LOCAL SURFACE WATER MANAGEMENT PLAN FOR THE CITY OF ST. PAUL, MINNESOTA

WSB Project No. 1610-00

October 2006

PREPARED BY

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

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Current water resource related information can be obtained from the City of St. Paul website at http://www.ci.stpaul.mn.us/code/

SECTION I

I. EXECUTIVE SUMMARY

This Local Surface Water Management Plan for the City of St. Paul has been developed to meet local watershed management planning requirements of the Metropolitan Surface Water Management Act and Board of Water and Soil Resources Rules 8410. It has also been developed to be in conformance with the requirements of local Watershed District and Watershed Management Organizations, Metropolitan Council requirements, and applicable State and Federal laws. This document and its referenced literature are intended to provide an inventory of pertinent water resource related information that affects the City and management of those resources.

Section II

Section II of this plan provides an introduction and purpose. The Local Surface Water Management Plan has been developed to provide the City of St. Paul with direction concerning the administration and implementation of water resource activities within the City. This plan is intended to meet the requirements for a local watershed management plan as required by the Metropolitan Surface Water Management Act and be in conformance with Board of Water and Soil Resources (BWSR) Rules Chapter 8410. This section also lists the personnel contacts involved in the assistance and implementation of this plan, including the staff from the Capitol Region Watershed District, Ramsey-Washington Metro Watershed District, Lower Mississippi River Watershed Management Organization, and the Mississippi Watershed Management Organization.

Section III

Section III of this plan provides an inventory of land and water resources within the City including a general description and summary of data related to precipitation, geology, topography, flood problem areas, existing flood insurance studies, shoreline ordinances, surface and ground water appropriations, ground water, soils, land use, public utilities services, public areas for water-based recreation and access, fish and wildlife habitat, unique features, scenic areas and pollutant source locations within the City.

This section contains general summary information about the soils within the City, fishery information, historical sites, and the location of various pollutant sources. A number of maps were also developed as part of the Plan to assist in summarizing this information.

Section IV

Section IV of this plan outlines water resource management related goals and policies of the City. Goals and policies have been developed for the City concerning water quantity, water quality, recreation, fish and wildlife management, enhancement of public participation, information and education, ground water, wetlands, and erosion.

Section V

Section V of this Local Surface Water Management Plan provides an assessment of the existing and potential water resource related concerns within the City. These concerns were identified based on an analysis of the land and resource data collected as part of

this plan preparation and through public input. This section summarizes the problems and corrective actions that were identified through this process.

Section VI

Section VI outlines implementation priorities and develops an implementation program. This section contains a prioritized listing of the studies, programs and capital improvements that have been identified as necessary to respond to the water resource needs within the City.

The implementation period identified within this report for the programs, studies and capital improvements is from the year 2006 through 2015. This plan is to be used for planning purposes only. Detailed feasibility analysis has not been completed to develop this section; therefore, cost estimates are subject to change and updates as more detailed information is obtained.

Section VII

Section VII discusses the financial considerations of implementing the proposed regulatory controls, programs and improvements, which have been identified in this plan and their financial impact on the City. Funding sources available for implementing the policies and corrective actions identified within this plan are identified. The plan indicates that the majority of funding for the policies and corrective actions will be from the City's Storm Water Utility Fund. Other possible funding sources for the implementation of this plan include special assessments and grant monies, which may be secured from various local, regional, County, State or Federal agencies. These other funding sources will be necessary to aggressively implement the Plan.

Section VIII

Section VIII discusses the procedures to be followed in the event this Local Surface Water Management Plan is amended. Once this Local Surface Water Management Plan is approved, no significant changes to this plan can be facilitated without the approval of the proposed revisions by the Watershed Management Organizations and Districts within the City that are affected by the change. Significant changes to the plan shall be made known to the Mayor, City Council, City Staff, the Metropolitan Council, and the affected Watershed Management Organizations and Districts within the City.

Section IX

Section IX provides references to supplemental documents.

Appendices

Appendices are included in the back of the plan and are summarized below. These documents are included because they provide supporting information to the main body of the plan, are useful information, and/or are required by Minnesota Rules.

- **Appendix A:** This appendix contains any water resource related agreements that the City has entered in to with and watershed management organizations. **Section II** contains a summary of these agreements.

- **Appendix B:** A copy of the FEMA Flood Insurance Study is included in this appendix.

- **Appendix C:** The appendix includes the City current floodplain management regulations.

- **Appendix D:** The City's existing River Corridor Overlay District regulations are located in Appendix D.

- **Appendix E:** The City's existing Storm Water Ordinance is located in Appendix E.

- **Appendix F:** The City's Zoning Code for Administration and Enforcement and the Building Code and Inspection requirements include erosion control practice specifications and the planning procedures to control soil erosion and sedimentation.

- **Appendix G:** The appendix includes infiltration design guidelines and additional infiltration design information.

- **Appendix H:** The City's Zoning Code includes a wetland regulations from the City's zoning code that incorporates by reference the Wetland Conservation Act and accompanying rules of the Minnesota Board of Water and Soil Resources.

- **Appendix I:** The appendix includes public education information obtained from the St. Paul Storm Water Permit. This information includes public education and public outreach programs implemented by the City.

- **Appendix J:** The appendix includes the MPCA search results for LUST sites and Tank sites within the City of St. Paul, Ramsey County.

- **Appendix K:** The appendix contains the Capitol Region Watershed District newsletter informing the public of the project summary for the Arlington Pascal Storm Water Improvement Project.

- **Appendix L:** The appendix contains information pertaining to the Individual Sewage Treatment Systems (ISTS) within the City. The information includes general, management, inspection and maintenance, nonconformance systems, testing, record keeping, enforcement of rules and regulations, Chapter 50 of the St. Paul Legislative and Administrative Codes, and an ISTS Location map.

- **Appendix M:** The appendix includes water quality information obtained from the Storm Water Permit Annual Report for the City.

- **Appendix N:** The appendix includes an outfall inventory for the City of St. Paul. This information was obtained from the Storm Water Permit Annual Report for the City.

- **Appendix O:** This appendix includes the Minnesota's Phosphorous Lawn Fertilizer Law.

- **Appendix P:** The appendix includes the City's Storm Water Management Site Plan Review Worksheet submitted as part of the site plan package for review by the Department of Public Works.

- **Appendix Q:** The appendix includes descriptions of the federal, state, district, and local permitting programs.

- **Appendix R:** This appendix includes the Street Management information contained in the City of St. Paul Storm Water Permit Annual Report completed in June 2004.

Additional material is referenced within this report and is available in the St. Paul Department of Public Works.

This Local Surface Water Management Plan will be in effect through the year 2015, at which time this plan will be updated. However, if significant changes to the plan are deemed necessary prior to that date the City may revise this plan in its entirety.

SECTION II

II. INTRODUCTION AND PURPOSE

A. General

This Local Surface Water Management Plan has been developed to provide the City of St. Paul with direction concerning the administration and implementation of water resource activities within the City. This plan is intended to meet the requirements for a local surface water management plan as required by the Metropolitan Surface Water Management Act and be in conformance with Board of Water and Soil Resources (BWSR) Rules Chapter 8410.

In addition to being in conformance with the above state law, this plan has also been developed to meet the needs, requirements, and direction outlined by the following list:

1. Capitol Region Watershed Management Plan
2. Ramsey-Washington Metro Watershed District Plan
3. Lower Mississippi River Watershed Management Organization Plan
4. Mississippi Watershed Management Organization Plan
5. State Laws and Rules concerning wetland management as outlined in the Wetland Conservation Act of 1991 and amendments
6. State and Federal laws regarding the need to secure a National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge permit
7. Applicable erosion control and soil loss guidelines

This plan incorporates the approaches and direction provided in the programs and documents listed above into a comprehensive plan that can be consistently applied across the City.

B. Personnel Contacts

To implement this plan, a coordinated water resource management approach must be used. This approach utilizes the services of staff personnel within the City and surrounding communities, as well as staff associated with the various Watershed Districts and Watershed Management Organizations having jurisdiction over areas within the City. The Watershed Districts and Watershed Management Organizations having jurisdiction within the City are shown on **Figure II-1.**

The primary implementation responsibility will lie with the appropriate staff members at the City. Assistance from the surrounding municipalities and Watershed Districts and Watershed Management Organizations will also be expected. Outlined below are the names, addresses, telephone numbers, and website address for personnel having

responsibilities for overseeing or implementing various aspects of the Local Surface Water Management Plan.

City of St. Paul
Department of Public Works
Anne Weber, P.E.
700 City Hall Annex
25 W. Fourth St.
St. Paul, MN 55102
(651) 266-6245
http://www.ci.stpaul.mn.us/

Capitol Region Watershed District
Contact: Mark Doneux
1410 Energy Park Drive – Suite 4
St. Paul, MN 55108
(651) 644-8888
http://www.capitolregionwd.org/

Ramsey-Washington Metro Watershed District
Contact: Cliff Aichinger
2665 Noel Drive
Little Canada, MN 55117
(651) 792-7950
http://www.rwmwd.org/

Lower Mississippi River Watershed Management Organization
Contact: John Sachi
City of South St. Paul
125 3rd Avenue North
South St. Paul, MN 55075
(651) 554-3210

Mississippi Watershed Management Organization
Contact: Doug Snyder
2520 Larpenteur Avenue West
Lauderdale, MN 55113
(651)287-0948
http://www.mwmo.org/

C. Water Resource Related Agreements

The City has entered into water resource-related agreements that govern in part how the City must manage its water resources. These agreements include joint powers agreements between the City and Watershed Management Organizations having jurisdiction within its boundaries, agreements between the City and adjoining communities, or agreements it may have with other governmental units or private

parties. Listed below is a description of the water resource related agreements which the City has entered into. Copies of these agreements or appropriate portions thereof, are included in **Appendix A.**

Cities of Inver Grove Heights, Lilydale, St. Paul, Mendota Heights, South St. Paul, Sunfish Lake, and West St. Paul

- Joint powers agreement for the establishment of the Lower Mississippi River Watershed Management Organization to provide an organization to preserve and use the natural water storage and retention of the Lower Mississippi River Watershed, 1985.

- Updated 2003

City of Minneapolis, St. Paul, St. Anthony, Lauderdale, and the Minneapolis Park and Recreation Board

- Joint Powers Agreement for the establishment of the Middle Mississippi River Watershed Management Organization, 1985.

- Amended Joint and Cooperative Agreement for the establishment of the Middle Mississippi River Watershed Management Organization, 1997.

- Restated Joint and Cooperative Agreement for the establishment of the Mississippi Watershed Management Organization, 2002.

SECTION II

Figure II-1
Watershed District and Management Organization Boundary Map

SECTION III

III. LAND AND WATER RESOURCE INVENTORY

In conformance with the Metropolitan Surface Water Management Act and as required in Minnesota Rules Section 8410.0060, this section of the plan provides a general description and summary of the climate, geology, surficial topography, surface and ground water resource data, soils, land use, public utilities services, water-based recreation, fish and wildlife habitat, unique features, scenic areas, and pollutant sources. This section also identifies where detailed information can be obtained for many of these areas of concern.

A. Climate and Precipitation

1. Climate

The climate within the Minneapolis/St. Paul metropolitan area is described as a humid continental climate with moderate precipitation, wide daily temperature variations, warm humid summers and cold winters. The total average annual precipitation is approximately 27 inches, of which approximately one-third occurs in the months of June, July and August. The annual snowfall average is about 56 inches and is equivalent to approximately 5.6 inches of water. Average monthly temperature and precipitation are shown in **Table III-1.**

2. Precipitation

The probability of a rainfall event occurring in any given year is illustrated in **Table III-2.** The recurrence interval is a measure of the probability of occurrence of the storm event. A rainfall event having a 99% chance of occurrence in a 24-hour period is approximately 2.4 inches. A rainfall event having a 1% chance of occurrence in a 24-hour period is approximately 5.9 inches. The 1%, 10-day runoff is 7.2 inches. **Figures III-1** and **III-2** show the 1% rainfall event and the annual normal precipitation within the State of Minnesota. Additional climatological information for the area can be obtained from the U.S. Weather Bureau Technical Paper 40.

B. Geology and Topographic Information

1. Geology:

The City of St. Paul is located in southern Ramsey County **(Figure III-3)**. Total area within the corporate limits is approximately 56 square miles. The City is bordered by Minneapolis, Lauderdale, Falcon Heights, Roseville, Maplewood, Newport, South St. Paul, West St. Paul, Mendota Heights, Lilydale, and Mendota.

According to the Bedrock Geologic Map and Bedrock Topographic Map of Ramsey County (Minnesota Geologic Survey, 1992), the geomorphology of the City in the uppermost geologic formation is quaternary deposits that are more than 500 feet thick along some of the deeper valleys.

The unconsolidated quaternary deposits of glacial and post glacial material conceal a majority of the bedrock within the City. All of the bedrock formations are marine sedimentary rocks of Early Paleozoic age when shallow seas covered southeastern Minnesota. Large-scale block faulting caused the formation of an elongated, northeast-trending basin beneath what was to become the Twin Cities Metropolitan Area.

The bedrock formations include Decorah Shale, Platteville and Glenwood formations, St. Peter Sandstone, Prairie Du Chein Group, and Jordan Sandstone. Depth to the bedrock can vary from approximately 900 feet above sea level inland from the Mississippi River to bedrock exposures along the bluffs and bedrock terraces of the Mississippi River.

Six aquifers are located within the City boundaries: the St. Peter Aquifer, Prairie Du Chien-Jordan Aquifer, the Franconia-Ironton-Galesville Aquifer, and the Mt. Simon Aquifer, which is the deepest high-yield aquifer available to Ramsey County.

Additional geologic information for areas within the City can be found in the following plans:

- Ramsey County Ground Water Quality Protection Plan.
- Capitol Region Watershed District Comprehensive Plan.
- Ramsey-Washington Metro Watershed District Management Plan.
- Lower Mississippi River Watershed Management Organization Plan.
- Mississippi River Watershed Management Organization Plan.

TABLE III-1 AVERAGE MONTHLY TEMPERATURE AND PRECIPITATION DATA FOR CITY OF ST. PAUL

Months	**Average Temp** (F^0)	**Precipitation** (MSP Airport)	**Snowfall** (inches)	**Capitol Region Plan** (30-year average)
January	12.2	0.83	12.5	0.95
February	18.2	0.85	9.2	0.88
March	31.0	1.60	11.6	1.94
April	46.4	2.17	3.6	2.42
May	58.5	3.38	0.1	3.39
June	68.2	4.17	0.0	4.05
July	73.6	3.55	0.0	3.53
August	70.5	3.40	0.0	3.62
September	60.5	2.89	0.0	2.72
October	48.8	2.01	0.4	2.19
November	33.1	1.45	7.3	1.55
December	17.9	0.94	11.3	1.08
Totals	**44.8**	**27.24**	**56.0**	**28.32**

Source: State Climatology Office for the Minneapolis/St. Paul Airport and Capitol Region Watershed District Comprehensive Management Plan

TABLE III-2 STORM EVENTS FOR THE CITY OF ST. PAUL

Recurrence Interval (Years)	24-Hour Rainfall Amount (Inches)
1	2.4
2	2.8
5	3.6
10	4.2
25	4.8
50	5.3
100	5.9

United States Weather Bureau

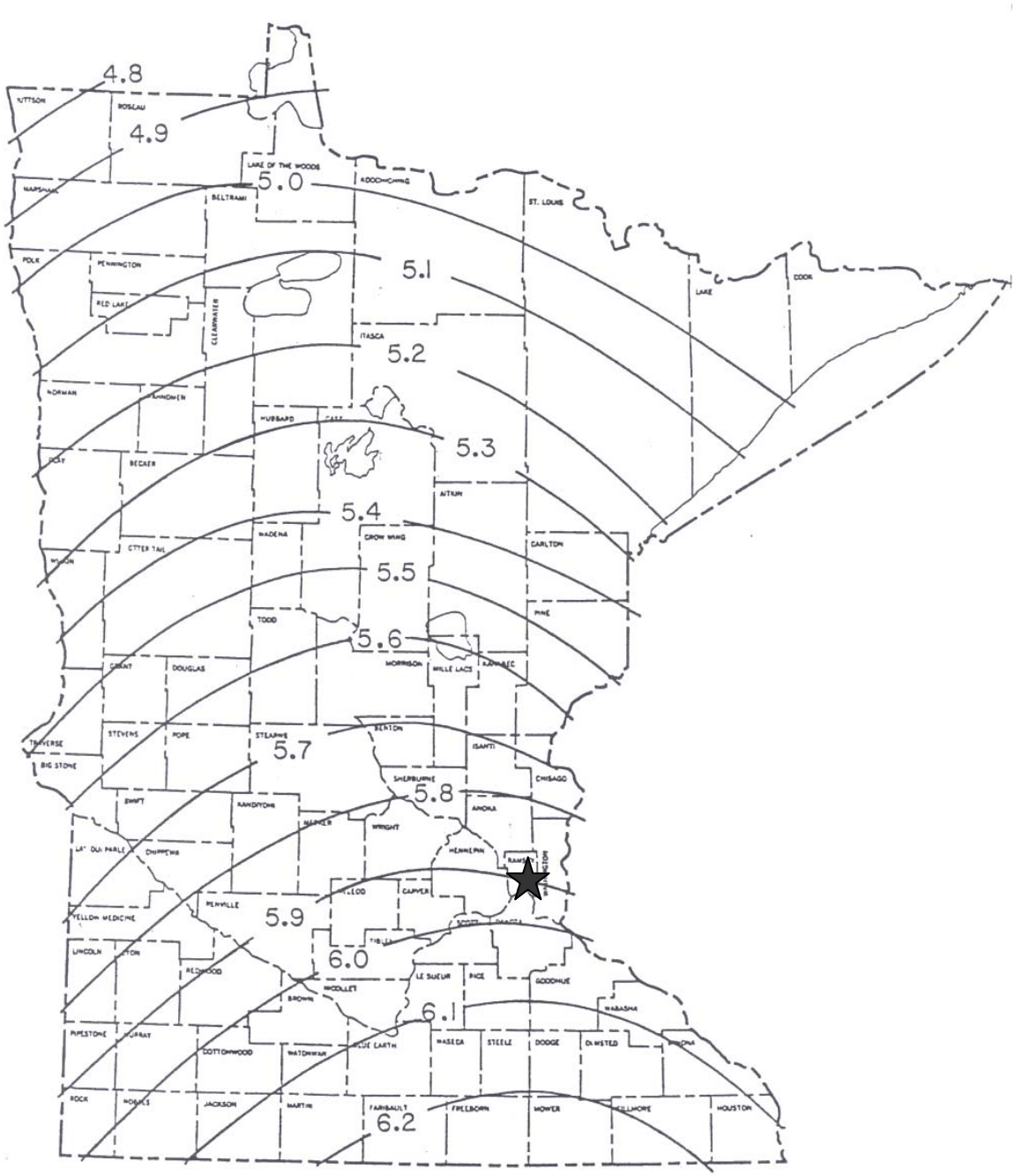

Figure III-1. 1% Chance Rainfall Event in 24-hours within the State of Minnesota.

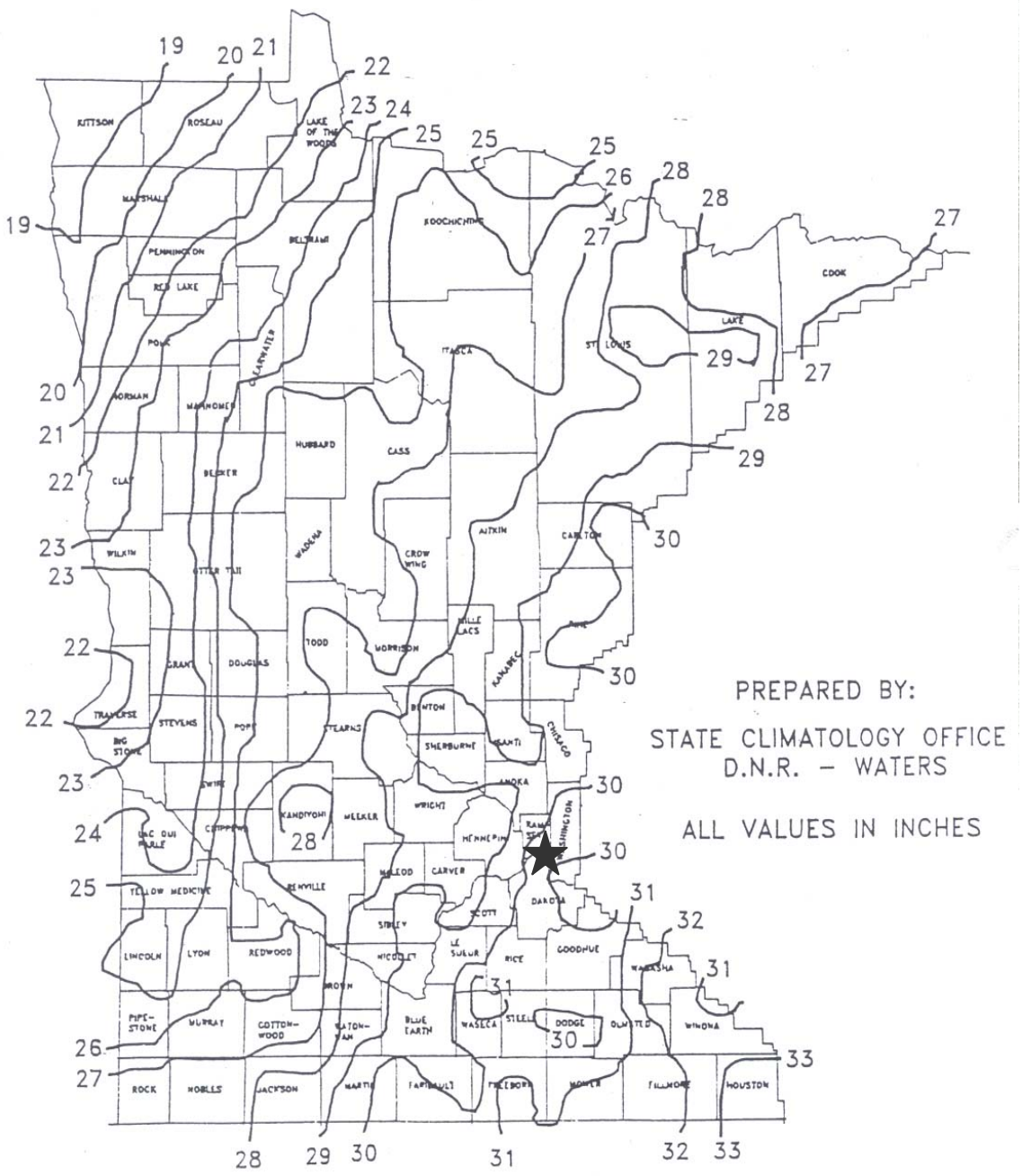

Figure III-2. Annual Normal Precipitation with the State of Minnesota.

Figure III-3
City Location Map

2. Topography:

The topography of the City varies from steep river bluffs along the Mississippi River to moderately or gently rolling land north and south of the river. Storm water runoff from the City is generally directed from higher elevations to depression areas. A majority of the storm water runoff drains to the Mississippi River either directly via storm sewer systems or indirectly due to the topography.

The majority of St. Paul is urban developed land with an approximate elevation of 900 feet above sea level. A majority of the City is located approximately 200 feet above the Mississippi River. The area north of the bluff is primarily level. The area south of the bluff gradually increases in elevation. The highest elevation within the City of St. Paul is 1,070 feet above sea level at Hillcrest Golf Course. The lowest elevation is approximately 687 feet above sea level in the Mississippi River floodplain.

The drainage patterns, which depict topography for areas within the City, are shown on the subwatershed delineation map referred to as **Figure III-4.** The City of St. Paul can be divided into many major watersheds. The major watershed delineation is utilized by the City for surface water management and the Annual Storm Water Permit Report for the Minnesota Pollution Control Agency.

Additional information regarding watershed delineation studies within the City can be found in the following reports or studies:

- Capitol Region Watershed Management Plan.
- Ramsey-Washington Metro Watershed District Management Plan.
- Como Lake Strategic Management Plan.
- Lake Phalen Shoreland Restoration Five Year Plan.
- City of Saint Paul Storm Water Permit Annual Report 2004.
- Robie Street and Bancroft Avenue Drainage Area Study Report.
- Lower Mississippi River WMO Plan.
- Mississippi River WMO Plan.

This information is available at the St. Paul Public Works Department.

C. Surface Water Resource Data

Available surface water resource data within the City is summarized in this section. Detailed information has been included either in the appendices to this report or has been identified by reference and is available at the St. Paul Public Works Department.

Additional detailed information, including the City's storm sewer mapping, which is too extensive to include in this report can be obtained through the City's Public Works portal. The following steps outline how to gain access to this information:

- Go to http://pwportal.ci.stpaul.mn.us
- Go to "Wanna Register?" and enter the data to obtain a user name and password
- Once you have received a user name and password, you can log onto the portal and search the data

The hydrologic system of the City consists of wetlands, lakes, streams, and major water bodies as outlined below.

1. Wetlands

A wetland inventory has been completed by U.S. Fish and Wildlife Service as published on the National Wetland Inventory Maps, and by the Minnesota Department of Natural Resources as published in their Public Waters and Wetlands Inventory. These wetland inventories will be utilized to assist in determining if a wetland is present on a given parcel of property within the City. The National Wetland Inventory map is shown on **Figure III-5** and the DNR Public Waters/Wetlands is shown on **Figure III-6.**

Additional wetland inventories were completed for areas within the City of St. Paul. This information can be obtained by reviewing the following plans:

- Capitol Region Watershed Management Plan.
- Ramsey-Washington Metro Watershed District Management Plan.

These wetland inventories include functions and values assessments of the wetlands within each watershed and/or management classifications for individual wetlands.

2. Major Bodies of Water

There are several major water bodies that convey and store water within and through the City. These water bodies include:

- Mississippi River and associated wetlands
- Battle Creek
- Como Lake
- Loeb Lake
- Lake Phalen
- Frost Lake
- Beaver Lake
- Crosby Lake
- Burlington Pond
- Mallard Marsh
- Pickerel Lake
- Pig's Eye Lake
- Little Pig's Eye Lake

- Suburban Pond
- Upper Lake

These water bodies are within City or public owned land and/or easements. More information about these water bodies is included in various portions of this section.

3. Water Quantity Inventory and Modeling

The City's hydrologic/hydraulic system consists of ponds, wetlands, and storm sewer pipe systems within multiple subwatersheds that drain towards the Mississippi. The City is divided into approximately 23 subwatershed areas, which are shown on **Figure III-4a and III-b.** The watershed inventory and hydrological modeling information is available in the Comprehensive Sewer Plan for the City of St. Paul. This plan was completed as part of the City's sewer separation project. This plan is available at the St. Paul Public Works Department.

Additional information regarding water quantity within the City can be found in the following studies:

- Robie Street and Bancroft Avenue Drainage Area Study Report.
- Storm Water Permit Annual Report for the City of St. Paul
- Ramsey-Washington Metro Watershed District Management Plan
- Como 7 Subwatershed Analysis.

Information regarding outfalls within the City is included in **Appendix N**. These studies and the results are available at the St. Paul Public Works Department.

4. Landlocked Basins

While most surface waters in the City have an outlet via the storm sewer system or natural overflows, the following surface waters or areas are landlocked:

- Loeb Lake
- Residential area west of McKnight Road and south of I-94

D. Flood Insurance Studies

A Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) was completed for areas within the City in April 2003. The Flood Insurance Study consisted of a study report, a set of floodway and floodplain delineation maps, and a set of Flood Insurance Rate Maps (FIRM) maps. This study provides the basis for floodplain management regulations and is included in **Appendix B**. The City's floodplain management regulations are included in **Appendix C.** The FIRM's are available at the St. Paul Public Works Department. The floodplain boundaries for the City of St. Paul are shown in **Figure III-7**.

E. Water Resource Problem Areas

A number of water resource problems have been identified within the City in recent history. The problem areas were identified through information obtained from City Staff and from the public input process. Each site was investigated, background information collected, and potential solutions to address the problems were developed. The City has completed the necessary hydrologic and hydraulic analysis and implemented corrective actions. Many problem areas resulted from rainfall events that occurred during 1987 and 1997. These problem areas that have required corrective actions include:

- Hillcrest Knoll Flood Remediation Project
- Arlington Pascal Storm Water Improvement Project (See **Appendix K**)
- Robie Street and Bancroft Avenue drainage system. A July 1, 1997 rainstorm, that followed several rainstorms the prior week, reportedly flooded the Robie/Bancroft intersection. As a result of the flooding the City retained a consultant in 2001 to conduct a hydrologic and hydraulic analysis of the entire watershed area draining to the Robie/Bancroft area. The City has constructed improvements to address this problem area.

More detailed information about these issues is available in **Section V** of this Plan.

F. Water Quality Data

1. Overview

Water quality data for the City has been obtained from the City and the Storage and Retrieval Database (STORET) water quality database, which is available through the Minnesota Pollution Control Agency (MPCA). This database is utilized by participating agencies to compile water quality testing data and is almost entirely used for the storage of water quality parameters. Additional water quality monitoring information is available in the St. Paul Storm Water Permit Annual Report (2004).

Figure III-12 shows the location of monitoring sites. Available water quality information obtained from the MPCA (STORET) is contained at the St. Paul Public Works Department or can be obtained at the following website: http://www.epa.gov/storet/.

Figure III-12 also shows the designated impaired waters listed by the MPCA. These waters are listed below with the designated impairment:

- Mississippi River – mercury, PCB's, fecal coliform, turbidity
- Como Lake – nutrients
- Beaver Lake – nutrients
- Battle Creek – fish IBI

- Unnamed basin 62023700 – PCB's

No Total Maximum Daily Loads (TMDL's) have been developed for these water bodies at this time. More information regarding when a TMDL study is anticipated to be completed is available from the MPCA.

2. Water Quality Modeling Data

To provide additional information on water quality within the City information from the Storm Water Permit Annual Report is included in **Appendix M**. This information includes annual and seasonal pollutant loading calculations for the subwatersheds within the City. Additionally, the following studies have been completed and are available upon request:

- Water Quality Feasibility Study: Ivy Falls Creek, Interstate Valley Creek, ad Highway 13 Watersheds (July 2004, Barr Engineering)
- Water Quality Modeling Study: Ivy Falls Creek, Interstate Valley Creek, and Highway 13 Watershed (February 2003, Barr Engineering)

G. Floodplain Management Regulations

The City of St. Paul has developed Floodplain Management Regulations. A copy of these regulations can be found in **Appendix C**. These regulations generally prohibit uses or activities within the floodplain that include structures or fill or that obstruct flood flows or cause increased flood elevations.

The City will adopt and implement MnDNR required shoreland ordinances when approached by the MnDNR to complete the ordinance.

H. River Corridor Overlay District

The City of St. Paul has developed a River Corridor Area Overlay District as part of the zoning ordinance of the City. This zoning code provides standards for conditional uses in the flood fringe district within the length of the corridor located in the City. Standards for all flood fringe uses must meet the density, setback, flood protection, and other requirements included in the housing and building codes. A copy of this regulation is found in **Appendix D**.

I. Ground Water Appropriations

The St. Paul Regional Water Services (SPRWS) is a special public authority that is responsible for supplying water to the City of St. Paul and several other cities both within and outside Ramsey County. Most of the water supplied by the SPRWS comes from the Mississippi River through a series of lakes. Between 10-20% of the total water supplied yearly by the SPRWS comes from the four

large diameter public supply wells, located in Vadnais Heights, which pump water from the Prairie Du Chien-Jordan aquifer. The SPRWS supplies water to the cities of St. Paul, Roseville, Maplewood, Little Canada, Lauderdale, Falcon Heights, West St. Paul, Mendota, Mendota Heights, and Arden Hills. This information and additional information was and can be obtained from the Ramsey County Ground Water Quality Protection Plan and the SPRWS website.

Additional wells for industrial processing, water level maintenance, irrigation, and air conditioning have a ground water appropriation permit from the DNR. **Figure III-9** shows the locations of the DNR permitted ground water appropriation sites within the City.

J. Ground Water Resource Data

The City of St. Paul obtains 10-20% of the total water supplied yearly from the four large diameter public supply wells, located in Vadnais Heights, which pump water from the Prairie Du Chien-Jordan aquifer. The St. Paul Regional Water Services (SPRWS) added two wells in 2004 and anticipates adding two wells each subsequent year until a total of 12 well systems have been completed. These SPRWS wells also supply water to the cities of Roseville, Maplewood, Little Canada, Lauderdale, Falcon Heights, West St. Paul, Mendota, Mendota Heights, and Arden Hills.

The SPRWS anticipates completing a Wellhead Protection Plan in the fall of 2005. A wellhead protection area (WHPA) program is anticipated to be completed as part of this plan. This program is a method of protecting the public water supply from contamination. The purpose of the WHPA is to define the area of an aquifer that provides water to a public well and to identify and manage potential contamination sources within this limited geographical area. The goal of the program is to prevent contamination that may have acute or chronic adverse impacts on human health from entering public water supply wells.

Additional information can be obtained from the Ramsey County Ground Water Quality Protection Plan completed in 1996, containing information on water-table hydrogeology and water well data base distribution and sensitivity of the water-table system to pollution.

K. Soils Information

The soils in most areas of the City are sandy, gravelly material deposited by glaciers or outwash from the river. The hydrologic soil classification map is shown in **Figure III-10**. The four soil classifications are defined as follows:

> **Group A -** Soils have high infiltration rates even when thoroughly wetted. The infiltration rates range from 0.3 to 0.5 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and

gravel. Group A soils have a high rate of water transmission, therefore resulting in a low runoff potential.

Group A/D - Soils hydrology is a mixture of Group A and Group D. Group A/D soils contain the features and characteristics of both Group A and Group D soils depending on whether the soils are drained or undrained.

Group B - Soils have moderate infiltration rates ranging from 0.15 to 0.30 inches per hour when thoroughly wetted. Group B soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.

Group B/D - Soils hydrology is a mixture of Group B and Group D. Group B/D soils contain the features and characteristics of both Group B and Group D soils depending on whether the soils are drained or undrained.

Group C - Soils have slow infiltration rates ranging from 0.05 to 0.15 inches per hour when thoroughly wetted. Group C soils have moderately fine to fine texture.

Group C/D - Soils hydrology is a mixture of Group C and Group D. Group C/D soils contain the features and characteristics of both Group C and Group D soils depending on whether the soils are drained or undrained.

Group D - Soils have very slow infiltration rates ranging from 0 to 0.05 inches per hour when thoroughly wetted. Group D soils are typically clay soils with high swelling potential, soils with high permanent water table, soils with a clay layer at or near the surface, or shallow soils over nearly impervious material.

Urban Land – This miscellaneous area has more than 90% of the surface covered with buildings and other impervious surfaces. Soils in these areas have been greatly altered in various ways by construction. Runoff in these areas is high and often flows into storm sewer drainage systems.

The general soils in most of the City were formed dominantly in outwash and glacial till. These upland areas consist of Urban Land – Chetek – Mahtomedi, Urban Land – Waukegan – Chetek, and Kingsley – Urban Land soil series.

Urban Land – Chetek – Mahtomedi – This series consists of nearly level to very steep, somewhat excessively drained to excessively drained, and moderately coarse textured to coarse textured urban land soils. These soils are located primarily in upland areas.

Urban Land – Waukegan – Chetek – This series consists of nearly level to moderately steep, well drained to somewhat excessively drained, and medium to moderately coarse textured urban land soils. These soils are located primarily in upland areas.

Kingsley – Urban Land – This series consists of undulating to steep, well drained, moderately coarse textured urban land soils. These soils are located primarily in upland areas.

Along the Mississippi River, the general soils were formed mainly in loamy sediments over bedrock, glacial till over outwash, and in recent alluvium. These upland and floodplain areas consist of Kingsley – Mahtomedi, Urban Land – Copaston, and Udorthents – Algansee soil series.

Kingsley – Mahtomedi – This series consists of undulating to very steep, well drained to excessively drained, and moderately coarse textured to coarse textured urban land soils. These soils are located primarily in upland areas.

Urban Land – Copaston – This series consists of urban land, level to very steep, well drained, and medium textured soils. These soils are located primarily in upland areas.

Udorthents – Algansee – This series consists of nearly level to very gently sloping, variably textured fill material and nearly level, somewhat poorly drained, coarse textured soils. These soils are located primarily in floodplain areas.

Additional information on the geology and soil for the City is included in the Soil Survey of Ramsey County available at the St. Paul Public Works Department.

L. Land Use and Public Utilities Services

The City of St. Paul land use practices include residential, commercial, industrial, and public and private open space areas. **Figure III-11** is a representation of the land use districts for the City.

Most of the residences and businesses in the City are served by public water and sewer systems. The City does, however, contain approximately 200 Individual Sewage Treatment Systems (ISTS). The greatest concentration of ISTS is in the South Highwood area. Much of this area is not currently served by public sanitary sewer facilities. For additional information see **Appendix L**.

The City of St. Paul permits the building and usage of ISTS in areas of the City that are not served by public sewer or are unable to connect to an existing sewer system. The City's management program for on-site sewage treatment includes provisions for the regulation and monitoring of all individual sewage treatment systems. The maintenance, design, construction, and location of septic systems

are required to conform with Minnesota Pollution Control Agency Minnesota Rules 7080, Minnesota State Building Code, Minnesota Plumbing Code, and Minnesota Water Well Construction Code.

M. Public Areas for Water Based Recreation and Access

There are a number of water bodies that both active recreation such as fishing and passive recreation such as walking. These recreational resources are outlined below:

Mississippi River: The Mississippi River provides boating, fishing, and hiking opportunities within the City. The Mississippi River is also a State Canoe Route operated by the DNR Division of Trails and Waterways

Cherokee Park: This park offers two open-air picnic shelters with the opportunity to picnic and grill. The park also contains one ball field, two tennis courts, a tot lot, basketball court, and two scenic overlooks of the Mississippi River.

Como Park: This park offers multiple types of recreational opportunities. The park contains the Como Park Shelter and Como Park Midway Pavilion for picnicking and grilling. Como Park contains 1.67 miles of trail. The Department of Natural Resources reports bass and walleye fishing opportunities around the lake. Other passive recreational activities such as the Marjorie McNeely Conservatory, Como Ordway Japanese Garden, 18-Hole Como Golf Course, pool, mini golf, and amusement rides, one also within the park.

Crosby Regional Park: This regional park contains an extensive trail system along the Mississippi River. This riverside park offers opportunities to fish along the river, launch a boat, picnic, grill, and have a contained fire, and use the 6.7 miles of trail.

Harriet Island Regional Park: This regional park contains an extensive trail system along the Mississippi River. This riverside park offers opportunities to fish along the river, launch a boat, picnic, grill, overnight at a bed and breakfast, enjoy musical events, and scenic views of St. Paul. A planned future park facility for the park includes a floating restaurant.

Hidden Falls Park: This park contains approximately 6.7 miles of trails along the wooded bottomlands next to the Mississippi River where patrons can fish from the banks of the river.

Indian Mounds Park: This park contains six burial mounds along the Mississippi River bluff. The park offers patrons opportunities to view the river, picnic, and contains a play lot.

Marydale Park: This park surrounds Loeb Lake and contains a 1 mile trail around the lake as well as a fishing pier, grilling area, and tot lot. Loeb Lake is designated as a fishing pond by the Department of Natural Resources and is stocked with panfish each spring.

Phalen Park: This park offers many recreational opportunities for the public. It contains an 18-hole golf course, 3.2 miles of paved trails, tot lot, beach, lakeside activities center, amphitheater, picnic shelter, and recreation center. The Department of Natural Resources reports walleye and northern pike fishing in the deeper areas of Phalen Lake and bass in the shallower areas. The park also includes Round Lake and parts of Keller Creek.

Beaver Lake County Park: This park offers many recreational opportunities for the public. The park includes a fishing pier, game field, play area, and a picnic shelter.

Additional information regarding recreational opportunities within the City can be obtained by visiting the City of St. Paul's Parks and Recreation web site at http://www.ci.stpaul.mn.us/depts/parks/userguide.html.

N. Fish and Wildlife Habitat

St. Paul provides habitat for a variety of small mammals, reptiles, birds, amphibians, and insects. Maintenance of habitat for wildlife species is important in maintaining ecological stability in St. Paul natural areas. These natural areas primarily include the areas around the lakes within the City and the Mississippi River floodplains and adjacent bluffs.

The Department of Natural Resources has been stocking open water bodies within the City with various fish species. These lakes include Como Lake, Phalen Lake, Loeb Lake, Beaver Pond, and Pig's Eye Lake. Information regarding fish surveyed in a sample year, including fish length as well as fish stocked by species for the last five years can be obtained by visiting the Minnesota Department of Natural Resources Lake Finder web site at: http://www.dnr.state.mn.us/lakefind/index.html

The United States Geological Survey completed a study entitled "Water Quality, Physical Habitat, and Fish-Community Composition in Streams in the Twin Cities Metropolitan Area, Minnesota 1998-98". This study looked at 13 streams in the Twin Cities area, including Battle Creek within the City of St. Paul. This study found that total instream habitat was greatest in 5 of the streams, including Battle Creek. The results of this study determined that fish-community composition appeared to be affected by percent of impervious cover in the watershed, water chemistry, water temperature, geomorphology, substrate, instream habitat, and migration barriers. This study is available at the St. Paul Public Works Department.

O. Unique Features and Scenic Areas

Unique features and scenic areas include State designated Scientific and Natural Areas, designated scenic areas, areas containing rare and endangered species, and historic areas.

A review of the Minnesota County Biological Survey Map was completed to determine the Natural Communities and Rare Species within the City of St. Paul. This review identified locations for 29 rare animals and 10 rare plant species that are either protected under the provisions of the Federal or Minnesota Endangered Species Acts or are being considered for protection.

Within the City many natural communities, classified primarily by vegetation and major habitat features, are identified on the County Biological Survey Map. The following areas are identified on the map:

- Mississippi River National River and Recreation Area
- Hidden Falls-Crosby Regional Park
- Lilydale-Harriet Island Regional Park
- Battle Creek Regional Park
- Pig's Eye Island Heron Rookery
- Fish Creek Open Space
- Como Regional Park
- Phalen-Keller Regional Park
- Beaver Lake County Park
- Suburban Avenue Open Space

Among the areas listed above are the natural communities identified on the County Biological Survey Map. These are provided below along with the species that may be present within the community:

Deciduous Forest

Oak Forest – dry subtype – northern pin oak, bur oak, white oak, quaking aspen, or red maple
Oak Forest – mesic subtype – red oak, basswood, bur oak, white oak, or northern pin oak
Oak Forest – subtype not determined – dry or mesic
Maple Basswood Forest – mesic forest – sugar maple, basswood, red oak, or green ash

Deciduous Woodland / Savanna

Oak Woodland-Brushland – dry to dry-mesic – bur oak, northern pin oak, American hazelnut, red raspberry, or choke cherry

Forested Wetlands

Mixed Hardwood Swamp – wet forests – paper birch, yellow birch, red maple, quaking aspen, or black ash

Floodplain Forest

Floodplain Forest – seasonally flooded – silver maple, bur oak, green ash, or cottonwood

Open Wetlands

Wet Meadow – tussock sedge, Hayden's sedge, lake sedge, blue-joint, Joe-pye-weed, meadowsweet, or slender willow.
Mixed Emergent Marsh – broad leaved arrowhead or bulrushes

The City does have a number or historical and architectural resources as identified by the Minnesota State Historical Preservation Office. This 232 page database is available at the St. Paul Public Works Department.

P. Pollutant Source Locations

A search was completed of the MPCA Aboveground/Underground Storage Tank Site Database for the presence of LUST sites and Tank sites within the City of St. Paul. This information is obtained from the MPCA is included in **Appendix J**.

Figure III-8 shows the approximate locations of a variety of sites. Many of these sites have been cleaned up or are in the process of being cleaned up. The MPCA should be contacted for site-specific details.

Minnesota's Phosphorous Lawn Fertilizer Law, effective January 1, 2004, restricts the use of lawn fertilizers within the metro area. In conformance with the Storm Water Permit Annual Report requirements the City of St. Paul has completed an inventory of the fertilizer and pesticide usage by the City. A summary of the Minnesota Phosphorous Lawn Fertilizer Law is included in **Appendix O**.

Q. NPDES Phase I

A 1987 amendment to the federal Clean Water Act required implementation of a two-phase program to address stormwater runoff. Since the early 1990's, Phase I regulated large construction sites, 10 categories of industrial facilities, and major metropolitan Municipal Separate Storm Sewer Systems. Under Phase I, Minneapolis and St. Paul were required to obtain individual permits and designed and implemented stormwater programs.

Each year the City of St. Paul completes the Storm Water Permit Annual Report in fulfillment of the annual reporting requirements of the Phase I NPDES Storm Water Discharge Permit MN 0061263 issued to the City of St. Paul on December 1, 2000. An application for reissuance was submitted to the MPCA in July of 2003.

SECTION III

The annual report submitted to the MPCA includes the following information regarding the storm water conveyance system for the City of St. Paul:

- Contact information and Certifications
- Storm Water Monitoring and Modeling
- Inventory
- Storm Sewer System Management
- Street Management
- Storm Water Management Ordinance
- Pesticides and Fertilizers
- Illicit Discharges and Improper Disposal
- Public Education Program
- Coordination with Other Government Units

The annual report is available at the St. Paul Public Works Department.

SECTION IV

IV. ESTABLISHMENT OF GOALS AND POLICIES

The City of St. Paul has developed a number of goals and policies that conform to the overall purpose that is specified in Minnesota Statutes Section 103B.201. These goals and policies have been developed to complement County, Regional or State goals and policies, and to be in conformance with the policies required by comprehensive plans for the Capitol Region Watershed District (CRWD), Ramsey-Washington Metro Watershed District (RWMWD), Lower Mississippi River Watershed Management Organization (LMRWMO), and the Mississippi Watershed Management Organization (MWMO). The City of St. Paul will work with the watershed districts and watershed management organizations on intercommunity issues.

These goals and policies have also been developed to preserve and use natural water storage and retention systems in order to:

A. Limit public capital expenditures that are necessary to control excessive volumes and rates of runoff.

B. Improve water quality.

C. Prevent erosion of soil into surface water systems.

D. Promote ground water recharge.

E. Protect and enhance fish and wildlife habitat and water recreational facilities.

F. Secure the other benefits associated with the proper management of surface water.

The goals and policies the City has developed address issues related to water quantity, water quality, recreation, fish and wildlife, enhancement of public participation, information and education, public ditch system management, ground water management, wetland management, soil erosion management, Mississippi River management, and the NPDES Storm Water Permit. Outlined below are the goals and policies that have been developed for each of the above areas of concern.

Watershed Rules

Capital Region Watershed District and Ramsey-Washington Metro Watershed District have jointly been working on rules which require storm water volume control for land disturbances over one acre, including road reconstruction projects. Staff from various City departments including PED, Parks, Public Works, LIEP and the Mayor's Office, along with the St. Paul Port Authority and the Planning Commission participated on the Technical Advisory Committee (TAC) to the Watershed Districts for the rule development process. The TAC made a list of recommendations to be brought to the watershed boards at their meetings in early April. The revised rules were distributed in June of 2006 for public comment. Both Districts issued draft rules in June of 2006, with rule adoption expected to take place in October of 2006. The City intends to work cooperatively with both Watershed Districts throughout the rule implementation process, including ongoing participation on each district's TAC.

SECTION IV

The various watershed districts in the City have a separate rule process. These rules will apply to projects within the City and separate approvals may be required for projects. For City projects, the City anticipates obtaining approvals from the watershed districts and entering into a Memorandum of Agreement for the project to address maintenance in conformance with these rules.

A. Water Quantity

Goal:

Limit public capital expenditures that are necessary to control excessive runoff volumes, rates, and downstream impacts from development.

Policies:

1. The level of flood protection to be provided along trunk conveyance systems streams, channels, wetlands, ponds, detention basins, and lakes shall be based on the critical-duration 100-year flood.

2. The critical 1% chance event will be defined as the event that requires the greatest storm water storage volume in a storage facility. These facilities include lakes, ponds, and their outlets.

3. Outlets for landlocked basins will be provided based on the following conditions:

    a. Only the existing tributary area may discharge to a landlocked basin, unless provision has been made for an outlet from the basin.

    b. The form of outlet may range from temporary pumps to gravity storm sewers. The outlet is to be in place before increased water levels are likely to affect vegetation, slope stability and property values.

    c. The City will encourage the reduction of impervious area coverage and increase infiltration opportunities in watersheds tributary to landlocked basins.

    d. In establishing high water elevations and whether outlets are needed for landlocked basins, the long duration events, such as multiple-year wet cycles and high runoff volume events will be considered (e.g. snowmelt events that last for many weeks).

    e. Emergency overflows or outlets to drainage systems will be provided to any landlocked area if the available storm water storage capacity is inadequate to prevent flooding of residences and if the available downstream conveyance system capacity is adequate to accept additional flow.

4. The City's natural ponding areas, such as wetlands and lakes, currently provide and will continue to provide for the impoundment and treatment of surface water runoff as appropriate and according to local, state, and federal regulations.

5. The City intends to use both designated and non-designated areas to store storm water runoff. Non-designated areas include general depressions, areas lacking easements, low points, and streets where structures and/or property is not damaged and any inundation that occurs will only be temporary in nature.

6. The City will work with the local watershed districts and watershed management organizations to monitor lake levels and modify predicted flood levels when necessary.

7. Trunk storm water systems shall be designed to provide discharge capacity for the critical-duration runoff event that is not less than a 5-year frequency event. For open channel conveyance systems, the design criteria shall be for the critical 100-year event (See **Appendix P**).

8. All minor drainage systems (non-trunk) and local storm water collection systems analyses and design will be based on a 5-year event unless otherwise specified.

9. The City will encourage the development of enhanced infiltration practices wherever practical and feasible to reduce impervious areas. The City will not maintain private infiltration areas. **Appendix G** contains information on infiltration design guidelines.

10. The City requires rate control according to the Storm Water Ordinance (see **Appendix E**) and the Stormwater Management Site Plan Review Worksheet (see **Appendix P**).

11. Project proposers will need to contact the local watershed district or watershed management organization to determine if there are additional rate control requirements. Contact information is located in **Section II** of the City's Surface Water Management Plan.

12. Drainage calculations must be submitted and approved as part of any development or redevelopment applications for sites larger than one quarter acre or greater in accordance with to the Storm Water Ordinance (see **Appendix E**) and the Stormwater Management Site Plan Review Worksheet (see **Appendix P**) prior to the issuance of any building or grading permit.

13. The City will maintain maximum and average 100-year discharge rates and storage volume in regional detention areas.

14. The City maintains a hydrologic model of the storm water system. A hydrologic model was developed for the City of St. Paul Sewer Separation

project. This model is included in the Comprehensive Sewer Plan for the City of St. Paul and is available at the St. Paul Public Works Department**.**

15. Emergency overflow structures (e.g. swales, spillways) are to be incorporated, where feasible, into pond outlet structure designs to prevent undesired flooding resulting from storms larger than the 100-year (one percent) event or plugged outlet conditions.

16. Detention facility design will include access for maintenance of the outlet structure and to the facility in general.

17. Easements over floodplains, detention areas, wetlands, ditches, and all other parts of the stormwater system are required as areas develop or redevelop.

18. The City will ensure that City development, redevelopment, and/or infrastructure projects will not overtax the existing downstream stormwater drainage system.

19. Uses or activities within the 100-year floodplain that include structures, fill, obstruction of flood flows that cause increased flood elevations are prohibited.

20. The minimum building elevation for new or redevelopment shall meet the following criteria:

    a. The basement floor will be 4 feet above the currently observed groundwater elevations in the area.

    b. The basement floor elevation will be 2 foot above the 100-year high surface water elevation for the area.

    c. Apply to all areas within the City except the River Corridor Overlay Districts which are required to be in conformance with Chapter 68 of the Zoning Code (See **Appendix D**).

B. Water Quality

Goal:

Maintain or improve the quality of water in lakes, streams or rivers within or immediately downstream of the City.

Policies:

1. The watershed districts and watershed management organizations have developed the following lake classification system for lakes within their watershed:

CAPITOL REGION WATERSHED DISTRICT		
LAKE NAME	*PLAN*	*STATUS*
Como Lake	Strategic Lake Management Plan	Complete
Crosby Lake	Lake and Natural Resource Plan	Incomplete

Strategic Lake Management Plan identifies important management issues through input from key stakeholder groups, prioritizes the issues and associated goals, and identifies implementation activities, including institutional and public roles, time frames, and funding.

Lake and Natural Resource Plan to address resource concerns and future management. Cooperation between the City, residents, businesses, watershed district, and non-profit organizations will aid in developing the plan.

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT		
LAKE NAME	*USE LEVEL*	*MANAGEMENT CLASS*
Beaver Lake	3	Restore / Improve
Lake Phalen	1	Restore / Improve

Level-1 activities require excellent lake water clarity. As water begins to appear green, clarity and color appeal decline. Clarity for swimming and scuba diving should be at least 5.25 feet.

Level-3 activities require good lake habitat for fish and wildlife, along with public boat access for fishing. In the urban setting it is wise to manage for less than or equal to 60 ug/L TP to

minimize the potential for foul odor when poor conditions occur, such as long periods of hot days.

Fish production is affected by a lake's dissolved-oxygen concentration under the ice during the winter months. Lake depth is critical in predicting the tendency of a lake toward winterkill conditions, when large numbers of fish perish due to low dissolved-oxygen concentrations during the late winter. A minimum depth of 13 feet is generally needed to avoid winterkill. Lake aeration can also be used to provide oxygenated water during winter months.

LOWER MISSISSIPPI RIVER WMO		
LAKE NAME	*CLASSIFICATION*	*MINIMUM ACTION NEEDED*
Pickerel Lake*	Category III	Trend analysis; Secchi disc monitoring

Category III water body classification recommends water quality monitoring to include secchi disc monitoring (i.e. MPCA's Citizen Lake Monitoring Program).
*****Intercommunity water resources are the responsibility of the WMO.

MISSISSIPPI RIVER WMO	
None	None

No designated water bodies currently exist within St. Paul for this watershed.

Monitoring of these water bodies may be coordinated with local watershed districts, watershed management organizations, adjacent cities, and environmental advisory groups. Currently, Ramsey County is completing water quality monitoring for several lakes within the City. More information regarding the lake classification system can be obtained in the watershed district or watershed management organization comprehensive plans.

2. In the design and construction of new, or modifications to the existing storm water conveyance systems, pretreatment of storm water runoff to Nationwide Urban Runoff Program (NURP) recommendations must be provided prior to discharge from the site and/or to a wetland, lake, or stream.

3. The City has developed the following NURP design recommendations for the design of storm water treatment basins:

    a. A permanent pool ("dead storage") volume below the principal spillway (normal outlet) which shall be greater than or equal to the runoff from a 2.5 inch rainfall over the entire contributing drainage area assuming full development.

b. A permanent pool average depth (basin volume/basin area) which shall be ≥ 4 feet, with a maximum depth of ≤ 10 feet.

c. An emergency overflow (emergency outlet) adequate to control the one percent frequency/critical duration rainfall event.

d. Basin side slopes above the normal water level should be no steeper than 4:1, and preferably flatter. A basin shelf with a minimum width of 10 feet and one foot deep below the normal water level is recommended to enhance wildlife habitat, reduce potential safety hazards, and improve access for long-term maintenance.

e. To prevent short-circuiting, the distance between major inlets and the normal outlet shall be maximized.

f. A flood pool ("live storage") volume above the principal spillway shall be adequate so that the peak discharge rate from the critical 100-year storm event is no greater than 0.05 cfs/acre.

g. No orifice smaller than 4” is allowed in the construction of ponds or outlets within the City.

h. Retardance of peak discharges for the more frequent storms can be achieved through a principal spillway design which may include a perforated vertical riser, small orifice retention outlet, or compound weir.

i. Consideration for aesthetics and wildlife habitat should be included in the design of the pond.

4. In areas of redevelopment where ponding is not feasible or available, in-line storm water treatment systems will be required to treat storm water runoff.

5. Project proposers will need to contact the local watershed district or watershed management organization to determine if there are additional water quality requirements. Contact information is located in **Section II** of the City’s Surface Water Management Plan.

6. The City will continue to work cooperatively with Ramsey County to implement the household hazardous waste disposal program and educate residents on the proper disposal of household hazardous waste. For more information see http://www.co.ramsey.mn.us/.

7. The City has worked to eliminate illegal connections to the City's storm water conveyance system and will continue this work when additional connections are identified.

8. The City anticipates working with neighboring municipalities to control runoff rates and provide water quality treatment prior to the discharge of storm water across municipal boundaries.

9. The City will continue to respond to hazardous spills as required by state law.

10. The City will continue to follow the MPCA NPDES Phase I guidelines and has obtained a Municipal Storm Sewer Permit in 2000 as part of the MPCA requirements.

11. The City will share water quality data and trends with the surrounding cities, watershed districts, and watershed management organizations.

12. The City will coordinate with local, state, and federal agencies to establish, implement, and evaluate lake, wetland, and stream monitoring programs.

13. The City requires implementation of best management practices during development and redevelopment to achieve the goal of reducing nonpoint source pollution.

14. The City will use the “Minnesota Urban Small Sites BMP Manual” (Metropolitan Council) and “Protecting Water Quality in Urban Areas” (MPCA) for water quality guidance for new development and redevelopment projects.

15. The City will encourage the reduction in the amount of impervious surface upon development or redevelopment.

16. The City will promote Low Impact Development (LID) design concepts into development and redevelopment projects to the greatest extent feasible. Additional information on LID is available in the St. Paul Department of Public Works.

17. The City has adopted the Storm Water Ordinance outlined in **Appendix E**, which includes established standards and specifications for practices and planning activities, which minimize storm water pollution, soil erosion, and sedimentation.

18. The City will work with the watershed districts and watershed management organizations when practical and feasible to construct regional detention basins to treat storm water runoff when upstream facilities cannot effectively reduce sediment and nutrient loads to target levels.

19. The City will work to reduce small non-point sources of pollution through community education, demonstration projects and various housekeeping practices and maintenance procedures in compliance with the Municipal Storm Sewer Permit.

20. The City will adopt and implement MnDNR required shoreland ordinances when required by the MnDNR.

21. The City will require adherence to the NPDES/SDS Construction Permit for all construction sites disturbing 1 acre or more.

C. Recreation, Fish and Wildlife

Goal:

Protect and enhance recreational facilities and fish and wildlife habitat.

Policies:

1. The City will cooperate with the Minnesota Department of Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other appropriate agencies in promoting public enjoyment and protecting fish, wildlife, and recreational resources in the City. For permitting process information see **Appendix Q**.

2. The City will work to preserve wetlands that provide habitat for wildlife and spawning of fish.

3. The City will encourage land owners to maintain wetlands and open space areas for the benefit of wildlife.

4. The City will participate with local watershed districts, watershed management organizations, and the MnDNR Natural Heritage Program to identify high value natural communities, and collectively discourage, critically review, and modify proposals where appropriate to avoid the loss of high value natural resources (wetlands, forests, shrublands, grasslands, and open spaces).

5. The City will complete a Wetland Management Plan that will include a wetland inventory, habitat assessment, and management plan for wetlands and water bodies on public property with assistance from the local Watershed Districts.

6. The City will encourage buffers on private land to be implemented around storm ponds, lakes, wetlands, and streams upon new development or redevelopment. These buffers will be promoted and encouraged for all existing properties adjacent to lakes, streams, and wetlands and promoted through public education.

7. The City will establish and maintain vegetative buffer areas around lakes, wetlands, and streams on public property where practical. The extent and location of these buffers will be assessed as part of the Wetland Management Plan development.

8. The City may incorporate into proposed projects alternative landscape designs that:

   a. Increase beneficial habitat, wildlife and recreational uses; promote infiltration and vegetative water use; and

   b. Decrease detrimental wildlife uses (such as beaver dams, goose overabundance) that damage water control facilities, shoreline vegetation, water quality or recreational facilities.

9. The City will manage and control noxious and invasive plant species as practical and work to increase awareness of the problem.

D. Enhancement of Public Participation, Information, and Education

Goal:

Educate and inform the public on pertinent water resource management issues and increase public participation in water management activities.

Policies:

1. The City will disseminate information to the public regarding its water resources, stormwater management, etc.

2. The City will coordinate its education efforts with the local watershed districts, watershed management organizations, and Ramsey County.

3. The City will continue to implement an education program. Public education information can be found in **Appendix I.** This program includes the following:

   - Storm drain stenciling (contracted with Friends of the Mississippi River)

   - Door hangers with information about protecting water resources (contracted with Friends of the Mississippi River)

   - City Staff go to local schools to share information about protecting water resources

   - City newsletters

   - City website (http://www.ci.stpaul.mn.us/).

   - Include informational brochure with storm sewer service utility charge mailing

4. The City will sponsor a city-wide parks cleanup day.

E. Public Ditch Systems

Goal:

There are no public ditch systems owned by the City of St. Paul. The Beltline Interceptor, identified in Table 3.5-2 of the RWMWD Comprehensive Plan, was transferred to the district in January 1, 1996.

F. Ground Water

Goal:

To coordinate activities and/or manage surface water runoff to the degree necessary to meet requirements for ground water protection or management as required by Ramsey County, Minnesota Pollution Control Agency, the Minnesota Department of Health, and the Department of Natural Resources.

Policies:

1. The City will work cooperatively with Ramsey County to protect groundwater sources and recharge areas identified in the Ramsey County Groundwater Quality Protection Plan.

2. The City will cooperate with state and regional agencies on ground water monitoring, inventorying, wellhead protection efforts, and permitting programs.

3. The City will cooperate with the Department of Health and the Ramsey Conservation District to insure that all unsealed or improperly abandoned wells within the City are properly sealed. Technical requirements for the abandonment of these wells will be in conformance with the local and state regulations.

4. The City will coordinate with the watershed districts to evaluate the need and resources for a permanent groundwater quality monitoring program.

5. The City will maintain updated records of all known on-site septic systems and prohibits the installation of new individual septic systems or alterations, repairs or extensions of existing systems when connection can be made to the city sanitary system. The City will also continue to develop a management program and ordinance for individual sewage treatment systems (ISTS) that is consistent with MPCA Rules 7080 and Metropolitan Council policies. The current management program for ISTS within the City of St. Paul is available in **Appendix L**.

6. The City will encourage the development of alternative storm water management methods including vegetated swales and infiltration practices

for storm water projects, development, and redevelopment, provided these methods do not contaminate ground water. Infiltration recommendations are provided in **Appendix I**.

7. The City will adopt the County Ground Water Plan by reference through this Local Surface Water Management Plan.

G. Wetlands

Goals:

The City will protect wetlands in conformance with the requirements of the Wetland Conservation Act of 1991, as amended.

Policies:

1. The City is the local governmental unit (LGU) responsible for administering the Wetland Conservation Act (WCA) and rules. The City will protect and manage wetlands in conformance with WCA (See **Appendix H**).

2. The City will complete a Wetland Management Plan that will include a wetland inventory, habitat assessment, and management plan for wetlands and water bodies on public property.

3. The City will encourage public and private landowners to maintain wetlands and open space areas for the benefit of wildlife.

4. Prior to issuance of any city grading or building permits, all development and redevelopment activities must comply with the Wetland Conservation Act.

5. When managing a wetland for the primary purpose of quality management and flood retention, detrimental effects to the other wetland functions and values such as wildlife habitat, species diversity, aesthetics, etc will be minimized to the extent practical and feasible.

6. The City will encourage buffers on private land to be implemented around storm ponds, lakes, wetlands, and streams upon new development or redevelopment. These buffers will be promoted and encouraged for all existing properties adjacent to lakes, streams, and wetlands and promoted through public education.

7. The City will seek opportunities to create new wetlands and restore previously impacted wetlands in cooperation with citizens, counties, and the state.

8. The City will work with local watershed districts and watershed management organizations to streamline and coordinate the application and approval process for wetland permits.

H. Erosion

Goals:

To prevent soil erosion and sedimentation.

Policies:

1. The City requires adherence to the NPDES Construction Permit for all projects that disturb one acre of more of land.

2. The City will require erosion control plans for land development and construction work that will disturb 10,000 square feet or more of land in conformance with City codes (See **Appendix E, F, P**).

3. The City's Inspectors will conduct erosion control inspections for construction projects.

4. Point discharges of stormwater to open channels or detention basins shall be constructed in a manner that minimizes erosion.

5. Effective energy dissipation devices should be provided at all conveyance system discharges to prevent bank, channel or shoreline erosion.

6. Design of stream bank stabilization and streambed control measures should consider unique or special site conditions, energy dissipation potential, adverse effects, preservation of natural processes and habitat, and aesthetics in addition to standard engineering and economic criteria.

7. The City will require any development or redevelopment to comply with the erosion control standards found in the City's Storm Water Ordinance included in **Appendix E.**

8. The City will maintain its erosion and sediment control standards to be in conformance with the "Minnesota Urban Small Sites BMP Manual" (Metropolitan Council) and "Protecting Water Quality in Urban Areas" (MPCA). This Building Code contains information about erosion control requirements and is included in **Appendix F**.

9. It shall be the responsibility of the developer / contractor to keep streets and property adjacent to construction areas free from sediment carried by construction traffic at site entrances and access points, and from site runoff and blowing dust.

10. Acceptable erosion in drainageways is limited to that which causes no net degradation of the watercourse or destruction of properties adjacent to the watercourse.

I. Mississippi River

Goals:

To continue to protect and preserve the Mississippi River corridor, Mississippi River, and associated wetlands.

Policies:

1. Work cooperatively with Federal, State, and County agencies in the development of resource management and implementation plans affecting the Mississippi River

2. The City will participate in the Watershed Outlet Monitoring Program (WOMP) with the Metropolitan Council at outlets to the Mississippi River.

J. NPDES Storm Water Permit

A full copy of the City's Storm Water Permit Annual Report can be obtained upon request. This document is incorporated into this Local Surface Water Management Plan by reference. The goals and policies of Storm Water Permit are outlined below.

Goals:

The City will continue to meet the goals of its current NPDES permit to fulfill the obligations of the permit to reduce the amount of sediment and pollution that enters surface and ground water from storm sewer systems to the maximum extent possible.

Policies:

1. The City has developed a Storm Water Permit Annual Report, in conformance with the Minnesota Pollution Control Agency's NPDES Storm Water Discharge Permit MN0061263 issued to the City of Saint Paul on December 1, 2000. A copy of the report is available at the St. Paul Public Works Department.

2. The City will continue to implement a water quality monitoring program per the NPDES permit.

3. The City will sweep all the City streets and alleys as outlined in the Storm Water Permit Annual Report. Street sweeping frequency ranges from three times per week to twice per year as indicated in **Appendix R**. A copy of the report is available at the St. Paul Public Works Department.

4. The City will continue to implement the City's Public Education Program. More information regarding the storm drain stenciling education program can be found in the Storm Water Permit Annual Report available at the St. Paul Public Works Department or contacting the Friends of the Mississippi River (FMR) citizens' organization.

5. The City will continue to implement an Asset Management system to have the data and system necessary to accurately determine the drainage area, land use, population, percent impervious surface, and the runoff coefficient for each of the City's storm sewer outfalls. This system is being jointly implemented with the St. Paul Regional Water Services.

6. The City will maintain a list of facilities that are issued NPDES permits by the MPCA and provide this list in the Storm Water Permit Annual Report.

7. The City will operate, maintain, and construct its storm sewer system in a manner to minimize the impacts on water quality of the receiving waters. The performance measures for this policy are outlined in the Storm Water Permit Annual Report.

8. The City will continue to monitor 20% of its storm sewer outfalls on an annual basis and provide erosion protection as necessary based on the outlet inspection results. Results of previous inspections are available in the Storm Water Permit Annual Report.

9. The City will continue to inspect its storm water ponds on an annual basis and perform maintenance as needed.

10. The City will continue to train employees on snow and ice control on streets in order to maintain safe streets in an economical way while protecting the environment.

11. The City will conduct an annual field screening of illicit discharges and improper disposal of materials into the storm sewer system.

12. The City will continue to implement its storm drain stenciling program with assistance from other organizations, such as the Friends of Mississippi River.

13. The City will continue its involvement with Metro Watershed Partners.

14. The City will continue to support Waterfest with the Ramsey-Washington Metro Watershed District.

15. The City will continue to support the Como Lake Water Festival.

16. The City will continue to support the Annual Spring Parks Clean Up.

V. ASSESSMENT OF PROBLEMS AND CORRECTIVE ACTIONS

Outlined below is an assessment of existing and potential water resource related problems that are known at this time. These problems have been identified based on an analysis of the land and water resource data collected as part of this local plan preparation and through information collected at the public input meetings.

A. Lake and stream water quality

1. Development in the Como Lake watershed, which includes the City of Roseville and the City of Falcon Heights, has impacted the water quality in Como Lake.

   Corrective Action

   a. Work with the CRWD to review water quality impacts on storm water that transcends municipal boundaries.

   b. As street reconstruction in the Como Subwatershed occurs, install grit chambers or sump manholes as appropriate.

   c. Conduct aquatic vegetation management and remove filamentous algae on Como Lake.

   d. Install “Do not feed the waterfowl” signs on Como Lake.

   e. Remove trash in and around Como Lake.

   f. Identify locations for roadside infiltration swales along Como Lake.

   g. Continue to review and evaluate the results and implementation plan outlined in the Como Lake Strategic Management Plan.

2. Development in the Lake Phalen, Beaver Lake, and Pigs Eye Lake watersheds, which includes the City of Maplewood, has impacted the water quality in the lakes.

   Corrective Action

   a. Work with the RWMWD to review water quality impacts on storm water that transcends municipal boundaries.

   b. Review these water bodies as part of the Wetland Management Plan and further identify actions to be taken by the City to prevent further degradation of these water bodies.

   c. Work with the RWMWD to review and implement the Phalen Lake and Beaver Lake Strategic Management Plans.

   d. Implement policies outlined in the City’s Surface Water Management Plan.

3. The water quality of the Mississippi River has been noted as a concern.

   Corrective Action
   a. Work with the CRWD, RWMWD, LMRWMO, MWMO, and others to reduce the pollutants entering the Mississippi River.

   b. Participate in the Watershed Outlet Monitoring Program (WOMP) to monitor outlets to the Mississippi River.

   c. Implement the policies outlined in the City's Surface Water Management Plan.

4. The City anticipates that there will be changes to rules and regulations associated with discharges to the Mississippi River, Como Lake, Beaver Lake, Battle Creek, and Unnamed water body 62-0237-00 as part of a Total Maximum Daily Load study.

   Corrective Action
   a. The City will work with Federal and State agencies to address potential rule changes.

B. Flooding and storm water rate control concerns within the City

1. Following a storm event in 1997 flood problem areas were identified within the City of St. Paul.

   Corrective Action
   a. These issues have been addressed and/or corrected or are listed in the plan if not yet corrected.

2. Flooding associated with Como Lake and surrounding park.

   Corrective Action
   a. Capitol Region Watershed District with the City of St. Paul, City of Falcon Heights, City of Roseville, and Ramsey County completed the Como 7 Subwatershed Analysis report, now referred to as the Arlington Pascal Storm Water Improvement Project.

   b. Continue to work with the CRWD to implement the Como 7 analysis.

C. Flooding or storm water rate control concerns between the City and adjoining entities

1. Flooding with at St. Paul's Robie Street between Anita Street and US Highway 52 has occurred during rainfall events. High water may overtop curbs, pool in the Robie/Bancroft intersection, and inundate adjacent homes. This area is fully developed.

Corrective Action

a. While storm water is directed to this area from West St. Paul, the City has completed work in the area within the City limits to address the problem. The City is not requesting assistance from the City of West St. Paul or the LMRWMO at this time.

2. The Arlington Pascal (Como 7) flood problem area has been noted as a problem. This area is within a Como Lake sub-watershed roughly bounded by Snelling Avenue on the west, Midway Parkway on the south, Roselawn to the north, and Como Park on the east.

Corrective Action

a. This problem area was addressed with a collaborative effort between the cities of St. Paul, Roseville, and Falcon Heights along with the Ramsey County and the Capitol Region Watershed District (See **Appendix K**).

b. Frequency and duration of flooding was reduced in this sub-watershed and Midway Parkway through an improved drainage system, ponding areas, rainwater gardens, and infiltration trenches.

D. Impacts of storm water quality on fish and wildlife resources

1. Water quality impacts to the Mississippi River have impacted fish and wildlife resources.

Corrective Action

a. Work with the watershed districts and water management organizations and other Federal, State, and local agencies to improve the water quality in the Mississippi River.

b. Participate in the Watershed Outlet Monitoring Program (WOMP) to monitor outlets to the Mississippi River.

c. Work with various stakeholders to implement the ecological inventory and restoration management plan for Crosby Farm Regional Park (plan completed in 2005).

d. Implement the policies outlined in the City's Surface Water Management Plan.

2. The Trout Brook System conveys storm water from Como Lake and other areas outside of the City of St. Paul. The Capitol Region Watershed District (CRWD) and the City each own a portion of the system. The CRWD has taken ownership of the system and is responsible for conducting maintenance, creating a management plan for the system, and exploring the possibility of daylighting the system.

No Corrective Action Needed

E. Impacts of soil erosion on water quality and water quantity

1. During significant rainfall events, soil erosion has carried sediment to water bodies within the City. Sediment deposits reduce the depth of water and degrade the quality of water within a basin.

2. Erosion control along the Mississippi River has been noted as a concern.

Corrective Action

a. Implement the goals, policies, capital improvements program, and studies outlined within this Local Surface Water Management Plan.

b. Continue monitoring required for the Storm Water Permit Annual Report submitted to the Minnesota Pollution Control Agency.

c. The City's building inspectors will continue to conduct erosion control inspections. The inspectors also will continue to receive training to conduct these inspections.

d. The City will coordinate park maintenance, erosion control, and restoration projects along the bluffs with the DNR, National Park Service, and other groups identified by the City.

F. General impact of land use practices and in particular land development and land alteration on water quality and water quantity

1. The City of St. Paul is a fully developed urban city. The City is directly tributary to the Mississippi River and discharges storm water directly to the River. In many cases this water is not controlled or treated prior to discharge.

Corrective Action

a. The City will implement storm water rate control and treatment of runoff directed to the Mississippi River as required in the Watershed District requirements and the City Storm Water Ordinance as part of redevelopment.

b. The City will complete a regional infiltration study to identify suitable locations to construct regional infiltration basins.

G. The adequacy of existing regulatory controls to manage or mitigate adverse impacts on public waters and wetlands

1. The City will need to update some of ordinances to be in conformance with the City's Surface Water Management Plan.

2. The City is required to be in conformance with the NPDES Phase I Program.

Corrective Action

a. The City will continue monitoring required for the Storm Water Permit Annual Report submitted to the Minnesota Pollution Control Agency.

b. Update the floodplain and river corridor zoning codes to be in conformance with the City's Surface Water Management Plan.

c. Update the City's storm water ordinance to be in conformance with the City's Surface Water Management Plan.

d. Develop a shoreland zoning ordinance when required to do so by the DNR.

H. The adequacy of programs to protect ground water quality

1. The City will work with the watershed districts and water management organizations and other Federal, State, and local agencies to promote groundwater protection within the City.

Corrective Action

a. The City will adopt the Ramsey County Groundwater Quality Protection Plan as part of the City's Surface Water Management Plan to protect groundwater sources and recharge areas identified within the City

I. The adequacy of programs to maintain the tangible and intrinsic values of natural storage and retention systems

1. It is the position of the City that the goals and policies outlined in the Local Surface Water Management Plan, the contents of the St. Paul Storm Water Annual Report, City ordinances, policies of local watershed districts and watershed management organizations, and the policies of other agencies are adequate to maintain the tangible and intrinsic values of natural storage and retention systems within the City.

Corrective Action

No corrective action needed.

J. The adequacy of programs to maintain water level control structures

1. It is the position of the City that the goals and policies outlined in the Local Surface Water Management Plan, the contents of the St. Paul Storm Water Annual Report, City ordinances, policies of local watershed districts and watershed management organizations, and the policies of other agencies are adequate to maintain the water level control structures within the City.

Corrective Action

No corrective action needed.

K. The adequacy of capital improvement projects to correct problems relating to water quantity, water quality management, fish and wildlife habitat, public waters and wetland management, and recreational opportunities

1. The capital improvement projects outlined within the City's Surface Water Management Plan and the general operating procedures of the City are sufficient to address water resource related concerns. However, the Storm Water Utility Fund, by itself, may not be an adequate funding source to allow for the aggressive implementation of the capital improvement projects.

   Corrective Action

   a. The City will review the needs for storm water capital Improvements on a regular basis and adjust its fees accordingly.

   b. The City will actively seek outside grant funding and assistance to help in the implementation of these projects.

L. Identification of potential problems which are anticipated to occur within the next twenty years based on growth projections and planned urbanization

1. The City anticipates that there will be increased demand to improve the quality of water within the City and the appearance of storm water retention areas. Additional funding sources will need to be sought to address this demand.

   Corrective Action

   a. The implementation of this Local Surface Water Management Plan will address water quantity, quality, and maintenance issues associated with storm water retention areas. Maintenance of these storm water retention areas will be undertaken as outlined in the City of St. Paul Storm Water Permit Annual Report for the Minnesota Pollution Control Agency**.**

   b. The City will actively seek outside grant funding and assistance when available and practical, to improve the quality and appearance of storm water retention areas.

M. The adequacy of existing technical and background information on systems in the City that are used to manage water resources

1. The City acknowledges that additional technical and background information is required to efficiently and effectively manage water resources.

   Corrective Action

   a. Continue to implement a long-range water quantity and quality-monitoring plan for the City.

   b. Continue to keep up to date with technological advances and pursue innovative technologies to manage water resources.

c. Improve the transfer of surface water resource information to the public through the education program and working with local citizens' organizations.

d. Continue development of the GIS storm sewer asset management system.

SECTION VI

VI. IMPLEMENTATION PRIORITIES/IMPLEMENTATION PROGRAM

Based on the information developed in **Sections III through V**, the City has developed a Local Surface Water Management Plan that reflects the needs and concerns of the City Council, City Staff, citizens, and the funding capabilities of the City. A prioritized listing of the studies, programs and capital improvements that have been identified as necessary to respond to the water resource needs within the City is outlined on the following tables. This is a planning document. The City anticipates implementing the regulatory programs, studies, or improvements identified within this plan within the next 10 years.

Table VI-1 contains Storm Water Capital Improvement Projects (CIP), **Table VI-2** contains Storm Water Management Programs (SMP), and **Table VI-3** contains Storm Water Management Studies (SMS). **Table VI-4** summarizes the information from all of these tables. The costs associated with these items reflect year 2006 costs and do not take into account inflation. These tables are for planning and budgeting purposes and are considered rough estimates. It is anticipated that these projects, their priorities, and cost estimates will be reviewed annually and updated as needed.

TABLE VI-1												
CAPITAL IMPROVEMENT PROJECTS												
Capital Improvement Projects												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Potential Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
PROJECT TO BE COMPLETED												
CIP-1	V.F	High	Construct regional infiltration basins (dependent on outcome of study)		Storm Water Utility Fund	Timing and cost dependent on outcome of study						
CIP-2	V.A	High	Annual replacement of storm sewer with road projects (includes remaining Como subwatershed)	$750,000	Storm Water Utility Fund	$75,000	$75,000	$75,000	$75,000	$75,000	$375,000	To be scheduled with street reconstruction projects
CIP-3	V.B, V.C	High	Arlington Pascal Reconstruction Project (Como 7 watershed)	$1,200,000	City	$1,200,000						Includes infiltration; inline treatment systems; rain gardens
CIP-4	V.E	Medium	Coordinate park maintenance, bluff erosion, natural areas restoration, and lake management along the Mississippi River	$70,000	CRWD, Friends of the Parks and Trails, MnDNR, Great River Greening, National Park Service, St. Paul			$10,000		$20,000	$40,000	CRWD E.7
			Total:	$2,020,000		$1,275,000	$75,000	$85,000	$75,000	$95,000	$415,000	

CAPITAL IMPROVEMENT PROJECTS												
Capital Improvement Projects												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Potential Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
COMPLETED PROJECTS												
	V.A	High	In-line treatment systems have been installed in East Como Boulevard (Como subwatershed)		Storm Water Utility Fund	**COMPLETED**						

These tables are provided for planning purposes only.

TABLE VI-2												
STORM WATER MANAGEMENT OPERATION AND MAINTENANCE PROGRAMS												
Storm Water Management Programs												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
SMP-1	IV.J.3	High	Continue street sweeping program per MPCA Storm Water Permit and City standards	$25,000,000	ROW Maintenance Fund	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$12,500,000	Como Plan #1
SMP-2	IV.J.11 VI.J.9 IV.J.7	High	Conduct Sewer Maintenance. (NOTE: This includes both sanitary and storm sewer).	$68,400,000	Sewer Utility	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$39,900,000	The City's budget does not itemize this cost between sanitary and storm sewer. This number reflects the total cost for both systems.
SMP-3	IV.J. 13-15 IV.C.4 V.A	High	Be an active participant in the activities of the local watershed districts and water management organizations	$400,000	Storm Water Utility	$40,000	$40,000	$40,000	$40,000	$40,000	$200,000	
SMP-4	IV.H.1	High	Provide review for all new development or redevelopment of sites within the City to assure the goals, policies, and objectives outlined in this plan are implemented. Includes cost for City staff as well as any consultant review time.	$800,000	Storm Water Utility	$80,000	$80,000	$80,000	$80,000	$80,000	$400,000	
SMP-5	IV.G.1	High	Perform Local Government Unit (LGU) Role for Wetland Conservation Act	$100,000	General Fund	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000	
SMP-6	IV.D.4	High	Sponsor City-wide Parks clean up day	$150,000	General Fund	$15,000	$15,000	$15,000	$15,000	$15,000	$75,000	

TABLE VI-2												
STORM WATER MANAGEMENT OPERATION AND MAINTENANCE PROGRAMS												
Storm Water Management Programs												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
SMP-7	IV.B.2	High	Coordinate with Ramsey County to continue to implement the household hazardous waste disposal program	$10,000	General Fund	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	
SMP-8	IV.H.1	High	Inspect and enforce erosion control measures required for site development activities within the City in accordance with the NPDES Erosion Control Program.	$200,000	Permit Fees	$20,000	$20,000	$20,000	$20,000	$20,000	$100,000	
SMP-9	IV.I IV.J.2 V.M IV.I.2 V.A V.D	High	Continue NPDES water quantity and quality monitoring program per the permit	$750,000	Storm Water Utility	$75,000	$75,000	$75,000	$75,000	$75,000	$375,000	Includes WOMP; Monitoring required by St. Paul NPDES Storm Water Permit; CRWD E.2
SMP-10	IV.J.4 IV.G.8 IV.D IV.C.6	High	Implement a public education program	$404,400	Storm Water Utility	$40,000	$44,400	$40,000	$40,000	$40,000	$200,000	Includes $4,400 for brochure to be included with storm sewer service charge mailing in 2007
SMP-11	IV.J.15	High	Participate in annual Como Lake event	$50,000	St. Paul Parks	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	Como Plan #12
SMP-12	V.A	High	Install "Do not feed waterfowl" signs on Como Lake	$1,000	St. Paul Parks		$1,000					Como Plan #10
SMP-13	V.A	High	Remove trash in and around Como Lake at regular intervals	$50,000	St. Paul Parks	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	Como Plan #9

TABLE VI-2												
STORM WATER MANAGEMENT OPERATION AND MAINTENANCE PROGRAMS												
Storm Water Management Programs												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
SMP-14	IV.J.4, 12	High	Implement storm drain stenciling program	See SMP-10	City, Friends of the Mississippi River							See SMP-10
SMP-15	IV.J.10	High	Conduct annual erosion control and BMP training for staff	$50,000	City	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	
SMP-16	IV.J.9	High	Annually inspect storm water ponds and remove sediment as needed	$20,000	City	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000	CRWD A.18
SMP-17	IV.J.8	High	Monitor 20% of storm sewer outfalls annually	$50,000	City	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	CRWD A.18
SMP-18	J.B	High	Continue to support Waterfest with RWMWD	$50,000	City, RWMWD	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	
SMP-19	IV.J.5 V.M	High	Continue development of the GIS storm sewer asset management system	$30,000	City	$3,000	$3,000	$3,000	$3,000	$3,000	$15,000	
SMP-20	IV.F.4 IV.C.4 IV.B.15 IV.A.6	Medium	Review and discuss with watershed districts and watershed management organizations redevelopment plans and identify partnering opportunities	TBD	City, Watershed Districts, Watershed Management Organization	TBD	TBD	TBD	TBD	TBD	TBD	To be completed on a project by project basis

TABLE VI-2												
STORM WATER MANAGEMENT OPERATION AND MAINTENANCE PROGRAMS												
Storm Water Management Programs												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011 - 2015	Comments
SMP-21	IV.C.8	Medium	Manage and control noxious and invasive plant species and work to increase awareness of problems	$50,000	CRWD, Friends of the Parks and Trails, MnDNR, Great River Greening, National Park Service	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	
SMP-22	V.A	Medium	Conduct aquatic vegetation and filamentous algae management on Como Lake	$100,000	St. Paul Parks	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000	Como Plan #11; CRWD A9
			Total:	$96,665,400		$8,526,000	$8,531,400	$8,526,000	$8,526,000	$8,526,000	$54,030,000	

These tables are provided for planning purposes only.

TABLE VI-3												
STORM WATER MANAGEMENT STUDIES												
Storm Water Management Studies												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011-2015	Comments
STUDIES TO BE COMPLETED												
SMS-1	V.G	High	Update Floodplain Management Regulations, River Corridor Overlay Zoning Code, and Storm Water Management Ordinance	$15,000	City	$7,000	$8,000					
SMS-2	IV.C.5 V.A	High	Complete wetland inventory, habitat assessment, and management plan for wetlands and water bodies on public property.	$30,000	City; Watershed Management Organizations		$30,000					An implementation plan and management strategies will be developed once the assessment is completed; data from the WD/WMO is anticipated to assist in this effort
SMS-3	V.F	High	Complete regional infiltration study	$25,000	City	$25,000						Implementation items will be developed based on study
SMS-4	IV.J.11	Medium	Identify improper discharges to the storm sewer system	$10,000	CRWD, MPCA	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	
SMS-5	IV.B.1	Medium	Identify and target certain high-priority areas for watershed district and watershed management organizations redevelopment partnerships	$20,000	City, RWMWD				$20,000			
SMS-6	V.A	Medium	Identify locations for roadside infiltration swales along Como Lake	$10,000	City, Grants, CRWD			$10,000				CRWD A.24 Implementation activities will be developed following study

TABLE VI-3

STORM WATER MANAGEMENT STUDIES

Storm Water Management Studies												
No.	Plan Reference Location	Priority	Project Description	Cost Estimate[a]	Funding Sources	2006	2007	2008	2009	2010	2011-2015	Comments
SMS-7	V.A	Low	Evaluate/revise as needed the Phalen Lake Strategic Management Plan	$5,000	City, RWMWD, Maplewood					$5,000		
SMS-8	V.A	Low	Evaluate/revise as needed the Beaver Lake Strategic Management Plan	$5,000	City, RWMWD, Maplewood					$5,000		
SMS-9	V.A	Low	Evaluate/revise as needed the Como Lake Strategic Management Plan	$5,000	City, CRWD					$5,000		
SMS-10	IV.B.19 V.G	Low	Develop shoreland management ordinance when required by the DNR	$8,000	City						$8,000	
			Total:	$133,000		$33,000	$39,000	$11,000	$21,000	$16,000	$13,000	
STUDIES COMPLETED												
	V.D	Medium	Develop a Lake and Natural Resource Management Plan for Crosby Lake Regional Park			**Completed**						CRWD B.1

These tables are provided for planning purposes only.

TABLE VI-4								
SUMMARY								
		Proposed Expenses for Year						
Tables	Cost Estimate[a]	2006	2007	2008	2009	2010	2011-2015	Comments
Table VI-1: Capital Improvement Projects	$2,020,000	$1,275,000	$75,000	$85,000	$75,000	$95,000	$415,000	
Table VI-2: Surface Water Management Operation and Maintenance Programs	$96,665,400	$8,526,000	$8,531,400	$8,526,000	$8,526,000	$8,526,000	$54,030,000	
Table VI-3: Surface Water Management Studies	$133,000	$33,000	$39,000	$11,000	$21,000	$16,000	$13,000	
Grand Total:	**$98,818,400**	**$9,834,000**	**$8,645,400**	**$8,622,000**	**$8,622,000**	**$8,637,000**	**$54,458,000**	

These tables are provided for planning purposes only.

SECTION VII

VII. FINANCIAL CONSIDERATIONS

Implementation of the proposed regulatory controls, programs and improvements that are identified in this plan will have a financial impact on the City. To establish how significant this impact will be, a review of the means and ability of the City to fund these controls, programs and improvements is necessary. Outlined below is a listing of various sources of revenue that the City will endeavor to implement the water resource management efforts outlined in this plan.

For 2006-2015, the capital improvement projects are estimated to cost approximately **$2,020,000**. The storm water management operation and maintenance programs costs are estimated at about **$95,565,400**. The storm water studies are estimated to cost about **$133,000**. Over this 10- year period, these projects, programs, and studies are estimated to cost about **$98,869,000**.

DESCRIPTION OF FUNDING SOURCE	REVENUE GENERATED
1. Revenue generated by City's Storm Water Utility	$9,000,000/yr.
2. Revenue generated by City's ROW Maintenance Fund	$17,250,000
3. Special assessments for local improvements made under the authority granted by Minnesota Statutes Chapter 429 and 444.	Variable depending on activities undertaken
4. Revenue generated by Watershed Management Special Tax Districts provided for under Minnesota Statutes Chapter 473.882	Variable depending on activities undertaken
5. For projects being completed by or in cooperation with Capitol Region Watershed District (CRWD), Ramsey-Washington Metro Watershed District (RWMWD), Lower Mississippi River Watershed Management Organization (LMRWMO), and/or the Mississippi River Watershed Management Organization (MRWMO) project funds could be obtained from watershed districts or watershed management organizations	Variable depending on activities undertaken
6. Grant monies that may be secured from various local, regional, County, State, or Federal agencies. This would include MnDOT, MPCA, Metropolitan Council, the MnDNR and others	Variable depending on activities undertaken
7. Other Sources: These may be other sources of funding for storm water activities such as tax increment financing, state aid, etc. The City will continue to explore additional revenue sources as they become available.	Variable depending on activities undertaken
8. Tax abatement	Variable

SECTION VIII

VIII. AMENDMENT PROCEDURES

This Local Surface Water Management Plan has been reviewed and approved by the Capitol Region Watershed District (CRWD), Ramsey-Washington Metro Watershed District (RWMWD), Lower Mississippi River Watershed Management Organization (LMRWMO), and the Mississippi Watershed Management Organization (MWMO). Once approved, no significant changes to this plan can be facilitated without the approval of the proposed revisions by the watershed districts and watershed management organizations. Significant changes to the local plan shall be made known to the following parties:

1. Director of Public Works
2. City Council
3. Capitol Region Watershed District
4. Ramsey-Washington Metro Watershed District
5. Lower Mississippi River Watershed Management Organization
6. Mississippi Watershed Management Organization
7. Metropolitan Council
8. Ramsey Conservation District
9. Ramsey County Public Works
10. Public within the City through a public hearing process

Following notification of the above parties, they shall have 60 days to comment on the proposed revisions. Failure to respond within 60 days constitutes approval. Upon receipt of approvals from the Watershed Management Organization, any proposed amendments will be considered approved.

Minor changes to the Plan shall be defined as changes that do not modify the goals, policies, or commitments expressly defined in this plan by the City. Adjustment to subwatershed boundaries will be considered minor changes provided that the change will have no significant impact on the rate or quality in which storm water runoff is discharged from the City boundaries. Minor changes to this plan can be made by the staff at the City without outside review. This Plan is effective until 2015. It is the intention of the City that this Plan be updated when the Plan expires or when significant changes to the plan are deemed necessary or an update is required by a Watershed District Plan update or a Watershed Management Organization Plan update.