on said extended centerline in said Sec. 11 and Sec. 12, T118N, R22W to the centerline of Wellington Lane, thence southeasterly along said centerline to the northwest line of Lot 3, Block 3, Sky Line Hills Unit No. 1, extended, thence northeasterly on said northwest line to the northeast line of said Lot 3, thence southeasterly on said northeast line and the northeast line of Lot 4, Block 3, Sky Line Hills Unit No. 1 to the east line of Sky Line Hills Unit No. 1, thence southerly along said east line to the north line of the South 1/2 of the NW 1/4 of the SW 1/4 of said Sec. 12, thence easterly along said north line and the north line of the South 1/2 of the NE 1/4 of the SW 1/4 of said Sec. 12 to the east line of the SW 1/4 of said Sec. 12;

Thence southerly along said east line of the SW 1/4 of Sec. 12 to the south line of Outlot C, Nathan Trails, thence generally easterly along said south line to the easterly line of said Outlot C, thence generally northerly along said easterly line of Outlot C to the centerline of 47th Avenue North, thence easterly along said center line to the west line of Lot 1, Block 4, Nathan Trails, extended,

thence southerly along said west line to the south line of said Lot 1, thence easterly along said south line to the west line of Outlot B, Nathan Trails, thence southerly along said west line to the south line of said Outlot B, thence easterly along the south line of Outlot B to the centerline of Nathan Lane which is the east line of Nathan Trails thence generally northerly to the northeast corner of the NE 1/4 of the SE 1/4 of Sec. 12, thence easterly to the east line of said Sec. 12, which is the east line of the City of Plymouth.

City of New Hope

Thence southerly along the east line of the City of Plymouth which is also the west line of the City of New Hope to a point at the extension of the north line of Lot 11, Block 4, Hillsborough Manor, thence easterly along the extended north line of said Lot 11 to the west line of Lot 9, Block 6, Hillsborough Manor, thence northerly along said west line to the intersection of Independence Avenue and 45th Avenue North, thence southeasterly along the south line of 45th Avenue North to the east line of Lot 5, Block 6, Hillsborough Manor, thence south along said east line of Lot 5 to the southeast corner of said Lot 5, thence southwesterly along an extension of the east line of Lot 13, Block 2, Gettysburg Hills to the centerline of the Independence Avenue North cul-de-sac, thence southerly along the centerline of Independence Avenue North cul-de-sac extended to the south line of Independence Avenue North, thence easterly along the south line of Independence Avenue North to the northeast corner of Lot 6, Block 1, Gettysburg Hills, thence southerly along the east line of said Lot 6 to the southeast corner of said Lot 6, thence easterly along the south line of Block 1, Gettysburg Hills extended, to the east line of Gettysburg Avenue North, thence southerly along the east line of Gettysburg Avenue North to 42nd Avenue North (Rockford Road, Co. Rd. 9).

Thence easterly along the north line of 42nd Avenue North to the southeast corner of Lot 5, Block 1, Flag Addition, thence northerly along the east line of said Lot 5 to the northeast corner of said Lot 5, thence generally easterly along the north line of Lot 13, Block 2, Cooper Herman Addition to the southwest corner of Lot 12, Block 2, Cooper Herman Addition thence southeasterly along south line of said Lot 12 to the southeast corner of said Lot 12, thence northerly along the east Lot of said Lot 12 extended to the northwest corner of Lot A, RLS No. 1267, thence easterly along the north line of Lot A and Lot B, RLS No. 1267 to the northeast corner of Lot B, RLS No. 1267, thence southerly along the east line of said Lot B to the south line of Lot 11 and Lot 10, Block 1, Ridgeview, thence northeasterly along said south line to the east line of said Lot 10, thence north along the east line of Lot 10, Lot 9 and Lot 8 to the northeast corner of Lot 8, Block 1, Ridgeview, thence easterly along the south line of Lot 7, Block 2 and Lot 7, Block 1, Midwestern Properties Addition extended to the east line of Boone Avenue North.

Thence northerly along the east line of Boone Avenue North to the northwest corner of Lot 23, Block 2, Sandra Terrace, thence easterly along the north line of said Lot 23 to the northeast corner of said Lot 23, thence northerly along the east line of Lot 24, Lot 25, Lot 26, Lot 27, Lot 28 and Lot 29, Block 2, Sandra Terrace to the northeast corner of said Lot 29, thence easterly along the north line of said Lot 29 to the northeast corner of Lot 1, Block 2, Sandra Terrace, thence southeasterly along the east and south line of 44th Avenue North to the northeast corner of Lot 1, Block 3, Sandra Terrace, thence southerly along the east line of said Lot 1 to the north line of Lot 25, Block 3, Sandra Terrace, thence easterly along said north line of Lot 25 to the northeast corner of said Lot 25, thence southerly along the east line of Lot 25, Lot 24, Lot 23, Lot 22, Lot 21, Lot 20, Lot 19, Lot 18, Lot 17, Lot 16 and Lot 15 extended to the south line of 42nd Avenue North, thence southeasterly along the south line of 42nd Avenue North to the centerline of Xylon Avenue North extended, which is also the west line of the SE 1/4 of the NE 1/4 of Section 18, T118N R21W.

Thence south along the said west line of the SE 1/4 of the NE 1/4 of Section 18 to the south line of the NE 1/4 of Section 18, T118N R21W, thence east along said south line of the NE 1/4 of Section 18 to the centerline of Winnetka Avenue North, thence southerly along the centerline of Winnetka Avenue South to the south line of the North 1/2 of the SW 1/4 of Section 17, T118W, R21W, which is also the border between New Hope and Crystal, thence easterly along said south line of line of the North 1/2 of the SW 1/4 of Section 17 to the east line of the Soo Line RR Company,

Thence northerly along the east line of the Soo Line Railroad Co. to the northwest corner of Lot 9, Block 1, Gwynnco Addition, thence easterly along the north line of said Lot 9 to the northeast corner of said Lot 9, thence easterly to the northwest corner of Lot 2, Block 4, Gwynnco Second Addition, thence easterly to the northeast corner of said Lot 2, thence easterly and northerly along the rear Lot line of Lot 13, Lot 12, Lot 11, Lot 10, Lot 9, Lot 8, Lot 7, Lot 6, Lot 5, Lot 4, Lot 3, Lot 2, Lot 1, Block 3, Gwynnco Second Addition, thence northerly along the west line of Lot 1, Block 7, Gwynnco Second Addition extended to the centerline of 40th Avenue North, thence easterly along the centerline of 40th Avenue North extended to the east line of the SW 1/4 of Section 17, T118W, R21W, which is also the border between the City of New Hope and the City of Crystal.

City of Crystal

Thence southerly along said east line of the SW 1/4 of Section 17 to the northwest corner of Lot 15, Block 1, Brownwood Manor 2nd Addition, thence easterly along the north line of said Lot 15 extended to the east line of Kentucky Avenue thence southerly along the east line of Kentucky Avenue to the north line of the South 1/2 of the SE 1/4 of Section 17, T118N, R21W, thence easterly

along said north line of the South 1/2 of the SE 1/4 of Section 17 to the southeast corner of Lot 5, Block 3, Gaulke's 5th Addition, thence northerly along the east line of said Lot 5, Lot 6 and Lot 7, Block 3, Gaulke's 5th Addition to the northwest corner of Lot 2, Block 3, Gaulke's 5th Addition, thence easterly along the north line of said Lot 2 to the northeast corner of said Lot 2, thence easterly to the northwest corner Lot 7, Block 2, Gaulke's 5th Addition, thence easterly along the north line of said Lot 7 to the northeast corner of said Lot 7, thence southerly along the east line of said Lot 7, Lot 6 and Lot 5, Block 2, Gaulke's 5th Addition to the north line of the South 1/2 of the SE 1/4 of Section 17, T118N, R21W, thence easterly along said the north line of the South 1/2 of the SE 1/4 of Section 17 to the centerline of Douglas Drive (County Rd. 102).

Thence northerly along the centerline of Douglas Drive (County Road 102) to the extension of the centerline of 39th Avenue North, thence easterly along said centerline of 39th Avenue North to the extension of the east line of Lot 1, Block 1, Beelen Addition, thence southerly along the extended east line of said Lot 1, Lot 4 and Lot 3, Block 1, The Red Barn Addition and Lot 1, Block 1, Douglas Terrace First Addition extended to the centerline of 38th Avenue North, thence easterly along the centerline of 38th Avenue North to the extension of the east line of Lot 12, Block 2, Douglas Terrace Second Addition thence southerly along the said extended east line of Lot 12 to the southeast corner of said Lot 12, thence easterly to the northeast corner of Lot 2, Block 2, Douglas Terrace Second Addition thence easterly to the northwest corner of Lot 2, Block 2, Stromberg Sunnyslopes 3rd Addition, thence easterly along the north line of said Lot 2 to the northeast corner of said Lot 2, thence southerly along the east line of said Lot 2 to the southeast corner of said Lot 2, thence easterly along the north line of Lot 1, Block 2, Sandberg's First Addition, extended to the centerline of Adair Avenue North, thence northerly along the centerline of Adair Avenue North to the extension of the north line of Lot 9, Block 1, Stromberg Sunnyslopes 1st Addition, thence easterly along the north line of said Lot 9 and Lot 8, Block 1, Stromberg Sunnyslopes 1st Addition to the northeast corner of Lot 8, Block 1, Stromberg Sunnyslopes 1st Addition, thence northerly along the east boundary of Lot 10, Lot 11, Lot 12, Lot 13, and Lot 14, Block 1, Stromberg Sunnyslopes 1st Addition to the border between the City of Crystal and the City of Robbinsdale.

City of Robbinsdale

Thence easterly along the border between the City of Crystal and the City of Robbinsdale to the northeast corner of Lot 1, Block 1, Hansen's Beltline Addition, thence easterly along the north line of Lot 27 and Lot 4, Block 5, Seminary Park extended to the north line of Lot 9 and Lot 32, Rearrangement of Blocks 1,2,7,8,9, Seminary Park, thence easterly to the centerline of Regent Avenue North, thence southerly along the centerline of Regent Avenue North to the extension of the

north line of Lot 24, Block 5, Robbinsdale Park, thence easterly along north line of said Lot 24 to the northeast corner of said Lot 24, thence southerly along the east line of said Lot 24, Lot 23, Lot 22 and Lot 21, Block 5, Robbinsdale Park to the southeast corner of said Lot 21, thence easterly along the north line of Lot 11, Block 5, Robbinsdale Park extended to the centerline of Quail Avenue North, thence southerly along the centerline of Quail Avenue North to the centerline of 38th Avenue North.

Thence easterly along the centerline of 38th Avenue North to the centerline between Quail Avenue North and Perry Avenue North, thence southerly along said centerline to the north line of 37th Avenue North, thence easterly along the north line of 37th Avenue North to the west line of Perry Avenue North, thence southerly along the west line of Perry Avenue North to the north line of 36th Avenue North, thence easterly along the north line of 36th Avenue North to the centerline of France Avenue North, thence southerly along the centerline of France Avenue North, to the extension of the south line of Oakdale Avenue North, thence southeasterly along the south line of Oakdale Avenue North to the west line of Victory Memorial Drive (Memorial Parkway), thence southerly along the west line of Victory Memorial Drive to the extension of the centerline of Lowry Avenue North.

City of Minneapolis

Thence easterly along Lowry Avenue North to Newton Avenue North, thence northerly along Newton Avenue North to 33rd Avenue North, thence easterly along 33rd Avenue North to the alley between James Avenue North and Knox Avenue North⁶.

Thence southerly along said alley to Lowry Avenue North; thence easterly along Lowry Avenue North to James Avenue North; thence southerly along James Avenue North to 30th Avenue North; thence easterly along 30th Avenue North to Fremont Avenue North; thence southerly along Fremont Avenue North to 29th Avenue North; thence westerly along 29th Avenue North to the alley between Fremont and Girard Avenues North; thence southerly along said alley to 27th Avenue North; thence westerly along 27th Avenue North to the alley between Humboldt and Irving Avenues North; thence southerly along said alley to 26th Avenue North; thence westerly along 26th Avenue North to Irving Avenue North; thence southerly along Irving Avenue North to 25th Avenue North; thence easterly along 25th Avenue North to Humboldt Avenue North; thence southerly along the southerly extension

⁶ Starting at this point is the boundary between the Bassett Creek and Mississippi watershed.

of Humboldt Avenue North to 23rd Avenue North; thence westerly along 23rd Avenue North to Irving Avenue North; thence northwesterly along Irving Avenue North to Ilion Avenue North; thence southwesterly along Ilion Avenue to Hillside Avenue; thence northwesterly along Hillside Avenue to the alley between James and Logan Avenues North; thence southwesterly along said alley to the easterly alley lying between Lots 72 and 73, Block 19, Forest Heights Addition to Minneapolis; thence westerly along last described alley to Logan Avenue North; thence southerly along Logan Avenue North to West Broadway and Oliver Avenue North; thence westerly and southerly along Oliver Avenue North to 21st Avenue North; thence westerly along 21st Avenue North to Penn Avenue North.

Thence southerly along Penn Avenue North to centerline between 16th and 17th Avenues North that are lying west of Penn Avenue North; thence westerly along said centerline to Queen Avenue North; thence southerly along Queen Avenue North to Plymouth Avenue North, thence westerly along Plymouth Avenue North to Russell Avenue North, thence southerly along Russell Avenue North to 12th Avenue North, thence easterly along 12th Avenue North to Queen Avenue North, thence southerly along Queen Avenue North to 8th Avenue North, thence westerly along 8th Avenue North to Russell Avenue North, thence southerly along Russell Avenue North to 4th Avenue North, thence easterly along 4th Avenue North to Logan Avenue North, thence southerly along Logan Avenue North to 3rd Avenue North, thence easterly along 3rd Avenue North to Gramercy Avenue North, thence southwesterly and southerly along Gramercy Avenue North to 2nd Avenue North, thence southeasterly along 2nd Avenue North to Cedar Lake Road North, thence northeasterly along Cedar Lake Road North to 2nd Avenue North, thence easterly along 2nd Avenue North to Market Street North.

Thence southerly along Market Street North extended to the southerly R/W of the M & St L RR, thence southwesterly along the southerly R/W line of the M & St L RR to the west line of Dupont Avenue South extended, thence southerly along the west line of Dupont Avenue South to the southerly line of Highway No. 12, thence southwesterly along the southerly line of Highway No. 12 to the north line of Wayzata Boulevard, thence southeasterly along the north line of Wayzata Boulevard to the 1/16 line of the South 1/2 of the NE 1/4 of Section 28, T29N, R24W, thence southerly along said 1/16 line of the South 1/2 of the NE 1/4 of Section 28, T29N, R24W to the intersection of Kenwood Parkway and Emerson Avenue South, thence southeasterly along Emerson Avenue South to Groveland Terrace, thence southerly along Groveland Terrace to Mount Curve

Avenue (said point being in Section 28, Township 29 North, Range 24 West of the 4th Principal Meridian in the City of Minneapolis)⁷.

Thence west along the centerline of Mt. Curve Avenue to the intersection of the centerline of Mt. Curve Avenue and the centerline of Kenwood Parkway; thence westerly and southwesterly along the centerline of Kenwood Parkway to the intersection of the centerline of Kenwood Parkway and the centerline of Sheridan Avenue South; thence southwesterly and southerly to the intersection of the centerline of Sheridan Avenue South and the centerline of West Franklin Avenue; thence westerly along the centerline of West Franklin Avenue to the southwest corner of the unplatted Great Northern Railway right of way; thence northeasterly and northwesterly along the boundary of the Great Northern Railway right of way to the intersection of that boundary line and the west line of the SE 1/4, Section 29, Township 29 North, Range 24 West; thence north to the southerly line of Block 3 of Wright's Cedar View Heights; thence easterly along the southerly line of said Block 3 and the southerly line of Block 9, Cedar Lake Townhouses to the southeast corner of said Block 9; thence northerly along the easterly line of said Block 9 to the westerly line of Madeira Avenue; thence northwesterly and northeasterly along the westerly line of Madeira Avenue and its northerly extension to the north line of the South 1/2 of Section 29, Township 29 North, Range 24 West; thence westerly along said north line to the northwest corner of the South 1/2 of Section 29, Township 29 North, Range 24 West.

City of Golden Valley

Thence proceeding westerly along the north line of the SE 1/4 of Section 30, Township 29 North, Range 24 West, to the centerline of June Avenue; thence southerly along the centerline of June Avenue to the intersection of the centerline of June Avenue and the south line of Lots 1 through 4, Block 1 of Kennedy's South Tyrol Hills addition extended; thence westerly along that line to the southwest corner of Lot 4, Block 1 of Kennedy's South Tyrol Hills addition; thence southwesterly and northwesterly along the southerly line of Lot 5, Block 1 of Kennedy's South Tyrol Hills addition, to the intersection of the easterly line of Lot 23, Block 1 of Kennedy's South Tyrol Hills addition; thence northerly along the easterly line of said Lot to the northeast corner of said lot; thence westerly along the northerly line of said Lot to the intersection of the northerly line extended and the easterly line of Lot 2, Block 2, Kennedy's South Tyrol Hills addition;

⁷ Starting at this point is the boundary between the Bassett Creek and Minnehaha Creek watersheds.

thence northerly along the easterly line of said Lot to the northeast corner of said lot; thence westerly along the northerly line of said Lot to the northwest corner of said lot; thence southerly along the westerly line of said Lot to the northeast corner of Lot 26, Block 2, Kennedy's South Tyrol Hills addition; thence westerly along the north line of said Lot to the intersection of the north line extended and the centerline of Natchez Avenue South; thence southerly along the centerline of Natchez Avenue South to the intersection of the centerline of Natchez Avenue South and the centerline of Ottawa Avenue South; thence westerly, southwesterly and southerly along the centerline of Ottawa Avenue South to the intersection of the centerline of Ottawa Avenue South and the extension of the north line of Block 2, Kavlis Cedardale addition; thence westerly along the north line of Block 2 to the northeast corner of Lot 12, Block 2, Kavlis Cedardale addition; thence southerly along the east line of said Lot to the southeast corner of said lot;

thence westerly along the south line of said Lot to the intersection of the south line of said Lot extended and the centerline of Princeton Avenue South; thence southerly along the centerline of Princeton Avenue South to the intersection of the centerline of Princeton Avenue South and the south line of Lot 4, Block 3, Kavlis Cedardale addition extended; thence westerly along said line to the southwest corner of Lot 4, Block 3, Kavlis Cedardale addition; thence southerly along the westerly line of Lots 5 and 6 of Block 3, Kavlis Cedardale Addition to the intersection of the westerly line of Lots 5 and 6 extended and the northerly line of Lot 35, Block 1, Kavlis Cedarhurst addition; thence easterly along the north line of said Lot to the northeast corner of said lot.

Cities of St. Louis Park and Golden Valley

Thence southerly along the east line of Lots 32 through 35, Block 1, Kavlis Cedarhurst addition to the southeast corner of Lot 32; thence westerly along the south line of Lot 32 to the intersection of the south line of Lot 32 extended and the centerline of Quentin Avenue South; thence southerly along the centerline of Quentin Avenue to the centerline of Old Cedar Lake Road; thence westerly along the centerline of old Cedar Lake Road to the easterly line of State Highway 100; thence southerly along said easterly line to the south line of Section 30, Township 29 North, Range 24 West; thence west along the south line of Section 30 to the westerly line of State Highway 100; thence northerly along said westerly line of State Highway 100 to the southerly line of U.S. Highway 12;

City of St. Louis Park

Thence westerly along the southerly line of U.S. Highway 12 to the westerly right of way line of Zarthan Avenue; thence southerly along the westerly right of way line of Zarthan Avenue to a point 126 feet north of the northerly right of way line of West 16th Street; thence westerly to the easterly

right of way line of the Minneapolis Northfield and Southern Railway; thence southwesterly along the right of way line to the centerline of West 18th Street; thence westerly along the centerline of West 18th Street to the westerly right of way line of Dakota Avenue; thence southerly along that line to the northeast corner of Lot 10, Block 1, Westwood Park; thence westerly along that line to the northwest corner of said lot; thence southerly along the west line of Lots 10 through 16 extended to the, southerly right of way line of West Franklin Avenue;

thence northwesterly along the north line of Lot 1, Block 3, Westwood Park to the northwest corner of said lot; thence southerly along the westerly line of Lot 1 to the southeast corner of Lot 2, Block 3, Westwood Park; thence westerly along the north line of Lot 4, Block 3, Westwood Park and its westerly extension to its intersection with the northerly extension of the east line of Lot 7, Block 2, Supreme Park First Division; thence southerly to the southeast corner of said Lot 7; thence southwesterly along the southerly line of said Lot 7 and its westerly extension to the westerly right of way line of Florida Avenue; thence southerly along that line to the northeast corner of Lot 4, Block 3, Supreme Park First Division; thence southwesterly along the rear Lot line of Lots 4 through 9, Block 3, Supreme Park First Division extended to the westerly right of way line of Georgia Avenue;

thence southerly along that line to the northeast corner of Lot 7, Block 4, Spring Park First Division; thence southwesterly along the rear Lot lines of Lots 7 through 12, Block 4, Supreme Park First Division extended to the intersection of that line and the centerline of Hampshire Avenue; thence northerly along the centerline of Hampshire Avenue to the intersection of the centerline of Hampshire Avenue and the extension of the south line of Lot 11, Richmond Third Addition; thence westerly along that line to the southwest corner of Lot 20, Richmond Third Addition; thence westerly to the southeast corner of Lot 41, Richmond Third Addition; thence westerly to the southwest corner of said lot; thence northerly along the west line of Lots 39, 40 and 41, Richmond third Addition, to the southeast corner of Lot 69, Richmond Third Addition; thence westerly to the southwest corner of said lot;

thence westerly to the southeast corner of Lot 86, Richmond Third Addition; thence northerly to the northeast corner of Lot 85; thence westerly to the northwest corner of Lot 85; thence north to the northeast corner of Lot 135, Richmond Third Addition; thence westerly to the northwest corner of said Lot 135; thence westerly to the northwest corner of Lot 136, Richmond Third Addition; thence northerly to the southwest corner of Lot 407, Richmond Addition; thence northerly along the west line of Lots 397 through 407, Richmond Addition, to the northwest corner of Lot 397, Richmond Addition; thence northerly to the southwest corner of Lot 396, Richmond Addition; thence northerly

along the west line of Lots 384 through 396, Richmond Addition, to the northwest corner of Lot 384, Richmond Addition; thence northerly to the southwest corner of Lot 383, Richmond Third Addition; thence northerly along the west line of Lots 374 through 383, Richmond Addition, to the southeast corner of Lot 441, Richard Addition;

thence westerly to the southwest corner of said lot; thence westerly to the northeast corner of Lot 11, Richmond Addition; thence southerly to the southeast corner of Lot 12, Richmond Addition; thence west to the southwest corner of said Lot 12; thence northerly along the west lines of Lots 1 through 12 and its northerly extension to the centerline of 14th Street; thence westerly along the centerline of 14th Street to the southeast corner of Lot 1, Block 1, Bar Ett Addition; thence northerly 90 degrees, 7 minutes to a point 209.7 feet north of the centerline of 14th Street; thence westerly to the centerline of Pennsylvania Avenue; thence southerly along the centerline of Pennsylvania Avenue to the intersection of the southerly line of Lot 8, Block 1, Penn-Zayta Second Addition extended; thence westerly along that line to the southwest corner of said lot; thence northerly along the westerly line of Lot 8 to the northwest corner of Lot 8; thence westerly along the south line of Lots 4 through 9, Block 2, Penn-Zayta Addition, to the southwest corner of Lot 4;

thence northerly along the west line of said Lot to the intersection of that line extended and the north right of way line of 13th Lane; thence westerly along the north right of way line of 13th Lane to the southwest corner of Lot 1, Block 1, Penn Zayta; thence northerly along the west line of Lot 1 to the northerly line of the South 1/2 of Section 5, Township 117 North, Range 21 West; thence westerly along that line and the north line of the South 1/2 of Section 6, Township 117 North, Range 21 West, to its intersection with the westerly line of Skyehill Townhomes; thence southerly along said westerly line to the southwest corner of said Skyehill Townhomes; thence east along the south line of Skyehill Townhomes to the east line of the SE 1/4 of said Section 6; thence south along said east line to the north line of the Second Country Club Addition of Westwood Hills; thence west along said north line to the northwest corner of Lot 1, Block 1, of said Addition; thence south along the west line of said Lot 1 to the north line of West 16th Street;

thence west along said north line to the west line of Virginia Avenue South; thence south along said west line to its intersection with the westerly line of Westwood Hills Drive; thence southwesterly and southeasterly along said westerly line to the northeast corner of Lot 2, Block 1, Westwood Estates; thence westerly to the northwesterly corner of said Lot 2; thence southerly, southeasterly, and southwesterly along the west lines of Lots 2 and 3, Westwood Estates to the southwest corner of said Lot 3; thence southerly along the extension of Lot 3, to the intersection of that line and the south

right of way of Franklin Avenue; thence northwesterly along the northerly line of Lot 4, Block 2, Westwood Estates Fourth Addition, to the northwest corner of Lot 4; thence southwesterly to the southwest corner of said Lot 4; thence northwesterly along the northerly line of Block 1, Westwood Hills Grove Addition to the northwest corner thereof; thence southerly along the westerly line of Block 1, Westwood Hills Grove Addition, to the southwest corner of Lot 11, Block 1, Westwood Hills Grove;

thence westerly along the south line of the NW 1/4 of the NE 1/4 of Section 7, Township 117 North, Range 21 West to the southwest corner thereof; thence southerly along the west line of the SW 1/4 of the NE 1/4 of Section 7 to the intersection of that line and the north right of way line of West 24th Street extended; thence westerly along that line to the westerly line of the replat of part of Block 1, Golf View Terrace, extended; thence southerly along that line to the north right of way line of Club Road; thence westerly along that line to the southeast corner of Lot 7, Block 5, Flag Terrace Addition; thence northerly along the east line of Blocks 1 through 5, Flag Terrace Addition, to the northeast corner of Lot 1, Block 1, Flag Terrace Addition; thence westerly along the north line of Block 1, Flag Terrace Addition, to the intersection of that line extended and the centerline of Flag Avenue; thence northerly along the centerline of Flag Avenue to the intersection of that line and the north line of Lot 43, Crestview Addition extended;

thence westerly along the north line of Block 43 to the northwest corner of said lot; thence southerly along the west line of said Lot to the northeast corner of Lot 40, Crestview Addition, thence westerly along the north line of said Lot to the intersection of that line and the west right of way line of Hillsborough Avenue; thence northerly along the west right of way of Hillsborough Avenue to the northeast corner of Lot 28, Crestview Addition; thence westerly along the north line of said Lot to the northwest corner of said lot; thence southerly along the west line of said Lot to the northeast corner of Lot 23, Crestview Addition; thence westerly along the north line of said Lot to the west right of way line of Independence Avenue; thence southerly along the west right of way line of Independence Avenue to the northeast corner of Lot 11, Crestview Addition; thence westerly along that line to the centerline of County Road 18; thence southerly along the centerline of County Road 18 to the southeast corner of Section 1, Township 117 North, Range 22 West; thence west along the south line of said Section 1 to the east line of Ford Road; thence north along said east line to its intersection with the easterly extension of the north line of Block 1, Windsor Highlands.

City of Minnetonka

Thence west along said north line and its easterly extension to the easterly line of Lot 10, Block 2, Windsor Hills; thence northerly along said easterly line to the northeasterly corner of said Lot 10; thence westerly to the most easterly corner of Lot 9, Block 2, Windsor Hills; thence northwesterly along the northeasterly line of said Lot 9 and its northwesterly extension to the southeasterly line of Lot 11, Block 3, Windsor Hills; thence northeasterly along said southeasterly line to the southeasterly corner of said Lot 11; thence northerly to the northeasterly corner of Lot 13 of said Block 3, thence westerly to the northwesterly corner of said Lot 13; thence northerly along the westerly line of said Block 3 and its northerly extension to the southerly line of Lot 8, Block 6, Windsor Hills;

thence northeasterly to the southeasterly corner of said Lot 8; thence northerly to the southwest corner of Lot 5 of said Block 6; thence northeasterly to the southeasterly corner of said Lot 5; thence northerly along the easterly line of Lots 5 and 4 of said Block 6 to the northeast corner of said Lot 4; thence west to the northwest corner of said Lot 4; thence north to the northeast corner of Tract B Registered Land Survey No. 927; thence west along the north line of said Tract B and its westerly extension to the centerline of Traymore Avenue extended; thence south along said centerline to the centerline of Crestridge Drive extended; thence southwest along the centerline of Crestridge Drive to its intersection with northerly extension of east line of Lot 5, Block 2, Green Acres; thence south to the southeast corner of said Lot 5; thence west to the northeast corner of Lot 11 of said Block 2;

thence south along the east line of said Lot 11 and its southerly extension to the centerline of Belmont Road; thence west along said centerline to the east line of Block 1 Allentown; thence south to the southeast corner of said Block 1; thence west to the southwest corner of said Block 1; thence north to the most easterly corner of Lot 11, Block 1, Oak Knoll Terrace; thence west to the northwest corner of said Lot 11; thence south to the northeast corner of Lot 10, Block 2, Oak Knoll Terrace;

thence west to the northwest corner of said Lot 10; thence south to the southwest corner of said Lot 10; thence west to the northwest corner of Lot 14 of said Block 2; thence south to the southwest corner of Lot 18, Block 1, Oak Knoll Terrace; thence east to the northeast corner of the North 125 feet of the West 983 feet of the South 1/2 of the SW 1/4 of the SW 1/4 of Section 1, Township 117 North, Range 22 West; thence south to the southeast corner thereof; thence west along the south line thereof to the easterly line of Vernon Drive South; thence southerly along said easterly line and its southerly extension to the north line of Section 12, Township 117 North, Range 22 West; thence east along said north line to its intersection with northerly extension of east line of Lot 1,

Block 1, Cape Cod Estates First; thence south to the southeast corner of said Lot 1; thence west to the southwest corner of said Lot 1; thence south to the northeast corner of Lot 3, Block 1, Knoll Ridge; thence west along the north line of said Lot 3 and its westerly extension to the east line of Block 2, Knoll Ridge;

thence south to the southeast corner of Lot 6 of said Block 2; thence west along the south line of Lots 6 and 21 of said Block 2 and its westerly extension to the west line of County Road No. 73; thence south along said west line to the northeast corner of Lot 5, Block 2, Replat of Oak Knoll Third Addition; thence west to the northwest corner of said Lot 5; thence south to the northeast corner of Lot 9 of said Block 2; thence west to the northwest corner of said Lot 9; thence southerly and westerly along the easterly and southerly lines of Park Ridge Drive West to the northeast corner of Lot 13, Block 2, Replat of Oak Knoll Third Addition; thence southerly to the southeast corner of said Lot 13; thence westerly to the northeast corner of Lot 2, Block 1, Fetterly Woods; thence south to the southeast corner of said Lot 2; thence westerly along the southerly line of Lots 2 and 1 of said Block 1 to the southwest corner of said Lot 1; thence north along the west line of said Lot 1 to a point 122 feet south from the northwest corner of said Lot 1;

thence westerly to a point on the east line of Lot 2, Block 2, Sherwood Hills Distant 211.12 feet north from the southeast corner thereof; thence north to the northeast corner of said Lot 2; thence east to the southeasterly corner of Lot 8, Block 6, Replat of Oak Knoll Third Addition; thence northerly to the southeasterly corner of Lot 7 of said Block 6; thence westerly to the southwesterly corner of said Lot 7; thence westerly along the southerly line of Lot 10 of said Block 6 and its westerly extension to the easterly line of Block 7 Replat of Oak Knoll Third Addition; thence northerly along said easterly line to the northeasterly corner of Lot 7 of said Block 7; thence west to the northwest corner of said Lot 7; thence south to the northwest corner of the south 100 feet of the west 160 feet of the North 1/4 of the SW 1/4 of the NE 1/4 of Section 11, Township 117 North, Range 22 West; thence east to the northeast corner thereof; thence south to the southeast corner thereof; thence east to the northeast corner of Lot 1, Block 1, Sherwood Hills;

thence southerly along the easterly line of said Lot 1 to the most northerly corner of Lot 1, Block 1, Sherwood Oaks; thence southwesterly to the most westerly corner of said Lot 1; thence southeasterly to the most southerly corner of said Lot 1; thence southwesterly to the most westerly corner of Lot 2 of said Block 1; thence south to the southwest corner of Lot 4 of said Block 1; thence west to the southwest corner of Lot 1, Block 1, Byrnes Woods Second Addition; thence north to the northwesterly corner of said Lot 1; thence northwesterly along the southwesterly line of Byrnes Road

to the south line of Tract H Registered Land Survey go. 1444; thence west to the southwest corner of said Tract H; thence north to the northwesterly corner of Tract E Registered Land Survey No. 1444; thence westerly along the centerline of Hilloway Road to its intersection with the southerly extension of the west line of Block 2, Hilloway Glen; thence north to the northwest corner of Lot 3 of said Block 2; thence west to the southwesterly corner of Lot 3, Block 1, Sherwood Gardens 1st Addition;

thence northerly along the westerly line of Lots 3 and 4 of said Block 1 to the northwesterly corner of Lot 4; thence west along the north line of sections 11 and 10, Township 117 North, Range 22 West, to the easterly line of Plymouth Road; thence southerly along said easterly line to its intersection with a line bearing N 88 degrees, 43 minutes, 25 seconds East from a point 310 feet south as measured at right angles from a point on the north line of said section 10 distant 711.31 feet west from the northeast corner thereof; said north line having an assumed bearing of S 88 degrees, 47 minutes, 45 seconds West; thence west to said point being 310 feet south from the north line of section 10; thence north to said point on north line of section 10 being 711.31 feet west from the northeast corner thereof; thence east along said north line to the centerline of Plymouth Road; thence northerly along said centerline to the north line of the South 1/2 of Section 3, Township 117 North, Range 22 West;

thence east along the north line of the South 1/2 of Sections 3 and 2, Township 117 North, Range 22 West to its intersection with the southerly extension of the east line of Lot 13, Block 5, Sunset Hill; thence north along said east line and its northerly extension to the south line of Lot 15 of said Block 5; thence west along the south line of said Lot 15 and its westerly extension to the east line of Tract H Registered Land Survey No. 451; thence north to the southeast corner of Tract B Registered Land Survey No. 451; thence west to the southwest corner thereof; thence north to the northwest corner thereof; thence west along the north line of Tract O and its westerly extension to the west line of Corens Drive; thence north along said west line and its northerly extension to the north line of Fairfield Road; thence west along said north line to the east line of the SW 1/4 of the NE 1/4 of the NE 1/4 of Section 3, Township 117 North, Range 22 West; thence north to the northeast corner thereof; thence west along the north line thereof to the east line of Milbert Road;

thence north along said east line and its northerly extension to the north line of Section 3, Township 117 North, Range 22 West (which is also the border between the City of Minnetonka and the City of Plymouth); thence westerly along said north line to the centerline of Plymouth Road; which is the point of beginning.