

Middle St. Croix
Watershed Management Organization

2015 Watershed Management Plan
90-Day Draft Revisions

August 2015

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Executive Summary

The Middle St. Croix Watershed Management Organization (MSCWMO) is a Joint Powers Watershed Management Organization composed of ten St. Croix Valley communities that was established under State Statute 103B to cooperatively manage water resources within the watershed. The member municipalities and townships of the MSCWMO appoint members of the MSCWMO Board. The ten member communities of the MSCWMO are: Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater, and West Lakeland Township (Figure 1.1).

The specific purposes of a watershed management organization according to the Minnesota Surface Water Management Act and Minnesota Statutes 103B.201 are to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge; and
- Protect and enhance fish and wildlife habitat and water recreational facilities.

The MSCWMO has developed the following additional purposes to help guide its goals and policies:

- Cooperatively manage water resources;
- Inventory and assess the resources;
- Monitor the water quality of lakes and streams;
- Provide education on water related issues;

The Middle St. Croix watershed encompasses approximately 19.8 square miles and is located in the east-central part of Washington County. The watershed is unique when compared to other watersheds in Washington County in that it lacks a major perennial stream channel and has a minimal number of surface water features: Lily Lake, McKusick Lake, Perro Pond, and Perro Creek. Lake St. Croix (the lower 25 miles of the St. Croix River) lies adjacent to the MSCWMO and receives drainage directly from many of the subwatersheds within the MSCWMO.

Water quality monitoring is performed by the MSCWMO in the major water bodies. A few of these water bodies are considered "impaired" as they do not meet State water quality standards and are thus placed on the impaired waters list. Lily Lake, considered a deep lake, does not meet State water quality standards due to excess nutrients which impacts its aquatic recreation use. McKusick Lake was added to the Impaired Waters List for excess nutrients in 2006 but was subsequently removed from the list (delisted) in 2012 after improvements in the watershed were installed and new monitoring data indicated the lake is now meeting water quality standards.

Brick Pond, ~~while classified as eutrophica clear water, vegetation dominated wetland~~, is not considered impaired because its high phosphorus levels do not result in high amounts of algae. Perro Creek is on the State's Impaired Waters List for high bacteria (*Escherichia coli*) levels.

Lake St. Croix, the lower 25 miles of the St. Croix River between Stillwater, MN and Prescott, WI, was designated as impaired in 2008 for excess phosphorus. The Lake St. Croix Nutrient TMDL was completed in 2012 by the MPCA and the Wisconsin Department of Natural Resources. The TMDL Implementation Plan was completed in February 2013.

This Plan was developed with input from various stakeholder groups including the MSCWMO member communities, lake associations, citizens, technical agencies, and MSCWMO board members. A wide ranging list of issues for the management of the water and natural resources in the watershed was developed (Section 3.2). Major topic areas included administration, education, erosion and sediment control, water quality and monitoring, groundwater, water quantity, development reviews, wetlands, and prioritization and tracking. Many of these issues are interconnected as they are impacted by development in the watershed. Section 3 provides specific issues statements and further discussion of the input process.

All existing local ordinances of the ten member communities, Washington County, and the rules of the adjoining watershed districts pertaining to stormwater management, erosion and/or sediment control, and wetlands were reviewed during the development of this plan. A summary of existing federal and state rules and authorities is located in Section 4 of this plan. There are varying degrees of local controls and ordinances among the member cities in the MSCWMO pertaining to stormwater management, erosion and/or sediment control, and wetlands. Member communities currently enforce State regulations in these areas while the MSCWMO reviews developments and projects for conformance with its watershed management plan policies and performance standards. In order to address the issues identified by stakeholders, the following goals were developed (Section 5):

- Protect and improve water quality in the Middle St. Croix watershed through the treatment and control of stormwater runoff.
- Minimize existing and future potential damages to property, public safety, and water resources due to flood events.
- Prevent erosion and subsequent sedimentation from surface runoff within the watershed on construction sites; agricultural lands; and along stream banks, lakeshores, and roadsides.
- Collect monitoring data needed to understand the quality of major water bodies, identify problems and determine appropriate practices and management practices.
- Manage the quantity and quality of wetlands, in conformance with the Minnesota Wetland Conservation Act (WCA) and Water Quality Standards Rules (Minnesota Rules 8420 and 7050).
- Collaborate to protect the quantity and quality of groundwater resources.
- Maintain or improve habitats by implementing protection or restoration measures that consider ecological functions as well as recreation, human health, safety, and welfare.
- Increase the knowledge and understanding of watershed residents, government officials and staff, consultants and developers on water quality, water quantity, wetlands and natural resource protection.
- MSCWMO is an efficient, well organized, and proactive organization that collaboratively prioritizes and manages water resources with member communities and other government jurisdictions.

A total of 67 strategies and 20 policies were developed to reach these goals. The strategies and policies are specific and measurable and include strategies the MSCWMO will take, along with policies that require actions by member communities (Section 5.0). The most notable of these strategies include:

- Work with local governments and state agencies to implement Minimal Impact Design Standards (S5)
- Develop and adopt a simplified review process and guidance and application materials to meet performance standards for minor subdivisions (S6)
- Inventory and evaluate outlets directly discharging to Lake St. Croix to further identify and prioritize practices to meeting the Lake St. Croix TMDL (S2)
- Require that new development and redevelopment areas be limited to the predevelopment or existing rate of runoff or to a rate within the capacity of downstream conveyance systems (S12)
- Require that project applicants secure any flowage easements that would be required to accommodate the stormwater management facilities. These easements shall be granted up to the 100-yr flood level (S14)
- Require and inspect proper temporary and permanent erosion and sediment control throughout the watershed to prevent nuisance conditions, erosion in receiving channels or on down slope properties, and inundation of wetlands (S21)
- Require vegetated buffers for projects adjacent to water bodies (S22)
- Require buffers and prohibit construction on steep slopes and bluffs (S23)
- Require thorough consideration and documentation of alternatives presented to justify wetland impacts; all projects shall be designed with minimal wetland impact (S32)
- Require wetland buffers based on wetland categories in the MSCWMO Performance Standards (S37)
- Collaborate with member communities, Washington County and other agencies on the development and adoption of policies on the quantity of water used in areas where existing wells and/or groundwater dependent natural resources could be negatively impacted by overuse of groundwater (S43)
- Promote the protection and restoration of natural and native shoreland areas, including the preservation of lakeshore and stream bank vegetation, and the establishment and maintenance of buffers adjacent to priority water bodies (S49)
- Provide training and education to local land use councils and staff on how they can accommodate growth while protecting and improving local water resources (S55)
- Maintain efficient water management programs where existing local units of governments remain the primary regulators and refer projects to the MSCWMO for investigation, comments and recommendations based on the MSCWMO's performance standards of this Plan (S58)
- Biennially evaluate this Plan's implementation by the MSCWMO and member communities and present the implementation of strategies and policies in a report (S64)

The MSCWMO Performance Standards (outlined in Section 7.0) will apply to new and re development within the Middle St. Croix watershed and will focus on stormwater management, erosion and sediment control, and wetland protection. The standards will also apply whenever a variance, grading, or building permit is required. Each member community will be responsible for incorporating the performance standards of this plan into their existing processes, and will refer projects to the MSCWMO for full review when triggered by the activities listed below.

- Any project undertaking grading, filling, or other land alteration activities which involve movement of earth or removal of vegetation on greater than 10,000 square feet of land.
- Any project that creates or fully reconstruct 6,000 square feet or more of impervious surface.
- All major subdivisions. Major subdivisions are defined as subdivisions with 4 or more lots.

- Any project with wetland impacts and any project with grading within public waters, the wetland buffer as identified in the plan, or within 40-feet of the bluff line.
- Development projects that impact 2 or more of the member communities.
- New or redevelopment projects that require a building permit that add 500 square feet of additional impervious surface.
- Any project requiring a variance from the current local impervious surface zoning requirements for the property.

The MSCWMO Implementation Program (Section 6.0) includes an information and education program, a data collection program for resource inventories and water quality, and a best management practices technical assistance and cost share program for encouraging water quality improvement and protection. Additionally, Section 6.0 provides information on MSCWMO and member community responsibilities, specifics of the MSCWMO review process, funding mechanisms (including grants), the process for amending this plan, if needed, and a description of this Plan's impact on member communities, and a list of past accomplishments.

Glossary

Acre-feet: The volume of water that would cover an acre of land to a depth of one foot, equal to 43,560 cubic feet.

[Atlas 14: Precipitation Frequency Estimates released by the National Weather Service Hydrometeorological Studies Design Center. Volume 8, released in 2013, provides precipitation frequency estimates for many Midwestern states including Minnesota.](#)

Aquifer: A saturated permeable geologic unit that can transmit significant quantities of water.

Banks and shorelines: Those areas along streams, lakes, ponds, rivers, wetlands, and estuaries where water meets land. The topography of banks and shorelands can range from very steep to very gradual.

Bedrock: Any solid rock exposed at the earth's surface or covered by unconsolidated materials such as till, gravel, or sand.

Best Management Practices (BMP): An engineered structure or management activity, or a combination of these that eliminates or reduces adverse environmental effects of pollutants.

Bioretention Basin- Smaller scale (up to 5 acre drainage area) vegetated treatment facilities typically distributed throughout the catchment area treating small storm runoff events.

Bluff line: A line along the top of a slope connecting the points at which the slope, proceeding away from the adjoining watershed channel, becomes less than twelve percent (12 %) and it only includes slopes greater than twelve percent (12%) visible from the river or any watercourse tributary to the river.

Buffer zone: The area between a water body and upland areas. The area of land that a transition zone occupies varies and is greatly influenced by topography.

Channel: A natural stream that conveys water or a ditch excavated for the flow of water.

Chlorophyll-a: The primary photosynthetic pigment in plants used as a measure of the algal biomass in lakes.

Common plan of development: A contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

Development, new: Any development that results in the conversion of land that is currently prairie, agriculture, forest, or meadow and has less than 15% impervious surface. Land that was previously developed, but now razed and vacant, will not be considered new development.

Dewatering , surface water: The removal (though pumping or trenching) of surface water to dry a construction site to enable construction activity.

Dewatering, ground water: The removal of ground water to dry and/or solidify a construction site to enable construction activity. Dewatering may require a Minnesota Department of Natural Resources water appropriation permit and, if dewatering water is contaminated, discharge of such water may require an individual MPCA NPDES/SDS permit.

Dissolved oxygen (D.O.): The concentration of molecular oxygen dissolved in water. Fish and other water organisms rely on dissolved oxygen levels to sustain life processes.

Drainage density: Sum of all stream channel lengths divided by the watershed area; also affects the time of concentration or the rapidity by which water can flow to an outlet.

Low: highly permeable soils, flat to moderately flat relief on the terrain, numerous landlocked water features.

Medium: low to medium permeable soils, moderately flat to medium/high relief on the terrain, well-defined drainage systems with few landlocked water features, existing water features dominated by perennial and ephemeral streams.

High: low to very low permeable soils, sometimes non-existent soils with exposed bedrock, high relief on the terrain, very well defined drainage systems with virtually no landlocked water features. ~~Virtually all water features perennial and ephemeral streams and man-made holding ponds/water features.~~

Drift: A comprehensive term that includes all rock materials that were deposited by glaciers composed of stratified and unstratified materials ranging in size from fine particles to boulders.

Erosion: The wearing away of the land surface by flows of water, wind, ice, or other geological agents.

Erosion prevention: Measures employed to prevent erosion. Examples include but not limited to: soil stabilization practices, limited grading, mulch, temporary erosion protection or permanent cover, and construction phasing.

Eutrophic lake: A nutrient-rich lake usually shallow and green due to excessive algal growth and limited oxygen in the bottom layer of water.

Eutrophication: The process of over-enrichment of lakes with nutrients, particularly phosphorus. The term also refers to the results of nutrient enrichment such as algae blooms and excessive plant growth.

Fully Reconstructed Impervious Surface: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects, and pavement rehabilitation projects that do not alter underlying soil material beneath the structure, pavement, or activity are not considered fully reconstructed impervious surfaces. Reusing the entire existing building foundation and re-roofing of an existing building are not considered fully reconstructed

Glacial deposits: Materials deposited as a result of glacial activity.

Gradients: Steepness or angle of slope. Also the rate of change in hydraulic head over distance.

Groundwater: Water contained in, or flowing through, the ground. Amounts and flows of groundwater depend on the permeability, size, and hydraulic gradient of the aquifer.

Groundwater discharge areas: Areas where groundwater exits to the surface. Depending on local topography, these may create continuously saturated areas on slopes or in shallow depressions that support unusual plant communities, or may interact with surface water runoff to create ponds and deep-water wetlands.

Groundwater recharge areas: Areas on the earth's surface where surface water can percolate down to the water table.

Gully: A channel or miniature valley formed by concentrated runoff.

High water level (HWL): The highest water elevation obtained during a design storm. Typically design storms are the 100-year storm.

Hydrologic soil groups: The classification of soils by their reference to the intake rate of water, which is influenced by texture, organic matter content, stability of the soil aggregates, and soil horizon development.

Hydrology: The study of water, especially its natural occurrence, characteristics, control, and conservation.

Ice-contact stratified deposits: Sand, loamy sand, and gravel locally stratified with silt and glacial till.

Impervious Surface: A constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.

Infiltration Basin- Development or regional scale (up to 50 acre drainage area) vegetated treatment facilities down-gradient of smaller scale water quantity control practices.

Infiltration rate: Rate at which water percolates into the ground.

Landlocked basins: Basins or depressions that have no surface outlet to a body of water.

Limiting factor: Environmental factor that limits the growth or activities of an organism or that restricts the size of a population or its geographical range.

Linear Project: Construction or reconstruction of roads, trails, sidewalks, and rail lines that are not part of a common plan of development or sale. Mill, overlay and other resurfacing projects are not considered to be reconstruction.

Loam: Soil composed of sand, silt, clay, and possible organic material.

Lowest Floor Elevation: The lowest floor of the lowest enclosed area (including basement).

[Low Impact Development \(LID\) - An approach to stormwater management that mimics a site's natural hydrology as the landscape is developed. Using the LID approach, stormwater is managed on site and](#)

the rate and volume of predevelopment stormwater reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

Metropolitan Urban Service Area (MUSA): The portion of the seven-county Metropolitan Area where local and regional services are committed and which have urban levels of regional sewer and transportation services.

Major Subdivision: All subdivisions not classified as minor subdivisions including, but not limited to, subdivisions of four (4) or more lots, or any size subdivision requiring any new street or extension of an existing street.

Minor Subdivision: Any subdivision containing three (3) or less lots fronting on an existing street, not part of a common plan of development nor involving any new street or road or the extension of municipal facilities.

Non-point source: Polluted runoff; nutrients and pollution sources not discharged from a single point.

Ordinary high water level (OHWL): The highest level reached by a body of water under normal conditions.

Outwash: Sandy or gravelly material deposited by glacial meltwater flowing from an ice sheet.

Peak discharge: The maximum instantaneous flow from a given storm condition at a specific location.

Permeability: The ability of a substance, such as rock or soil, to allow a liquid to pass or soak through it.

Phosphorus: A nutrient essential to plant growth. Phosphorus is the nutrient most commonly limiting plant growth in lakes.

Predevelopment Hydrology: The calculation of volume and rate of stormwater reaching water resources based on native soils and vegetation.

Protected Waters: Also known as “Public Waters”. These terms relate to MN Statute 105.37, subdivision 14 of the MDNR regulations and are identified on the MDNR ~~Protected Waters~~Public Water Inventory maps and in figure of Washington County (Figure 2.12 of this plan.). Proposed projects affecting the course, current, or cross-section of these water bodies may require a Public Waters Work Permit from the DNR and permits from other agencies. Any work or alteration in the beds of these waters requires a permit from the MDNR.

Public Waters: See definition for “protected waters.”

Recharge: Water added to the saturated zone of the water table. The main source of recharge is precipitation.

Reconstruction: The rebuilding, repair or alteration of a structure, surface, or facility.

Redevelopment: Any development that is not considered new development.

Retain: Manage stormwater on site using low-impact development approach so that the rate and volume of predevelopment stormwater reaching receiving waters is unchanged.

Sediment: Solid materials, both mineral and organic, that are in suspension, being transported, or have been moved from their sites of origin by air, water, wind, gravity, or ice.

Sediment control: Methods employed to prevent sediment from leaving the site. Sediment control practices include: silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, bio rolls, rock logs, compost logs, storm drain inlet protection, and temporary or permanent sedimentation basins.

Seeps: Groundwater/surface water connections; a moist or wet place in the land where water, usually groundwater, reaches the surface from an underground aquifer.

Stormwater runoff: Water that is generated by rainfall or snowmelt which causes runoff and is often routed into drain systems for treatment or conveyance. ~~Water falling as rain during a storm and entering a surface water body by flowing over land. Stormwater runoff picks up heat and pollutants from developed surfaces such as parking lots.~~

Stabilized: Exposed ground surface has been covered by appropriate materials such as mulch, staked sod, riprap, erosion control blanket, mats or other material that prevents erosion from occurring. Grass, agricultural crop or other seeding alone is not stabilization. Mulch materials must achieve approximately 90 percent ground coverage (typically 2 ton/acre).

St. Croix Riverway: All lands and public waters within the riverway boundary subject to the standards and criteria for the Lower Saint Croix National Scenic Riverway in Minnesota.

Stormwater Pollution Prevention Plan (SWPPP): A plan for stormwater discharge that includes erosion prevention BMPs, sediment control BMPs, and permanent stormwater management systems that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site nonpoint pollution.

Subwatershed: A smaller geographic section of a larger watershed unit with a drainage area between two and fifteen square miles and whose boundaries include all the land area draining to an outlet where two second order streams combine to form a third order stream.

Till: Un-stratified and unsorted material deposited directly by a glacier. Till consists of clay, sand, gravel, or boulders mixed in any proportion.

Total Phosphorus: A measure of all the different forms of phosphorus in water. Includes phosphorus dissolved in the water, suspended or incorporated in algae or other organisms.

Transparency: A measure of the clarity of water; the depth at which an object can be seen in water.

Trophic state: The level of growth or productivity of a lake as measured by the phosphorus content, algae abundance, and/or depth of light penetration.

Wetland or Wetlands: As defined in Minnesota Rules 7050.0130, subp. F and includes those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to

support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes:

- I. A predominance of hydric soils.
- II. Inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition.
- III. Under normal circumstances support a prevalence of such vegetation.

Watershed: The area of land draining into a specific body of water.

Acronyms

BCWD	Brown's Creek Watershed District
BMPs	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
CAC	Citizen Advisory Committee
CFS	Cubic Feet per Second
CIP	Capital Improvement Program
COD	Chemical Oxygen Demand
COE	U.S. Army Corps of Engineers
DO	Dissolved Oxygen
MDNR	Minnesota Department of Natural Resources
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GAC	Granulated Activated Carbon
GIS	Geographic Information Systems
HWL	High Water Level
JPA	Joint Powers Agreement
MAC	Metropolitan Airports Commission
<u>MDA</u>	<u>Minnesota Department of Agriculture</u>
MDH	Minnesota Department of Health
MES	Minnesota Extension Service
Met Council	Metropolitan Council
MGS	Minnesota Geological Survey
MNRAM	Minnesota Rapid Assessment Method
MPCA	Minnesota Pollution Control Agency
MSCWMO	Middle St. Croix Watershed Management Organization
MUSA	Metropolitan Urban Service Area
NEMO	Nonpoint source pollution Education for Municipal Officials
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NURP	National Urban Runoff Program
NWI	National Wetlands Inventory
NWL	Normal Water Level
OHWL	Ordinary High Water Level
PAHs	Polycyclic Aromatic Hydrocarbons
PPB	Parts Per Billion (ug/L)
PCBs	Polychlorinated Biphenyls
SWSRMP	State Wild and Scenic Rivers Management Program
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TCE	Trichloroethylene
TMDL	Total Maximum Daily Load
ug/L	Micrograms per Liter (PPB)
VOC	Volatile Organic Compounds
VBWD	Valley Branch Watershed District

WCA Wetlands Conservation Act
WCD Washington Conservation District
WD Watershed District
WMO Watershed Management Organization
WMP Watershed Management Plan
WRAPS Watershed Restoration and Protection Strategy
~~COE~~USACE U.S. Army Corps of Engineers
USDA United States Department of Agriculture

1.0 Introduction

1.1 Purpose

The Middle St. Croix Watershed Management Organization (MSCWMO) is a joint powers organization composed of ten St. Croix Valley communities that was established under Minnesota State Statute 103B to cooperatively manage water resources within the watershed. The member municipalities and townships of the MSCWMO appoint members of the MSCWMO Board.

In general, the purpose of a Watershed Management Organization (WMO) is to conserve natural resources through land use planning, flood control, and other conservation projects in order to ensure continued public health and welfare. The specific purposes of a watershed management organization according to the Minnesota Surface Water Management Act and Minnesota Statutes 103B.201 are to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge; and
- Protect and enhance fish and wildlife habitat and water recreational facilities.

The MSCWMO has developed the following additional purposes to help guide its goals and policies:

- Cooperatively manage water resources;
- Inventory and assess the resources;
- Monitor the water quality of lakes and streams;
- Provide education on water related issues;
- Review development plans for stormwater management, erosion and sediment control, and wetland and shoreland protection; and
- Plan and implement capital improvement projects that enhance the water resources of the watershed.

The MSCWMO's Second Generation Watershed Management Plan was completed in 2006 as a recommendation of the Washington County Water Governance Study (<http://mn-washingtoncounty.civicplus.com/DocumentCenter/View/728>) and the Minnesota Board of Water and Soil Resources (BWSR). Upon the completion of all projects in the Second Generation's Implementation Program in 2013, the BWSR recommended the development of a Third Generation Watershed Management Plan, even though such a plan would be completed ahead of the typical 10-year planning cycle.

This Plan identifies and prioritizes issues in the watershed and lays out goals, strategies and policies to address the issues. Performance standards for activities such as development and redevelopment in the watershed are also included herein.

1.2 Background

The Middle St. Croix watershed encompasses approximately 19.8 square miles and is located in the east-central part of Washington County. A distinction exists between the Middle St. Croix watershed and the other watersheds of Washington County in that the Middle St. Croix watershed has many small, parallel watersheds that all flow to the St. Croix, whereas the other watersheds in the County generally have one major drainage area with a headwaters and outlet (i.e., a creek with tributaries). Land use in the watershed is evenly distributed between agricultural uses, rural residential and high-density residential/commercial land uses.

The ten member communities of the MSCWMO are: Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater, and West Lakeland Township (Figure 1.1). The area and percentage of the member communities is included in Table 1.1.

Table 1.1 Area and Percentage of Member Communities

Community	Area (sq mile)	% Area
Afton	0.18	1
Bayport	1.70	9
Baytown Township	3.85	19
Lakeland	2.06	10
Lakeland Shores	0.30	2
Lake St. Croix Beach	0.55	3
Oak Park Heights	2.17	11
St. Mary's Point	0.66	3
Stillwater	3.35	17
West Lakeland Township	4.99	25
Total	19.81	100

The MSCWMO offices are located at:

C/o Washington Conservation District
455 Hayward Avenue
Oakdale MN 55128

1.3 Mission Statement

The MSCWMO revised its mission statement to align with current issues and the scope and purposes of this Plan:

"The Middle St. Croix Watershed Management Organization jointly and cooperatively manages the water resources of the Middle St. Croix Watershed. The ten member communities do so to collectively protect, manage and improve the quality of water resources in an efficient and effective manner."

2.0 Inventory and Assessment of Resources

2.1 Physical Environment

Climate and Precipitation

The climate of the Middle St. Croix watershed is consistent with the climate for the Seven County Twin Cities Metropolitan Area. The summers are relatively short in duration with a seasonal mean temperature of 70 degrees Fahrenheit (°F). The ground is usually covered with snow from late fall to early spring. Average annual snowfall accumulation is 56 inches. Average annual temperature and total annual precipitation at the Minneapolis/St. Paul International Airport are 46.2°F and 30.61 inches, respectively. (1981 – 2010, Minnesota Climatology Working Group).

Thirty-year average monthly temperature and precipitation data for Stillwater, Minnesota are summarized in Table 2.1.

Table 2.1 Stillwater, MN (1981 - 2010) Average Temperature and Precipitation, compiled by National Weather Service and National Climatic Data Center

Month	Temperature (°F)	Precipitation (in)
January	13.4	0.88
February	17.5	0.76
March	30.5	1.72
April	46.2	2.93
May	57.1	3.74
June	67	4.42
July	71.3	4.3
August	69.2	4.81
September	60.5	3.72
October	47.8	2.81
November	32.3	1.9
December	17.6	1.43
Annual Mean Temp and Total Precipitation	44.2	33.42

The standard values assumed for the probability of a rainfall event occurring in any given year is illustrated in Table 2.2. The recurrence interval is a measure of the probability of occurrence of a particular storm event. For example, a rainfall event of 7.18 inches has a 1% probability of occurring in a 24-hour period during any given year, which is expressed as once in every 100 years.

Table 2.2 Recurrence Intervals of Storm Events

Recurrence Interval (Years)	24-Hour Rainfall Amount (Inches)
1	2.44
2	2.81
5	3.50
10	4.17
25	5.23
50	6.16
100	7.18

Source: National Oceanic and Atmospheric Administration, Atlas 14

Geology, Groundwater Resources, and Soils

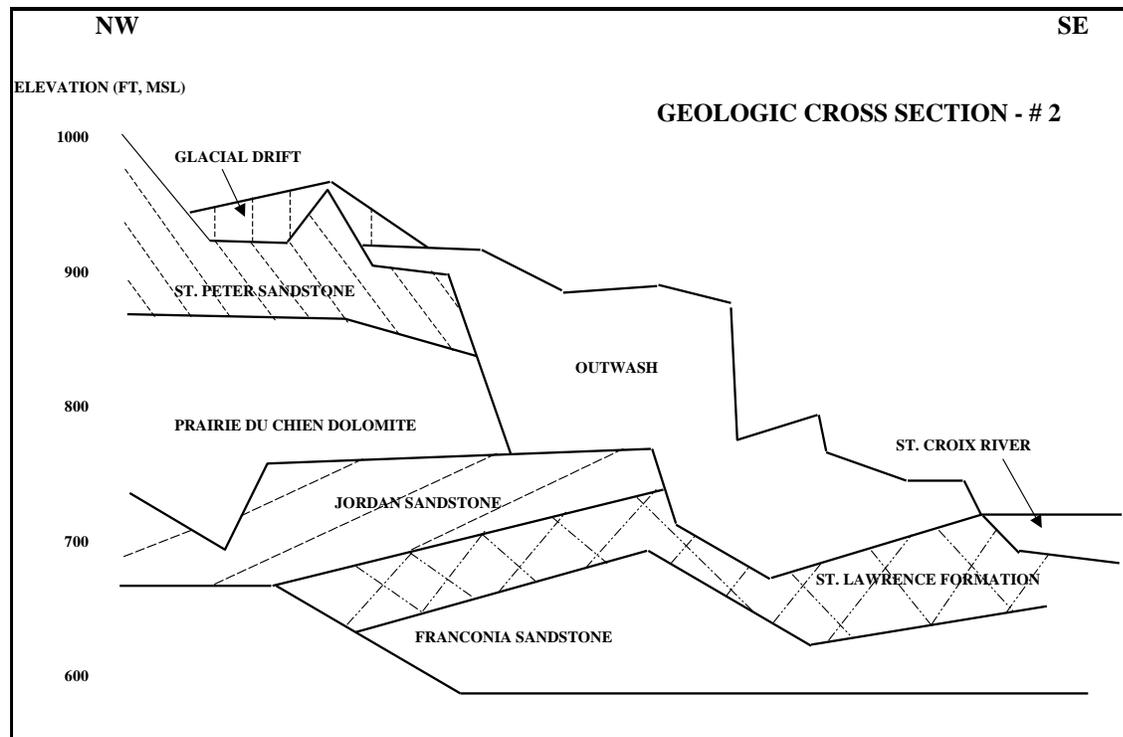
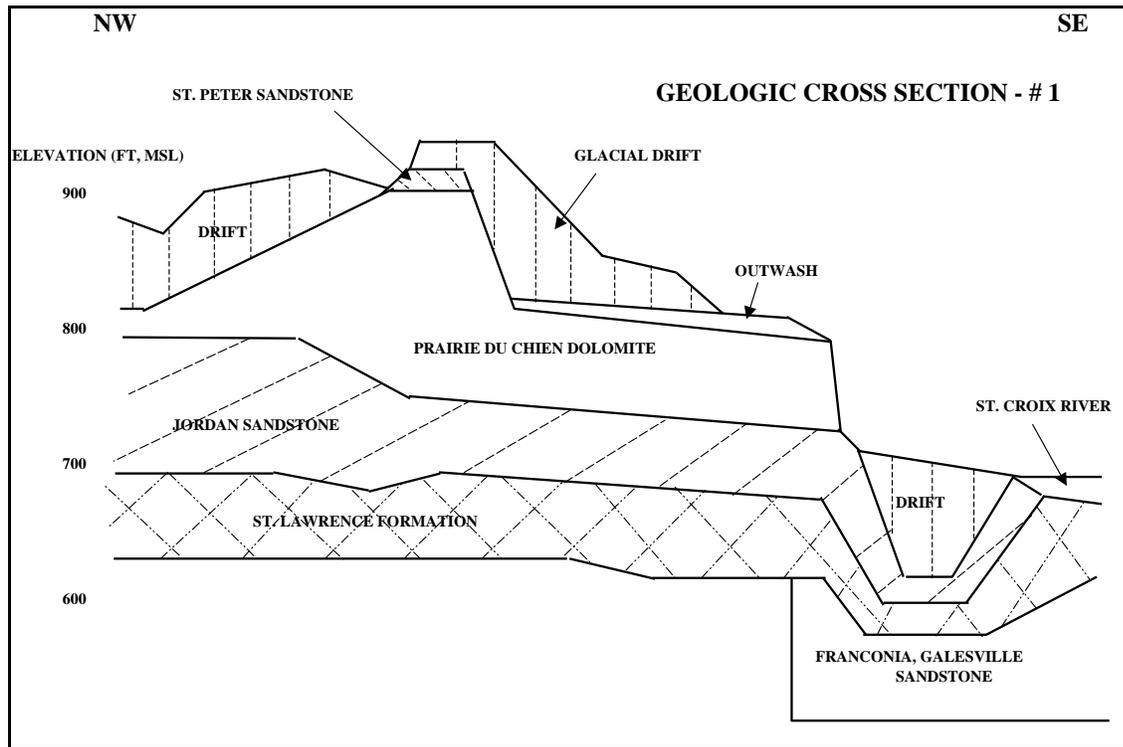
The geology of the Middle St. Croix watershed is typified by layers of glacial outwash and till ranging from 0 to 150 feet thick overlying bedrock. The surface materials are characterized primarily by glacial drift and outwash materials that were deposited by the St. Croix phase of the Superior Ice Lobe, a glacier that advanced from the Lake Superior Basin and receded about 12,000 years ago. These materials are often described as red sandy drift. The outwash and till are underlain by various layers of bedrock. St. Peter sandstone is the uppermost bedrock formation in the Middle St. Croix watershed. Beneath the St. Peter sandstone is Prairie du Chien Group, Jordan Sandstone, St. Lawrence Formation, Franconia Formation, Ironton & Galesville Sandstones, Eau Claire Formation, and the Mt. Simon Sandstone respectively. The older geologic deposits (bedrock formations) can be seen in the geologic cross sections shown in Figure 2.1. The locations of these cross sections can be seen in Figure 2.2.

The surface materials in the central and northern parts of the Middle St. Croix watershed are till and ice contact stratified drift. Till is unsorted material deposited by the glacier itself, which has not been subsequently affected by flowing water. Ice contact stratified drift is material left at the edges and bottom of a glacier by melt water as the water leaves the glacier. These materials have a relatively low permeability and may retard recharge through them to bedrock aquifers. The southern portion of the watershed is mapped as outwash or alluvium that was deposited by large streams that carried meltwater away from the retreating glacier. A generalized map of the surficial geology is shown in Figure 2.3. A generalized map of the surficial soils, based on the Washington County Soil Survey, is shown in Figure 2.4.

The lakes and depressional wetlands of the Middle St. Croix watershed are largely the result of different types of kettle basins or hummocks formed when glaciers retreat, leaving large blocks of ice in the till or outwash. When these ice deposits melt, a depression is left, which eventually form the wetlands that are present today. These features are confined to the quaternary deposits above the bedrock.

Groundwater under the Middle St. Croix watershed is located in the bedrock and surficial materials and discharges directly to the St. Croix River. Additions to the water table are made mainly through infiltration from rainfall or snowmelt. Withdrawals from the water table occur via discharge to surface water bodies, infiltration into deeper aquifers, and groundwater pumping from wells. The Middle St. Croix watershed surficial groundwater table has experienced both seasonal and long-term fluctuations. The long-term climatic cycles, characterized by several wet years or dry years in succession, have probably contributed most significantly to the fluctuating levels experienced.

Figure 2.1 Profiles of Representative Bedrock Formations



The MSCWMO has identified areas with soil types, slopes, and/or water levels that are unsuitable for development of any type or agricultural production involving intensive tilling of the land. Commercial and residential development and inappropriate farming practices in these identified areas increase soil erosion and sedimentation, increase the potential for the introduction of toxic materials into groundwater, encourage pollution, destroy ecological and natural resources, and require expenditures of public funds to correct deficiencies. Figure 2.5 is an inventory of the areas highly susceptible to erosion from land disturbing activities.

Critical Recharge Areas

The majority of recharge in the Middle St. Croix watershed occurs in the western portion of the watershed and discharge occurs predominately in the eastern portion of the watershed. Lakes, wetlands, depressions, and landlocked basins are all characteristic of the western portion of the watershed. Water drains to these vital areas, infiltrates into the groundwater system, and eventually discharges in the eastern portion of the watershed. The location and analysis of these important groundwater recharge areas was completed through a study – “Integrating Groundwater and Surface Water Management in South Washington County.” This study was a cooperative effort between Washington County and several southern Washington watershed management organizations including the MSCWMO. (<http://mn-washingtoncounty.civicplus.com/DocumentCenter/View/730>)

2.2 Hydrologic System

The hydrologic system of the Middle St. Croix watershed is distinctive from other watersheds in Washington County in that it is not one contiguous watershed draining to one outlet. The Middle St. Croix watershed drainage system is better described as many parallel drainages generally trending west to east that empty directly into the St. Croix River (see lakes and streams in Figure 1.1.).

The general drainage system of the watershed can be broken into two different types. The first type is located in the western area of the Middle St. Croix watershed and is characterized by numerous small ponds and lakes, many of which are landlocked. The drainage density in this area of the watershed is low, indicating the permeable nature of the soils and the relatively flat relief of the terrain.

The second type of drainage system in the Middle St. Croix watershed is located in the northern, eastern and southern portions of the watershed. Well-defined drainage systems and few lakes, ponds and wetlands characterize this area. The drainage density of this portion of the watershed is medium, indicating the permeable nature of the soils and moderate to steep relief of the terrain. This portion of the watershed is also dominated by the St. Croix River bluff, which has many perennial and ephemeral streams that flow parallel to each other and into the St. Croix River. With further urbanization, ~~infiltration basins and stormwater ponds~~ the integration of Low Impact Development stormwater management practices will be necessary to capture excess runoff from increasing amounts of impervious surfaces. These basins will be created based on rates of urbanization and drainage potential of particular areas in Middle St. Croix watershed as they are developed.

There are four primary waterbodies in the Middle St. Croix watershed: Lily Lake, McKusick Lake, Perro Pond, and Perro Creek (Figure 1.1). Lily Lake is deep lake located within the City of Stillwater and has a surface area of 35.9 acres, average depth of 18 feet and an ordinary high water level of 844.8 feet. The subwatershed of Lily Lake encompasses approximately 567 acres. Major land uses include 60% residential and 10% industrial. The lake drains to McKusick Lake which ultimately discharges to the St. Croix River.

Lake McKusick is a shallow lake also located in the City of Stillwater and has a surface area of 45 acres, an average depth of 3 feet, and an ordinary high water level of 851.7 feet. Its subwatershed encompasses approximately 586 acres including about 192 acres of impervious cover and a primary land use of residential development. The lake ultimately discharges to the St. Croix River.

Perro Creek is an urban stream that runs 1.8 miles through the City of Bayport, discharging directly to the St. Croix River. The creek conveys water from two subwatersheds that encompass a total of 660 acres of urban land in the cities of Oak Park Heights, Stillwater, and Bayport.

Perro Pond is a shallow 53 acre water body classified by the Minnesota Department of Natural Resources (MDNR) as a public water wetland. Perro Pond receives drainage from 340 acres of mixed urban land use primarily from the City of Oak Park Heights. The pond outlets to Perro Creek.

Subwatershed Summary

~~In 2006 nNinety-seven minor subwatersheds have ~~were~~ been delineated based on Washington County's two-foot topographic mapping, shown in Figure 2.6 along with the major subwatersheds in the Middle St. Croix watershed. At the writing of this plan the Middle St. Croix had conducted four prioritized subwatershed analyses: Lake McKusick, Lily Lake, Perro Creek and Lake St. Croix Direct Discharge. The subwatershed assessments more precisely defined drainage areas, identified potential water quality improvement practice locations and prioritized those practices based on a cost benefit analysis. Figure 2.6 provides a summary of these subwatershed analyses and the subwatersheds identified in 2006. Appendix B provides a summary of the area and drainage of these subwatersheds.~~

Wetlands Inventory

In 2005, the MSCWMO performed a new inventory and functional assessment of wetlands in the watershed (Figure 2.7 and Appendix C). This inventory complimented the National Wetland Inventory (NWI) conducted between 1988 and 1992 within the state of Minnesota. The NWI delineated areas that are critical wetland resources within the state and more importantly within Washington County.

Storm Sewer and Stormwater Systems

The municipalities of Stillwater, Oak Park Heights, Bayport, and Lakeland have developed and adopted stormwater management plans that include stormwater treatment facilities of various types and designs. The remainder of the Middle St. Croix watershed has been and will likely continue to be served by stormwater ponds and other management facilities.

Stormwater retrofit assessments for the subwatersheds of Lily Lake, McKusick Lake, Perro Creek, and areas which directly discharge to Lake St. Croix were recently completed by the Washington Conservation District in cooperation with the MSCWMO (Appendix D). These assessments recommend catchments for the placement of best management practices and retrofits that address the goals of the local governing units and stakeholder partners.

Flood Level Information

The potential for flooding occurs throughout the Middle St. Croix watershed along the intermittent streams and landlocked basins that exist in the watershed and along the St. Croix River. The threat of flooding will increase as more development occurs.

In communities directly along the St. Croix River, flooding takes place both from the river in high water years and from watershed runoff early in the season when water backs up in the frozen ground before infiltrating. The MSCWMO will actively manage areas of its watershed that are adjacent to the St. Croix River. However, because the MSCWMO does not have jurisdiction or regulatory control over the river or its floodplain it will defer to those organizations that do including the US Army Corps of Engineers, US National Park Service, Minnesota Department of Natural Resources, Washington County, [National Flood Insurance Program](#), [Federal Emergency Management Agency](#) and the municipalities.

Lily and McKusick lakes are both located entirely within the Middle St. Croix watershed and have outlet structures that are maintained by the City of Stillwater. Assessment of the flooding potential for the intermittent streams, wetlands, and landlocked basins within the Middle St. Croix watershed will occur as the land is subdivided and developed. With further urbanization and increased storm runoff, future efforts to reduce flooding will continue to be a high priority for the MSCWMO.

Water Quality, Quantity and Impaired Waters

Water quality and quantity data are collected to provide baseline information, assess trends, and determine impacts on water quality that will lead to proper management of these resources. The MSCWMO has monitored water quality and water levels in Lily Lake since 1985, McKusick Lake since 1994, and Brick Pond since 2008. Water levels on Perro Pond were also recorded in 2013. Water quality and quantity of Perro Creek and the Brown's Creek Diversion Structure were monitored 2006 - 2013.

The MSCWMO 2013 Water Monitoring Report is included in Appendix E. Additional monitoring data and annual water monitoring reports can be found at <http://www.mscwmo.org/water-monitoring>.

Lily Lake, considered a deep lake, does not meet State water quality standards and is subsequently included on the State's Impaired Waters List or 303(d) list due to excess nutrients which impacts its aquatic recreation use. Lily Lake was added to the Impaired Waters List in 2002. The 2007 Lake Management Plan for Lily Lake identifies a phosphorous reduction of 145 pounds is required to achieve the State water quality standard. The Minnesota Pollution Control Agency (MPCA) lists a 2021 start date for a Total Maximum Daily Load study (TMDL) for Lily Lake.

McKusick Lake was added to the Impaired Waters List for excess nutrients in 2006 but was subsequently removed from the list (delisted) in 2012 after improvements in the watershed were installed and new monitoring data indicated the lake is now meeting water quality standards.

Brick Pond, ~~while classified as eutrophic a clear water, vegetation dominated wetland~~, is not considered impaired because its high phosphorus levels do not result in high amounts of algae. Figure 2.8 shows average summer total phosphorus concentrations Lily and McKusick Lakes and Brick Pond.

Aquatic plants in lakes can be affected by and can affect water quality, in addition to recreation and aesthetics. In 2013, the City of Stillwater and the MSCWMO cooperated on aquatic plant management plans for Lily and McKusick Lakes (Appendix F).

Perro Creek is on the State's Impaired Waters List for high bacteria (*Escherichia coli*) levels. [The MPCA uses the E. coli standard based on the geometric mean EPA criterion of 126 E. coli colony forming units per 100 ml as the numeric standard to determine if the water is impaired.](#) Table 2.3 shows the monthly geometric mean of E. coli in Perro Creek 2006 – 2013. [The years the geometric mean exceeded the](#)

numeric standard are highlighted green. There is no TMDL study for Perro Creek at this time. The MPCA lists a 2021 target start date for a TMDL study.

Lake St. Croix, the lower 25 miles of the St. Croix River between Stillwater, MN and Prescott, WI, was designated as impaired in 2008 for excess phosphorus. The Lake St. Croix Nutrient TMDL was completed in 2012 by the MPCA and the Wisconsin Department of Natural Resources. The TMDL Implementation Plan was completed in February 2013. The TMDL established water quality targets for the lake including 40 ug/L of total phosphorus, 14 ug/L chlorophyll-a, and 1.4 meter Secchi transparency. It was determined that in order to meet the goals, the phosphorus loading to Lake St. Croix could not exceed 360 metric tons of phosphorus per year. This loading target is more than twice the estimated natural background phosphorus load of 166 metric tons per year. (Find the TMDL report and implementation plan at: <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/tmdl-projects/st.-croix-river-basin-tmdl/project-lake-st-croix-excess-nutrients.html>.) When broken out among watershed districts and organizations in Washington County, it was calculated that the area within the MSCWMO must reduce phosphorus loading to Lake St. Croix by 35% or 1,521 lbs/year from the baseline year of 1992 (MPCA staff personal communication, 2014).

***Naegleria fowleri* ameba**

The ameba *Naegleria fowleri* is found in warm freshwater during periods of high water temperatures and low water levels. It causes a very rare fatal brain infection called primary amebic meningoencephalitis or PAM. *Naegleria fowleri* causes an infection that develops when the ameba enters the human body through the nose, making its way to the brain. In recent summers, two children have died from PAM from *Naegleria fowleri* in Lily Lake. Testing of Washington County areas lakes was conducted in 2010 – 2013 in cooperation with the Centers for Disease Control and Prevention to track the presence of the ameba in water and lake sediments. See <http://www.co.washington.mn.us/index.aspx?nid=597> for more information.

Water Appropriations

The Minnesota Department of Natural Resources (MDNR) regulates surface water and groundwater appropriations through a permitting program. Active surface water and groundwater appropriations can be found on the MDNR's website at: http://files.dnr.state.mn.us/waters/watermgmt_section/appropriations/index-county-location-active.pdf.

Figure 2.8 Historic Average Summer Total Phosphorus Levels in MSCWMO Lakes

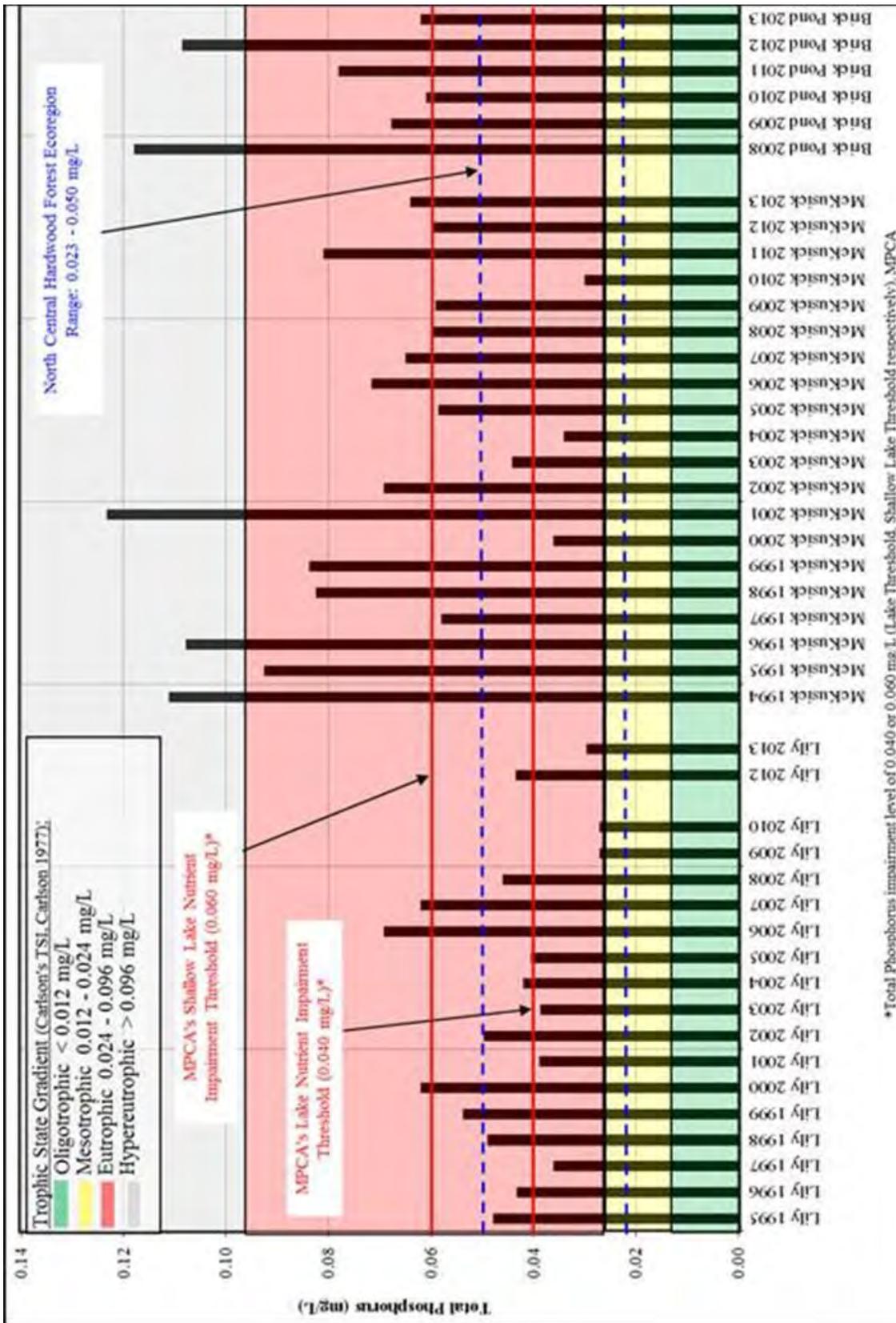


Table 2.3 E. coli Monthly Geometric Mean for Perro Creek 2006 – 2013

	May	June	July	August	September	October
6/14/06 11:10		150				
7/25/06 8:45			249			
8/10/06 9:12				318		
9/6/06 9:50					291	
9/10/06 10:20					252	
5/2/07 12:00	276					
6/13/07 10:14		185				
7/16/07 9:51			488			
8/28/07 8:04				1986		
10/18/07 12:15						114
6/5/08 10:18		276				
6/26/08 9:43		153				
7/17/08 8:30			194			
8/27/08 10:20				1553		
7/29/09 9:30			261			
8/27/09 10:25				1120		
9/30/09 8:50					163	
5/25/10 9:00	99					
6/24/10 9:15		225				
7/28/10 11:25			93			
8/26/10 9:49				111		
9/30/10 9:51					95	
6/9/11 10:24		345				
7/7/11 8:32			262			
8/11/11 8:53				40		
9/8/11 8:07					196	
10/5/11 9:03						133
5/31/12 9:13	41					
6/26/12 10:25		96				
7/24/12 11:30			291			
8/30/12 9:44				345		
9/26/12 9:17					145	
6/27/2013 9:25		194				
7/29/2013 10:09			80			
8/15/2013 10:13				91		
9/24/2013 9:00					91	
Perro Creek Monthly Geometric Mean	Insufficient Data	189.94	207.90	333.53	162.07	Insufficient Data
Exceeds geometric mean of 126 #/100mL from not less than 5 samples in a calendar month						

2.3 Human Environment

Transportation

Continued improvement of county and township roads in the Middle St. Croix watershed will most likely occur with increasing development. Improved access to the major arterial transportation systems of State Highway 36 and Interstate 94 will be needed and these improvements have the potential to impact the water resources of the watershed.

The Lake Elmo Airport is the nearest airport facility to the Middle St. Croix watershed and is located approximately one mile west of the watershed's western boundary. The airport is not expected to have an impact on the plans of the MSCWMO.

Gravel Mining

Four active gravel-mining operations exist in the Middle St. Croix watershed (Figure 2.9) in Baytown and West Lakeland Township. Mining regulation and permitting is a function of Washington County. In addition, gravel-mining operations may be required to obtain a permit from the Minnesota Pollution Control Agency (MPCA). This includes gravel mines that have stormwater not contained directly on-site; wastewater from dewatering of pits and quarries; wash water from sand, gravel, or aggregate washing; water from cooling cutting saws; and/or water from other sources that may carry sediment and solids to Waters of the State. New pits or quarries must obtain a General Construction Stormwater Permit from the MPCA during the construction phase.

Land Use and Land Cover

The Middle St. Croix watershed lies along the eastern fringe of the Twin Cities Metropolitan Area. The current land use is predominantly a mix of agriculture, rural residential, high-density residential, and commercial areas shown in Figure 2.9. Land cover in the Middle St. Croix watershed was updated using the Minnesota Land Cover Classification System in 2006 (Figure 2.10). Each individual community has prepared a future land-use plan that indicates residential development will continue in the central and western portions of the watershed. Projected land use is shown in Figure 2.11.

Public Utility Service

The comprehensive plans of the member communities currently indicate no extension of the Metropolitan Urban Service Area into the Middle St. Croix watershed. With continued growth, municipal sewer lines of the cities of Stillwater, Oak Park Heights, and Bayport will continue to expand within the cities' borders to the west and north. The remainder of the watershed will continue use of individual sewage treatment systems.

Water-based Recreation Areas

The St. Croix River is the major water-based recreation area within the Middle St. Croix watershed and provides a variety of water-based recreation and-is currently classified by the State of Minnesota as a Scenic and Recreational Outstanding Resource Value Water. Lily Lake in Stillwater has a public access and fishing pier operated by the City. The lake is used for boating, fishing, and swimming. McKusick Lake does not have a public beach. However, a fishing pier was installed on the lake in 2014 with the assistance of multiple partners including the MDNR. The MDNR is now stocking the lake through its Fishing in the Neighborhood program.

2.4 Fish and Wildlife Habitat

The fish and wildlife habitat concerns of the MSCWMO are the natural areas associated with the St. Croix River and the wetlands, streams, and lakes draining to the St. Croix River. The St. Croix River is of regional importance, which the MSCWMO feels should be studied and addressed either at the regional or State level to adequately plan for future uses that take all interests into account. Impacts of future development in the Middle St. Croix watershed will need to be addressed as to how they may potentially reduce or hinder fish and wildlife habitat.

Four separate natural communities have been identified in the Natural Communities and Rare Species, Washington County 1987-1989 map (Minnesota County Biological Survey, University of Minnesota Press, 1990). These communities include a dry gravel prairie stretching along St. Croix Trail through most of Lake St. Croix Beach, another area of dry gravel prairie within Lakeland Shores, an area of oak forest within the Bayport Wildlife Management Area (WMA) in the northeast corner of West Lakeland Township, and an area of oak savanna also in the Bayport WMA in the south east corner of Baytown Township (Figure 2.13). Future priorities and protection efforts will take into account these resources.

MDNR Classifications for Lakes, Streams and Wetlands

The Minnesota MDNR has recognized and classified particular lakes, streams, and wetlands as MDNR Protected Waters. These water resources are of important concern and typically have monitoring or assessments to evaluate the changes over time that occur to these resources. Figure 2.12 shows the MDNR protected waters within Middle St. Croix watershed.

Biological Surveys, Endangered Species, and Significant Natural Areas

The Natural Heritage Information System (NHIS) is a database maintained through the Natural Heritage and Non-game Research Program within the MDNR. The NHIS has the most complete list of rare or significant species, natural communities, and other natural features. Because the information in the database is not based on a comprehensive inventory, there may be rare or otherwise significant natural features within the Middle St. Croix watershed that are not found in the list. The most current statewide list can be obtained from <http://www.dnr.state.mn.us/ets/index.html>.

Based on a review of the Minnesota Natural Heritage Information System database, several rare endangered species and species of special concern as found within the Middle St. Croix watershed along with eleven separate natural community types (Table 2.4). (Fish and mussel species found in the St. Croix River are not listed here.) Many of these species depend on the St. Croix River, wetlands, or riparian areas including the smooth softshell turtle, Blanding's turtle, and the American bald eagle. Find more information on rare and endangered species at <http://www.dnr.state.mn.us/rsg/index.html>.

Future priorities and protection efforts will take into account these resources. Additional information may be added with the completion of future inventories and assessments.

Fourteen city parks and recreational facilities exist within the Middle St. Croix watershed, but no regional or county parks are located within its boundaries. Member communities, Washington County and the State of Minnesota are planning and investing in regional trails that will enhance connectivity and use of natural resources. The State of Minnesota owns and operates approximately six hundred acres within the Middle St. Croix watershed including the Bayport Wildlife Management Area (WMA) and the St. Croix Savanna Scientific Natural Area (SNA) with portions open to the public (Figure 2.13).

The 263.8- acre Bayport WMA is managed for a variety of woodland and grassland wildlife. The area consists of 72% grassland/agricultural land, 27% woodland and a small amount of wetland. Much of the grassland on this area is planted prairie on previously agricultural land.

The St. Croix Savanna SNA occurs along the top and side of a south-facing bluff, with views of the St. Croix River. Its slopes of loamy sand have eroded extensively, their soils now supporting an alluvial forest along the bottom. Scattered bur oak and pin oak on the open gravel prairie become increasingly dense toward the northeast and northwest, forming first oak woodland and then an oak forest. Prescribed burning and removal of the exotic black locust has greatly enhanced the savanna. The dry savanna exhibits a significant diversity of grasses and several species of native wildflowers. According to the MNDNR the St. Croix Savanna SNA is the best hill prairie and oak savanna along the Lower St. Croix National Scenic Riverway.

Significant and threatened native plant communities also exist within the Middle St. Croix watershed including a Dry Sand-Gravel Prairie and remnant prairies along the Union Pacific railroad. Additionally, a high ranking Regionally Significant Ecological Area is located west of the St. Croix Savanna SNA. This area has terrestrial and wetland resources that support a variety of plant and animal species and provide habitat connectivity to other ecologically intact areas. Finally, the Audubon St. Croix Lake Important Bird Area is located south of I-94 (Figure 2.13)

These rare and sensitive lands should be protected if development is considered in these areas.

Table 2.4 Natural Heritage Occurrences within the Middle St. Croix Watershed

Scientific Name	Common Name	Minnesota Status
<i>Acipenser fulvescens</i>	Lake Sturgeon	Special Concern
<i>Actinonaias ligamentina</i>	Mucket	Threatened
<i>Alasmidonta marginata</i>	Elktoe	Threatened
<i>Alosa chrysochloris</i>	Skipjack Herring	Endangered
<i>Apalone mutica</i>	Smooth Softshell	Special Concern
<i>Arcidens confragosus</i>	Rock Pocketbook	Endangered
<i>Baptisia lactea</i> var. <i>lactea</i>	White Wild Indigo	Special Concern
<i>Besseyia bullii</i>	Kitten-tails	Threatened
<i>Buteo lineatus</i>	Red-shouldered Hawk	Special Concern
<i>Cumberlandia monodonta</i>	Spectaclecase	Endangered
<i>Cycleptus elongatus</i>	Blue Sucker	Special Concern
<i>Cyclonaias tuberculata</i>	Purple Wartyback	Endangered
<i>Cygnus buccinator</i>	Trumpeter Swan	Special Concern
<i>Decodon verticillatus</i>	Waterwillow	Special Concern
<i>Dryopteris goldiana</i>	Goldie's Fern	Special Concern
<i>Ellipsaria lineolata</i>	Butterfly	Threatened
<i>Elliptio crassidens</i>	Elephant-ear	Endangered
<i>Elliptio dilatata</i>	Spike	Threatened
<i>Falco peregrinus</i>	Peregrine Falcon	Special Concern

Fusconaia ebena	Ebonyshell	Endangered
Haliaeetus leucocephalus	Bald Eagle	Watchlist
Hesperia leonardus leonardus	Leonard's Skipper	Special Concern
Lampsilis higginsii	Higgins Eye	Endangered
Lasmigona costata	Fluted-shell	Threatened
Lechea tenuifolia var. tenuifolia	Narrow-leaved Pinweed	Endangered
Lethenteron appendix	American Brook Lamprey	Watchlist
Ligumia recta	Black Sandshell	Special Concern
Megaloniais nervosa	Washboard	Endangered
Necturus maculosus	Mudpuppy	Special Concern
Nuttallanthus canadensis	Old Field Toadflax	Special Concern
Obovaria olivaria	Hickorynut	Watchlist
Orobanche ludoviciana var. ludoviciana	Louisiana Broomrape	Threatened
Pantherophis ramspotti	Western Foxsnake	Watchlist
Penstemon digitalis	Beard-tongue	Watchlist
Percina evides	Gilt Darter	Special Concern
Pleurobema sintoxia	Round Pigtoe	Special Concern
Polanisia jamesii	James' Polanisia	Endangered
Polyodon spathula	Paddlefish	Threatened
Quadrula fragosa	Winged Mapleleaf	Endangered
Quadrula metanevra	Monkeyface	Threatened
Simpsonia ambigua	Salamander Mussel	Endangered
Tritogonia verrucosa	Pistolgrip	Endangered

Natural Community Type
Sedimentary unit or sequence (Cambrian, Ordovician)
Seepage Meadow/Carr Type
Colonial Waterbird Nesting Area
Dry Bedrock Bluff Prairie (Southern) Type
Sugar Maple - Basswood - (Bitternut Hickory) Forest Type
Northern Bulrush-Spikerush Marsh Class
Elm - Ash - Basswood Terrace Forest Type
Black Ash - (Red Maple) Seepage Swamp Type
Dry Sand - Gravel Oak Savanna (Southern) Type
Dry Sand - Gravel Prairie (Southern) Type
Colonial Waterbird Nesting Area

Copyright (2014), State of Minnesota, Department of Natural Resources. Rare features data included here were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (MDNR), and were current as of (November 29, 2014). These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

2.5 Pollution Sources

Sources of pollution in the Middle St. Croix Watershed are varied and originate from both point and non-point sources. Point sources of pollution are those with a definite “end-of-pipe” source and are typically subject to a State permit. These include discharges from wastewater treatment plants and industries. Nonpoint sources of pollution originate from diffuse sources such as storm sewers, failing septic systems, and runoff from construction sites, cultivated lands, animal feedlots, paved surfaces, and turf. Nonpoint sources contribute huge quantities of phosphorus, bacteria, sediments, nitrates, and other pollutants to our lakes and streams. Nonpoint sources typically represent the largest combined source of pollution in a given watershed.

2.5.1 Point Sources of Pollution

Point sources of pollution in the Middle St. Croix watershed included permitted sites, hazardous waste generators, and contaminated sites. The MPCA maintains a database of these sites which includes permitted sites (air, industrial stormwater, construction stormwater, wastewater discharge), hazardous waste generating sites, leak sites, petroleum brownfields, tank sites, unpermitted dump sites, and sites enrolled in the Voluntary Investigation and Cleanup (VIC) program. This information is available online through the MPCA’s What’s In My Neighborhood program. The location of these potentially contaminated or hazardous waste sites should be considered as sites are redeveloped and BMPs are implemented.

[MPCA’s “What’s in my Neighborhood” interactive map:

<http://www.pca.state.mn.us/index.php/data/wimn-whats-in-my-neighborhood/whats-in-my-neighborhood.html>]

One licensed hazardous waste site is present within the Middle St. Croix watershed. The A.S. King Ash disposal site is located at a forty-three acre abandoned sand and gravel quarry in Oak Park Heights near the generating plant. The disposed waste is made up of fly ash and slag, which originates from the burning of coal to generate power. The site is full and does not continue to receive new disposals.

Underground Storage Tanks (UST) and Aboveground Storage Tanks (AST) are regulated at both the state and federal levels. A regulated UST system is defined as any one or combination of containers including tanks, vessels, enclosures, or structures and underground appurtenances connected to them that is used to contain or dispense an accumulation of regulated substances, and the volume which, including the volume of underground pipes connected to them, is ten percent or more beneath the surface of the ground. Tank owners and operators must comply with both state and federal regulations for underground storage tanks which can be found on the EPA web site at <http://www.epa.gov/swerust1/fedlaws/cfr.htm>. ASTs, which store liquid substances that may pollute the waters of the state, are regulated by Minnesota Rules, Chapter 7151 if site capacity is less than one million gallons. Larger facilities (facilities with a capacity of one million gallons or more) are regulated by permits negotiated with MPCA. Information on the status and location of USTs and ASTs is available in a searchable database at the PCA website: http://www.pca.state.mn.us/programs/tanks_p.html#search.

2.5.2 Nonpoint Sources of Pollution

Subsurface Sewage Treatment Systems

A large percentage of the Middle St. Croix watershed population is served by individual (or subsurface) sewage treatment systems (SSTS) rather than municipal sewage treatment. Failing or substandard SSTS may be a nonpoint source of pollutants. Improperly sited or installed and unmaintained systems may not achieve adequate treatment of sewage. Sewage contains nutrients, bacteria, pharmaceuticals, and other pollutants. Pollutants could leach into the groundwater or nearby surface waters or could be illegally discharged (piped) to surface waters.

Utilizing available data from Washington County, there are an estimated 2,224 SSTS within the Middle St Croix watershed. Of these, there are approximately 962 systems that are potentially noncompliant. This estimate was developed using a GIS model that compared parcel data of where there are known systems (per the county's maintenance pumping database), and where there is an absence of any permit record. Of these noncompliant systems, it is unknown how many may be 'failing to protect groundwater' versus an 'imminent public health threat' (straight pipe, surface discharge, etc).

Agricultural Drainage

Artificial drainage in agricultural areas (including tiling and draining land and ditching and straightening streams) can be an important component of some agricultural activities. However, artificial drainage can also contribute nutrients, bacteria, and other pollutants to surface waters. Drainage activities can also increase the rate and volume of water running off the land, contributing to erosion and sedimentation in streams.

New drainage and drainage improvements represent an opportunity to design and install systems in ways that help reduce nutrient losses into surface water and positively affect the timing and flows of drainage water into surface waters. These efforts combined with wetland restoration and water retention initiatives can have positive impacts upon water quality in agricultural landscapes. Learn more at:

<http://www.mda.state.mn.us/en/protecting/waterprotection/waterplanning/agdrainage.aspx>.

Abandoned Wells

Abandoned wells are difficult to identify as many were created before adequate well drilling and sealing logs and records were kept. According to Washington County data, twenty-five wells have been sealed within the Middle St. Croix watershed from 2005-2013, through the County's abandoned well sealing cost share program. It is highly likely additional abandoned wells exist within the watershed and pose a groundwater contamination threat.

Livestock, Feedlots and Agricultural Fields

A variety of pollutants including nutrients, chemicals (like pesticides) and bacteria can runoff agricultural fields and feedlots during rain and snowmelt events. Additionally, pastures that allow livestock access to surface waters can result in direct pollution of these waters and severe erosion of streambanks or shorelines. Feedlots can pose a threat to water quality if runoff is not properly diverted away from surface waters or conduits to groundwater. Manure from feedlots should be properly stored and, if utilized as fertilizers, should be applied according to rules, guidelines, and recommended practices.

More information on groundwater and surface water protection from agrichemicals and nutrients:

<http://www.mda.state.mn.us/protecting/waterprotection/waterplanning/agchemicals.aspx>.

More information on feedlots and nutrient and manure management:

<http://www.pca.state.mn.us/index.php/topics/feedlots/feedlot-nutrient-and-manure-management.html>.

Eroding Gullies, Streambanks, Construction Sites

Soil erosion can be a significant sediment source to water resources throughout the Middle St. Croix watershed. This can result in decreased water depths and degraded water quality. Erosion from active gullies is common in the watershed due to steep slopes and erodible soils. Additionally, increased stream flows due to artificial drainage and stormwater runoff from impervious surfaces cause erosion of streambanks and downcutting within the stream. Further, construction sites – especially those out of compliance with standards – can contribute sediment to adjacent water resources or through stormsewer systems to receiving waters downstream.

An inventory and evaluation of gullies (drainage features) in the MSCWMO was completed in 2005 and 2006. Gullies with severe and moderate erosion ratings at the time of the survey were listed as areas of concern (Figure 2.14).

Urban Stormwater Runoff

Pollution from urban and suburban areas sometimes flows directly from streets, roofs, parking lots, and lawns to a body of water. More often, runoff from these areas enters a stormsewer system during a rain event or snowmelt event, which quickly transports this pollutant-laden runoff to surface waters. Sometimes the runoff is treated in a pond, filtered, or infiltrated into the ground before it enters a stream, river or lake. Other times, it flows untreated into a waterbody.

Urban runoff contains a wide variety of pollutants including nutrients (from grass clippings, leaves, fertilizers, etc.), pesticides, bacteria (from pet waste and wildlife), oil, gas, and antifreeze (from leaking autos, leaking underground storage tanks, or spills), sediment (from construction sites and eroding streambanks), and toxins such as chloride (from winter deicers), PCBs (from previous industries), heavy metals (from spills or dumping), and PAHs (from coal-tar sealants).

Find more information on PAHs: <http://www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/contaminated-sediments/index.html> or <http://www.pca.state.mn.us/index.php/view-document.html?gid=11857>.

Atmospheric Deposition

Atmospheric deposition occurs when pollutants are transferred from the air to the earth's surface. Atmospheric deposition can be a significant source of pollutants to water bodies. Pollutants can get from the air into the water through rain and snow, falling particles, and absorption of the gaseous form of the pollutants into the water. The pollutants that are often identified as having significant atmospheric contributions in waterbodies are sulfur compounds, nitrogen compounds, mercury compounds, other heavy metals, and a handful of anthropogenic (of human origin) pesticides and industrial by-products, including current-use pesticides and herbicides such as atrazine.

2.5.3 Groundwater Pollution

Most of the MSCWMO is in an area with water tables highly or very highly sensitive to pollution (Figure 2.15). Additionally, the Prairie du Chien-Jordan aquifer is moderately to very highly sensitive to pollution in much of the MSCWMO (Figure 2.16). The growing demand for groundwater for irrigation, industrial, commercial, and drinking water supplies, along with the increased detection of groundwater contamination focuses attention on this resource in Washington County and in the Middle St. Croix watershed. Planning, management, and protection of the groundwater supply must be supported by the basic understanding of the occurrence, movement, and composition of the groundwater resource. Groundwater and surface water systems do not necessarily coincide with surface water divides or boundaries; therefore, groundwater protection efforts, to be most effective, should be coordinated at the county or regional level. The MSCWMO cannot successfully plan for or control activities outside its boundaries, which ultimately could have a detrimental impact on the groundwater resource it is dependent upon.

In 1987, the Minnesota Department of Health (MDH) issued a Well Advisory for Lakeland and Lakeland Shores. Wells in these cities were identified with higher than average levels of volatile organic compounds (VOCs). The advisory prohibits the deepening of existing wells into lower bedrock formations or the drilling of new wells into the lower bedrock formations. Small lots, private septic systems, and many private shallow sand point wells, and coarse textured sandy outwash soils characterize these cities, which makes them more conducive to groundwater contamination problems. At least two sources of plumes are suspect in the area, one with fluorocarbons and petroleum products and the other with solvents. Monitoring of over 360 private wells has indicated the presence of VOCs in 193 wells, some of which are at levels considered unsafe to drink. Residents in these homes have been connected to a municipal water system.

The drinking water supply management areas' vulnerability to pollution is shown in Figure 2.17.

MDH has also identified a Special Well Construction Area (SWCA) located in the Middle St. Croix watershed due to trichloroethylene (TCE) and carbon tetrachloride (CCl₄). These contaminants have been detected in the Prairie du Chien, Franconia, and Jordan groundwater aquifers. Municipalities that are or have portions within the SWCA include the Cities of Oak Park Heights, Lake Elmo, and Bayport; and Baytown and West Lakeland Townships. Municipalities that are or have portions affected by the contaminant plume in the groundwater of the Prairie du Chien and Jordan aquifers are the City of Bayport, Baytown Township, and West Lakeland Township. Thus far, CCl₄ doesn't appear to pose any problem due to its low concentrations within tested wells. The CCl₄ source was identified as a former grain storage facility where this pesticide had seeped into the ground.

The TCE plume, however, is of health concern. TCE was most commonly used as a degreasing agent for washing metal parts and also as a dry-cleaning solvent. Exposure to high levels of TCE in drinking water can damage the liver, kidneys, immune system, and nervous system. Exposure to low levels of TCE over a long period of time, may be linked to an increased risk of several types of cancer. TCE may also harm a developing fetus if consumed in high concentrations by an expectant mother. The TCE Health Risk Level (HRL) established by MDH is 5 (μg/L). In May of 2013, MDH issued a new Health Based Value (HBV) for TCE at 0.4 (μg/L). An HBV level is not regulatory in nature (it must go through a longer rulemaking process at the state level to become an HRL), but can be used as a good indication of the health risk associated with a chemical and is the level the state will use moving forward regarding all decisions to protect public health.

The source of the TCE contamination is suspected to be a former metal working business known as Neilsen Products Company that occupied the property at 11325 Stillwater Boulevard in Lake Elmo in the 1950s and 1960s. The MPCA took remedial action at this site with a hydraulic barrier. The barrier includes four extraction wells to collect and capture the contamination before it migrates off of the property. The extracted water is then treated by air stripping to remove the TCE from the water. The water is then discharged back to the soil using horizontal wells approximately 25 feet underground.

Currently, the MPCA will install, maintain, and test a whole house granular activated carbon (GAC) filter for an existing well within the Baytown/West Lakeland SWBCA that exceeds the interim exposure limit of 0.4 µg/L TCE, only if the well is located on property approved for development on or before April 9, 2002.

For homes built after April 9, 2002, the two affected townships passed ordinances to ensure safe drinking water supplies for residents. Baytown Township enacted an ordinance on September 8, 2003, updated on September 12, 2011, pertaining to water testing and installation, testing, and maintenance of whole-house GAC filters. West Lakeland Township enacted a similar ordinance on March 1, 2004, updated on September 9, 2013. The ordinances require residents to install an approved GAC filter when TCE or carbon tetrachloride is detected in a well at concentrations exceeding exposure limits. All filter installation, testing, and maintenance costs are the responsibility of the well owner. The ordinances also require periodic testing and reporting of results.

3.0 Public Involvement and Development of Issues

3.1 Issues Identification Process

This watershed management plan (Plan) was developed with the input of local stakeholders, technical review agencies, and the public and in accordance with the MN Rule 8410.

The input process began in 2012 with a meeting of the MSCWMO Plan Update Subcommittee and a subsequent plan update stakeholder meeting. This stakeholder meeting (November 2012) resulted in a list of ideas and issues in the areas of administration, education, erosion control, groundwater, water quality, water quantity, and project prioritization and tracking.

Additional input for this plan was gathered on multiple occasions in 2013 and 2014 via email from State and local review agencies including Washington County, the MN Department of Natural Resources (MDNR), MN Board of Waters and Soil Resources (BWSR), MN Department of Agriculture (MDA), the MN Pollution Control Agency (MPCA), and the Metropolitan Council. Multiple meetings with the staff of every MSCWMO member community in 2013 and 2014 focused on setting appropriate goals, strategies, and policies for the MSCWMO and integrating the MPCA's Minimal Impact Design Standards (MIDS) into this Plan.

Meetings with the Lily Lake and McKusick Lake Associations garnered even more important input for the Plan. A public stakeholders input open house in September 2014 also resulted in important issues identification and input to the Plan.

Through input from MSCWMO member communities, lake associations, citizens, technical agencies, and board members, the MSCWMO developed a list of issues for the management of the water and natural resources in the watershed (Section 3.2). A chronological list of input activities and participants is found in Appendix G.

3.2 Issue Statements

The list of issues determined by the MSCWMO Board and stakeholders include nine distinct areas of concern: administration, education, erosion and sediment control, groundwater, water quality and monitoring, development reviews, water quantity, wetlands, and project prioritization and tracking. The following bullets provide an overview of specific stakeholder input in these areas.

Administration

- Continue to efficiently, effectively and cooperatively manage the water resources of the MSCWMO including quick and efficient project reviews.
- More clearly define roles and responsibilities between the MSCWMO and member communities – including inspections and maintenance needs
- Balance existing ordinances and State laws, resource protection, constructability and expense when considering new requirements.
- Continue to work with member cities to ensure appropriate planning and water quality protection.

- Describe implementation activities including adoption of controls, identification of responsibilities, schedule of implementation, description of capital improvement program, identification of enforcement procedure(s), and identification of administration processes.
- Allow for effective collaboration as new opportunities arise.
- Communicate and work collaboratively with member communities and the county to evolve policies and practices, as needed.
- Communicate with member community's staff and councils particularly on project funding and the value of the MSCWMO as a resource.

Education

- Develop long term plan for education program and partnership with East Metro Water Resource Education Program (EMWREP).
- Promote and educate public and private applicators about the effects of chloride
- Provide education and outreach to rural and urban landowners to promote practices that reduce pollutants.
- Consider expanding communications to the public with social [media](#) based and electronic communications to feature innovative projects, updates, demonstration projects, etc.
- Continue to share success stories; consider featuring stories from residential cost share participants on local public access channels.
- Use local media sources and social [media](#) sites and increase workshops, trainings and meetings with local and county staff.
- Begin to prioritize outreach and voluntary projects in targeted study areas.
- Identify grant funding to implement programs.
- Start an innovative stenciling program to decrease illicit discharges to storm sewers that have been witnessed.
- Consider supporting or developing community groups who can aid in local education.
- Communicate with member communities by providing regular updates on watershed activities, offering periodic refresher trainings and joint field inspections for "front line" officials (administrators, clerks, and staff).

Erosion and Sediment Control

- More clearly define steep slopes and method for measurement.
- Consider a 50' bluff requirement (rather than 25' requirement) to ensure protection of bluff integrity.
- Develop specific goals and policies that will control soil erosion and identify controls, programs, and organizations responsible for controlling soil erosion.
- Identify impacts of runoff and soil erosion on water quality, including impacts from development.
- Include Washington County Gully Inventory and prioritization work.

Groundwater

- More clearly define long term goals and role in groundwater protection through collaboration with Washington County.
- Address potential for groundwater contamination in wellhead protection areas.
- Address aging individual septic systems in areas of shallow bedrock and along bluff; encourage hook up to city sewer.

- Include a list of estimated number of subsurface sewage treatment systems (SSTS) including the number of compliant systems and non-compliant systems and a discussion of how the estimate was developed; the number of cluster systems; the number of imminent public health threat systems.
- Require local ordinances regulating SSTS and describe the status of ordinance adoption by member communities and their program of tracking maintenance and non-compliant systems.

Water Quality and Monitoring

- Address the occurrence of *Naegleria fowleri* amoeba in Lily Lake.
- Protect water quality of Lake McKusick.
- Develop long term plan for water monitoring program.
- Address lack of monitoring data from storm sewers discharging to the St. Croix River.
- Continue to ensure that a continuous record is kept to track trends and the impacts of specific best management practices.
- Include water quality monitoring efforts by local jurisdictions.
- Identify appropriate good housekeeping practices, including design criteria for stormwater outlet structures, maintenance and repair of existing structure, and street sweeping.
- Initiate large demonstration water quality practices with signage in challenging areas (shallow bedrock, bluff line areas, etc.).
- Develop long term plan for cost-share program.
- Initiate smart streets program with infiltration/filtration practices.
- Discuss how MSCWMO will work to meet State water quality standards.
- Include list of impaired waters in the MSCWMO and how the organization will integrate MPCA priorities and schedules for addressing impaired waters and developing TMDLs.
- Develop inspection and maintenance program to track and maintain the growing number of water quality projects in the watershed.
- Describe how MSCWMO will meet nutrient load reductions for Lake St. Croix TMDL.
- Engage agricultural communities in targeted BMP implementation including livestock and manure management, pesticide and water use, and general agricultural land management.
- Identify feedlots, animal units, feedlots of concern, and areas receiving applied manure.
- Address feedlot management and manure application with goals, policies, technical and financial assistance, and education.

Development Reviews

- Protect natural resources from development pressures.
- More clearly define reconstruction vs. new construction.
- Revise process for reviews for small projects (home construction for example) less than one acre; current process is overkill and expensive for homeowners.
- Provide guidelines, brochures and handouts for small sites whose impacts are minimal.
- Consider guidance in place of a review and permit process or creating a scaled back permit process for small sites.
- Consider review triggers, rules, and goals of neighboring watershed districts when appropriate to ease permitting difficulty for member communities.
- Consider wider range performance standards such as Minimal Impact Design Standards and implement when appropriate.
- More clearly define staff level review and small projects performance standards/submittal items.

- Provide consistent and flexible stormwater quality standards for new and redevelopment that address the requirements for the Lake St. Croix TMDL.
- Establish consistent project review process and continue to improve efficiency.
- Consider increasing the minimum area of disturbance required for a review from the current 10,000 square feet.

Water Quantity

- Manage runoff quantity, including establishing peak flow reduction strategies, maximum allowable runoff rates, and runoff from new developments.
- Identify stormwater water control issues within and between the communities
- Consider volume reduction goals more stringent than NPDES.
- Address flooding issues in the watershed.

Wetlands

- Identify untreated discharges to wetlands and impacts to wetlands, particularly those used to attenuate stormwater.
- Develop appropriate design criteria for stormwater ponds and outlets.
- Describe any wetland inventories and functional values assessments completed in MSCWMO.
- Describe how the Plan is consistent with requirements of [Minnesota Rule 7050](#).

Prioritization and Tracking

- Ensure that analyses inform local water plans, guide targeted education and technical assistance needed to develop projects, and secure local, watershed and grant funding.
- Expand targeted subwatershed analyses to prioritize implementation of best management practices (BMPs).
- Address areas lacking stormwater best management practices.
- Track, inspect and maintain BMP installations.
- Develop methods for tracking the MSCWMO's success in reaching the goals laid out in this Plan.

4.0 Regulatory Framework

Currently, there are varying degrees of local controls and ordinances among the member cities in the MSCWMO pertaining to stormwater management, erosion and/or sediment control, and wetlands. Member communities currently enforce State regulations in these areas while the MSCWMO reviews developments and projects for conformance with its watershed management plan policies and performance standards. The third generation watershed management plan utilizes MIDS standards to simplify and increase consistency of the volume control standard and best management practice credits while allowing for more flexibility.

Various federal, state and local units of government are involved in regulating activities that may affect water resources.

The **Minnesota Board of Water and Soil Resources (BWSR)** is the state's administrative agency for soil and water conservation districts, watershed districts, metropolitan watersheds, and county watershed management organizations. The BWSR also oversees the administration of the Wetland Conservation Act.

The **Minnesota Pollution Control Agency (MPCA)** and the U.S. Environmental Protection Agency (EPA) enforce the Federal Clean Water Act and various permitting programs in order to limit pollution caused by businesses, organizations and individuals to protect human health and the environment.

The **Minnesota Department of Natural Resources (MDNR)** enforces conservation law throughout the state including the Wetland Conservation Act, surface and ground water appropriations, and floodplain, shoreland, and in-stream alterations.

The **Minnesota Department of Health (MDH)** administers the Well Management Program, the Wellhead Protection Program, and the Safe Drinking Water Act rules.

The **Minnesota Environmental Quality Board** administers the state's environmental review program, including Environmental Assessment Worksheets (EAW) and Environmental Impact Statements (EIS).

The **U.S. Army Corps of Engineers** administers the permit programs under Section 404 of the Clean Water Act.

The MSCWMO does not administer a permit program. Rather, the MSCWMO reviews projects for compliance with its performance standards.

The MSCWMO Member Communities implement the MSCWMO technical review recommendations through their existing regulatory controls.

The following sections describe the units of government involved in water resource related activities.

4.1 Public Waters, Shoreland, Floodplain and Scenic and Wild Rivers Management

The MDNR’s Public Waters and Wetlands Permit Program (Minnesota Statutes 103G) requires a MDNR public waters 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 designated protected water, including lakes, wetlands and streams. For lakes and wetlands, the MDNR’s jurisdiction extends to designated U.S. Fish and Wildlife Service Circular 39 Classification Types 3, 4, and 5 wetlands which are generally 10 acres or more in size in unincorporated areas, or generally 2.5 acres or more in size in incorporated areas. The program prohibits most filling of protected waters and wetlands for the purpose of creating upland areas.

The U.S. Army Corp of Engineers oversees Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Primarily the Corps of engineers oversees dredging, filling, and dam maintenance activities in waters of the United States

Statewide minimum shoreline standards affect nearly all of Minnesota's lakes and rivers. These standards set guidelines for the use and development of shoreland property, including a sanitary code, minimum lot size, minimum water frontage, building setbacks, building heights, and subdivision regulations. Local units of government with priority shorelands are required to adopt these or stricter standards into their zoning ordinances. For those communities without approved shoreland ordinances, administration of the shoreland ordinance defaults to Washington County. All communities within the MSCWMO have complied with the MDNR’s requests to adopt shoreland ordinances. . Table 4.1 indicates the status of shoreland ordinances for the communities with in the Middle St. Croix watershed.

The State Wild and Scenic Rivers Program (SWSRMP) affect the areas along the St. Croix River. The St. Croix riverway is protected by a combination of standards, zoning, and easements. Communities along the St. Croix River are required to adopt and enforce zoning ordinances and permits for alterations to the natural landscape such as grading and filling and cutting vegetation. These activities are restricted within setback areas and on slopes greater than 12 percent. Existing vegetation must be maintained to reduce bluff erosion and screen structures from view on the river, which preserves the scenic qualities important to the river’s designation.

Table 4.1 Status of Shoreland Ordinances within MSCWMO Member Communities

Community	Status of Shoreland and St. Croix Riverway Ordinances
Afton	St. Croix Riverway ordinance approved by MNDNR. Shoreland ordinance adopted.
Bayport	St. Croix Riverway ordinance approved by MNDNR.
Baytown Township	Covered under Washington County’s MDNR approved shoreland ordinance.
Lakeland	SWSRMP adopted.
Lakeland Shores	SWSRMP adopted.
Lake St. Croix Beach	SWSRMP adopted.
Oak Park Heights	SWSRMP adopted.
St. Mary’s Point	SWSRMP adopted.
Stillwater	Shoreland ordinance approved by Metro MDNR.

West Lakeland Township	Covered under Washington County's MDNR approved shoreland ordinance.
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The Washington County Development Code includes official controls for the purposes of regulating the physical development of land in the unincorporated areas of the County. In shoreland areas, the County regulates vegetation alterations, topographic alterations including grading and filling, and placement and design of roads, driveways and parking lots. Additionally, the County requires buffer strips around all natural environment lakes and streams and type 3, 4 and 5 wetlands. The County code also regulates forest management, agricultural use, structure placement, and subdivisions within shoreland areas. (<http://www.co.washington.mn.us/DocumentCenter/View/53>)

The Washington County Development Code includes floodplain management regulations that apply to all lands within the unincorporated areas of Washington County shown as being located within the boundaries of the Floodway, and General Floodplain in the Flood Insurance Study for the unincorporated areas of Washington County prepared by the Federal ~~Insurance Administration~~ Emergency Management Agency dated ~~May 17, 1982~~ February 3, 2010, and the Flood Boundary and Floodway Maps and Flood Insurance Rate Maps therein. The ordinance regulates the construction, addition, or alteration of any building or structure. (<http://www.co.washington.mn.us/DocumentCenter/View/56>)

The Washington County Public Health and Environment Department coordinates and conducts monitoring, tracking and public education regarding the risk of *Naegleria fowleri* and other public health concerns. Additional information can be found at: <http://www.co.washington.mn.us/index.aspx?NID=471>

The National Park Service has some regulatory control on the Lower St. Croix National Scenic Riverway, which extends fifty-two miles from St. Croix Falls/Taylor's Falls to the confluence with the Mississippi River at Prescott/Point Douglas. This section of river is jointly managed by the National Park Service (NPS), MDNR, and Wisconsin Department of Natural Resources. Additional information regarding the regulatory authority of the NPS can be found at: <http://www.nps.gov/sacn/parkmgmt/lawsandpolicies.htm>.

4.2 Wetlands

There are federal and state regulations pertaining to wetland management:

Food Conservation and Energy Act of 2008 (2008 Farm Bill)

The federal USDA Natural Resources Conservation Service (NRCS) began regulating wetlands under the 1985 Farm Bill. Their regulations only apply to those farmers that participate in USDA programs. The USDA wetland compliance provisions are not administered through an approval or permitting process and the NRCS does not issue drainage permits. Wetland compliance is administered through farmer self-certification. Farmers may request a certified wetland determination from the NRCS to proactively assist them in identifying specific areas that are protected from new or additional drainage activities.

Section 404 of the Clean Water Act

The federal U.S. Army Corps of Engineers (USA ~~COE~~ USACE) administers Section 404 of the Clean Water Act which regulates the discharge of dredge or fill material into waters of the United States including wetlands. The US ~~COE~~ USACE has several types of permits they issue under various circumstances

including Letters of Permission, General Permits, Nationwide Permits and Individual Permits. The US~~COE~~USACE regulates all discharge of dredge or fill activities in wetlands including agricultural drainage projects, regardless of other State or Federal regulatory programs. However, the US~~COE~~USACE currently does not regulate isolated wetlands. The US~~COE~~USACE has attempted to coordinate its regulatory program with the USDA NRCS Farm Bill provisions. However the US~~COE~~USACE currently retains sole responsibility for implementing the Section 404 Program including the regulation of non-exempt discharges into waters of the United States, including wetlands, located on lands in agricultural use.

Section 401 of the Clean Water Act

The Environmental Protection Agency delegated responsibility for this program to the MPCA. ~~to the MPCA.~~ Activities which require a Section 404 individual permit or Federal Energy Regulatory Commission permit must first obtain Section 401 water quality certification from the MPCA stating that the activity conforms to state water quality standards.

Protected Waters and Wetlands program, Minnesota Statutes 103G

The MDNR is the responsible agency for administering this program (see Section 4.1 of this plan for changes to jurisdiction and administration).

Wetland Conservation Act of 1991 (WCA)

Local Government Units (LGUs) are responsible for administering the State WCA Rule. In the MSCWMO, the ten member communities are the LGUs responsible for administering the WCA. (However, the Minnesota Department of Transportation is the WCA LGU in its right-of-way.) The Washington Conservation District provides technical assistance regarding WCA enforcement as requested by the member communities. The intent of the WCA is to promote no net loss of wetlands. The WCA rules regulate draining, filling, and some excavation activities in wetlands not under the jurisdiction of the MDNR. The WCA rules (Minnesota Rules 8420) require that altered wetlands be replaced at replacement ratios of 2:1 or 1:1, depending on the situation. Local units of government may adopt stricter wetland regulations. The WCA allows for the preparation of wetland management plans by LGUs that may give them more flexibility with the State Rule. These wetland management plans need to go through a public review process and become effective upon adoption by the local government unit and the BWSR board. The MDNR is involved in enforcement of the WCA and is responsible for identification, protection and management of calcareous fens. As part of administering the WCA Rules, the LGUs or their delegated authority are responsible for reviewing wetland delineations, wetland functions and values assessments, and wetland replacement plans.

State Water Quality Standards, Minnesota Rules 7050

The MPCA is the agency responsible for implementing Minnesota Rules 7050~~agency~~. The rules include water use classifications and water quality standards for wetlands that are narrative rather than numerical. The rules include a mitigative process to protect wetlands from significant adverse impacts and to maintain nondegradation of wetland-designated uses.

4.3 Stormwater Management and Erosion and Sediment Control

The MPCA administers the EPA's Storm Water Phase II National Pollution Discharge Elimination Systems (NPDES) Rules. The NPDES program includes three regulatory areas including industrial permitting, construction permitting and stormwater permitting. The stormwater permitting program, termed the

MS4 program (Municipal Separate Stormsewer System). In the MSCWMO, the communities of Stillwater and Lakeland Township are currently MS4 communities. The communities of Oak Park Heights, Baytown and Bayport Township were recently notified that they will be considered MS4 communities in the future. The MS4 General Permit is designed to reduce the amount of sediment and that enters surface and ground water from storm sewer systems to the maximum extent practicable. Through the MS4 General Permit, the system owner or operator is required to develop a stormwater pollution prevention program (SWPPP) that incorporates best management practices applicable to their MS4.

The MPCA Citizens' Board approved reissuance of the NPDES Construction Stormwater (CSW) General Permit on June 25, 2013. NPDES CSW permits are needed by owners or operators for any construction activity disturbing one acre or more of soil; disturbing less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources.

The Metropolitan Council requires cities to adopt stormwater management ordinances as part of their comprehensive plan updates. The Metropolitan Council's adopted "Interim Strategy to Reduce Nonpoint Source Pollution to All Metropolitan Water Bodies" includes three requirements: (1) local governments must adopt design standards (such as Nationwide Urban Runoff Program) for new stormwater ponds that will reduce pollutant loadings from stormwater runoff, (2) local governments must follow the best management practices given in the MPCA's 2000 document Protecting Water Quality in Urban Areas, or an equivalent set of standards, and (3) local governments must adopt the MDNR's shoreland regulations, as required by the MDNR's priority phasing list.

4.4 Groundwater Protection

At the state level, different agencies have responsibility for different aspects of groundwater quality and quantity. The Minnesota Department of Health (MDH) is the official state agency responsible for addressing all environmental health matters, including groundwater protection. The MDH is responsible for preventing pollution of water supplies to ensure safe drinking water sources and to limit public exposure to contaminants. Through implementation of the Safe Drinking Water Act, the MDH conducts the Public Water Supply Program, which allows the MDH to monitor ground water quality and train water supply system operators. 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 the recharge zones of public well supplies. In 1997, the Wellhead Protection Program rules (Minnesota Rules 4720.5100 to 4720.5590) went into effect. These rules require all public water suppliers that obtain their water from wells to prepare, enact, and enforce wellhead protection plans. The MDH prepared a prioritized ranking of all such suppliers in Minnesota. Regardless of the ranking, Rules 4720 require all public water suppliers to initiate wellhead protection measures for the inner wellhead management zone prior to June 1, 2003. If a city drills a new well and connects it to the distribution system, the city must begin development of a wellhead protection plan.

The Minnesota Department of Agriculture, (MDA) under the state Groundwater Protection Act, is responsible for preventing and mitigating the degradation of groundwater from agricultural chemicals, in particular from fertilizers and from pesticides.

The MDNR regulates the rate and volume of groundwater use 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 must obtain a water appropriation permit from the MDNR. The MDNR is also responsible for mapping sensitive groundwater areas, conducting groundwater investigations, addressing well interference problems, and maintaining the observation well network. The MDNR has initiated a planning process to establish a Groundwater Management Area (GWMA) in the North & East Metro which includes all of Ramsey and Washington counties and the southern portion of Anoka County. The GWMA planning process will produce a plan to guide MDNR groundwater management in the area. Formal designation of the GWMA will take place at the completion of the planning process when the Commissioner of the MDNR approves the plan. Implementation will begin following formal designation of the GWMA expected by **early fall** 2015. Find more information at <http://www.dnr.state.mn.us/gwmp/area-ne.html>.

The MPCA administers and enforces laws relating to pollution of the state's waters, including groundwater (except for agricultural chemicals). The MPCA monitors ambient groundwater quality, and administers septic system design and maintenance standards. The Tanks and Spills Section of the MPCA regulates the use, registration and site cleanup of underground and above ground storage tanks.

The Minnesota Geological Survey provides a complete account of the state's groundwater resources through geological mapping and investigation projects. The Minnesota Geological Survey produces the county geologic atlases, interprets water well log information, and manages a database of county well information.

Since 2003 Washington County has excised its authority to prepare and adopt groundwater plans through Minnesota Statutes 103B.255, which provides a mechanism for counties to set priorities, address issues, and build local capacity for the protection and management of groundwater. An updated county groundwater plan was approved by BWSR in August 2014 and adopted by the board of commissioners in September 2014. The Groundwater Plan provides a countywide framework, issues, policies and strategies to address existing and future groundwater issues – related to both groundwater quality and groundwater quantity. It is intended to compliment and coordinate with other state, regional, county and local planning efforts, including wellhead protection planning, city comprehensive planning and watershed management planning. The 2014 Washington County Groundwater Plan identifies several strategies requiring collaboration with WDs and WMOs. The development and implementation of current and future Washington County groundwater plans provides opportunities for the Middle St Croix WMO and Washington County to collaborate on groundwater issues.

For more information see the Washington County Groundwater Plan 2014 – 2024:
<http://www.co.washington.mn.us/documentcenter/view/4462>.

4.5 Subsurface (Individual) Sewage Treatment Systems

Subsurface sewage treatment systems are regulated through a combined state and local program. The state effort is led by the Minnesota Pollution Control Agency (MPCA). The MPCA has three main responsibilities: 1) revisions to the state's onsite code (MN Rules Chapters 7080 - 7083), 2) assistance and interpretations to Chapters 7080 - 7083, and 3) administration of the statewide professional certification and licensing program.

The statewide code requires that all onsite professionals be licensed by the MPCA including maintainers, service providers, installers, designers, and inspectors. The requirements to become licensed include education, examination, apprenticeship, continuing education, and appropriate insurance and bonding.

The MPCA adopted new Sewage System Rules 7080, 7081, 7082, and 7083 on February 4, 2008. Washington County subsequently adopted a new septic system ordinance (County Ordinance 179; <http://www.co.washington.mn.us/DocumentCenter/View/690>) on September 8, 2009. The purpose of the Ordinance is to regulate the location, design, installation, use and maintenance of subsurface sewage treatment systems in all areas of Washington County other than cities and towns that have adopted ordinances that comply with Minnesota Statute 115.55 and are as strict as Ordinance 179.

State Rules require that cities and townships adopt the minimum County Ordinance standards into their own local septic ordinance within one year after the County's Ordinance amendment. Washington County revised their SSTS ordinance in 2015. Washington County Physical Health and Environment Department administers the SSTS program in unincorporated areas of the County and portions of the county delegated through contracts with incorporated cities. The City of Stillwater has adopted and enforces their own SSTS ordinances.

4.6 Feedlots

The MPCA administers the state feedlot rules (MN Rules Chapter 7020) first adopted in 1971, and most recently revised in April 2014. Chapter 7020 governs the storage, transportation, disposal, use of animal manure, processing of wastewaters, and the application for and issuance of permits for construction and operation of animal manure management and disposal or utilization systems for the protection of the environment. (<http://www.pca.state.mn.us/index.php/topics/feedlots/index.html>.)

All feedlot owners with 50 or more animal units (10 or more animal units in Shoreland areas) are required to register their feedlot with the MPCA, and the registration must be updated every four years. The feedlot registration process simply identifies the feedlot owner and operator, the location of the feedlot, and the maximum animal unit capacity the feedlot can hold. Feedlot permits provide additional feedlot details, including the site's runoff and manure management, and are required for construction of new feedlots or expansion of existing feedlots over 300 animal units. New feedlots cannot be constructed and existing feedlots are not allowed to expand within designated Shoreland areas (typically within 300-feet of a stream or 1,000-feet of a lake). All feedlots over 300 animal units must develop and maintain a Manure Management Plan.

4.7 Federal Farm Program and Pesticide Use

The primary regulatory controls in agricultural areas come from the U.S. Department of Agriculture Food Conservation and Energy Act of 2008 (Farm Bill). Most agricultural operators enroll and participate in the Farm Bill programs in order to ensure price support for their crop or produce. With inclusion in the Farm Bill Program, there are two major regulatory controls, Swampbuster and Sodbuster, administered by the Natural Resources Conservation Service (NRCS). Swampbuster prohibits the alteration of wetlands that weren't already altered before 1985 and requires an approved mitigation plan for the alteration of wetlands after 1985. The NRCS, in coordination with the U.S Army Corps of Engineers, is

currently working to develop a general permit process to reduce the amount of wetland regulatory overlap between federal agencies on agricultural lands enrolled in the Farm Bill. Sodbuster requires an approved conservation plan if historically uncultivated areas are to be plowed and cultivated in areas of Highly Erodible Land (Figure 2.5). This helps prevent soil loss from agricultural fields.

The Minnesota Department of Agriculture (MDA) is statutorily responsible for the management of pesticides and fertilizer other than manure to protect water resources. The MDA implements a wide range of protection and regulatory activities to ensure that pesticides and fertilizer are stored, handled, applied and disposed of in a manner that will protect human health, water resources and the environment. The MDA works with the University of Minnesota to develop pesticide and fertilizer Best Management Practices (BMPs) to protect water resources, and with farmers, crop advisors, farm organizations, other agencies and many other groups to educate, promote, demonstrate and evaluate BMPs, to test and license applicators, and to enforce rules and statutes.

4.8 Surface Water Quality

The federal Clean Water Act requires states to adopt water quality standards to protect lakes, streams, and wetlands from pollution. The standards define how much of a pollutant (bacteria, nutrients, turbidity, mercury, etc.) can be in the water and still meet designated uses, such as drinking water, fishing, and swimming. A water body is “impaired” if it fails to meet one or more water quality standards.

To identify and restore impaired waters, Section 303(d) of the Clean Water Act requires states to:

1. Assess all waters of the state to determine if they meet water quality standards.
2. List waters that do not meet standards (also known as the 303d list or the impaired waters list) and update the list every even-numbered year.
3. Conduct TMDL (total maximum daily load) studies in order to set pollutant reduction goals needed to restore waters.

Federal and state regulations and programs also require the implementation of restoration measures to meet TMDLs. The Minnesota Pollution Control Agency (MPCA) is charged with enforcing the Clean Water Act in Minnesota. MPCA responsibilities include monitoring and assessing water quality, listing impaired waters, and conducting TMDLs. The agency also coordinates closely with other state and local agencies on restoration activities. To best align resources, the MPCA is following the Intensive Watershed Monitoring approach for both monitoring (agency and local via grant funds) and assessments.

The MPCA’s watershed approach includes four steps: 1) monitor waterbodies and collect data, 2) assess data, 3) develop strategies to restore and protect the watershed’s waterbodies, and 4) conduct restoration and protection projects in the watershed. Step 3 includes the completion of a watershed restoration and protection strategy (WRAPS) and report which:

- Summarizes scientific studies of the watershed, including the physical, chemical, and biological assessment of the water quality of the watershed
- Identifies impairments and water bodies in need of protection

- Identifies biotic stressors and sources of pollution (both point and nonpoint)
- Provides scientific analysis for impairments (TMDLs) that determines the sources of pollution and the reductions needed to meet water quality standards
- Includes an implementation table which contains strategies and actions designed to achieve and maintain water quality standards and goals

The MPCA also coordinates the State's Nutrient Reduction Strategy that guides the state in reducing excess nutrients in waters so that in-state and downstream water quality goals are ultimately met.

5.0 Goals, Strategies, & Policies

Watershed management plans provide a means for the management of water resources at a watershed scale and allow communities to develop and implement programs and regulations to ensure that future development and land use activities will occur with consistent regard for water resources. This section of the plan presents the goals, strategies and policies of the Middle St. Croix Watershed Management Organization (WMO) with the following definitions for these terms:

Goal: Desired outcome to help realize the vision of the WMO and the purpose of this plan

Strategy: Activity the WMO will undertake to help achieve its goals

Policy: Specific action required of the member communities to help achieve the goals of the WMO

This section is organized by topic area with some general information and key concepts preceding the goals, strategies and policies. Enumeration of strategies and policies are continuous from one topic area to the next for easier reference.

Section 7 of this plan includes specific performance standards for implementation by developers and member communities. These performance standards, together with the policies provide the framework in which local communities will prepare or update their local water management plans, or accept this plan by reference. The WMO will monitor the adoption of the plan within each member community to ensure that the plan is implemented.

5.1 Water Quality

Improving and protecting water quality is the highest priority of the MSCWMO. Stormwater runoff presents a significant concern with respect to water quality. Runoff collects pollutants and pollutant-laden sediments that drain into the lakes, wetlands, and streams of the watershed, rather than filtering through the ground. This non-point source of pollution is considered the leading source of water pollution in the United States. Stormwater runoff contains a variety of elements that can negatively impact the quality of receiving waters. Phosphorus and nitrogen accelerate eutrophication of surface waters and increase surface algal scum, algal blooms, water discoloration, and depressed oxygen levels. Stormwater carries heavy metals, oils and grease from roads and parking lots and toxic organic compounds from herbicides, pesticides and wood preservatives as well as fecal coliform bacteria and sediments that degrade aquatic habitats. These pollutants may impair recreational and aquatic life uses of receiving waters.

The strategies and policies presented here will assist in implementing the Minnesota Nutrient Reduction Strategy to achieve nitrogen and phosphorus reduction milestones in the St. Croix and Mississippi Rivers.

GOAL: Protect and improve water quality in the Middle St. Croix watershed through the treatment and control of stormwater runoff.

STRATEGIES:

S1. Apply for grants to augment local funds to address the nutrient load reductions identified in the Lake St. Croix Total Maximum Daily Load (TMDL), and prioritized practices identified in the Lake St. Croix Direct Discharge, Perro Creek, Lake McKusick, Lily Lake and other prioritized subwatershed analyses.

S2. Inventory and evaluate outlets directly discharging to Lake St. Croix to further identify and prioritize practices to meeting the Lake St. Croix TMDL.

S3. Review projects and development plans to evaluate compliance with the MSCWMO Watershed Management Plan.

S4. Utilize a checklist of site design practices for developers that promote site design practices such as impervious surface disconnect, reduced impervious surfaces, the use of buffer strips along receiving waters and drainage swales, to achieve compliance with the water quality performance standards.

S5. Work with local governments and state agencies to implement Minimal Impact Design Standards in order to provide clear, flexible and consistent new development and redevelopment stormwater standards.

S6. Develop and adopt a simplified review process and guidance and application materials to meet performance standards for minor subdivisions undertaking grading, filling, or other land alteration activities that are less than one acre and which trigger a review by the MSCWMO.

S7. Provide technical support to member communities to achieve water quality goals such as assisting with construction inspections and providing technical recommendations and resources.

S8. Collaborate with member communities, Washington County and the Washington Conservation District to prioritize and target conservation practices, pursue grant application opportunities to install prioritized and targeted best management practices (BMPs).

S9. Promote voluntary water quality best management practices by providing on-site consultation, design assistance, and cost share.

S10. Support communities to implement MS4 requirements and track, inspect and maintain water quality improvement practices so they provide their designed benefits.

POLICIES:

P1. Require MSCWMO review of water quality treatment of stormwater runoff when performance standard triggers are met or exceeded and adopt the MSCWMO review comments into the community comments for each project. .

P2. Notify the MSCWMO of capital or street improvement project priorities prior to the start of design.

P3. Collaborate with the MSCWMO to identify and implement practices to address sources and discharges of pollutants.

P4. Collaborate with the MSCWMO to track, inspect and maintain water quality improvement practices so they provide their designated benefits.

5.2 Water Quantity

Increased stormwater runoff from developed land presents significant concerns in terms of water quantity, in addition to water quality. Land development alters the hydrology of a watershed. As ditches, sidewalks, roads, parking lots, rooftops, and other hard surfaces that inhibit water from infiltrating into the ground are constructed, more water runs off the land and less water infiltrates into groundwater. During storms, the rainwater flows off impervious areas very quickly and often discharges directly into streams, wetlands, and lakes. Decreased flow during dry weather periods and increased flow during storms have a serious adverse impact on local surface waters.

Flooding caused or exacerbated by stormwater runoff from developed or drained areas is a concern in the MSCWMO. The MSCWMO uses performance standards, design standards and collaborative programs to minimize the volume and control the rate of runoff and, hence, the potential for flooding.

GOAL: Minimize existing and future potential damages to property, public safety, and water resources due to flood events.

STRATEGIES:

S11. Require project applicants perform hydrologic studies that analyze the 2-, 10- and 100-year rainfall event [based on Atlas 14 precipitation frequency events](#), with the critical duration defined as that event causing either the highest water surface elevation or the largest peak discharge in an area or both.

S12. Require that new development and redevelopment areas be limited to the predevelopment or existing rate of runoff or to a rate within the capacity of downstream conveyance systems, whichever is less, and prohibit an increase in the volume or rate of runoff from areas where natural outlets do not exist.

S13. Require that in sub-areas of a landlocked watershed, new and redevelopment shall not increase the predevelopment volume or rate of discharge from the sub-area for the 10-year return period event.

S14. Require that project applicants secure any flowage easements that would be required to accommodate the stormwater management facilities. These easements shall be granted up to the 100-yr flood level.

S15. Require that applicants provide the MSCWMO with 100-year flood levels on the ponds, lakes, and streams prior to development as part of the application process.

S16. Support and promote the implementation of the Washington County Floodplain Regulations through project review process.

S17. Collaborate with local, state and federal governments to identify, prioritize, fund and install projects and practices that minimize existing and future potential damages to property, and water resources due to flooding.

POLICIES:

P5. Require a MSCWMO review of rate and flood control measures when performance standard triggers are met or exceeded and adopt the MSCWMO review comments into the community comments for each project.

P6. Notify the MSCWMO of existing and future potential damages to property, public safety, and water resources due to flood events.

5.3 Erosion and Sediment Control

Erosion and sedimentation cause several negative effects on receiving waters. Sediment smothers fish larvae and eggs by covering the coarser substrate that fish typically use to spawn. Sediment induced turbidity reduces light penetration of water, hinders sight-feeding fish and can increase the cost of providing drinking water. Sedimentation impairs aesthetics, reduces water quality for recreational uses, lowers the value of adjoining lands, and increases public costs to maintain waterways and stormwater conveyances. Soil particles carry nutrients, trace metals and hydrocarbons into receiving waters and foster algae and weed growth. Runoff from construction sites is the largest source of sediments in areas undergoing development. Uncontrolled runoff from agricultural crop production can also contribute greatly to sedimentation problems.

The MSCWMO recognizes the negative effects of erosion and sedimentation and uses performance standards, design standards and collaborative programs to help control erosion. The use of vegetated buffers along waterbodies is one of the best ways to alleviate erosion occurring on streambanks and shorelines.

GOAL: Prevent erosion and subsequent sedimentation from surface runoff within the watershed on construction sites; agricultural lands; and along stream banks, lakeshores, and roadsides.

STRATEGIES:

S18. Require both temporary (during construction) and permanent (long-term) erosion control for developing or redeveloping land in MSCWMO undertaking grading, filling, or other land alteration activities involving the movement of over 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land.

S19. Require a stormwater pollution prevention plan (SWPPP) compliant with the most recent version of the NPDES/SDS Construction Stormwater (CSW) General Permit for all projects undertaking grading, filling or other land alteration activities 1 acre or greater.

S20. Implement a simplified erosion and sediment control review process for all minor subdivisions undertaking grading, filling, or other land alteration activities that are less than one acre and trigger a review by the MSCWMO.

S21. Require and inspect proper temporary and permanent erosion and sediment control throughout the watershed to prevent nuisance conditions, erosion in receiving channels or on down slope properties, and inundation of wetlands.

S22. Require vegetated buffers for projects adjacent to water bodies.

S23. Require buffers and prohibit construction on steep slopes and bluffs.

S24. Require land use alteration and construction setback from the top of bluffs.

S25. Identify, evaluate, prioritize, and seek funding for gully stabilization opportunities to reduce sediment and phosphorous discharges to water resources.

POLICIES:

P7. Require a MSCWMO review of sediment and erosion control measures when performance standard triggers are met or exceeded and adopt the MSCWMO review comments into the community comments for each project..

5.4 Monitoring

Monitoring water resources is an important function of the MSCWMO and its partners. Regular and coordinated monitoring facilitates trend analyses to look at changes over time and/or the impact of improvement projects and best management practices. Monitoring is also needed to identify impaired waters in need of total maximum daily load studies (TMDLs) and waters with good quality that should be protected. Monitoring data can also facilitate the appropriate prioritization of projects and practices throughout the MSCWMO.

GOAL: Collect monitoring data needed to understand the quality of major water bodies, identify problems and determine appropriate practices and management practices.

STRATEGIES:

S26. Conduct water quality monitoring of lakes in cooperation with municipalities, Washington County, and state agencies as appropriate to establish water quality goals, target the implementation of best management practices and improvement projects, and evaluate progress toward water quality goals.

S27. Support lake and stream volunteer monitoring efforts.

S28. Create and distribute an annual Water Quality Monitoring Report that summarizes monitoring data collection, analysis and results.

POLICIES:

P8. Coordinate all water quality monitoring efforts with the MSCWMO.

P9. Provide all water quality data and analyses to the MSCWMO.

5.5 Wetlands

Wetlands provide many important benefits including storage areas for excess water during times of flooding; filtration of sediments and nutrients before they enter lakes, rivers, streams, and groundwater; important fish and wildlife habitat; and public recreation and landscape aesthetics. Wetlands are divided into eight types depending on the amount and frequency of water retention and their typical vegetation.

The MSCWMO requires buffers around wetlands along with other performance standards which often exceed requirement of the State's Wetland Conservation Act. An inventory of wetlands within the boundaries of the MSCWMO and their functional assessment is available in Appendix C.

GOAL: Manage the quantity and quality of wetlands, in conformance with the Minnesota Wetland Conservation Act (WCA) and Water Quality Standards Rules (Minnesota Rules 8420 and 7050).

STRATEGIES:

S29. Review all WCA applications in the MSCWMO.

S30. Require wetland performance standards in this plan that may parallel and/or exceed the WCA performance standards.

S31. Require the submission of all permits prior to starting work that impacts a wetland or its required buffer.

S32. Require thorough consideration and documentation of alternatives presented to justify wetland impacts; all projects shall be designed with minimal wetland impact. The pre-existing wetland functions will be taken into account as alternatives are considered.

S33. Require applicants to provide wetland type and a wetland delineation, using a methodology approved by BWSR; any inventories or ranking assessments completed by the MSCWMO are for preliminary purposes only.

S34. Require applicants to provide a functional assessment when necessary.

S35. Require evaluation of the effect of bounce from treated stormwater input per State of Minnesota Stormwater Advisory Group's guidelines for wetland susceptibility in the publication Stormwater and Wetlands: Planning and Evaluation for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt runoff on Wetlands available from the MPCA.

S36. Require review and evaluation of changes to the hydrology of the wetland (i.e. changes to the outlet elevation or contributing drainage area) for both the existing and proposed wetland conditions.

S37. Require wetland buffers based on wetland categories in the MSCWMO Performance Standards.

POLICIES:

P10. Require a MSCWMO review of wetland protection measures when performance standard triggers are met or exceeded and adopt the MSCWMO review comments into the community comments for each project.

P11. Notify MSCWMO for all Wetland Conservation Act (WCA) applications.

5.6 Groundwater

The growing demand for groundwater for drinking water supplies, irrigation, industrial, and commercial uses, along with the increased detection of groundwater contamination, focuses attention on this resource in Washington County and in the Middle St. Croix watershed. Groundwater and surface water systems do not necessarily coincide with surface water divides or boundaries and should be coordinated at the county or regional level.

GOAL: Collaborate to protect the quantity and quality of groundwater resources.

STRATEGIES:

S38. Collaborate with Washington County to implement the actions of the 2014-2024 Groundwater Plan including considering well head protection areas and separation of infiltration areas during project reviews and enforcing State required setbacks.

S39. Support Washington County to identify, prioritize and address failing septic systems.

S40. Encourage member communities to adopt well head protection programs.

S41. Collaborate with Washington Conservation District and Washington County to identify and seal abandoned wells.

S42. Identify and prohibit activities during the review process that may negatively impact groundwater.

S43. Collaborate with member communities, Washington County and other agencies on the development and adoption of policies on the quantity of water used in areas where existing wells and/or groundwater dependent natural resources could be negatively impacted by overuse of groundwater. Negative impacts include reduced flow to surface water bodies, lowering of lake or wetland levels, or interference with other wells.

S44. Provide education to citizens and public officials on the inter-relation of surface and groundwater quality and quantity; the value of and need to protect groundwater recharge areas and wetlands; and implementation of best management practices and low-impact development and redevelopment strategies to protect groundwater resources.

S45. Require infiltration of stormwater per MSCWMO performance standards to promote low impact development that mimics natural hydrology and recharges groundwater.

POLICIES:

P12. Adopt well head protection programs.

P13. Collaborate with the MSCWMO and Washington County to implement the actions of the 2014-2024 Groundwater Plan.

P14. Collaborate with the MSCWMO and Washington County to identify, prioritize and address failing septic systems and to seal abandoned wells.

~~P13. Collaborate with the MSCWMO and Washington County to identify, prioritize and address failing septic systems.~~

5.7 Habitat and Recreation

Natural habitats and water-based recreation are important areas to consider during development, redevelopment and project implementation within the MSCWMO. MSCWMO strategies and policies in multiple disciplines benefit habitats and recreation by improving the quality of surface water resources. As water quality improves, so do aquatic habitats for fish and other organisms along with recreational experiences. Additional and direct habitat and recreation improvements will be done in collaboration with other entities.

GOAL: Maintain or improve habitats by implementing protection or restoration measures that consider ecological functions as well as recreation, human health, safety, and welfare.

STRATEGIES:

S46. Promote habitat preservation and restoration within the watershed when reviewing projects or completing MSCWMO projects.

S47. Collaborate with other entities (e.g., agencies, lake associations, cities, Washington County) to manage and prevent the spread of aquatic invasive species; MSCWMO services may include point-intercept surveys of aquatic vegetation, feasibility studies, technical analysis, education, exploring funding options, and applying for grants. The MSCWMO will not manage increased growths of native aquatic vegetation resulting from improved water quality.

S48. Cooperate with the Minnesota Department of Natural Resources and other entities, as requested, to protect rare and endangered species under the State's Endangered Species Statute.

S49. Promote the protection and restoration of natural and native shoreland areas, including the preservation of lakeshore and stream bank vegetation, and the establishment and maintenance of buffers adjacent to priority water bodies.

S50. Encourage landowners to protect, restore, or improve degraded native habitats including shoreland, uplands, bluff lands, wetlands, streambanks, and prairies for the benefit of fish, wildlife and water quality.

POLICIES:

P15. Consider designs for projects located in close proximity to waterbodies or natural areas to increase beneficial habitat, wildlife and recreational uses.

5.8 Education

MSCWMO is a member of the East Metro Water Resource Education Program (EMWREP), a city-county-watershed partnership formed in 2006 and hosted by the Washington Conservation District. The purpose of the shared education program is to provide education about the impacts of non-point source pollution on water resources and to engage people in projects that will help to protect and improve water quality in the region. In addition to educating the public, EMWREP also provides training for city, county and watershed staff and local elected officials. A copy of the most recent EMWREP Education Plan can be found at www.mnwcd.org/emwrep.

In addition to participating in EMWREP, MSCWMO works one-on-one with landowners, developers, and municipal staff and officials within its member communities to educate these people about local water resources, issues affecting the resources, and watershed rules and projects.

GOAL: Increase the knowledge and understanding of watershed residents, government officials and staff, consultants and developers to encourage actions which improve water quality, water quantity, wetlands and natural resource protection.

STRATEGIES:

S51. Collaborate with the East Metro Water Resource Education Program to build awareness about the impacts of non-point source pollution on local lakes, rivers, streams, wetlands and groundwater resources and engage stakeholders (watershed residents, government officials and staff, consultants, and developers) in the recognition and implementation of water resource management policies, programs and practices.

S52. Promote the use of native plants, raingardens and shoreline plantings to reduce runoff pollution and conserve groundwater resources through Blue Thumb – Planting for Clean Water® workshops, or equivalent programs.

S53. Conduct tailored outreach to commercial, residential, and rural landowners to facilitate project implementation in priority areas.

S54. Offer technical workshops for staff from local units of government – public works, engineers, planners and consultants on water resource related topics.

S55. Provide training and education to local land use councils and staff on how they can accommodate growth while protecting and improving local water resources.

S56. Regularly publish water education related blogs, social media and newspaper articles.

S57. Promote educational messaging for public projects in public spaces.

POLICIES:

P16. Provide guidance to the MSCWMO and the East Metro Water Resources Education Program (EMWREP) for technical, policy and general education messages and programs on water resources and land use related topics.

P17. Encourage city staff and councils to attend relevant educational events.

P18. Include applicable EMWREP educational announcements, articles and events in member community newsletters and on websites.

5.9 Administration

The MSCWMO strives to work cooperatively and collaboratively with its member communities and other partners to implement projects, programs, and development reviews in the most efficient and effective manner possible. MSCWMO administration is performed on a contract basis by staff with the Washington Conservation District, providing a significant level of efficiency (sharing of office space and resources) and collaboration. MSCWMO administration works to avoid duplication among agencies and follow state law regarding watershed management organizations, while protecting and improving water resources to the greatest extent possible.

GOAL: MSCWMO is an efficient, well organized, and proactive organization that collaboratively prioritizes and manages water resources with member communities and other government jurisdictions.

STRATEGIES:

S58. Maintain efficient water management programs where existing local units of governments remain the primary regulators and refer projects to the MSCWMO for investigation, comments and recommendations based on the MSCWMO's performance standards of this Plan.

S59. Regularly review and revise project review fees, application materials and guidance.

S60. Meet or exceed the requirements of the MN Board of Water and Soil Resource's Performance Review and Assistance Program and the Metropolitan Surface Water Management Act regarding the management of a watershed management organizations including submitting annual reports and audits, biennially implementation plan reports, 5-year implementation plan update, and plan amendments, as needed.

S61. Seek opportunities to form and use a citizen advisory committee (CAC) to complete meaningful finite or ongoing tasks of the MSCWMO and to advise the MSCWMO on projects and programs, as needed.

S62. Maintain a technical advisory committee (TAC) to promote communication and cooperation between the MSCWMO and member cities.

S63. Meet or exceed the criteria of the Washington County Governance Study (April 16, 2002 or as amended).

S64. Biennially evaluate this Plan's implementation by the MSCWMO and member communities and present the implementation of strategies and policies in a report.

S65. Maintain a website with MSCWMO meeting agendas, minutes, Watershed Management Plan, and focused articles on MSCWMO activities.

S66. Represent the MSCWMO at state, county and city meetings, as requested, to maintain collaborative and efficient governance.

S67. Keep member communities informed of water related issues and programs.

POLICIES:

P19. Modify local controls and procedures to be in conformance with this Plan, including the performance standards for development and redevelopment and MSCWMO project reviews, as required.

P20. Designate staff to attend an annual meeting to evaluate progress and collaborate to improve efficiency in meeting standards and policies.

6.0 Implementation

This section describes the responsibilities of the Middle St. Croix Watershed Management Organization (MSCWMO) and the responsibilities the MSCWMO has delegated to its member communities. Within the MSCWMO, many federal, state, and local agencies also have regulatory functions related to water resources. A description of these agencies and their responsibilities can be found in Section 4.0 of this Plan (Regulatory Framework). This section also includes information on funding sources, financial considerations and impacts on local communities. Finally, the implementation program of the MSCWMO is presented in Table 6.4 including implementation costs and timeframes.

6.1 Responsibilities and Management Programs

6.1.1 MSCWMO Responsibilities

The MSCWMO serves many water resources management roles, as listed in Minnesota Statutes 103B. The MSCWMO works to collaborate with all agencies in the WMO, but particularly with its member communities and Washington County to effectively and efficiently manage water resources within its jurisdiction. The current Joint Powers Agreement (JPA) of the MSCWMO is included in Appendix H. The JPA provides details of the MSCWMO's official controls and functions and its relationship with member communities. The MSCWMO was established with the philosophy that local units of government would be the primary regulator of activities of concern, but where issues affect more than one unit of government the MSCWMO maintains a coordination and dispute resolution role. To achieve and maintain compliance with the water management system and land use controls, local units of government will refer projects to the MSCWMO for investigation, comments, and recommendations regarding the proposed activity based on the strategies, policies and performance standards of this Plan (Section 5.0). Overall, the MSCWMO will:

1. Review development and redevelopment projects for conformance with MSCWMO requirements and standards (see section 7.0 Performance Standards);
2. Evaluate the implementation of this Plan by local units of government,
3. Conduct water monitoring activities to track trends and target best practices;
4. Assist communities with appropriate planning and ordinance development;
5. Collaborate on grant applications and project management; and
6. Educate communities and residents in partnership with the East Metro Water Resources Education Program.

Section 5.0 of this Plan includes a complete list of strategies to be implemented by the MSCWMO over the life of this Plan.

At this time, the MSCWMO does not anticipate hiring staff. Administration and technical implementation of this Watershed Management Plan and its policies will be performed through a service contract. Supervision of the administrative and technical services will be through the MSCWMO Board of Managers. Administrative and technical services will include review of activities for conformance with performance standards, coordination of Board meetings, preparation of Board meeting minutes, implementation of educational programs, and other activities as requested by the Board. Legal, accounting, and engineering services will also be contracted for on a biennial basis. Legal, professional or technical consultant services will be solicited and contracted for on a biennial basis in accordance with MN Statutes 103B.227 Subd. 5.

6.1.2 Member Community Responsibilities

Successful management of water resources includes not only collaboration between the MSCWMO and member communities, but also implementation by member communities of appropriate policies and performance standards. Section 5.0 of this Plan includes several policies for member communities (i.e., specific activities to be implemented by the member communities).

Additionally, each of the ten member communities are expected to follow the provisions of the MSCWMO Joint Powers Agreement and to:

Appoint one manager to the MSCWMO Board of Managers (and one alternate manager, if desired) to attend regular and special meetings of the Board in order to conduct the MSCWMO business and maintain communication among member cities.

Collaborate with the MSCWMO on water management issues, including providing technical staff and input at appropriate MSCWMO meetings, functions, and trainings.

Use its official controls (e.g., ordinances) to enforce the requirements and performance standards of the MSCWMO. Member communities shall inform developers and other project applicants that the MSCWMO has performance standards and project review requirements and will refer development plans to the MSCWMO for review and comment according to the provisions of this Plan. MSCWMO reviews will comply with 50 days of receipt of application materials. Member communities will permit only those projects that conform to the requirements and standards of the MSCWMO.

Update its Local Water Management Plan and official controls. Following final approval of this Plan by the Minnesota Board of Water and Soil Resources and adoption by the MSCWMO Board of Managers, each member community in the MSCWMO is required to prepare a new local government water resources management plan, adopt this Plan by reference, or amend any existing plan to comply with this Plan pursuant to Minnesota Statute 103B and Minnesota Rules 8410. Section 6.54.1 includes the process and timeline for local water plan revisions.

If MSCWMO member communities are found to not be implementing strategies, policies or performance standards consistent with the MSCWMO Plan, the MSCWMO will take administrative or legal action to ensure the MSCWMO strategies, policies and performance standards are being implemented by member communities.

6.1.3 Washington County Water Governance and Water Consortium

The MSCWMO continues to work with Washington County to improve water governance and cooperation throughout the County. The 2002 Washington County Governance Study resulted in multiple goals:

1. To create a water management structure that will provide long-term protection for surface and ground water resources.
2. To create local water management units with the fiscal capacity and authority to govern efficiently and effectively.
3. To identify financing mechanisms that are fair and adequate to meet the needs of the county.

4. To coordinate surface water, ground water, land-use and natural resources management to provide for a more comprehensive approach to resource management.
5. To adopt a proactive rather than a reactive approach to countywide water governance.
6. To increase the accountability of the water management structure.

One of the paths to realizing these goals is the collaboration of the Washington County Water Consortium. The purpose of the consortium is to preserve and improve the quality of the county's water resources in the most efficient manner by partnering and facilitating collaboration with watersheds, communities, state and local agencies and county departments on shared water resource issues. The MSCWMO is an active member of this ad hoc group which has been in existence since 2000. The consortium meets monthly to discuss, learn, and collaborate. Currently, the consortium has two work groups that focus on better local government and WMO collaboration on permitting, water quality standards, and best management practice maintenance.

In addition to being an active member of the consortium, the MSCWMO presents its accomplishments and budget to the Washington County Board of Commissioners each year. The presentation is an effective way to keep the County Board apprised of the WMO's activities and priorities, to answer questions from Commissioners, and to receive feedback on WMO projects and programs.

The MSCWMO also recognizes the water governance recommendations of Washington County specific to the MSCWMO. These recommendations are included in the Washington County Governance Study (<http://mn-washingtoncounty.civicplus.com/DocumentCenter/View/728>).

6.1.4 MSCWMO Review Process

Each community will refer projects to the MSCWMO for full review when deemed necessary based on the activities listed below. All applicable Performance Standards will apply to all projects that trigger the MSCWMO review process. Each community will adopt the MSCWMO review comments into the community comments for each project.

1. Any project undertaking grading, filling, or other land alteration activities which involve movement of 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land.
2. All projects which create or fully redeveloped impervious surface of 6,000 square feet or more.
3. All projects within the St. Croix Riverway that requires a building permit and adds five hundred (500) square feet of additional impervious surface or a project requires a variance from the current local impervious surface zoning requirements.
4. All major subdivisions. Major subdivisions are defined as subdivisions with 4 or more lots.
5. Any project with wetland impacts and any project with grading within the wetland/public water buffer or within 40-feet of the bluff line.
6. Development projects that impact 2 or more of the member communities.

Building permits for new construction in an approved major subdivision that meets the requirements of the Performance Standards are exempt from the water quantity and quality standards as long as the individual property does not exceed impervious surface percentage approved for the given parcel in that subdivision.

In addition, as a prerequisite for construction stormwater permitting, development projects fifty acres or more in size and within ~~two thousand feet~~ one mile (aerial radius measurement) of impaired water or a special water (i.e., trout stream or outstanding resource value) must submit stormwater management plans to the MPCA for a thirty-day review.

6.1.5 Variances from Performance Standards

Project variance requests shall be submitted to the member community and MSCWMO. The member community shall provide the MSCWMO administrator notification and variance documents to review and comment within 30 days prior to the scheduled Planning Commission Review. MSCWMO comments will be provided to community planning commission and, when applicable, council for consideration during variance hearing.

Variances may only be granted when in harmony with the general purpose and intent of the Performance Standard. “Practical difficulties” is a legal standard set forth in law that must be applied when considering applications for variances. It is a three-factor test and applies to all requests for variances. To constitute practical difficulties, all three factors of the test must be satisfied including reasonableness, uniqueness, and essential character. Economic considerations alone shall not constitute a practical difficulty if a reasonable use for the land exists under the terms of these performance standards. Member communities may impose conditions in the granting of a variance to insure compliance and to protect adjacent land and the public health and general welfare of the MSCWMO.

6.1.6 Reporting and Evaluation

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

- A summary of the previous year’s work plan that indicates if the stated activities were completed and enumerates accomplishments.
- A work plan budget for the current year specifying which activities will be undertaken
- A minimum of every two years, an evaluation of progress on goals and the implementation actions, including stormwater retrofits program, to determine if amendments to the implementation plan are necessary.

An annual monitoring report summarizing significant trend is also provided.

This plan includes high-level goals that address nine areas of water resource management. As stated at the beginning of Section 5.0, “goals” are desired outcomes to help realize the vision of the MSCWMO and the purpose of the Plan. Each goal has multiple measurable strategies and policies that will be implemented to help meet the stated goal. Evaluating the implementation of strategies and goals will be the measurement of progress toward meeting goals. On a biennial basis the MSCWMO will evaluate progress of meeting each of the strategies and policies listed for each goal. In addition to the reporting activities described above, the MSCWMO will biennially review member city compliance with the goals, policies and requirements established in the MSCWMO 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 community ordinance revisions addressing management of water resources (e.g., wetlands, erosion and sediment control), including their enforcement.

- A review and summary of member communities' permits and variances issued or denied and violations under rule or ordinance requirements of the organization or local water plan.
- Review of member communities annual MS4 reports.
- Self-reporting by member communities using criteria or checklist established by the MSCWMO.

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

The MSCWMO 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 MSCWMO managers; and a list of employees including postal and electronic mailing addresses and telephone numbers. The website will be kept current on a monthly basis or more frequently.

An evaluation matrix that will be used to measure progress toward achieving the MSCWMO goals and strategies will be posted on the website before January 2017. The MSCWMO website is located at <http://www.mscwmo.org/>.

6.2 Water Monitoring Program

Based on the information available at the writing of the plan, the MSCWMO proposes to continue condition monitoring of Lily Lake and Lake McKusick. In addition, the following problem investigation monitoring efforts are proposed to be implemented as a part of a data collection program.

Table 6.1 Monitoring Plan

Year	Activity	Goal
2015	Lily Lake outfall flow monitoring and event grab samples <u>(7 sites, up to 10 samples per site)</u>	Identify flow contributions and estimate average loads
2016	Lily Lake targeted outfall flow and load sampling <u>(~3 sites, up to 21 samples per site)</u>	Monitor annual load from select outfalls
2017	Lily Lake targeted outfall flow and load sampling <u>(~3 sites, up to 21 samples per site)</u>	Monitor annual load from select outfalls
2018	Perro Pond/Perro Creek flow and event grab samples <u>(~7 sites, up to 10 samples per site)</u>	Identify flow contributions and estimate average loads
2019	Perro Pond/Perro Creek targeted outlet flow and load sampling <u>(~3 sites, up to 21 samples per site)</u>	Monitor annual load from select outfalls
2020	Perro Pond/Perro Creek targeted outlet flow and load sampling <u>(~3 sites, up to 21 samples per site)</u>	Monitor annual load from select outfalls
2021	Targeted Lake St. Croix Outfall Monitoring**	Targeted Lake St. Croix Outlet Monitoring
2022	Targeted Lake St. Croix Outfall Monitoring**	Identify flow contributions and estimate average loads
2023	Targeted Lake St. Croix Outfall Monitoring**	Identify flow contributions and estimate average loads
2024	Targeted Lake St. Croix Outfall Monitoring**	Identify flow contributions and estimate average loads
2025	Targeted Lake St. Croix Outfall Monitoring**	Identify flow contributions and estimate average loads

** 2021-2025 The location and frequency of targeted monitoring of Lake St. Croix Outfalls will be based on the outcomes of implementation item #12 (Table 6.4) "Inventory and evaluate outfalls directly discharging to Lake St. Croix".

Integrated Water Quality Monitoring Program

Since the development of the 2006 monitoring plan, the MSCWMO has expanded the approach to water quality monitoring. The MSCWMO will employ monitoring strategies to track the condition of surface waters, more effectively target strategies and practices to improve water quality and measure the effectiveness of water quality improvement strategies and practices. This approach provides the opportunity to more effectively target the monitoring program to meet the goals of the watershed. This provides the opportunity to address the needs in the watershed through a coordinated strategy development process. This is much different than past monitoring efforts, when limited monitoring resources were distributed broadly throughout watershed and not concentrated in defined areas.

[The MSCWMO contracts with the Washington Conservation District and the Minnesota Pollution Control Agency Citizen Monitoring Program. The MSCWMO service agreement requires quality control and quality assurance per the Washington Conservation District standard operating procedures. Samples are also submitted to the MPCA EQUIS database or to Met Council through Citizen Monitoring Program when appropriate. An annual monitoring report is published and posted on the MSCWMO website.](#)

This plan employs the MPCA categorization of monitoring activities according to the monitoring purpose and how the monitoring data are assessed and used

<http://www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/water-quality-condition-monitoring/index.html>.

–Monitoring activities of the MSCWMO will fall into one of three “use” categories, as follows:

Condition monitoring

This type of monitoring is used to identify overall environmental status and trends by examining the condition of individual water bodies or aquifers in terms of their ability to meet established standards and criteria. Condition monitoring may include chemical, physical, or biological measures.

Problem investigation monitoring

This monitoring involves investigating specific problems or protection concerns to allow for the development of a management approach to protect or improve the resource. Problem investigation monitoring is used to determine the specific causes of impairments to surface water, to evaluate the extent and magnitude of a contaminant plume in groundwater, and to quantify inputs/loads of contaminants to a water body from various sources.

To make the most effective use of limited resources, the MSCWMO has adopted a tiered monitoring strategy to be applied to problem investigation. Generally, the first year of a targeted monitoring plan will use widespread low intensity flow monitoring, coupled with grab sampling when feasible, to identify catchments that are contributing the greatest volume to the body of water being investigated. After sufficient data has been collected to identify such catchments, the monitoring strategy will shift to a smaller more targeted approach. More intensive equipment allowing for a higher level of data collection and automated sampling will be utilized, which in turn will make it possible to identify major stressors and develop an accurate load estimate.

Effectiveness monitoring

This type of monitoring is used to determine the effectiveness of a specific regulatory or voluntary management action taken to improve impaired waters or remediate contaminated groundwater.

Effectiveness monitoring allows for the evaluation and refinement of a selected management or remedial action over time to ensure the approach is ultimately successful.

Volunteer monitoring will continue to be incorporated into the MSCWMO Data Collection Program whenever feasible. The MSCWMO recognizes that volunteers can collect reliable, meaningful data that can be used in watershed planning and decision-making. Additionally, volunteer monitoring programs promote watershed stewardship by engaging, involving, and educating volunteers in natural resource management.

Monitoring procedures and protocols will be implemented so that collected data can be better utilized in future decision making processes. The practices used in data collection need to encompass dataset requirements set by the MPCA to be used for identifying, listing, and restoring impaired waters.

6.3 Cost Share Program

The Middle St. Croix Watershed Management Organization, MSCWMO offers cost-share grants within the MSCWMO. The cost share program ~~incentivizes the incentives~~ reduction in stormwater pollutants, restoration of native habitat and provides and education and outreach opportunity to demonstrate conservation practices on private lands. The amount of cost share funding is determined by the board of managers on an annual basis. Funding for cost share is a combination of general funds and grants applied for and received by the MSCWMO. All cost share applications are ranked using the MSCWMO Best Management Practices Program-Priority Ranking Sheet. The priority ranking considers the site location, total area treated, water quality improvement, natural resource criteria, land owner contribution, community support, opportunity for demonstration and education. [Information on the MSCWMO cost share program can be found at <http://www.mscwmo.org/cost-share-program>. The website will be updated annually with information on the needed to meet the requirements of M.R. 8410.0105 Subp. 7 including relevant documents like the MSCWMO Best Management Practices Program-Priority Ranking Sheet and will identify and annually update the funds available for the cost share program as approved by the Managers.](http://www.mscwmo.org/cost-share-program)

6.4 Financing Mechanisms

Various funding mechanism are available to watershed management organizations (WMOs) to fund projects and programs of the organization. Minnesota Statute 103B.251 gives WMOs with an adopted watershed plan the ability to certify for payment by the county all or part of the cost of a capital improvement contained in the capital improvement program of the plan. Additionally, Minnesota Statutes 103B.245 allows a WMO to change its Joint Powers Agreement giving its member communities the ability to levy funds for the WMO through individual taxing districts within each community. Additionally, Minnesota Statutes 103B.252 allows local governments or WMOs to declare an emergency and order work to be done without a contract. This statute does not contain levy limits.

6.4.1 MSCWMO General Fund

Through the current Joint Powers Agreement (JPA), funding for MSCWMO administration and programs is derived from fees (dues) paid by the member communities annually. All communities fund

administration of the MSCWMO; large expenditures are funded by those communities receiving a direct benefit.

The MSCWMO Joint Powers Agreement states that the portion of general funds paid by each community is determined in the following way:

1. 40% is determined by amount of land area of a community as a percentage of the land area of the entire watershed.
2. 20% is determined by the tax capacity of a community's area in the watershed as a percentage of the tax capacity of the entire watershed.
3. 40% is determined by the population of a community's area in the watershed as a percentage of the population of the entire watershed.

In summary, the amount paid is based forty percent on land area, forty percent on population, and twenty percent on tax base for the area of the community within the watershed. The MSCWMO will use the Washington County Standardized Chart of Accounts for WMOs to track its revenues and expenditures.

Funding mechanisms available to member communities for programs and projects include: general funds, special assessments, ad valorem taxes, stormwater utility fees, development fees, tax increment financing, and grants.

6.4.2 Federal, State, and Private Funding Sources

The **U.S. Environmental Protection Agency (EPA)** has discretionary funds available through each division and program area of the EPA 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 EPA 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.

The **Minnesota 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, EPA 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.

The **Minnesota Department of Agriculture (MDA)** administers an Ag BMP Loan Program, which is a low interest loan program available to farmers, rural landowners, and agricultural supply businesses to address a wide variety of water quality concerns. The program encourages agricultural best management practices that prevent or reduce runoff from feedlots, farm fields and other pollution problems. More information can be found at www.mda.state.mn.us/grants/loans/agbmploan.aspx.

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.

In addition to state and federal funding sources, some private funding sources may be available. Examples include (but are not limited to) St. Croix River Association for projects that protect, restore and celebrate the St. Croix river and its watershed; Audubon Society, Ducks Unlimited and Pheasants Forever for projects that enhance, create, or protect habitat; Lake Associations who actively commit time and financial resources to improve the quality and recreational value of their lakes; individual entities needing to provide wetland mitigation in compliance with the Wetland Conservation Act (WCA); or service organizations (e.g., Lions Club and Elks), youth groups (e.g., Boy/Girl Scouts), Adopt-a-Highway/River cleanup groups, and sportsman clubs.

6.5 Impact on Member Communities

It is the intention of the MSCWMO to limit the impact on member communities while still accomplishing the goals, strategies and policies of the organization to improve and protect water resources. The MSCWMO will continue to fund its primary programs and administration through its general fund, collected annually through dues from the member cities. Table 6.2 includes the anticipated costs (in 2015 dollars) to member communities for the MSCWMO's general fund.

In placing requirements on its member communities, the MSCWMO recognizes the associate financial burden and seeks to most efficiently use finite financial resources to accomplish its goals. Some MSCWMO strategies and policies increase responsibility on member communities while others reflect requirements already existing in other regulatory government units. Some member communities

already have ordinances in place that address many of the MSCWMO requirements including shoreland, bluffland, floodplains, wetland protection, stormwater management, and erosion control.

Table 6.2 Estimated Annual Costs to Member Communities of MSCWMO General Fund (based on 2015 dollars)

Member Community		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
City of Afton	0.45%	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32	\$488.32
City of Bayport	12.12%	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51	\$13,214.51
City of Lake St. Croix Beach	3.90%	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71	\$4,254.71
City of Lakeland	9.95%	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05	\$10,840.05
City of St. Mary's Point	0.80%	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60	\$875.60
City of Lakeland Shores	1.18%	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84	\$1,281.84
City of Oak Park Heights	15.97%	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68	\$17,410.68
West Lakeland Township	14.57%	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68	\$15,884.68
Baytown Township	10.19%	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48	\$11,104.48
City of Stillwater	30.87%	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14	\$33,645.14
Total	100.00%	\$109,000.00										

6.5.1 Local Water Management Plans and Official Controls

It is likely that most member communities will need to revise their local plans and official controls to bring them into conformance with this Plan, Minnesota law (Minnesota Statutes 103B), and Minnesota Rules (Minnesota Rules 8410). Member communities must revise and adopt local water management plans according to the timeline and content requirements established in MN Rules 8410 and Minnesota Statutes 103B.235. 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 MSCWMO. Member community ordinances, management programs, and other official controls required by this Plan must be implemented within 2 years from the adoption of this Plan. Any revisions to local water management plans or revisions to local controls that are potentially inconsistent with the MSCWMO plan must be submitted by the member cities to the MSCWMO for review.

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 Washington County for concurrent review. Within 60 days of receipt of the local plan, the MSCWMO will review the local plan for conformance with this Plan. As part of its review, the MSCWMO will take into consideration any comments received from the Metropolitan Council and the County. The MSCWMO will approve or disapprove all or part of the local plan within the 60-day time frame, unless an extension is granted by the MSCWMO. If the MSCWMO does not complete its review, or fails to approve/disapprove the plan within the allotted time, and the local government 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 MSCWMO 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 community must notify the MSCWMO (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 MSCWMO for review and approval prior to their adoption by the member community. The MSCWMO review process for amendments is the same as for the original or revised local plan.

If a local plan is not approved by the MSCWMO, the local government must revise and resubmit a local plan which complies with this Plan.

6.6 Amendments to Plan

This Plan remains in effect for ten (10) years from the date it was approved by BWSR, 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 State laws and rules, as revised. Plan amendments may be proposed by any person, agency, city, or the County to the MSCWMO Board, but only the MSCWMO may initiate the amendment process. The MSCWMO may amend its Plan in the interim if either changes are required or if problems arise that are not addressed in the Plan. Changes to this Plan not requiring an amendment are specified in Minnesota Rules 8410. Minnesota Rules 8410 requires WMOs to evaluate the implementation actions regularly.

The MSCWMO 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 including submitting the amendment to member communities, Washington County, state review agencies, the Metropolitan Council, and the Minnesota Board of Water and Soil Resources (BWSR) for a 60-day review; responding in writing to any comments from reviewers; holding a public hearing on the proposed amendment; submitting the final revised amendment and responses to comment to the BWSR for a 90-day review and approval.

The MSCWMO will follow the minor plan amendment process, requiring only one 30-day review period, when proposed amendments meet the criteria for minor amendments as established in Minnesota Rules 8410.

When and if plan amendments are completed, the MSCWMO will prepare and distribute those amendments consistent with Minnesota Rules 8410. The MSCWMO will maintain a distribution list of everyone receiving a copy of this Plan. Within 30 days of adopting an amendment, the MSCWMO will distribute copies of the amendment to everyone on the distribution list and post the amendment on the MSCWMO website.

6.7 Past Accomplishments

The MSCWMO has successfully implemented all projects, programs and tasks included in its 2006 Watershed Management Plan. Table 6.3 provides an overview of those accomplishments since 2006.

Table 6.3 Past Accomplishments of the MSCWMO

Project	Year Completed	Notes
Wetland Inventory and Functions Assessment	2005	The MSCWMO completed a MNRAM assessments and Level 5 MLCCS GIS data layer for 202 natural wetland basins in the MSCWMO.
Perro Pond and Creek Flood Control Structure	2005	Flooding along Perro Creek in the City of Bayport was a problem identified and addressed in the early 2000's. The State of Minnesota Storm Sewer Project completed a design for Perro Pond and Perro Creek in 2003 that significantly decreased the chance of flooding along the creek and pond. MSCWMO completed the final phase of the project in 2005, which allows for the safe, year-around conveyance of water from the Perro Creek watershed to the St. Croix River. 100-year flood elevations along Perro Creek were identified in conjunction with this project.
Gully and Ravine Inventory	2006	Inventory and evaluation of gullies (drainage features) in the MSCWMO north of I-94. (The area south of I-94 was inventoried in 2005.) Gullies with severe and moderate erosion ratings at the time of the survey were listed as areas of concern.
Development of a land cover/land classification for the Middle St. Croix watershed using MLCCS.	2006	The MSCWMO in partnership with the Washington Conservation District completed a MLCCS assessment and GIS data layer.

Incorporate MSCWMO review into member community review process	2006	The MSCWMO created and implements standardized triggers and review process with member communities.
Establishment of an erosion and sediment monitoring program	2006	The MSCWMO established minimum erosion and sediment control standards, created and implemented standardized triggers and review process with member communities
Establishment of floodplain elevations	2006	The MSCWMO adopted the Washington County Floodp l <u>a</u> ine Requirements in 2006.
Collaboratively established the East Metro Water Resources Education Program	2006	The MSCWMO helped establish and continues to participate in the shared East Metro Water Resource Educator Program (EMWREP). Through this program a variety of water resource education events and trainings are provided to interested residents, LGU officials, and professionals within the MSCWMO.
Update Joint Powers Agreement	2006	The MSCWMO Joint Powers Agreement was executed in 2006.
Conduct plan reviews to assist members communities with the implementation of MSCWMO performance standards	Continuous	The MSCWMO conducted between 4 to 13 new and redevelopment plan reviews annually for conformance MSCWMO performance standards
Support the implementation of the 2004-2014 Washington County Groundwater Plan	Continuous	The MSCWMO promoted well head protection programs, directed communities to the well sealing program; considered groundwater protection during project reviews and support the
Integrated Water Monitoring	Continuous	The MSCWMO has annually monitored water quality and water levels in Lily Lake since 1985, McKusick Lake since 1994, and Brick Pond since 2008. Water levels on Perro Pond were also recorded in 2013. Water quality and quantity of Perro Creek and the Brown's Creek Diversion Structure were monitored 2006 - 2013. Annual water monitoring reports are available on the MSCWMO website.
Review all WCA applications for conformance with MSCWMO performance standards	Continuous	The MSCWMO reviews WCA applications for conformance with MSCWMO performance standards.
Communication in local newspapers and newsletters	Continuous	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) and financially supports the writing and submission of weekly articles and blogs for water resource awareness and protection.
Technical Fact Sheets for BMPs	Continuous	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) and financially supports the development of documents and presentations

		for water quality practices and maintenance.
Conduct Nonpoint Education for Municipal Officials workshops and trainings for local land use officials and staff	Continuous	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) and collaboratively develops and hosts annual educational events for local land use officials and staff.
Conduct technical workshops for local units of government	Continuous	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) and collaboratively develops and hosts annual water quality technical workshops for local units of government.
Conduct Blue Thumb education and design assistance for land owners	Continuous	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) and collaboratively hosts annual water quality improvement workshops for residents of the watershed.
Regular attendance at member communities' city or town meetings, and planning advisory boards	Continuous	The MSCWMO staff and council members regularly attend member community meeting county and state planning advisory boards and workgroups.
Presentations to member communities regarding water issues	Continuous	The MSCWMO regularly presents to member communities planning commissions and councils on water quality related topics.
Demonstration sites of innovative BMPs for local communities, elected officials, staff, landowners and developers.	Continuous	Many MSCWMO practices and programs have been highlighted in presentations at the Water Resources Conference, Minnesota Association of Watershed Districts, Washington County Water Consortium, Stormwater U and other educational venues
Annual Report	Continuous	Annual reports have been created, submitted to the Board of Water and Soil resources and are available on the MSCWMO website.
Stormwater Audit Program	2008-2010	The MSCWMO partnered with Brown's Creek Watershed District, and the WCD to develop a Stormwater Audit Program to educate residents on their own contributions to water quality.
Afton Lakeland gully stabilization project	2007-2009	The MSCWMO collaborated with the cities of Afton and Lakeland to address pronounced within a 1,000 foot long network of steep, unstable ravines, which ultimately drained to the St. Croix River
Lily Lake Subwatershed Assessment	2010	The MSCWMO mapped the drainage areas for Lily Lake and modeled to determine pollutant loads generated from catchment areas draining to the lake. Potential BMPs were mapped, modeled and prioritized and ranked. This assessment is used to target a portion of the MSCWMO's cost-share program and also be used for writing grant applications.
Lake McKusick	2010	The MSCWMO mapped the drainage areas for Lake

Subwatershed Assessment		McKusick and modeled to determine pollutant loads generated from catchment areas draining to the lake. Potential BMPs were mapped, modeled and prioritized and ranked. This assessment is used to target a portion of the MSCWMO's cost-share program and also be used for writing grant applications.
City of Lakeland Ordinance Update	2010	The MSCWMO worked with the City of Lakeland and the MDNR to update the City's riverway ordinances to further protect the St. Croix riverway from development pressure.
City of Lakeland Public Beach Buffer Project	2010-2013	The MSCWMO worked with the city of Lakeland to complete a buffer stabilization project at the Lakeland Public Beach.
City of Lake St. Croix Beach Bluffland Restoration Project	2011	the MSCMWO completed major restoration work on a section of City owned bluffland in the City of Lake St. Croix Beach using funding from a BWSR native buffers grant. The project included removal of non-native Siberian elm, slope reshaping and stabilization, and major plant community restoration work.
Update MSCWMO website	2011	The MSCWMO redesigned and continues to maintain a website which contains the 2006 Watershed Management Plan, development review requirements, meeting minutes and agendas, and pertinent news.
Update Local Member Communities Local Water Management Plans	2011	The MSCWMO works with its member communities to update and implement their local water management plans. By December of 2011, all ten member communities had completed final drafts of their Local Water Management Plans.
City of Stillwater and Bayport Street Projects	2012	The MSCWMO worked with the cities of Stillwater and Bayport to provide enhanced stormwater treatment on road reconstruction projects with grant funds from the Saint Croix River Association.
Rural Subwatershed Assessment Program	2012	In 2011, the MSCWMO worked with the WCD and the St. Croix River Association to complete an assessment of the more rural portions of the WMO. The assessment included the development of a GIS based model to estimate soil loss as well as ground truthing to locate potential water quality improvement projects. Several projects were identified in the MSCWMO boundaries.
Perro Creek Stormwater Retrofit Analysis	2013	The MSCWMO conducted a stormwater retrofit analysis for Perro Creek in Bayport. Through this process, the drainage areas for Perro Creek were analyzed and modeled to determine pollutant loads. Potential BMPs were mapped, modeled and prioritized. This assessment is used to target a portion of the MSCWMO's cost-share program and prioritizing grant writing to match local funds.
Lake St. Croix Direct Discharge Subwatershed	2014	The MSCWMO conducted a subwatershed of the Lake St. Croix direct discharge in Stillwater, Oak Park Heights and

Analysis		northern Bayport. Through this process, the drainage areas directly discharging to Lake St. Croix were analyzed and modeled to determine pollutant loads. Potential BMPs were mapped, modeled and prioritized. This assessment is used to target a portion of the MSCWMO's cost-share program and prioritize grant writing to match local funds.
Installation of Lily Lake prioritized stormwater quality practices	2011 and 2014	The MSCWMO received a matching grant from the BWSR's Clean Water Legacy Program projects outlined in the 2010 Lily Lake Subwatershed Assessment study. To date, 19 water quality improvement Best Management Practices have been installed in the city right-of-way to capture and treat street runoff prior to its discharge into Lily Lake.
Development of a watershed BMP tracking, inspection and maintenance geospatial database	2014	The MSCWMO partnered with the Washington Conservation District and other Washington County watershed organizations to develop a tool to track the pollutant load reduction, location, condition and maintenance needs for the growing number of practices within the watershed.

6.8 Implementation Program

Table 6.4 identifies the projects, programs, and activities that comprise the WMO implementation program. The WMO developed these activities through reviewing existing information (Section 2) and public input and agency coordination (Section 3), developing goals, strategies, and policies (Section 5), and then assessing the need for programs, studies or projects. Each row shows estimated cost, proposed year of implementation, and proposed financing method for each element of the implementation program. The proposed dates listed to complete the projects, programs, and activities are estimates and highly dependent upon many variables. The implementation plan will be reviewed biennially and updated as necessary based on past progress, emerging issues, partner priorities, new/better data and external funding priorities and availability.

The activities listed in table 6.4 are the specific means by which the WMO achieves its strategies which are the measurable activities used to evaluate the WMOs progress towards meeting each of the following goals listed in Section 5:

5.1 Protect and improve water quality in the Middle St. Croix watershed through the treatment and control of stormwater runoff.

5.2 Minimize existing and future potential damages to property, public safety, and water resources due to flood events.

5.3 Prevent erosion and subsequent sedimentation from surface runoff within the watershed on construction sites; agricultural lands; and along stream banks, lakeshores, and roadsides.

5.4 Collect monitoring data needed to understand the quality of major water bodies, identify problems and determine appropriate practices and management practices.

5.5 Manage the quantity and quality of wetlands, in conformance with the Minnesota Wetland Conservation Act (WCA) and Water Quality Standards Rules (Minnesota Rules 8420 and 7050).

5.6 Collaborate to protect the quantity and quality of groundwater resources.

5.7 Maintain or improve habitats by implementing protection or restoration measures that consider ecological functions as well as recreation, human health, safety, and welfare.

5.8 Increase the knowledge and understanding of watershed residents, government officials and staff, consultants and developers to encourage actions which improve water quality, water quantity, wetlands and natural resource protection.

5.9 The MSCWMO is an efficient, well organized, and proactive organization that collaboratively prioritizes and manages water resources with member communities and other government jurisdictions.

Implementation items with grant funding sources will only be completed if grant funds or other stakeholder funding is received.

16	Maintain MSCWMO website for public access to documents and information (S64)	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	Member Dues
Administration													
17	Conduct annual financial audit (S60)	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700	Member Dues
18	Maintain MSCWMO operation (accounting, legal, insurance, clerical, supplies)	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	Member Dues
19	Perform general MSCWMO administration (Administrator) (S58 – S67)	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	Member Dues
20	Evaluate plan implementation (S64)	Included in general MSCWMO administration											Member Dues
21	Support the implementation of the Washington County Groundwater Plan (S38-S43)	Included in general MSCWMO administration											Member Dues
22	Collaborate to prevent spread of aquatic invasive species (S47)	Included in general MSCWMO administration											Member Dues
23	Develop and adopt simplified review process and guidance and application materials minor subdivisions (S6, S20)	\$2,000											Member Dues
24	Assist communities to integrate MIDS into local controls (S5)	\$60,000	\$45,000										Grants*
25	Water Monitoring Equipment Savings	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	Member Dues
26	Water Mgmt Plan (set aside for future plan)	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	Member Dues
Total MSCWMO Budget		\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000	Member Dues
Total Grants Targets		\$227,000	\$225,000	\$105,000	\$135,000	\$250,000	\$200,000	\$65,000	\$347,750	\$97,500	\$54,000	\$213,000	Grants*
Total Potential Budget (in 2015 dollars)		\$336,000	\$364,000	\$214,000	\$244,000	\$359,000	\$309,000	\$174,000	\$456,750	\$206,500	\$163,000	\$322,000	

*Grant match dollars are provided through multiple sources including the MSCWMO technical and financial assistance funds, member communities, private landowners, and Washington County.

Table 6.5 Implementation Program Narrative

Project Review			
1	Conduct project reviews and inspections to ensure implementation of MSCWMO performance standards (S3, S4, S11 – S19, S21 – S24, S45)	The MSCWMO provides technical reviews of projects that meet or exceed the triggers identified in Sections 6.1.4 and 7.1.1. All applicable Performance Standards apply to all projects that trigger the MSCWMO review process. Each community adopts the MSCWMO review comments into the community comments for each project.	Member Dues and Project Review Fees
2	Review projects to protect groundwater quality/quantity (S42, S45)		Member Dues
3	Promote habitat preservation when reviewing projects (S46)		Member Dues
4	Review WCA applications and projects for MSCWMO wetland requirements (S29 – S37)		Member Dues
Technical and Financial Assistance			
5	Provide technical assistance to member communities and landowners(S7 - S10, S46)	The MSCWMO provides technical assistance member communities to achieve water quality goals such as assisting with construction inspections and providing technical recommendations and resources; to prioritize and target conservation practices, pursue grant application opportunities to install prioritized and targeted best management practices (BMPs); to promote voluntary water quality best management practices by providing on-site consultation, design assistance, and cost share; to support communities to implement MS4 requirements and track, inspect and maintain water quality improvement practices so they provide their designed benefits; promote habitat preservation and restoration within the watershed when reviewing projects or completing MSCWMO projects.	Member Dues
6	Update the 2006 Gully Inventory (S25)	In 2005 and 2006 the MSCWMO inventoried and evaluated gullies (drainage features) in the MSCWMO. Gullies with severe and moderate erosion ratings at the time of the survey were listed as areas of concern. Many gullies have been addressed but most the current status is unknown. In Section 5.3 the plan identifies the strategy to updating the inventory to identify new gullies, re-evaluate previously identified gullies and prioritize gully stabilization efforts based on impacts to water resources. This work is planned to occur from 2017 to 2019.	Member Dues
7	Identify, evaluate, prioritize, and seek funding stabilize gullies. (S1, S25)	From 2019-2022 the MSCWMO will coordinate partners and funding to design and install high priority gully stabilization projects to reduce sediment and phosphorous discharges to water resources.	Member Dues
8	Promote voluntary BMPs through cost share assistance (S8, S9, S17, S25, S44, S46, S49, S50, S51, S52)	Section 6.3 outlines the MSCWMO cost-share grants within the MSCWMO. The cost share program incentivizes the reduction in stormwater pollutants, restoration of native habitat and provides and education and outreach opportunity to demonstrate conservation practices on private lands.	Member Dues
9	Install prioritized and targeted projects in Lily, McKusick and Perro Creek subwatersheds (s1)	In 2010 the MSCMWO completed the Lily Lake Subwatershed Assessment and the Lake McKusick Subwatershed Assessment. In 2013 the MSCWMO completed the Perro Creek Stormwater Retrofit Analysis (Table 6.3) . All three subwatersheds, included in Appendix C of this plan, ultimately discharge to Lake St. Croix. All three analyses mapped drainage area and modeled, prioritized and ranked potential best management practices. Several factors drive the temporal implementation of the subwatershed analyses. Partnerships, willing landowners, new/better data, external funding availability and priorities and climatic events are some examples of the variables that influence implementation priorities. Section 2.2 describes the water quality, quantity and impaired waters in the MSCWMO. One of the priorities of the MSCWMO is to continue to implement practices to effectively address the Lily Lake nutrient impairment and negate the need for a TMDL in 2021. Additionally, designing and installing low cost/ high benefit practices reducing stormwater pollutants discharging to Perro Pond, Perro Creek and Lake McKusick address the goal of improving the quality of those water resources while reducing phosphorous discharges to Lake St. Croix. Table 6.4 and Table 6.5 identify the estimated implementation schedule.	Member Dues Grants
10	Assist Lake St. Croix TMDL implementation w/ installation of targeted and prioritized BMPS (S1)	In 2014 he MSCWMO conducted a subwatershed analysis of the Lake St. Croix direct discharge in Stillwater, Oak Park Heights and northern Bayport. Through this process, the drainage areas directly discharging to Lake St. Croix were analyzed and modeled to determine pollutant loads. Potential BMPs were mapped, modeled and prioritized. The analysis provides a or	Member Dues Grants*
11	Assist communities to track, inspect and maintain water quality improvement practices (S10)	The MSCWMO in partnership with the Washington Conservation District maintains a Best Management Practices Inspection and Tracking Database. On an annual basis the MSCWMO populates the database with newly installed permanent stormwater best management practice and inspection results.	Member Dues
12	Inventory and evaluate outlets directly discharging to Lake St.	Drainage information for the southern portion of the watershed is sparse and based on old data. New LIDar data provides more precise	Member Dues

	Croix (S2)	drainage information that can be used in combination with an inventory of stormwater outfalls to more accurately identify stormwater outflow points. Evaluating the outfalls to the St. Croix river with this new data will provide more precise information for high priority areas for meeting the Lake St. Croix TMDL. Table 6.4 and Table 6.5 identify the estimated implementation schedule*	Grant*
13	Provide technical assistance to member communities to integrate MIDS into local ordinance (S5 S7)	The Middle St. Croix was awarded a Clean water Fund Grant in 2014 to work with up to 13 communities in the St. Croix River Basin to adopt Minimal Impact Design Standards into local ordinance. All 10 member communities of the MSCWMO have passed resolutions to integrate MIDS into local ordinance or have adopted MIDS standards for stormwater quality and volume standards for new development and redevelopment. Ordinance and code updates are anticipated to be completed and adopted by member communities by November 2016.	Grant*
Water Quality Monitoring			
14	Monitor water quality and quantity in lakes and streams (S26, S27, S28)	The MSCWMO conducts water quality monitoring in cooperation with municipalities, Washington County, and state agencies as appropriate to establish water quality goals, target the implementation of best management practices and improvement projects, and evaluate progress toward water quality goals. These monitoring efforts include working with the lake and stream volunteer monitoring program. Section 6.2 outlines the 10 year monitoring strategy and table 6.1 identifies the anticipated monitoring plan. The MSCWMO will continue annual condition monitoring of Lily Lake and Lake McKusick. Additionally the MSCWMO will implement problem investigation monitoring to more effectively target and size best management practices. Problem investigation monitoring will be conducted on the following areas in order of priority as funding is available: 1. Lily Lake outfalls, 2. Perro Pond and Perro Creek outfalls, 3. Lake St. Croix outfalls.	Member Dues
Education and Outreach			
15	Educate all sectors, provide training/ workshops, publish messages and articles through support of EMWREP (S44, S51 – S57)	The MSCWMO participates in the shared East Metro Water Resource Educator Program (EMWREP) to increase the knowledge and understanding of watershed residents, government officials and staff, consultants and developers to encourage actions which improve water quality, water quantity, wetlands and natural resource protection. (Section 5.8). Education efforts include groundwater quality and quantity, the use of native plants, raingardens and shoreline plantings to reduce runoff pollution and conserve groundwater resources; tailored outreach to commercial, residential, and rural landowners to facilitate project implementation in priority areas; technical workshops for staff from local units of government; training and education to local land use councils and staff; published water education related blogs, social media and newspaper articles; and educational messaging for public projects in public spaces.	Member Dues
16	Maintain MSCWMO website for public access to documents and information (S64)	The MSCWMO will continue to maintain a website that contains meeting agendas, minutes, the watershed management plan, annual reports, annual water quality monitoring reports, contact information of WMO staff, a list of the managers, cost share program information, notifications, plan amendments and time and location of MSCWMO public meetings.	Member Dues
Administration			
17	Conduct annual financial audit (S60)	The MSCWMO will continue to conduct and submit an audit report for the previous fiscal year within 180 days of the end of the MSCWMO fiscal year.	Member Dues
18	Maintain MSCWMO operations (accounting, legal, insurance, clerical, supplies)	Maintain MSCWMO base operational functions.	Member Dues
19	Perform general MSCWMO administration (Administrator) (S58 – S67)	The MSCWMO maintains efficient water management programs where existing local units of governments remain the primary regulators and refer projects to the MSCWMO for investigation, comments and recommendations based on the MSCWMO's performance standards of this Plan. Administration of the MSCWMO requires the following actions: regularly review and revise project review fees, application materials and guidance, meet or exceed the requirements of BSWR and the Metropolitan Surface Water Management Act regarding the management of a watershed management organizations. The MSCWMO also meets or exceeds the criteria of the Washington County Governance Study; biennially evaluate this Plan's implementation by the MSCWMO and member communities and present the implementation of strategies and policies in a report; maintain a website with MSCWMO meeting agendas, minutes, Watershed Management Plan, and focused articles on MSCWMO activities; represent the MSCWMO at state, county and city meetings, as requested, to maintain collaborative and efficient governance; and keep member communities informed of water related issues and programs.	Member Dues

20	Evaluate plan implementation (S64)	The MSCWMO will continue to collaborate with Washington County to implement the actions of the 2014-2024 Groundwater Plan including considering well head protection areas and separation of infiltration areas during project reviews and enforcing State required setbacks; identifying, prioritizing and addressing failing septic systems; encouraging member communities to adopt well head protection programs; identifying and sealing abandoned wells; identifying and prohibiting activities during the review process that may negatively impact groundwater; developing and adopting policies on the quantity of water used in areas where existing wells and/or groundwater dependent natural resources could be negatively impacted by overuse of groundwater; educating citizens and public officials on the inter-relation of surface and groundwater quality and quantity, the value of and need to protect groundwater recharge areas and wetlands, and implementation of best management practices and low-impact development and redevelopment strategies to protect groundwater resources. In addition the MSCWMO will require infiltration of stormwater per MSCWMO performance standards to promote low impact development that mimics natural hydrology and recharges groundwater.	Member Dues
21	Support the implementation of the Washington County Groundwater Plan (S38-S43)	The MSCWMO will continue to collaborate with Washington County to implement the actions of the 2014-2024 Groundwater Plan including considering well head protection areas and separation of infiltration areas during project reviews and enforcing State required setbacks; identifying, prioritizing and addressing failing septic systems; encouraging member communities to adopt well head protection programs; identifying and sealing abandoned wells; identifying and prohibiting activities during the review process that may negatively impact groundwater; developing and adopting policies on the quantity of water used in areas where existing wells and/or groundwater dependent natural resources could be negatively impacted by overuse of groundwater; educating citizens and public officials on the inter-relation of surface and groundwater quality and quantity, the value of and need to protect groundwater recharge areas and wetlands, and implementation of best management practices and low-impact development and redevelopment strategies to protect groundwater resources. In addition the MSCWMO will require infiltration of stormwater per MSCWMO performance standards to promote low impact development that mimics natural hydrology and recharges groundwater.	Member Dues
22	Collaborate to prevent spread of aquatic invasive species (S47)	Collaborate with other entities (e.g., agencies, lake associations, cities, Washington County) to manage and prevent the spread of aquatic invasive species. MSCWMO services may include point-intercept surveys of aquatic vegetation, feasibility studies, technical analysis, education, exploring funding options, and applying for grants. The MSCWMO will not manage increased growths of native aquatic vegetation resulting from improved water quality.	Member Dues
23	Develop and adopt simplified review process and guidance and application materials minor subdivisions (S6, S20)	Assist member communities to develop and adopt a simplified review process, guidance and application materials to meet performance standards for minor subdivisions undertaking grading, filling, or other land alteration activities that are less than one acre and which trigger a review by the MSCWMO.	Member Dues
24	Assist communities to integrate MIDS into local controls (S5)	Work with local governments and state agencies to implement Minimal Impact Design Standards in order to provide clear, flexible and consistent new development and redevelopment stormwater standards.	Grants*
25	Water Monitoring Equipment Savings	Set aside funding to maintain or purchase water quality monitoring equipment when necessary.	Member Dues
26	Water Mgmt. Plan (set aside for future plan)	The MSCWMO will begin saving for the 2025 Watershed Management Plan update.	Member Dues

Table 6.6 Targeted Implementation Plan

Implementation Item	2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025			
	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match	Grant	Match		
7 Gully Stabilization Based on Gully Inventory Update												\$30,000	\$7,500	\$120,000	\$42,500	\$30,000	\$10,000	\$120,000	\$40,000					
9 Perro Creek Subwatershed Analysis							\$45,000	\$15,000				\$75,000	\$25,000			\$75,000	\$25,000	\$97,500	\$32,500	\$30,750	\$10,250			
9 Lily Lake Subwatershed Analysis			\$90,000	\$22,500	\$36,500	\$9,500			\$112,500	\$37,500	\$75,000	\$25,000												
9 Lake McKusick Subwatershed Analysis	\$30,000	\$3,000																						
10 Lake St. Croix Direct Subwatershed Analysis	\$100,000	\$12,500	\$107,250	\$35,750	\$56,250	\$18,750	\$56,250	\$18,750	\$75,000	\$25,000			\$65,000	\$16,250	\$185,800	\$61,950			\$9,750	\$3,250	\$160,000	\$53,000		
Total	\$130,000	\$15,500	\$197,250	\$58,250	\$92,750	\$28,250	\$56,250	\$33,750	\$187,500	\$62,500	\$180,000	\$57,500	\$185,000	\$58,750	\$290,800	\$96,950	\$217,500	\$72,500	\$40,500	\$13,500	\$160,000	\$53,000		
Estimated Phosphorous Load Reduction (lb/yr)	19.1		20		15		15		25		20		28		15		40		12.3		13			
Applications	Lake St. Croix Direct Discharge SD-13 \$143,000		Lake St. Croix Direct SD-13, SD-11, SD-3, SD-36 \$150,000		Lily feasibility and design based on Monitoring Results \$50,000 /Perro PC-4 \$60,000		Lily Phase IV \$250,000 Lake St. Croix Direct SD-36 and SD-30 \$100,000		Perro Creek PC-3 \$100,000 /St. Croix Gully Stabilization \$200,000		Lake St. Croix Direct Discharge SD-14 \$329,000		Perro Creek PC-5 \$230,000/ Gully Stabilization \$200,000				Lake St. Croix Direct SD-30, SD-2, SD-6 /Perro Creek PC-7							

7.0 Performance Standards

The MSCMWO Watershed Management Plan performance standards provide board managers with the criteria against which proposed projects will be reviewed. These standards also inform review applicants of the criteria which their proposed developments and inform member communities local water management plan by providing guidelines for new and redevelopment projects.

7.1 Implementation of Performance Standards

Performance Standards will apply to new and re development within the Middle St. Croix watershed and focus on stormwater management, erosion and sediment control, and wetland protection. These standards will also apply whenever a variance, grading, or building permit is required. The MSCWMO review process, Section 6.2.1, will be incorporated into existing city and township review processes, and member communities will not grant variances, grading, or building permits until MSCWMO review has occurred. All projects regardless of whether public or private can be reviewed. The MSCWMO requires an annual report from each member community summarizing the projects within the community and the application of the performance standards.

For parcels on the borders of the MSCWMO that are within the jurisdictional MSCWMO boundaries, but are hydrologically outside of the MSCWMO or vice versa, the MSCWMO plans to work cooperatively with the adjacent watershed districts. The MSCWMO recognizes that the authority will remain with the watershed organizations where the project is legally located, but will provide or obtain review comments from the watershed organization where the runoff flows.

7.1.1 Project Review Triggers

Each community will refer projects to the MSCWMO for full review when deemed necessary based on the activities listed below. All applicable Performance Standards will apply to all projects that trigger the MSCWMO review process. Each community will adopt the MSCWMO review comments into the community comments for each project.

1. Any project undertaking grading, filling, or other land alteration activities which involve movement of 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land.
2. Any project that creates or fully reconstruct 6,000 square feet or more of impervious surface.
3. All major subdivisions or minor subdivisions that are part of a common plan of development. Major subdivisions are defined as subdivisions with 4 or more lots.
4. Any project with wetland impacts, grading within public waters, grading within buffers or within 40-feet of the bluff line.
5. Development projects that impact 2 or more of the member communities.
6. New or redevelopment projects within the St. Croix Riverway that require a building permit that add 500 square feet of additional impervious surface.
7. Any project requiring a variance from the current local impervious surface zoning requirements for the property.

In addition, for projects or common plans of development or sale disturbing 50 acres or more and within one mile of and flow to a special water or impaired water (for phosphorous, turbidity, dissolved oxygen or biotic indicators), a complete application and SWPPP must be submitted to the MPCA at least 30 days before the start of construction activity.

7.1.2 Timeline for Submittal

Major subdivisions or minor subdivisions that are part of a larger plan of development and qualifying for full review shall be submitted to the MSCWMO administrator by the project owner at least 21 days prior to the scheduled meeting date of the MSCWMO Board. Late submittals or submittals with incomplete exhibits will be scheduled to a subsequent meeting date. In accordance with this policy, comments will be returned to the member community within 50 days of receipt of complete application materials and review fee. Member communities may require applicants to submit projects directly to the MSCWMO.

Minor subdivisions that are not part of a common plan of development will be reviewed by staff and comments will be returned to member communities within 14 days of receipt of a complete application and application fee.

7.1.3 Fee Schedule

The MSCWMO will require the submission of a review application and review fee from the applicant before a full review is completed. Project review fees will be reviewed and set by the MSCWMO on an annual basis.

7.1.4 Submittal Items

The MSCWMO requires submittals for all projects within the MSCWMO that require a review. The submittals must accompany the review application and must show how the project conforms to the MSCWMO performance standards. Electronic submittals are strongly encouraged.

The following submittals and exhibits must be submitted for review for all projects:

1. A completed and signed permit application form.
2. Evidence of ownership for the project site.
3. The required permit application fee.
4. Grading Plan/Mapping Exhibits:
 - a. Property lines and delineation of lands under ownership of the applicant.
 - b. Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).
 - c. Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).
 - d. Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.
 - e. Drainage easements covering land adjacent to ponding areas, wetlands, and waterways up to their 100-year flood levels and covering all ditches and storm sewers. Access easements to these drainage easements and to other stormwater management facilities shall also be shown.
 - f. Minimum building elevation for each lot.
 - g. Identification of downstream water body.

5. Erosion and Sediment Control Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit
6. Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit
 - a. Construction plans and specifications for all proposed stormwater management facilities.
 - b. Location(s) of past, current or future onsite well and septic systems (if applicable).
7. Other exhibits required to show conformance to these Performance Standards.
8. Additional submittals and exhibits must be submitted for review for all major subdivisions or minor subdivisions that are part of a common plan of development and qualify for review:
 - a. A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit
 - b. Additional Grading Plan/Mapping Exhibits:
 - i. Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.
 - ii. Location, alignment, and elevation of proposed and existing stormwater facilities.
 - iii. Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.
 - c. Additional Hydrologic/Hydraulic Design Exhibits:
 - i. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities shall be submitted. Model summaries must be submitted. The summaries shall include a map that corresponds to the drainage areas in the model and all other information used to develop the model.
 - ii. A table (or tables) must be submitted showing the following:
 - (1) A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
 - (2) A listing of the normal water levels under existing and proposed conditions and the water levels produced from the storm and runoff events listed above for all on-site wetlands, ponds, depressions, lakes, streams, and creeks.
 - iii. A completed stormwater volume reduction checklist.
 - d. Any flowage easements, granted up to the 100 year flood level required to accommodate the stormwater management facilities.
 - e. A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the MSCWMO.

7.2 Stormwater Management

7.2.1 Stormwater Quality

1. Direct discharge of stormwater to water bodies without water quality treatment is prohibited.

2. Major subdivisions or construction activities that result in land disturbances of one or more acre must comply with the requirements of the NPDES SDS Construction Stormwater Permit.

7.2.2 Rate and Flood Control Standards

1. The peak rate of stormwater runoff from a newly developed or redeveloped shall not exceed the 2-, 10-, and 100-year 24-hour storms with respective 2.8, 4.2, and 7.3-inch rainfall depths with MSCWMO approved time distribution [based on Atlas 14](#) for existing and proposed conditions. The runoff curve number for existing agriculture areas shall be less than or equal to the developed condition curve number. The newly developed or redeveloped peak rate shall not exceed the existing peak rate of runoff for all critical duration events, up to and including the 100-year return frequency storm event for all points where discharges leave a site during all phases of development.
2. Predevelopment conditions shall assume “good hydrologic conditions” for appropriate land covers as identified in TR-55 or an equivalent methodology. The meanings of “hydrologic soil group” and “runoff curve number” are as determined in TR-55. However, when predevelopment land cover is cropland, rather than using TR-55 values for cropland, the following runoff curve numbers shall be used. These curve numbers represent midrange values for soils under a good hydrologic condition where conservation practices are used and are selected to be protective of the resource waters. Hydrologic Soil Group A, Curve Number 56; Hydrologic Soil Group B, Curve Number 70; Hydrologic Soil Group C, Curve Number 79; Hydrologic Soil Group D, Curve Number 83.
3. Computer modeling analyses must include secondary overflows for events exceeding the storm sewer systems level-of-service up through the critical 100-year event.
4. In sub-areas of a landlocked watershed, development shall not increase the predevelopment volume or rate of discharge from the sub-area for the 10-year return period event.
5. The MSCWMO conforms to the most recent version of the Washington County Floodplain Regulations. . Lowest floor elevations of structures built adjacent to stormwater management features and other water bodies must be a minimum of two feet above the 100-year flood elevation and a minimum of two feet above the natural overflow of landlocked basins. The landowner or developer is required to provide MSCWMO with the location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.
6. Applicants may be required to demonstrate that downgradient stormwater conveyance structures and features will be adequate to safely convey proposed increased peak flow or volume from the site.

7.2.3 Volume Control Standard

Stormwater runoff volume must be controlled for newly developed or redeveloped sites. The MSCWMO design standards for controlling stormwater runoff volumes are the following:

1. New, Nonlinear Developments: For new, nonlinear developments that create new impervious surfaces on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from impervious surfaces.
2. Reconstruction/Redevelopment Projects: Nonlinear redevelopment projects on site without restrictions that create or fully reconstruct impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

3. Linear Projects: Linear projects (roadways, sidewalks, and trails) that create or fully reconstruct impervious surface without restrictions and not part of another development shall capture and retain the larger of the following:
 - a. 0.55 inches of runoff from the new and/or fully reconstructed impervious surfaces
 - b. 1.1 inches of runoff from the net increase in impervious area

4. Sites with Restrictions: If a site has restrictions where infiltration is not feasible or advised, such as karst topography, very fast or very slow infiltrating soils, shallow bedrock, a shallow confining layer/rough terrain, shallow groundwater, Drinking Water Management Supply Areas , and/or potential stormwater hotspots, as determined by the applicant and agreed upon by the Community and MSCWMO or as determined by the Community and MSCWMO, the applicant must follow these flexible treatment options, as summarized in the design sequence flow chart in Appendix J.
 - a. Project must first attempt to design the site to achieve retention of at least 0.55 inches of runoff from the proposed impervious surfaces and remove 75% of the annual total phosphorus load leaving all points on the site. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.
 - b. If the project cannot achieve the standards listed in Standard 4a above, the project shall achieve volume reduction to the maximum extent practicable and remove 75% of the annual total phosphorus load leaving all points on the site. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.
 - c. If the project cannot achieve the standards listed in Standard 4b above, the project shall achieve volume reduction to the maximum extent practicable and remove 60% of the annual total phosphorus load leaving all points on the site. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.
 - d. Off-site mitigation (including banking or cash or treatment on another project) will be considered by the MSCWMO on a case-by-case basis. In all cases, the receiving water shall be protected.

5. All volume control facilities must meet or exceed NPDES General Construction Permit requirements and be designed in conformance with the most recent edition of the State of Minnesota Stormwater Manual and MSCWMO standards.
 - a. Pretreatment: Surface flows to volume control facilities must be pretreated for long-term removal of at least 50 percent of sediment loads. In the event a volume control facility is constructed in the vicinity downstream of a potential Hot Spot, a skimmer shall be installed to facilitate clean-up.
 - b. Design: Volume control facilities must drain down within 48 hours, as required by the MPCA NPDES Construction Stormwater Permit.
 - i. For bioretention (biofiltration and bioinfiltration) volume control management facilities above ground with vegetation the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil

- infiltration rate. The maximum water depth for bioretention stormwater volume control management facilities above ground with vegetation is 1.5 feet.
- ii. For infiltration basin volume control management facilities the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate. The maximum water depth for infiltration basin volume control management facilities above ground with vegetation is 4.0 feet.
 - iii. Volume control facilities should be located in permeable soils and a minimum 3-foot distance is required from the bottom of the practice to the seasonally high water table, bedrock or other impeding layer per the MPCA NPDES Construction Stormwater Permit.
 - iv. Volume control facilities must conform to the minimum setbacks required by the Minnesota Department of Health, as summarized below:
 1. For proposed volume control facilities with drainage areas of two acres or more soil borings or infiltration testing in conformance with guidance provided in the Minnesota Stormwater Manual will be required. The soil boring will be required to go to a depth of at least five feet below the proposed bottom of the volume control facility. If fractured bedrock is suspected, the soil boring should go to a depth of at least ten feet below the proposed bottom of the volume control facility. The least permeable soils horizon will dictate the infiltration rate.
 2. A volume control facility shall bypass high flows and must be designed so that volumes in excess of the design volume are safely conveyed into the downstream stormwater system.
 - v. Construction: To prevent soil compaction, the proposed volume control facility must be staked off and marked during construction to prevent heavy equipment and traffic from traveling over it.
 1. Volume control facilities may not be excavated within 2.0 feet of final grade until the contributing drainage area has been constructed and fully stabilized.
 2. If volume control facilities are in-place during construction activities, all sediment and runoff must be diverted away the facility, using practices such as pipe capping or diversions.
 3. Installation of volume control facilities must occur in dry soil conditions. Excavation, soil placement and rapid stabilization of perimeter slopes must be accomplished prior to the next precipitation event.
 4. Excavation shall be performed by an excavator with a toothed bucket. Use excavator bucket to place materials. Construction equipment shall not be allowed into the basin.
 5. Prior to the release of any remaining fee or security, the permit holder must provide documentation that constructed volume control facilities perform as designed.
 - vi. Volume control facilities require a maintenance agreement, which may be in the format of Appendix K, or other form approved by the MSCWMO or member

- community attorney. For sites within Minnesota Department of Transportation right-of-way, no maintenance agreement is required.
- vii. Land used for stormwater management facilities shall be preserved by dedication and/or perpetual easement, including maintenance access to the municipality. These easements shall cover those portions of the property which are adjacent to the facility and which lie below the 100-year flood elevation. For sites within public right-of-way, no easement is required.

7.3 Erosion and Sediment Control Performance Standards

1. All erosion and sediment control requirements must conform to the current requirements of the NPDES/SDS Construction Stormwater Permit. The MSCWMO standards for all project are the following:
 - A. Erosion Prevention
 - i. Stabilize all exposed soil areas (including stockpiles) with temporary erosion control (seed and mulch or blanket) within 14 days (or 7 days for all projects within 1 mile and discharging to the St. Croix River or impaired water) after construction activities in the area have temporarily or permanently ceased.
 - ii. Identify location, type and quantity of temporary erosion prevention practices.
 - B. Sediment Control
 - i. Sediment control practices will be placed down-gradient before up-gradient land disturbing activities begin.
 - ii. Identify the location, type and quantity of sediment control practices.
 - iii. Vehicle tracking practices must be in place to minimize track out of sediment from the construction site. Streets must be cleaned if tracking practices are not adequate to prevent sediment from being tracked onto the street.
 - C. Dewatering
 - i. Dewatering turbid or sediment laded water to surface waters (wetlands, streams, lakes) and stormwater conveyances (gutters, catch basins, or ditches) is prohibited.
 - D. Inspections and Maintenance
 - i. Applicant must inspect all erosion prevention and sediment control practices to ensure integrity and effectiveness. All nonfunctional practices must be repaired, replaced or enhanced the next business day after discovery.
 - ii. Plans shall include contact information including email and a phone number of the person responsible for inspection and compliance with erosion and sediment control.
 - E. Pollution Prevention
 - i. Solid waste must be stored, collected and disposed of in accordance with state law.
 - ii. Provide effective containment for all liquid and solid wastes generated by washout operations (concrete, stucco, paint, form release oils, curing compounds).

- iii. Hazardous materials that have potential to leach pollutants must be under cover to minimize contact with stormwater.

F. Final Stabilization

- i. For residential construction only, individual lots are considered final stabilized if the structures are finished and temporary erosion protection and downgradient sediment control has been completed.
- ii. Grading and landscape plans shall include soil tillage and soil bed preparation methods that are employed prior to landscape installation to a minimum depth of 8" and incorporate amendments to meet Minnesota State Stormwater Manual predevelopment soil type bulk densities.

- 1. Observe minimum setbacks as directed by the Engineer for areas within the dripline of existing trees, over utilities within 30 in of the surface, where compaction is required by design and inaccessible slopes

G. Steep Slopes within the St. Croix Riverway

- i. Construction is prohibited on slopes greater than twelve percent (12%).
 - 1. Twelve percent (12%) slopes are defined as lands having average slopes 12% or greater over horizontal distances of fifty feet (50) or more.

H. Bluffline Setbacks

- i. Construction is prohibited within 40 feet of the top of blufflines in urban areas and 100 feet in rural areas. a.
 - 1. Blufflines are defined as a line along the top of a slope connecting points at which the slope, proceeding away from the waterbody or adjoining watershed channel, becomes less than twelve percent (12%). The location of the bluffline shall be certified by a registered land surveyor or the Zoning Administrator

- 2. Additional requirements for major subdivisions or minor subdivisions that are part of a common plan of development:

- A. A copy of the Stormwater Pollution Prevention Plan (SWPPP), prepared by a qualified individual, which conforms to the MPCA's NPDES Construction Stormwater Permit requirements. The SWPPP must conform to the special requirements for "Special Waters" (St. Croix River), when applicable. The SWPPP shall also show how erosion will be prevented during construction on individual building sites.

7.4 Wetland Performance Standards

- 1. Direct discharge of stormwater to wetlands and all other water bodies without water quality treatment as required in Section 6.2.1 is prohibited.
- 2. Permits shall be obtained from appropriate regulatory authorities before any work is started that impacts a wetland or its required buffer.

3. Any potential changes to the hydrology of the wetland (i.e. changes to the outlet elevation or contributing drainage area) must be reviewed to evaluate the impact of both the existing and proposed wetland conditions and approved by the MSCWMO.
4. Land-altering activities shall not increase the bounce in water level or duration of inundation from a 2.0-inch 24-hour storm for any downstream wetland beyond the limit specified in Table 7.2 for the individual wetland susceptibility class.

Table 7.1. MSCWMO Wetland Management Classes and Requirements

Management Class	Wetland A Preserve	Wetland B Maintain	Wetland C Manage
Definition	The wetlands in this category are rated high in those functions that protect downstream water quality, groundwater quality, and/or provide flood and stormwater attenuation or rated exceptional vegetation.	The wetlands in this category are rated high in those functions related to wildlife habitat, vegetation quality, and in-wetland water quality; and/or rated moderate for protecting downstream water quality, groundwater quality, and/or providing flood and stormwater attenuation.	All other wetlands are included in this category.
Minimum Buffer Width	≥ 60 feet Require monument to mark edges.	≥ 30 feet	No buffer
WCA Sequencing	Higher emphasis on avoidance. Replacement emphasizes lost functions, otherwise per WCA.	Per WCA	Per WCA
Excavation or Wetland Type Alteration	Considered an adverse impact.	Proposed alteration will be assessed for improvements based on MNRAM. Will not be allowed for mitigation credit and must still conform to WCA and other applicable regulations.	Restoration and enhancement encouraged

7.5 Lake, Stream and Wetland Buffers

1. Buffers of unmowed natural vegetation shall be maintained or created upslope of wetlands, lakes and streams.
 - a. Buffer and setback requirements shall apply to:
 - i. Sites that have been (a) subdivided or split or (b) subject to a new primary use for which a necessary rezoning, special use permit or variance has been approved. These requirements will apply on or after May 11, 2006.
2. Buffer width must conform with provisions in Table 7.1.
 - a. Wetlands applicants are responsible for providing MSCWMO with identification of wetland type and wetland delineation, using a methodology approved by BWSR; any inventories or ranking assessments completed by the MSCWMO are for preliminary planning purposes. The functional assessment and inventory summary can be found in Appendix C. Wetlands will be assumed to be Management Class A Preserve in the absence of a functional assessment. The applicant is required to provide MSCWMO with a delineation of the wetland edge.
 - b. Buffer averaging: Buffer width may vary where the applicant can clearly demonstrate the need to vary from the performance standard or when there is a potential to provide benefits to the resources, provided that the average width at least equals the applicable width of Table 7.1 and half the applicable width at all points, and the buffer provides water resource and habitat protection at least equivalent to that of a uniform buffer of

the required width. Buffer area calculation will exclude any part of the buffer exceeding twice the width specified in Table 7.1.

- All buildings (principle and accessory) must be set back at least 20 feet from the upslope edge of the buffer.

Table 7.2. MSCWMO Wetland Susceptibility Class*

Susceptibility	Highly Susceptible	Moderately or Slightly Susceptible	Least Susceptible
Wetland Type	Sedge Meadow, Open Bog, Coniferous Bog, Calcareous Fen, Low Prairies, Coniferous Swamp, Lowland Hardwood Swamp, Seasonally Flooded Basins, Mitigation Areas	Shrub-carrs ^a , Alder Thickets ^b , Fresh (Wet) Meadows ^{c,e} , Shallow Marshes ^{d,e} , Deep Marshes ^{d,e} , Floodplain Forests ^f , Shallow Marshes ^g , Deep Marshes ^h	Gravel Pits, Cultivated Hydric Soils, Degraded Material/Fill Material Disposal Sites
Inundation Period for 1 and 2 year precipitation event	Existing. Special consideration must be given to avoid altering these wetland types. Inundation must be avoided. Water chemistry changes due to alteration by stormwater can also have adverse impacts.	Existing plus 1-2 days, depending on site conditions. a, b, and c can tolerate inundation from 6-12 inches for ≤ 1 day. d can tolerate 12+ inches, but adversely impacted by sediment and/or nutrient loading and prolonged high water levels. e fresh meadows dominated by reed canary grass ≤ 2 days. f can tolerate annual inundation of 1 to 6 feet or more, possibly more than once/year ≤ 2 days. g shallow marshes dominated by reed canary grass, cattail, giant reed, or purple loosestrife ≤ 2 days.	Existing plus 7 days. These wetlands are usually so degraded that input of urban storm water may not have adverse impacts.
Bounce	Existing	Existing plus 0.5 to 1.0 feet, depending on site conditions	No limit

*Adapted from: State of Minnesota Stormwater Advisory Group “Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-water and Snow-melt Runoff on Wetlands” (June 1997)