SOURCE WATER PROTECTION PLAN FOR SAINT PAUL REGIONAL WATER SERVICES SAINT PAUL, MINNESOTA

PART II

POTENTIAL CONTAMINANT SOURCE INVENTORY AND MANAGEMENT STRATEGY

MARCH 2008

TABLE OF CONTENTS

PAGE NUMBER

TABLE OF CONTENTS (CONT.)

APPENDICES:

Formatted: Bullets and Numbering

PUBLIC WATER SUPPLY PROFILE

PUBLIC WATER SUPPLY

NAME	Saint Paul Regional Water Services
ADDRESS	1900 Rice Street
	Saint Paul, Minnesota 55113
TELEPHONE	651-266-6324
E-MAIL	John.F.Blackstone@ci.stpaul.mn.us
FAX NUMBER	651-266-1658

SOURCE WATER PROTECTION MANAGER

NAME	John F. Blackstone, P.E.
ADDRESS	1900 Rice Street
	Saint Paul, Minnesota 55113
TELEPHONE	651-266-6324
E-MAIL	John.F.Blackstone@ci.stpaul.mn.us
FAX NUMBER	651-266-1658

CONSULTANTS

NAME	David L. Brostrom	Bayerl Water Resources
ADDRESS	2159 Berkeley Avenue	9083 State Hwy 114 SW
	Saint Paul, MN 55105	Alexandria, MN 56308
TELEPHONE	651-690-0690	320-283-6127
E-MAIL	brost004@umn.edu	bayerl@runestone.net

TECHNICAL ADVISORS

NAME	Mike Howe, MDH	Art Persons, MDH	Chris Elvrum, Metropolitan Council
ADDRESS	3333 W Division St, Suite 212	18 Woodlake Drive SE	390 N Robert St
	St. Cloud, MN 56303	Rochester, MN 55904	Saint Paul, MN 55101
TELEPHONE	320-650-1076	507-292-5138	651-602-1066
E-MAIL	mike.howe@health.state.mn.us	art.persons@health.state.mn.us	christopher.elvrum@metc.state.mn.us
FAX NUMBER	320-223-7342	507-285-7745	651-602-1130

NAME	Dave Neiman, MRWA	Charles Regan, MPCA	Douglas Hansen, MPCA
ADDRESS	217 12th Avenue Southeast	520 Lafayette Rd N	520 Lafayette Rd N
	Elbow Lake, MN 56531	Saint Paul, MN 55155	Saint Paul, MN 55155
TELEPHONE	218-820-0595	651-296-7363	651-296-9192
E-MAIL	dave.neiman@mrwa.com	charles.regan@pca.state.mn.us	douglas.hansen@pca.state.mn.us
FAX NUMBER	218-825-7411	612-297-7178	651-297-7708

GENERAL INFORMATION

NAME OF SOURCE WATER: Mississippi River

POPULATION SERVED AND CAPACITY: 417, 000 and 47-MGD

DOCUMENTATION LIST

STEP	DATE
Scoping Meeting 2 Held (SWP Surface Intake Guidance (SIG) Chapter 6)	July 14, 2005
Scoping 2 meeting results letter received (SWP SIG Chapter 6)	August 11, 2005
Part 2 SWP Plan Submitted to Local Units of Government (LGUs) (SWP SIG Chapter 7)	October 29, 2007
Response to Comments From Local Units of Government (SWP SIG Chapter 7)	January 31, 2008
Public Hearing Conducted (SWP SIG Chapter 7)	January 16, 2008
Part 2 SWP Plan Submitted (SWP SIG Chapter 7)	March 17, 2008
Final Part 2 SWP Plan Review Received (SWP SIG Chapter 7)	
Final State Approved Part 2 SWP Plan Submitted to LGUs (SWP SIG Chapter 7)	

ABBREVIATIONS

ACOE	Army Corps of Engineers
BMP	Best Management Practices
BN	Burlington Northern Railway
BWC	Board of Water Commissioners of the City of Saint Paul
BWSR	Board of Water and Soil Resources
CERCLIS	Comprehensive Environmental Response, Compensation & Liability System
CP	Canadian Pacific Railway
CROW	Crow River Organization of Water
CRP	Conservation Reserve Program
DNR	MN Department of Natural Resources
DWSMA	Drinking Water Supply Management Area
EQIP	Environmental Quality Incentive Program
ISTS	Individual Sewage Treatment Systems
IBI	Index of Biological Integrity
LGU	Local Units of Government
LUST	Leaking Underground Storage Tanks
LWMP	Local Water Management Plan
MDA	MN Department of Agriculture
MDH	MN Department of Health
MDPS	MN Department of Public Safety
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MGS	MN Geologic Survey
MN	Minnesota
MNDOT	MN Department of Transportation
MPCA	MN Pollution Control Agency
MRWA	MN Rural Water Association
MSP	Minneapolis / Saint Paul
MWW	Minneapolis Water Works
NFRAP	No Further Remedial Action Planned
NPDES	Point Discharge
NRCS	Natural Resources Conservation Services
OHW	Ordinary High Water Mark
OPS	Office of Pipeline Safety
PCB	Polychlorinated Biphenyl
PCSI	Potential Contaminant Source Inventory
RDN	Mississippi River Defense Network
SWCD	Soil & Water Conservation District
SPRWS	Saint Paul Regional Water Services
SRWD	Sauk River Watershed District
SWP	Source Water Protection
SWPA	Source Water Protection Area
SWPP	Source Water Protection Plan
SWUDS	State Water Use Data System
TMDL	Total Maximum Daily Load
UMRSWPP	Upper Mississippi River SWP Project
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
VLAWO	Vadnais Lake Area Watershed Management Organization
WD	Watershed District
WCA	Wetland Conservation Act
WHP	Wellhead Protection
WMO	Water Management Organization

EXECUTIVE SUMMARY

The Minnesota Department of Health (MDH) was required to complete source water assessments for public water systems. This Source Water Protection Plan (SWPP) is not mandatory by the 1996 Amendments to the Safe Drinking Water Act or Minnesota State Law. Saint Paul Regional Water Services (SPRWS) has proactively developed this Plan to protect the drinking water supply for the City of Saint Paul and the thirteen communities served by the water utility.

Part One of this Plan included the delineation of the Source Water Protection Area (SWPA), and the Drinking Water Supply Management Area (DWSMA). The Surface Water Intake Susceptibility and Surface Water Source Susceptibility are complete; the area boundaries as shown in **Figure One** were utilized to complete this document. The Scoping Document prepared by MDH (**Appendix I**), lists the required data elements that are addressed in Part Two of this Plan. Available data was utilized and where data was inadequate, strategies to verify or supplement existing information are addressed.

This Plan, Part Two, addresses data elements and their assessments; impacts of changes on the public water supply; issues, problems and opportunities; sourcewater protection goals, objectives and action plans; program evaluation; and alternative water supply/contingency strategy.

The susceptibility of any surface water source is high because preventing potential contaminant releases is not possible. The Federal Safe Drinking Water Act recognizes the susceptibility of surface waters and requires filtration to remove pathogens and particulate contaminants. SPRWS effectively treats the source water to meet safe drinking water standards.

The overall intent of this SWPP is to establish a basis for:

- Focusing limited resources within the community to protect the drinking water source.
- Informed decision-making regarding land use within the community.
- Informed source water planning efforts for the “Source Water Protection Area”.

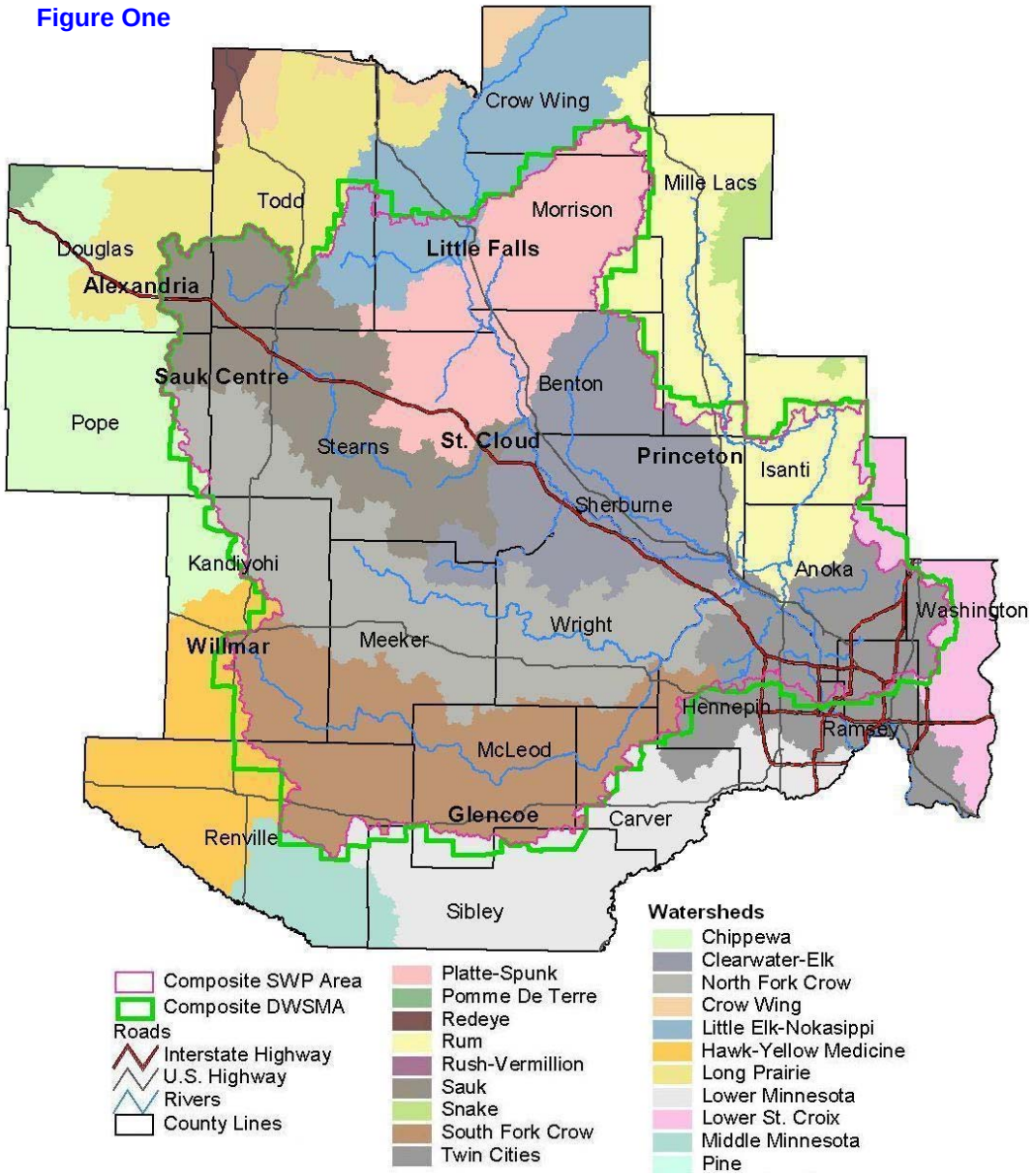
The Source Water Protection (SWP) Team intends to proactively establish, through an EPA 319 Clean Water Partnership Grant from the Minnesota Pollution Control Agency (MPCA), a protective Best Management Practices (BMP), education, monitoring and regulation within the SWPA. This Plan is intended to provide prioritization of needs to better utilize the limited dollars available to protect and improve the drinking water resource.

The Upper Mississippi River Source Water Protection Project (UMRSWPP), consisting of the Cities of St. Cloud and Minneapolis, SPRWS, MDH, Minnesota Rural Water Association (MRWA), the Metropolitan Council and the MPCA has played a major role and has expended considerable resources to protect and facilitate the effective use of the region’s water supplies.

The Project has assisted SPRWS in completing Part II of the Source Water Protection Plan.

Composite Source Water Protection Area and Drinking Water Source Management Area Saint Cloud, Saint Paul Regional Water Services and Minneapolis

Figure One



CHAPTER ONE

DATA ELEMENTS AND ASSESSMENT

I. DATA ELEMENTS

Data elements are important to understanding how environmental factors influence quality and the protection of source water. Data elements must be evaluated relative to one another and with respect to contaminant source locations and land use factors.

Data elements are considered within a "time of travel" context. Time of travel and the presence of potential contaminant sources are the central delineation components for **Priority Area A**. An eight-hour time of travel was used to delineate the boundaries of **Priority Area A**. If a contaminant is released, eight hours is used to provide sufficient lead-time to maximize finished water storage and close water intakes. Since a contaminant spill within the **Priority Area A** will likely reach the intake in less than eight hours, an early notification system must be established.

Priority Area B has the capacity to cause contamination to the source water by both point and non-point sources. Preventative management will be used to address potential contaminant sources. **Figure One** identifies both priority areas.

A. PHYSICAL ENVIRONMENT DATA ELEMENTS

1. Precipitation

A heavy rain event or snowmelt may affect the time of travel of a contaminant. The larger the magnitude of a flood event (aerial coverage and intensity), the more magnified the potential hydrologic impact and catastrophic impacts to infrastructure.

Figure Two shows the normal statewide annual precipitation according to the Minnesota Department of Natural Resources (MnDNR) Climatology office. Rainfall data from all counties within the SWPA are located at http://climate.umn.edu. Average annual precipitation varies within the SWPA with gradual increases from northwest to southeast.

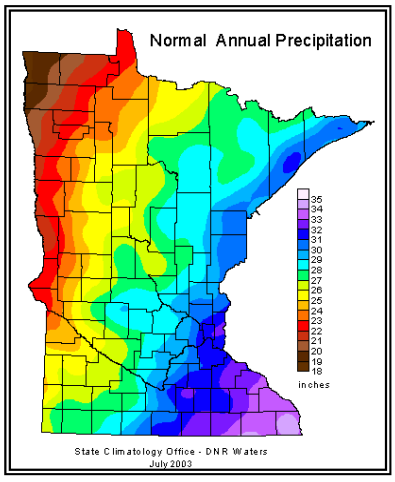


Figure Two

Large amounts of precipitation over a short period of time can lead to flood events. As water accumulates in the higher elevations of the SWPA, it increases in velocity and volume. What reaches the River system is dependent on vegetative cover. Studies from agricultural settings suggest that a 15-foot wide grass buffer can achieve a 50% removal rate of nitrogen, phosphorous and sediment, and that a 100-foot buffer can reach close to 70% removal of these constituents (Desbonette et al., 1994).

Precipitation averages described in **Figure Three** can be linked to stream flow. Stream flow data for the Mississippi Rivers is derived from historic low, median and high flow data. Stream flow velocity at the time of a contaminant release can be compared to these historically derived data to calculate time of travel of a contaminant.

Figure 3
Saint Paul (Vadnais Station) Monthly Precipitation Totals 2002 - 2006 (inches)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
2002	0.21	0.56	1.85	3.35	3.04	9.81	7.62	3.36	4.34	4.21	0.09	0.25	**38.69**
2003	0.24	0.79	1.35	2.38	6.57	2.36	2.06	0.66	2.28	1.10	0.76	0.90	**21.45**
2004	0.32	1.03	1.44	3.09	7.45	3.30	3.14	1.47	3.58	4.41	1.24	0.47	**30.94**
2005	0.87	0.83	1.27	2.66	3.74	5.93	3.23	3.87	5.26	5.14	1.22	0.62	**34.64**
2006	0.64	0.42	1.83	4.06	3.13	4.34	2.46	8.60	3.14	0.51	0.91	1.43	**31.47**

2. Geology

The corridor along the Mississippi River between the SPRWS Mississippi River intake and Little Falls, which includes the areas of concern for SWP, lacks comprehensive geologic studies. This corridor is characterized by unconfined drift aquifers which are often shallow aquifers in sandy soils. Ground water in such a geologic environment has the potential to be directly connected to surface water, such as the Mississippi River and its tributaries. It is important to note that aquifer boundaries do not match the boundaries of overlying surface watersheds.

Information from well logs is available for the entire area, but the scope and volume of the available data make it difficult to manage. Sensitivity to contamination derived from soils and depth to bedrock is available statewide at http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm.

3. Soils

Important soil characteristics include adsorption/absorption capacity, infiltration and permeability rates and distribution patterns. Soils vary over a region due to variability in parent material, topography, vegetation, climate and time. County soil surveys reflect these differences. There are “detailed” soil surveys for all counties in the SWPA.

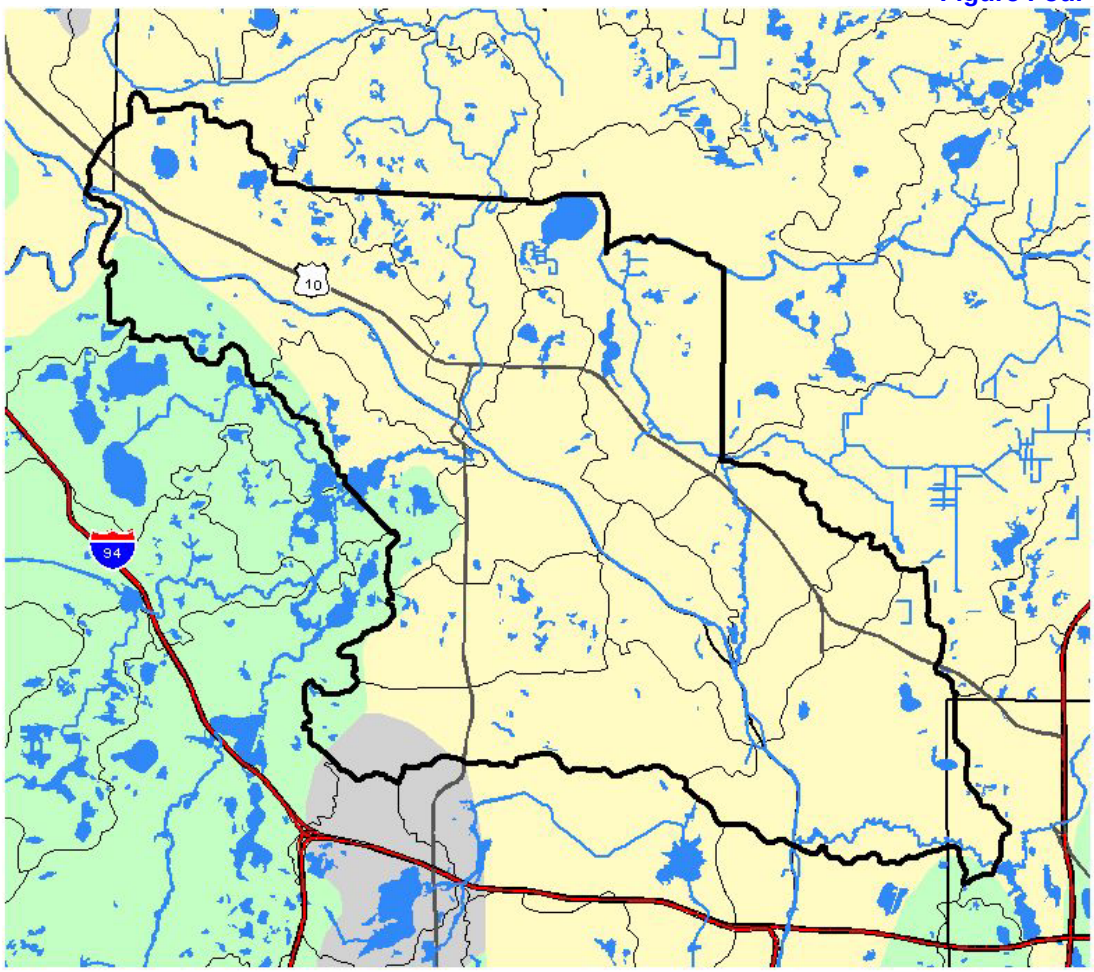
Figure Four shows the soil sequences present in the **Priority Area A**. The yellow-colored soils are predominantly composed of sand from top to bottom or peaty organic deposits overlying the sandy substrata. Typically, rapid infiltration rates exist in the sandy material with drainage ranging from poor to well drained. These soils are typically found on outwash plains or river terraces.

The gray-colored soils are a mix of coarse-textured soils formed mostly in reddish till that doesn't contain a lot of clay, likely from the Lake Superior basin. Infiltration rates vary from rapid to slow, depending on landscape position and overall soil development. Some peaty units are contained in this designation. It is not as completely sandy as the yellow unit, but does not have as much clay as the green unit.

On a broad scale, the yellow area needs the most attention regarding nitrogen management or other contaminants of concern due to the reduced ability of the soils to attenuate spills, etc. This soil characteristic dominates the **Priority Area A**.

Soil Properties within Priority Area A
SPRWS Source Water Protection Area

Figure Four



Priority Area A
Rivers
Public Waters
Sub-Watershed Boundaries
Interstate Highway
U.S. Highway
Sandy Loam / Oragnic Peat
Mix of Coarse Textured Soils
Mostly Clay-Rich Till

0 2 4 6 8 Miles

Prepared by the Upper Mississippi River Source Water Protection Project, March 2006

4. Water Resources

Extensive natural surface waters are located within the SWPA. **Figure Five** lists the **Priority A and B** Area protected waters as designated by the DNR. The MnDNR Protected Waters Inventory, authorized by Minnesota Statutes, section 103G, is available at http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html.

SWP Area Protected Waters **Figure Five**

	"A" Lakes	Public Water Wetlands	**"B"** Lakes	Public Water Wetlands	Undesignated Protected Waters
SPRWS	36	105	1069	2046	32
Vadnais Lake	23	52	39	70	

Public water wetlands listed are all types 3, 4 and 5 wetlands, as defined in United States Fish and Wildlife Service (USFWS) Circular No. 39 (1971 edition), that are ten or more acres in size in unincorporated areas or 2-1/2 or more acres in incorporated areas.

Filling of wetlands for farming or development depletes the capacity for groundwater recharge, flood and sediment control. These areas provide natural regulation of surface water runoff during times of heavy rains. They also provide habitat for waterfowl, frogs, turtles and other wetland animals.

While these wetlands are protected, numerous smaller wetlands exist and should be considered important to stormwater management in both quality and quantity of runoff during a storm event. Holding water back to allow sediment to precipitate and water to filter through the soil provides natural filtration of potential contaminants and reduces water volume reaching the water courses. The statewide National Wetlands Inventory is found on the DNR Data Deli website.

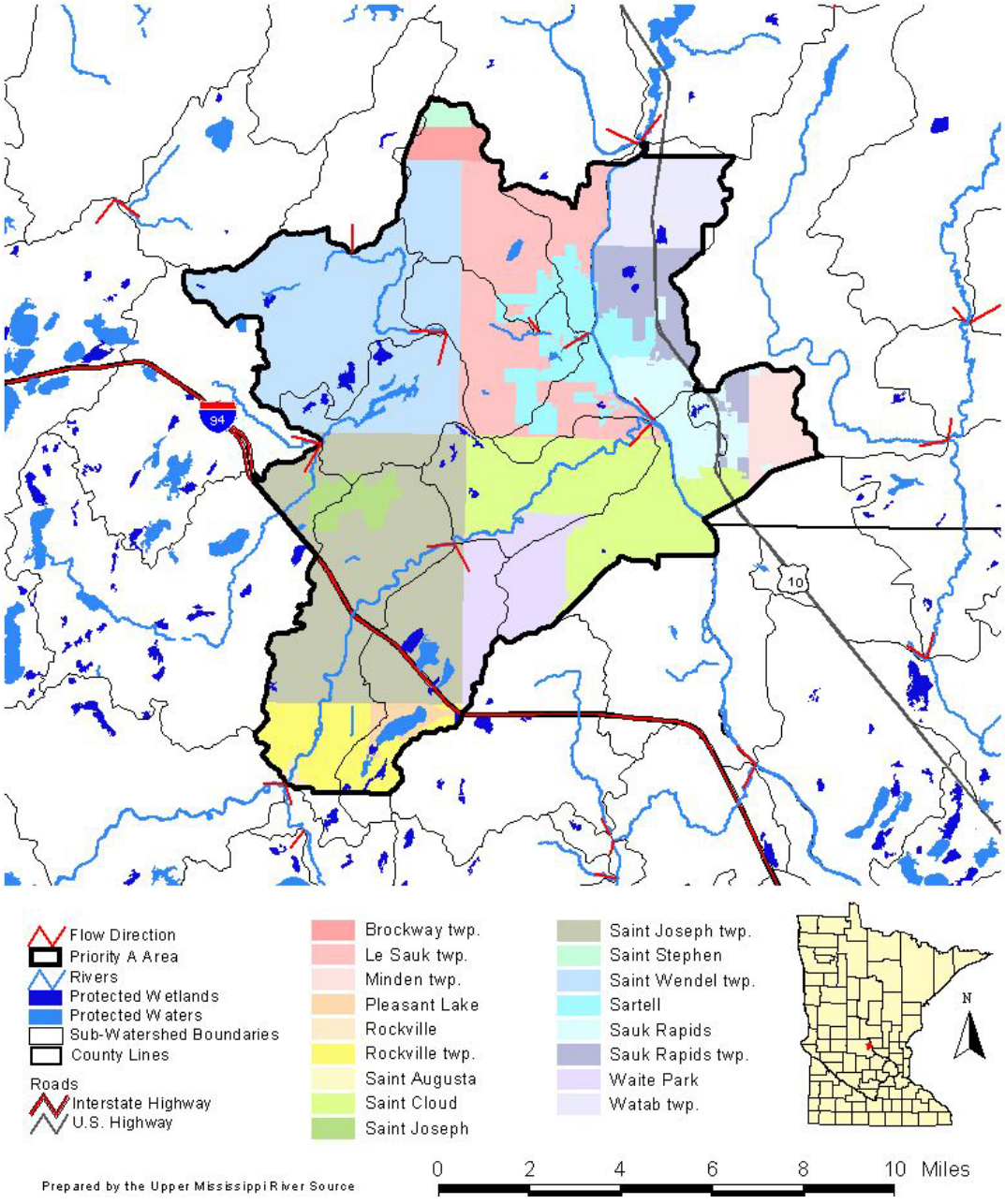
The MnDNR has “Lakefinder” to find the designation of an individual lake. This website contains a composite of all available data on an individual lake, such as fishery reports, water quality information, lake level data and lake designation. While it is not readily available in a useable format for this extensive area, this information can be found in local zoning departments or at http://www.dnr.state.mn.us/lakefind/index.html.

Public waters and drainage points from minor watersheds to the Mississippi River, as shown in **Figures Six and Seven,** show overland travel of water from high to low landforms. Public drainage ditches facilitate drainage of agriculture land and/or to prevent channelized erosion. The benefits verses the detriments of these drainage systems must be assessed in priority areas of the SWPA. The quality of water leaving each watershed area will prioritize mitigation by greatest potential impact.

Floodplains are areas that are likely to flood with water during a large rain event. If soils in this area are not stabilized, sediment will also be carried downstream. This area should not contain contaminated soils or any land use that would potentially have products or byproducts that are harmful to the drinking water resource.

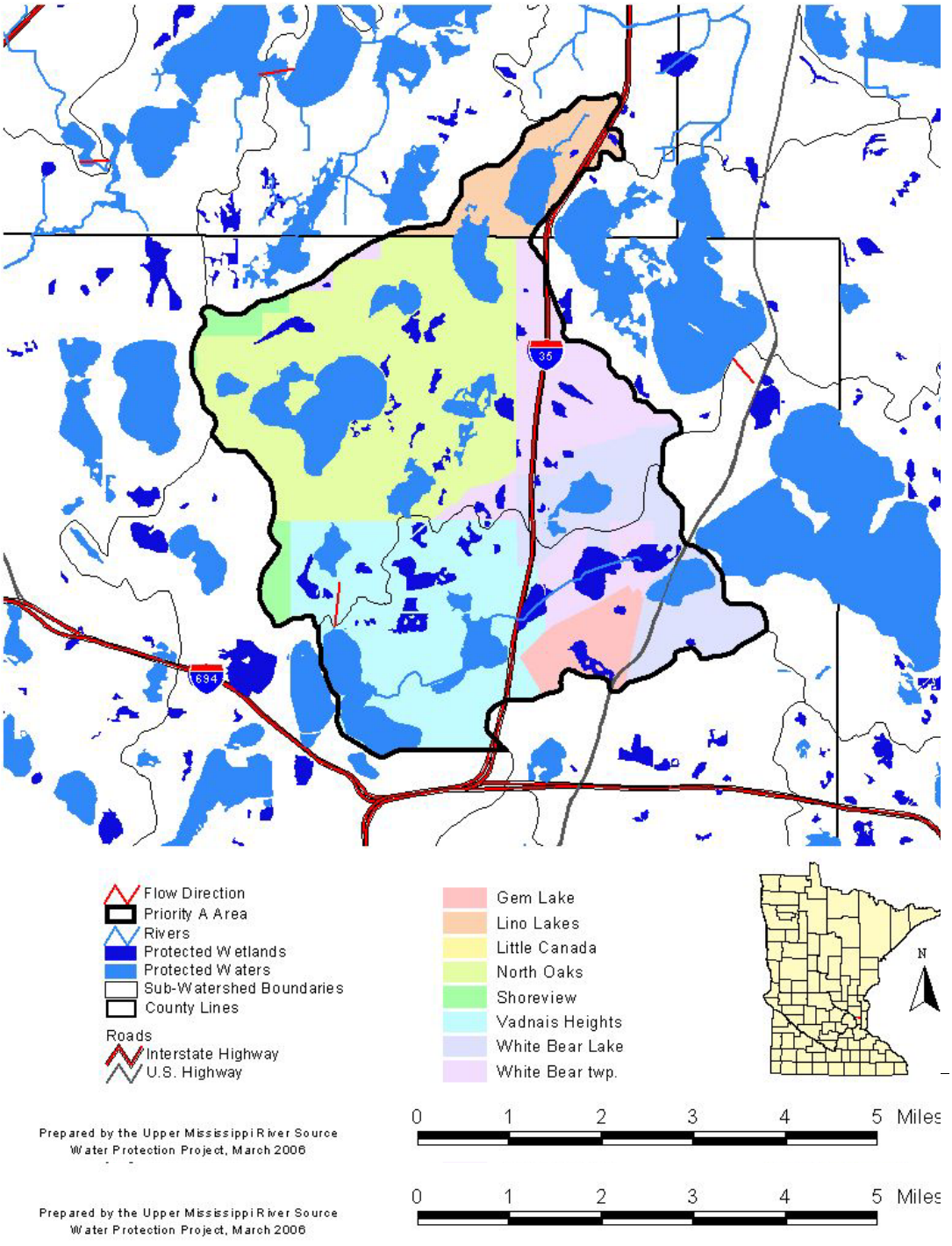
Surficial Hydrology within the Priority Area A
SPRWS Source Water Protection Area

Figure Six



Surficial Hydrology within the Priority Area A
Vadnais Lake Source Water Protection Area

Figure Seven



0 1 2 3 4 5 Miles
Prepared by the Upper Mississippi River Source Water Protection Project, March 2006

B. LAND USE DATA ELEMENTS

1. Land Use

The extent and accuracy of parcel mapping varies greatly by community and is not available for use in this Plan. Land use impacts on source water are evaluated within the context of the surrounding environment. Regarding land use, it is not necessarily a particular land use, but the specific activities associated with the land use that can result in significant impacts on source water.

Feedlots can influence source water to varying degrees depending management practices. Manure management practices vary among feedlots; manure stockpiled on or applied to frozen ground can runoff quickly during a rapid snowmelt or heavy spring rain. Runoff can contribute nutrient, sediment and pathogen loading to area surface waters. Pathogens including Cryptosporidium, Giardia, protozoa and other microorganisms are difficult to remove/sterilize by conventional treatment.

Nutrients, primarily in the form of nitrates, are not removed at surface water treatment facilities. Elevated levels of ammonia nitrogen in the source water can cause problems with disinfection. Accidental spills or leaks, transportation accidents or leaks, temporary stockpile leaks and improperly abandoned sites are all cause for concern for surface water suppliers.

Land use compiled from the 2001 Landsat imagery has been utilized to determine potential non-point sources of contamination. Land uses within the **Priority Area A, Figures Eight and Nine,** will be targeted for BMPs.

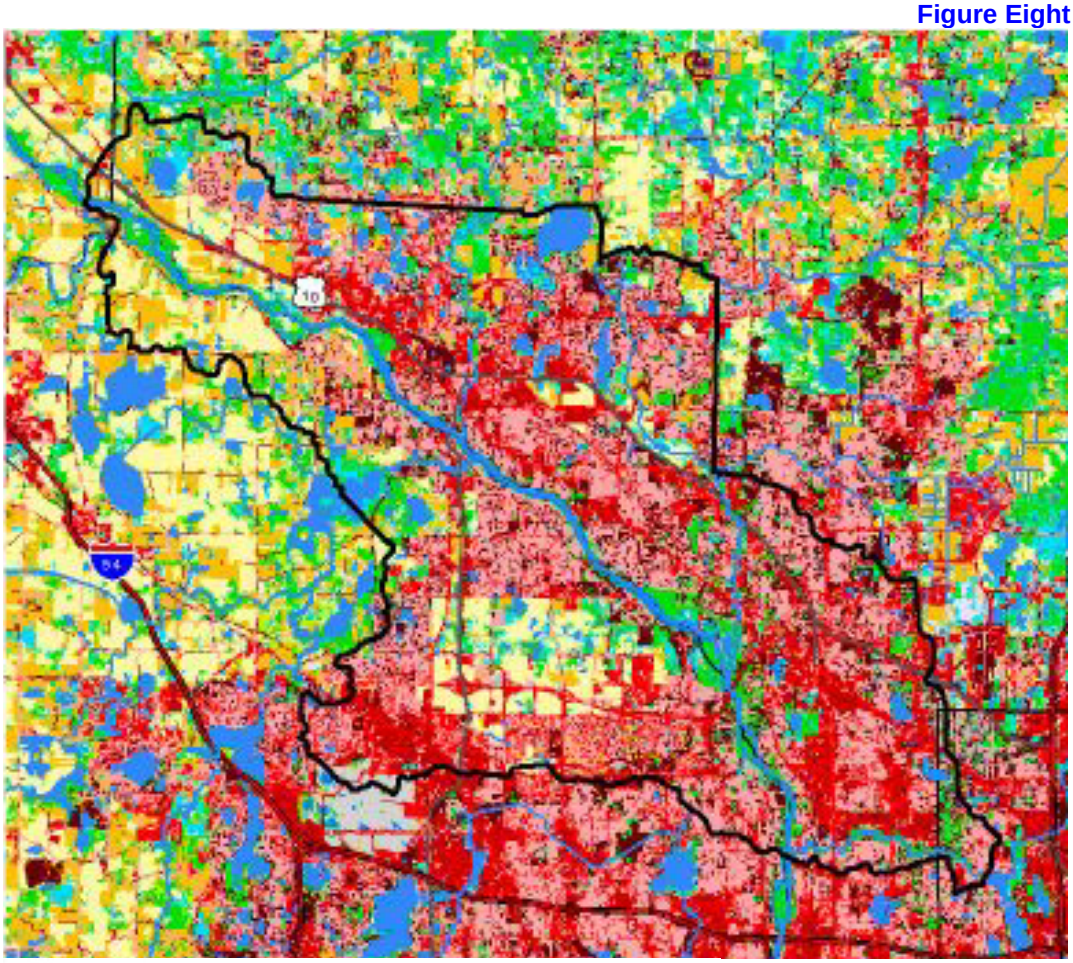
Land use in **Priority Area B** must be considered for potential non-point sources of contamination. The available data within this area, as shown in Part One of this Plan, are outdated, requiring confirmation. This land use information is based on data from http://deli.dnr.state.mn.us/data_catalog.html. This web site also contains public land survey information. The production of a map including this information becomes illegible. Zoning and present land use information is available from LGUs and will provide the most current data. Political boundaries can be found at http://www.gis.leg.mn/.

Forms of pollution in the Mississippi River and many of its tributaries include suspended solids, nutrients, oxygen-consuming materials, metals, pathogenic microorganisms and several organic and inorganic chemical constituents. Maps and tables of the individual potential contaminant sources for each **Priority Area** are available in electronic format in **Appendix III**. Printed maps must be in a larger scale than is practical to include in this Plan.

Stormwater drainage and agricultural tiling systems are examples of how land use changes can dramatically influence contaminant transport and time of travel. Both can increase velocity from a contaminant release point to the source water. As development increases, the boundaries of **Priority Area A** will likely expand.

Land Use within the Priority Area A
SPRWS Source Water Protection Area

Figure Eight



Priority Area "A"
Rivers
County Line
Interstate Highway
U.S. Highway
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Med. Intensity
Developed, High Intensity

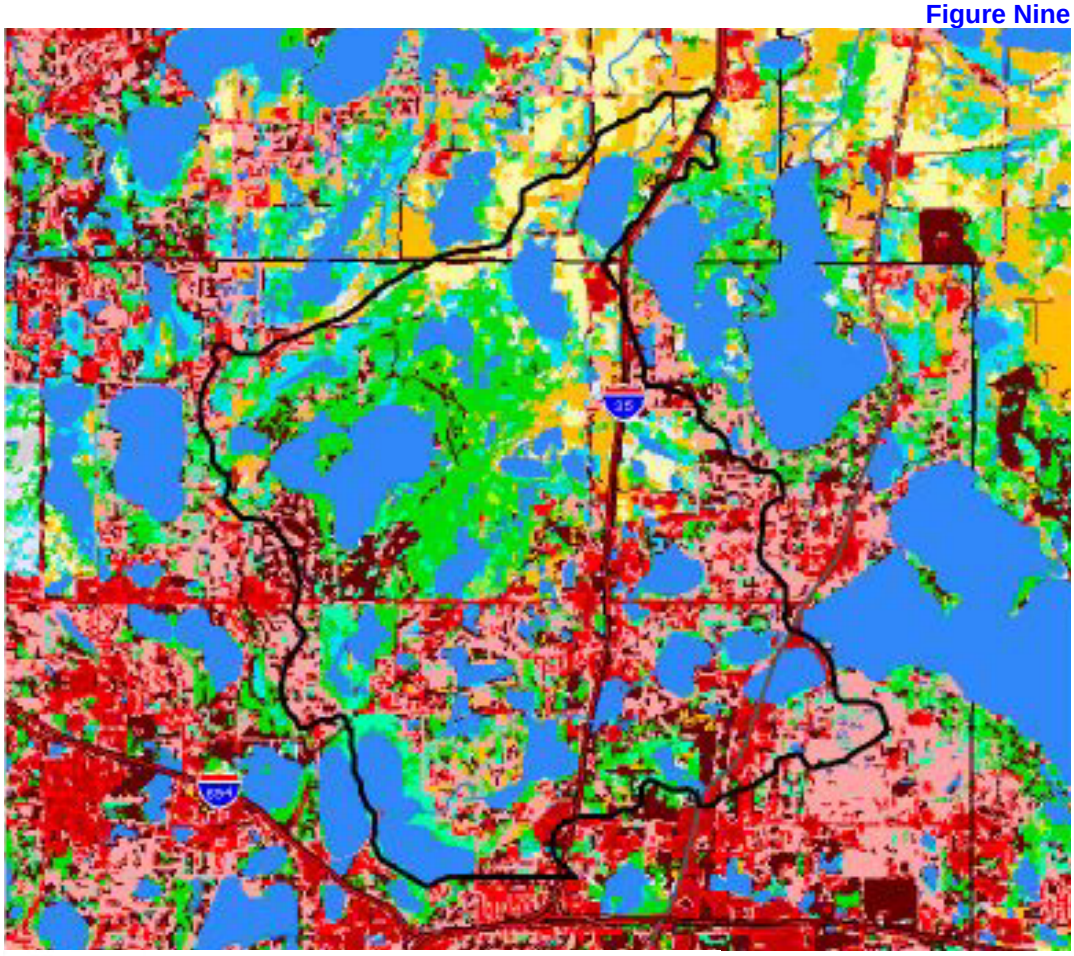
Barren Land
Decidious Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands

Prepared by the Upper Mississippi River Source Water Protection Project, March 2006

0 2 4 6 8 Miles

Land Use within the Priority Area A
Vadnais Lake Source Water Protection Area

Figure Nine



Priority Area "A"
Rivers
County Line
Interstate Highway
U.S. Highway
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Med. Intensity
Developed, High Intensity

Barren Land
Decidious Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands

0 1 2 3 4 Miles

Prepared by the Upper Mississippi River Source Water Protection Project, March 2006

2. Public Utility Services

Public utility maps are available in City and County offices throughout the SWPA. Water and wastewater transmission lines have negligible impact on source water quality. Storm sewer outfalls to the Mississippi River and tributaries will potentially impact the quality and quantity of the drinking water source. Inventory, mapping and sampling of these outfalls is the first step toward identifying potential sources of contamination coming from the watershed.

Public drainage systems have been created throughout the state to provide movement of water from poorly drained or eroding soils to tributaries and directly to the River. It is important to identify these systems within the SWPA as they contribute to the nutrient load. Management practices such as buffers and/or sedimentation basins will mitigate the impact.

Ground transportation corridors provide a potential source of contamination due to accidental spills and discharges. Interstate 94 and Highway 10 parallel the Mississippi River for much of its length in the SWPA. Both the Burlington Northern (BN) and the Canadian Pacific (CP) Railways are within the areas of protection as well as underground pipelines. The Minnesota Department of Transportation (MNDOT), BN, CP, the Office of Pipeline Safety (OPS) and the Cities located within the SWP area all have plans for mitigation of possible spills.

The Mississippi River Defense Network (RDN) included an inventory of potential oil and chemical spill sources within one-half mile of the Mississippi and near the lower reaches of certain tributaries between the Mississippi River headwaters and Saint Anthony Falls. Within this corridor more than 3,300 potential spill sources were identified including pipeline, highway, railroad river crossings and parallels, above- and below-ground petroleum and chemical storage tanks, agricultural chemical storage facilities and hazardous waste storage facilities.

C. Water Quantity Data Elements

1. Surface Water Quantity

The time of travel information supplied below is an excerpt from Part One of the SWP Plan and has been completed by the USGS and/or the Army Corps of Engineers (ACOE). USGS gauging stations have been mapped in Part One of the Plan but are difficult to evaluate at the size available. Complete information is included in the Appendix of Part One and gauging station information is available on at http://waterdata.usgs.gov/mn/nwis/rt.

Water Appropriation Permits are required for use of surface water in excess of 10,000 gallons per day or one million gallons per year. The DNR is the permitting authority. A listing of uses, sources and permitted amounts are on the DNR website at http://files.dnr.state.mn.us/waters/watermgmt_section/appropriations/idxloc.pdf. They are also listed by County in **Appendix IV**. There are no known water use conflicts.

Time of travel considerations are related to a single contaminant release and the duration it will take the contaminant to reach the source water intake. River miles noted refers to the point upstream of an intake where a contaminant release would require eight hours to reach the water intake under low, medium or high-flow conditions. For example, a contaminant release 12.10 miles upstream of the SPRWS intake would take eight hours to reach the intake station during high-flow conditions.

Eight-hour time of travel locations upstream of the SPRWS intake:

High flows:	(12.10 miles upstream)
Medium flows:	(4.95 miles upstream)
Low flows:	(3.75 miles upstream)

Times of travel from the Elk, Crow and Rum Rivers / Elm, Coon and Rice Creeks confluences with the Mississippi River to SPRWS intake:

	High flows	Medium flows	Low flows
Elk River	12 hrs 03 mins	33 hrs 40 mins	88 hrs 03 mins
Crow River	10 hrs 07 mins	29 hrs 21 mins	76 hrs 36 mins
Rum River	06 hrs 08 mins	19 hrs 32 mins	50 hrs 39 mins
Elm Creek	05 hrs 53 mins	18 hrs 54 mins	48 hrs 57 mins
Coon Creek	01 hr 06 mins	02 hrs 10 mins	04 hrs 12 mins
Rice Creek	N/A	N/A	N/A

2. Groundwater Quantity

Due to the limited data on hydraulic connections between surface water and ground water, it is difficult to estimate the effect of groundwater use on availability of surface water.

The number of high capacity wells located within the SWPA is too large to include in this Plan. The highest use of groundwater is agricultural irrigation. Permits are required for use of groundwater in excess of 10,000 gallons per day or one million gallons per year. The permitting authority is the DNR and a listing of uses, sources and permitted amounts, can be found in **Appendix IV** and at http://files.dnr.state.mn.us/waters/watermgmt_section/appropriations/idxloc.pdf.

D. Water Quality Data Elements

1. Surface Water Quality

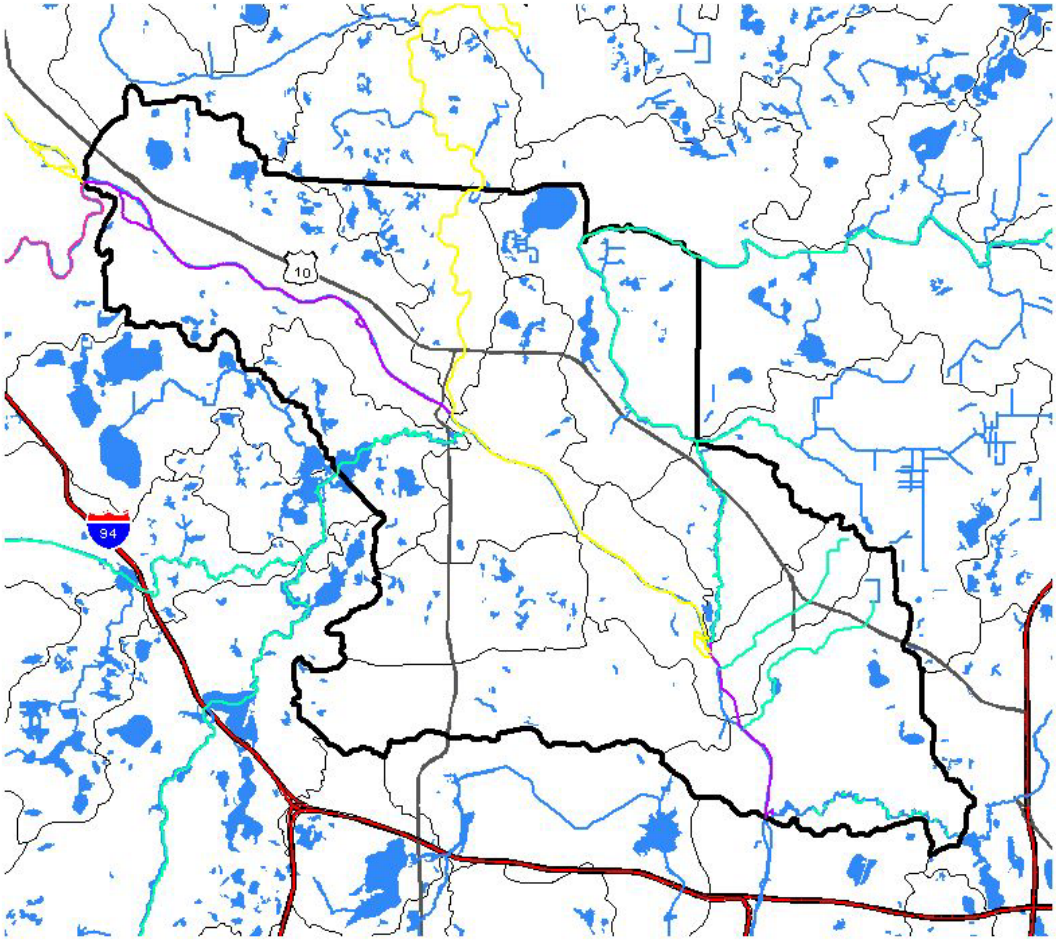
Surface water quality data can indicate areas that show a persistent impairment or where human activity has increased contaminant loading. If these areas fall within or near a SWPA, they could indicate that future problems could arise as activity increases. The MPCA evaluates surface water quality using the Clean Water Act goals of “fishable and swimmable”; drinking water use is not addressed.

The MPCA prepares a list of waters (lakes and river reaches) that are determined to be impaired by one or more constituents. These constituents relate to the Clean Water Act goals of "fishable" or "swimmable"; they do not relate to drinking water standards. However, certain constituents such as fecal coliform or turbidity are a concern from a drinking water perspective. **Figures Ten and Eleven** were derived from the 2006 draft Total Maximum Daily Load (TMDL) list found on the MPCA website at http://www.pca.state.mn.us/water/tmdl.index.html. Investigations of possible sources of contamination associated with the impairment may fall outside the delineated SWPA.

A copy of the 2008 draft TMDL list can be found in **Appendix IX.**

Impaired Waters within the Priority Area A
SPRWS Source Water Protection Area

Figure Ten



Priority Area A
Rivers
Public Waters
Sub-Watershed Boundaries
Interstate Highway
U.S. Highway

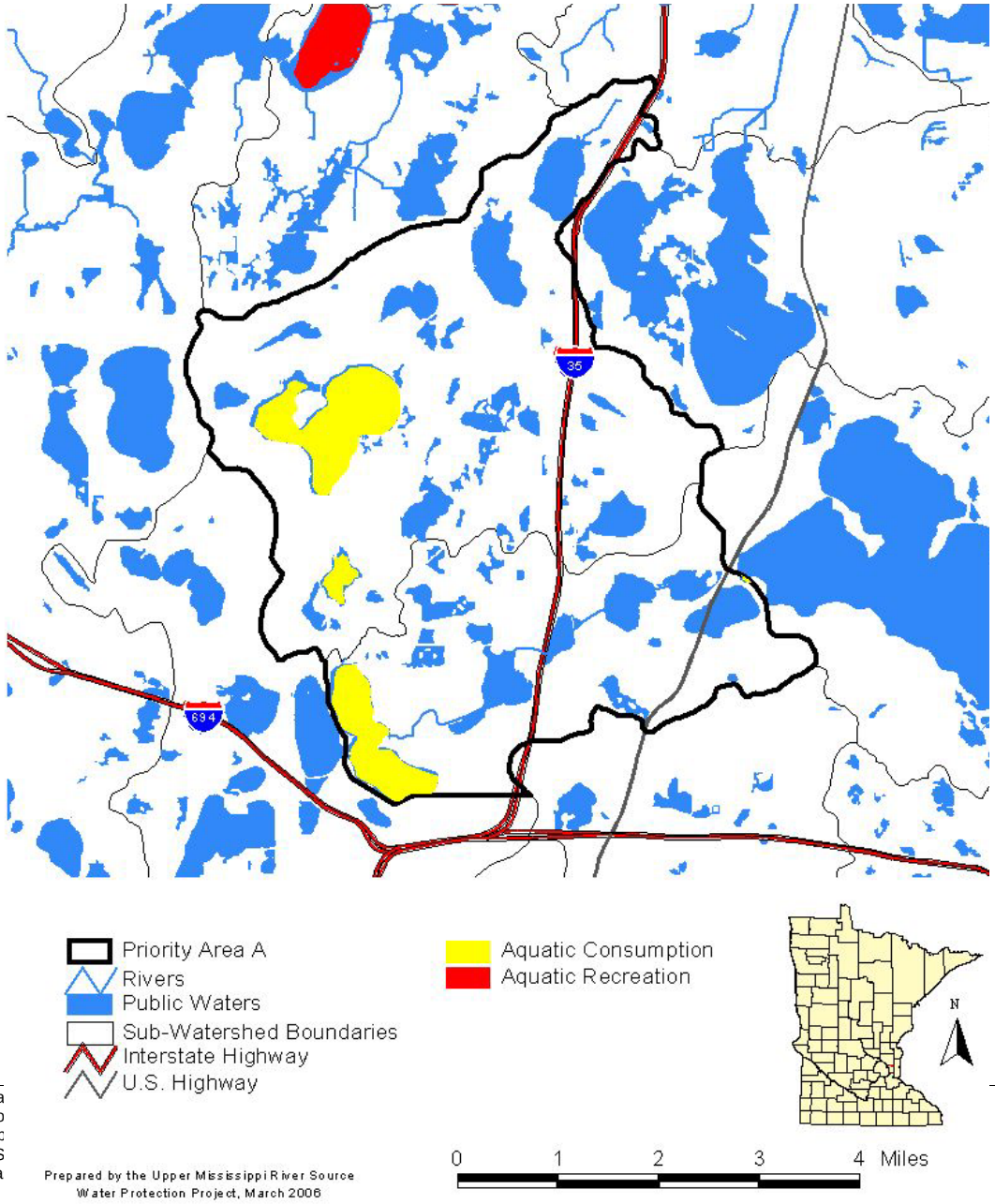
Aquatic Consumption
Aquatic Life and Aquatic Recreation
Aquatic Life
Aquatic Recreation and Aquatic Consumption

0 2 4 6 8 Miles

Prepared by the Upper Mississippi River Source Water Protection Project, March 2006

Impaired Waters within the Priority Area A
Vadnais Lake Source Water Protection Area

Figure Eleven



Pa
So
Up
\\S
La

2. Groundwater Quality

Geology is important in terms of interaction between groundwater and surface water. It is important to note that aquifer boundaries do not match the boundaries of overlying surface watersheds. Generally, ground water discharges to surface water.

Groundwater quality can vary dramatically both horizontally and vertically. If groundwater in alluvial, shallow aquifers adjacent to a SWPA is contaminated, it suggests that the aquifer is sensitive to pollution. Many alluvial aquifers exist within several miles of the Mississippi River. If the aquifer contributes or could contribute significant amounts of water to the surface water body, then indirectly, the surface water body would be sensitive to pollution via subsurface pathways.

II. ASSESSMENT OF DATA ELEMENTS

A. USE OF THE SURFACE INTAKE

SPRWS draws an average of 46.0 million gallons per day (MGD) from the Mississippi River, serving a population of 417,000.

B. QUALITY/QUANTITY OF WATER SUPPLY AT THE SURFACE INTAKE

Typical Mississippi River flow is approximately 3.9 billion gallons per day. At present, the **Priority Area A** has known fecal coliform and PCB impairments on several reaches of the Mississippi River. Fecal coliform and PCBs are found in the River system from Coon Creek inlet to Upper Saint Anthony Falls in several areas and from the Crow to Rum River inlets. While the quality of source water varies depending on rainfall, time of year and other factors such as land use, the SPRWS meets or exceeds drinking water standards. The most recent Consumer Confidence Report for is available in **Appendix V**.

C. THE LAND AND WATER USES IN THE DRINKING WATER SUPPLY MANAGEMENT AREA

Management Strategies to improve the quality of runoff to the River, along with actions to prevent contamination from accidental spills are a high priority in the **Priority Area A**. Proactive management of agricultural feedlots and stormwater runoff are included as part of the Management Strategies of this Plan.

CHAPTER TWO

POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) AND PRIORITIES

I. DESCRIPTION OF HOW THE PCSI WAS CONDUCTED

A preliminary listing of the known potential contaminants was supplied to the SWP Team by the MDH and was based on Federal and State permit information. Location of contaminants could be +/- several thousand feet. Gross maps and data base files of the contaminants are electronically available in **Appendix III** and must be evaluated for accuracy and refined in both the **Priority Areas A and B**.

II. SUMMARY OF PCSI

The potential contaminants listed in **Priority Area B**, **Figure Twelve**, must be evaluated according to their proximity to the source water, the ability of the soils in the area to assimilate contaminants and known data about the impact. All contaminants within the SWPA must be assessed for potential contamination and prioritized for mitigation.

Figure Twelve

Municipality / Priority Areas	SPRWS A	SPRWS B	Vadnais Lake A	Vadnais Lake B
Above Ground Storage Tanks	127	652	12	12
Agricultural Chemicals	146	1196	16	18
Animal Feedlot Permit	--	902	--	--
Delisted Permanent List of Priorities	4	21	--	--
Dump	35	189	16	16
Hazardous Waste Generator Investigative Clean-up	7	20	1	1
Hazardous Waste Generator Permit	1258	4511	146	154
Leaky Underground Storage Tanks	306	1375	29	
NPDES	12	147	--	--
Registered Storage Tank Permit	477	2366	42	46
Solid Waste Permit Site	8	62	2	2
Underground Storage Tanks	1292	5885	100	105
Vehicle Salvage Yards	12	79	1	1
CERCLIS Sites	0	0	0	0
Federal Superfund Sites	1	1	0	0
NFRAP Sites	5	46	1	1
State Superfund Sites	5	7	1	1
Transportation Crossings	43	817	3	6

Non-point land uses within the **Priority Area B** such as agriculture pasture and cropland, septic systems, development and stormwater must be assessed for potential contamination. The best available data for this determination are the land use maps and the PCSI.

III. IDENTIFICATION OF CONTAMINANTS OF CONCERN

It is necessary to establish geographic and contaminant priorities to effectively manage the contaminants that pose the greatest risk to public water supplies.

The contaminants listed in the Environmental Protection Agency's "National Primary Drinking Water Standards" are a concern to all public water suppliers. SPRWS has identified contaminant priorities on the basis of:

1. High levels of the contaminant in the source water,
2. Limitations of water treatment technologies,
3. Contaminant concentrations that could contribute to the creation of disinfection byproducts,
4. Lack of monitoring data, and
5. Lack of knowledge regarding contaminants, sources or health effects.

The contaminants of greatest concern to the SPRWS are listed below. <u>The listing is not ranked by priority</u>.

- **Total suspended solids, sediment and suspended organics**
- **Cryptosporidium**
- **Biological and microbiological organisms, such as fecal coliform, Giardia and viruses**
- **Nutrients, including phosphorus, nitrates and ammonia**
- **Pesticides**
- **Petroleum products**
- **Organic solvents**
- **Pharmaceuticals**
- **Endocrine-disrupting chemicals**

IV. PRIORITIZATION OF SOURCES

After identifying the contaminants of concern, the SWP Team investigated both point and non-point uses within the DWSMA, with focus on the **Priority Area A**. Potential sources of these contaminants were then determined. These potential sources were assessed by their ability to influence the surface water intakes and prioritized for implementation strategies as follows:

High Priority Sources: "Known Contaminants"

- Improper Manure Management/Storage Sites.
- Known Stormwater Discharge Sites.
- Cropland Sediment Runoff.
- Streambank Erosion.
- Transportation Corridors.
- Hazardous Waste Clean Up Sites.
- Failing Septic Systems.
- Leaking Underground Storage Tanks.

Medium Priority Sources: "Potential Contaminants"

- Gravel and Mining.
- Residential Lawn Management.
- Above Ground Storage Tanks.
- Agriculture Chemical and Pesticide Applicators.
- NPDES permits.
- Underground Storage Tanks.
- Vehicle Salvage Yards.

Low Priority Sources: "Permitted and Regulated"

- Wells.
- Permitted Feedlots.
- Permitted Hazardous Waste Generators.
- Permitted Registered Storage Tanks.
- Permitted Solid Waste Sites.

V. DESCRIPTION OF POTENTIAL CONTAMINANT SOURCES THAT MAY NEED FURTHER INVESTIGATION FOR PLAN IMPLEMENTATION

Potential contaminant sources identified within the **Priority Area B** need to be assessed to determine their capacity to enter the River system and influence the quality of drinking water. Each minor watershed needs to be reviewed for the potential contaminant sources from land use practices and the feasibility of conveyance to the Mississippi River.

Within **Priority Area A**, feedlot assessments must be completed and reviewed for potential impact. Leaky Underground Storage Tanks (LUST) should be mapped over a soils layer to determine the potential for groundwater contamination and assessed for the potential to enter the River. Stormwater outfalls need to be tested to determine watershed areas of concern and potential contaminant transport.

CHAPTER THREE

IMPACT OF CHANGES ON PUBLIC WATER SUPPLY INTAKE

I. CHANGES IDENTIFIED IN THE SOURCE WATER PROTECTION AREA

A. PHYSICAL ENVIRONMENT

1. Precipitation

An increase in the percentage of water vapor content will shift the type of weather from dry to humid resulting in an increase of rainfall intensity and quantity. This may have significant impacts on wetlands and other physical features. Erosion of marginally vegetated soils and utilizing wetlands beyond the natural capacity will minimize the benefits of the storage and filtration capacity.

2. Geology

The corridor between St. Cloud and the Metropolitan area is developing into residential homes. Expected changes include the land grading and additional drinking water wells. Areas with little protection to the aquifer should be designated as sensitive to development pressures.

3. Soils

The soils within the SWPA will not change, however land use is expected to change. As residential populations increase, so does the potential need for services such as underground storage tanks for gasoline and other amenities.

4. Water Resources

As development increases, there will be a decrease in natural wetlands and an increase in retention basins. Individual lakes are known to show development impacts from increases in impervious surfaces and sedimentation from vegetation removal and alteration of natural shorelines. Buffers along water courses and tributaries could impact the River in a positive way.

B. LAND USE

1. Land Use

Urban development is rapid in the DWSMA. The anticipated development is occurring in rural areas. This will result in the establishment and/or expansion of water and wastewater systems.

A large feedlot within runoff proximity could present direct impacts to the drinking water resource. Management of size and/or location of feedlots within the SWPA will mitigate potential contamination issues and are important to the protection of the source water.

2. Public Utility Services

The increase of public utilities is inevitable with the predicted rise in residential development. Water, wastewater and transportation corridors will need to accommodate this growth. Stormwater must be managed such that no further impact to the River will occur.

C. Surface Water

1. Quality

Surface water throughout the SWPA shows the results of human impacts to quality due to total suspended solids and other undesirable contaminants. Lakes have been showing gradual degradation with regard to clarity and production of algae.

2. Quantity

The anticipated changes in quantity of the surface waters are somewhat unknown. If predictions of increased rainfall are true, it will increase the quantity in the River system and recharge to the aquifer.

D. Groundwater

1. Quality

There are no anticipated changes to the groundwater quality within the SWPA. Mitigation of potential sources of contamination will help maintain the good quality of this resource.

2. Quantity

Changes in groundwater quantity are not anticipated. High-capacity wells located within the alluvial soils bordering the River will be inventoried and monitored for potential impact. Cooperation with the DNR regarding new applications within this area will be pursued and input offered.

II. IMPACT OF CHANGES

A. Expected Changes in Water Use

SPRWS average annual water consumption is approximately 47 MGD. This is a slight decline over the past few years. Declines are expected to continue as the consumption shifts from industrial to residential users. SPRWS is actively pursuing the opportunity to provide water to surrounding communities; however, until those communities are actively part of the system they cannot be included in the average daily demand. SPRWS maintains an alternate ground water source of approximately 28 (MGD) and is in the process of expanding to 50 MGD.

B. Influence of Existing Water and Land Government Programs and Regulation

The quality of source water is directly impacted by existing water, land and government programs and regulations. The Mississippi River and the tributaries draining to it are regulated locally based on floodplain and shoreland regulation standards outlined in Minnesota Rules, Chapter 6120. Cities and Counties enforce these protective rules through zoning. SWCD and the Natural Resources Conservation Service (NRCS) work with landowners to implement the Conservation Reserve Program (CRP) and other set-aside programs that are important to provide a buffer between the waterways and the use of the land. The Conservation Reserve Enhancement Program (CREP) enacted legislatively would add additional incentives for land preservation. Another important protective regulation is the Wetland Conservation Act (WCA). This program is charged with minimizing and mitigating wetland destruction.

WDs and WMOs have programs to provide both financial and technical assistance to property owners on BMPs. Their monitoring programs provide data on the impacts of land use and their strategic plans have goals common to this Plan. Support for existing programs will help implementation of strategies outlined in Chapter Six.

SPRWS owns all land surrounding the two primary reservoirs known as Sucker Lake and Lake Vadnais located in Ramsey County. However, it does not own land within the Lambert Creek Watershed, which is a major contributor of phosphorous to Lake Vadnais. Regulatory authority over this watershed is controlled by the WMO.

C. Administrative, Technical and Financial Considerations

Implementation of this plan is the intention of SPRWS. The resources available to continue this project is expect to continue. There is an issue that the needed resources to continue at the desired level of operations. SPRWS intends to continue to work with the UMRSWPP and explore necessary means to find additional funding resources.

The Cities of St. Cloud, Minneapolis and the Board of Water Commissioners of the City of Saint Paul (BWC) have put forth a cooperative effort to support SWP. A SWP Team has been formed and is actively involved in the planning process. Commitments to continue efforts in implementation of this Plan have been made by these communities.

The three public utilities involved, the Metropolitan Council, USGS, DNR, MRWA, MDH, MPCA, USGS and the ACOE provided technical assistance for this Plan. The Upper Mississippi River Source Water Protection Project Coordinator provided facilitation grant writing and documentation.

CHAPTER FOUR

ISSUES, PROBLEMS AND OPPORTUNITIES

I. LAND USE ISSUES, PROBLEMS AND OPPORTUNITIES

A. SOURCE WATER

Contamination of land within runoff proximity will lead to source water contamination. Contaminants contained in the sediment will enter the River system during high rainfall events. This source water system is vulnerable to contamination from land use issues.

Opportunities resulting from this determination include establishment of educational programs on BMPs, outreach assistance to property owners in the form of set-aside programs, cost-share for BMPs, proper disposal assistance for hazardous waste and regulatory enforcement. These actions will be completed with cooperation of local government officials and programs.

B. GROUNDWATER

The areas of concern for contamination from land use practices are located adjacent to the Mississippi River in the sandy, alluvial soils. This includes most of the priority areas. This presents the opportunity to further study the connectivity between the soils and the Mississippi River. LGUs are a resource for collaboration on the permitted land uses within this area and possible requirements for mitigation with the permits.

Geographic areas where aquifers serving as public water supplies are close to surface waters have the potential to 1) be hydraulically connected with one another and
2) provide a transport mechanism for cross-contamination in one or both directions. Understanding where such hydraulic connections and the potential for cross-contamination exists would enhance source water protection and wellhead protection efforts, particularly in the event of a large contaminant release.

The areas where surface waters and aquifers are hydraulically connected should be identified and mapped. In such areas, contaminants can be transported from ground water to surface water or surface water to ground water. Depending on surficial flow conditions, transport can be in both directions, in the same area, at different times. Pumping from an aquifer can intensify this flow mechanism and contaminant transport. It is important to inventory and manage potential sources of point and non-point contaminants that could enter surface and ground water in areas where hydraulic connection could provide a mechanism of cross-contamination of a surface or ground water that is a source water supply.

There has been one unsuccessful attempt to obtain the information; the City will proceed to gather this information if it can be obtained in an economical and cost-effective manner.

C. THE DRINKING WATER SUPPLY MANAGEMENT AREA

The Drinking Water Supply Management Area / Source Water Protection Area is broken down into **Priority Area A** and **Priority Area B**. The **Priority Area A** is within an eight-hour time-of-travel from the intake station. The **Priority Area B** provides a conduit to the source water intake but is further than eight hours away.

The management and dissemination of available data within this area is a challenge. It is difficult to produce a PCSI map that is valuable because of the size of the DWSMA and the numerous potential contaminants. Data management opportunities include breaking the data into manageable areas, starting with the highest potential contamination areas.

Also related to the large area are the numerous governing agencies within the DWSMA. Establishing a working relationship with the watershed groups and other LGUs within the SWPA presents an opportunity to share expertise and funding for common priorities.

At present, the largest potential impact to the DWSMA is agriculture runoff. Stormwater runoff from developed, unvegetated land and/or from pavements is also a concern.

Studying sedimentation processes will help to establish effective controls. Controlling the volume of sediment that enters the River will positively impact the water quality. Requiring NPDES permits for future development and managing runoff without impacting the River will be the challenge.

II. IDENTIFICATION OF:

A. PROBLEMS AND OPPORTUNITIES DISCLOSED AT PUBLIC MEETING AND IN WRITTEN COMMENT

The public has expressed no concerns at public meetings. Issues identified at the SWP Team meetings include education, agriculture impacts and sedimentation.

B. DATA ELEMENTS

The State's Source Water Protection Guidance Document requires that existing information be utilized in developing the initial Source Water Protection Plan. Much of the data collected and utilized to delineate the Upper Mississippi SWPA and DWSMA and to determine vulnerability of the surface intake to possible contamination comes from regional sources.

This Plan will be updated in ten-year intervals as recommended by the State of Minnesota. Updated data will be utilized at that time.

C. Status and Adequacy of Official Controls, Plans and Other Local, State and Federal Programs on Water Use and Land Use

The SWP Team feels adequate protection of the SWPA is available through existing land use ordinances in the Cities, Counties and other local control authorities. Programs available for landowners to control detrimental land use practices are available. Identification of problem sites and education of the landowner is the preferred method of mitigation. The CROW has developed monitoring and mitigation plans to support the need to work with local landowners on BMPs.

Important to the implementation of the SWPP is the development of a collaborative partnership with local, State and Federal entities so that source water protection can be promoted in their programs. SPRWS will be vigilant to observe the activities that are occurring in the source water protection area. As opportunities arise, SPRWS will take the initiative to review and comment on permits and environmental reviews from a source water protection perspective.

CHAPTER FIVE

SURFACE WATER INTAKE PROTECTION GOALS

I. GOALS

THE OVERALL GOAL OF THE SOURCE WATER PROTECTION PLAN IS TO:

Promote public health, protect the environment, encourage economic development, manage community infrastructure and reduce current drinking water treatment costs by improving the quality of source waters and maintaining a potable drinking water supply at a reasonable cost for all residents of the community, now and in the future.

IN ADDITION THE UTILITY WILL:

Promote and support the communication and working relationships developed through this planning process between the Cities of Minneapolis and St. Cloud.

IN ADDITION THE UTILITY WILL:

Promote and support communication and working relationships between the Cities of Minneapolis and Saint ` and other LGUs, public water suppliers, watershed districts, water management organizations, joint powers boards and Soil and Water Conservation Districts within the Mississippi River SWPA.

IN ADDITION THE UTILITY WILL:

Actively support public and consumer understanding of and involvement in managing land uses within the Mississippi River watersheds and protecting Mississippi River drinking water intakes.

II. THE SOURCE WATER PROTECTION PLAN WILL ACHIEVE THESE GOALS THROUGH:

- Public education programs
- Dissemination of appropriate and timely information
- Coordination with other surface water protection efforts
- Emergency response procedures
- Implementation of BMPs for all identified categories of potential contaminant sources
- Enhancement, including financial support, of other local drinking water protection efforts
- Data collection and analysis

CHAPTER SIX

OBJECTIVES AND PLANS OF ACTION

I. ESTABLISHING PRIORITIES

The core of this SWP Plan is the identification and implementation of effective contaminant source management strategies that will protect the public water supply intake from potential contamination. These management strategies range from non-regulatory activities, such as public education, to regulatory activities such as adoption of new ordinances. Both point and non-point source contamination management will be focused on in **Priority Area A**. The focus of **Priority Area B** will be primarily non-point sources with attention to pertinent point sources such as NPDES and known impact areas. This will be further explored and refined during the implementation process.

The management strategies listed in this chapter have been prioritized based on the following factors:

1. Knowledge of contamination of the public water supply intake;
2. Types and quantities of the potential contamination sources;
3. Location of the potential contaminant source in relation to the intake;
4. Capability of the source water to attenuate or dilute a contaminant;
5. Capability of the geologic material in the SWPA to absorb a contaminant;
6. Existence and effectiveness of existing official controls;
7. Time required to obtain cooperation; and
8. Administrative, legal, technical and financial resources needed.

Based upon these factors, the availability of resources and the priorities determined in Chapter Five of this Plan, the SWP Planning Team will concentrate management efforts on the following categories and subsequent strategies to create awareness of source water protection and help prevent future contamination of the drinking water resource.

- SWP Education & Awareness
- Urban Stormwater Management
- Agriculture Management
- Transportation Corridor & Spills
- Commercial & Industrial Management Practices
- Well and ISTS Management
- Data Collection and Analysis
- Administration

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

II. MANAGEMENT STRATEGIES

A. SWP EDUCATION AND AWARENESS MANAGEMENT PRACTICES

OBJECTIVE A-1: CREATE A PUBLIC AWARENESS CAMPAIGN INVOLVING THE SWP AREA AND PROTECTION OF THE DRINKING WATER RESOURCE.

MEASURE A-1-1: Assist with development and maintenance of the UMRSWPP web site to provide updates of current activities and archive applicable documents and data.

Source of Action: SPRWS
Cooperators: MRWA, UMRSWPP
Timeline: 2008 - 2010
Estimated Cost: In-kind
Goal Achieved: Disseminate information on general SWP and the UMRSWPP project and provide a venue for questions from LGUs and public.

MEASURE A-1-2: Establish an electronic newsletter to send to local governments and public contacts of pertinent interests.

Source of Action: SPRWS
Cooperators: MRWA, UMRSWPP
Time Frame: 2008 - 2010
Estimated Cost: $6,000 (Grant, Cash, and In-kind)
Goal Achieved: Disseminate information on general SWP and the UMRSWPP project and provide venue for questions from LGUs and public.

MEASURE A-1-3: Conduct an annual or semiannual workshop to provide information on UMRSWPP content to discuss issues that are common to SWP and local governments and to update local officials on SWP accomplishments.

Source of Action: SPRWS
Cooperators: UMRSWPP, MRWA, MDH, LGU, WD
Timeline: 2008 - 2016
Estimated Cost: $6,000 (Grant, Cash, and In-kind)
Goal Achieved: Local government “buy-in” to project with local participation in workshop and potential technical and financial assistance with meeting project goals.

MEASURE A-1-4: Establish educational fact sheets, poster displays, flyers, radio and television ads as appropriate to get the message to users of the watersheds in the SWPA.

Source of Action: SPRWS
Cooperators: UMRSWPP, MRWA, MDH, LGU, WD, WMO
Time Frame: 2008 - 2010
Estimated Cost: $5,000 (Grant, Cash, and In-kind)
Goal Achieved: Establish a better understanding of the SWPA and the need to protect it. Develop a cause / effect relationship between land use and the quality of the drinking water resource.

MEASURE A-1-5: Participate as a sponsor or co-sponsor of educational activities (water festivals, environmental fairs, county fairs, etc.) in the protection area.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGUs, WDs, WMO, MRWA, MDH
Timeline: 2008 and on-going
Estimated Cost: $10,000, In-kind staff time
Goal Achieved: Public visibility of the project and establishment of a better understanding of the SWP area and the need to protect it. Develop a cause / effect relationship between land use and the quality of the drinking water resource.

B. Urban Stormwater Management Practices

Objective B-1: Develop working relationships with communities regarding stormwater management in high priority areas.

MEASURE B-1-1: Support stormwater management plans in SWP areas, providing education and recommendations for inclusion of SWP strategies.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, MRWA, MDH
Timeline: 2007 - 2016
Estimated Cost: $10,000 (Grant, Cash, and In-kind)
Goal Achieved: Communities will consider the land use / drinking water resource connection during plan development, allowing SPRWS and UMRSWPP the opportunity to provide expertise and funding for management strategies.

MEASURE B-1-2: Determine which potential contaminants need detailed inventory within Priority Area A by assessing geographic boundaries and land use patterns.

Source of Action: SPRWS
Cooperators: LGU, SWCD, MPCA, NRCS
Timeline: 2008 - 2009
Estimated Cost: $10,000 (Grant, Cash, and In-kind)
Goal Achieved: Inventory of potential contaminants will be limited to the highest impact to the drinking water resource.

MEASURE B-1-3: Develop a protocol to complete a detailed contaminant source inventory for the contaminants of concern.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGU, SWCD, MPCA, NRCS
Timeline: 2009
Estimated Cost: $10,000 (Grant, Cash, and In-kind)
Goal Achieved: Inventory of potential contaminants will be limited to the highest impact to the drinking water resource.

MEASURE B-1-4: Complete detailed contaminant source inventory as determined.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGU, SWCD, MPCA, NRCS
Timeline: 2009 - 20011
Estimated Cost: $10,000 (Grant, Cash, and In-kind)
Goal Achieved: Inventory of potential contaminants will be limited to the highest impact to the drinking water resource.

MEASURE B-1-5: Map existing NPDES permit sites and assess discharge parameters, proximity to intake and potential for influence.

Source of Action: SPRWS
Cooperators: MPCA, UMRSWPP
Timeline: 2008 - 2011
Estimated Cost: $4,000 plus in-kind staff time
Goal Achieved: Permitted NPDES sites will be either eliminated from the list of potential contaminant concerns or addressed as a new management strategy.

MEASURE B-1-6: Map and GPS all storm water outfalls on the Mississippi River and major tributaries within Priority Area A.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, DNR, LGU
Timeline: 2009 - 2011
Estimated Cost: $20,000 plus in-kind staff time
Goal Achieved: Direct potential contributors to the River system will be identified.

MEASURE B-1-7: Map and GPS all private and public drainage ditch outfalls within Priority Area A.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, DNR, LGU
Timeline: 2009 - 2011
Estimated Cost: $20,000 plus in-kind staff time
Goal Achieved: Direct potential contributors to the River system will be identified.

MEASURE B-1-8: Gather information on storm-shed for storm outfalls and ditch outfalls within areas of concern.

Source of Action: SPRWS
Cooperators: DNR, MPCA, LGU
Timeline: 2010 - 2011
Estimated Cost: In-kind staff time
Goal Achieved: Quantification of potential impact will be made possible by understanding not only the monitoring data gathered, but the volume associated with it.

MEASURE B-1-9: Develop a monitoring protocol to establish a characterization of contaminant contribution due to stormwater outfalls and drainage ditch outfalls.

Source of Action: SPRWS
Cooperators: MPCA, USGS, MDH, DNR
Timeline: 2011
Estimated Cost: In-kind staff time
Goal Achieved: Missing data will be collected to assist in decision-making strategies regarding prioritization.

OBJECTIVE B-2: REDUCE SEDIMENT FROM STREAMBANK EROSION.

MEASURE B-2-1: Develop an agreement with the CROW to inventory and map areas that need buffers to reduce sediment loading.

Source of Action: SPRWS
Cooperators: SWCD, CROW, NRCS, BWSR, landowners
Timeline: 2008 - 2009
Estimated Cost: In-kind staff time
Goal Achieved: Areas of erosion will be analyzed for their capacity to produce sediment and the likelihood of that sediment entering the River.

MEASURE B-2-2: Promote continuous CRP signup for buffers along priority streams, ditches and wetlands.

Source of Action: SPRWS
Cooperators: SWCD, NRCS, LGU, WD, WMO
Time Frame: 2008 and on going
Estimated Cost: In-kind staff time
Goal Achieved: Highly erodible lands will maintain cover, reducing sediment run-off to the River and decreasing turbidity and suspension of nutrients.

MEASURE B-2-3: Establish a funding mechanism and provide supplemental funding to existing programs to establish grass buffer strips in areas identified as priority in the watersheds.

Source of Action: SPRWS
Cooperators: SWCD, CROW, NRCS, BWSR, landowners
Timeline: 2009 - 2011
Estimated Cost: $100,000 per year for three years
Goal Achieved: Sediment reduction from buffers will decrease the TSS within the River system.

OBJECTIVE B-3: LAND OWNERS WITHIN THE PRIORITY AREAS WILL UNDERSTAND THE POTENTIAL IMPACT OF TURF MANAGEMENT TO THE RIVER SYSTEM.

MEASURE B-3-1: Send turf management educational information to land owners located within the riparian areas of the SWP Area.

Source of Action: SPRWS

Cooperators: UMRSWPP, MRWA, MDH, landowners

Timeline: Every two years, starting in 2008

Estimated Cost: $4,000

Goal Achieved: Land owners within the SWP Area will have a better understanding of source water protection and the connection between their own land use and the quality of the drinking water.

OBJECTIVE B-4: PROMOTE PROPER DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE THROUGH INCENTIVE AND EDUCATION.

MEASURE B-4-1: Insert "Upper Mississippi River Source Water Protection Project" information in utility billings.

Source of Action: SPRWS

Cooperators: UMRSWPP

Time Frame: Every other year, starting in 2008

Estimated Cost: $4,000 plus in-kind time

Goal Achieved: Land owners within the SWP Area will gain an understanding of cause / effect of their disposal of household hazardous wastes.

MEASURE B-4-2: Support Household Hazardous Waste collection days through notification of land owners of the dates.

Source of Action: SPRWS

Cooperators: UMRSWPP

Timeline: Annually

Estimated Cost: $2,000, In-kind time, printing costs

Goal Achieved: Land owners will have the opportunity to properly dispose of contaminants that might otherwise reach the drinking water supply.

MEASURE B-4-3: Work with Watershed Districts and Water Management Organizations in designing school programs on household hazardous waste.

Source of Action: SPRWS
Cooperators: UMRSWPP, WD, WMO, LWMP
Timeline: 2008 - 2011
Estimated Cost: $6,000 (Grant, cash and in-kind)
Goal Achieved: Understanding of the need for proper use and disposal of household hazardous waste will become a lifestyle for the school-age generation. Education may "trickle-down" to parents.

OBJECTIVE B-5: WORK TO ELIMINATE KNOWN IMPAIRMENTS ALONG THE RIVER SYSTEM AND WITHIN THE SWP AREAS OF SPRWS.

MEASURE B-5-1: Elevate the priority of addressing impaired waters within the SWP area for SPRWS.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, LGUs, WDs, WMO
Time Frame: 2008, on-going
Estimated Cost: In-kind time
Goal Achieved: Implementation dollars to mitigate impaired waters can be used to address the same issues listed within this plan.

C. AGRICULTURE MANAGEMENT PRACTICES

OBJECTIVE C-1: INVENTORY THE PERTINENT NON-POINT CONTAMINANT SOURCES (FEEDLOTS AND MANURE MANAGEMENT) LOCATED WITHIN THE SWP AREA.

MEASURE C-1-1: Delineate a focus area that would allow for direct conveyance of contaminants to the Mississippi River and its tributaries.

Source of Action: SPRWS
Cooperators: UMRSWPP SRWD, CROW, SWCD, NRCS, MPCA
Timeline: 2008
Estimated Cost: In-kind staff time
Goal Achieved: Create a manageable area for focus of limited resources.

MEASURE C-1-2: Develop a protocol to conduct an accurate contaminant source inventory and determine which potential contaminants are important to include – such as feedlots and slurry storage.

Source of Action: SPRWS

Cooperators: County Feedlot Managers, MPCA, SWCD, NRCS, WD, WMO

Time Frame: 2008

Estimated Cost: In-kind staff time

Goal Achieved: Prioritization of unmanageable volume of listed PCSI data to contaminants most likely to affect the drinking water resource.

MEASURE C-1-3: Conduct contaminant source inventory of determined potential contaminants within the designated area.

Source of Action: SPRWS

Cooperators: County Feedlot Managers, MPCA, SWCD, NRCS, WD, WMO

Timeline: 2009 - 2010

Estimated Cost: $30,000 (Grant, Cash, and In-kind)

Goal Achieved: Non-point contaminant sources will be inventoried and assessed for potential impact to the drinking water resource. Limited implementation funding will be utilized for maximum impact.

MEASURE C-1-4: Promote the Conservation Reserve Enhancement Program (CREP) in the SRWD and other identified areas of concern.

Source of Action: SPRWS

Cooperators: UMRSWPP, CROW, SWCD, NRCS

Timeline: 2008 - 2016

Estimated Cost: $3,000 and In-kind staff time

Goal Achieved: Allow land to be preserved with deeply rooted vegetation or buffers and/or large tract conservation. Support local conservation groups – Pheasants Forever.

MEASURE C-1-5: Supplement existing programs to provide further incentives to land owners for set aside programs or buffer strip installations in designated priority areas.

Source of Action: SPRWS
Cooperators: County Feedlot Managers, MPCA, SWCD, NRCS, WD, WMO
Time Frame: 2008 - 2012
Estimated Cost: $200,000 (Grant, Cash, and In-kind)
Goal Achieved: Education, incentive and assistance will mitigate potential problems from improper manure management.

OBJECTIVE C-2: REDUCE AGRICULTURAL CHEMICAL USAGE IN AREAS WHERE RUNOFF AND/OR INFILTRATION TO THE AQUIFER ARE A CONCERN THROUGH EDUCATION AND INCENTIVE PROGRAMS.

MEASURE C-2-1: Work with University Extension educators and NRCS to develop and perform workshops on proper Chemigation practices.

Source of Action: SPRWS
Cooperators: Extension, NRCS, SWCD, LGU, WD, WMO
Timeline: 2008 and on-going as needed
Estimated Cost: In-kind staff time
Goal Achieved: A balance will be met between the need for chemicals in row crop farming and the need to protect the drinking water resource.

D. TRANSPORTATION CORRIDOR AND SPILLS MANAGEMENT PRACTICES

OBJECTIVE D-1: DEVELOP AN EARLY WARNING SYSTEM FOR WITHIN THE EIGHT-HOUR TIME OF TRAVEL AREA.

MEASURE D-1-1: Identify potential spill sites of concern to the intake station.

Source of Action: SPRWS
Cooperators: UMRSWPP, RDN, DNR, USGS
Time Frame: 2008 - 2011
Estimated Cost: $40,000 (Grant, cash and in-kind)
Goal Achieved: Identify the contaminant sources of greatest concern to the SPRWS intake station.

MEASURE D-1-2: Prepare a public water supplier spills notification protocol for use by the State Duty Officer, MPCA, other governmental entities and responsible parties.

Source of Action: SPRWS

Cooperators: UMRSWPP, RDN, MDPS, owners of facilities identified as contaminant sources

Time Frame: 2008 - 2011

Estimated Cost: In-kind staff time

Goal Achieved: Improve the effectiveness and timeliness of notification of public water suppliers in the event of an upstream contaminant release.

OBJECTIVE D-2: UPDATE TRAINING OF FIRST RESPONDERS ON THE MISSISSIPPI RIVER TO MAINTAIN SPILL RESPONSE PREPAREDNESS.

MEASURE D-2-1: Work with MPCA to identify priorities regarding the first responder update training.

Source of Action: SPRWS

Cooperators: UMRSWPP, RDN, MPCA, First Responders

Time Frame: 2008 - 2011

Estimated Cost: $2,000 plus In-kind staff time

Goal Achieved: First responder training will be updated to incorporate new priorities, including the eight-hour time-of-travel for the SPRWS SWPA.

MEASURE D-2-2: Cooperate with MPCA in the first responder update training, emphasizing special needs in protecting the intake station.

Source of Action: SPRWS

Cooperators: RDN, MPCA, First Responders

Time Frame: 2009 - 2012

Estimated Cost: In-kind staff time

Goal Achieved: First responders will develop an understanding of the need to protect the surface water intake and the urgency of protecting the eight-hour time-of-travel.

OBJECTIVE D-3: UPDATE MISSISSIPPI RIVER DEFENSE NETWORK DATA BASES WITHIN THE HIGHEST PRIORITY SWP AREA.

MEASURE D-3-1: Advise UMRSWPP staff of RDN data resources.

Source of Action: SPRWS
Cooperators: UMRSWPP, RDN
Time Frame: 2008 - 2011
Estimated Cost: $6,000 (Grant, cash and in-kind)
Goal Achieved: Improve the quality of RDN data within the high-priority source water protection area.

OBJECTIVE D-4: EVALUATE THE PLACEMENT, CONDITION AND NEED FOR REPLACEMENT OF MISSISSIPPI RIVER DEFENSE NETWORK SPILL RESPONSE EQUIPMENT.

MEASURE D-4-1: Review with first responders the condition of spill response equipment.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, RDN
Time Frame: 2008
Estimated Cost: In-kind staff time
Goal Achieved: Determine the status of existing RDN spill response equipment.

MEASURE D-4-2: Review with water suppliers the location of cached spill response equipment relative to their intake protection needs.

Source of Action: SPRWS
Cooperators: UMRSWPP, RDN
Time Frame: 2008
Estimated Cost: In-kind staff time
Goal Achieved: Determine the adequacy of existing spill response equipment locations to protect SPRWS's intake station.

MEASURE D-4-3: Assist MPCA as necessary in obtaining replacement and new spill response equipment.

Source of Action: SPRWS
Cooperators: UMRSWPP, RDN
Time Frame: 2008 - 2011
Estimated Cost: In-kind staff time
Goal Achieved: Maximize the capacity to protect Mississippi River surface water intakes in the event of an upstream contaminant release.

E. COMMERCIAL AND INDUSTRIAL MANAGEMENT PRACTICES

OBJECTIVE E-1: TRAINING, EDUCATION AND REGULATION OF ABOVE AND BELOW GROUND TANK OWNERS.

MEASURE E-1-1: Work with the MPCA to sponsor a training session locally for tank owners in the SWP Area.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, tank owners
Timeline: 2008 and on-going as necessary
Estimated Cost: $1,000 plus In-kind by cooperators
Goal Achieved: Education of owners in SWP Area, potential for contamination of drinking water resource and proper tank maintenance and practices.

MEASURE E-1-2: Assist regulated tank owners with leak detection and record keeping.

Source of Action: SPRWS
Cooperators: MPCA, tank owners
Timeline: 2008, and on-going
Estimated Cost: In-kind by cooperators
Goal Achieved: Education of owners in SWP Area, potential for contamination of drinking water resource and proper tank maintenance and practices.

MEASURE E-1-3: For all above ground storage tanks, encourage proper monitoring of secondary contaminant for cracks and early detection of leaks and notify the tank owner of any leaks, etc., to ensure that proper repair and clean-up occurs.

Source of Action: SPRWS
Cooperators: MPCA, owners, LGU, watershed groups, State Agencies
Time Frame: 2008 - 2012
Estimated Cost: In-kind by MPCA
Goal Achieved: Assure structural integrity of secondary confinement systems.

MEASURE E-1-4: Work with the appropriate authorities to enact and enforce requirements for underground and above ground storage tanks not regulated by local, county or state agencies.

Source of Action: SPRWS
Cooperators: LGUs, MPCA, owners
Time Frame: 2009 - 2016
Estimated Cost: In-kind by staff
Goal Achieved: Assure structural integrity of unregulated tanks.

MEASURE E-1-5: Make grant and/or loan funds available for above ground storage tanks without secondary containment.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGUs, MPCA, owners
Time Frame: 2009 - 2016
Estimated Cost: $15,000 per year for 8 years
Goal Achieved: Provide incentives for secondary confinement, protecting the drinking water resource from spill runoff.

MEASURE E-1-6: Work with the appropriate authorities to monitor and mitigate LUST sites to prevent contamination from entering the River system.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGUs, MPCA, owners
Time Frame: 2008 - 2016
Estimated Cost: In-kind by staff
Goal Achieved: Track impacts of LUST and assure clean-up of contaminants.

OBJECTIVE E-2: PROMOTE EDUCATION AND PROPER DISPOSAL OF COMMERCIAL HAZARDOUS WASTE IN THE SWP AREA.

MEASURE E-2-1: Locate and identify each Hazardous Waste Generator in the River corridor area and the remainder of Priority Area A.

Source of Action: SPRWS
Cooperators: MPCA, tank owners
Timeline: 2008 - 2010
Estimated Cost: In-kind by cooperators
Goal Achieved: Reduce or eliminate hazardous waste in the Mississippi River to protect public health and to reduce the cost of water treatment.

MEASURE E-2-2: Distribute hazardous waste pollution prevention information to Hazardous Waste Generators.

Source of Action: SPRWS
Cooperators: MPCA, owners
Time Frame: Every other year, starting in 2008
Estimated Cost: In-kind by MPCA, utilities
Goal Achieved: Education of owners in SWP Area regarding the potential for contamination of drinking water resource from their management practices.

MEASURE E-2-3: Work with local municipalities having regulatory authority to provide pollution prevention programs for Hazardous Waste Generators.

Source of Action: SPRWS
Cooperators: LGUs, owners
Time Frame: 2009, and on-going
Estimated Cost: In-kind by LGU, utilities
Goal Achieved: Empowerment, collaboration and incentive for LGUs to make management of Hazardous Waste Generators a priority.

OBJECTIVE E-3: MANAGE DUMP SITES THROUGH PERMITTING, EDUCATION AND ENFORCEMENT.

MEASURE E-3-1: Educate, encourage and assist LGUs in the establishment of comprehensive solid waste management programs.

Source of Action: SPRWS
Cooperators: MPCA, LGUs
Time Frame: 2008 - 2016
Estimated Cost: In-kind staff time
Goal Achieved: Assure proper solid waste disposal.

OBJECTIVE E-4: INVENTORY, ASSESS AND REGULATE EXISTING SALVAGE YARDS TO PROMOTE CLEAN-UP AND PREVENT FURTHER USE IN PRIORITY AREAS.

MEASURE E-4-1: Work with owners, LGUs and MPCA as liaison on regulation and enforcement of existing salvage yards that are known polluters.

Source of Action: SPRWS
Cooperators: LGUs, MPCA, salvage yard owners
Timeline: 2008 - 2016
Estimated Cost: In-kind by staff
Goal Achieved: Presentation of solutions and reaching a consensus toward a plan to clean up existing contaminant sites.

MEASURE E-4-2: Work with LGUs and MPCA to explore funding to assist salvage yard owners in clean up of contaminants.

Source of Action: SPRWS
Cooperators: MPCA, LGUs
Time Frame: 2008 - 2016
Estimated Cost: In-kind staff time and grand dollars as available
Goal Achieved: Cost assistance to salvage yard owners to provide clean-up.

OBJECTIVE E-5: INVENTORY AND ASSESS FOR POTENTIAL IMPACT TO THE DRINKING WATER SUPPLY ALL PERMITTED SOLID WASTE SITES IN PRIORITY AREAS.

MEASURE E-5-1: Work with owners, LGUs and MPCA as liaison on regulation and enforcement of existing solid waste sites that are known polluters.

Source of Action: SPRWS
Cooperators: LGUs, MPCA, salvage yard owners
Timeline: 2008 - 2016
Estimated Cost: In-kind by staff
Goal Achieved: Presentation of solutions and reaching consensus toward a plan to clean up existing contaminant sites.

MEASURE E-5-2: Work with LGUs and MPCA to establish funding to assist owners.

Source of Action: SPRWS
Cooperators: MPCA, LGUs
Time Frame: 2008 - 2016
Estimated Cost: In-kind staff time
Goal Achieved: Cost assistance to solid waste owners to provide clean-up.

F. Well and Individual Sewage Treatment System (ISTS) Management Practices

Objective F-1: Determine impact of ISTS on the surficial drinking water supply in the Mississippi River.

MEASURE F-1-1: Inventory ISTS located within sandy, riparian areas and in heavy soils where surface contamination may have potential to run into the Mississippi River or its tributaries. Work with LGUs to educate and enforce existing regulations regarding non-compliant ISTS.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGU, MPCA, Local water suppliers
Time Frame: 2008 - 2012
Estimated Cost: In-kind staff time
Goal Achieved: Potential sources of contamination will be identified for upgrade.

MEASURE F-1-2: Mail "Septic System Owner's Guide" to property owners with ISTS residing within the determined priority areas.

Source of Action: SPRWS
Cooperators: UMRSWPP, LGU, MPCA, WD, WMO, Local water suppliers
Time Frame: 2008
Estimated Cost: $12,000 plus In-kind staff time
Goal Achieved: ISTS owners will gain an understanding of how their system works, needed maintenance to keep it working properly, and how to tell if it isn't working.

G. Data Collection and Analysis Management Practices

Objective G-1: Perform an inventory of Potential Contaminants of concern within the SWP Area.

MEASURE G-1-1: Review the PCSI within SWP areas and assess available data to establish needs for additional information.

Source of Action: SPRWS
Cooperators: UMRSWPP, MDH, MPCA
Time Frame: 2008 - 2009
Estimated Cost: $15,000 (Grant, Cash, and In-kind)
Goal Achieved: Existing data will be evaluated for usefulness and completeness.

MEASURE G-1-2: Delineate boundaries of highest priority areas of concern within the SWP areas through review of existing data.

Source of Action: SPRWS
Cooperators: MPCA, LGU, MDH
Time Frame: 2008 - 2011
Estimated Cost: $30,000 (Grant, Cash, and In-kind)
Goal Achieved: Prioritize areas within the SWP areas for concentration of efforts in areas of greatest potential to affect the drinking water resource.

MEASURE G-1-3: Describe needs for additional and refined data within SWP areas.

Source of Action: SPRWS
Cooperators: MDH
Time Frame: 2008 - 2011
Estimated Cost: $21,000 (Grant, Cash, and In-kind)
Goal Achieved: Identification of data needed to adequately assess the potential for contamination within the designated priority areas.

MEASURE G-1-4: Identify LGUs that have local data within the SWP areas and work with them to establish list of existing data available and incorporate it into the Plan.

Source of Action: SPRWS
Cooperators: MDH, LGUs
Time Frame: 2008 - 2011
Estimated Cost: $15,000 (Grant, Cash, and In-kind)
Goal Achieved: Establish working relationship with LGUs by sharing existing data and incorporating their data into Plan.

MEASURE G-1-5: Hire a Consultant and evaluate anticipated land and water use changes in the SWP areas.

Source of Action: SPRWS
Cooperators: MDH, LGUs
Time Frame: 2008 - 2010
Estimated Cost: $150,000 (Grant, Cash, and In-kind)
Goal Achieved: Provide UMRSWPP with information needed for future planning and potential areas for education and/or incentives.

OBJECTIVE G-2: DETERMINE METHODOLOGY ON PILOT SECTION OF THE MISSISSIPPI RIVER FOR MEASUREMENT OF GROUND WATER GAINS AND LOSSES.

MEASURE G-2-1: Perform an inventory of the potential contaminant sources based on the results of the groundwater gains and losses study.

Source of Action: SPRWS
Cooperators: UMRSWPP, MDH, USGS
Timeline: 2011 - 2012
Estimated Cost: $5,000 (In-kind)
Goal Achieved: Identification of contaminant sites.

MEASURE G-2-2: Implement appropriate educational efforts and BMPs as described earlier for the inventory of potential contaminant sources based on the groundwater gains and losses study.

Source of Action: SPRWS
Cooperators: UMRSWPP, MDH, USGS
Timeline: 2012 - 2017
Estimated Cost: $5,000 (Grant, Cash, and In-kind)
Goal Achieved: Education is needed to assist with preventing future events and forming collaborative relationships.

OBJECTIVE G-3: INVESTIGATE IMPAIRED WATERS LOCATED WITHIN THE SWP AREA TO DETERMINE THEIR IMPACT TO THE DRINKING WATER SUPPLY.

MEASURE G-1-4: Participate in the TMDL study process in SW protection priority areas of impaired waters along the Mississippi River.

Source of Action: City of St. Cloud
Cooperators: UMRSWPP, MPCA, LGUs, MDH, SRWD, SWCD
Timeline: 2008 and on-going
Estimated Cost: In-kind
Goal Achieved: Work collaboratively in cleaning up impaired areas of the River, utilizing the expertise and funding the TMDL program provides.

H. ADMINISTRATION

OBJECTIVE H-1: MRWA WILL WORK WITH LGUS AND SPRWS TO PROVIDE TECHNICAL ASSISTANCE IN PUBLIC INFORMATION AND DOCUMENTATION.

MEASURE H-1-1: SWP coordinator will provide fiscal management and overall coordination of contract with MRWA.

Source of Action: SPRWS
Cooperators: UMRSWPP, MRWA, MDH, LGU, WD, WMO
Timeline: 2008 - 2011
Estimated Cost: $8,000 (Grant, Cash, and In-kind)
Goal Achieved: Fiscal responsibility for grant dollars and assurance that required elements are completed.

OBJECTIVE H-2: IMPLEMENTATION OF SWPP WILL OCCUR WITH PRIORITIZATIONS FOLLOWED, REGULAR MEETINGS OF THE TEAM AND REPORTING AND ACCOUNTING FOR GRANT FUNDS.

MEASURE H-2-1: Prepare project progress reports, work plan amendments and final report to MPCA.

Source of Action: SPRWS
Cooperators: Consultant, MDH, MPCA
Timeline: 2008 - 2011
Estimated Cost: $12,000 (Grant, Cash, and In-kind)
Goal Achieved: The Implementation Plan will be followed, the terms of the grant will be adhered to and fiscal accountability will occur.

MEASURE H-2-2: Produce technical documents and reports on project activities for reporting purposes.

Source of Action: SPRWS
Cooperators: UMRSWPP, MPCA, MDH
Time Frame: 2008 - 2011
Estimated Cost: $6,000 (Grant, Cash, and In-kind)
Goal Achieved: Preparation of project documents as needed in the course of the project for use by project sponsors and partners in decision making and prioritization.

MEASURE H-2-3: Prepare project documents for broad distribution in a variety of formats.

Source of Action: SPRWS
Cooperators: MRWA, MDH, MPCA, LGU, WD, WMO
Timeline: 2008 - 2011
Estimated Cost: $6,000 (Grant, Cash, and In-kind)
Goal Achieved: Material will be collated in one central area and utilized on web page, in newsletters, summary documents and status reports.

MEASURE H-2-4: Prepare papers for presentation at conferences and other forums.

Source of Action: UMRSWPP
Cooperators: MRWA, MDH, MPCA, LGU, WD, WMO
Timeline: 2008 - 2011
Estimated Cost: $6,000 (Grant, Cash, and In-kind)
Goal Achieved: Consistent material will be available for presentations.

OBJECTIVE H-3: ESTABLISH A POSITION OF SWP COORDINATOR WHO WILL CONDUCT INITIATION OF ALL MANAGEMENT STRATEGIES FOUND IN THE PLAN, PROVIDE FISCAL ACCOUNTABILITY AND PROVIDE PROGRESS REPORTS AS REQUIRED.

MEASURE H-3-1: Plan and facilitate monthly project management meetings.

Source of Action: SPRWS
Cooperators: Consultant, UMRSWPP, MPCA, MDH, MRWA
Time Frame: 2008 - 2011
Estimated Cost: $25,000 (Grant, Cash, and In-kind)
Goal Achieved: Project continuity and accountability will occur with minutes and scheduled meetings.

MEASURE H-3-2: Coordinate the work of project staff and contractors on all project activities.

Source of Action: SPRWS
Cooperators: Consultant, UMRSWPP, MDH, MPCA, MRWA, LGU, WD, WMO
Timeline: 2008 - 2011
Estimated Cost: $15,000 (Grant, Cash, and In-kind)
Goal Achieved: Project continuity and accountability will occur.

MEASURE H-3-3: Serve as a liaison to agencies, LGUs and other groups.

Source of Action: SPRWS
Cooperators: LGU, WD, MRWA, MDH, WMO, MPCA
Timeline: 2008 - 2011
Estimated Cost: $15,000 (Grant, Cash, and In-kind)
Goal Achieved: One central source of information to eliminate multiple answers to the same questions.

MEASURE H-3-4: Project Coordinator will oversee all project administration.

Source of Action: SPRWS
Cooperators: MPCA, MDH
Timeline: 2008 - 2011
Estimated Cost: $30,000 (Grant, Cash, and In-kind)
Goal Achieved: All aspects of the existing grant will be coordinated by one person, with progress tracking, scheduling, budget and payment requests.

OBJECTIVE H-4: IDENTIFY POTENTIAL CONTAMINANTS AND THEIR SOURCES AND WORK WITH LGUS TO IMPLEMENT STRATEGIES IDENTIFIED IN THIS PLAN.

MEASURE H-4-1: Inventory and notify affected governmental units of Source Water Protection adoption.

Source of Action: SPRWS
Cooperators: MDH, LGU, WD, WMO
Time Frame: 2008 - 2011
Estimated Cost: $13,000 (Grant, Cash, and In-kind)
Goal Achieved: Local government agencies will develop an understanding of SWP and their opportunities for collaboration in the implementation of this Plan.

MEASURE H-4-2: Identify priority areas to implement SWP strategies through review of geographic areas and contaminants and evaluation of data provided by LGUs.

Source of Action: SPRWS
Cooperators: MDH, LGU, WD, WMO
Timeline: 2008 - 2011
Estimated Cost: $20,000 (Grant, Cash, and In-kind)
Goal Achieved: Local data and expertise will be utilized to determine actual areas of potential contamination.

MEASURE H-4-3: Identify local government partners to assist in the implementation of SWP strategies. Develop a relationship with them in the SWPA by jointly signing a memorandum of cooperation

Source of Action: SPRWS

Cooperators: LGU, WD, MRWA, MDH, WMO, MPCA

Timeline: 2008 - 2011

Estimated Cost: $16,000 (Grant, Cash, and In-kind)

Goal Achieved: Development of relationships locally to assist in working with local landowners and within the parameters of local regulations to assist in implementation of this Plan.

MEASURE H-4-4: Identify and develop BMPs appropriate for SWP, providing financial and in-kind assistance to LGUs for implementation of these practices.

Source of Action: SPRWS

Cooperators: UMRSWPP, DNR, BWSR, MDA, LGU, WD, WMO, MPCA, MDH

Timeline: 2008 - 2011

Estimated Cost: $130,000 (Grant, Cash, and In-kind)

Goal Achieved: Money and expertise for on-the-ground practices will be put in place to mitigate designated pollutants identified by LGUs and the UMRSWPP.

MEASURE H-4-5: Seek to establish a regular funding source for implementation of the SWPP.

Source of Action: SPRWS and UMRSWPP

Cooperators: MRWA, WD, WMO, LGU

Time Frame: 2008 – 2011 and on-going

Estimated Cost: $13,000 (Grant, Cash, and In-kind)

Goal Achieved: Money for continued implementation and study of the SWP Plan will be established on a long-term basis

MEASURE H-4-6: Establish broad endorsement of SWPP in adopted plans from Minnesota State Agencies, LGUs and Federal Agencies with prioritization of programs toward drinking water protection where appropriate.

Source of Action: SPRWS

Cooperators: LGU, MPCA, DNR, MDH, MDA, SWCD, USFWS

Timeline: 2008 - 2011

Estimated Cost: $2,000 (Grant, Cash, and In-kind)

Goal Achieved: By working locally and building outward to establish this area as high priority, protective measures and financial assistance will be more readily available.

MEASURE H-4-7: Work in cooperation with SWCD's Watershed to assist groundwater-based water suppliers with their Wellhead Protection Planning process in the project area.

Source of Action: SPRWS

Cooperators: MRWA, MDH, Local Water Suppliers

Timeline: 2008 - 2016

Estimated Cost: $8,000 (Grant, Cash, and In-kind)

Goal Achieved: Common contaminant issues will provide additional funding and assistance in mitigation.

CHAPTER SEVEN

EVALUATION PROGRAM

I. IDENTIFYING A STRATEGY TO EVALUATE THE EFFECTIVENESS OF MANAGEMENT STRATEGIES

The success of the SWP management strategies must be evaluated to determine whether the SWP Plan is effective. This evaluation will be conducted annually or when a Plan is amended. It will need to encompass the DWSMA, be based on the health risk the contaminant presents to the intake and specify the approach used. The following activities will be implemented to:

1. Track the implementation of the objectives identified in the previous section of this SWP Plan,
2. Determine the effectiveness of specific management strategies regarding the protection of the drinking water supply, and
3. Identify possible changes to these strategies, which may improve their effectiveness.

This evaluation will be used to focus the selection of management strategies in subsequent amendments of the SWP Plan.

CHAPTER EIGHT

ALTERNATIVE WATER SUPPLY / CONTINGENCY STRATEGY

I. PREPARING THE CONTINGENCY STRATEGY FOR AN ALTERNATIVE WATER SUPPLY

Public water suppliers have developed an approved "Water Conservation Plan" with the DNR. A current copy of the DNR approval letter can be found in **Appendix VII** of this Plan.

The "Water Conservation Plan" is available for review, contact:

John F. Blackstone, P.E.
Source Water Protection Manager
Saint Paul Regional Water Services
1900 Rice Street
Saint Paul, Minnesota 55113
651-266-6324
john.f.blackstone@ci.stpaul.mn.us

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix I

Potential Concerns Scoping Document

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix II

Composite Soils in Drinking Water Source Management Area

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix III

Potential Contaminant Source Inventory

June 10, 2010

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix IV

Minnesota Department of Natural Resources Appropriation Permits –
State Water Use Data System

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix V

Consumer Confidence Report

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix VI

Upper Mississippi River Source Water Protection Project
Well Head Protection Areas Map

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix VII

Minnesota Department of Natural Resources Water Emergency and Conservation Plan Letter

June 10, 2010

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix VIII

References

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix IX

Comments

June 10, 2010

Deleted: DRAFT

SAINT PAUL REGIONAL WATER SERVICES

SOURCE WATER PROTECTION PROJECT

Appendix X

Public Hearing
and
Board Resolutions

June 10, 2010

Deleted: DRAFT

Surficial Hydrology within the Priority Area A SPRWS Source Water Protection Area

Figure Six