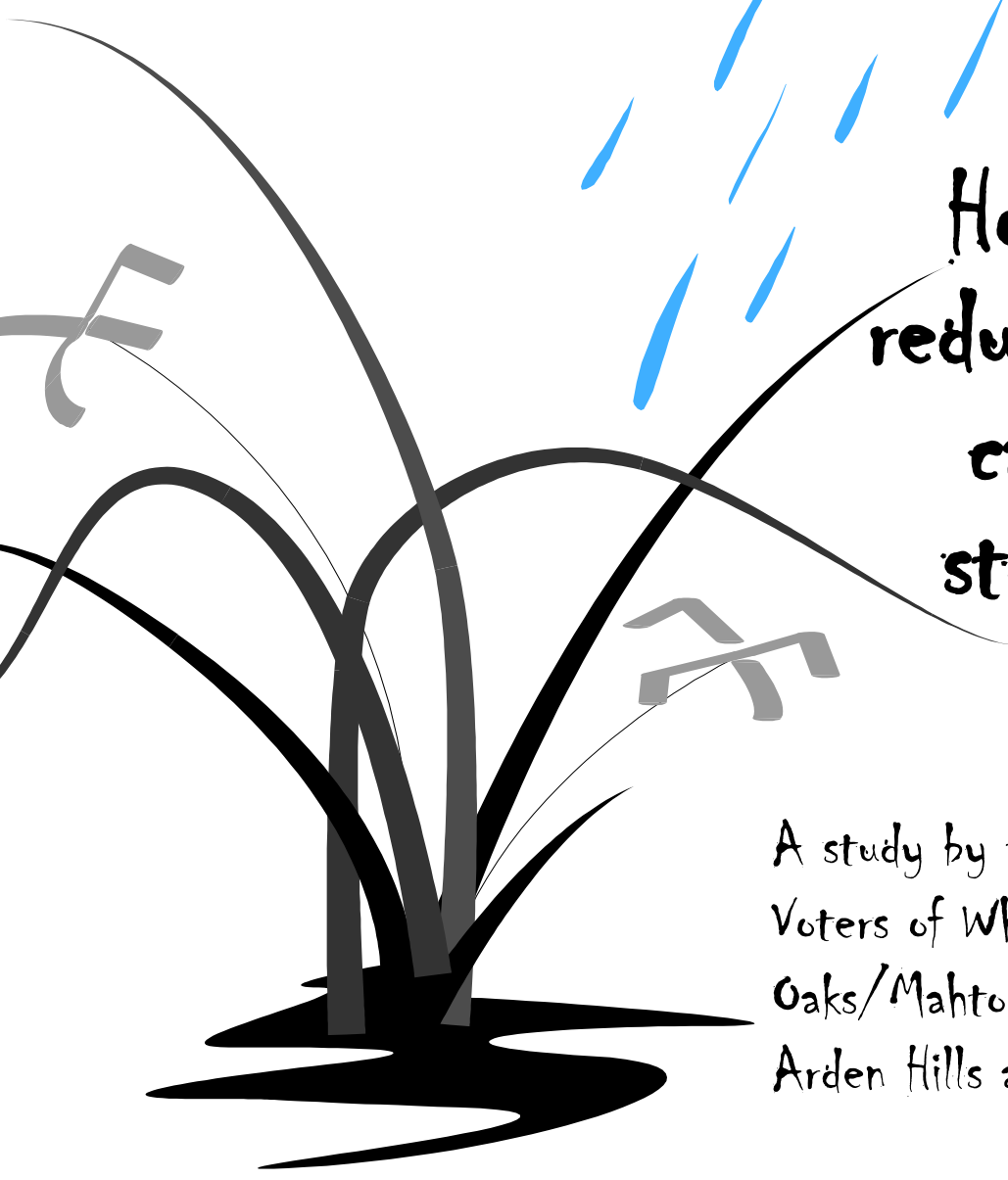


PROTECTING MINNESOTA LAKES, STREAMS AND WETLANDS



How we can
reduce pollution
carried by
storm water

A study by the League of Women
Voters of White Bear/North
Oaks/Mahtomedi Area including
Arden Hills and Shoreview

Achieving the state's water quality goals will require long-term commitment and cooperation by all state and local agencies, and other public and private organizations and individuals, with responsibility and authority for water management, planning, and protection.

-Minnesota Legislature, 2006

PROTECTING MINNESOTA LAKES, STREAMS AND WETLANDS

Facts and Concepts

**A study by the League of Women Voters
of White Bear/North Oaks/Mahtomedi Area
including Arden Hills and Shoreview**

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Made possible by a grant from the League of Women Voters Minnesota Education Fund.

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Introduction

THE LEAGUE OF WOMEN VOTERS OF WHITE BEAR/ NORTH OAKS/ MAHTOMEDI AREA, INCLUDING SHOREVIEW AND ARDEN HILLS in May of 2007 authorized a study of

- (1) the purity of lakes and streams in the geographic area of its membership and
- (2) steps that could be taken to reduce water pollution.

Immediately coming to their attention was the critical role played by municipal governments in the protection of surface waters. Although the study concentrates on municipalities of the area, * the information obtained is pertinent to other municipalities in Minnesota. It also is pertinent to counties, government agencies, colleges and other entities having responsibility for managing water that drains into lakes, streams and wetlands.

The study assumes that efficient sewage treatment plants are in operation and that, in urban areas, storm sewers have been constructed in addition to sanitary sewers. The two types of sewers are not to be confused. Storm sewers refer to rain water. On the other hand, sanitary sewers carry household and industrial waste. A century ago there was just one type of sewer, and it carried both waste and rainwater. As storm sewer systems were built, the State of Minnesota developed a process of granting permits for their operation.

Recognizing that rainwater carries pollutants into storm sewers and storm sewers direct their output into lakes, streams and wetlands the committee's focus became a study of the management of runoff by municipalities in the process of urban development and in the maintenance of streets and storm sewers. For this purpose the LWV used public documentation submitted by municipalities to the Minnesota Pollution Control Agency (MPCA). These are reports on the "Storm Water Pollution Prevention Program" (SWPPP) of each municipality.

Most importantly, the study committee also explored new and more natural methods of purifying storm water. They decrease the amount of water entering storm sewers and increase the amount filtering into the ground.

Mercury pollution that afflicts many Minnesota lakes should not be ignored, even though the major source is airborne in chemicals and particulates from coal burning power plants. These emissions of course, cannot be influenced at the local level. However, this pollution is deposited everywhere, then is washed by rain from roofs and yards onto streets and then into lakes and streams via storm sewers where it is concentrated. Hence, mercury is a concern that is local as well as national.

Traditionally Americans assumed that water was infinite and self-cleaning. The unique ability of wetlands and other landscape to purify water was neither understood nor appreciated.

* Going from east to west, the municipalities are Grant, Mahtomedi, Willernie, Dellwood, Hugo, Birchwood, White Bear Lake, White Bear Township, Lino Lakes, Gem Lake, Vadnais Heights, North Oaks, Shoreview and Arden Hills.

Historical Background and Legislative Action

Traditionally Americans assumed that water was infinite and self-cleaning. The unique ability of wetlands and other landscape to purify water was neither understood nor appreciated. Over decades vast expanses of wetlands were drained to create more farmland. Untreated sewage was dumped into waterways from city sewage pipes and factories. Gradually, in some locations, sewage treatment plants were built to lessen the pollution of rivers. As time went on increasing amounts of natural landscapes were turned over to hardscape for residential areas, commercial buildings, streets, roadways and parking lots. Rainwater, of course, drained from streets into sewers and mixed with raw sewage.

The Clean Water Act requires that all states test their water bodies for pollutants and determine whether they are “impaired” for their designated uses.

U.S. Clean Water Act. In 1972 pollution caused the surface of the Cuyahoga River to catch fire, and fisheries throughout Chesapeake Bay to be decimated. Congress quickly responded to these disasters with the Clean Water Act. This federal Act established a floor below which water quality should not decline: it must be able to sustain a fish population. Higher standards were set according to the use of the water: drinking, swimming, or recreation. The Act is administered by the U.S. Environmental Protection Agency.

The Act in Phase I focused on “point-source pollution,” that is, pollution at the “end of the pipe” where water from a pipe discharges into a body of water. The National Pollution-Discharge Elimination System (NPDES) was set up, and under its rules permits were issued to construct and operate sewage treatment plants, which resulted in improvements in, and greater numbers of, these facilities. These efforts were effective. Yet ongoing studies of water purity called for further measures, as did the fact that unusually heavy rains overwhelmed the capacity of treatment plants and sent raw sewage into rivers. Also, in low-lying residential areas heavy rains could result in a backup of sewage into basements. Separating storm water sewers from sanitary sewers was an obvious need. This costly operation was done in many parts of the country including Minneapolis and St. Paul. Federal money for sewer separation was available up to the mid-1990s, and local bonds were also used for the program.

Phase II of the Clean Water Act came in 1999 and emphasizes “non-point pollution,” which originates in multiple places along a waterway or lake such as farm feedlots and fertilized lawns. The EPA granted the Minnesota Pollution Control Agency (MPCA) authority to implement and oversee the National Pollution Discharge Elimination System (NPDES) in Minnesota.

In addition, the Clean Water Act requires that all states test their water bodies for pollutants and determine whether they are “impaired” for their designated uses (drinking, fishing, swimming and recreation) and what the specific pollutants are. The list of “impaired waters” in the United States is published annually. Although in 2007 only 14 percent of bodies of water in Minnesota had been tested by the MPCA, findings indicated that two out of every five (40 percent) were impacted by one or more pollutants, some by many. In the Metropolitan Area about 170 lakes and 180 other waters were classified as “impaired.”

In Minnesota the Clean Water Legacy Act (CWLA), passed in 2006 and administered by the MPCA, furthers the goals of the federal Clean Water Act. It

provides limited funding for water quality testing and cleanup. Quoting Minnesota Statute 114 D.15 the CWLA's purpose is to "maintain water quality standards for surface waters as required by section 303(d) of the federal Clean Water Act"

The legislature finds that:

- (1) there is a close link between protecting, restoring, and preserving the quality of Minnesota's surface waters and the ability to develop the state's economy, enhance its quality of life, and protect its human and natural resources;
- (2) achieving the state's water quality goals will require long-term commitment and cooperation by all state and local agencies, and other public and private organizations and individuals, with responsibility and authority for water management, planning, and protection; and
- (3) all persons and organizations whose activities affect the quality of waters, including point and nonpoint sources of pollution, have a responsibility to participate in and support efforts to achieve the state's water quality goals.

To repeat, the Clean Water Legacy Act is administered by the MPCA. This agency then acts through local units of government, particularly municipalities, and also can act through other agencies. In administering the law, MPCA requires that municipal governments in urbanized areas apply for permits to construct and operate a system of storm water management, adhering to the requirements of the National Pollution-Discharge Elimination System.

The Great Outdoors and Heritage Amendment to the Minnesota Constitution.

Since 2001 there has been a drop in money expended or to be expended by the State for the primary departments and agencies dedicated to conservation of the environment. In the past, particularly in 2003, state funds holding money for environmental work were used for other purposes. Furthermore, only about an eighth of lottery profits go to the environment, although ads suggest otherwise. To assure funding would be more secure voters approved the Amendment to the Constitution at the General Election of 2008. It provides ongoing funding for the environment and the arts through a 3/8 of a cent sales tax. One third of the tax collected will go to forests, wetlands and other wildlife habitat; one third for cleanup and protection of rivers, lakes and streams. The other third is divided among parks-and-trails and the arts, art education, state history and cultural heritage. In the spring of 2009 "legislators appropriated the first \$300 million on projects ranging from a permanent conservation easement on northern forest land to grants for civics education." ¹

Although in 2007 only 14 percent of bodies of water in Minnesota had been tested by the MPCA, findings indicated that two out of every five (40 percent) were impacted by one or more pollutants, some by many.

¹ Editorial, *St. Paul Pioneer Press*, "A bad end to the session but a good start on conservation", 6/7/2009

Improvements in Handling Storm Water

One of the primary needs for sewers was flood control, which has been achieved so well it is taken for granted. Today even intense rainfall, if not of long duration, is quickly led off with little inconvenience to the population. There also has been an ongoing evolution of methods to manage storm water in preventing pollution from reaching our wetlands, lakes, streams and rivers. Four practices have been devised, each one building in some way on an earlier design.

(1) The Use of Separate Storm Sewers and Ponds

Sewer separation was discussed above under the U.S. Clean Water Act, Phase I.

Ponds, along with storm sewers, were constructed in appropriate places to hold the runoff and allow it to infiltrate, sinking into the ground. While very helpful, ponds lose their permeability after a time. A pond's life span as a filtration mechanism is only 10 to 20 years. Thus, Public Works Departments must send in their backhoes and trucks periodically to clean out the ponds and restore their usefulness. When municipalities do not own land abutting a pond, easements are placed on certain lots. Residents who are not aware of such easements may plant gardens in the way, etc. resulting in stressful situations.

(2) Advanced Engineering Methods for Storm Sewers

New ways of constructing and maintaining storm sewers have been developed and are continually refined by engineers and scientists to lessen the impact on bodies of water. For small spaces below grade, chambers of various designs are used. Large storm sewer pipes that are porous across the bottom are sometimes used so that water can seep out and be filtered by the sand below. Certain devices are installed to stop or slow the movement of silt and sand into or through the pipes. Manual shoveling out of large pipes or use of vacuum trucks* to clean pipes and various appliances, along with frequent sweeping of streets, are essential for the system to function well.

Storm sewer pipes dump water into ponds, lakes, rivers and perhaps into wetlands. The quality of the water at the outfall can be monitored, but this is labor-intensive. When it begins to rain someone must take samples of the water at or near each storm sewer outfall and continue to do so during the rain. Significantly, *the first one-half inch of rain washes the largest proportion of pollution into the system of pipes.*

(3) The Use of Pipes Augmented by Other Efforts

Even when storm sewers are present, water containing pollutants continues to run into lakes and streams. Important sources of contaminants are sites of development and redevelopment. Improved grounds keeping, such as preventing erosion from each development site and cleanup of junk and spills, lessens pollution and can be required by the municipality. The same applies to property owned by the municipality.

* The City of White Bear Lake uses a new vacuum truck and other advanced technologies.

All persons and organizations whose activities affect the quality of waters, including point and nonpoint sources of pollution, have a responsibility to participate in and support efforts to achieve the state's water quality goals.

-Minnesota
Legislature, 2006

While all these efforts were being made, new real estate developments—of traditional kinds—were replacing the natural environment with non-permeable surfaces (roofs, roads and parking lots) and less permeable surfaces (lawns) across large stretches of land. Thus, development increases the volume of water in storm sewers, volume correlating roughly with the extent of development. Once again testing of lakes and streams showed diminished water quality. Scientists and public and private environmental groups recognized that we should attempt to return to nature’s way of cleaning water by allowing it to filter through the ground.

(4) Reduction in the Volume of Water Runoff / Low Impact Development

On January 17, 2008 the U.S. Environmental Protection Agency (EPA) released a comprehensive plan to reduce runoff called “Managing Wet Weather with Green Infrastructure Action Strategy 2008.”² The EPA produced the plan in cooperation with American Rivers, the Association of State and Interstate Water Pollution Control Administrators, the National Association of Clean Water Agencies, the Natural Resources Defense Council and the Low Impact Development Center. The plan explains how various levels of government and private organizations and enterprises can bring low impact development practices into mainstream use for environmentally responsible management of runoff and sewer overflow. The plan offers better site design standards.

In Low Impact Development (LID) impermeable surfaces are kept to a minimum. Roads and parking lots are reduced in size. Green roofs, rain gardens, vegetated swales and porous pavement are very important in the better site design standards because they allow water to filter into the ground. Downspouts on houses and buildings can direct water onto lawns, gardens, and into rain barrels. Storm water can also be recycled for other uses.

When a high volume of water courses across the ground—even if it carries little pollution—the volume magnifies the amount of nutrients, sediment and bacteria that eventually reaches bodies of water. This alters the hydrology and the conditions for plant and animal life. Therefore, it is essential to increase the amount of water filtering into the ground and decrease our dependence on storm sewers. This is much easier said than done. It is most difficult and expensive in already developed areas and least complicated and costly in new developments. It is not always possible. Filtration areas must have an elevation well above bodies of water, and the soil must not contain much clay; sandy soil is ideal.

Most rains, about 90 percent of them, result in no runoff because rainfall is light allowing water to evaporate or sink into the ground where water-borne pollutants are filtered by soil, sand and gravel and broken down by plants and microbes. When rain is heavier there is a great difference between areas left in their natural state and those that are developed. In the natural state 50 percent of rainfall infiltrates the ground, about 40 percent or less evaporates, and only 10 to 15 percent runs off. In built-up areas the opposite occurs. The same or more evaporation occurs, but only 10 percent or so filters into the ground. This means that half of the rain runs off and enters storm sewers.

Scientists and public and private environmental groups recognized that we should attempt to return to nature’s way of cleaning water by allowing it to filter through the ground.

² <http://cfpub.epa.gov/npdes/greeninfrastructure.information.cfm>

Obviously infiltration is very helpful for decreasing pollution in our lakes and rivers. Additionally, infiltration holds the water back from flowing down the great rivers to the ocean. It also recharges aquifers that can be tapped by wells. Unfortunately, the level of aquifers under the Twin Cities Metropolitan Area has been dropping for many years. During that period the regions of aquifer recharge, some of which lie in the northeast Metropolitan Area, have seen a decrease in pervious land due to development.



The goal of Low Impact Development is to allow at least the first half inch of rain to sink into the ground where roots, soil and sand filter out impurities. Research and experience have shown that rain gardens and grassy swales (low areas of land where water collects) provide effective infiltration. Blocks of permeable cement can be used for sidewalks, parking lots and streets. They have been used successfully in winter climates but may not be durable under heavy traffic and snow plow use. They cannot be used, however, if funding for the project is obtained from the Minnesota Department of Transportation. In addition, less area can be given to roadways and parking lots, and buildings can be designed with reduced roof area.

It is worth noting that the City of Burnsville conducted an experiment in storm water management. Two neighborhoods that are similar in many respects suffered from intermittent flooding. Their storm sewer systems directed water into Lake Crystal. In one neighborhood curb cuts were made that allowed water to run from the street into newly created rain gardens on residential property, and grassy swales were constructed in some of the back yards—all with the consent and cooperation of residents. In the other neighborhood the storm sewer system was extended and improved. The result was that during and after heavy rains the pre-existing storm sewer pipes carried very little water to the Lake from the neighborhood with curb cuts, etc. while water gushed into the Lake where low impact development was not used. The residents with rain gardens and swales were the most satisfied.

The Rice Creek Watershed District webpage on the subject of STORMWATER INFILTRATION states:

“Developers benefit from reduced pipe size and cost. Cities and residents benefit from reduced frequency and duration of flooding and improved water quality. . . . The environment benefits because infiltration duplicates ‘natural’ rainfall absorption mechanisms, better mimics natural groundwater stream baseflow relationship, traps pollutant, slows runoff velocities, sustains base flows, and protects aquatic organisms from high turbulent flows.”

Permits and Enforcement Regarding Storm Sewers

While permits are issued by state agencies, the U.S. EPA is the source of the permitting process regarding management of storm water runoff by municipalities through the use of storm sewers. The requirements for permits are defined by the National Pollution Discharge Elimination System (NPDES), and permits issued by the Minnesota Pollution Control Agency must be in compliance with federal requirements.

The application made by each municipality describes in detail how it will manage the entire city area's storm water, that is, its Storm Water Pollution Prevention Program (SWPPP). Ponds, street sweeping, erosion control and even low impact development may be included in the application. The Program deals largely with water from rainstorms and snow melt and also to a smaller degree from homeowner uses of water such as for car washing. All Minnesota cities in urbanized areas are required to apply to the MPCA for a permit to discharge runoff through pipes from rains and snow melt into a lake, stream or other body of water. In Minnesota the first permit was written in 2003 and was called the MS4 General Permit. (MS4 refers to Municipal Separated Storm Sewer System.)

Certain other cities and entities also must apply. Cities not in an urban area that have population over 10,000 must apply and also those with populations of 5,000 to 10,000 if their discharge contributes to an existing impairment of a body of water, such as the Minnesota River. The MS4 owner can be a city, county, government agency, college or university, or another entity having ownership of operational responsibility for a system of storm sewers.

The General Permit includes a broad goal of reducing pollution. No measurable reductions are required. However, the MPCA commissioner can impose conditions deemed necessary.

In 2003 a private organization, the Minnesota Center for Environmental Advocacy, sued MPCA for not including important federal EPA requirements. This resulted in the requirement that all MS4s renew their permits. Permits are granted for five years, and annual SWPPP reports summarize compliance by the municipality.

Since the lawsuit by the MCEA all SWPPP reports must be placed on public notice prior to any permit being granted, extended or amended. The public notice gives residents opportunity to make written comments and suggestions and even request that MPCA hold a public meeting where residents can ask questions regarding the handling of storm water. The City of White Bear Lake is one of two municipalities in the state where such a meeting has been held.³ The MPCA can, and occasionally will, negotiate mutually agreeable changes to the permit before approval.

³ The City of White Bear Lake sent its MS4 application to the MPCA in late August 2007. During the Public Notice Period residents requested a meeting under the new law. It was held on December 10, 2007. Subsequently, meetings were held by the MPCA with White Bear Lake city staff, watershed districts and interested community members.

Before new construction can occur under the General Permit, each proposed construction project must submit a more focused SWPPP for the specific project showing how erosion and pollution will be avoided or at least minimized both during construction and once the finished project is operating. The MPCA, however, does not have sufficient staff to make site visits and check for SWPPP compliance.

What happens if an MS4 SWPPP does not meet minimum requirements? So far in these cases the MPCA has extended coverage under the permit of a previous year. (For example, the City of White Bear Lake is legally able to operate its present system under its 2003 permit.)

Impaired waters are surface waters that do not meet applicable water quality standards for their purposes. A lake or stream can be impaired by separate pollutants, each to a different level.

SWPPP reports focus on Best Management Practices in each location or each step of development. How can Best Management Practices be enforced? At the project level the MPCA has a series of fines from \$10,000 to \$100,000. Exacting a fine depends on the provisions in the municipality's original plan and its approval by the city, the Department of Natural Resources (DNR), MPCA, etc. However, there must be documentable damage first, and administering the penalty order is slow. It is possible, but rare, for a project to be shut down. Damage may not be apparent until after the project is completed. For example, during the past several decades a delta has built up along the south shore of White Bear Lake close to the boundary of Ramsey and Washington Counties, and this did not appear until a few years had passed after development of the area.

Impaired Waters

Impaired waters are surface waters that do not meet applicable water quality standards for their purposes. A lake or stream can be impaired by separate pollutants, each to a different level. There are hundreds of pollutants recognized by the MPCA, but the major ones are:

Suspended solids, causing turbidity, originating primarily in construction sites

Phosphorus, which comes from decaying organic life, waste, and fertilizer. In water it supports algae blooms. In 1977 phosphorus was banned in laundry detergent, and this reduced concentration of phosphorus in wastewater by nearly half.

E coli bacteria, which comes from septic systems, animal feedlots, etc.

Persistent toxins, such as mercury (most of which is airborne coming from burning coal) and polycarbonated biphenals. Such toxins are assimilated by fish and animals up the food chain.

The U.S. Environmental Protection Agency requires the MPCA to identify impaired waters and propose a list of waters for review and approval by the EPA. The MPCA can also propose that the EPA de-list a water body that has improved. The first publication of Minnesota's list of impaired waters occurred in 1992, and the most recent in 2006. As stated earlier, by 2006 only about 18

percent of lakes and 14 percent of rivers had been assessed in the state, and 40 percent of those did not meet at least one standard.

When a stream or lake is found to be impaired the Clean Water Act requires that a process begin that centers on the “Total Maximum Daily Load” or TMDL. The presumption is that if no new pollution, or very little, is added, water will become more pure over time through natural processes. A separate TMDL for each pollutant gives the maximum for that pollutant that may be introduced into a surface water and still ensure that applicable water quality standards are being restored and maintained. It is calculated on a number of factors such as expected rainfall, and it is the sum of all sources of that pollutant including the natural background and a margin of safety to account for uncertainty.

The process is managed by the MPCA. Although the word “daily” is used the requirements are per year and are written in pounds (or some other weight). The total load is apportioned among the several permittees who have developments in the area of concern, and each portion is called a “Waste Load Allocation.” The process must be approved by the federal EPA. Federal laws, codes and regulations define TMDL requirements. There are other polluters that are not touched by the TMDL process, for example residents who fertilize lawns in the vicinity of the listed water. Their contribution is called the “Load Allocation.”

Total Maximum Daily Load Implementation Plans are documents that detail restoration activities needed to meet the approved TMDLs. The pace of studies calculating the TMDL has outpaced the resources to deal with the problems. In the Twin Cities Metropolitan Area about a dozen have been completed in about 50 MS4s (Municipal Separated Storm Sewer Systems). At a conference sponsored by the Vadnais Lake Area Water Management Organization 2007 a participant made the statement that sixty are ongoing, and more are scheduled to start in 2008.

The statute orders MPCA to submit TMDLs for all listed waters to the EPA, but first must make efforts to notify persons who may be required to make significant changes. If there are objections judicial reviews might then occur. After completion of reviews, or when the allowed time to report has run out, MPCA shall submit the TMDL to the EPA along with facts, science reports, costs, etc. for each listed water.

The statute calls for a great deal of cooperation among local units of government, water management organizations and districts, state agencies and interested volunteers.

When a stream or lake is found to be impaired the Clean Water Act requires that a process begin that centers on the “Total Maximum Daily Load” or TMDL.

Threats to Clean Water Act

The United States Clean Water Act is the collection of amendments to the Federal Water Pollution Control statute that were passed by Congress in 1972. The Act's prohibition of un-permitted point source discharge, oil spill prevention program, impaired waters cleanup and other requirements has brought good progress in improving the condition of waters in our country. Major amendments again were passed in 1977 and in 1987 without decreasing the Act's effectiveness. One rationale for the Act was protection of navigable rivers.



In 2001 the Supreme Court issued a decision in the case of *Solid Waste Agency of North Cook County v. U.S. Corps of Engineers*. It possibly denied the Act's hold in non-navigable, intrastate waters and certainly denied the "Migratory Bird Rule" of 1986 that protected small bodies of water for migratory birds. It called into question the relationship between small headwaters and wetlands and larger navigable rivers downstream. In view of this decision, and yielding to outside pressure, the U.S. Environmental Protection Agency and the Corps of Engineers directed their field staff to stop applying the Clean Water Act to many waters unless given specific instructions from their headquarters.

In addition the Supreme Court decision of *Rapanos v. U.S.* in 2006 suggested a narrowing of federal jurisdiction and implied the need for better describing a substantial link between navigable federal waters and wetlands. These and other rulings have created uncertainty in court interpretations regarding clean water.

Thus, many small streams and wetlands have lost the protection of the Clean Water Act. The extent of waters at risk have been estimated by the Clean Water Action organization. In Minnesota they estimate that 51% of headwaters and small streams are at risk.

On April 2, 2009 Senator Feingold introduced Senate File 787, an amendment to the Clean Water Act, and on June 19 the U.S. Senate Environment and Public Works Committee gave its approval. It is known as the Clean Water Restoration Act and contains language intended to diminish the uncertainty resulting from court decisions and return the administration of the Clean Water Act to its former geographical extent. It is supported by a variety of persons and organizations concerned for pure water. A letter was sent to President Obama on February 25, 2009 signed by over 160 scientists urging his support. The writers stress that small streams and wetlands are interconnected and are essential to the health of downstream waters. Of concern is clear drinking water, public safety and fish and wildlife habitat.

What Can You as a Citizen Do?

Citizens can attempt to become informed on the many aspects of preventing or ameliorating the pollution of bodies of water. These are some questions you will want to answer.

What is the condition of bodies of water in your municipality? Local Watershed Districts or Watershed Management Organizations have this information. The Department of Natural Resources publishes “fish advisories” relating to the safety of eating fish from each lake. Information on pollution also can be learned from the website of the MPCA. To learn about specific lakes you will need a “lake number” which the website will supply.

How often is water in the lake tested for pollutants? Which pollutants? What are the changes over the months from spring through the fall? What do the records show over a period of years? For purposes of testing, samples of lake water sometimes—or even very often—are taken by volunteers. Learn who these volunteers are and consider ways to give them special recognition.

Visit with personnel from your local watershed district or organization. What are their plans and their needs? Perhaps a representative of the watershed could speak at a LWV meeting.

If your municipality is characterized by abundant unimproved land, how are these spaces protected so rain water can continue to filter through the soil? Is the use of fertilizers discouraged on lots bordering bodies of water—including streams and wetlands? How often is street-sweeping done? Are there storm sewers in parts of the municipality? How is maintenance funded?

How can Low Impact Development (LID) be used in your municipality? What locations would be most conducive to success of these measures? In order to achieve LID help your municipality inform the public and make special efforts to win cooperation for these initiatives. You might consider having a bus tour of rain gardens and other exemplary measures. Recognize that increasing the use of LID can be slow and halting and may have unexpected problems. Even so, continue to review and compare progress year by year and make your findings known.

Do proposals for improving the management of storm water in parts of your municipality rely mostly on extension of storm sewers, mostly on increasing pervious areas, or a mixture of both? What will be the dollar cost for each possibility? How will each be funded? What technological progress has been made in managing the storm sewer system?

Some answers to the above questions can be found in the report on your municipality’s Storm Water Pollution Prevention Program, and these reports should be available at your city hall. Find out when the annual SWPPP meeting will be held, put it on your calendar and attend. Find out when your municipality is applying for renewal of its MS4 permit. Send in comments during the Public Notice period—even if you don’t feel very knowledgeable about details or technical information. If you request a local meeting chaired by the MPCA, help publicize the meeting.

Is the use of fertilizers discouraged on lots bordering bodies of water—including streams and wetlands?

Summary

The U.S. Environmental Protection Agency (EPA) sets standards and in various ways affects actions of states in their work to protect lakes and streams.

Trusting that flowing waters could purify themselves, and focusing on flood control, early Americans piped their sewage, along with rain water, into rivers. Gradually, sewage treatment plants were built but pollution continued to increase, sometimes dramatically. When the Cuyahoga River caught fire in the early 1970s Congress passed the U.S. Clean Water Act, focusing on pollution carried by sewers. It is administered by the U.S. Environmental Protection Agency (EPA) which sets standards and in various ways affects actions of states in their work to protect lakes and streams. The National Pollution-Discharge Elimination System (NPDES) was developed, and its rules affected the management of sewers by state environmental agencies. This resulted in greater numbers of sewage treatment plants and in improvements in these plants.

Heavy rains, however, could overwhelm treatment plants and result in untreated sewage flowing into rivers. The solution was the construction of separate storm sewers, a lengthy and costly operation. Anti-erosion methods including ponds were used especially near construction sites. Still, pollution of waters worsened.

The federal EPA developed a system of evaluating waters as to impairment by specific pollutants. Also, in Phase II of the U.S. Clean Water Act the focus from 1999 on was “non-point” pollution.

In Minnesota the Clean Water Legacy Act (CWLA) was passed in 2006. It is administered by the Minnesota Pollution Control Agency (MPCA) and conforms to the federal Clean Water Act. It provides limited funding for water quality testing and cleanup.

After many years of testing and observation the need to decrease the volume of runoff by allowing more water to infiltrate the ground became well understood. Sometimes this is called “low impact development” and calls for decreasing the areas that are impermeable to water. It can be achieved through the use of rain gardens, grassy swales, roof gardens, permeable cement, smaller sized parking lots, etc.

In the older and more densely settled parts of the area looked at in this study city engineers follow the best management practices in the use of storm sewers and ponds. In some locations they have helped create rain gardens and swales and have used other low-impact advances. Newer municipalities have more opportunities to move towards low impact development, but limited public understanding may impede this environmental progress.

The population of the Metropolitan Area is estimated to grow by 1,200,000 in the next 25 years, an increase that will put great pressure on our land and water resources. Buildings, roads and parking lots markedly decrease pervious surfaces and interfere with the natural removal of pollutants from water when rainwater infiltrates the soil. Adding homes, workplaces and roads to our Metro Area for perhaps a million more people could turn more of our lakes, streams and wetlands into “impaired waters” unless development is carefully and properly planned. The latest technologies in sewer pipes and in their maintenance should be used. At the same time it is important that scientific knowledge and methods be followed which maximize infiltration and minimize the use of sewer pipes wherever this is possible and practical. It is essential that these measures be supported by a well-informed citizenry.

APPENDIX A

GOVERNMENTAL BODIES WORKING TO PREVENT POLLUTION OF WATER

U.S. ARMY CORPS OF ENGINEERS

Wetlands are very important in their filtration and the purification of water, and also for water storage, hence for the amelioration of flooding. Because the loss of wetlands affects game birds the federal government sought to reverse that loss, and the protection of wetlands was assigned to the Corps. It relates to their charge of maintaining rivers as navigable waterways, and maintaining dams and levies for flood control.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) AND MINNESOTA POLLUTION CONTROL AGENCY (MPCA)

The roles of these agencies have been discussed.

CITY COUNCILS

Each municipality is responsible for property development within its boundaries as well as the design, building and maintenance of sanitary and storm sewers. Development, of course, causes or contributes to pollution and reduces impermeable surfaces. Thus, *direct actions to prevent pollution of storm water rests with city councils and their public works departments*. In this they are, of course, guided by legal requirements, directed by the EPA, the MPCA and by agencies contracted by the MPCA. The Department of Natural Resources limits development near lakes and wetlands and the Environmental Quality Board can require environmental studies. Cities receive advice and assistance from the watershed management district or organization of which they are a part and from county departments concerned with preventing water pollution.

The “front line” responsibility of city councils to prevent water pollution is not widely recognized by voters.

ENVIRONMENTAL QUALITY BOARD (EQB)

In regard to development the Board can require Environmental Impact Studies, which are extensive and meticulous. Among other responsibilities the EQB develops the State Water Plan every ten years, coordinates state water activities, and is involved in environmental review of development projects.

The EQB issues the “Priorities Report” on water resources which comes out the first year of each biennium. The Report draws together the Governor’s Office, five citizens and the heads of nine state agencies to review proposed priorities that would significantly influence Minnesota’s environment and development.

The population of the Metropolitan Area is estimated to grow by 1,200,000 in the next 25 years, an increase that will put great pressure on our land and water resources.

The text of the Report is on their webpage--www.eqb.state.mn.us/

MINNESOTA BOARD OF WATER AND SOIL RESOURCES (BWSR, or “Bowser”)

The Board has oversight of Watershed Districts and Watershed Management Organizations, to which they both report, and is involved in the funding of Conservation Districts

SOIL AND WATER CONSERVATION DISTRICTS (SWCDs)

These Districts are political subdivisions of the state, each managed by five elected supervisors. The first one was established during the dust bowl of the 1930s. There are 91 SWCDs in the state, one in each of the 87 counties, and in several counties there are two. Funding passes through the Board of Water and Soil Resources and funds also come from counties, fees, etc. Some of these have shortened their name, e.g., Ramsey County Conservation District and Hennepin County Conservation District.

RAMSEY COUNTY CONSERVATION DISTRICT (RCCD)

The Ramsey County Conservation District has staff to advise on diverse problems of erosion and pollution, and its headquarters provides information to the public. It often serves as the agent of the PCA in direct oversight of construction. In addition to support from the county, the staff generates income from fee-for-service on development sites. The staff works with the U.S. Army Corps of Engineers on restoration.

WATERSHED DISTRICTS (WDs) AND WATERSHED MANAGEMENT ORGANIZATIONS (WMOs)

A watershed is the geographic area of tributaries that flow into a major stream or lake from several municipalities and in some cases from parts of more than one county. The purpose of these Districts and Organizations is to be able to deal politically and financially with each watershed as a whole. Their need was first apparent in rural areas of Minnesota, and the statute creating the Districts was passed in the 1958. A report in 1985 by the Council of Metropolitan Area Leagues of Women Voters, or CMAL, states: “There had been a rapid creation of WDs in the metro area in the seventeen years between 1958 and 1975 when nine were established.” Another was created in the next ten years. Then in 1982 a law provided that WMOs could be established either by joint powers agreements between local units of government or created by Watershed Districts.” The LVW made a detailed survey of how they are organized, who is on their governing body, the stage of planning, the variety of water problems they faced, technical assistance, expected costs and public participation. The WDs were given taxing authority but WMOs are funded by the participating municipalities whose representatives make up their boards.

RICE CREEK WATERSHED DISTRICT (RCWD)

Rice Creek Watershed District was formed in 1972 when lower Rice Creek in Fridley was very badly eroded and polluted. This District is one of the largest in

the Metropolitan Area occupying parts of Ramsey, Washington and Anoka Counties and extending a little into Hennepin County. It involves 29 cities.

The District plans, finances and executes many water improvement projects. It has \$200,000 for monitoring lake quality. It also cost-shares with residents for improvements, and financial incentives are offered to cities. Its Comprehensive and Annual Plan is updated periodically, the District being unable to do anything that is not in this Plan.

In a program called “Blue Thumb” Rice Creek WD has information on how to create and maintain a rain garden. They also sell a book on the topic for around \$18.

VADNAIS LAKE AREA WATER MANAGEMENT ORGANIZATION (VLAWMO)

This WMO encompasses sources of the St. Paul water supply and covers most of North Oaks and Vadnais Heights and portions of four other municipalities, Lino Lakes, White Bear Lake, White Bear Township and Gem Lake. It was established as a joint powers agreement among its member cities in 1983. It oversees the chain of lakes and streams that feed into the St. Paul water supply.

Its staff works with the member cities to make sure water plans comply with new laws for water protection, which are stricter than in the past. Its role in dealing with development and redevelopment has been expanded. It has completed extensive and much needed improvements on an important creek running between Goose Lake in the City of WBL and Lake Vadnais, and will continue to work to prevent runoff from entering the creek. In 2007 it approved an ambitious water plan. For Birch Lake in White Bear Lake it works with the homeowner association in extensively monitoring the lake, which will lead to improvements. The organization encourages and advises residents on how to install natural plantings along shorelines and construct rain gardens in other locations. The staff considers “anyone who lives on a storm sewer line to have shoreline property because all that water ends up in large water bodies.”

GRASS LAKE WATER MANAGEMENT ORGANIZATION (GLWMO)

This small water management organization was set up at the request of the cities of Shoreview and Roseville, both with governments where similar points of view prevail. It covers the southern half of Shoreview and part of Roseville.

Grass Lake partners with Ramsey Conservation District to give free technical assistance to homeowners creating rain gardens. The Organization will pay up to 50 percent of the material costs, with maximum of \$600 and will pay up to \$1000 for lakeshore restoration. The organization also gives annual awards to outstanding properties in Shoreview and along the Lake Owasso shore area.

TWIN CITIES METROPOLITAN COUNCIL

The Council oversees the sewage treatment plants in the Metropolitan Area including the sewer lines that lead to the plants. Soon after the Metropolitan

Council was created it established the Maximum Urban Service Area, the extent of transportation service and sewer service. This area is defined on a map by the "MUSA Line." Areas beyond, lacking critical services as they do, discourage large developments. Extending or not extending this area gives the Council a lever to help control urban sprawl and influence preservation of the environment. The Council also works to obviate the need for new or expansion of sewage plants.

In the operation of the sewer system the Council knows the expected inflow of water into the system, and compares that to their measured amount. Additional amounts come from leaky sewer pipes and also comes from "sump pumps." These pumps are used by homeowners in low lying areas to keep basements from flooding. No harm is done if the water is pumped onto their yards, but it is illegal to empty them into a sewer. Inspection is required to demonstrate that the water does not go into the sewer system.

The Metropolitan Council also reports on problems with waters in its seven county area.

MINNESOTA DEPARTMENT OF NATURAL RESOURCES (MDNR)

Under the PCA, the Department of Natural Resources works to support the law. It works in hydrology, bio-criteria, fish contaminants, and many types of research. It recommends how much fish to eat. Information is on its website. DNR is doing a statewide study of TMDL regarding mercury. The Department also sets shoreland zoning standards along lakes and rivers, and these are adopted into local ordinances. Implementation is the responsibility of cities, towns, counties through their zoning authority. Some have chosen standards that exceed state minimum. DNR purchases high quality river-edge properties to protect from development. It helps to assess the quality of waters, and it is in charge of efforts to control invasive species.

MINNESOTA DEPARTMENT OF AGRICULTURE (MDA)

The MDA regulates most matters regarding pesticides and fertilizers. It is a source of much information for farmers and also gives lawn care advice. MDA oversees several research projects aimed at cleanup efforts, and is in charge of a loan program for Agricultural Best Management Practices. An example of its informational papers and booklets is "Reducing the Impact of Spring Flooding on Agriculture Chemicals." The Department assesses the "Nutrient Management of Agriculture Practices" and each year issues "The Greenbook: Sustainable Agriculture."

MINNESOTA DEPARTMENT OF TRANSPORTATION (MDOT)

Construction of roads and highways requires the diversion of excess water away from the roads and prevention of erosion around the roads. The Department uses a manual (MDOT Manual) on building highways that includes procedures for directing water. These rely on creating settling ponds and on pipes. The manual applies to state highways and also to highways and roads receiving state aid.



At a Shoreview Green Community Clean Water Forum held in February 2008 a member of the audience asked if there was duplication of effort since there are many councils, boards, agencies, departments and organizations working to prevent or lessen the pollution of water. The answer was no; they have different roles, keep out of each other's way and cooperate on certain projects.

APPENDIX B

SUMMARY OF SWPPP REPORTS

Volunteers from the League of Women Voters reviewed copies of the rather massive SWPPP Reports made by eight municipalities. These reports do not cover the full extent of actions which can be used to reduce pollution in storm water. The volunteers also interviewed staff in each of the larger municipalities, a different volunteer contacting each city. Their discussions followed the general framework of the SWPPP Reports. The conversations were not identical in each case, and different subjects were emphasized. Consequently, a compilation of the facts was not a standard inventory on everything each municipality is doing in regard to stormwater. Much of the information collected by the Committee was done in 2007, and for most municipalities this did not include planning and actions taken in 2008.

The SWPPP Reports cover six Basic Areas:

Public Education and Outreach

Public Involvement and Participation

Illicit Discharge Detection and Elimination

Construction Site Stormwater Runoff

Post-Construction Stormwater Management

Pollution Prevention/Good Housekeeping for Municipal Operations

The Committee received SWPPP Reports from the following jurisdictions: Hugo, Lino Lakes, Mahtomedi, North Oaks, Shoreview, Vadnais Heights, White Bear Lake, and White Bear Township.

Details can be obtained by contacting the League of Women Voters of White Bear/ North Oaks/ Mahtomedi Area and of Arden Hills-Shoreview. Contact

names of this LWV can be found by phoning the Minnesota LWV at 651-224-5445 or going to the website at www.lwvmn.org.

APPENDIX C

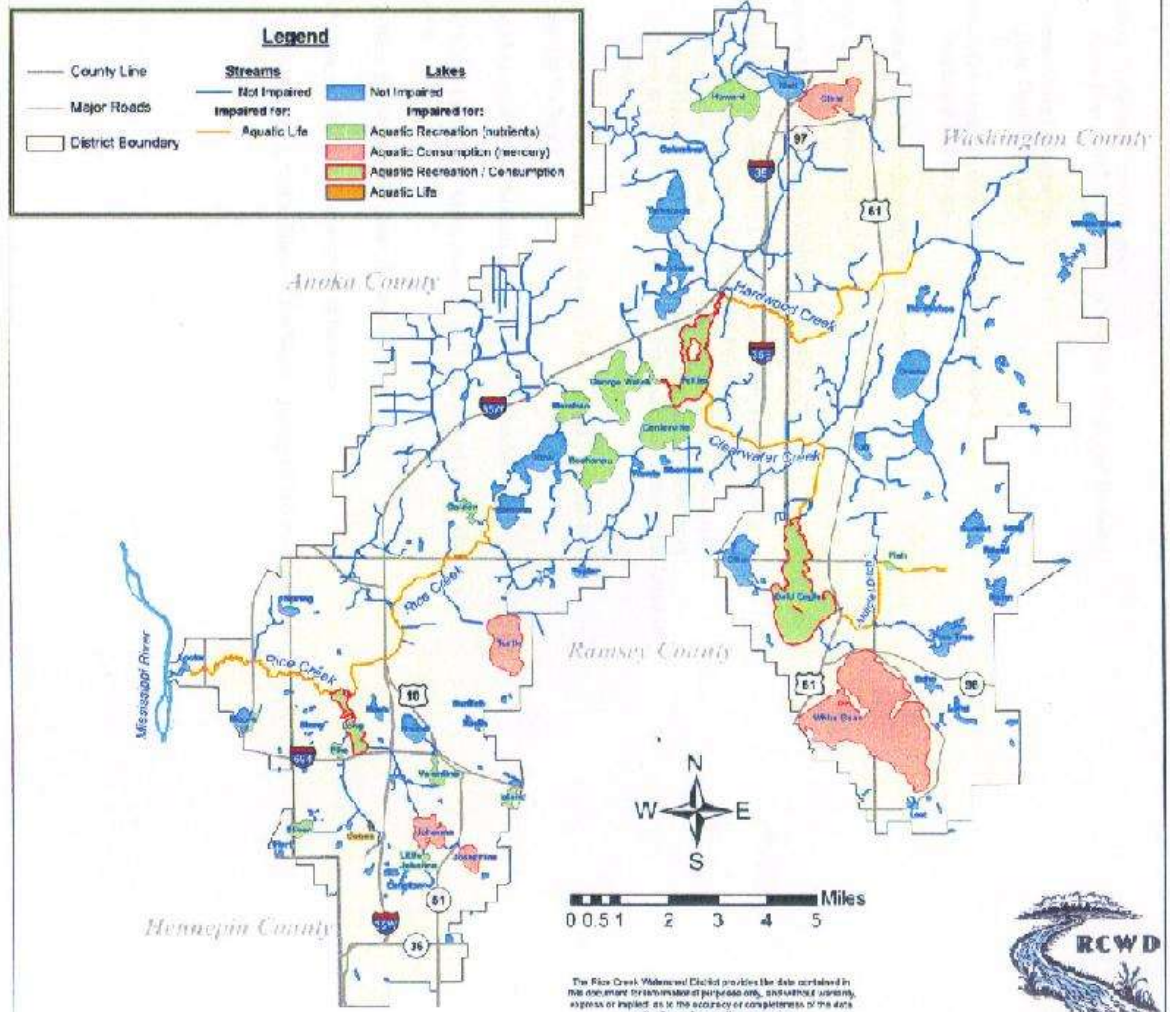
MAPS OF LAKES IN THE AREA OF STUDY AND INFORMATION ON IMPAIRMENTS

Details can be obtained by contacting the League of Women Voters of White Bear/ North Oaks/ Mahtomedi Area and of Arden Hills-Shoreview. Contact names of this LWV can be found by phoning the Minnesota LWV at 651-224-5445 or going to the website at www.lwvmn.org.

Rice Creek Watershed

2008 List of Impaired Waters

303D List, Federal Clean Water Act



RESOURCES

U.S. Environmental Protection Agency - Website only

Minnesota Pollution Control Agency

Anna Kerr, MPCA, Stormwater Section, Municipal Division

Rice Creek Water Management District

Blue Thumb Program

Vadnais Lake Area Water Management Organization

Stephanie McNamara

Grass Lake Water Management Organization

Ramsey County Conservation District

Minnesota Department of Agriculture -Website only

Shoreview Green Community Clean Water Forum, February 2008

Mark Maloney, City of Shoreview Public Works Director

Tom Peters, Ramsey County Conservation District Manager

Doug Thomas, Rice Creek Watershed District Administrator

Steve Wood, Minnesota Board of Water and Soil Resources, Assistant Director

City of Hugo: Chris Petree, Public Works Director and Scott Anderson, Engineering Technician

City of Shoreview: Mark Maloney, Public Works Director

City of White Bear Lake: Mark Burch, City Engineer and Brent Thompson, Engineer

White Bear Township: Bill Short, Township Clerk

Beth Nixon, employee of a conservation business

Metropolitan Council, "2006 Study of the Water Quality of 186 Metropolitan Area Lakes"