

- MPCA; 2013/BCWMC
- BCWMC Jurisdictional Boundary
  - Major Subwatersheds
  - Flow Directions
  - Creeks
  - Chemical Water Quality Monitoring Station (BCWMC or Citizen Assisted Monitoring Program)
  - Biotic Monitoring Locations (BCWMC)
  - Watershed Outlet Monitoring Program (WOMP) Station

See section 2.7.1 of the plan for more information regarding the monitoring programs and locations illustrated in this figure.

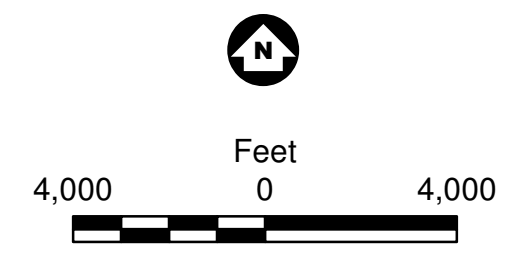
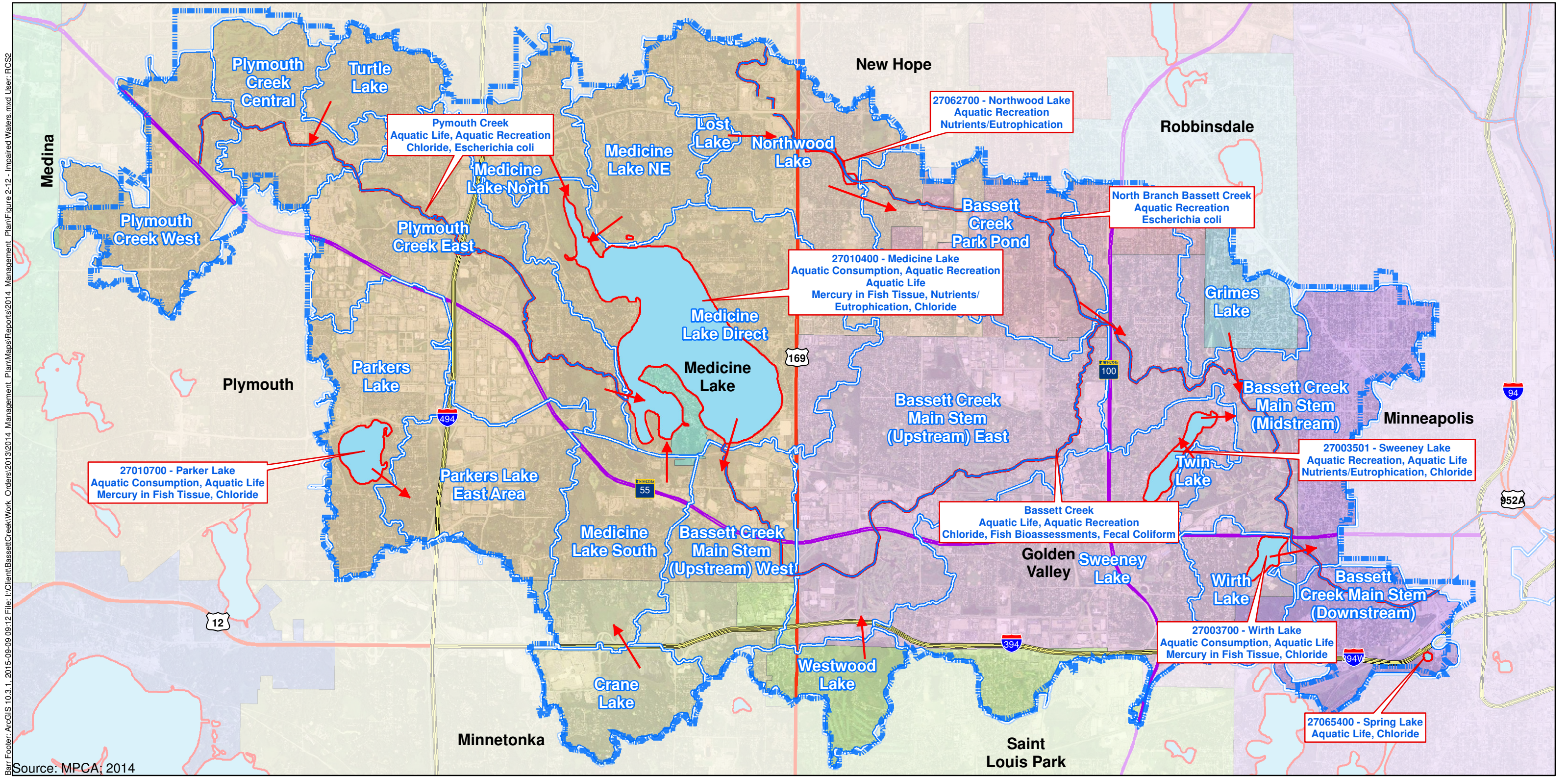


Figure 2-11  
 WATER QUALITY AND STREAM  
 BIOTIC MONITORING LOCATIONS  
 Bassett Creek Watershed  
 Management Commission  
 2015 Management Plan



Bar Footer: ArcGIS 10.3.1, 2015-09-09 09:12 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\BassettCreek\MapFigure 2-12 - Impaired Waters.mxd User: RCS2



- BCWMC Jurisdictional Boundary
- Major Subwatersheds
- Flow Directions
- Impaired Streams
- Impaired Lakes

**North Branch Bassett Creek**  
Aquatic Recreation  
Escherichia coli

← Name/Public Waters ID  
← Impaired Uses  
← Pollutant/Stressors

Data based on the 2014 MPCA 303(d) Impaired Water List. See section 2.7.2.1 of the plan for more information about impaired waters and the MPCA's 303(d) Impaired Waters List.

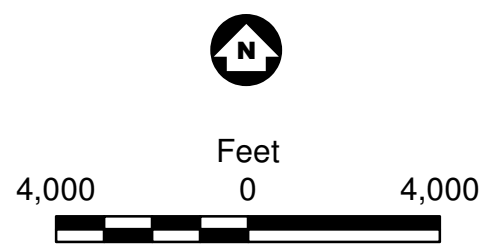


Figure 2-12  
MPCA 303(d) IMPAIRED WATERS  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan







Bar Footer: ArcGIS 10.3.1, 2015-09-03 14:55 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Maps\Reports\2014 Management Plan\Figure 2-14 - Flood Control Projects.mxd User: RC92

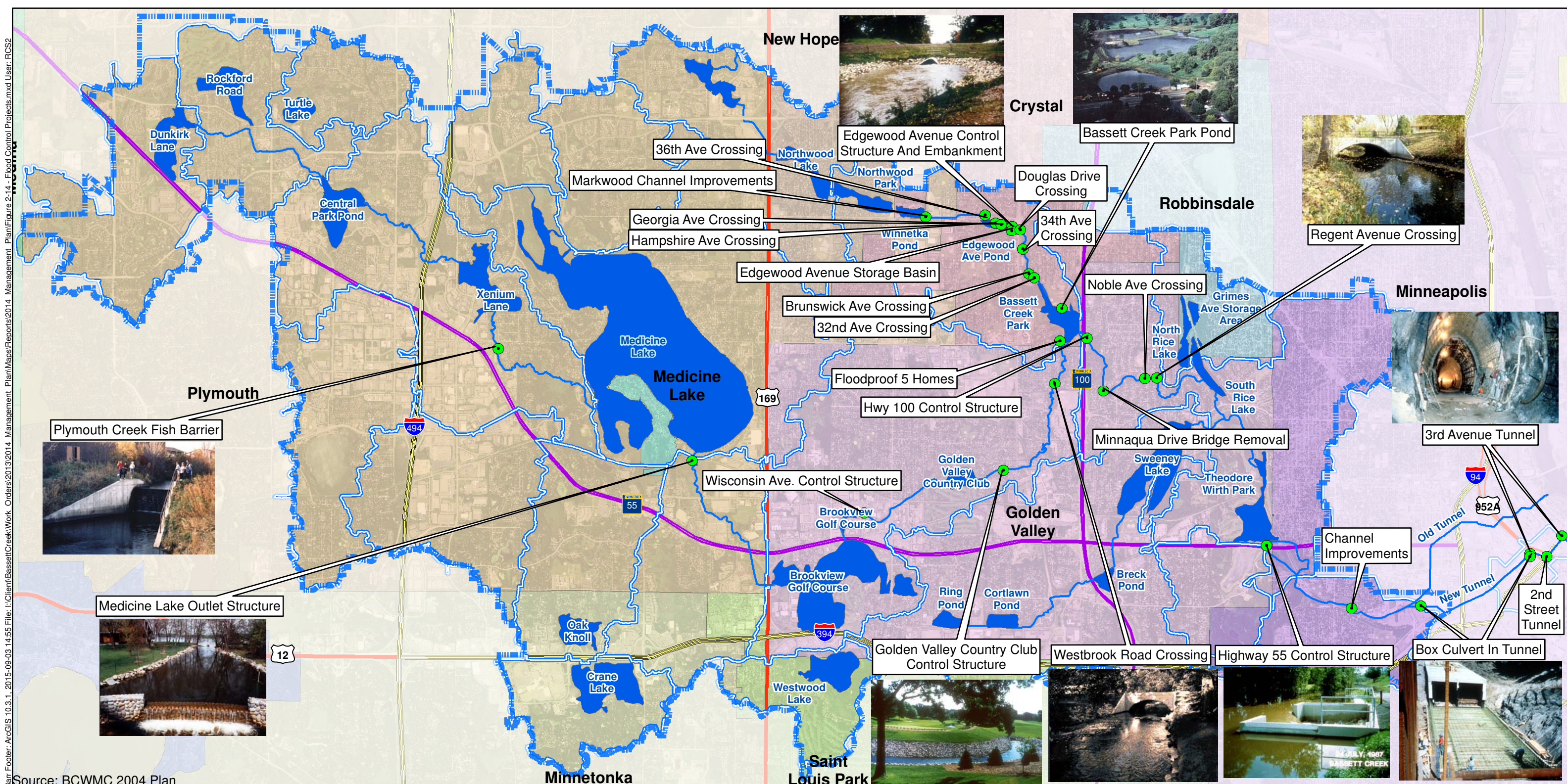
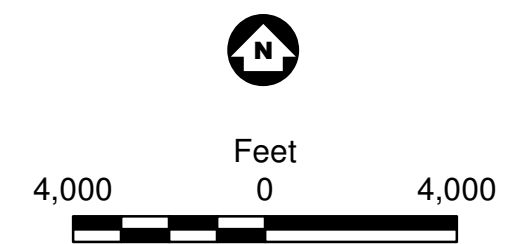


Figure 2-14

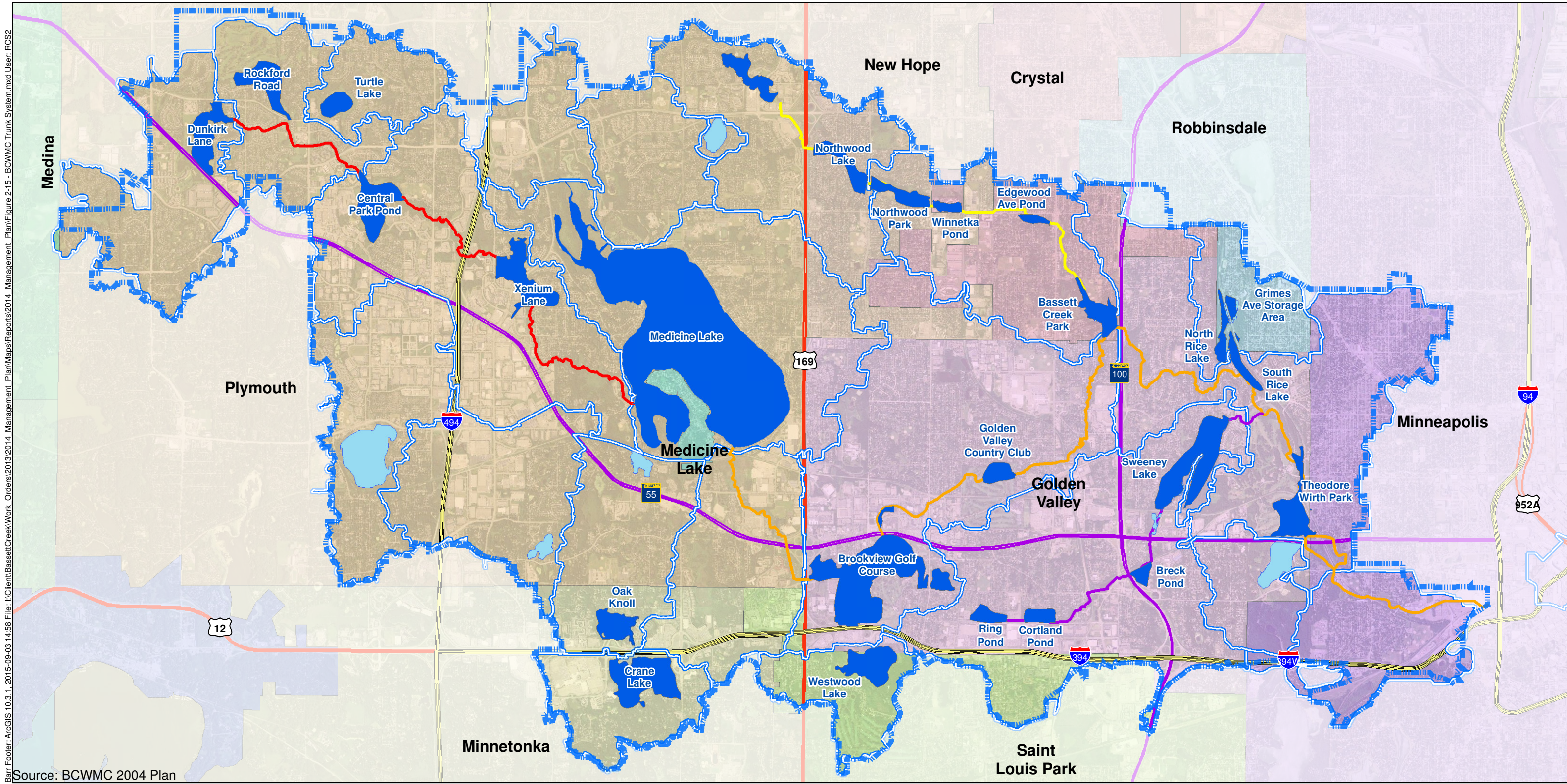
FLOOD CONTROL PROJECT  
FEATURES  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan

- BCWMC Jurisdictional Boundary
- Major Subwatersheds
- Flood Control Projects
- Designated Water Quantity and Water Quality Storage Facilities (From Fig. 15 of 2004 Plan)





Bar Footer: ArcGIS 10.3.1, 2015-09-03 14:58 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Maps\Reports\2014 Management Plan\Figure 2-15 - BCWMC Trunk System.mxd User: RCS2



- BCWMC Jurisdictional Boundary
- Major Subwatersheds
- Trunk System Components**
  - Main Stem Bassett Creek
  - North Branch Bassett
  - Plymouth Creek
  - Sweeney Branch Bassett Creek
- Designated Water Quantity and Water Quality Storage Facilities (From Fig. 15 of 2004 Plan)

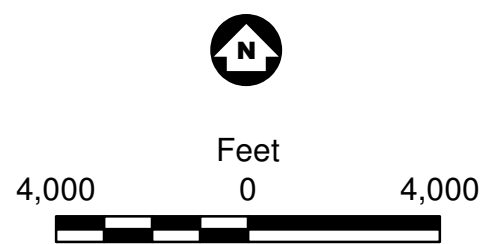
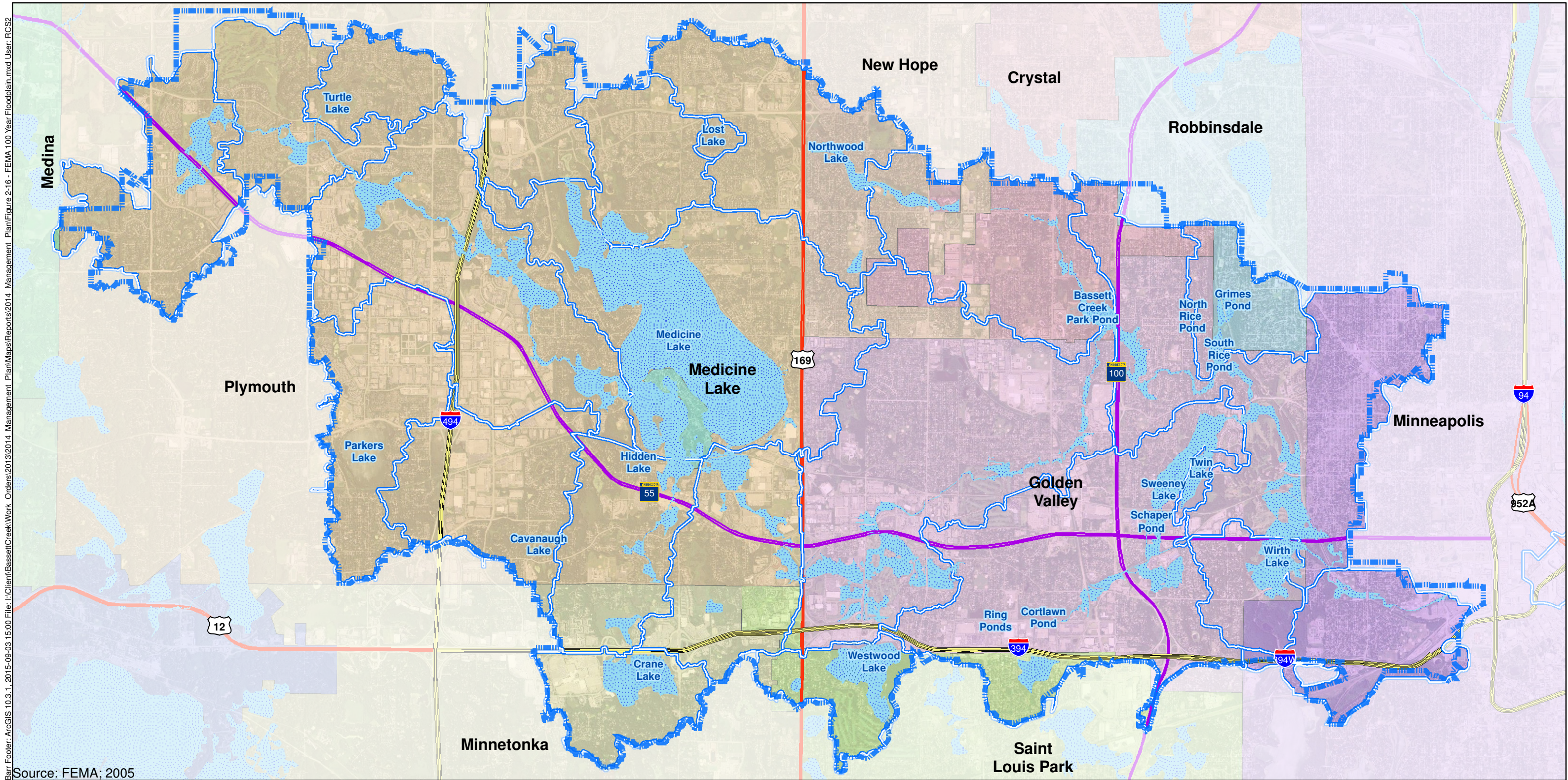


Figure 2-15

BCWMC TRUNK SYSTEM  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan



Bar Footer: ArcGIS 10.3.1, 2015-09-03 15:00 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Maps\Reports\2014 Management Plan\Figure 2-16 - FEMA 100 Year Floodplain.mxd User: RC52



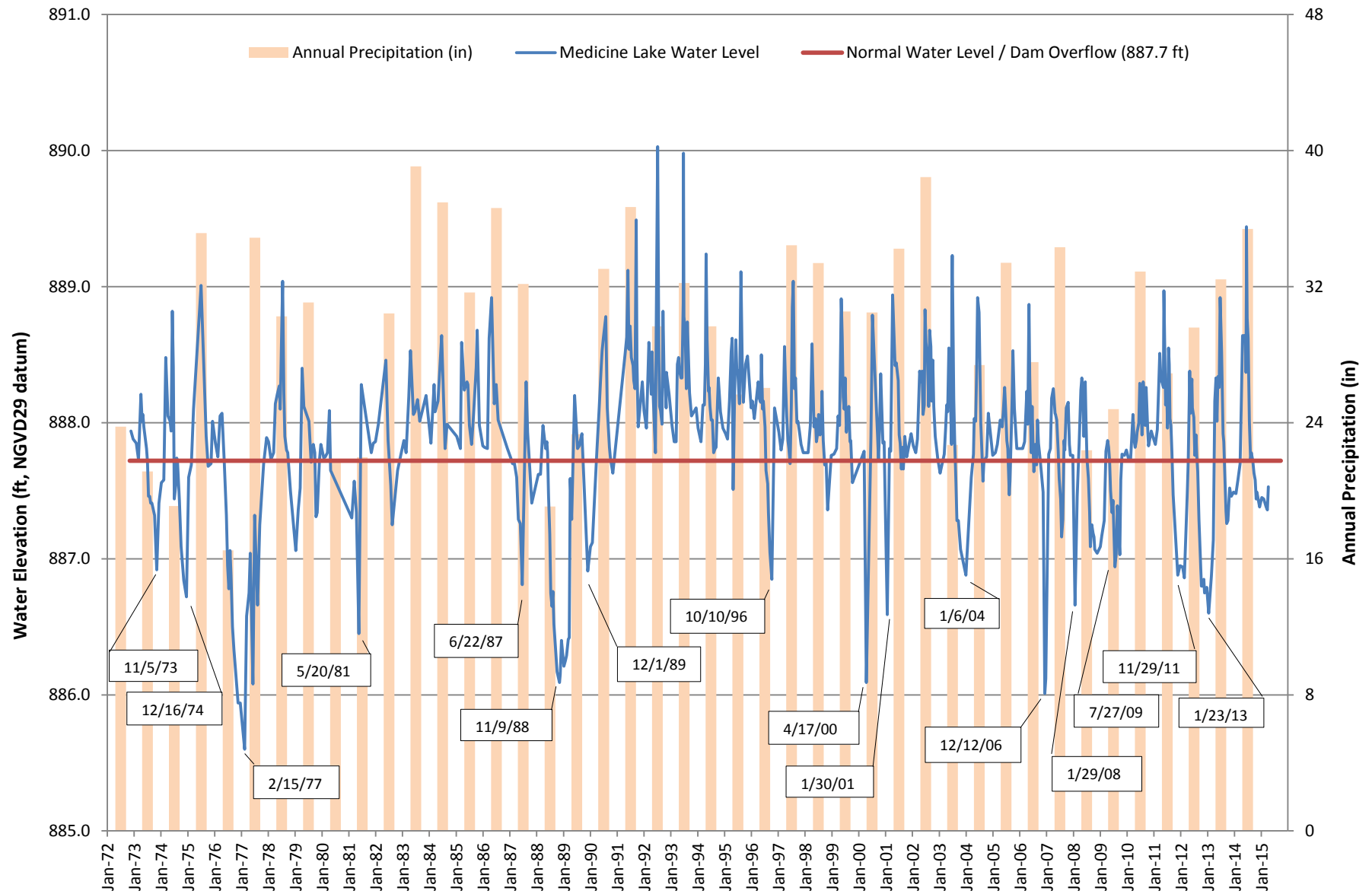
- BCWMC Jurisdictional Boundary
- Major Subwatersheds
- FEMA 100 Year Floodplain

Figure 2-16

FEMA 100-YEAR FLOODPLAIN  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan





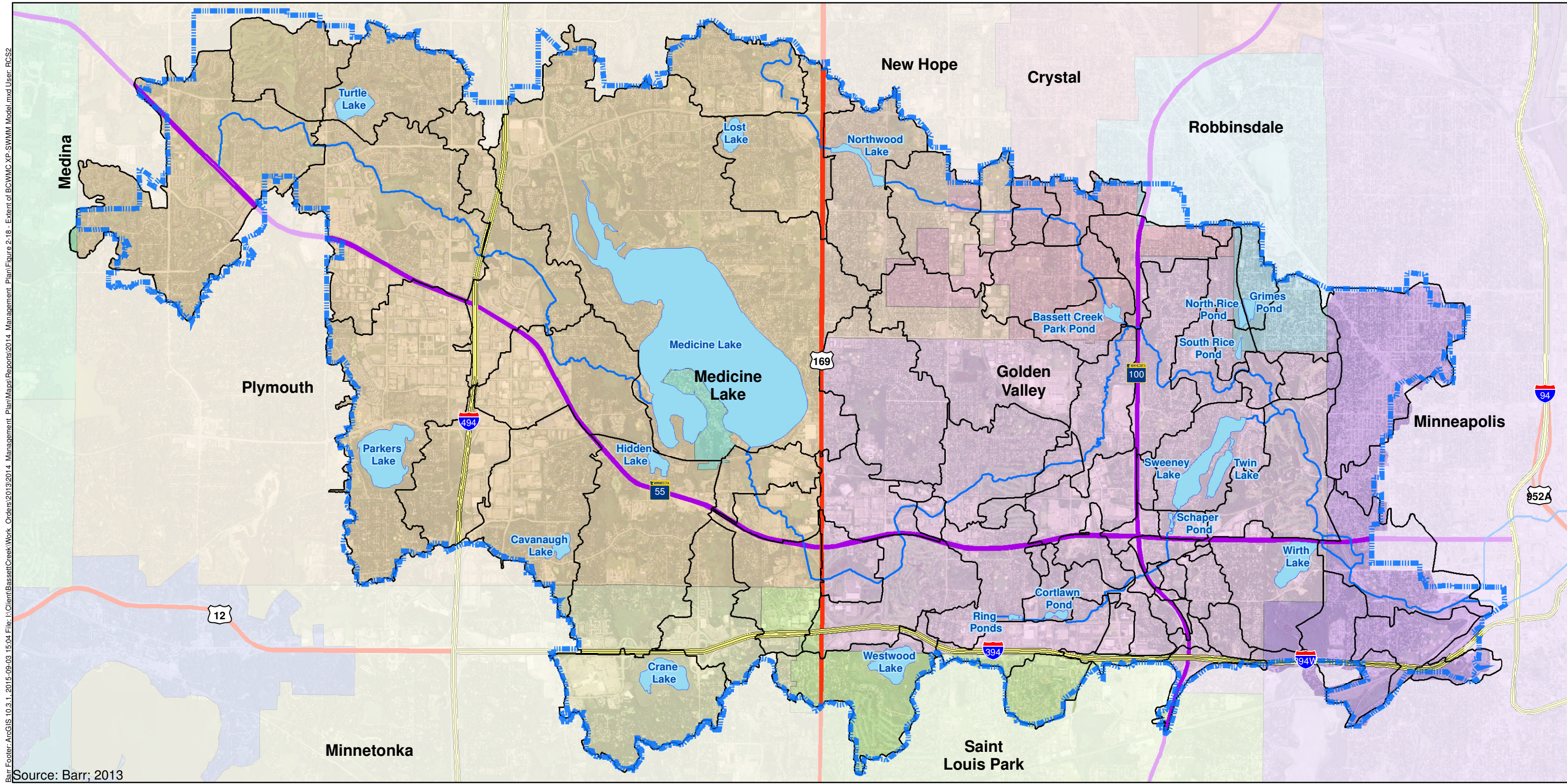


**Figure 2-17**  
**Medicine Lake Water Level and**  
**Precipitation (1972-2015)**

Sources: MDNR lakefinder, Minnesota Climatology Working Group, BCWMC



Bar Footer-ArcGIS 10.3.1, 2015-09-03 15:04 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Map\Figure 2-18 - Extent of BCWMC XP-SWMM Model.mxd User: RGS2



Source: Barr, 2013

- BCWMC Jurisdictional Boundary
- Watersheds Used in XP-SWMM Model
- Creeks
- Lakes and Ponds

See section 2.8.6.1 for more information about the BCWMC watershed-wide XP-SWMM hydrologic and hydraulic model.

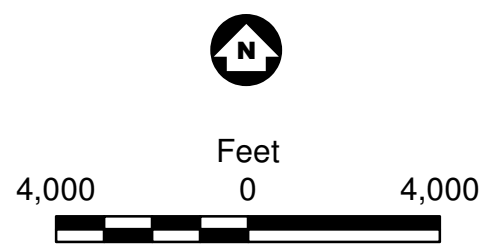
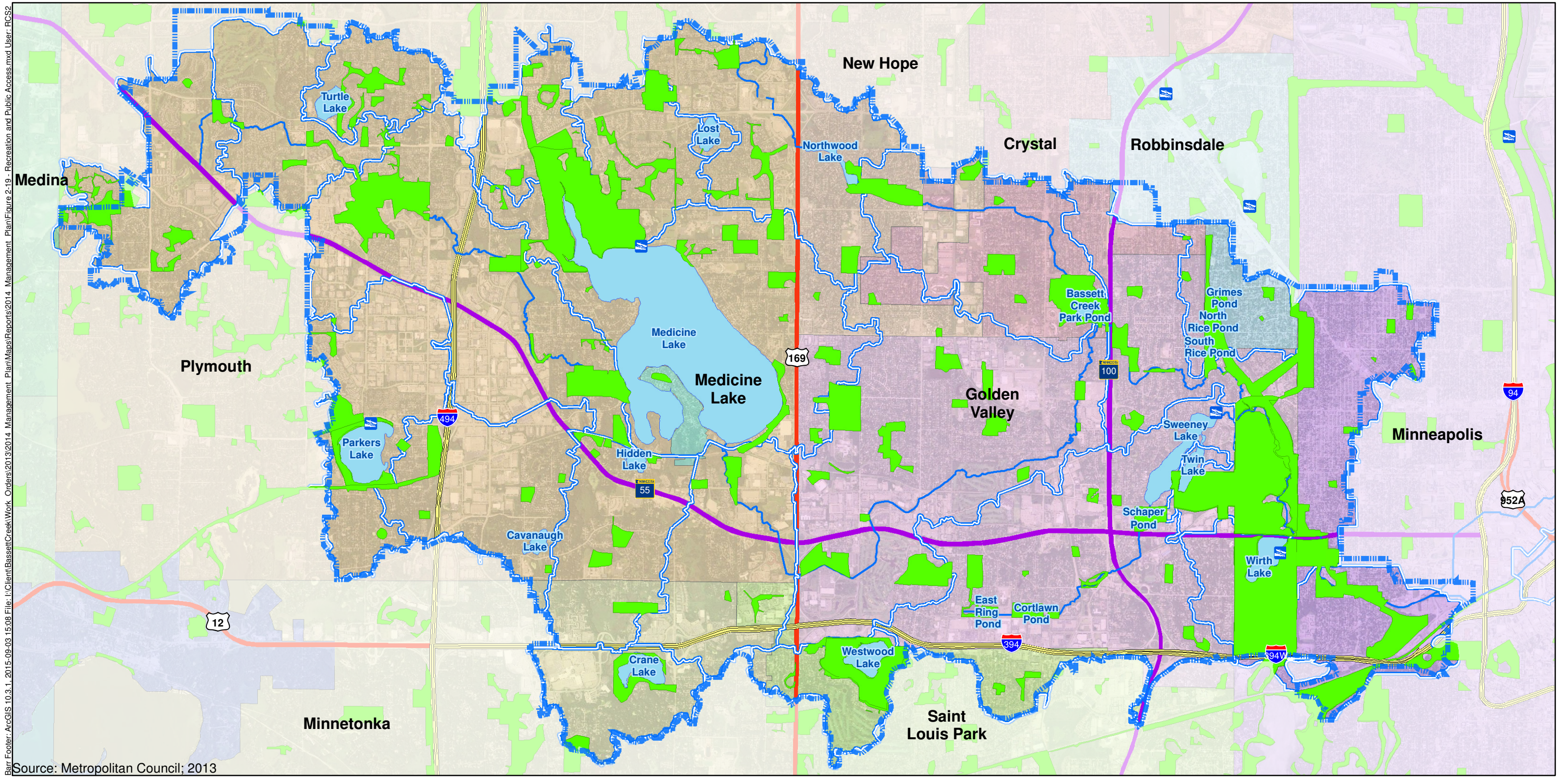


Figure 2-18

WATERSHEDS USED IN  
BCWMC XP-SWMM MODEL  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan





Bar Footer: ArcGIS 10.3.1, 2015-09-03 15:08 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Maps\Reports\2014 Management Plan\Figure 2-19 - Recreation and Public Access.mxd User: FCS2

- BCWMC Jurisdictional Boundary
- Major Subwatersheds
- Boat Access
- Creeks
- City or Regional Park

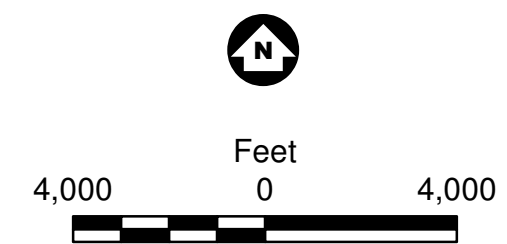
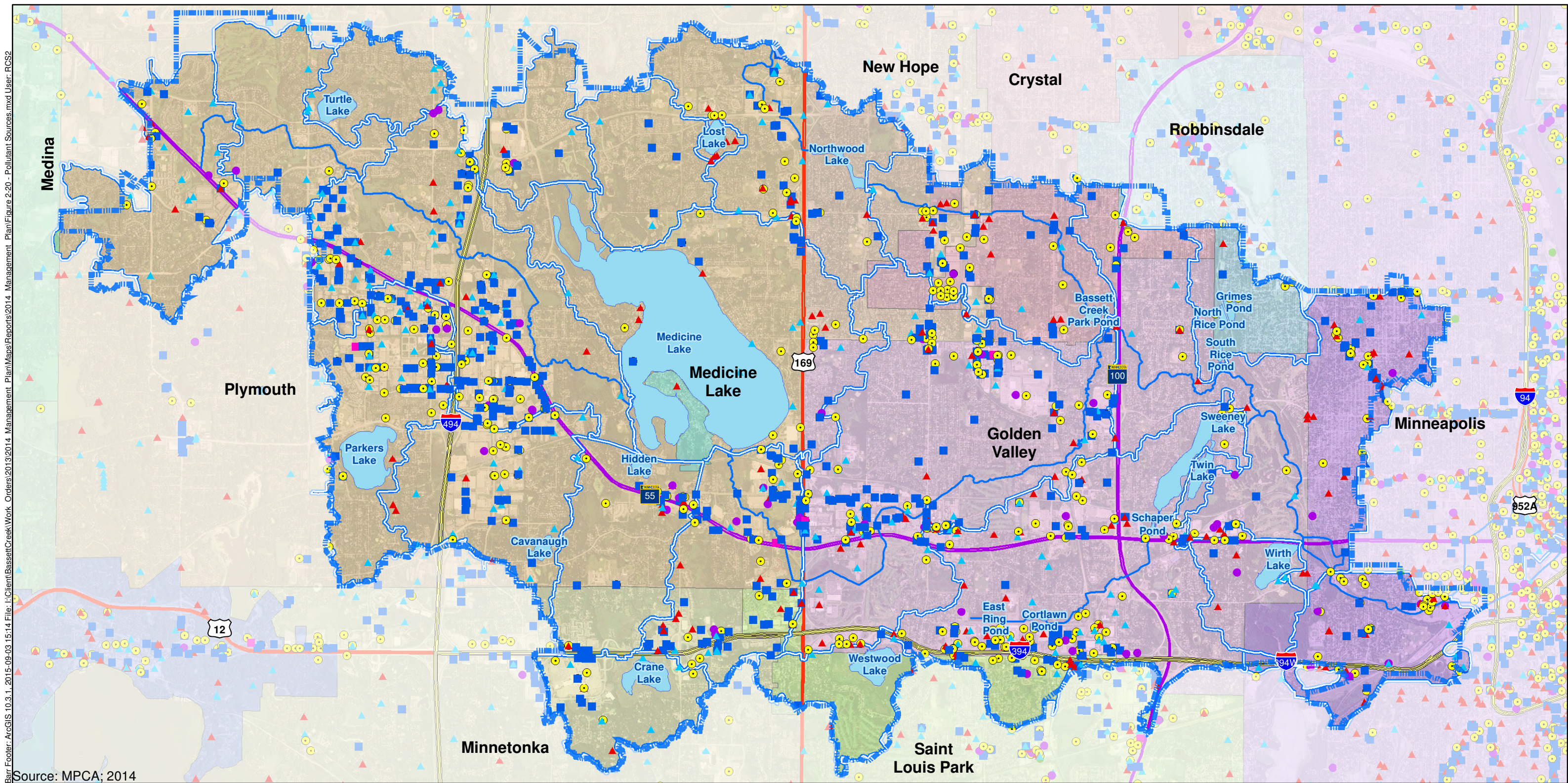


Figure 2-19

RECREATION AREAS AND  
PUBLIC BOAT ACCESS  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan



Bar Footer: ArcGIS 10.3.1, 2015-09-03 15:14 File: I:\Client\BassettCreek\Work Orders\2013\2014 Management Plan\Maps\Reports\2014 Management Plan\Figure 2-20 - Pollutant Sources.mxd User: RCS2



Source: MPCA; 2014

- What's in my Neighborhood**
- BCWMC Jurisdictional Boundary
  - Major Subwatersheds
  - Lakes and Ponds
  - Creeks
  - Air Permit
  - Feedlot
  - Hazardous Waste
  - Investigation and Cleanup
  - Solid Waste
  - Underground Storage Tanks
  - Water Quality
  - Multiple Activities

See section 2.11 of the plan for more information about the data illustrated in this figure.

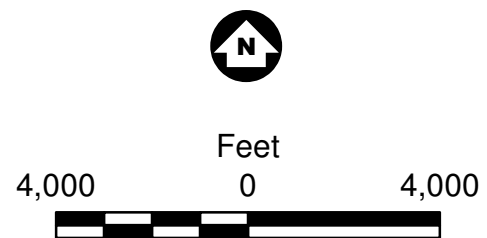


Figure 2-20

POLLUTANT SOURCES  
Bassett Creek Watershed  
Management Commission  
2015 Management Plan



**Bassett Creek Watershed  
Management Commission**



# BCMWC 2015 Watershed Management Plan

## Section 3 – Assessment of Issues and Opportunities

### Contents

3.0	Assessment of Issues and Opportunities .....	3-1
3.1	Water Quality .....	3-1
3.2	Water Quantity and Flooding .....	3-3
3.2.1	Floodplain Management .....	3-5
3.3	Erosion and Sedimentation .....	3-6
3.4	Streams .....	3-8
3.5	Wetlands, Habitat, and Shoreland Areas.....	3-11
3.5.1	Wetland and Shoreland Buffers.....	3-13
3.5.2	Aquatic Invasive Species (AIS) .....	3-14
3.5.3	Member City Wetland Management and Wetland Classification .....	3-15
3.6	Groundwater.....	3-16
3.7	Education and Outreach .....	3-18
3.8	Implementation and Responsibilities .....	3-19
3.8.1	Maintenance of Stormwater Systems and Projects .....	3-20
3.8.2	Public Ditches.....	3-21
3.8.3	Funding and Financing.....	3-21



## List of Tables

Table 3-1	Impacts of Urbanization on Streams .....	3-10
-----------	--	------



---

## 3.0 Assessment of Issues and Opportunities

This section of the Plan presents and discusses the issues and opportunities facing the Bassett Creek Watershed Management Commission (BCWMC), organized by various water topic categories. Issue identification was an important task in development of this Plan, and included a gaps analysis, the development of a Gaps Analysis document (see Appendix D), and a rigorous public participation process called the Watershed Assessment and Visioning Exercise (WAVE). The WAVE included an online survey with 174 respondents, a small group discussion and issues identification session in each city with city officials and/or city staff, a Watershed Summit event where the public prioritized issues, and a prioritization of issues by the Commission, Technical Advisory Committee (TAC) members, and technical partners (see Appendix E for WAVE results). The key issues identified through this process are among the following topic areas: 1) water quality; 2) water quantity and flooding; 3) erosion/sedimentation; 4) streams; 5) wetlands, habitat, and shoreland areas; 6) groundwater; 7) education and outreach; and 8) implementation and responsibilities (administration). The issues are discussed in the respective topical subsections below.

### 3.1 Water Quality

Pollutants are discharged to surface waters as either point sources or non-point sources. Point source pollutants discharge to receiving surface waters at a specific point from a specific identifiable source. Discharges of treated sewage from a wastewater treatment plant or discharges from an industry are examples of point sources. Unlike point sources, non-point source pollution cannot be traced to a single source or pipe. Instead, pollutants are carried from land to water in stormwater or snowmelt runoff, in seepage through the soil, and in atmospheric transport. All these forms of pollutant movement from land to water make up non-point source pollution.

For most waterbodies, non-point source runoff—especially stormwater runoff—is a major contributor of pollutants. As urbanization increases and other land use changes occur in the watershed, nutrient and sediment inputs (i.e., loading) from stormwater runoff can far exceed the natural inputs to waterbodies. In addition to phosphorus and sediment, stormwater runoff may contain pollutants such as chlorides, oil, grease, chemicals (including hydrocarbons), nutrients, metals, litter, and pathogens, which can severely reduce water quality.

For lakes, ponds, and wetlands, phosphorous is typically the pollutant of major concern. Land use changes resulting in increased imperviousness (e.g., urbanization) or land disturbance (e.g., urbanization, construction, or agricultural practices) result in increased amounts of phosphorus carried in stormwater runoff. In addition to watershed (stormwater runoff) sources, other possibly significant sources of phosphorus include atmospheric deposition, internal loading (e.g., release from anoxic sediments, algae die-off, aquatic plant die-back, and fish-disturbed sediment), and failing subsurface sewage treatment systems (SSTS).

As phosphorus loadings increase, it is likely that water quality degradation will accelerate, resulting in unpleasant consequences such as profuse algae growth or algal blooms. Algal blooms, overabundant



---

aquatic plants, and the presence of nuisance/exotic species, such as Eurasian watermilfoil, purple loosestrife, and curlyleaf pondweed, interfere with ecological function as well as recreational and aesthetic uses of waterbodies. Phosphorus loadings must often be reduced to control or reverse water quality degradation.

The Minnesota Pollution Control Agency (MPCA) is the state regulatory agency primarily tasked with protecting and improving water quality in Minnesota. In its enforcement of the federal Clean Water Act (CWA), the MPCA administers the Municipal Separate Storm Sewer System (MS4) permit program (see Section 5.1.3.3). All BCWMC member cities are required to maintain an MS4 permit from the MPCA and annually submit an MS4 report to the MPCA. The numerous and expanded requirements of the MPCA's MS4 permit present opportunities for the BCWMC to cooperate with member cities to prevent redundancy in implementing or reporting on activities related to water quality.

In administering the CWA in Minnesota, the MPCA also maintains a list of impaired waters (see Section 2.7.2.1). The MPCA performs Total Maximum Daily Load (TMDL) studies to address impaired waters. A watershed restoration and protection strategy (WRAPS) is similar to a TMDL and may examine other waterbodies in the watershed in addition to impaired waterbodies. Both TMDLs and WRAPSs may result in implementation plans to address water quality issues of the affected waterbodies. Future TMDL and/or WRAPS implementation presents an opportunity for the BCWMC to coordinate water quality improvement efforts between the member cities, especially for waterbodies with intercommunity drainage areas.

Improving and protecting water quality is a primary focus of the BCWMC. Prior to the development of this Plan, the BCWMC and its member cities implemented several projects aimed at improving water quality (see Table 5-5). During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Lack of consistency between BCWMC water quality standards ("Level I") and other applicable standards, such as the MS4 permit
- Updates needed in the list of acceptable best management practices (BMPs) in the *BCWMC Requirements for Improvements and Development* (BCWMC Requirements document, see Appendix H)
- Interest in implementing an infiltration performance standard
- Need for additional clarity in Total Maximum Daily Load (TMDL) study roles
- Maintenance responsibilities for water quality improvement projects
- Exploring partnerships for water quality monitoring

In addition to the Gaps Analysis, the public weighed in on water quality issues through the WAVE. Survey respondents ranked water pollution, water clarity, and sedimentation among their highest concerns for



waterbodies in the watershed. Reducing stormwater runoff volumes, contaminants, and algal blooms were viewed by the public as having the most positive impact on water quality. When prioritizing issues at the Watershed Summit, the public ranked the effects of stormwater runoff and degraded water quality as the 3<sup>rd</sup> and 4<sup>th</sup> highest priorities, respectively. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked the effects of stormwater runoff and degraded water quality as their 1<sup>st</sup> and 3<sup>rd</sup> highest priorities, respectively (see Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies and implementation program. Specifically, the BCWMC identified strategic waterbodies, updated its water quality monitoring program, established policies, and adopted the MPCA's Minimal Impact Design Standards (MIDS) and Flexible Treatment Options performance standards.

## 3.2 Water Quantity and Flooding

In a natural, undeveloped setting, the ground is often pervious, which means that water (including stormwater runoff) can infiltrate into the soil. Land development dramatically changes how stormwater runoff moves in the local watershed. The changes begin during construction, when clearing and grading of the site results in less infiltration, higher rates and volumes of stormwater runoff, and increased erosion. As construction continues, ground surfaces become covered with impervious materials (e.g., asphalt and concrete) that prevent infiltration of water into the soil. As a result, the rate and volume of stormwater runoff from the site further increases, which can create significant problems for downstream water resources. Further, the reduced amount of infiltration means less water is being recharged into the groundwater system, which can result in decreased baseflows in creeks and streams and, potentially, a loss to the long-term sustainability of groundwater drinking supplies.

If the land drains to a landlocked basin, the additional volume of runoff can increase the water level and flood level of the basin. If the land drains to a stream, the additional runoff volume can cause the stream to flow full for longer durations, which increases the erosion potential. The increase in runoff rates from sites can also increase flooding risks and erosion.

Although both high-water levels (flooding) and low-water levels are of concern to watershed residents and public officials/staff, more concern and attention is usually paid to flooding because it is a greater threat to public health and safety and can result in significant economic losses. Flooding may cause other damages that are harder to quantify, including the following:

- Flooding of roads so they are impassable to emergency vehicles and residents
- Shoreline erosion
- Destruction of riparian habitats and vegetation such as grass, shrubs, trees, etc.
- Unavailability of recreational facilities for use by the public (e.g., inundation of shoreline) and/or restricted recreational use of waterbodies



- More strain on budgets and personnel for repairing flood-damaged facilities and controlling public use of facilities during flooding events
- Alterations to the mix and diversity of wildlife species as a result of inundation of habitats

Of special concern is flooding on landlocked waterbodies, which prolongs the damages and impacts. When there is no surface outlet, runoff which collects in these depressions is removed only by seepage and evaporation. As water tables rise during periods of above-average precipitation, seepage out of landlocked basins can also decrease. As a result, landlocked basins are subject to wide variations in water levels and their 100-year floodplains typically cover large areas. Landlocked basins can also provide benefits. The long-lasting seepage from landlocked basins provides important groundwater recharge benefits. Also, landlocked basins do not discharge surface waters to downstream basins, which could otherwise be negatively impacted by the additional stormwater volume. Lost Lake is the largest landlocked basin in the BCWMC (see Section 2.6.4.4).

Aging stormwater control facilities and rapid urbanization caused the Bassett Creek watershed to experience flooding problems beginning in the 1960s. Severe storms in the summers of 1974, 1978, and 1987 resulted in millions of dollars in damage to homes and infrastructure. A modest storm (2.5 inches over 24 hours) in the spring of 1975 was exacerbated by wet antecedent conditions, again resulting in damage to homes. In a 1982 design memorandum, the US Army Corps of Engineers (USACE) estimated the damages sustained by Bassett Creek flooding were approximately \$4 million per year (extrapolated to 2014 dollars). The worst problem was the 1.5-mile long Bassett Creek Tunnel, which was undersized and severely deteriorated.

To address the major flooding along Bassett Creek, the BCWMC cooperated with the USACE, Minnesota Department of Transportation (MnDOT), Minnesota Department of Natural Resources (MDNR), and its member cities to construct the Bassett Creek Flood Control Project (see Section 2.8.1). Although major flooding along Bassett Creek has been addressed, some homes remained in the floodplain following the construction of the Flood Control Project. In addition, the BCWMC and member cities are aware of local flooding issues within the watershed that are not adjacent to Bassett Creek (e.g., DeCola Ponds, Medicine Lake Road).

The current flood control issues include maintenance and repair of the Flood Control Project system, flood-proofing or removal of homes that are remaining in the floodplain, and implementing appropriate stormwater volume and rate controls during development and redevelopment to prevent additional flooding.

Low water levels on Medicine Lake is another water quantity-related issue where the BCWMC has been involved in recent years. The following list summarizes the recent involvement of the BCWMC:

- In 2009, lake residents requested that the BCWMC address low water levels in the lake because of the impact on some recreational activities. The lake residents requested that the BCWMC analyze the effect of altering the height of the lake's outlet structure (i.e., raising the elevation) on lake levels.



- In 2009, the BCWMC Engineer summarized and reported data on recent precipitation and lake levels throughout the Metro Area.
- In 2012, the BCWMC presented further information on the dam and the history of water levels in Medicine Lake.
- In 2014, in response to continued requests from lake residents for the BCWMC to perform a study of the effect of alterations to the Medicine Lake outlet structure on lake water levels, the BCWMC Engineer prepared a list of components likely needed for such a study.
- In 2014, the BCWMC hosted a Medicine Lake stakeholder meeting that included presentations from technical experts about the lake and its various issues, including water levels.

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to update precipitation frequency estimates from TP-40 to Atlas 14 figures
- Opportunity to clarify and update rate control performance standards
- Inconsistency between BCWMC-determined 100-year flood elevations and FEMA’s 100-year flood elevations
- Opportunity to incorporate flood control objectives into other capital projects

In addition to the Gaps Analysis, the public weighed in on water quantity and flooding issues through the WAVE. Survey respondents ranked flooding quite low in their list of concerns for waterbodies. However, they ranked the stability of water levels among their highest concerns – with most respondents referring to water levels on Medicine Lake. When prioritizing issues at the Watershed Summit, participants ranked Medicine Lake water levels as a high priority, while flooding and water levels in other areas of the watershed ranked 7<sup>th</sup> out of 10 issues. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked water quantity and flooding as a top priority, just below the effects of stormwater runoff on water quality (Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies and implementation program. Specifically, the BCWMC updated policies addressing rate control, clarified maintenance responsibilities for elements of the Flood Control Project, and seeks to update its floodplain and flood elevations to reflect the most current precipitation data.

### **3.2.1 Floodplain Management**

Floodplain management is the management of development and other activities in or near the floodplain to prevent flood damages. The MDNR defines floodplain management as *“the full range of public policy and action for ensuring wise use of the floodplains. It includes everything from collection and dissemination*



---

*of flood control information to actual acquisition of floodplain lands, construction of flood control measures, and enactment and administration of codes, ordinances, and statutes regarding floodplain land use.”*

Minnesota law defines the floodplain as the land adjoining lakes, water basins, rivers, and watercourses that has been or may be covered by the “100-year” or “regional” flood. Floodplains of larger basins and streams are mapped by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRMs), which are included in community Flood Insurance Studies (FIS). The BCWMC reviews proposed activities in designated floodplain, as described in the BCWMC Requirements document.

Floodplains within the BCWMC were established prior to the publication of the National Oceanic and Atmospheric Administration’s (NOAA) Atlas 14 precipitation data (see Section 2.2). Updating BCWMC floodplains based on current precipitation data may increase floodplain areas within the BCWMC and result in additional structures located within the floodplain.

As development and redevelopment occur within the watershed, appropriate rate and volume controls are necessary to avoid creating future flooding issues or exacerbating existing flooding issues. The BCWMC established rate control performance standards as described in Policy 31 (see Section 4.2.2) and its Requirements document. Volume control is directly addressed through the BCWMC’s adoption of the MPCA’s Minimal Impact Design Standards (MIDS) and Flexible Treatment Options performance standards.

### **3.3 Erosion and Sedimentation**

Sediment is a major contributor to water pollution. Stormwater runoff from streets, parking lots, and other impervious surfaces carries suspended sediment consisting of fine particles of soil, dust, and dirt. Abundant amounts of suspended sediment are carried by stormwater runoff from actively eroding areas.

Although erosion and sedimentation are natural processes, they are often accelerated by human activities, especially during construction activities. Prior to construction, the existing vegetation on the site intercepts rainfall and slows down stormwater runoff rates, which allows more time for runoff to infiltrate into the soil. When a construction site is cleared and graded, the vegetation (and its beneficial effects) is removed. Also, natural depressions that provided temporary storage of rainfall are filled and graded, and soils are exposed and compacted, resulting in increased erosion, sedimentation, and decreased infiltration. As a result, the rate and volume of stormwater runoff from the site increases (*Minnesota Urban Small Sites BMP Manual*, 2001). The increased stormwater runoff rates and volumes cause increased soil erosion, which releases significant amounts of sediment that may enter water resources.

Regardless of its source, sediment deposition decreases water depth, degrades water quality, smothers fish and wildlife habitat, and degrades aesthetics. Sediment deposition can also wholly or partially block culverts, manholes, storm sewers, etc., causing flooding. Sediment deposition in detention ponds and wetlands also reduces the storage volume capacity, resulting in higher flood levels and/or reducing the amount of water quality treatment provided. Suspended sediment carried in water can cloud lakes and streams and disturb aquatic habitats. Sediment also reduces the oxygen content of water and is a major source of phosphorus, which is frequently bound to the fine particles. Erosion also results in



---

channelization of stormwater flow, increasing the rate of stormwater runoff and further accelerating erosion.

As erosion and sedimentation increase, the stormwater management systems (e.g., ponds, pipes) require more frequent maintenance, repair, and/or modification to ensure they will function as designed. In recognition of these issues, the BCWMC reviews projects which result in more than 200 yards of cut or fill or more than 10,000 square feet of grading. For these projects, the BCWMC requires an erosion and sediment control plan meeting requirements specified in the BCWMC Requirements document.

In addition to meeting BCWMC and member city requirements, owners and operators of construction sites disturbing 1 or more acres of land must obtain a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit from the MPCA. Owners/operators of sites smaller than 1 acre that are a part of a larger common plan of development or sale that is 1 acre or more must also obtain permit coverage. A key permit requirement is the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) with appropriate best management practices (BMPs). The SWPPP must be a combination of narrative and plan sheets that: (1) address foreseeable conditions, (2) include a description of the construction activity, and (3) address the potential for discharge of sediment and/or other potential pollutants from the site. The SWPPP must include the following elements:

- Temporary erosion prevention and sediment control BMPs
- Permanent erosion prevention and sediment control BMPs
- Permanent stormwater management system
- Pollution prevention management measures

A project's plans and specifications must incorporate the SWPPP before applying for NPDES Permit coverage. The permittee must also ensure final stabilization of the site, which includes final stabilization of individual building lots.

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Outdated references to the NPDES Construction Stormwater Permit
- Opportunity to refine triggers for BCWMC review of erosion and sediment control plans and coordinate erosion and sediment control inspections with member cities
- Accumulation of sediment deltas downstream of stormwater system outfalls

In addition to the Gaps Analysis, the public weighed in on sedimentation and erosion issues through the WAVE. Survey respondents ranked shoreline erosion and sedimentation among their highest concerns for waterbodies in the watershed. When prioritizing issues at the Watershed Summit, the public ranked degraded habitats as their 2<sup>nd</sup> highest priority, especially noting the issues of eroded streambanks and



sedimentation. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked degraded streams and shorelines (mostly due to erosion) as the 5<sup>th</sup> most important issue out of 10 issues (Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies and implementation program. Specifically, the BCWMC updated policies to reference current state requirements for erosion and sediment control, deferred inspection of erosion and sediment control practices on BCWMC-reviewed projects to member cities, and established a policy to address sediment deltas downstream of intercommunity stormwater outfalls.

### 3.4 Streams

Increased rates and volumes of runoff, resulting from urbanization and other activities, can degrade a stream's hydrology and physical condition, its water quality, its function as aquatic habitat, and can reduce the amount of groundwater flowing to a stream. Negative impacts resulting from increased development are summarized in Table 3-1, developed from information published in the *Minnesota Stormwater Manual*.

Hydrologic, geomorphic, and water quality changes can impact the overall ecological health of streams. Insects and other inhabitants are indicators of stream health. Some insects can only survive in high quality water, whereas others can survive in much poorer quality of water. A healthy stream has a good diversity of insects and stream inhabitants. The BCWMC monitors macroinvertebrates in Bassett Creek to assess overall stream health (see Section 2.7.1.1.2).

Streambank, ravine and gully erosion degrade the appearance, usability, ecological health and water quality of streams. The BCWMC has implemented erosion control and stabilization capital projects along Bassett Creek. To prevent potential future impacts to BCWMC streams, the BCWMC reviews projects that may affect the water surface elevation, shoreline, or streambank areas. The BCWMC reviews projects located within in the floodplains of BCWMC creeks and streams, per the BCWMC Requirements document.

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to create a more comprehensive approach to prioritizing stream restoration projects
- Opportunity to emphasize soft armoring techniques for streambank restoration and stabilization projects

In this Plan, the BCWMC addresses the above issues through its policies. Specifically, the BCWMC updated policies related to capital project selection and prioritization, placed an emphasis on specific stream restoration and stabilization practices referenced by the Minnesota Department of Natural Resources (MDNR), and created a policy requiring buffers along streams during some development and redevelopment projects.



**Table 3-1 Impacts of Urbanization on Streams**

Type of Impact	Specific Impacts
Stream Hydrology Impacts	<ul style="list-style-type: none"> <li>• <b>Increased frequency of bankfull and near bankfull events:</b> Increased runoff volumes and peak flows increase the frequency and duration of smaller bankfull and near bankfull events, which are the primary channel forming events.</li> <li>• <b>Increased flooding:</b> Increased runoff volumes and peak flows also increase the frequency, duration and severity of out-of-bank flooding.</li> <li>• <b>Lower dry weather flows (baseflow):</b> Reduced infiltration of stormwater runoff could cause reduced shallow groundwater inflow during dry weather periods resulting in less baseflow in streams.</li> </ul>
Stream Geomorphology Impacts	<ul style="list-style-type: none"> <li>• <b>Stream widening and bank erosion:</b> Stream channels widen to accommodate increased runoff and higher stream flows from developed areas. More frequent small and moderate runoff events undercut and scour the lower parts of the streambank, causing the steeper banks to slump and collapse during larger storms.</li> <li>• <b>Higher flow velocities:</b> Higher flow velocities result in increased streambank erosion rates, which can cause a stream to widen many times its original size.</li> <li>• <b>Stream downcutting:</b> Streams accommodate higher flows by downcutting their streambed. This causes instability in the stream profile, or elevation along a stream's flow path, which increases velocity and triggers further channel erosion both upstream and downstream.</li> <li>• <b>Loss of riparian canopy:</b> As streambanks are gradually undercut and slump into the channel, the vegetation (e.g., trees, shrubs) that had protected the banks are exposed at the roots. This leaves them more likely to be uprooted or eroded during major storms, further weakening bank structure.</li> <li>• <b>Changes in the channel bed due to sedimentation:</b> Due to channel erosion and other sources upstream, sediments are deposited in the stream as sandbars and other features, covering the channel bed, or substrate, with shifting deposits of mud, silt and sand.</li> <li>• <b>Increase in the floodplain elevation:</b> To accommodate the higher peak flow rate, a stream's floodplain elevation typically increases following development in a watershed. Property and structures that had not previously been subject to flooding may now be at risk.</li> </ul>



**Table 3-1 Impacts of Urbanization on Streams**

Type of Impact	Specific Impacts
Aquatic Habitat Impacts	<ul style="list-style-type: none"> <li>• <b>Degradation of habitat structure:</b> Higher and faster flows can scour channels and wash away entire biological communities. Streambank erosion and the loss of riparian vegetation reduce habitat for many fish species and other aquatic life, while sediment deposits can smother bottom-dwelling organisms and aquatic habitat.</li> <li>• <b>Loss of pool-riffle structure:</b> Streams draining undeveloped watersheds often contain pools of deeper, more slowly flowing water that alternate with “riffles” or shoals of shallower, faster flowing water. These pools and riffles provide valuable habitat for fish and aquatic insects. Increased flows and sediment loads from urban watersheds can replace pools and riffles with more uniform streambeds that provide less varied aquatic habitat.</li> <li>• <b>Reduced baseflows:</b> Reduced baseflows that may result from increased impervious cover in a watershed and the loss of rainfall infiltration into the soil and water table adversely affect in-stream habitats, especially during periods of drought.</li> <li>• <b>Increased stream temperature:</b> Runoff from warm impervious areas (e.g., streets and parking lots), storage in impoundments, loss of riparian vegetation and shallow channels can all cause an increase in temperature in urban streams. Increased temperatures can reduce dissolved oxygen levels and disrupt the food chain. Certain aquatic species, such as trout, can only survive within a narrow temperature range.</li> <li>• <b>Decline in abundance and biodiversity:</b> When there is a reduction in various habitats and habitat quality, both the number and the variety, or diversity, of organisms (e.g., wetland plants, fish, and macroinvertebrates) are also reduced. Sensitive fish species and other life forms disappear and are replaced by those organisms that are better adapted to the poorer conditions. Fish and other aquatic organisms are impacted not only by the habitat changes brought on by increased stormwater runoff quantity, but are often also adversely affected by water quality changes.</li> </ul>

### 3.5 Wetlands, Habitat, and Shoreland Areas

Diverse wetland systems and shoreland areas are critical components of a healthy hydrologic system and positively affect soil systems, groundwater and surface water quality and quantity, wildlife, fisheries, aesthetics, and recreation. The benefits of wetlands and shoreland can be compromised by hydrologic alterations, exotic and invasive species, and erosion and sedimentation. The effectiveness of wetland communities for wildlife habitat, and for human appreciation, is greatly increased when they are physically or functionally connected with other native communities.

Wetlands are a key element of the hydrologic system. Wetlands have several functions that can provide hydrologic and water quality benefits, including:

- Maintaining stream baseflow



- Recharging groundwater
- Providing flood storage and attenuating peak flows
- Providing erosion protection
- Physically filtering particulates (and pollutants attached to particulates) from runoff
- Biologically removing nutrients from runoff in some wetlands and at certain times of the year

Development of land and other human activities can affect the hydrology in wetlands and shoreland areas. Numerous wetlands within the BCWMC have already been affected by hydrologic alterations, both direct and indirect. Some of the activities that can affect wetland hydrology include:

- Ditching and drain tiling; often for agricultural purposes, but also for flood control
- Groundwater pumping; typically from surficial aquifers, but also from confined aquifers
- Lowering natural outlet elevations; thereby draining water from areas that naturally flooded
- Reducing the volume of water reaching a wetland through watershed diversions
- Filling, which can impact remaining wetland areas by increasing water level fluctuations
- Removing wetland vegetation; often to improve access or for aesthetic reasons

Wetlands and shoreland areas are important for protecting and maintaining downstream water quality and the ecological integrity of the communities that inhabit these areas. Overloading wetlands beyond their natural capacity with water, sediment, or nutrients can diminish their effectiveness in providing water quality benefits. Most natural wetland systems have developed with relatively low levels of sediment and nutrient inputs (riparian wetlands located in floodplains are an exception). When land use and/or upstream hydrologic systems become altered, the hydraulic, natural sediment, and nutrient loads can (and often do) increase in magnitude and frequency. These changes may result in tipping the ecological balance to benefit non-native and invasive plant species, thereby reducing the benefits to wildlife, fisheries, amphibians, and humans. Degraded water quality in wetlands can pass on to downstream waters, contributing to degradation of additional resources.

Wetlands and shoreland areas provide valuable habitat for many types of wildlife including waterfowl, songbirds, raptors, mammals, fish, and many species of amphibians. It is difficult to determine the value of wetlands for wildlife due to the specialized requirements of each species. However, it is possible to determine wildlife, fisheries, and amphibian habitat values in a general sense. Maintaining and improving wildlife viability requires that water resources and land management activities consider the life cycles of various animals. By considering habitat benefits or detriments when approaching water resources projects, the BCWMC has the opportunity to enrich the ecological fabric of the area.



The overall ecological health of wetland and shoreland areas can be significantly impacted by the presence or absence of vegetated buffers (see Section 3.5.1) and aquatic invasive species (see Section 3.5.2).

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to develop more comprehensive wetland management regulatory controls
- Opportunity to develop more comprehensive buffer width requirements
- Opportunity to address protection of rare and endangered species
- Need to clarify the BCWMC's role in managing aquatic invasive species (AIS)

In addition to the Gaps Analysis, the public weighed in on wetlands, habitat, and aquatic invasive species (AIS) issues through the WAVE. Survey respondents ranked the spread of AIS as their #1 concern, while "abundance and diversity of wildlife" ranked in the middle of the issues. When prioritizing issues at the Watershed Summit, the public ranked degraded habitats as their 2<sup>nd</sup> highest priority, especially noting AIS. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked the lack of biodiversity and wetlands as their 8<sup>th</sup> and 9<sup>th</sup> highest priorities out of 10 issues (see Appendix E).

In this Plan, the BCWMC addresses the above issues through its goals, policies and implementation program. Specifically, the BCWMC requires member cities to adopt wetland management ordinances meeting specific criteria, requires minimum buffer widths for high quality wetlands and priority waterbodies (see Policy 68, Section 4.2.6), developed policies addressing its role in the management of aquatic invasive species (see Policy 72 in Section 4.2.6 and Policy 79 in Section 4.2.8), and developed a policy to cooperate with the MDNR and others to protect and report rare and endangered species.

### **3.5.1 Wetland and Shoreland Buffers**

Buffers are upland, vegetated areas located adjacent to wetlands and shoreland areas. Many of the hydrologic, water quality, and habitat benefits achieved by wetland and shoreland areas are directly attributable to or dependent on the presence of buffers. Vegetation and organic debris shield the soil from the impact of rain and bind soil particles with root materials, reducing erosion. Vegetation obstructs the flow of runoff, thereby decreasing water velocities, allowing infiltration, and reducing the erosion potential of stormwater runoff. Leaf litter from vegetation can also increase the organic content of the soil and increase adsorption and infiltration. As a physical barrier, vegetation also filters sediment and other insoluble pollutants from runoff. Vegetation scatters sunlight and provides shade, reducing water temperature in the summer, limiting nuisance algae growth, and reducing the release of nutrients from the sediment. Buffers also have habitat benefits; native plants provide the best food and shelter for native wildlife, fish, and amphibians. Buffers provide needed separation and interspersed areas for animals, to reduce competition and maintain populations.



The presence of adequate buffers surrounding wetland and shoreland areas is critical to preserving the ecological functions and environmental benefits of downstream waterbodies, including wetlands. Establishing buffers in developed areas may be difficult, as existing structures may be located within the desired buffer area. Redevelopment offers an opportunity to establish adequate buffers in areas that are already developed.

### 3.5.2 Aquatic Invasive Species (AIS)

The term “invasive species” describes plants, animals, or microorganisms within lakes and streams that are non-native and that 1) cause or may cause economic or environmental harm or harm to human health, or 2) threaten or may threaten natural resources or the use of natural resources in the state (Minnesota Statutes Chapter 84D.01). Aquatic invasive species (AIS) is a term given to invasive species that inhabit lakes, wetlands, rivers, or streams and overrun or inhibit the growth of native species. Aquatic invasive species pose a threat to natural resources and local economies that depend on them.

The presence of non-native species and invasive species can impair the ecological, aesthetic, and recreational functions of aquatic, wetland and shoreland areas. Not all non-native species are invasive; “invasive” refers to those non-native species that are able to out-compete, displace, and even eliminate native species (i.e., some “non-native” species to the region are able to coexist with native species).

Under direction from the Minnesota Legislature, the MDNR established the Invasive Species Program in 1991. The program is designed to implement actions to prevent the spread of invasive species and manage invasive aquatic plants and wild animals (Minnesota Statutes 84D). The goals of the MDNR Invasive Species Program are to:

1. Prevent the introduction of new invasive species into Minnesota
2. Prevent the spread of invasive species within Minnesota
3. Reduce the impacts caused by invasive species to Minnesota’s ecology, society, and economy

As part of its Invasive Species Program, the MDNR maintains a list of waters infested with specific AIS (MDNR Designation of Infested Waters, 2013 as amended). The MDNR list includes several BCWMC priority waterbodies as infested with Eurasian watermilfoil, including:

- Medicine Lake
- Parkers Lake
- Wirth Lake

In 2014 the MN Legislature approved Statute 477A.19, instituting a new county aid tax bill that will provide \$4.5 million in 2014 and \$10 million a year in 2015 and years after to Minnesota counties to help prevent the spread of aquatic invasive species. Find more information at <http://www.dnr.state.mn.us/invasives/ais/prevention.html>.



---

The MDNR's list of AIS infested waterbodies may not include all known AIS occurrences within the BCWMC. The MDNR infested waters list does not include curlyleaf pondweed, which has been identified in several BCWMC waterbodies.

Of the AIS identified in the BCWMC, curlyleaf pondweed is of special concern due to its potential as a source of internal phosphorus loading. This submersed aquatic plant grows vigorously during early spring, outcompeting native species for nutrients. After curlyleaf pondweed dies out in early to mid-summer, decay of the plant releases nutrients and consumes oxygen, exacerbating internal sediment release of phosphorus. This process may result in algal blooms during the peak of the recreational use season, which further inhibit native macrophytes by reducing water clarity and blocking sunlight necessary for growth.

Invasive aquatic animals present in the BCWMC include common carp, which can degrade water quality, especially in shallow lakes and wetlands. Carp feeding techniques disrupt shallow-rooted plants, which can reduce water clarity and possibly release phosphorus bound in sediment, leading to increased algal blooms and a decline in native aquatic plants. Common carp are also present in the Mississippi River. Common carp are typically spread between lakes by the accidental inclusion and later release of live bait, but can also migrate through natural or built channels as adults.

Zebra mussels have not been identified in BCWMC waterbodies, but are present in several surrounding watersheds. Zebra mussels can cause problems for lakeshore residents and recreationists by clogging water intakes and attaching to motors and possibly clogging cooling water areas. Zebra mussel shells can cause cuts and scrapes if they grow large enough on rocks, swim rafts and ladders. Zebra mussels can also attach to native mussels, killing them. Zebra mussels filter plankton from the surrounding water, which can result in improved water clarity and result in more aquatic vegetation. In large populations, zebra mussel filter feeding could impact the food chain, reducing food for larval native fish. Zebra mussels are typically spread as adult mussels attached to boats or aquatic plants, or as larvae carried in bait buckets, bilges, or any other water moved from an infested lake or river.

Based on their potential environmental impact and the difficulty of eradication once a waterbody is infested, the BCWMC is interested in preventing the spread of AIS and managing the AIS already present in BCWMC waterbodies. To this end, this Plan clarifies the BCWMC's role as a supporter of collaborative AIS management efforts (see Policy 79 in Section 4.2.8) and continues BCWMC monitoring for AIS as part of its ongoing monitoring efforts.

### **3.5.3 Member City Wetland Management and Wetland Classification**

The BCWMC currently acts as the local governmental unit (LGU) responsible for administering the Wetland Conservation Act (WCA) in the Cities of St. Louis Park, Robbinsdale, and Medicine Lake. The remaining BCMWC member cities serve as the LGUs for their own communities.

Per the requirements of WCA, each BCWMC member city must maintain a comprehensive wetland inventory or inventory, classify, and assess the functions and values of wetlands on an as-needed basis. The BCWMC adopts the Minnesota Rapid Assessment Method (MnRAM) and encourages member cities



to use this method when performing functions and values assessments. The BCWMC encourages member cities to complete comprehensive wetland management plans as part of their local water management plans.

Wetland management performance standards implemented through member city ordinances are a primary means for protecting BCWMC wetlands. To promote consistency in wetland management, the BCWMC requires that member cities develop and implement wetland protection ordinances (or other local controls applicable to wetlands) that:

- Consider the results of functions and values assessments
- Are based on comprehensive wetland management plans, if available
- Include performance standards for wetlands classified as Preserve or Manage 1 similar to BWSR guidance that address:
  - bounce
  - inundation
  - runout control

Section 4.2.6 of this Plan describes other wetland management policies of the BCWMC.

### 3.6 Groundwater

Groundwater is a finite resource with inputs and outputs. The input is generally rainwater and snowmelt that seeps into the ground (recharge). The outputs can be groundwater that is pumped out for human use and groundwater that naturally discharges to lakes, wetlands, and streams. The inputs and outputs need to be managed to ensure a sustainable groundwater supply. While rainfall and snowmelt are variable factors the BCWMC cannot control, the amount of rainfall or snowmelt that becomes recharge is affected by land use. Development generally results in larger impervious areas and more compacted soils, thus decreasing opportunities for infiltration and recharge. In addition, population increases may result in additional groundwater appropriations to meet municipal demands.

Long-term well data collected by the MDNR, United States Geological Survey (USGS), and others identifies declines in groundwater levels across the state. In response to mounting concern about groundwater supply, the MDNR published a draft strategic plan identifying strategies and actions intended to achieve sustainable use of groundwater resources (MDNR, 2013), and established three pilot Groundwater Management Areas (GWMAs).

The BCWMC recognizes that surface water resources and groundwater resources are interdependent. Precipitation and snowmelt that infiltrate the ground surface may ultimately discharge to streams, lakes, and wetlands. Groundwater levels that are higher than the water level of adjacent surface waters create a gradient (or head differential) driving groundwater flow toward the surface water. When groundwater



---

levels are lower than adjacent surface water elevations, the gradient is reversed and surface water recharges groundwater. The rate of inflow and outflow from surface waters to groundwater is a function of the difference in water level as well as soil and bedrock characteristics. The temporal and spatial variability of each of these factors make it extremely difficult to quantify the exchange of water between surface waters and the groundwater.

The interaction of groundwater and surface water can have negative consequences on either resource. Contaminated groundwater discharged to surface waters may have a direct impact on surface water quality and/or habitat. Declines in groundwater levels may result in decreased baseflow to streams, which can in turn result in decreased water quality and ecosystem function. Decreased baseflow is especially problematic for streams supporting fish populations (e.g., trout streams), as decreased baseflow may result in higher stream temperatures. Lower water levels in lakes may limit recreational use, reduce habitat areas, and result in increased growth of aquatic plants including invasive species (via an increased littoral zone).

Maintaining clean, safe groundwater supplies is critical to human and environmental health and to the economic and social vitality of communities. Groundwater can be contaminated by commercial and industrial waste disposal, landfills, leaking underground storage tanks, subsurface sewage treatment systems (SSTS), mining operations, accidental spills, feedlots, and fertilizer/pesticide applications.

Prevention of groundwater contamination through best management practices is critical. Once contaminated, groundwater may remain contaminated for long periods of time. Groundwater clean-up is expensive and technically complex, even when feasible. Increased public awareness of the importance of drinking water protection on the public's general health and well-being is critical to promote practices that protect the quality of groundwater.

While infiltration is often a preferred method of stormwater treatment, it may have negative consequences in areas with vulnerable groundwater resources. To protect these resources, the BCWMC requires that infiltration practices be implemented with consideration of guidance provided by the MPCA in its NPDES General Construction Stormwater permit (2013, as amended) and MIDS guidance (2013, as amended), and the Minnesota Department of Health's (MDH), *Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas* (2007) (see Policy 48 in Section 4.2.3).

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to expand or clarify the BCWMC's role in groundwater management
- Lack of information regarding protection of groundwater resources as related to infiltration practices (e.g., MIDS)
- Opportunity to include groundwater protection guidance developed by the Minnesota Department of Health (MDH)



---

In addition to the Gaps Analysis, the public weighed in on groundwater issues through the WAVE. When prioritizing issues at the Watershed Summit, the public ranked groundwater as their lowest priority out of 10 issues. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked groundwater as their 4<sup>th</sup> highest priority out of 10 issues (see Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies. Specifically, the BCWMC policies identify the BCWMC's role as a collaborator in the development of groundwater management strategies (see Policy 47 in Section 4.2.3) and cite guidance for infiltration practices intended to protect groundwater resources (see Policy 48 in Section 4.2.3).

### 3.7 Education and Outreach

Public education and outreach plays an important role in protecting water resources. Education and public outreach provides opportunities for the BCWMC to raise awareness of its role in managing water resources and increase public confidence in its expertise. The BCWMC and member cities also use education and outreach to raise awareness of the impact that individuals, businesses, and organizations can have on the watershed, both positive and negative, and reinforce positive actions.

The BCWMC performs its education and public outreach duties through a variety of means. The BCWMC Education and Outreach Plan describes the topics, key messages, and implementation methods used by the BCWMC to educate its target audiences (see Appendix B). The BCWMC also maintains a website containing meeting minutes, contact information, and reports and studies, including the watershed management plan. The BCWMC website also contains links to other reference and educational material. More information is available at the BCWMC website: <http://www.bassettcreekwmo.org/>

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to identify specific training opportunities for member city staff
- Opportunity to update or establish metrics to track progress towards educational goals
- Opportunity to incorporate latest technology in distributing information and engaging the public
- Opportunity to establish educational programs/events in association with projects or programs
- Opportunity to expand education programs to address TMDL implementation and specific citizen concerns (e.g., value of studies versus projects)
- Opportunity to further develop educational partnerships with member cities

In addition to the Gaps Analysis, the public weighed in on education and outreach issues through the WAVE. Sixty-one percent (61%) of survey respondents indicated they did not receive enough information about Commission projects. When prioritizing issues at the Watershed Summit, the public ranked a lack of



---

information and education as their 6<sup>th</sup> most important issue out of 10 issues, as did the BCWMC Commissioners, TAC members, and technical partners (Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies and implementation program. Specifically, the BCWMC Education and Outreach Plan (see Appendix B) identifies the BCWMC's target audiences and types of messages the BCWMC seeks to convey, the methods or actions the BCWMC will perform or support, and evaluation methods to track success. As described in the Education and Outreach Plan, 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.

### 3.8 Implementation and Responsibilities

Because the BCWMC is a joint powers organization, many of the responsibilities for implementing activities, programs, and projects are delegated to the member cities. The BCWMC and its administrator are responsible for coordinating these responsibilities to ensure implementation of the goals and policies of this Plan. The following sections address key management and coordination issues for successful plan implementation.

During the development of this Plan, the BCWMC, member cities, and other stakeholders identified the following issues/opportunities (see Appendix D – Gaps Analysis):

- Opportunity to establish quantifiable goals and policies
- Opportunity to quantify the costs of regulatory controls on cities
- Opportunity to clarify roles and re-evaluate maintenance/replacement responsibilities and funding mechanisms for the Commission's Flood Control Project
- Opportunity to develop a mechanism for evaluating member city implementation of Commission policies and requirements
- Lack of active management of public ditches may delay or complicate BCWMC projects involving public ditches
- Opportunity to incorporate Minnesota rules and statutes affecting watershed organizations that have been updated since the 2004 Plan
- Opportunity to identify and maximize cooperative relationships with agencies, organizations and adjacent WMOs
- Opportunity to refine the Commission's capital improvement program (CIP) implementation and funding process



---

In addition to the Gaps Analysis, the public weighed in on governance, management and funding issues through the WAVE. When prioritizing issues at the Watershed Summit, the public ranked the issues of governance, management and funding as their 8<sup>th</sup> most important issue out of 10 issues. Meanwhile, the BCWMC Commissioners, TAC members, and technical partners ranked these issues as their 7<sup>th</sup> out of 10 issues (see Appendix E).

In this Plan, the BCWMC addresses the above issues through its policies (Section 4) and implementation program (Section 5), which detail the delegation of responsibilities and further define the roles of the BCWMC and its member cities. Section 5.1 details the major responsibilities of the BCWMC, including:

- Reviewing improvements and developments
- Management of the BCWMC Trunk System (see Table 2-9 and Figure 2-15) and BCWMC Flood Control Project (see Tables 2-8 and Figure 2-14)
- Implementing the BCWMC capital improvement program (CIP)
- Reviewing and assisting with intercommunity planning and design
- Dispute resolution
- Reporting and evaluation
- Monitoring
- Total maximum daily load (TMDL) implementation

Section 5 of the Plan addresses the implementation responsibilities of the member cities versus the BCWMC and clarifies the role of the BCWMC and member cities regarding specific topics, including maintenance of the Flood Control Project (see Section 5.1.1.3). Section 5.2.1.1 describes the process for implementing the CIP program.

### **3.8.1 Maintenance of Stormwater Systems and Projects**

Member cities and other MS4 permit holders are generally responsible for maintaining their stormwater management systems. Member cities manage these systems according to system maintenance plans detailed in each city's Stormwater Pollution Prevention Program (SWPPP) and local water management plan. Proper maintenance of the stormwater system will ensure that the stormwater system provides the necessary flood control and water quality treatment.

Other entities are responsible for maintaining the stormwater systems in the BCWMC that are within their jurisdiction, including:



- MnDOT is responsible for major maintenance and reconstruction of stormwater infrastructure associated with state highways. In the BCWMC, these locations include Interstate 494, Interstate 394, US Highway 169, Highway 100, and Highway 55.
- Hennepin County is responsible for maintaining only the “mainline” culvert crossings in their county state aid highways (CSAHs), including County Roads 4, 6, 9, 24, 61, 66, 70, 73, 81, 101, 102, and 156. Cities may maintain these mainline culvert crossings by agreement with the county. Cities are responsible for maintaining storm sewer catch basins and leads in the county roads.
- Owners of private stormwater facilities are responsible for maintaining their facilities in proper condition, consistent with the original performance design standards and any maintenance agreements with member cities.

The BCWMC and member cities are jointly responsible for management and maintenance of the BCWMC Flood Control Project. Responsibilities for routine maintenance and major rehabilitation or replacement are detailed in Section 5.1.1.3 and in the policies listed in Section 4.2.2. Member cities are responsible for routine maintenance of BCWMC Flood Control Project features located within their city, including debris removal (see Policy 24 in Section 4.2.2) and repairs that are primarily aesthetic improvements (see Policy 62 in Section 4.2.5).

Maintenance responsibilities for BCWMC-ordered water quality improvement projects are typically defined in the cooperative agreement between the BCWMC and the member city for each project. Generally, member cities are responsible for routine maintenance of BCWMC projects located in their city. The BCWMC will work with member cities to resolve issues related to BCWMC project maintenance or replacement as they arise.

### **3.8.2 Public Ditches**

Judicial ditches and county ditches are public drainage systems established under Chapter 103E of Minnesota Statutes and are under the jurisdiction of the county (see Section 2.6.2). The BCWMC and member cities currently manage public ditches according to the policies listed in Section 4.2.7. Per Minnesota Statute 363B.61, cities or watershed management organizations (WMOs) within Hennepin County may petition the county to transfer authority over public ditches to the city or WMO.

The limitation that the BCWMC cannot own property (per the Joint Powers Agreement) prevents the BCWMC from petitioning Hennepin County to transfer authority over public ditches to the BCWMC. Hennepin County may transfer authority over public ditches to the member cities, if the member cities request such action (see Policy 75 in Section 4.2.7).

### **3.8.3 Funding and Financing**

The extent to which the BCWMC may implement projects and programs to achieve its goals is limited by the availability of funding. The BCWMC is funded by public dollars collected by its member cities and Hennepin County and through grants from government agencies (which are also ultimately taxpayer-funded). The BCWMC has a duty to its taxpayers to spend its funds in a responsible manner that considers



---

the relative benefits, per dollar, of its actions. The benefits of effective water resource management are extremely difficult to quantify in dollars (e.g., increased wildlife habitat or recreational use). Despite this, the BCWMC will continue to evaluate the relative cost/benefit through its CIP implementation process, using best professional judgment and drawing on resources including consultants, advisory committees, and other cooperating entities.



BCMWC 2015 Watershed Management Plan

Section 4 – Goals and Policies

Contents

4.0 Goals and Policies.....4-1

4.1 BCWMC Goals.....4-1

4.2 BCWMC Policies .....4-2

4.2.1 Water Quality Policies.....4-2

4.2.2 Flooding and Rate Control Policies .....4-5

4.2.3 Groundwater Management Policies .....4-8

4.2.4 Erosion and Sediment Control Policies.....4-9

4.2.5 Stream Restoration and Protection Policies .....4-10

4.2.6 Wetland Management Policies .....4-11

4.2.7 Public Ditch Policies .....4-13

4.2.8 Recreation, Habitat, and Shoreland Management Policies .....4-13

4.2.9 Education and Outreach Policies .....4-14

4.2.10 Administration Policies.....4-15



*This page intentionally left blank*



---

## 4.0 Goals and Policies

This section presents the goals set by the Bassett Creek Watershed Management Commission (BCWMC) in the pursuit of its mission and the policies established by the BCWMC to achieve these goals. The policies establish responsibilities for the BCWMC and member cities and serve as decision-making guidelines.

Policies address topic areas including:

- Water quality
- Flooding and rate control
- Groundwater management
- Erosion and sediment control
- Stream restoration and protection
- Wetland management
- Public ditches
- Recreation, habitat and shoreland management
- Education and outreach
- Administration

### 4.1 BCWMC Goals

The BCWMC established goals to address the purposes established for watershed management organizations in Minnesota Statutes 103B (see Section 1). These goals include:

- Manage the surface water resources of the watershed to meet or exceed state standards and BCWMC water quality goals for wetlands, lakes, and streams.
- Improve the quality of stormwater runoff reaching the Mississippi River by reducing nonpoint source pollution.
- Protect and enhance fish and wildlife habitat in the BCWMC.
- Take into account aesthetics and recreational opportunities within the watershed when completing BCWMC projects.
- Reduce stormwater runoff volume for the purposes of improving water quality.
- Protect against flood risks along the Bassett Creek trunk system.
- Protect human life, property, and surface water systems that could be damaged by flood events.
- Reduce stormwater runoff rates and volumes to minimize flood problems, flood damages, and the future costs of stormwater management systems.
- Provide leadership and assist member cities with coordination of intercommunity stormwater runoff issues.



- 
- Notwithstanding that which occurs from natural processes, minimize erosion and sedimentation to protect the BCWMC's water resources and health, safety and welfare.
  - Maintain or improve shoreland integrity and implement stream restoration measures to maintain or enhance ecological functions as well as human health, safety, and welfare.
  - Increase the quality and quantity of wetlands in the BCWMC.
  - Protect the quantity and quality of groundwater resources.
  - Manage public ditches in a manner that recognizes their current use as urban drainage systems and as altered natural waterways.
  - Raise awareness of the BCWMC's existence and its role in protecting and improving water quality, minimizing flooding, and preserving the watershed's ecological functions and aesthetics.
  - Strengthen public confidence in the BCWMC's expertise and enable meaningful public participation in the planning process and ongoing projects conducted by the BCWMC.
  - Raise awareness of the impact that individuals, businesses, and organizations have upon water resources and motivate these audiences to change personal/corporate behavior that has a negative impact on the watershed.
  - Minimize the spread and manage the adverse impacts of harmful aquatic invasive species.
  - Develop a greater understanding of climate change and its impact on water resources, including stormwater infrastructure capacity and flooding, and develop strategies to appropriately manage future impacts.

## **4.2 BCWMC Policies**

The BCWMC established policies to guide the BCWMC and its member cities towards the achievement of the BCWMC's goals. Policies serve as decision-making guidelines and establish responsibilities for the BCWMC and its member cities. Policies are grouped by primary topic area, but may address multiple topics and goals.

### **4.2.1 Water Quality Policies**

1. The BCWMC will classify priority waterbodies based on desired water quality standards and other uses of the waterbodies. Table 2-6 lists the management classifications of the priority waterbodies.
2. The BCWMC adopts MPCA water quality standards (Minnesota Rules 7050, as amended) for BCWMC priority waterbodies (see Table 2-7).



- 
3. Member cities shall classify other waterbodies according to the BCWMC classification system and include this information in their local water management plans.
  4. The BCWMC will work with stakeholders to manage its priority waterbodies to meet the applicable water quality goals of the BCWMC.
  5. The BCWMC and the member cities will implement the improvement options listed in the BCWMC's CIP (Table 5-3) to address the water quality of priority waterbodies based on feasibility, prioritization, and available funding (see policy 110 regarding CIP prioritization criteria).
  6. The BCWMC will prioritize water quality improvement projects that are most effective at achieving water quality goals, including non-structural BMPs and education.
  7. The BCWMC will cooperate with member cities, the MPCA and other stakeholders in the preparation of total maximum daily load (TMDL) studies for waterbodies on the MPCA's current or future impaired waters 303(d) list, including Northwood Lake and Bassett Creek. The BCWMC will work to align TMDL implementation items into its Watershed Management Plan to achieve efficiency. The BCWMC will work with the cities to evaluate funding options for the TMDL studies.

The BCWMC may append future studies to this Plan with the intent that they serve as the equivalent to a TMDL study.

8. The BCWMC will continue to identify opportunities to achieve and maintain excellent water quality in priority waterbodies.
9. The BCWMC will continue to monitor its priority waterbodies on a rotating schedule as described in the BCWMC Monitoring Plan (Appendix A). Monitoring may include biota, vegetation, and water chemistry (e.g., nutrients, chloride in streams). The objective of the monitoring is to detect changes or trends in the water quality over time and the effectiveness of efforts to preserve/improve water quality. The BCWMC will determine the appropriate frequency of monitoring under programs funded by the BCWMC.
10. For every year sampling is conducted for the BCWMC's lakes and/or streams, the BCWMC will compile the available monitoring data, include the data in an annual report available on the BCWMC website, and submit the data to the MPCA in an appropriate format.
11. The BCWMC will coordinate monitoring efforts with other programs including:
  - Member city monitoring
  - Metropolitan Council Citizen Assisted Monitoring Program (CAMP) and Watershed Outlet Monitoring Program (WOMP)
  - Three Rivers Park District monitoring

- Minneapolis Park and Recreation Board monitoring
  - Minnesota Pollution Control Agency Citizen Lake Monitoring Program (CLMP) and other monitoring
  - Hennepin County River Watch Program
12. The BCWMC requires all stormwater to be treated in accordance with the MPCA's Minimal Impact Design Standards (MIDS) performance goal for new development and redevelopment. If the MIDS performance goal is not feasible and/or is not allowed for a proposed project, then the project proposer must implement the BCWMC flexible treatment options, as shown in the BCWMC Design Sequence Flow Chart. The BCWMC revised its performance goals for linear projects in May 2017; they can be found in the BCWMC's *Requirements for Improvements and Development Proposals* document (BCWMC, 2015, as revised).
  13. The BCWMC will review non-linear projects and developments to evaluate compliance with the MPCA's Minimal Impact Design Standards (MIDS) performance goals, triggers, and flexible treatment options (which are adopted by the Commission as BCWMC water quality management standards) if the projects are located in member cities that have not adopted the MIDS performance goals, triggers, and flexible treatment options, or at the request of the member city. For projects located in member cities that have adopted the MIDS performance goals, triggers, and flexible treatment options, the member cities shall review projects for conformance with MIDS water quality treatments standards, unless Commission review is requested by the member cities.
  14. The BCWMC requires public agencies to comply with water quality management standards and policies presented in this Plan in order to maintain or improve water quality of stormwater runoff.
  15. Member cities shall not allow the drainage of sanitary sewage or non-permitted industrial wastes onto any land or into any watercourse or storm sewer discharging into Bassett Creek.
  16. The BCWMC will maintain a water quality model (e.g., P8) for the watershed. Each year, member cities shall provide the BCWMC with plans for BMPs constructed within their city. The BCWMC will update the model annually to incorporate completed BCWMC capital improvements and BMP information provided by the member cities. The BCWMC will develop a summary report of the water quality model results and provide that report to the member cities to assist in their MS4 reporting.
  17. The BCWMC encourages member cities to implement best management and good housekeeping practices to minimize chloride loading to surface water and groundwater resources, utilizing emerging technology, as appropriate.
  18. The BCWMC will assist and cooperate with member cities, MPCA, MDNR, MnDOT, other watersheds and other stakeholders in implementing projects or other management actions resulting from the Minnesota Pollution Control Agency's Twin Cities Metro Chloride Project or future chloride TMDL.



---

#### 4.2.2 Flooding and Rate Control Policies

19. The BCWMC will maintain a Flood Control Emergency Repair Fund for funding emergency repairs of the BCWMC Flood Control Project features.
20. The BCWMC will maintain a Long-Term Maintenance Fund with annual assessments. The BCWMC will use the Long-Term Maintenance Fund to fund major repairs and major maintenance of the BCWMC Flood Control Project features (Flood Control Project features are listed in Table 2-8).
21. The BCWMC will regularly inspect the BCWMC Flood Control Project system, including water level control and conveyance structures, and perform the follow-up reporting. This is part of the BCWMC's annual water quality and flood control programs (see Table 5-4).
22. During the first five years of Plan implementation, the BCWMC will work with the member cities to determine responsibilities for major rehabilitation and replacement of the BCWMC Flood Control Project features and establish the associated funding mechanisms.
23. The BCWMC will finance major maintenance and repair of water level control and conveyance structures that were part of the original BCWMC Flood Control Project on the same basis as the original project. New road crossings of the creek that were installed as part of the project will be maintained by the city where the structure is located.
24. Member cities shall be responsible for routine maintenance and repair of BCWMC Flood Control Project structures located within each city. Each member city shall be responsible for routine cleaning, including removal of debris, brushing, and tree removal from the BCWMC Flood Control Project features located within their city.
25. The BCWMC will reevaluate flood elevations and flood risk to affected properties based on the most recent NOAA precipitation data (e.g., Atlas 14) and will determine actions for protection, including partnering with and applying for grants from Federal and State agencies.
26. When implementing BCWMC flood risk reduction projects, the BCWMC will identify properties prone to flooding. The most effective and reasonable solutions as approved by the member city will be evaluated. Solutions to be considered may include purchase of the properties, with attention to impact on tax base and other community factors.
27. The BCWMC will develop criteria for the allocation of funding for flood risk reduction projects, which may include the purchase of property prone to flooding.
28. The BCWMC will monitor or coordinate with other entities to monitor water levels on the primary lakes in the watershed. Water levels on Bassett Creek and other waterbodies will be monitored periodically during flooding events.
29. The member cities must implement the BCWMC's development policies, including minimum building elevations of at least 2 feet above the 100-year flood level for new and redeveloped

---

structures, as outlined in the BCWMC's *Requirements for Improvements and Development Proposals* document (BCWMC, 2015, as revised).

30. The BCWMC encourages property owners to implement best management practices to reduce the volume of stormwater runoff beyond the minimum requirements imposed by the city's MS4 permit, NPDES construction stormwater permit and MIDS performance goal adopted by the BCWMC. Examples of stormwater runoff volume reduction methods include:

- Reducing the amount of planned impervious surface (as areas develop).
- Reducing the amount of impervious surface (during redevelopment).
- Additional infiltration and/or evapotranspiration.
- Stormwater reuse.

31. The BCWMC and member cities must require rate control in conformance with the Flood Control Project system design and this Plan.

The BCWMC requires cities to manage stormwater runoff so that future peak flow rates leaving development and redevelopment sites are equal to or less than existing rates for the 2-year, 10-year, and 100-year events.

32. The BCWMC requires the retention of on-site runoff from development and redevelopment projects consistent with the MPCA's Minimal Impact Design Standards (MIDS) performance goals. These include the retention of:

- 1.1 inches of runoff from impervious areas for new development creating more than 1 acre of new impervious area
- 1.1 inches of runoff from new or fully reconstructed impervious areas for redevelopment creating one or more acres of new or fully redeveloped impervious area
- 1.1 inches of runoff from net new impervious areas for linear projects creating one or more acres of net new impervious area (revised May 2017).
- If an applicant is unable to achieve the performance goals due to site restrictions, the BCWMC flexible treatment options approach shall be used, following the BCWMC design sequence flow chart.

For all other projects, the BCWMC encourages the use of infiltration, filtration, or other abstraction of runoff from impervious areas for all development and redevelopment projects as a best practice to reduce stormwater runoff.



- 
33. The BCWMC will revise floodplain elevations along the trunk system as necessary to reflect channel improvement, storage site development, or requirements established by appropriate state or federal governmental agencies.
  34. The BCWMC will allow only those land uses in the BCWMC-established floodplain that will not be damaged by floodwaters and will not increase flooding. Allowable types of land use that are consistent with the floodplain include recreation areas, parking lots, temporary excavation and storage areas, public utility lines, agriculture, and other open spaces.
  35. The BCWMC prohibits the construction of basements in the floodplain; construction of all other infrastructure within the floodplain is subject to BCWMC review and approval.
  36. The BCWMC prohibits permanent storage piles, fences and other obstructions in the floodplain that would collect debris or restrict flood flows.
  37. Where streets, utilities, and structures currently exist below the 100-year floodplain, the BCWMC encourages the member cities to remove these features from the floodplain as development or redevelopment allows.
  38. The BCMWC requires that projects within the floodplain maintain no net loss in floodplain storage and no increase in flood level any point along the trunk system. The BCWMC prohibits expansion of existing non-conforming land uses within the floodplain unless they are fully flood-proofed in accordance with codes and regulations.
  39. The BCWMC requires member cities to maintain ordinances that are consistent with BCMWC floodplain standards. Member cities must submit ordinances to the BCWMC for review.
  40. The BCWMC will review changes in local water management plans, comprehensive land use plans, and other plans, for their effect on the adopted floodplain and Flood Control Project, when such plans are submitted to BCWMC.
  41. The BCWMC will update, as necessary, the existing flood profile to reflect any increases resulting from modifications to a flood storage site or the Flood Control Project system, following the approval of those modifications by the BCWMC, local and state agencies, and after a public hearing on the modification plan has been held.
  42. 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. With respect to diversions, the BCWMC:
    - Prohibits 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.

- Requires that 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.
  - Requires effort be made to ensure that there is no fish migration from one watershed to another.
43. The BCWMC will pursue opportunities to collaborate with state agencies and other entities in the development of action plans (or similar management tools) related to the response of surface water and groundwater resources to long-term changes in precipitation and hydrology.
44. The BCWMC will continue to monitor water quantity and quality in the watershed and will seek opportunities to contribute BCWMC data to other datasets, for the purpose of assessing the response of surface water and groundwater resources to long-term changes in precipitation and hydrology.

### **4.2.3 Groundwater Management Policies**

45. The BCMWC will review all MDNR groundwater appropriation permit applications in the BCWMC excluding applications for temporary appropriations permits.
46. The BCWMC will work with member cities to consider a program to review development or redevelopment projects which include long-term dewatering within 1,000 feet of priority waterbodies.
47. The BCWMC will collaborate with local and state agencies if/when these agencies develop a groundwater action plan in an effort to gain a better understanding of groundwater-surface water interaction and develop management strategies that consider the protection of both resources. The role of the BCWMC may include:
- Collaborate with local and state agencies to identify data gaps and attempt to fill those gaps through collection of groundwater level data and/or surface water flow data.
  - Coordinate with appropriate local and state agencies to develop a groundwater budget for the watershed.
  - Coordinate with appropriate local and state agencies to develop and utilize tools to assess surface water impacts and groundwater impacts of groundwater use (e.g., refinement of the Metro groundwater model, synchronization of the BCWMC XP-SWMM model with groundwater models).
48. To protect groundwater quality, the BCWMC requires infiltration practices to be implemented in accordance with the following guidance for determining the feasibility of infiltration:
- NPDES General Construction Stormwater Permit (2013, as amended)



- Minimal Impact Design Standards (MIDS) Design Sequence Flow Chart (2013, as amended)
- Minnesota Department of Health's *Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas* (MDH, 2007)

The BCWMC recommends that infiltration practices be designed with consideration for the following guidance:

- BCWMC's *Requirements for Improvements and Development Proposals* (BCWMC, 2015, as revised)
- Minnesota Pollution Control Agency's *Minnesota Stormwater Manual* ([http://stormwater.pca.state.mn.us/index.php/Main\\_Page](http://stormwater.pca.state.mn.us/index.php/Main_Page))

49. The BCWMC encourages member cities to educate residents regarding the importance of implementing BMPs to protect groundwater quality and quantity.

50. Member cities shall share groundwater elevation data, where available, with the BCWMC.

#### **4.2.4 Erosion and Sediment Control Policies**

51. Member cities shall continue managing erosion and sediment control permitting programs and ordinances as required by their NPDES MS4 permit and the NPDES Construction Stormwater General Permit. These programs must address:

- Permitting and inspection of erosion controls
- Erosion and sediment control at individual building sites
- Requirements and procedures for reviewing, approving, and enforcing erosion control plans

52. The BCWMC will review projects and developments to evaluate compliance with BCWMC erosion and sediment control standards.

The types of projects that must be submitted to the BCWMC for review, the BCWMC's review procedure, submittal requirements, guidelines, design criteria, etc. are provided in the BCWMC's document *Requirements for Improvements and Development Proposals* (BCWMC, 2015, as revised).

53. The BCWMC requires preparation of erosion control plans for construction projects meeting the applicable BCWMC threshold. Erosion control plans shall meet the standards given in the NPDES Construction Stormwater General Permit (as amended), and shall show proposed methods of retaining waterborne sediments onsite during the construction period, and shall specify methods and schedules for restoring, covering, or re-vegetating the site after construction.

- 
54. Member cities shall perform regular erosion and sediment control inspections for projects triggering BCWMC review and subject to BCWMC erosion and sediment control standards. The member cities will annually report to the BCWMC regarding compliance with BCWMC standards as part of annual MS4 reporting or as requested by the Commission.
  55. The BCWMC requires local water management plans to describe existing and proposed city ordinances, permits, and procedures addressing erosion and sediment control.
  56. The BCWMC will work with member cities to evaluate end-of-pipe sediment sources and controls. Following adequate source control, the BCWMC may fund removal of end-of-pipe sediment deltas downstream of intercommunity watersheds, or facilitate collaboration among responsible parties to remove these deltas.

#### **4.2.5 Stream Restoration and Protection Policies**

57. The BCWMC will continue to maintain a Channel Maintenance Fund through an annual assessment. This fund will be used to help finance minor stream maintenance, repair, stabilization and restoration projects and/or portions of larger stream restoration projects.
58. The Channel Maintenance Fund may also be used to finance the BCWMC's share of maintenance projects that have a regional benefit, or to partially fund smaller, localized projects that cities wish to undertake.
59. Major stream and streambank stabilization and restoration projects will be considered and prioritized by the BCWMC for inclusion in its annual CIP. Stabilization and restoration projects may include any or all of the following components:
  - Restoration of a stream or streambank area to the designed flow rate
  - Restoration or stabilization of a stream or streambank area that has either resulted in damage to a structure, or where structural damage is likely
  - Restoration or stabilization of a stream or streambank to reduce erosion, improve water quality, and improve riparian or in-stream habitat
  - Restoration or stabilization of a stream or streambank to address flooding, mitigation of water quality impairment, or minimizing the potential for water quality impairment
60. Recognizing their benefits to biodiversity and more natural appearance, the BCWMC will strive to implement stream and streambank restoration and stabilization projects that use soft armoring techniques (e.g., plants, logs, vegetative mats) as much as possible and wherever feasible.
61. The BCWMC will consider improving natural habitat and navigability, and will consider the needs of pedestrians when planning and implementing near-stream and in-stream projects, and when rehabilitating existing projects.



- 
62. The member cities are responsible for funding maintenance and repairs that are primarily aesthetic improvements.
  63. The BCWMC will take into account aesthetic and habitat values of future flood control and stabilization/restoration projects.
  64. Member cities shall maintain and enforce buffer requirements adjacent to priority streams for projects that will result in more than 200 yards of cut or fill, or more than 10,000 square feet of land disturbance. Buffer widths adjacent to priority streams must be at least 10 feet or 25 percent of the distance between the ordinary high water level and the nearest existing structure, whichever is less.

Allowable land uses, and vegetative criteria for buffers are specified in the BCWMC's *Requirements for Development and Redevelopment* (BCWMC, 2015, as amended). Member cities may allow exemptions for public recreational facilities parallel to the shoreline (e.g. trails) up to 20 feet in width, with that width being added to the required buffer width.

#### **4.2.6 Wetland Management Policies**

65. The BCWMC requires member cities to inventory, classify and determine the functions and values of wetlands, either through a comprehensive wetland management plan or as required by the Wetland Conservation Act (WCA).

Member cities shall maintain a database of wetland functions and values assessment results.

The BCWMC encourages member cities to complete comprehensive wetland management plans as part of their local water management plan or as an implementation task identified in their local water management plan. Completed comprehensive wetland management plans shall be submitted to the BCWMC for review and comment.

66. The BCWMC requires member cities to develop and implement wetland protection ordinances that consider the results of wetland functions and values assessments, and are based on comprehensive wetland management plans, if available. For wetlands classified as Preserve or Manage 1, member cities shall implement standards for bounce, inundation, and runout control that are similar to BWSR guidance; member cities are encouraged to apply standards for other wetland classifications.
67. The BCWMC adopts the Minnesota Rapid Assessment Method (MnRAM) as the wetland assessment method and the wetland management classification system. Member cities are encouraged to use MnRAM for all wetland assessment and classification, but are not required to perform reassessments using the MnRAM for wetlands already assessed.
68. Member cities shall maintain and enforce buffer requirements for projects containing more than one acre of new or redeveloped impervious area. Average minimum buffer widths are required according to the MnRAM classification (or similar classification system):

- An average of 75 feet and minimum of 50 feet from the edge of wetlands classified as Preserve
- An average of 50 feet and minimum of 30 feet from the edge of wetlands classified as Manage 1
- An average of 25 feet and minimum of 15 feet from the edge of wetlands classified as Manage 2 or 3.

Allowable land uses and vegetative criteria for buffers are specified in the BCWMC's *Requirements for Development and Redevelopment* (BCWMC, 2015, as amended).

Member cities may allow exemptions for public recreational facilities parallel to the shoreline (e.g. trails) up to 20 feet in width, with that width being added to the required buffer width.

69. The member cities are required to manage wetlands in accordance with the WCA. The BCWMC will assist the member cities with managing wetlands in accordance with the WCA, as requested. The MnDOT is the LGU within its right-of-ways.
70. The BCWMC will serve as the local governmental unit (LGU) responsible for administering the WCA for member cities, as requested (currently Medicine Lake, Robbinsdale, and St. Louis Park).
71. The BCWMC prefers any wetland mitigation to be performed within the same subwatershed as the impacted wetland.
72. The BCWMC requires that member cities annually inspect wetlands classified as Preserve for terrestrial and emergent aquatic invasive vegetation, such as buckthorn and purple loosestrife, and attempt to control or treat invasive species, where feasible.
73. The BCWMC encourages member cities to pursue wetland restoration projects, as opportunities allow.
74. The BCWMC encourages member cities to participate in wetland monitoring programs (e.g., Wetland Health Evaluation Program).

#### **4.2.7 Public Ditch Policies**

75. The BCWMC encourages member cities to petition Hennepin County to transfer authority over public ditches in the BCWMC to the member cities (per MN Statute 383B.61). If authority is transferred to the member cities, the BCWMC and cities will manage these drainages similar to other BCWMC waterways, in accordance with the BCWMC's latest adopted Plan. Until authority over public ditches is transferred, the BCWMC will continue to recognize Hennepin County's jurisdiction over public ditches in the BCWMC.



76. In consideration for the original function of public ditches to provide drainage of agricultural lands, the BCWMC will support the efforts of other entities to pursue legislation abandoning public ditches on land zoned non-agricultural.
77. The BCWMC will manage abandoned or transferred public ditches that are part of the trunk system consistent with the policies of this Plan. Member cities will be responsible for management of abandoned or transferred public ditches that are not on the trunk system, but are currently part of their municipal drainage system.

#### **4.2.8 Recreation, Habitat, and Shoreland Management Policies**

78. The BCWMC will consider developing and implementing a shoreland habitat monitoring program for its Priority 1 lakes to monitor biological and physical indicators and to recommend management actions (to cities or for the Commission's consideration) based upon monitoring results. If implemented, monitoring may include assessment of upland and aquatic vegetation, buffer zones, erosion, sedimentation, and the presence of non-native invasive species.
79. The BCWMC will support and collaborate with other entities (e.g., agencies, lake association, cities, counties) to manage and prevent the spread of aquatic invasive species; BCWMC services may include point-intercept surveys of aquatic vegetation, feasibility studies, technical analysis, education, exploring funding options, and applying for grants. The BCWMC will not manage increased growths of native aquatic vegetation resulting from improved water quality.
80. The member cities are responsible for shoreland regulation and are required to adopt MDNR-approved shoreland ordinances, in accordance with the MDNR's priority phasing list.
81. The BCWMC will promote the protection of natural and native shoreland areas, including the preservation of lakeshore and streambank vegetation during and after construction projects, and the establishment and maintenance of buffers adjacent to priority waterbodies. The BCWMC will seek opportunities to restore disturbed shorelines and streambanks to their natural state where feasible.
82. The BCWMC encourages cities to develop and maintain water-related recreational features (such as trails adjacent to waterbodies and water access points), with consideration for buffers, use of pervious surfaces, and other best management practices to reduce runoff.
83. The BCWMC will take into account aesthetics, habitat, and recreation benefits during CIP project selection and prioritization, and when considering how a project might address multiple Commission goals (see policy 110).
84. The BCWMC will encourage public and private landowners to maintain, preserve or restore open space and native habitats such as wetlands, uplands, forests, shoreland, streambanks, and prairies for the benefit of wildlife through education and by providing information on grant programs.

- 
85. Member cities shall consider opportunities to maintain, enhance, or provide new open spaces and/or habitat as part of wetland creation or restoration, stormwater facility construction, development, redevelopment, or other appropriate projects.
  86. The BCWMC will cooperate with the MDNR and other entities, as requested, to protect rare and endangered species under the State's Endangered Species Statute. The BCWMC will review the Natural Heritage Information System during the design phase of Commission projects.
  87. The BCWMC will submit data, as available, and encourages others to submit data regarding occurrences of rare and endangered species and native plant communities to the State's Natural Heritage Information System.
  88. The BCWMC will consider implementing a grant or cost-share program to fund the establishment of buffers adjacent to priority waterbodies.
  89. Member cities shall adopt State buffer and/or shoreland management requirements for public waters in incorporated areas, if and when they are promulgated.

#### **4.2.9 Education and Outreach Policies**

90. The BCWMC will develop an education and outreach plan (see Appendix B). The education and outreach plan will identify key messages about watershed management and guidance for distributing that information to specific stakeholder audiences using various, targeted methods. The BCWMC will regularly review its education and public involvement plan and update it, as necessary.
91. The BCWMC will develop and maintain standard BCWMC messaging items to increase awareness of the BCWMC and its role.
92. The BCWMC will evaluate the success of its education and public involvement plan.
93. The BCWMC will recruit volunteers to conduct monitoring and participate in activities sponsored or promoted by the BCWMC and will provide training as needed (e.g., Citizen Assisted Monitoring Program, River Watch, adopt-a-stream, adopt-a-wetland programs).
94. The BCWMC will support cooperative educational and volunteer programs, such as the West Metro Water Alliance, Blue Thumb, River Watch, Metro Blooms, Metro Watershed Partners, Citizen Assisted Monitoring Program, Wetland Health Evaluation Program, etc.
95. The BCWMC will develop and implement a recognition program (certificates, letters of appreciation, events, thank you ads, etc.) for BCWMC volunteers.
96. The BCWMC will update and maintain its website and use it to communicate with and provide information to the public.



- 
97. The BCWMC will seek opportunities to incorporate education and public involvement efforts into all of its proposed projects.
  98. The BCWMC will seek opportunities to use a citizen advisory committee to complete tasks meaningful to the Commission.
  99. The BCWMC will distribute BCWMC meeting notices and agendas to city officials and key staff. The meeting notice and/or agenda will include a description of the key discussion item(s).
  100. The BCWMC will post informational signs at BCWMC projects during construction.

The BCWMC will consider installing permanent informational signs at BCWMC watershed projects, major BCWMC waterbodies, monitoring sites, demonstration projects, adopt-a-stream/wetland sites, etc.

The BCWMC will work with cities and other road authorities to install stream identification signs along roads at stream crossings.
  101. The BCWMC will regularly hold watershed tours for the Commission and the public.
  102. The BCWMC will tailor its communications and educational strategies to present complex and/or technical issues in a manner that is appropriate for the audience.

#### 4.2.10 Administration Policies

103. The BCWMC will fund 100 percent of eligible project costs for those projects listed in the 10-year CIP (Table 5-3). Eligible project costs are listed in Table 5-1. The Commission will determine eligibility of project costs following the completion of a feasibility study for the project. The projects will be funded in accordance with the BCWMC joint powers agreement and (specifically) Minnesota Statutes 103B.251. The BCWMC will follow the process for ordering projects as outlined in its joint powers agreement and summarized in Section 5.2.1.1.
104. The Commission will review projects that trigger BCWMC review. The types of projects that must be submitted to the BCWMC for review, the BCWMC's review procedure, submittal requirements, guidelines, design criteria, etc. are provided in the BCWMC's document *Requirements for Improvements and Development Proposals* (BCWMC, 2015, as revised).
105. At the request of the member cities, the BCWMC will review projects that would not otherwise trigger review per the BCWMC's *Requirements for Improvements and Development Proposals* (BCWMC, 2015, as revised).
106. The BCWMC will review local water management plans for compliance with this Plan's goals and policies.

- 
107. The BCWMC will annually evaluate member cities' compliance with the goals and policies of this Plan (see Section 5.1.1.6). The BCWMC will take appropriate administrative or legal action in response to non-compliance.
  108. The BCWMC will review applications for MDNR Work in Public Waters Permits.
  109. The BCWMC will annually review and update its 10-year CIP. The BCWMC will re-evaluate new or proposed additions to the CIP annually or as new data or opportunities develop, with consideration for the criteria outlined in policy 110.
  110. The BCWMC will consider including projects in the CIP that meet one or more of the following "gatekeeper" criteria.
    - Project is part of the BCWMC trunk system (see Section 2.8.1, Figure 2-14 and Figure 2-15)
    - Project improves or protects water quality in a priority waterbody
    - Project addresses an approved TMDL or watershed restoration and protection strategy (WRAPS)
    - Project addresses flooding concern

The BCWMC will use the following criteria, in addition to those listed above, to aid in the prioritization of projects:

- Project protects or restores previous Commission investments in infrastructure
- Project addresses intercommunity drainage issues
- Project addresses erosion and sedimentation issues
- Project will address multiple Commission goals (e.g., water quality, runoff volume, aesthetics, wildlife habitat, recreation, etc.)
- Subwatershed draining to project includes more than one community
- Addresses significant infrastructure or property damage concerns

The BCWMC will place a higher priority on projects that incorporate multiple benefits, and will seek opportunities to incorporate multiple benefits into BCWMC projects, as opportunities allow.

111. The BCWMC defines the trunk system as the collection of waterbodies and natural or constructed conveyances listed in Table 2-9 of this Plan.



- 
112. The BCWMC may review proposed changes to member city development regulations (e.g., zoning and subdivision ordinances) at its discretion or the request of the member cities.
  113. Member cities must inform the BCWMC regarding updates to city ordinances or comprehensive plans that will affect stormwater management. Stormwater management elements of the member cities' comprehensive plans must conform to the BCWMC Plan.
  114. The BCWMC will annually assess its progress towards the goals presented in this plan, using quantitative metrics where appropriate. The BCMWC will provide this analysis, or a summary, to BWSR, as part of its annual reporting.
  115. The BCWMC will work with member cities to assess the financial impact of regulatory controls and identify areas where the BCWMC may assist member cities in meeting the requirements of their MS4 permits.
  116. The BCWMC will periodically review its capital improvement program (CIP) process and revise the process, as necessary.
  117. The BCWMC will assist in calculating or calculate when necessary, the apportionment of costs between adjoining communities for water resource projects with intercommunity participation.
  118. The BCWMC will assist member cities in resolving watershed management disputes, as requested. The BCWMC will follow the dispute resolution procedure described in Section 5.1.1.5 of this Plan.
  119. The BCWMC will maintain a Technical Advisory Committee (TAC) to promote communication and cooperation between the BCWMC and member cities. Member cities shall appoint a technical advisor to the TAC and encourage the technical advisor to attend BCMWC meetings.
  120. The BCWMC will continue to rely on member cities to implement the BCWMC's policies at the time of development and redevelopment. Member cities shall inform developers and other project applicants regarding BCWMC requirements.
  121. The BCWMC will continue to rely on member cities to issue permits. Member cities shall permit only those projects that conform to the policies and standards of the BCWMC. The BCWMC will review proposed projects after the member city has provided preliminary approval (indicating compliance with the member city's local water management plan) and submitted a signed BCWMC application form to the BCWMC. Member cities shall not issue construction permits, or other approvals, until the BCWMC has approved the project.
  122. For CIP projects that have been ordered by the Commission, the BCWMC requires member cities to acquire and maintain easements, right-of-way, or interest in land necessary to

---

implement and maintain projects upon order of the BCWMC (the cost of land acquisition may be eligible for Commission reimbursement, see Table 5-1).



# BCMWC 2015 Watershed Management Plan

## Section 5 – Implementation

### Contents

5.0	Implementation .....	5-1
5.1	Responsibilities .....	5-1
5.1.1	BCWMC Responsibilities.....	5-1
5.1.1.1	Review of Improvements and Developments .....	5-2
5.1.1.2	Implementation of the BCWMC Capital Improvement Program .....	5-3
5.1.1.3	Management of the BCWMC Trunk System and Flood Control Project .....	5-3
5.1.1.4	Intercommunity Planning and Design .....	5-4
5.1.1.5	Dispute Resolution.....	5-4
5.1.1.6	Reporting and Evaluation.....	5-5
5.1.1.7	Monitoring .....	5-6
5.1.1.8	Total Maximum Daily Load (TMDL) Implementation .....	5-7
5.1.2	Member City Responsibilities .....	5-7
5.1.3	Agency Responsibilities .....	5-8
5.1.3.1	Minnesota Department of Natural Resources (MDNR) .....	5-9
5.1.3.2	Minnesota Board of Water and Soil Resources (BWSR).....	5-10
5.1.3.3	Minnesota Pollution Control Agency (MPCA).....	5-10
5.1.3.4	Minnesota Department of Health (MDH) .....	5-13
5.1.3.5	Minnesota Environmental Quality Board (EQB) .....	5-14
5.1.3.6	Minnesota State Historic Preservation Offices (SHPO).....	5-14
5.1.3.7	Minnesota Department of Transportation (MnDOT) .....	5-14
5.1.3.8	U.S. Army Corps of Engineers (USACE) .....	5-15
5.1.3.9	The Metropolitan Council .....	5-15
5.2	Implementation Program .....	5-16
5.2.1	Implementation Program Components .....	5-16
5.2.1.1	Capital Improvement Program and Project Implementation .....	5-16
5.2.1.2	Programs.....	5-18
5.2.1.3	Annual Reporting .....	5-18
5.2.2	Financial Considerations.....	5-18
5.2.2.1	Funding Mechanisms Available to the BCWMC.....	5-18

5.2.2.2	Past and Proposed Funding Mechanisms .....	5-20
5.2.2.3	Member City Funding .....	5-21
5.2.2.4	State Funding Sources.....	5-21
5.2.2.5	Federal Funding Sources .....	5-22
5.2.2.6	Private Funding Sources .....	5-22
5.3	Impacts on Local Government.....	5-23
5.3.1	Local Water Management Plans and Official Controls.....	5-23
5.3.1.1	Requirements for Local Water Management Plans and Official Controls .....	5-24
5.3.1.2	BCWMC Review of Local Water Management Plans.....	5-24
5.4	Plan Approval and Adoption.....	5-25
5.4.1	Stakeholder and Public Involvement.....	5-25
5.5	Plan Revision and Amendment .....	5-27
5.5.1	General Amendment Procedure.....	5-27
5.5.2	Minor Plan Amendments .....	5-28
5.5.3	Amendment Format and Distribution .....	5-28

### List of Tables

Table 5-1	Project Costs Eligible for BCWMC Reimbursement.....	5-17
Table 5-2	Permit Authority of Agencies with Jurisdiction within the BCWMC .....	5-29
Table 5-3	BCWMC 2015-2025 CIP .....	5-31
Table 5-4	BCWMC Annual Implementation Program (non-CIP) .....	5-32
Table 5-5	Past BCWMC Accomplishments (since approval of 2004 Plan).....	5-34



---

## 5.0 Implementation

This section describes the responsibilities of the Bassett Creek Watershed Management Commission (BCWMC) and the responsibilities the BCWMC has delegated to its member cities. Many agencies have jurisdiction within the BCWMC; the roles and responsibilities of those agencies relevant to the management of water resources are also discussed in this section. This section presents the BCWMC implementation program, including its capital improvement program (CIP) and other implementation responsibilities (e.g., BCWMC Flood Control Project system maintenance, local water management plan review, etc.).

### 5.1 Responsibilities

#### 5.1.1 BCWMC Responsibilities

The BCWMC serves many water resource management roles, as listed in Minnesota Statutes 103B and summarized in Section 1. While the BCWMC is the entity ultimately responsible for fulfilling the duties of Minnesota Statutes 103B, the BCWMC seeks to collaborate with its member cities, community groups, and others to achieve its goals. The BCWMC will work closely with its nine member cities to assign responsibility for water resource issues to most efficiently and effectively use the cities' and the Commission's planning and implementation resources. In an effort to achieve its goals through enhanced collaboration, the BCWMC will continue to:

- Partner with member cities in the management of surface and groundwater resources for the benefit of residents, businesses, and other stakeholders within the watershed and region.
- Work with residents, citizen advisory groups, and member cities to establish goals and identify, prioritize, and implement initiatives that will preserve and improve water resources within the watershed.
- Collect, develop, and distribute information regarding surface water and groundwater resources in the watershed to assist member cities in the preparation of local plans for the management of water resources and to educate residents, businesses and others about their collective impact on water resources.

The BCWMC has many specific responsibilities, as identified in policies (see Section 4) and as described in the following sections. Major responsibilities of the BCWMC include:

- Review of improvements and developments
- Management of the BCWMC Flood Control Project (see Table 2-8 and Figure 2-14) and Trunk System (see Table 2-9 and Figure 2-15)
- Implementation of the BCWMC capital improvement program (CIP)
- Intercommunity planning and design review and assistance

- Dispute resolution
- Reporting and evaluation
- Monitoring
- Total Maximum Daily Load (TMDL) implementation

#### 5.1.1.1 Review of Improvements and Developments

Cooperation between the BCWMC, the member cities, and concerned stakeholders is critical to effectively facilitate the management of the watershed's water resources. The BCWMC does not have a permit program. The BCWMC Plan and the BCWMC *Requirements for Improvements and Development Proposals* (as amended) (Requirements document) establish goals, standards, and requirements that the member cities must incorporate into their official controls (e.g., ordinances). The BCWMC relies on its member cities to review improvement (e.g., redevelopment projects) and development proposals for compliance with BCWMC requirements, when applicable, and to issue permits only after compliance has been determined.

Member cities must inform the BCWMC of improvements or land development proposals that trigger review per the BCWMC Requirements document (available online). Consistent with BCWMC policies (see Section 4) and the joint powers agreement (see Appendix G), the BCWMC will review projects meeting specific triggers for compliance with BCWMC requirements as described in this Plan and in the BCWMC Requirements document. The BCWMC will provide information and assistance in the preliminary planning stages of these improvements or land development proposals at the request of member cities or project proposers; however, because of the large number of developments requiring review, a review procedure is necessary. Prior to BCWMC conducting its formal review, city staff completes their review and establishes that the improvement or development proposal conforms to their local municipal ordinances and regulations. The BCWMC will then review the proposal and submit their comments and recommendations to the city and other appropriate governmental agencies prior to the city or other governmental agency giving their final approval or disapproval, or the granting of any required permits.

The BCWMC established criteria (or "triggers") for the types of projects that require BCWMC review (e.g., projects located in floodplains, projects disturbing greater than 10,000 square feet). Non-linear projects generating more than one acre of new or redeveloped impervious area and linear projects creating more than one acre of net new impervious surface must also meet the BCWMC water quality requirements or Flexible Treatment Option (FTO) process, which reflect the Minnesota Pollution Control Agency's (MPCA) Minimal Impact Design Standards (MIDS) level of treatment for all nonlinear projects. The BCWMC's review procedure, submittal requirements, guidelines, design criteria, and other relevant information are provided in the BCWMC's *Requirements for Improvements and Development Proposals* (as amended). The Requirements document was updated to incorporate the policies and requirements established in this Plan. For projects located in member cities that have adopted the MIDS performance standard, the member city shall review the project for compliance with the MIDS water quality performance standards.



The BCWMC also reviews applications to the Minnesota Department of Natural Resources (MDNR) for public waters work permits.

#### **5.1.1.2 Implementation of the BCWMC Capital Improvement Program**

The BCWMC is responsible for managing its capital improvement program (CIP), which includes the development and implementation of capital projects to address water quality, flooding, and other issues within the watershed. The CIP is presented in Table 5-3. The processes the BCWMC uses to manage the CIP are described in Section 5.2.1.1.

#### **5.1.1.3 Management of the BCWMC Trunk System and Flood Control Project**

The BCWMC is responsible for managing the trunk system, which is defined as the watercourses and waterbodies listed in Table 2-9 and shown in Figure 2-14 and Figure 2-15. The BCWMC requires that all modifications to the trunk system be made in accordance with the joint powers agreement (JPA) (see Appendix G) and to the applicable requirements and procedures included in this Plan.

The BCWMC and member cities are jointly responsible for the BCWMC Flood Control Project. The Flood Control Project is defined as the structures and storage areas shown in Figure 2-14 and listed in Table 2-8. The BCWMC annually inspects the Flood Control Project, including water level control and conveyance structures, as part of its annual programs (see Table 5-4). The BCWMC maintains funds for emergency repairs and major repair/maintenance of the BCWMC Flood Control Project, including:

- Flood Control Emergency Repair Fund (fund amount currently maintained at up to \$500,000)
- Flood Control Project Long-term Maintenance Fund (fund amount currently maintained at up to \$1,000,000)

The BCWMC will finance major maintenance and repair of water level control and conveyance structures that were part of the original BCWMC Flood Control Project on the same basis as the original project. New road crossings of the creek that were installed as part of the project will be maintained by the city where the structure is located. Member cities are responsible for routine maintenance and repair of BCWMC Flood Control Project structures located within each city; this includes the removal of debris, brush, and trees. The BCWMC will work with member cities to determine responsibilities for major rehabilitation and replacement of the BCWMC Flood Control Project features and establish the associated funding mechanisms (see policy 22, Section 4.2.2).

The BCWMC may construct and fund modifications to existing BCWMC Flood Control Project structures and new features that increase the benefits provided by the Flood Control Project system. The BCWMC requires that all modifications to the Flood Control Project be performed according to provisions of the JPA and requirements described in this Plan.

For all proposed modifications to the BCWMC Flood Control Project system or the trunk system, including existing control structures, structures along the trunk system, and structures between storage sites, the following are applicable:

- All proposed changes must be submitted to the BCWMC for review and approval.
- The location and design of the control structure, including all proposed culverts or other controls, shall also be subject to BCWMC approval.
- The effect of the 100-year storm on the control structure, the trunk system and the storage site must be assessed by the project proposer to ensure that the design does not result in the improper operation of flood storage areas (see Figure 2-14).
- If required, the BCWMC shall modify the Flood Control Project, and the cost of the required modifications will be assessed against the municipality necessitating the modification.
- The BCWMC will not approve changes to the BCWMC Flood Control Project system that would result in effects to the Flood Control Project system components that cannot be resolved.

A joint and cooperative agreement (JCA, see Appendix I) between the BCWMC, Mississippi Watershed Management Organization (Mississippi WMO), and the City of Minneapolis defines additional management obligations for the old tunnel and new tunnel, both of which are part of the BCWMC Flood Control Project. Section 5.1 of the JCA requires the City of Minneapolis to maintain 50 cfs capacity in the old tunnel during the 100-year storm event to accommodate the overflow of stormwater that cannot be accommodated in the new tunnel. Section 6 of the JCA includes obligations relating to the new tunnel, which require BCWMC approval prior to increasing the drainage area tributary to the new tunnel, adding connections or outlets to the new tunnel, and altering the runoff to the new tunnel for the 10-, 50-, or 100-year rainfall event (see Appendix I) .

#### **5.1.1.4 Intercommunity Planning and Design**

The BCWMC relies on the member cities for primary management of runoff and water management issues. The BCWMC will provide leadership and assist member cities with intercommunity water management issues (e.g., stormwater runoff planning and design), or at the request of the member cities. To this end, the BCWMC will:

- Review city local water management plans for consistency with BCWMC goals and intercommunity consistency.
- Assist in calculating or calculate, when necessary, the apportionment of costs between adjoining cities for water resource projects with intercommunity participation. This role applies to both water quantity and water quality issues.

#### **5.1.1.5 Dispute Resolution**

If watershed management disputes should arise between the BCWMC member cities, these disputes may be referred to the BCWMC for resolution. Although the BCWMC's joint powers agreement does not specifically give the BCWMC the power to decide such disputes, the BCWMC will hear the disputes and endeavor to reach a mutually agreeable solution whenever possible. Under the joint powers agreement,



---

the BCWMC's findings and recommendations are not binding unless the parties to the dispute wish to make a prior agreement to that effect. The BCWMC has established the following policies regarding the procedures for the hearing of such disputes:

1. The BCWMC will mediate inter-community disputes relating to watershed management problems within the Bassett Creek watershed.
2. Disputes will be referred to a committee of three BCWMC members or alternate members from member communities who are not parties to the dispute. Members will be appointed by the BCWMC chair or vice-chair, which will also appoint one of the three members as the chair of the committee.
3. The committee chair will call a meeting where each party to the dispute will be allowed to present its suggestions to resolve the dispute.
4. The committee may consult with the members of the BCWMC staff and TAC and will prepare findings and recommendations to resolve the dispute.
5. The committee's recommendation will be presented to the full BCWMC, which may accept, reject, or amend the recommendation before forwarding the findings and recommendations to the parties of the dispute.

Disputes between a member city and the BCWMC regarding the allocation of project costs shall be resolved using the procedure describe in Section VII, Subd. 6 of the JPA (see Appendix G).

#### **5.1.1.6 Reporting and Evaluation**

The BCWMC is responsible for evaluating its progress in achieving its goals and reporting annually to the Board of Water and Soil Resources (BWSR), per Minnesota Rules 8410.0150. Within the first 120 days of the calendar year, the BCWMC must submit to BWSR an activity report for the previous calendar year; the BCWMC also posts this report to its website. The BCWMC must submit an audit report for the previous fiscal year within 180 days of the end of the BCWMC fiscal year. The required contents of the annual activity report are specified in Minnesota Rules 8410. Generally, the BCWMC's annual report includes:

- An assessment of the previous year's annual work plan that indicates whether the stated activities were completed, including the expenditures of each activity with respect to the approved budget (unless included in the audit report)
- A work plan and budget for the current year specifying which activities will be undertaken
- At a minimum of every two years, an evaluation of progress on goals and the implementation actions, including the capital improvement program, to determine if amendments to the implementation actions are necessary
- A summary of significant trends of monitoring data

---

The BCWMC will annually review member city compliance with the goals, policies, and requirements established in the BCWMC Plan. This action may include:

- Evaluation of the status of local water plan adoption and local implementation of activities required by the watershed management organization
- Review of member city ordinance revisions addressing management of water resources (e.g., wetlands, erosion and sediment control), including their enforcement
- A review and summary of member city permits and variances issued or denied and violations under rule or ordinance requirements of the organization or local water plan
- Review of member city annual MS4 reports
- Self-reporting by member cities using criteria or checklist established by the BCWMC

The annual review process provides an opportunity for the BCWMC to assess the effectiveness of its goals and policies. If the BCWMC determines that programmatic changes are necessary, the BCWMC may amend the Plan to reflect the needed changes and/or adopt new rules or policies that require the cities to effect the needed changes via city regulatory controls. If annual review of member city practices reveals implementation inconsistent with the BCWMC Plan, the BCWMC will take administrative or legal action to ensure that BCWMC rules and policies are being implemented by the member cities.

The BCWMC will continue to maintain its website, as required by Minnesota Statute 8410.0150. The website will contain the location, time, agenda, and minutes for organization meetings; contact information for the organization staff; the current watershed management plan; annual activity reports; rules and requirements; a list of the BCWMC Commissioners, Alternate Commissioners, and designated officers; and a list of employees including postal and electronic mailing addresses and telephone numbers. Additional content may be made available at the BCWMC website in accordance with the BCWMC Education and Public Outreach Plan (see Appendix B). The website will be kept current on a monthly basis or more frequently.

The BCWMC website is located at: [www.bassettcreekwmo.org](http://www.bassettcreekwmo.org)

#### **5.1.1.7 Monitoring**

The BCWMC will continue to monitor water quantity and water quality of waterbodies within the BCWMC, focusing on priority waterbodies (see Section 2.7.2.2). The BCWMC will coordinate its monitoring efforts with other programs (see policy 11, Section 4.2.1). Water quantity monitoring efforts may include flow monitoring of the Main Stem of Bassett Creek and water level monitoring in several lakes. Water quality monitoring may include detailed water chemistry performed at regular intervals, zooplankton and phytoplankton sampling in lakes, aquatic plant monitoring of lakes, and invertebrate monitoring in streams. Water quality and quantity monitoring programs are described in Section 2.7.1 and Section 2.8.5 of the Plan, respectively, and in the BCWMC Monitoring Plan (see Appendix A).



---

#### 5.1.1.8 Total Maximum Daily Load (TMDL) Implementation

There are several waterbodies located within the BCWMC that are listed in the MPCA's impaired waters 303(d) list. To address impaired waters and protect designated uses, the MPCA utilizes total maximum daily load (TMDL) analyses (see Section 3.1). The BCWMC has participated in TMDL studies for Wirth Lake, Medicine Lake, and Sweeney Lake. In each case, the BCWMC cooperated with the MPCA in the development of TMDL reports. For the Medicine Lake TMDL, the BCWMC is the "convener" of a categorical waste load allocation (WLA) shared by the member cities. As the convener, the BCWMC cooperates with the member cities to identify and implement water quality improvements to achieve the desired reduction in pollutant loading, and helps cities report progress towards the WLA to the MPCA annually. For the Wirth Lake TMDL, the BCWMC assumed the initial lead role in implementing the actions recommended in the TMDL implementation plan (the Wirth Lake outlet project). For the Sweeney Lake TMDL, the implementation strategy in the report calls for the BCWMC to take a lead role in implementation efforts for the categorical wasteload allocations and the (internal) load reductions, and in working directly with member cities to identify funding sources and to prioritize projects and other efforts.

The BCWMC will continue to participate in future TMDL studies and may assume a lead role in carrying out the resulting TMDL implementation plans, if appropriate.

#### 5.1.2 Member City Responsibilities

The success of the BCWMC is dependent upon its leadership and the cooperation of the nine member cities. The BCWMC relies on the member cities to perform many roles, as specified in the BCWMC's administrative policies (see Section 4.2.10), the JPA, or BCWMC actions. Generally, these roles and responsibilities include:

1. **Commissioner and Alternate Commissioner appointment:** Each member city is entitled to appoint one commissioner and one alternate commissioner to the BCWMC. See Section 1.4 for information about commissioner appointments and terms.
2. **Technical Advisory Committee (TAC):** The BCWMC amended its bylaws in July 2001 to allow each member city to appoint a technical advisor to the BCWMC. The TAC helped maintain continuity as the BCWMC transitioned to citizen leadership, and continues to provide an important opportunity for communication between the member cities and the BCWMC. The technical advisors are welcome to ask questions and express opinions at Commission meetings, but are not allowed to vote. It is the responsibility of each member city to appoint a technical advisor and encourage the technical advisor to attend the BCWMC and TAC meetings (see policy 119, Section 4.2.10). The TAC meets regularly to discuss and provide recommendations on topics and issues assigned by the Commissioners.
3. **Project Review & Permitting:** Each member city is responsible for incorporating the BCWMC's requirements into its official controls and implementing BCWMC policies at the time of development and redevelopment. Member cities shall inform developers and other project applicants that BCWMC review of their project may be required and will direct applicants to the

---

BCWMC, the Requirements Document, and more information online at <http://www.bassettcreekwmo.org>. BCWMC staff will ensure that developers and project applicants have first contacted appropriate city staff before reviewing or discussing details of the proposed project.

Member cities shall permit only those projects that conform to the policies and standards of the BCWMC. The BCWMC will review developer's submittals and other proposed projects only after the applicant demonstrates that the project has received preliminary approval from the member city, indicating compliance with the city's local water management plan. Once the proposed project has received preliminary approval from the city, the BCWMC Application Form shall be signed by city staff and submitted to the BCWMC for its review. The signed application form authorizes the BCWMC or its staff to commence its review. Following BCWMC review, the BCWMC or its staff will send a letter of approval or disapproval to each member city, stating that the proposed project meets the requirements of the BCWMC Plan or stating how the proposed project does not meet BCWMC requirements. Member cities shall not issue construction permits, or other approvals, until the BCWMC has approved the project (see policy 121, Section 4.2.10).

4. **Local Water Management Plan:** Each member city is required to prepare a local water management plan that conforms with the BCWMC Plan. The BCWMC is required to review and approve each local water management plan. See Section 5.3.1 for more information about local water management planning and requirements.
5. **Official Controls (Ordinances):** Each member city is required to update its ordinances (or other official controls) to conform to and implement the requirements of the BCWMC and the policies presented in this Plan (see Section 4). Affected ordinances/controls may include erosion and sediment control, wetland management, floodplain/zoning, stormwater management, and others.
6. **Capital Improvement Projects:** Member cities implement the capital improvement projects listed in Table 5-3, upon order by the BCWMC (see policy 4, Section 4.2.1).
7. **Land Acquisition:** Member cities acquire the necessary easements or right-of-way or interest in land upon order of the BCWMC (see policy 122, Section 4.2.10). The cost of land acquisition may be eligible for BCWMC reimbursement according to Table 5-1).
8. **Finances:** Each member city is required to contribute annually to the BCWMC general fund (see Section 5.2.2.1).

### 5.1.3 Agency Responsibilities

Various units of government are involved in regulating water resource related activities and have jurisdiction overlapping that of the BCWMC. The roles of these agencies are described in this section and summarized in Table 5-2.



---

### **5.1.3.1 Minnesota Department of Natural Resources (MDNR)**

The MDNR Division of Ecological and Water Resources manages water resources through a variety of programs related to lakes, rivers and streams, watersheds, wetlands, groundwater, and climate. The MDNR administers the Public Waters Work Permit Program, the Water Use (Appropriation) Permit Program, and the Dam Safety Permit Program. MDNR Fisheries administers the Aquatic Plant Management Program and other fishery related permits. The MDNR is involved in enforcement of the Wetland Conservation Act (WCA) and is responsible for identifying, protecting and managing calcareous fens. The MDNR also has model shoreland ordinances that cities and counties can adopt.

#### **Public Waters**

The MDNR's Public Waters Work Permit Program (Minnesota Statutes 103G) requires an MDNR permit for any work below the Ordinary High Water Level (OHWL) or any work that will alter or diminish the course, current, or cross-section of any public water or public waters wetland, including lakes, wetlands, and streams. For lakes and wetlands, the MDNR's jurisdiction extends to designated U.S. Fish and Wildlife Service Circular #39 Types 3, 4, and 5 wetlands which are 10 acres or more in size in unincorporated areas, or 2.5 acres or more in size in incorporated areas. The program prohibits most filling of public waters and public waters wetlands for the purpose of creating upland areas. The Public Waters Work Permit program was amended in 2000 to minimize overlapping jurisdiction with the WCA. Under certain conditions, work can be performed below the OHW level without a Public Waters Work Permit. Examples include docks, watercraft lifts, beach sand blankets, ice ridge removal/grading, riprap, and shoreline restoration. The MDNR public waters in the BCWMC are shown in Figure 2-9.

#### **Water Appropriations and Transport**

The MDNR regulates surface water and groundwater usage rate and volume as part of its charge to conserve and use the waters of the state. For example, suppliers of domestic water to more than 25 people or applicants proposing a use that exceeds 10,000 gallons per day or 1,000,000 gallons per year from surface water or groundwater sources must obtain a Water Appropriation Permit from the MDNR. Appropriation Permits from the MDNR are not required for domestic uses serving less than 25 persons for general residential purposes. An additional permit is required to appropriate or transport water from waters designated as infested with invasive species, regardless of the volume appropriated or transported.

#### **Groundwater**

In addition to regulating appropriations from groundwater, the MDNR is also responsible for mapping sensitive groundwater areas, conducting groundwater investigations, addressing well-interference problems, and maintaining the observation well network.

#### **Dam Safety**

The MDNR administers the state's Dam Safety Program (MN Rules 6115.0300 – 6115.0520), which applies to all impoundments that pose a potential threat to public safety or property. Dams 6 feet or lower in height and dams that impound 15 acre-feet or less of water are exempt from the rules. Dams less than 25

---

feet high that impound less than 50 acre-feet of water are also exempt, unless there is a potential for loss of life. The dam safety rules require that the downstream impacts of a dam failure be analyzed under high-flow conditions (i.e., greater than a 100-year flood).

### **Other Regulations**

In addition to permit programs, the MDNR oversees the Floodplain Management Program, the Public Waters Inventory Program, the Shoreland Management Program, the Flood Damage Reduction Grant Program, the Wild and Scenic Rivers Program, various surface and groundwater monitoring programs, and the Climatology Program.

Questions concerning the MDNR's role in water resource management should be directed to the MDNR Division of Ecology and Water Resources, Metro Region, 1200 Warner Road, St. Paul, MN 55106 (651-259-5774). More information is available at the MDNR website: <http://www.dnr.state.mn.us>

#### **5.1.3.2 Minnesota Board of Water and Soil Resources (BWSR)**

BWSR oversees the state's watershed management organizations (both joint powers and watershed district organizations), oversees the state's Soil and Water Conservation Districts, and administers the rules for the WCA and metropolitan area watershed management. BWSR also administers the Clean Water Fund (CWF) grant program, funded by the Clean Water Land and Legacy amendment passed in 2008. The purpose of the CWF is to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater and drinking water sources from degradation. Applicants eligible for CWF grants include counties, watershed districts, watershed management organizations, soil and water conservation districts, and cities working under a current BWSR-approved and locally adopted local water management plan.

Questions concerning BWSR's role in water resource management should be directed to the Minnesota Board of Water and Soil Resources, 520 Lafayette Road North, St. Paul, MN 55107 (651-296-3767). More information is available at the BWSR website: <http://www.bwsr.state.mn.us>

#### **5.1.3.3 Minnesota Pollution Control Agency (MPCA)**

The MPCA administers the State Discharge System/National Pollutant Discharge Elimination System (NPDES) Permit program (point source discharges of wastewater), the NPDES General Stormwater Permit for Construction Activity, the NPDES General Industrial Stormwater Permit Program, the NPDES Storm Water Permit Program, and the individual sewage treatment system regulations (7080 Rules). The MPCA also reports the state's "impaired waters" to the U.S. Environmental Protection Agency. Spills should be reported directly to the MPCA.

The MPCA administers and enforces laws relating to pollution of the state's waters, including groundwater. The MPCA monitors ambient groundwater quality and administers subsurface sewage treatment system (SSTS) design and maintenance standards. The MPCA is responsible for administering the programs regulating construction and reconstruction of SSTS. The MPCA requires an inspection

---

program for SSTS that meets MPCA standards. Minnesota Rules 7080 govern administration and enforcement of new and existing SSTS. The Tanks and Spills Section of the MPCA regulates the use, registration, and site cleanup of underground and above-ground storage tanks.

The MPCA resumed selective administration of the Section 401 of the Clean Waters Act – Water Quality Certification Program in 2007. The program is primarily administered by the U.S. Army Corps of Engineers (USACE). Section 401 Certification is required to obtain a federal permit for any activity that will result in a discharge to navigable waters of the United States. Formal applications for 401 Certification must be sent to the MPCA.

### ***Municipal Separate Storm Sewer System (MS4) Permitting***

The federal Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) to regulate point sources of pollution, with the MPCA as the delegated permitting authority. This program was later expanded to include both point and non-point sources of pollution, including the regulation of stormwater runoff, and created a two-phase comprehensive national program to address stormwater runoff. Phase I of the program was implemented in 1990 and covered two general categories of stormwater discharge including 11 categories of industrial activities (including construction) and Municipal Separate Storm Sewer Systems (MS4s) serving populations of 100,000 or more. A few years later, Phase II of the program was implemented. Phase II was a broader program that included smaller construction sites, municipally owned or operated industrial activities, and many more municipalities (MS4s).

In 2013, the MPCA reissued the MS4 General Permit, which replaced the Phase II permit. The permit focus shifts from permit program development to increasing emphasis on measured progress and beginning some of the implementation measures. Some of the requirements of the reissued MS4 permit include:

- More stringent construction related erosion control
- Post-construction controls to reduce volume, total phosphorus, and total suspended solids
- Documented enforcement response procedures
- Submittal of additional information on all stormwater ponds and outfalls
- Inventories of municipal facilities that could contribute pollutants to stormwater discharges

All of the member cities within the BCWMC are required to maintain an MS4 permit from the MPCA. As part of the permit program, each member city must annually submit an MS4 report to the MPCA. The numerous and expanded requirements of the MPCA's MS4 permit present opportunities for the BCWMC to cooperate with member cities to prevent redundancy in implementing or reporting on activities related to water quality.

More information about the MPCA's stormwater program can be found at the MPCA's website:

<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/index.html>



---

### ***Impaired waters and Total Maximum Daily Loads (TMDLs)***

In administering the CWA in Minnesota, the MPCA also maintains a list of impaired waters (see Section 2.7.2.1). The CWA requires the development of a total maximum daily load (TMDL) study for impaired waterbodies. A TMDL is a threshold calculation of the amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL establishes the pollutant loading capacity within a waterbody and develops an allocation scheme amongst the various contributors, which include point sources, non-point sources, and natural background levels, as well as a margin of safety. As a part of the allocation scheme a waste load allocation (WLA) is developed to determine allowable pollutant loadings from individual point sources (including loads from storm sewer networks). A load allocation (LA) establishes allowable pollutant loadings from non-point sources and natural background levels in a waterbody.

A watershed restoration and protection strategy (WRAPS) is similar to a TMDL and may examine other waterbodies in the watershed in addition to impaired waterbodies. Both TMDLs and WRAPSs may result in implementation plans to address water quality issues of the affected waterbodies. Approved TMDLs within the BCWMC are listed in Table 2-5 – note that in 2014 the MPCA recommended to the USEPA that Wirth Lake be removed from the list of waters impaired by nutrients. The USEPA is expected to agree with this recommendation.

Future TMDL and/or WRAPS implementation presents an opportunity for the BCWMC to coordinate water quality improvement efforts between the member cities, especially for waterbodies with intercommunity drainage areas. Depending upon its role in future TMDLs, the BCWMC may be responsible for reporting project implementation and TMDL progress to the MPCA as the TMDL implementation authority. Under such an arrangement, efforts may be made to eliminate any redundancies between the BCWMC and member cities in TMDL reporting to the MPCA.

### ***Guidance for Dredged Materials***

The MPCA considers material excavated below the OHW level of waterbasins, watercourses, public waters, or public waters wetlands (as defined by Minnesota Statutes 103G.005) to be dredged material. Dredged material is defined as waste and regulated by the MPCA. The MPCA provides guidance for the management of dredged material on its website: <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/dredged-materials-management.html>

In 2012, the MPCA developed specific guidelines for the removal of sediment from stormwater ponds. Guidance for the removal of sediment from municipal stormwater ponds differs from guidance for other dredged materials in three primary ways:

1. Permits are not required when performing routine maintenance on stormwater conveyance and collection systems.
2. The MPCA does not need to be notified of sediment removal activities. The MPCA recommends that cities keep records and documentation of sediment removal projects.

3. Best management practices were revised to include guidance from cities that have experience performing sediment removal projects.

Disposal options for sediment dredged from municipal stormwater ponds vary according to the level of contamination present in the excavated material. The document provides guidance for collecting samples and testing sediment, and calculating chemical concentrations relative to soil reference values (SRVs). The number of samples to be collected depends on the surface area of the pond. More detailed information regarding the disposal of sediment from stormwater ponds is available from the MPCA website:

<http://www.pca.state.mn.us/index.php/view-document.html?gid=18075>

Questions concerning MPCA's role in water resource management should be directed to the Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155-4194 (651-296-6300). More information is available at the MPCA website: <http://www.pca.state.mn.us>

#### **5.1.3.4 Minnesota Department of Health (MDH)**

The MDH is the official state agency responsible for addressing all public health matters, including drinking water protection. The MDH administers the Well Management Program, the Wellhead Protection Program, and the Safe Drinking Water Act rules. The MDH also issues fish consumption advisories. The MDH is responsible ensuring safe drinking water sources and limiting public exposure to contaminants. Through implementation of the federal Safe Drinking Water Act, the MDH conducts the Public Water Supply Program, which allows the MDH to monitor groundwater quality and train water supply system operators. The 1996 amendments to the federal Safe Drinking Water Act require the MDH to prepare source water assessments for all of Minnesota's public water systems and to make these assessments available to the public.

Through its Well Management Program, the MDH administers and enforces the Minnesota Water Well Code, which regulates activities such as well abandonment and installation of new wells. The MDH also administers the Wellhead Protection Program, which is aimed at preventing contaminants from entering public water supply wells.

The Wellhead Protection Program rules (Minnesota Rules 4720.5100 to 4720.5590) went into effect in 1997. These rules require all public water suppliers that obtain their water from wells to prepare, enact, and enforce wellhead protection plans (WHPPs, see Section 2.5.3). The MDH prepared a prioritized ranking of all such suppliers in Minnesota. Regardless of the ranking, Minnesota Rules 4720 required all public water suppliers to have initiated wellhead protection measures for the inner wellhead management zone prior to June 1, 2003. All cities within the BCWMC have MDH-approved WHPPs. If a city with an existing WHPP drills a new well and connects it to the distribution system, the WHPP must be amended.

Wellhead protection plans include: delineation of groundwater "capture" areas (wellhead protection areas), delineation of drinking water supply management areas (DWSMA), an assessment of the water supply's susceptibility to contamination from activities on the land surface, management programs such as identification and sealing of abandoned wells, and education/public awareness programs. As part of its

---

role in wellhead protection, the MDH developed the guidance document “Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas” (MDH 2007, as amended).

Questions concerning the MDH’s role in water resource management should be directed to the Minnesota Department of Health, P.O. Box 64975, St. Paul, MN (651-201-5000). See the Minnesota Department of Health website for more information about these programs:  
<http://www.health.state.mn.us/divs/eh/water/index.html>

#### **5.1.3.5 Minnesota Environmental Quality Board (EQB)**

The EQB administers the state’s environmental review program, including Environmental Assessment Worksheets (EAW), Environmental Impact Statements (EIS), and Alternative Urban Area-wide Reviews (AUAR). With respect to water resources, the EQB is responsible for developing the state water plan, a state water monitoring plan, biennial water policy and priorities reports, and biennial reports on trends in water quality and availability and research needs. Questions concerning the EQB’s role in water resource management should be directed to the Minnesota Environmental Quality Board, 520 Lafayette Road North, St. Paul, MN 55155 (651-296-9027). More information is available at the EQB website:  
<http://www.eqb.state.mn.us>

#### **5.1.3.6 Minnesota State Historic Preservation Offices (SHPO)**

Following the National Historic Preservation Act of 1966, Minnesota’s State Historic Preservation Office (SHPO) was established by state statute in 1969. The director of the Minnesota Historical Society serves as State Historic Preservation Officer. The mission of the SHPO is to preserve and promote Minnesota history by identifying, evaluating, registering, and protect Minnesota’s historic and archaeological properties and assisting government agencies in carrying out their historic preservation responsibilities. The SHPO maintains the National Register of Historic Places (NRHP) for the state. This includes several listed or eligible to be listed places within the BCWMC. To ensure the protection of places eligible for listing or listed in the NRHP, SHPO review is required for all state and federally funded projects, and all United States Army Corps of Engineers (USACE) projects.

Questions concerning SHPO’s role in historical resource management should be directed to the Minnesota State Historic Preservation Office, 345 Kellogg Boulevard West, St. Paul, MN 55102-1903 (651-259-3450). More information is available at the SHPO website: <http://www.mnhs.org/shpo/>

#### **5.1.3.7 Minnesota Department of Transportation (MnDOT)**

The MnDOT is responsible for major maintenance and reconstruction of storm water infrastructure associated with state highways. In the BCWMC, these locations include Interstate 494, Interstate 394, US Highway 169, Highway 100, and Highway 55.

Questions concerning MnDOT’s role in water resource management should be directed to the Minnesota Department of Transportation, 395 John Ireland Boulevard, St. Paul, MN 55101-1638 (651-296-3000). More information is available at the MnDOT website: <http://www.dot.state.mn.us>



---

### **5.1.3.8 U.S. Army Corps of Engineers (USACE)**

The USACE administers several regulatory permit programs, including Section 10 of the Rivers and Harbors Act permit program, the Section 404 permit program, and Section 401 Certifications. The USACE updated Section 10 of the Rivers and Harbors Act Permit and the Section 404 Permit in March 2012 to streamline the requirements of the Clean Water Act (CWA). The updated permits provide expedited review of projects that have minimal impact on the aquatic environment. These projects may include linear transportation projects, bank stabilization activities, residential development, commercial and industrial development, aids to navigation, and some maintenance activities. Permit programs are described briefly in this section.

Through Section 10 of the Rivers and Harbors Act, the USACE is responsible for administering this program, which regulates the placement of structures and/or work in, or affecting, navigable waters of the United States.

The Federal Clean Water Act requires that anyone who wants to discharge dredged or fill material into U.S. waters, including wetlands, must first obtain a Section 404 Permit from the USACE. Examples of activities that require a Section 404 Permit include: construction of boat ramps, placement of riprap for erosion protection, placing fill in a wetland, building a wetland, construction of dams or dikes, stream channelization, and stream diversion. When Section 404 Permit applications are submitted to the USACE, the applications are typically posted for the U.S. Fish and Wildlife Service, the U.S. Forest Service, the U.S. EPA, and other federal agencies to review and provide comments. The USACE evaluates permit requests for the potential impact to various functions and values of the wetland.

Section 401 Certification is required to obtain a federal permit for any activity that will result in a discharge to navigable waters of the United States. The program is primarily administered by the USACE along with the MPCA. A Section 401 Water Quality Certification may be granted if the applicant demonstrates that the proposed activity “will not violate Minnesota’s water quality standards or result in adverse long-term or short-term impacts on water quality.” Greater protection is given to a category of waters designated by the MDNR as Outstanding Resource Value Waters (ORVW). The waters in this category have received this designation because of their exceptional value. These waters include such groups as scientific and natural areas, wild, scenic and recreational river segments, and calcareous fens.

Questions concerning the USACE’s role in water resource management should be directed to the U.S. Army Corps of Engineers, St. Paul District, 180 East 5th Street, St. Paul, MN 55101-1678 (651-290-1678). More information is available at the USACE website: <http://www.usace.army.mil/>

### **5.1.3.9 The Metropolitan Council**

The Metropolitan Council provides regional planning and wastewater services (collection and treatment) for the seven county metropolitan area. The Metropolitan Council also operates the Citizen Assisted Monitoring Program (CAMP), which monitors lake water quality, and the Watershed Outlet Monitoring Program (WOMP), which monitors stream flow and water quality (see Section 2.7.1).

Questions concerning the Metropolitan Council's role in water resource management should be directed to the Metropolitan Council, 390 Robert Street North, St. Paul, MN 55101 (651-602-1000). More information is available from the Metropolitan Council's website: <http://www.metrocouncil.org/>

## **5.2 Implementation Program**

### **5.2.1 Implementation Program Components**

Table 5-3 and Table 5-4 are a comprehensive list of the projects, activities, and programs that comprise the BCWMC implementation program. Table 5-3 is the BCWMC's 10-year capital improvement program (10-year CIP). Table 5-4 lists the BCWMC's annual water quality and flood control programs, administrative actions, and education actions (i.e., non-capital projects). Table 5-5 lists the past accomplishments of the BCWMC.

#### **5.2.1.1 Capital Improvement Program and Project Implementation**

Table 5-3 lists the capital improvement projects the BCWMC plans to implement over the next 10 years. Many of the capital projects listed in Table 5-3 are water quality improvement projects. The current 10-year CIP is an estimate, and includes projects that may not be completed in the next 10 years.

In addition to Table 5-3, the BCWMC maintains a "working version" of its CIP that covers a 5-year period. As part of the annual BCWMC budgeting process, the BCWMC reviews its working CIP to consider whether new projects should be added to the CIP or whether project implementation dates and funding sources should be changed, as necessitated by changing priorities, funding availability, partnering opportunities, or other factors. New projects suggested by the BCWMC or member cities are sent to the TAC for consideration. The TAC develops a draft working CIP which is reviewed and revised by the BCWMC. Following another round of TAC review, the BCWMC approves the working CIP. In evaluating projects for inclusion in the working CIP, the BCWMC and TAC will consider the criteria identified in Policy 110 (see Section 4.2.10). The BCWMC focuses its resources on projects that primarily address water quality and water quantity (i.e., flooding) issues; additional benefits are considered when identifying and prioritizing projects.

Once a project has been added to the BCWMC's working CIP, the BCWMC goes through a process outlined for capital improvement projects as outlined in the JPA. This process begins with the preparation of a feasibility study, estimating costs (including costs eligible for reimbursement by the BCWMC), and issuing a report on the proposed project. The BCWMC develops a one-page project summary for all projects added to the working CIP (available from the Commission). Project-related costs incurred by member cities and eligible for reimbursements are listed in Table 5-1 (see Policy 122, see Section 4.2.10).

Following receipt of the feasibility report, the BCWMC must hold a public hearing on the proposed project, giving at least 45 days' notice to the clerk of each member city. After the hearing, the BCWMC may order the project by a two-thirds vote of its members. If the BCWMC decides to proceed with a project included in its CIP (Table 5-3) following the feasibility study process and public hearing, the BCWMC will certify a levy to Hennepin County for the cost of the project as determined during the

feasibility study process, and apply for grant funds, if applicable. The BCWMC begins project implementation through an agreement with the member city where the project is located.

**Table 5-1 Project Costs Eligible for BCWMC Reimbursement**

<b>Project costs eligible for reimbursement from BCWMC:</b>	<b>Other project costs that will be considered for whole or partial reimbursement on a project by project basis*:</b>
Feasibility study costs	Easement acquisition
Pre-project planning, monitoring (e.g., fish surveys, feasibility study review/follow-up)	Property acquisition
Plan amendment costs	Utility relocation
Grant application & administration costs	City improvements associated with the project but not directly tied to the goals of the BCWMC (e.g. trails, pedestrian bridges, signage)
Permitting costs and fees	Contaminated soils/groundwater remediation
Engineering and design costs (plans & specs)	City staff time and expenses (if not requested prior to levy certification)
Construction costs	Wetland mitigation or replacement
Project bidding & advertising fees	Art/aesthetic improvements directly associated with the project
Construction administration & observation costs	
Warranty period monitoring costs – e.g., wetland monitoring, vegetation monitoring, post-construction inspection	
City staff time and expenses (if requested prior to levy certification)	
Other BCWMC administration and engineering time, including tracking CIP project budget, engineering plan review and reviewing reimbursement requests	
Transfer to BCWMC administrative fund for CIP administrative expenses, as designated by the Commission	

\*The BCWMC will consider the cost effectiveness of the project including the cost per pound of pollutant removal relative to guidance to be established by the BCWMC (for water quality projects), along with partnerships, grant opportunities, and other factors in determining reimbursement of other project costs.

For projects not currently included in its BWSR-approved CIP (Table 5-3), the BCWMC must initiate a plan amendment to add the project to its CIP (Table 5-3) prior to certifying a levy to Hennepin County. The amendment process is described in Section 5.5 and requires a public hearing. Inclusion of a project in the



BCWMC CIP Table 5-3 allows the BCWMC to certify a levy to Hennepin County for the project, as well as apply for various grant funds. Following adoption of the plan amendment, the BCWMC will proceed with certifying a levy to Hennepin County, and project implementation as described above.

The BCWMC may implement the projects listed in Table 5-3 at a different time than shown in the table (e.g., year 2020 rather than 2018) as circumstances dictate. For example, the availability of grants and partnerships could result in either acceleration or delay of projects. The BCWMC will consider such shifts in the time schedule to also be consistent with the Plan and not require a plan amendment.

### **5.2.1.2 Programs**

Table 5-4 presents the on-going programs implemented by the BCWMC, which generally include:

- Administrative responsibilities
- Monitoring programs
- Flood Control Project activities
- Education programs

Table 5-4 presents the estimated cost for each program over the 10 year life of this Plan. Note that estimated costs for education, monitoring, and other actions may vary according to future revisions to the Education and Outreach Plan (see Appendix B) and the Monitoring Plan (see Appendix A).

### **5.2.1.3 Annual Reporting**

Per Minnesota Statute 103B, the BCWMC reports its accomplishments and progress toward goals in an annual report submitted to the Minnesota Board of Water and Soil Resources (BWSR) and posted on the BCWMC website (see also Section 5.1.1.6).

## **5.2.2 Financial Considerations**

This section provides a brief summary of the funding sources available to the BCWMC, followed by a discussion of the BCWMC proposed method(s) of funding the various items in its implementation program (Table 5-3 and Table 5-4).

### **5.2.2.1 Funding Mechanisms Available to the BCWMC**

#### ***Ad Valorem Tax***

Minnesota law (Minnesota Statutes 103B.231) requires watershed districts and joint powers WMOs within the metropolitan area to prepare a watershed management plan. The statute requires that a capital improvement program be part of the watershed management plan. Another statute (Minnesota Statute 103B.251) allows WMOs to certify capital improvements to the county for payment, if those improvements are included in the WMO's watershed management plan. The county then issues bonds and levies an ad valorem tax on all taxable property in the WMO (or subwatershed unit of the WMO) to pay for the projects. This process requires sufficient lead time and coordination with the County, as formal County

---

approval of any amendments to a WMO's plan and associated levy amounts is required. A WMO may also raise funds through direct ad valorem taxation (Minnesota Statutes 103B.241), but only if the WMO is specifically listed as a special taxing district in Minnesota Statutes 275.066. If a WMO is given taxing authority, the WMO may also accumulate funds to finance improvements as an alternative to issuing bonds (Minnesota Statutes 103B.241).

### **Emergency Projects**

Minnesota law allows local units of government or WMOs to declare an emergency and order work to be done without a contract, and without levy limits (Minnesota Statutes 103B.252).

### **BCWMC General Fund**

Through the BCWMC JPA, each member city contributes annually to the BCWMC general fund. The general fund is to be used for administrative purposes and certain operating expenses. Each city's annual contribution is based 50 percent on the assessed valuation of property in the watershed and 50 percent on the ratio of area of each member city within the watershed to the total BCWMC area. The general fund is used to pay for general BCWMC administrative expenses, monitoring program, watershed management plan development, TMDL involvement, special studies, and various projects (e.g., XPSWMM model and P8 model). The general fund may also be used to pay for routine repair and maintenance of facilities. The general fund could also be used to pay for the administrative expenses related to a capital project, such as preparing feasibility reports, conducting hearings, educating the public about the capital projects, etc.

### **CIP Project Funding – BCWMC Improvement Fund**

The BCWMC JPA calls for the establishment of an improvement fund for each improvement project ordered by the BCWMC. In accordance with the current JPA, the BCWMC may use one of the following three methods to apportion project costs to the member cities:

1. Negotiated settlement among the member cities.
2. Use the same basis as the BCWMC general fund (50 percent property value/50 percent watershed area), which can be varied (by a two-thirds vote of the BCWMC) under certain circumstances, and with credits given for land acquisition. Any member city unhappy with the cost allocation may appeal the decision and submit it for arbitration.
3. If the project is certified to the county for payment using Minnesota Statutes 103B.251, the costs will be apportioned according to a levy on all taxable property in the watershed.

### **Channel Maintenance Fund**

The BCWMC maintains a channel maintenance fund. Each year, funding is set aside to help member cities off-set the cost of minor stream maintenance, repair, stabilization, and restoration projects, and portions of larger stream restoration projects. The BCWMC transfers \$25,000 per year from the General Fund to this fund; those monies are part of the member cities' contribution to the BCMWC general fund.

---

### ***Flood Control Project Long-term Maintenance Fund***

The BCWMC maintains a long-term maintenance fund for its Flood Control Project. This fund was originally started with a portion of the funds remaining from the construction of the Flood Control Project. Each year, funding is set aside to help off-set the cost of maintenance of the Flood Control Project. The BCWMC has estimated the long-term replacement cost of the Flood Control Project and will clarify maintenance and replacement responsibilities between the BCWMC and the member cities (see Policy 22, Section 4.2.2). The BCWMC transfers \$25,000 per year from the General Fund to this fund; those monies are part of the member cities contribution to the BCMWC general fund. The BCWMC seeks to maintain the fund balance at (but not exceed) \$1,000,000.

### ***Flood Control Project Emergency Fund***

The BCWMC maintains this fund to address emergency repairs to the Flood Control Project. This fund was created using a portion of the remaining funds from the original construction of the Flood Control Project. The BCWMC does not add to this fund on an annual basis.

#### **5.2.2.2 Past and Proposed Funding Mechanisms**

In the past, the BCWMC has used the BCWMC general fund for administrative costs, monitoring, education, studies, and select projects. The BCWMC's Bassett Creek Flood Control Project was financed through a combination of state and federal grants and member city contributions (see Section 2.8.1).

The implementation program of this Plan includes both capital (structural) projects and nonstructural activities. The capital projects will be funded in accordance with the joint powers agreement, as described in Section 5.2.2.1. In particular, the BCWMC proposes to finance all of the capital improvement projects listed in Table 5-3 through an ad valorem tax levied by Hennepin County (per Minnesota Statutes 103B.251). The BCWMC will also seek grants, partnerships, etc. to reduce the BCWMC's share of the project costs.

If individual cities wish to fund their share of the project costs using a different funding source than the proposed ad valorem tax levy, Hennepin County would need to establish taxing districts based on city boundaries. The BCWMC will explore this possibility with Hennepin County if requested by member cities. If Hennepin County is willing to set up these separate taxing districts, the BCWMC will allow the cities to use this funding option.

Since the BCWMC proposes to finance the capital projects using Minnesota Statutes 103B.251 (an ad valorem tax levied by Hennepin County), BCWMC and the county will follow the process outlined in the statute. This process includes BCWMC forwarding a copy of the improvement plan to the county board prior to the BCWMC's public hearing on the project.

The nonstructural activities listed in Table 5-4 will be financed through the BCWMC general fund, as described in Section 5.2.2.1. In accordance with the JPA, the BCWMC must adopt a budget before July 1<sup>st</sup> of each year and decide upon the total amount needed for the general fund. Budget approval requires a



---

two-thirds vote (six Commissioners). The cities have until August 1<sup>st</sup> to register any objections to the budget.

### 5.2.2.3 Member City Funding

Funding mechanisms available to the member cities include:

- City General Funds
- Special Assessments
- Ad Valorem Taxes
- Stormwater Utility
- Development Fees
- Tax Increment Financing
- Hennepin County Grants (e.g., Natural Resource Grants, Environmental Response Fund)

### 5.2.2.4 State Funding Sources

In addition to stormwater utility fees, taxes, assessments, and the other funding sources discussed above, the cities and/or the BCWMC could obtain funding from various state sources, such as grant and loan programs. The city could use loans for projects instead of city-issued bonds. The following paragraphs list various state-funded sources, grouped according to the state agency that administers the various funding programs.

The **Board of Water and Soil Resources** (BWSR) administers several grant programs, including the Clean Water Fund (CWF) program; cities and WMOs are eligible for CWF grants.

The **Minnesota Pollution Control Agency** (MPCA) administers the Clean Water Partnership (CWP) grant and loan program, USEPA funded Section 319 programs (including a TMDL implementation grant program), the Surface Water Assessment Grant program, Phosphorus Reduction Grant program, and the Clean Water State Revolving Fund program.

The **Minnesota Department of Natural Resources** (MDNR) administers many grant programs that could be appropriate for the cities or WMOs, including the Flood Hazard Mitigation Grant Assistance program, the Parks and Trails Legacy Grant program, trail grants programs, aquatic invasive species prevention grants and other aquatic plant management grant programs, shoreland habitat restoration grant program, and dam safety program. Funding for many of these programs changes after each legislative session.

Other state funding programs include the Legislative-Citizen Commission on Minnesota Resources' (LCCMR) funds for non-urgent demonstration and research projects, the Minnesota Department of

---

Employment and Economic Development's (DEED) Contaminant Cleanup Development Grant Program, the Minnesota Department of Transportation (MnDOT) State Aid Funds, and ISTEA funds.

#### 5.2.2.5 Federal Funding Sources

The BCWMC and member cities may also receive funding from various federal sources, a few of which are discussed in the following paragraphs.

The **U.S. Environmental Protection Agency** (USEPA) has discretionary funds available through each division and program area of the USEPA and administers the Clean Lakes Program (CLP) established by Section 314 of the Clean Water Act; the CLP is similar to the MPCA's Clean Water Partnership program. The USEPA also administers the 604b Grant Program that targets water quality improvements in urban areas, and the Environmental Education Grant that finances local environmental education initiatives.

The **U.S. Army Corps of Engineers** administers the Planning Assistance to States (Section 22) program, the Project Cooperation Agreement (PCA) program, also known as the LCA (Local Cooperation Agreement) program for construction of Flood Control Projects, the Section 14 bank protection program, the Flood Plain Management Services Program, and the Aquatic Plant Control Program and provides many GIS products through its GIS Center.

The **U.S. Fish and Wildlife Service** administers the North American Wetlands Conservation Fund, as part of the North American Wetlands Conservation Act (WCA), and the Partners for Wildlife Grant Program.

The **Natural Resource Conservation Service** (NRCS) has funds available for technical assistance on various surface water projects, operations and maintenance, inspections and repairs. The NRCS also administers the Environmental Quality Incentives Program (EQIP), which was established through the 1996 Farm Bill Program.

The **Federal Emergency Management Agency** (FEMA) has funds available to restore areas (including water resources) damaged or destroyed by a disaster.

#### 5.2.2.6 Private Funding Sources

In addition to state and federal funding sources, some private funding sources may be available. Examples include (but are not limited to):

- Ducks Unlimited and Pheasants Forever funds are available for projects that enhance, create, or protect waterfowl or pheasant habitat,
- Individual entities needing to provide wetland mitigation in compliance with the Wetland Conservation Act (WCA) may have funds and/or technical resources available to restore or create wetland function and values lost or intended to be destroyed as part of a project.
- Service organizations (e.g., Lions Club and Elks), youth groups (e.g., Boy/Girl Scouts), Adopt-a-Highway/River cleanup groups, and sportsman clubs may also provide funds or assistance.

---

## 5.3 Impacts on Local Government

This section discusses how the BCWMC's implementation program will affect local government in terms of cost and administrative issues.

The BCWMC's intention is to minimize the duplication of efforts with member cities, and to limit additional requirements imposed upon local units of government as much as possible while still accomplishing the BCWMC's purposes and implementing the Plan. The BCWMC Plan's capital improvements (listed in Table 5-3) will be implemented by the member cities, but will be funded through a Hennepin County tax levy requested by the BCWMC. These improvements would not affect the member cities' finances directly since the tax levy would not apply towards the cities' levy limits. However, there would be a financial impact to the residents of the member cities that reside in the BCWMC watershed.

As in the past, the BCWMC's implementation of its annual water quality, flood control, and education programs will be funded through the BCWMC's general fund, as will its engineering and administrative services. Since the member cities contribute funds directly to the BCWMC general fund, this has a direct financial impact on the member cities.

In placing requirements on the member cities, the BCWMC recognizes the associated financial burden, and seeks to most efficiently utilize finite financial resources to accomplish its goals. Some BCWMC policies place increased responsibility on member cities (see Section 4). Some of the implementation program elements reflect the goals, policies, and requirements of state and regional units of government that local units of government would need to address regardless.

Some of the member cities already have ordinances in place that address many of the BCWMC requirements. Applicable ordinances address shorelands, floodplains, wetland protection, stormwater management, erosion control, and stormwater system maintenance. Local governments must adopt the MDNR's shoreland regulations, if required by the MDNR.

The BCWMC is not increasing the wetland regulation burden for the member cities since those cities that are already acting as the Local Government Unit for the WCA will continue to do so (no change).

### 5.3.1 Local Water Management Plans and Official Controls

It is anticipated that most of the member cities will need to revise their local plans and official controls to bring them into conformance with the BCWMC's revised Plan, Minnesota law (Minnesota Statutes 103B), and Minnesota Rules (Minnesota Rules 8410). BCWMC member cities must revise and adopt local water management plans according to the timeline established in MN Rules 8410 and Minnesota Statutes 103B.235. The BCWMC requires member cities to revise their official controls and management programs (e.g., ordinances) affected by the BCWMC Plan within 2 years of adoption of the BCWMC Plan.

A member city can assume as much management control as it wishes through its approved local water management plan. The BCWMC assumes that the member cities will continue to be the permitting authority for all land alteration activities (see Section 5.1.1.6). To continue as the permitting authority, the



---

local government must outline its permitting process in its local water management plan, including the preliminary and final platting process.

#### **5.3.1.1 Requirements for Local Water Management Plans and Official Controls**

Local water management plans are required to conform to Minnesota law (Minnesota Statutes 103B.235), Minnesota rules (Minnesota Rules 8410), and the BCWMC Plan. Minnesota Rules 8410 and Minnesota Statutes 103B.235 Subd. 2 include specific requirements for local water management plan contents.

The policies and goals established in each city's local water management plan must be consistent with the BCWMC Plan. The section of the local plan covering assessment of problems must include those problems identified in the BCWMC Plan that affect the city. The corrective action proposed must consider the individual and collaborative roles of the BCWMC and its member cities and must be consistent with the BCWMC Plan. A city may use all or part of the BCWMC Plan when updating its local plan.

Local units of government are to maintain stormwater systems (storm sewers, ponding areas, ditches, water level control structures, etc.) under their jurisdiction in good working order to prevent flooding and water quality problems. The BCWMC requires that local plans assess the need for periodic maintenance of public works, facilities and natural conveyance systems, including the condition of public ditches constructed under Minnesota Statutes 103D or 103E, if they are under the cities' jurisdiction.

The BCWMC also requires local water management plans to assess the need to establish a waterbody management classification system to provide for water quality and quantity management. If a different classification system than the BCWMC classification system is used, it must be correlated to the BCWMC system and approved by the BCWMC. Local plans must evaluate the need for other management programs, if necessary.

The local water management plan must identify official controls and programs (e.g., ordinances, management plans) which are used to enforce the policies and requirements of the BCWMC. Member city ordinances, management programs, and other official controls required by the BCWMC Plan must be implemented within 2 years of BCWMC Plan adoption. Revisions to local water management plans or local controls that are potentially inconsistent with the BCWMC plan must be submitted by the member cities to the BCWMC for review.

The BCWMC reserves the right to recommend to a member city that a project the BCWMC considers to be inconsistent with the local management plan be denied.

Section 4 of the BCWMC Plan (Goals and Policies) describes other requirements for local water management plans (local plans).

#### **5.3.1.2 BCWMC Review of Local Water Management Plans**

Before a member city adopts its local water management plan, the new or revised plan must be submitted to all of the affected watershed management organizations, the Metropolitan Council, and Hennepin County (if the County adopts a groundwater plan) for concurrent review. Within 60 days of receipt of the

local plan, the BCWMC will review the local plan for conformance with the BCWMC Plan. As part of its review, the BCWMC will take into consideration any comments received from the Metropolitan Council and the County. The BCWMC will approve or disapprove all or part of the local plan within the 60-day time frame, unless the city agrees to an extension. If the BCWMC does not complete its review, or fails to approve/disapprove the plan within the allotted time, and the city has not given an extension, the local plan will be considered approved (per Minnesota Rules 8410 and Minnesota Statutes 103B.235, Subd. 3 and 3a).

Once the BCWMC approves the local plan, the local government must adopt and implement its plan within 120 days and amend its official controls within 180 days of plan approval. Each member city must notify the BCWMC (and the other affected WMOs) within 30 days of plan adoption and implementation, and adoption of necessary official controls.

Any amendments to the local plan must be submitted to the BCWMC for review and approval prior to their adoption by the member city. The BCWMC review process for amendments is the same as for the original or revised local plan.

## 5.4 Plan Approval and Adoption

This Plan was submitted to the member cities, the BWSR, the MPCA, the MDNR, the Minnesota Department of Agriculture (MDA), the Minnesota Department of Health (MDH), the Metropolitan Council, the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Transportation (MnDOT), and Hennepin County for review, in accordance with Minnesota statutes. The BCWMC held a public hearing on the Plan on May 21, 2015; BWSR approved the Plan on August 27, 2015; the BCWMC formally adopted this Plan on September 17, 2015.

### 5.4.1 Stakeholder and Public Involvement

Input from review agencies and other public stakeholders was solicited during the development of this Plan. Prior to drafting the Plan, the BCWMC compiled recommendations regarding technical changes needed in the BCWMC Plan; this compilation is referred to as the "gaps analysis" (see Appendix D). The gaps analysis considered responses to the Plan notification letter received from the BWSR, MDNR, Metropolitan Council, and Three Rivers Park District.

The gaps analysis considered concerns raised by the BCWMC commissioners, as well as responses from the BCWMC Technical Advisory Committee to a series of five surveys distributed from 2010 through 2012 and addressing the following topics:

- Public education and involvement
- Erosion and sediment control
- Flood and rate control
- Public education and involvement
- Water quality
- Wetlands

- Funding
- Groundwater
- Planning process
- Public ditches
- BCWMC/City responsibilities
- BCWMC/City evaluation, accountability and enforcement
- New issues not otherwise raised

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 soliciting input via an online survey 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 objectives of these meetings were to:

- Gather input from member communities to guide the development of the BCWMC Plan
- Gather the thoughts and ideas about issues facing BCWMC water resources from watershed residents, elected and appointed officials, city staff, state agencies, and other partners
- Understand how the Commission can improve water resources while serving the member communities effectively and efficiently
- Prioritize watershed issues to inform the development of goals and policies in the BCWMC Plan

The results of the survey and workshops were presented at a “summit” meeting in June 2013, attended by the member city representatives, commissioners, review agencies, and the public. The outcome of the summit was a prioritized list of issues facing the BCWMC. The BCWMC commissioners considered the results of the summit in the development of Plan. Survey responses and summit ranking results are provided in Appendix E.)

Following the June 2013 summit, the BCWMC began in earnest developing sections of the Plan, facilitated by its Plan Steering Committee. The Plan Steering Committee was comprised of Commissioners, TAC representatives, and BCWMC staff. The Plan Steering Committee provided direction to BCWMC staff and preliminary review of draft Plan sections prior to review and discussion with the TAC, state review agencies, and the full BCWMC Board of Commissioners. The Plan Steering Committee hosted workshops to discuss draft Plan content. Workshops were attended by commissioners and alternates, city staff, and review agencies. Plan sections were revised per the comments received at these workshops.

The BCWMC Plan was submitted for formal 60-day review in November 2014 and revised per comments received during that period. Comments received during the formal review period can be found on the BCWMC website ([www.bassettcreekwmo.org](http://www.bassettcreekwmo.org)).



---

## 5.5 Plan Revision and Amendment

This Plan remains in effect for ten (10) years from the year it was approved and adopted, unless it is superseded by adoption and approval of a succeeding Plan. All amendments to this Plan must follow the procedures set forth in this section, or as required by revised laws and rules. Plan amendments may be proposed by any person to the BCWMC, but only the BCWMC may initiate the amendment process. The BCWMC may amend its Plan in the interim if either changes are required or if problems arise that are not addressed in the Plan, or if new projects need to be added to the CIP (see Section 5.2.1.1).

In accordance with Minnesota Statutes 103B.231, Subd. 3a, BWSR may develop a priority schedule for the revision of water management plans. BWSR uses the schedule to inform WMOs of when they will be required to revise their plans. If BWSR does not notify a WMO that a plan revision is required and the plan expires, Minnesota Statutes 103B.231, Subd. 3a states that the existing plan, authorities, and official controls of the WMO remain in full force and effect until a revision is approved. The same statute also allows a WMO to submit a draft plan revision for review prior to BWSR's scheduled date. If BWSR fails to adjust its priority review schedule and begin review of the submitted plan within 45 days of plan submittal, the WMO may adopt and implement their plan without formal BWSR approval.

Minnesota Rules 8410 provide additional information regarding plan amendments. Minnesota Rules 8410 requires WMOs to evaluate the implementation actions periodically. The BCWMC will review its implementation program annually. A plan amendment is required to add a project to the CIP (Table 5-3). A plan amendment is not required if projects listed in Table 5-3 are implemented at a different time than shown in the table.

### 5.5.1 General Amendment Procedure

The BCWMC will follow the plan amendment process described in Minnesota Statutes 103B.231, Subd. 11 unless the proposed amendment is considered a minor amendment according to the criteria described in Minnesota Rules 8410. In accordance with Minnesota Statutes 103B.231, Subd. 11, the plan amendment process is the same as the Plan review process, and is as follows:

1. The BCWMC must submit the amendment to the member cities, Hennepin County, the state review agencies (Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency, Minnesota Department of Agriculture, and the Minnesota Department of Health), the Metropolitan Council, and the Minnesota Board of Water and Soil Resources, for a 60-day review.
2. The BCWMC must respond in writing to any concerns raised by the reviewers.
3. The BCWMC must hold a public hearing on the proposed amendment.
4. The BCWMC must submit the final revised amendment and response to comments to the BWSR for a 90-day review and approval.

The BCWMC will consider sending drafts of proposed amendments to all plan review authorities to receive input before establishing a hearing date or beginning the formal review process.

---

The BCWMC may update its Requirements document (see Appendix H), Education and Outreach Plan (see Appendix B), and Monitoring Plan (see Appendix A) without performing a plan amendment.

### **5.5.2 Minor Plan Amendments**

The BCWMC will follow the following review process for minor plan amendments, provided that the amendment meets the criteria for a minor amendment as established in Minnesota Rules 8410:

1. The BCWMC will send copies of the proposed minor plan amendment to the affected local cities, the Metropolitan Council, Hennepin County (if the amendment is a minor amendment to the BCWMC capital improvement program), and the state review agencies for review and comment.
2. The BCWMC will hold a public meeting to explain the amendments and publish a legal notice of the meeting twice, at least 7 days and 14 days before the date of the meeting. The BCWMC will also provide mailed notice of the public meeting to the city clerk of each member city. The notice will be mailed not less than 45 days before the public meeting.
3. If the proposed amendment is a minor amendment to the BCWMC capital improvement program, Hennepin County must approve the minor amendment.
4. For proposed amendments with a project cost greater than \$500,000, the County review period will be 75 days. The BCWMC will submit detailed feasibility reports for these projects to the County along with the request for a minor plan amendment.

The minor plan amendment process is more streamlined than the general plan amendment process, since it requires only one (30-day) review.

### **5.5.3 Amendment Format and Distribution**

The BCWMC will prepare and distribute plan amendments in a format consistent with Minnesota Rules 8410. The BCWMC will maintain a distribution list of everyone who receives a copy of the Plan. Within 30 days of adopting an amendment, the BCWMC will distribute copies of the amendment to everyone on the distribution list and post the amendment on the BCWMC website. The BCWMC may consider sending drafts of proposed amendments to all plan review authorities to seek their comments before establishing a hearing date or commencing the formal review process, if schedule allows.

**Table 5-2 Permit Authority of Agencies with Jurisdiction within the BCWMC**

Agency	Type of Approval	Description
<b>Federal</b>		
U.S. Army Corps of Engineers (USACE)  Note: Section 401 Certification is implemented in coordination with the MPCA.	Section 10 of the Rivers and Harbors Act	Applies to placement of structures and/or work in, or affecting, navigable waters of the United States.
	Section 404 Permit	Applies to the discharge of dredged or fill material into waters of the United States. There are two types of Section 404 permits: regional and nationwide general permits, and individual permits.
	Section 401 of the Clean Water Act Water Quality Certification	Applies to activities that require a Corps of Engineers Section 10, Corps of Engineers Section 404 or Federal Energy Regulatory Commission permit. These activities must first obtain Section 401 water quality certification.
<b>State</b>		
Minnesota Department of Natural Resources (MDNR)	Public Waters Work Permit	Applies to any work that will alter the course, current or cross-section of any MDNR public water lake, wetland or watercourse; also applies to any work below the ordinary high water mark of MDNR public waters.
	Groundwater or Surface Water Appropriation Permit	Applies to suppliers of domestic water to more than 25 people or for any use of groundwater or surface water that exceeds 10,000 gallons/day or 1,000,000 gallons/year.
	Dam Safety Permit	Applies to impoundments that pose a potential threat to public safety or property. Dams 6 feet high or less and dams that impound 15 acre-feet of water or less are exempt from the rules. Dams less than 25 feet high that impound less than 50 acre-feet of water are also exempt unless there is a potential for loss of life.
	Riprap Shore Protection Permit	Applies to the placement of riprap shore protection or placement of fill to recover shoreland lost to erosion.
	Aquatic Plant Management Permit	Applies to chemical or mechanical removal of aquatic plants, including submerged, emergent, and floating vegetation.
	Fisheries Permit	Applies to transport and stocking of fish and the removal of rough fish.
Minnesota Environmental Quality Board (EQB)	Environmental Assessment Worksheet	Broad environmental assessment required for certain proposed developments and other activities.
Minnesota Department of Health (MDH)	Well Management Program	Applies to drilling of new water wells and sealing of abandoned water wells. Includes Wellhead Protection Program.
	Safe Drinking Water Act	Applies to construction of new water wells and other public water supply systems
Minnesota Pollution Control Agency (MPCA)	State Discharge System/National Pollutant Discharge Elimination System (NPDES) Permit	Applies to all discrete sources of wastewater discharge to surface waters, including sanitary wastewater, process wastewater, etc.
	NPDES/SDS Construction Stormwater Permit	Applies to construction activities that disturb 1 or more acres of land.



**Table 5-2 Permit Authority of Agencies with Jurisdiction within the BCWMC**

Agency	Type of Approval	Description
Minnesota Pollution Control Agency (MPCA)	NPDES General Industrial Stormwater Permit	Applies to certain industrial/ commercial activities that come into contact with stormwater. Requires preparation of stormwater pollution prevention plan.
	NPDES General Storm Water Permit for small Municipal Separate Storm Sewer Systems (MS4s)  Note: Minneapolis is a large MS4 and operates under an individual permit.	Applies to municipal storm sewer systems serving populations fewer than 100,000 located in urbanized areas, MnDOT, counties, and other public systems (e.g., universities). Requires permittees to implement public education programs, detect and eliminate illicit discharges, control construction site and post-construction stormwater runoff on sites that disturb 1 or more acres of land, and address pollution prevention at municipal operations.
	NPDES Phase 1 MS4 Storm Water Permit	Applies to municipal storm sewer systems serving populations over 100,000 (in Minnesota, only Minneapolis and St. Paul). Requires practices similar to permit for small MS4s, plus additional requirements.
	Permit for disposal of dredged material (permit not required for stormwater ponds)	Applies to material excavated at or below the ordinary high water level of waterbasins, watercourses, public waters, or public waters wetlands (note: specific guidance provide for material removed from stormwater ponds).
	Section 401 of the Clean Water Act Water Quality Certification	Applies to activities that require a Corps of Engineers Section 10, Corps of Engineers Section 404 or Federal Energy Regulatory Commission permit. These activities must first obtain Section 401 water quality certification.
Note: Section 401 Certification is implemented in coordination with the USACE.		

Table 5-3 BCWMC 2015-2025 CIP (Amended July 2017)

BCWMC ID	Capital Project Description		Estimated Capital	Year											
				2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Watershed-wide															
WS-1	Remove sediment deltas in lakes downstream of intercommunity watersheds to reduce phosphorus and sediment loading, following evaluation of sediment sources										TBD	TBD	TBD	TBD	TBD
	Implementation of water quality improvement projects resutling from Metro Chloride TMDL (pending) to address										TBD	TBD	TBD	TBD	TBD
	Implementation of water quality improvement projects resutling from the Upper Mississippi River Bacteria TMDL										TBD	TBD	TBD	TBD	TBD
	Implementation of water quality improvement projects resulting from future TMDLs (Policy 7, generally)										TBD	TBD	TBD	TBD	TBD
Medicine Lake															
ML-12	Projects address phosphorus load reduction requirements in-Medicine Lake TMDL	Medley Park Stormwater Treatment Facility, Golden Valley	\$ 500,000									\$200,000	\$300,000		
ML-14 <sup>3</sup>		Medicine Lake shoreland restoration	\$ 100,000							After 2023					
ML-15		Wet pond (0.5 acre) at downstream end of each major subwatershed	\$ 2,000,000							After 2023					
ML-16		Water quality retrofits to existing ponds upstream of Medicine Lake	\$11,000,000							After 2023					
ML-17		In-lake alum treatment (Option 18 in Medicine Lake Plan)	\$ 1,400,000							After 2023					
ML-19 <sup>4</sup>		Chemical treatment of inflow to Medicine Lake from watershed	\$ 1,000,000							After 2023					
ML-20		Mt. Olivet Stream Restoration Project	\$400,000							\$400,000					
ML-21		Jevne Park Stormwater Pond, City of Medicine Lake to alleviate flooding/improve water quality	\$500,000							\$ 200,000	\$300,000				
Plymouth Creek															
2017CR-P <sup>5</sup>	Plymouth Creek Restoration, from Annapolis Lane to 2,500 feet upstream (east) of Annapolis Lane to reduce phosphorus and sediment loading, and improve habitat		\$ 863,573			\$ 580,930	\$ 282,643								
Sweeney Lake															
SL-3 <sup>6</sup>	Projects to address phosphorus load reduction requirements in-Sweeney Lake TMDL	Schaper Pond Diversion Project	\$ 612,000												
SL-4		Sweeney Lake shoreland restoration	\$ 300,000							After 2023					
SL-5		Water quality retrofits to existing ponds upstream of Sweeney Lake	\$ 800,000							After 2023					
SL-6		Dredging of Spring Pond and diversion of Sweeney Lake branch into Spring Pond.	\$ 1,000,000							After 2023					
SL-7		Projects to reduce loading from untreated Hennepin County and MnDOT right-of-way	\$ 400,000							After 2023					
SL-8		In-lake alum treatment of Sweeney Lake	\$ 275,000							After 2023					
SL-9 <sup>4</sup>		Chemical treatment of inflow to Sweeney Lake from Sweeney Lake Branch of Bassett Creek	\$ 1,000,000							After 2023					
SL-10		Impervious area runoff retention and retrofits, including bioretention, rainwater gardens, and soil restoration (various locations)	\$ 500,000							After 2023					
SL-11	Stormwater treatment system for dissolved phosphorus removal in Golden Valley	\$ 400,000							After 2023						
Twin Lake															
TW-2 <sup>6</sup>	In-lake alum treatment of Twin Lake to reduce internal phosphorus loading		\$ 160,000												
Bassett Creek Park Pond															
BCP-2	Dredging of Bassett Creek Park Pond and upstream channel improvements for water quality treatment to reduce						\$1,000,000								
Northwood Lake															
NL-1 <sup>7</sup>	Northwood Lake Water Quality Project to reduce phosphorus loading		\$ 1,769,070		\$ 676,000	\$ 1,093,070									
NL-2 <sup>8</sup>	Four Seasons Mall Area Water Quality Improvements to reduce phosphorus loading		\$ 990,000												
	Implementation of water quality improvement projects recommended in future Northwood Lake TMDL study									TBD	TBD	TBD	TBD	TBD	
Bassett Creek Main Stem															
2015CR-M <sup>9</sup>	Restore Main Stem channel, 10th Avenue to Duluth Street, Golden Valley to reduce phosphorus and sediment loading		\$ 1,503,000	\$1,503,000											
2017CR-M <sup>10</sup>	Main Stem Channel Restoration, Cedar Lake Road to Irving Ave to reduce phosphorus and sediment loading		\$ 1,064,472			\$ 400,000	\$ 664,472								
2021CR-M	Main Stem Channel Restoration, Bassett Creek Drive to Golden Valley Road (in Golden Valley) to reduce phosphorus		\$ 500,000							After 2023					
BC2,3,8, 10	Medicine Lake Road and Winnetka Avenue Long Term Flood Mitigation Plan Implementation		\$ 2,900,000					\$ 500,000	\$1,100,000		\$300,000	\$1,000,000			
BC-4 <sup>12</sup>	Honeywell Pond Expansion, Main Stem Watershed (Golden Valley) to reduce phosphorus loading and provide water quantity benefits		\$ 1,202,000		\$1,202,000										
BC-5 <sup>13</sup>	Water Quality Improvements (phosphorus reduction) in Bryn Mawr Meadows, Main Stem Watershed (Minneapolis)		\$ 500,000					\$ 500,000							
BC-7	Dredging of accumulated sediment in Main Stem of Bassett Creek just north of Highway 55, Theodore Wirth Regional Park, to reduce phosphorus loading and improve habitat		\$ 400,000							\$ 400,000					
BC-9	Restoration and stabilization of historic Bassett Creek channel, Main Stem Watershed (Minneapolis) to reduce phosphorus and sediment loading		\$ 500,000								\$500,000				
Westwood Lake															
WST-2	Westwood Lake Water Quality Improvement Project in Westwood Hills Nature Center		\$300,000					\$300,000							
Parkers Lake															
PL-7	Parkers Lake Drainage Improvement Project to reduce erosion, suspended solids, and total phosphorus to Pakers Lake		\$400,000							\$200,000	\$200,000				
Crane Lake															
CL-3 <sup>14</sup>	Retention of impervious area drainage at Ridgedale area (e.g., bioswales, tree trenches, rain gardens) to reduce phosphorus loading									TBD	TBD	TBD	TBD	TBD	
Total Annual Estimated Cost <sup>15</sup>			\$35,454,115	\$1,503,000	\$1,878,000	\$2,074,000	\$1,947,115	\$1,300,000	\$1,300,000	\$1,300,000	\$1,200,000	\$1,300,000			

**Notes:**  
TBD = To be determined, usually at the time the project is listed in the working (5-year) CIP.

1. Project costs presented in 2015 dollars.

2. Estimated costs are from TMDL studies or from BCWMC 2017-2021 working CIP; as projects are added to the CIP, preliminary cost estimates will be added to the 5-year working CIP and refined thru feasibility study process.

3. ML-14: Project may include lakeshore restoration projects administered by the BCWMC. The City of Plymouth has already performed lakeshore restoration on some properties adjacent to Medicine Lake.

4. Estimated cost of projects ML-19 and SL-9 do not include the annual cost of chemical precipitant and operation/maintenance of treatment facility.

5. 2017CR-P: Project is based on recommendations in the 2009 Plymouth Creek Restoration feasibility study.

6. SL-3 and TW-2: Projects already levied, to be constructed in 2015.

7. NL-1: Project based on Option 4 of the 1996 Northwood Lake Watershed and Lake Management Plan. Project includes construction of a pond upstream of Northwood Lake and installation of underground stormwater treatment and reuse system, and bioinfiltration cells.

8. NL-2: The Four Seasons Mall Area Water Quality Project could include construction of stormwater treatment ponds,-restoration of an eroding stream channel, alum treatment of stormwater, or other projects to address phosphorus loading. The projects stem from recommendations from the 1996 *Northwood Lake Watershed and Lake Management Plan*. The 2012 feasibility study for the Four Seasons Mall Area Water Quality Project is still being considered and refined. The BCWMC has already levied for the project defined as option 1 in the 2012 feasibility study.

9. 2015CR-M: Project is based on recommendations in the Feasibility Study for 2015 Bassett Creek Main Stem Restoration Project (2014). Project already levied: the BCWMC certified a levy to the county for 2015 (\$1,000,000);

10. 2017CR-M: Project is based on recommendations in the Feasibility Study for 2012 Bassett Creek Main Stem Restoration Project (2011).

11. BC-2/BC-8: Option 2 BC-HH1111-1 and Option 3 BC-HH11-1 in the Bassett Creek Main Stem Watershed Management Plan (2000).

12. BC-4: Project would divert currently untreated stormwater runoff to the pond.

13. BC-5: Project based on Option 7 in the Bassett Creek Main Stem Watershed Management Plan to treat currently untreated stormwater runoff to reduce phosphorus loading.

14. CL-3: Project is based on recommendations in the Crane Lake Watershed and Lake Management Plan (1995).

15. Includes estimated costs for projects not yet assigned an implementation year. Annual Estimated Costs do not necessarily reflect actual Hennepin County levy amount due to grants, financial contributions from cities, and use of CIP fund balance.

**Table 5-4 BCWMC Annual Implementation Program (non-CIP)**

Implementation Program Item		Cost <sup>1</sup> by Year of Implementation										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Admin.	Administration (non-technical)		\$140,000	\$137,000	\$137,000	\$137,000	\$137,000	\$137,000	\$137,000	\$137,000	\$137,000	\$137,000
Engineering & Monitoring	Technical Services		\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
	Development/Project Review (offset by fees)		\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000
	Development/Project Review (non-fee)		\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
	Commission/TAC meetings		\$14,500	\$14,500	\$14,500	\$14,500	\$14,500	\$14,500	\$14,500	\$14,500	\$14,500	\$14,500
	Surveys/Studies		\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
	Detailed Water Quality Monitoring <sup>3</sup>		\$76,000	\$63,000	\$137,000	\$101,000	\$45,000	\$106,000	\$76,000	\$45,000	\$131,000	\$101,000
	Water Quantity Monitoring		\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500
	Flood Control Project Inspections <sup>5</sup>		\$10,000	\$10,000	\$10,000	\$29,000	\$10,000	\$10,000	\$10,000	\$10,000	\$29,000	\$10,000
	Watershed Inspections (for ESC in cities, etc.)		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
	WOMP Implementation <sup>2</sup>		\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000
	Municipal Plan Review		\$8,000	\$8,000	\$8,000							
	Management Plan Update									\$40,000	\$40,000	\$40,000
	Annual updates to P8 model		\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
	TMDL Work		\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
	Modeling to update flood levels (Policy 25)		\$85,000	\$85,000	\$85,000							
	Flood protection funding criteria (Policy 27)					\$5,000						
	Habitat Monitoring Program (Policy 78)		\$5,000									
	Aquatic Invasive Species Work (Policy 79)		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
	Groundwater Work (Policies 46 & 47)		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Education	Annual Report/Publications		\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
	Website Maintenance		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
	Watershed Education Partnerships		\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500
	Education and Public Outreach <sup>4</sup>		\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000
	Public Communications		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000



**Table 5-4 BCWMC Annual Implementation Program (non-CIP)**

Implementation Program Item		Cost <sup>1</sup> by Year of Implementation										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Maintenance	Annual allocation to Channel Maintenance Fund		\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
	Annual allocation to Flood Control Project Long-Term Maintenance Fund		\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
	Flood Control Project rehabilitation and replacement plan (Policy 22)		\$5,000									
<b>Total Annual Cost (non-CIP)</b>			\$724,500	\$698,500	\$772,500	\$667,500	\$587,500	\$648,500	\$618,500	\$627,500	\$732,500	\$683,500

**Notes:**

All costs presented in 2015 dollars

<sup>1</sup> All of the items in this table are funded under the BCWMC General Fund

<sup>2</sup> Cost-sharing provided by the Metropolitan Council for operation of WOMP station. Costs shown include only the BCWMC share of the costs.

<sup>3</sup> Estimated annual costs may vary based on revisions/updates to the BCWMC Monitoring Plan.

<sup>4</sup> Estimated annual costs may vary based on revisions/updates to the BCWMC education and outreach plan.

<sup>5</sup> Inspection of the double box culvert at the tunnel entrance performed every 5 years (2019, 2024); inspection of the deep tunnel is performed every 20 years (next planned for 2028).

**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
<b>Administrative and Review Activities</b>			
Review projects for consistency with BCWMC requirements	NA	Ongoing	Number of development proposals reviewed: <ul style="list-style-type: none"> <li>• 2007 – 26</li> <li>• 2008 – 31</li> <li>• 2009 – 13</li> <li>• 2010 – 28</li> <li>• 2011 – 32</li> <li>• 2012 – 37</li> <li>• 2013 – 41</li> </ul>
Review of member city local water management plans	NA	Periodic	<ul style="list-style-type: none"> <li>• 2006 – Minneapolis</li> <li>• 2008 – Golden Valley, Minnetonka, New Hope, Plymouth</li> <li>• 2009 – St. Louis Park, Crystal</li> </ul> 2010 – Robbinsdale, Medicine Lake
Complete minor and major plan amendments as necessary to update the Capital Improvement Program (CIP)	NA	Ongoing	Annually (2004 – 2013)
Erosion Control Inspections	NA	Ongoing	Performed monthly at construction sites within the watershed 2004 – 2013.
Flood control project inspections	NA	Annual	Performed annually; results are summarized and provided to appropriate municipalities and MnDOT.
Inspection of the double box culvert at the entrance to the Bassett Creek tunnel	NA	Every 5 years	Performed in 2004, 2009, and 2014.
Bassett Creek tunnel inspection	NA	2008	Performed every 20 years in coordination with City of Minneapolis, MnDOT, and U.S. Army Corps of Engineers
Long-term maintenance of the Flood Control Project	NA	Ongoing	Funded by annual assessments. Portion of funds used to complete Sweeney Lake outlet project (see Table 5-5).
Complete annual report, submit to BWSR and post to website	NA	Annually	Completed annually; available at BCWMC website.
Apply for grants and/or assist in city application for grants	NA	Ongoing	The BCWMC has received multiple grants for projects, including: <ul style="list-style-type: none"> <li>• \$360,000 BWSR Clean Water Fund for stream restoration projects on Plymouth Creek and Bassett Creek Main Stem (2010)</li> <li>• \$75,000 BWSR Clean Water Fund for Wirth Lake outlet modifications (2010)</li> </ul> \$217,500 BWSR Clean Water Fund for Bassett Creek Main Stem restoration projects (2011)
Complete annual audit and submit to BWSR	NA	Annually	Completed annually.
Update BCWMC Watershed Management Plan	NA	2012-	The BCWMC began updating its 2004 Watershed Management Plan in 2012, including establishing a Steering Committee and public participation process.

**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
			Plan approval and adoption expected in 2015. A gaps analysis was completed in 2012.
<b>Water Quality and Quantity Monitoring and Studies</b>			
Detailed lake water quality monitoring (Note that additional water quality monitoring is performed by other entities with varying levels of cooperation by the BCWMC)	NA	Annual	BCWMC performed detailed monitoring of waterbodies within the watershed on a rotating schedule: <ul style="list-style-type: none"> <li>• 2007 – Crane Lake, Westwood Lake</li> <li>• 2008 – Sweeney Lake, Twin Lake</li> <li>• 2009 – Sweeney Lake, Twin Lake, Northwood Lake, North Rice Pond, South Rice Pond</li> <li>• 2010 – Medicine Lake</li> <li>• 2011 – Crane Lake, Westwood Lake</li> <li>• 2012 – None</li> <li>• 2013 – Northwood Lake, North Rice Pond, South Rice Pond</li> <li>• 2014 – Sweeney Lake, Twin Lake</li> </ul>
Operate stormwater runoff monitoring station (i.e., WOMP)	NA	Ongoing	Performed in cooperation with the Metropolitan Council and Minneapolis Parks and Recreation Board (MPRB). MPRB's involvement ended in 2012.
Conduct Fish Index of Biological Integrity of Bassett Creek Main Stem	NA	2008	Performed in cooperation with MPCA.
E. coli bacteria monitoring of Bassett Creek Main Stem	NA	2008, 2009, 2010	Performed in cooperation with MPCA. Analysis of monitoring results completed in 2010.
Biotic index monitoring of Bassett Creek Main Stem and tributaries	NA	2006, 2009, 2012	Performed every 3 years at sampling sites on the Main Stem of Bassett Creek, North Branch of Bassett Creek, Plymouth Creek, and Sweeney Lake Branch of Bassett Creek
Lake and stream gauging program (water level readings)	NA	Ongoing	Lake level data collected at Medicine Lake, Sweeney Lake, Parkers Lake, Westwood Lake, Crane Lake, and Northwood Lake. Readings taken twice monthly from April 1 – September 30 and one per month in other months.
Twin Lake internal loading investigation	NA	2010-2011	Investigation included water quality monitoring and sediment analysis of Twin Lake. Report completed in 2011.
Updates to watershed-wide hydrologic/hydraulic model	NA	2012-2013	Converted existing models to a single watershed-wide XP-SWMM model.
Updates to the P8 water quality model	NA	2012-2013	Portions of the existing P8 water quality model were updated to reflect current land use and BMP conditions.
Completion of a <i>Resource Management Plan</i>	NA	2009	BCWMC completed a plan to expedite US Army Corps of Engineers' permitting process for water quality improvement projects in the BCWMC CIP.
Sweeney Lake TMDL Study and Implementation Plan	NA	2007-2010	BCWMC cooperated with the MPCA to undertake the Sweeney Lake TMDL study beginning with Phase I in 2007-2008 and continuing in 2008-2009 with Phase 2.



**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
			A draft of the TMDL was completed in 2010. The TMDL was approved by the MPCA and USEPA in 2011.
Medicine Lake TMDL Study and Implementation Plan	NA	2008-2010	BCWMC cooperated with the MPCA to undertake the Medicine Lake TMDL study beginning in 2008 with the MPCA taking the lead role. BCWMC partnered with the MPCA and Three Rivers Park District to develop the TMDL Implementation Plan beginning in 2009. The TMDL was approved by the MPCA and USEPA in 2011.
Wirth Lake TMDL Study and Implementation Plan	NA	2008-2010	BCWMC cooperated with the MPCA to undertake the Wirth Lake TMDL study beginning in 2008 with the MPCA taking the lead role. A draft of the TMDL was completed in 2009. The TMDL was approved by the MPCA and USEPA in 2010
<b>Education and Outreach</b>			
Publishing articles in local newspapers	NA	Ongoing	
Conducting tours of the watershed	NA	Approximately every other year	Conducted tours in 2005, 2007, 2009, 2011, 2014
Co-sponsoring MetroBlooms rainwater garden workshops	NA	2008, 2011 - 2014	
Staffing informational booths at fair, expos, and other events	NA	Ongoing	Events include: <ul style="list-style-type: none"> <li>Plymouth Yard/Garden Expo</li> <li>Plymouth Environmental Quality Fair</li> </ul> Golden Valley Days
Participating in Blue Thumb	NA	Ongoing since 2008	Blue Thumb is a local program that encourages homeowners to use native planting, rain gardens, and shoreline stabilization to reduce runoff.
Participating in Metro WaterShed Partners	NA	Ongoing	Including the Minnesota Waters "Let's Keep Them Clean" campaign
Conducting surveys of watershed residents	NA	Periodically	Surveys include a 2007 survey of residents' knowledge of water-related issues and 2013 resident survey intended to guide next generation Plan development.
Participated in watershed education alliance (West Metro Watershed Alliance, WMWA) with four neighboring WMOs	NA	Ongoing since 2009	
Giving away native seed packets	NA	Ongoing	
Participating in the development of educational materials distributed to target audiences	NA	Periodically	Including the "10 Things You Can Do" brochure distributed to member cities (2009 and 2014)
Maintaining the Technical Advisory Committee	NA	Ongoing	The TAC meets about six times per year to review and make recommendations regarding topics assigned by the Commission.
Maintain the BCWMC Website	NA	Ongoing	Continually update website with Commission meeting materials and minutes, technical reports and studies,

**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
			and watershed news.
<b>Capital Projects by Watershed</b>			
<b>Medicine Lake</b>			
Construction of wet detention pond to treat runoff from subwatershed BC94B1	ML-1	Pre-2004	Pond constructed by the City of Plymouth prior to 2004 Plan without BCWMC funding.
Reduce goose loading by 75 percent	ML-2	Ongoing	Option 17 in the Medicine Lake Plan. Periodically performed by the City of Plymouth.
Reroute flows from subwatershed BC94 to wet detention pond for BC92	ML-3	2006	Option 9a from the Medicine Lake Plan and included the dredging of accumulated sediment. Performed by the City of Plymouth.
Construction of Medicine Lake East Beach wet detention pond for subwatershed BC107	ML-4	2006	Option 11 from the Medicine Lake Plan. Constructed by the City of Plymouth.
Construction of wet detention pond for subwatersheds BC98, BC98A and BC98B	ML-5	2004	Option 10a from the Medicine Lake Plan. Constructed by the City of Plymouth.
In-lake Herbicide Treatment	ML-7	2004, 2005, 2006, 2008	Herbicide application to treat curlyleaf pondweed was performed in multiple years; a report was published in 2007. Performed by the City of Plymouth.
Construction of Lakeview Park Pond	ML-8	On Hold	Project includes <1 acre pond located in periodically-flooded are of Lakeview park. Pond will provide water quality treatment for an area draining to Medicine Lake currently without treatment.
West Medicine Lake Park Ponds water quality project	ML-11	2010	Project to improve quality of stormwater runoff to Medicine Lake. Constructed by the City of Plymouth
<b>Plymouth Creek</b>			
Channel restoration – Medicine Lake to 26 <sup>th</sup> Avenue (Plymouth)	PC-1	2010-2012	Project completed by the City of Plymouth. Partially funded by BWSR CWF grant.
Channel restoration –26 <sup>th</sup> Avenue to 37 <sup>th</sup> Avenue (Plymouth)	PC-2	Not Implemented	
<b>Parkers Lake</b>			
Improvements to stormwater basin in PL-A13 near Circle Park	PL-6	2010	Project completed by the City of Plymouth as part of street redevelopment.
<b>Wirth Lake</b>			
Dredging of detention pond in subwatershed FR-5	WTH-1	2007	Option 2 in the Wirth Lake Plan
Highway 55 detention pond	WTH-2	Not Implemented	Wirth Lake water quality has improved significantly. In 2014, it was removed from the Impaired Waters List. Project may be considered in future if necessary (see Table 5-3).
In-lake alum treatment of Wirth Lake	WTH-3	Not Implemented	Wirth Lake water quality has improved significantly. In 2014, it was removed from the Impaired Waters List.
Wirth Lake outlet modification to prevent backflow	WTH-4	2012	Project included the addition of two rubber check valves to prevent backflow from Bassett Creek into Wirth Lake under flooding conditions, reducing annual phosphorus loading to Wirth Lake. Project is

**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
			part of the Wirth Lake TMDL Implementation Plan. The project was constructed by the City of Golden Valley and was partially funded by a BWSR CWF grant.
<b>Sweeney Lake</b>			
Sweeney Lake outlet replacement	FC-1	2012	Project included stabilization of eroding embankments and replacement of outlet structure to prevent further erosion and maintain lake level for flood control purposes. Funded through BCWMC Flood Control Project Long-term Maintenance Fund and constructed by the City of Golden Valley.
Schaper Pond diversion project	SL-3	2015	Project includes rerouting of inflow from Highway 55 inlet to northwest side of the pond to improve phosphorus removal efficiency within the pond. Project is anticipated to meet required load reduction of the Sweeney Lake TMDL.
<b>Twin Lake</b>			
Pond expansion	TW-1	Not Implemented	Option 1 in the Twin Lake Plan. Project delayed due to site contamination and right-of-way issues.
In-lake alum treatment of Twin Lake	TW-2	2015	<i>Twin Lake Feasibility Study</i> (2013) recommended in-lake alum treatment as the most feasible option to reduce phosphorus and algae in Twin Lake to pre-2008 levels. Pending approval further review of recent water quality data.
<b>Westwood Lake</b>			
Construction of detention/ skimming facility at Flag Avenue	WST-1	2009	Option 1 in Westwood Lake Plan. Constructed by the City of St. Louis Park.
<b>Bassett Creek Park Pond – None Proposed</b>			
<b>Northwood Lake</b>			
Construction of ponds NB-35A, NB-35B, NB-35C and ponds NB-29A, NB-29B	NL-1	In progress	Option 4 in the Northwood Lake Plan. The City of New Hope constructed ponds NB-35A, NB-35B, and NB-35C, but not to degree of Northwood Lake Plan. Construction of ponds NB-29A, NB-29B, and a pond west of Northwood Lake (Jordan Outlet Pond) is planned for 2017-2018.
Four Seasons Mall area water quality project	NL-2	In Progress	Scenario 1 of a 2012 feasibility study. Project includes: <ul style="list-style-type: none"> <li>Construction of water quality treatment pond one site</li> <li>Construction of water quality treatment pond southwest of the mall near the intersection of 40<sup>th</sup> Avenue N and Pilgrim Lane</li> </ul> Restoration of an existing eroding stream channel.
Diversion of Lancaster Lane storm sewer	NL-3	Removed from CIP list	After more analysis, it was determined this project is not needed as the Lancaster Lane stormsewer already discharges to the wetland on the west side of Lancaster.



**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
Construction of ponds NB-36A, NB-37A, and NB-38A.	NL-4	2007	Option 5 in the Northwood Lake Plan. Ponds were constructed by the City of New Hope.
Northwood Lake East Pond water quality project	NL-7	2009	The City of New Hope constructed a pond to improve quality of stormwater runoff to Northwood Pond.
<b>Bassett Creek Main Stem</b>			
Construction of Pond BC 10-3	BC-1	2004	This project was completed as part of the Boone Ave and Brookview Golf Course improvement projects in 2004. Project completed without BCWMC funding.
Channel restoration – Crystal Border to Regent Avenue (Crystal/Golden Valley)	2010CR	2011	Project partially funded by a BWSR CWF grant.
Channel restoration – Wisconsin Ave. to Rhode Island Ave. and Duluth St. to Crystal/Golden Valley border	2011CR	2013	
Briarwood / Dawnview water quality improvement project (Golden Valley)	BC-7	2015	This project includes the installation of a stormwater management pond to treat 184 acres of residential area.
Channel restoration – Golden Valley Rd. to Irving Ave. N. (Golden Valley/Minneapolis)	2012CR	In Progress	Project restores streambank on Bassett Creek main stem. Project partially funded by a BWSR CWF grant.
<b>Sweeney Lake Branch of Bassett Creek</b>			
Channel Restoration – from Cortlawn Pond to Turner's Crossroad		2008	Constructed by the City of Golden Valley.
<b>North Branch of Bassett Creek</b>			
Channel restoration – 32 <sup>nd</sup> Ave. N. to Douglas Dr. N. (Crystal)	2011CR-NB	2013	Restored streambanks from 32 <sup>nd</sup> Avenue North to Douglas Drive North, in Crystal
<b>Grimes, North Rice and South Rice Ponds</b>			
Construction of Grimes Pond wet detention pond	GR-2	Not Implemented	Option 4 in the Rice and Grimes Ponds Plan
<b>Crane Lake</b>			
Construction of detention/skimming facility at Ramada Inn	CL-1	Not Implemented	Option 1 in the Crane Lake Plan
Construction of wet detention pond at Joy Lane	CL-2	Not Implemented	Project deemed not feasible by the City of Minnetonka in 2008.
<b>Turtle Lake – None Proposed</b>			
<b>Lost Lake – None Proposed</b>			
<b>Flood Control Project</b>			
Perform flood-proofing of homes along Bassett Creek Trunk System		2008	Funded by remaining portion of the Flood Control Project construction funds.

**Notes:**

<sup>1</sup> Project Number is based on Table 12-2 of the 2004 Plan (as amended). Table 12-2 from the 2004 Plan is updated as Table 5-3 in this Plan.

<sup>2</sup> Based on year of substantial progress (project completion may occur at a later date).

**Table 5-5 Past BCWMC Accomplishments (since approval of 2004 Plan)**

Implementation Item	Project No Table 12-2 of 2004 Plan (as amended) <sup>1</sup>	Year Implemented <sup>2</sup>	Status / Description
Construction of ponds NB-36A, NB-37A, and NB-38A.	NL-4	2007	Option 5 in the Northwood Lake Plan. Ponds were constructed by the City of New Hope.
Northwood Lake East Pond water quality project	NL-7	2009	The City of New Hope constructed a pond to improve quality of stormwater runoff to Northwood Pond.
<b>Bassett Creek Main Stem</b>			
Construction of Pond BC 10-3	BC-1	2004	This project was completed as part of the Boone Ave and Brookview Golf Course improvement projects in 2004. Project completed without BCWMC funding.
Channel restoration – Crystal Border to Regent Avenue (Crystal/Golden Valley)	2010CR	2011	Project partially funded by a BWSR CWF grant.
Channel restoration – Wisconsin Ave. to Rhode Island Ave. and Duluth St. to Crystal/Golden Valley border	2011CR	2013	
Briarwood / Dawnview water quality improvement project (Golden Valley)	BC-7	2015	This project includes the installation of a stormwater management pond to treat 184 acres of residential area.
Channel restoration – Golden Valley Rd. to Irving Ave. N. (Golden Valley/Minneapolis)	2012CR	In Progress	Project restores streambank on Bassett Creek main stem. Project partially funded by a BWSR CWF grant.
<b>Sweeney Lake Branch of Bassett Creek</b>			
Channel Restoration – from Cortlawn Pond to Turner's Crossroad		2008	Constructed by the City of Golden Valley.
<b>North Branch of Bassett Creek</b>			
Channel restoration – 32 <sup>nd</sup> Ave. N. to Douglas Dr. N. (Crystal)	2011CR-NB	2013	Restored streambanks from 32 <sup>nd</sup> Avenue North to Douglas Drive North, in Crystal
<b>Grimes, North Rice and South Rice Ponds</b>			
Construction of Grimes Pond wet detention pond	GR-2	Not Implemented	Option 4 in the Rice and Grimes Ponds Plan
<b>Crane Lake</b>			
Construction of detention/skimming facility at Ramada Inn	CL-1	Not Implemented	Option 1 in the Crane Lake Plan
Construction of wet detention pond at Joy Lane	CL-2	Not Implemented	Project deemed not feasible by the City of Minnetonka in 2008.
<b>Turtle Lake – None Proposed</b>			
<b>Lost Lake – None Proposed</b>			
<b>Flood Control Project</b>			
Perform flood-proofing of homes along Bassett Creek Trunk System		2008	Funded by remaining portion of the Flood Control Project construction funds.

**Notes:**

<sup>1</sup> Project Number is based on Table 12-2 of the 2004 Plan (as amended). Table 12-2 from the 2004 Plan is updated as Table 5-3 in this Plan.

<sup>2</sup> Based on year of substantial progress (project completion may occur at a later date).

BCMWC 2015 Watershed Management Plan

Section 6 – References

Contents

6.0      References .....6-1



*This page intentionally left blank*

---

## 6.0 References

- Barr Engineering Company, 2001. *Minnesota Urban Small Sites BMP Manual. Stormwater Best Management Practices for Cold Climates*. Prepared for the Metropolitan Council, with guidance and support from the city of Minneapolis, Minnehaha Creek Watershed District, Rice Creek Watershed District, and Six Cities Watershed Management Organization.
- Barr Engineering Company. 2010. *Wirth Lake Excess Nutrients Total Maximum Daily Load Report* prepared for Minnesota Pollution Control Agency.
- Bassett Creek Watershed Management Commission. 1972. *Watershed Management Plan for Bassett Creek*.
- Bassett Creek Watershed Management Commission. 1990. *Bassett Creek Water Management Plan*.
- Bassett Creek Watershed Management Commission. 2004. *Bassett Creek Watershed Management Plan*.
- Bassett Creek Watershed Management Commission. 2006. *2005 Lake Water Quality Study: Northwood, Sweeney and Twin Lakes*.
- Bassett Creek Watershed Management Commission. 2008. *2007 Lake Water Quality Study: Westwood Lake and Crane Lake*.
- Bassett Creek Watershed Management Commission. 2009. *2008 Lake Water Quality Study: Sweeney Lake and Twin Lake*.
- Bassett Creek Watershed Management Commission. 2008 and as amended. *Bassett Creek Water Management Commission Requirements for Improvements and Development Proposals*.
- Bassett Creek Watershed Management Commission. 2009. *Resource Management Plan for Bassett Creek Watershed Management Commission Proposed Water Quality Improvement Projects 2010 – 2016*.
- Bassett Creek Watershed Management Commission. 2010. *2009 Lake Water Quality Study: Sweeney Lake, Twin Lake, Northwood Lake, North Rice Pond, and South Rice Pond*.
- Bassett Creek Watershed Management Commission. 2011. *2010 Lake Water Quality Study of Medicine Lake*.
- Bassett Creek Watershed Management Commission. March 2011. *Twin Lake Phosphorus Internal Loading Investigation*.
- Bassett Creek Watershed Management Commission. February, 2013. *Feasibility Report for Water Quality Improvements in Twin Lake CIP Project TW-2*.
- Bassett Creek Watershed Management Commission. 2013. *A Biotic Index Evaluation of Bassett Creek and Plymouth Creek in 2012*.

---

Bassett Creek Watershed Management Commission. 2013. *Bassett Creek Water Quality Modeling*.

Bassett Creek Watershed Management Commission. 2014. *2013 Lake Water Quality Study: Northwood Lake, North Rice Pond, and South Rice Pond*.

Blue Water Science. 2013. *Trapnet Fish Surveys for Sweeney Lake (27-0035-01) and Twin Lake (27-0035-02), Hennepin County for Bassett Creek Watershed Management Commission*.

Blue Water Science. December, 2014. *Curlyleaf Pondweed Delineation and Assessment for Medicine Lake, Plymouth, Minnesota in 2014*. Prepared for the City of Plymouth.

DeShon, J.E. 1995. Development and application of the invertebrate community index (ICI). Pages 217-243 in W.S. Davis and T.P. Simon (editors). *Biological assessment and criteria: Tools for water resource planning and decision making*. Lewis Publishers, Boca Raton, Florida.

Hilsenhoff, William L. 1982. *Using a biotic index to evaluate water quality in streams*. Madison, WI, Dept. of Natural Resources.

LimnoTech. 2010. *Medicine Lake Excess Nutrients Total Maximum Daily Load* prepared for Minnesota Pollution Control Agency and the Bassett Creek Watershed Management Commission.

Minnesota Climatology Working Group Website – [www.climate.umn.edu](http://www.climate.umn.edu). Principal cooperators include the State Climatology Office (part of the Minnesota Department of Natural Resources - Division of Waters), Extension Climatology (part of Minnesota Extension Service), Academic Climatology (University of Minnesota), and other climate data providers (National Weather Service and National Climatic Data Center).

Minnesota County Biological Survey, Minnesota Department of Natural Resources, 1998. *Natural Communities and Rare Species of Carver, Hennepin, and Scott Counties, Minnesota County Biological Survey Map Series No. 18*.

Minnesota Department of Health. *Fish Consumption Advisory*. Data retrieved online from: <http://www.health.state.mn.us/divs/eh/fish/eating/sitespecific.html>.

Minnesota Department of Health. 2007. *Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas*.

Minnesota Department of Natural Resources. 2013. *Draft Strategic Plan for MDNR Groundwater Management Program*.

Minnesota Department of Natural Resources. 2014. Designation of Infested Waters. Online list retrieved from: <http://www.dnr.state.mn.us/invasives/ais/infested.html>

Minnesota Geological Survey, 1989. *Geologic Atlas of Hennepin County, Minnesota*.



---

Minnesota Pollution Control Agency. March. 2007. *Minnesota Statewide Mercury Total Maximum Daily Load*. Approved by the US Environmental Protection Agency in March, 2007.

Minnesota Pollution Control Agency. 2013. *National Pollution Discharge Elimination System Construction Stormwater General Permit*.

Minnesota Pollution Control Agency. 2014. *Guidance Manual for Assessing the Quality of Minnesota Surface Waters for Determination of Impairment: 305(b) Report and 303(d) List*.

Minnesota Pollution Control Agency. 2014. *State of Minnesota Minimal Impact Design Standards (MIDS)*.

Minnesota Pollution Control Agency. November. 2014. *Upper Mississippi River Bacteria Total Maximum Daily Load Study and Protection Plan*. Prepared for the Minnesota Pollution Control Agency and Minnesota Department of Health by Emmons and Olivier Resources, Inc. Approved by the US Environmental Protection Agency in November, 2014.

Minnesota Stormwater Manual contributors. May 2015. *Minnesota Stormwater Manual*.  
[http://stormwater.pca.state.mn.us/index.php/Main\\_Page](http://stormwater.pca.state.mn.us/index.php/Main_Page) [accessed 6 May 2015]

National Oceanic and Atmospheric Administration, National Climatic Data Center; Climate Data Online retrieved from: <http://www.ncdc.noaa.gov/>

Perica, Sanja, D. Martin, S. Pavlovic, I. Roy, M. St. Laurent, C. Trypaluk, D. Unruh, M. Yekta, and G. Bonnin. 2013. *NOAA Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 8 Version 2.0: Midwestern States (Colorado, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Wisconsin)*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Silver Spring, Maryland.

Seeley, Mark W. 2006. *Minnesota Weather Almanac*. Minnesota Historical Society. 294 pages.

Short Elliott Hendrickson Inc. and Barr Engineering Company. 2011. *Sweeney Lake Total Phosphorus Total Maximum Daily Load* prepared for Minnesota Pollution Control Agency and Bassett Creek Watershed Management Commission.

Soil and Water Conservation Society. 2003. *Conservation Implications of Climate Change: Soil Erosion and Runoff from Cropland*. Ankeny, IA: Soil and Water Conservation Society.

Three Rivers Park District. March 2008. *Medicine Lake Endothall Treatment to Control Curlyleaf Pondweed 2004-2007*.

United States Army Corps of Engineers, 1978. Bassett Creek Watershed, Minnesota, Communication from the Secretary of the Army, transmitting a Corps of Engineers Report on the Bassett Creek Watershed, Minnesota, in Response to Resolutions of the Senate and House Committees on Public Works Adopted

---

April 7, 1962, and September 24, 1970, Respectively. 95<sup>th</sup> Congress, 2d Session, House Document No. 95-360.

United States Department of Agriculture, Natural Resource Conservation Service. 1983. *Part 630 Hydrology, National Engineering Handbook, Chapter 4: Storm Rainfall Depth*.

United States Department of Agriculture, Natural Resource Conservation Service. 2001. *Soil Survey, Hennepin County, Minnesota*.

United States Fish and Wildlife Service. 1971. *Wetland Classification System, Circular 39*.