
ANNUAL NPDES REPORT
2007 MINNEAPOLIS STORMWATER MANAGEMENT PROGRAM & 2006 ACTIVITIES

Executive Summary

I. Executive Summary

Report Objective

This report is prepared in compliance with the requirements of NPDES (National Pollutant Discharge Elimination System) Permit No. MN0061018.

Background

The NPDES program was created in 1990 by the United States Environmental Protection Agency (EPA) to safeguard public waters through the regulation of the discharge of pollutants to lakes, streams, wetlands, and other surface waters. The Minnesota Pollution Control Agency (MPCA) is the local authority responsible for administering this program. Under this program, specific permits are issued to regulate different types of municipal and industrial activities.

The MPCA issued the first Municipal Separate Storm Sewer System (MS4) NPDES Permit to the City of Minneapolis on December 1, 2000. This Permit requires the implementation of approved stormwater management activities, referred to as Best Management Practices (BMPs). These efforts must be documented in the form of a Stormwater Management Program and Annual Report, which is due on June 1 of each year. The Permit also requires public input in the development of the priorities and programs, and adoption by City Resolution of the Annual Report as the City's Stormwater Management Plan. This Report presents the activities that will be implemented this year, and provides documentation and analysis of the activities conducted during the previous year.

The Minneapolis NPDES Stormwater Management program is developed and administered by the City departments/agencies that are responsible for permit activities. Included are the Minneapolis Park and Recreation Board (MPRB), and the City of Minneapolis Departments of Public Works and Regulatory Services. These stakeholders are jointly responsible for the completion of the required Permit submittals. Public Works provides program management and completes each Annual Report.

2006 Highlights and 2007 Work Plan

Storm Drain System Operational Management and Maintenance

The NPDES Permit objective for this program is to minimize the discharge of pollutants through the proper operational management and maintenance of the City's storm drain system. Targeted pollutants include Nutrients and Floatable Trash.

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A stormwater retention pond was constructed in 2006 for Flood Area 1, at 42nd Av N, from James to Morgan Av N, which is designed to also aid sediment control and nutrient removal. Maintenance and operation of the City's storm drain system is ongoing, with efforts in 2007 to add rainleader discharges and sump pump discharges, ultimately aimed at removing these inflow sources from the sanitary sewer system. Additionally in 2007, a final draft of an overall rehabilitation program will be completed for the 22 miles of deep storm drain tunnels in Minneapolis.

Structural Controls Operational Management and Maintenance

The NPDES objective for this program is to minimize the discharge of pollutants through the proper operational management and maintenance of the City's storm drain system. Within the system there are structural controls that affect system flow rates and water quality discharges. Structural controls include grit removal chambers, stormwater retention/detention ponds, outlet structures, inlet structures, pump stations, and level control weirs. Pollutants targeted include Sediment, Nutrients and Floatable Trash.

In 2006, inspection and maintenance activities were carried out for 25 pump stations, 114 grit chambers, 10 stormwater holding ponds, and about 20% of our 387 storm drain outfalls. The focus is on better condition assessment for maintenance pumps and ponds, and on long-term budgeting for pump station maintenance and operation.

Disposal of Removed Substances

The objective of the program is to minimize the discharge of pollutants through the proper operational management and maintenance of the City's storm drain system. A key component of this objective is the collection and disposal of targeted pollutants in a manner that will prevent pollution and that will comply with applicable regulations. As above, the targeted pollutants of this program are Sediment, Nutrients and Floatable Trash.

In 2006, approximately 859 cubic yards of targeted pollutants were removed from the City's storm drain system, consisting primarily of sand and vegetative matter that were collected from grit removal chambers. Disposal of removed substances will continue, however because of budgetary constraints, there will be a reduced effort in removing substances from system piping and deep drainage tunnels.

Stormwater Management for New Developments and Construction

The objective of this stormwater management program is to minimize the discharge of pollutants through the regulation of construction projects and new developments. Regulation includes erosion

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and sediment control, and approval of stormwater management including ongoing operation and maintenance commitments. Targeted pollutants include Mercury, Total Suspended Solids (TSS), Phosphorus, Biochemical Oxygen Demand (BOD5), Nitrate, Nitrite.

During 2006, Minneapolis Public Works took part in the preliminary review of over 250 site plans. Increased awareness of the Erosion & Sediment Control Ordinance, improvements in the plan submittal process, improved awareness of temporary erosion control Best Management Practices (BMPs), as well as our ongoing compliance-based inspection program, resulted in a continued rise in compliance.

In 2007, the City will study the option of requiring construction bonds to be posted from contractors to assure compliance and site completion, and also to facilitate the removal of temporary erosion controls at the completion of construction activities.

During 2006, over 100 permanent stormwater Best Management Practices (BMPs) were installed on 70 sites reviewed through the Minneapolis Development Review (MDR) process. BMP types included rain gardens, pervious pavement, infiltration areas, ponds and underground detention facilities. The redevelopment of existing sites continues to provide an opportunity to lessen the impacts of urbanization on the Mississippi River and other Minneapolis water resources.

The nearly 300 new residential rain gardens that were constructed in 2006 is testament to the success of a number of efforts including the stormwater utility credit program, Metro/Minneapolis Blooms rain garden workshops, and City of Minneapolis and MPRB stormwater education programs.

A new tracking process is in place to identify stormwater management opportunities. Public Works will continue to review all development plans from a Low Impact Design (LID) and sustainable water quality perspective.

Public Works is creating new performance measures and improving data collection, tracking and analysis. Means of measuring and understanding water quality impacts that are under study include total acres providing on-site water quality treatment, total pervious area in the City, regulatory costs per site, and cost vs. compliance benefits.

Roadways

The NPDES Permit objective of this program is to minimize the discharge of pollutants through the proper operation and maintenance of public streets, alleys, and municipal equipment yards. Targeted pollutants include Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD5),

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Chemical Oxygen Demand (COD), Phosphorus and Chlorides. Street sweeping, snow and ice control, and storage of de-icing material are the primary activities within this program.

Citywide sweeping operations occur every year in the spring and fall. Between these spring and fall sweep events, sweepers are assigned to maintenance districts for daily area sweeping. Downtown and other high traffic commercial areas are swept at night on a weekly basis. In addition, summer sweeping in the Chain of Lakes drainage areas has occurred since 1995 as part of the Clean Water Partnership project. Street sweeping techniques now utilize a combination of air regenerative and mechanical sweepers. Mechanical sweepers are best for sweeping where the debris is heavy, and then air regenerative street sweepers can be used to vacuum up some of the remaining, finer materials. Under the current program, each street in Minneapolis is swept a minimum of 4 to 5 times each year.

Street Maintenance applies salt and sand to City roadways every winter for snow and ice control. Efficient application of de-icing materials is sought to reduce costs, required maintenance, and environmental impact. The most obvious cost savings is a reduction of the overall amount of materials used: catch basins and grit chambers require more frequent cleaning due to the accumulation of the additional sand. Salt causes corrosive damage to bridges, reinforcement rods in concrete streets, metal structures and pipes in the street, and vehicles. Salt is also harmful to groundwater, surface water, plants, and trees. Sand harms lakes and streams by disturbing the ecosystems, and in depositing pollutants that bind to sand particles in lake bottoms and streambeds. Maintenance supervisors are trained in winter maintenance techniques through sessions that are sponsored by the [Local Road Research Board](#) training partnership.

Material spreaders are calibrated before each winter season. Maintenance yard housekeeping practices are designed to minimize salt/sand runoff. The materials that are used are tallied daily.

The 2005-2006 winter season was a cold year with many small snow events, but major events occurred at the beginning and end of the season. The most snowfall was observed in December and March, while January and February were relatively dry. There were three snow emergencies, and 149 days of snow and/or temperatures below freezing. The quantities of salt and sand used in snow and ice control are tracked by recording amounts that are delivered by suppliers, and also by estimating the quantities that are on-hand on a daily basis. All salt stockpiles are stored under cover to minimize potential groundwater contamination and runoff.

Ongoing activities to fulfill permit requirements will continue. Additional education opportunities will be explored for management and maintenance workers. Management will keep abreast of new

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technologies for street sweeping and for snow and ice control, as they become available. Any promising technologies will be tested on a pilot basis before implementation.

Flood Control

The objective of the program is to design flood control systems that manage stormwater quantities so that the runoff does not exceed the capacity of the existing facilities while minimizing the impacts on the water quality of the receiving water body. Targeted pollutants include Phosphorus and Total Suspended Solids (TSS).

In 2006, pipe work and pond excavation were completed in the vicinity of 42nd Av N and Russell Av N for the Flood Area 1 project. Construction was completed to resolve a flood area in the vicinity of W 44th St and Aldrich Av S for Flood Area 24. Preliminary design was started for the Lake Hiawatha/Blue Water Partnership mitigation area. All underground sewer work is complete for the multi-phase Flood Area 27 project along 28th Av S from E 38th St to E 40th St.

In 2007, in addition to work associated with the above, City personnel are in the process of requesting funding for the 2007 – 2011 Capital Improvement Program for Sibley Field work.

Pesticides and Fertilizer Control

The objective is to minimize the discharge of pollutants by controlling the application of pesticides and fertilizers. Targeted pollutants include Pesticides and Nutrients.

The MPRB has 175 trained staff with applicator licenses, and the MPRB also trains appropriate City staff. The MPRB has ongoing programs for vegetation management, tracking chemical applications, training and (re)certifying employees, and maintaining Audubon Cooperative Sanctuary Program (ACSP) certification for environmental operations at the Meadowbrook and Wirth Golf Courses. The MPRB is expanding its documentation of pesticide and fertilizer use to properties managed by City of Minneapolis Department of Public Works, Minneapolis Public Housing Authority, and Minneapolis School Board properties.

Illicit Discharges and Improper Disposal to Storm Sewer System

The NPDES Permit objective of this program is to minimize the discharge of pollutants by implementing a program to detect and mitigate illicit discharges, and to encourage that a NPDES (or other such permit) be obtained for non-stormwater discharges. All pollutants are targeted by this program.

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Environmental Services and the Minneapolis Fire Department personnel typically serve as the first responders to a spill event. The immediate goals of this response include:

- Spill containment
- Recovery of hazardous materials
- Collection of data (for use in assessment of site impacts)

Recovery efforts can take several forms, but typically fall into two broad categories:

- Recovery for re-use
- The use of absorbents or other media to collect hazardous waste for disposal

Training for emergency spill procedures is coordinated amongst the Minneapolis Fire Department, the Regulatory Services Environmental Services unit and the Public Works Street Maintenance section.

In 2006, 178 calls for emergency response were successfully addressed, including:

- Spill containment
- Chemical dumping
- Illegal disposal or handling of regulated or hazardous materials

In 2007, GIS mapping will be implemented as a tool to support these activities. The Facilities Inspection Program will be used to compile data on non-stormwater discharges, storage of hazardous materials, and activities or operations that may be potential water pollution point sources.

Storm Sewer Design for New Construction

There is a continuing effort to minimize the discharge of pollutants to public waters. The section describes the current focus and outlines the design measures used to control the discharge of pollutants by controlling the volume, loading or rate of storm water discharged. Targeted pollutants include Total Suspended Solids (TSS), Phosphorus, Chloride and Fertilizers.

Whenever storm sewer upgrades are required, installation of volume reduction systems are considered first. Pollutant load reducing facilities are considered next, and finally rate reduction Best Management Practices (BMPs) are incorporated in the work scope.

In the next five years, efforts will be concentrated on the removal of Inflow and Infiltration (I / I) from the sanitary sewer system, while also incorporating volume, pollutant load and rate reduction factors.

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Public Education

The objective of this stormwater management program is to educate the public regarding point and non-point source (stormwater) pollution. Numerous educational activities conducted by the MPRB and the City of Minneapolis address water quality education about erosion and sediment control, proper application of pesticides and fertilizers, proper use of the stormwater system to avoid illicit discharges and reduce pollutants, reducing overall imperviousness, yard care, on-site stormwater management, and other measures that impact non-point source pollution. Year 2007 highlights include ongoing programs by MPRB naturalists at recreation centers and along the Mississippi River, Earth Day activities, rain barrel distribution events, rain garden workshops, further development of multi-cultural and multi-lingual tools, and development of targeted education for developers and contractors.

Public Participation Process

The objective of the public participation process is to maximize the effectiveness of the City's NPDES program by seeking input about the Minneapolis stormwater management program and activities from the public. This outreach targets All Pollutants.

The City of Minneapolis and the MPRB are the joint holders of the NPDES Permit, and the Annual Report is a coordinated effort by various City departments and the MPRB. The Permit requires an opportunity for public input in the development of the priorities and programs necessary for compliance. Information in the Annual Report covers the activities that will be implemented for the current year, and provides documentation and analysis of the activities conducted in the previous year.

Each year in April, the City of Minneapolis holds a public hearing to provide an opportunity for public testimony prior to report submittal to the MPCA. In 2007, a notice was sent to the City's 81 neighborhood organizations and 16 interested parties, environmental groups, and related governmental entities advising them of the opportunity to provide comments on the Draft Annual Report at the public hearing or in writing. A Public Hearing Notice was also posted in *Finance and Commerce*.

The draft, as well as the finalized Annual Report, is made available on the City's [Storm and Surface Water Management](#) website. The City Clerk's office also keeps a copy on hand for public examination. An electronic version of the Report can be obtained on compact disk (CD) from Minneapolis Public Works at 612-673-2522.

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All testimony and written comments received are recorded and given consideration; these responses are then included in the Annual Report. Finally, the Annual Report is presented, with the responses to the public comments, to the Minneapolis City Council for approval and adoption. A copy of this resolution is then submitted to the MPCA by June 1.

The public hearing was held on April 17, 2007. No testimony or questions were presented. Written comments were accepted until Friday, April 27, 2007. Only one question was submitted, as follows:

Question: *What are the City's plans to keep water from rising up out of the storm sewers and flooding the N E Minneapolis area near 27th Avenue NE and California Street NE? This seems to happen at least once a year during the all to common heavy rain events. The area of Columbia Avenue also floods or fills with standing water.*

Response: *There are several stormwater-related projects that are scheduled for construction in the area in Year 2010. Public Works staff are contacting the individual that posed the question to communicate this, and also to request additional information to enter into the City's Flood Complaint database.*

In 2006, during development of the Local Surface Water Management Plan, three open houses were held to solicit public input on water resources management in Minneapolis. These open houses were held at Webber Park, at MPRB Headquarters, and at Nokomis Recreation Center. City staff will continue to update the Storm and Surface Water Management website: <http://www.ci.minneapolis.mn.us/stormwater/>

Coordination with Other Governmental Entities

Watershed Management Organizations

Coordination and partnerships of the City of Minneapolis and the Minneapolis Park & Recreation Board (MPRB) with other governmental entities include the four watershed management organizations (WMOs) in Minneapolis: Bassett Creek Water Management Commission (BCWMC), Mississippi Watershed Management Organization (MWMO), Minnehaha Creek Watershed District (MCWD), and Shingle Creek Watershed Management Commission (SCWMC).

The coordinated activities vary by watershed, but generally include some or all of the following:

- Joint review of projects
- Stormwater quality monitoring and outlet monitoring
- Water quality education and programs
- City staff attending watershed board meetings

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- Technical Advisory Committee (TAC) participation
- Providing developers contact information (through site plan review) regarding watershed requirements
- Sharing information regarding watershed characteristics, flooding problems, public outreach opportunities, modeling data, etc.
- Input, review and comment of various planning efforts and documents
- In some cases, cost sharing for water quality projects

Other Stormwater Partners

The City and the MPRB also coordinate stormwater management efforts with Minnesota Department of Transportation (MnDOT), Metropolitan Council Environmental Services (MCES), the MPCA, the Minnesota Department of Natural Resources (DNR), surrounding municipalities, and Hennepin County.

Water Quality Monitoring Task Force

After three and a half years, the Water Quality Monitoring Task Force (WQMTF) was dissolved in January 2007, when the goals had been met. The WQMTF had included policymakers from the City, MPRB, and local WMOs. The goals were to determine whether there were overlaps in monitoring efforts carried out by the various organizations, and to determine whether it would be of benefit to standardize the organizations' monitoring parameters. It was determined that the monitoring efforts carried out by the various entities are not repetitive with one another, and that the various monitoring programs address different needs and therefore should not be standardized.

The Minneapolis Local Surface Water Management Plan

In 2006, the City of Minneapolis completed its Local Surface Water Management Plan (LSWMP), developed to meet the requirements of Minnesota Statute 103B, as well as to provide a resource for City staff. The LSWMP serves as a guidance manual for handling regulatory requirement issues, planning and managing surface water resources, stormwater and sanitary sewer infrastructure, as well as stormwater management for development and redevelopment. The intent of the LSWMP is to benefit stormwater management within Minneapolis, and to improve both the coordination and effectiveness of efforts by the City, the MPRB, and the WMOs.

The LSWMP was prepared to guide the City in conserving, protecting, and managing its surface water resources, and meeting agency review requirements. The LSWMP brings together all water resources issues and activities, and identifies improvements, gaps or overlaps that will help to better

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manage the City's water resources and attain overall goals. The LSWMP content of the LSWMP is in large part determined by Minnesota Statute 103B and Rules 8410. Web links are provided throughout the document to allow the user to access the wealth of local water resources information available on the Internet. Contributors included various City departments, MPRB, MCES, and the four WMOs in Minneapolis. The Plan can be accessed at the City's Stormwater website: <http://www.ci.minneapolis.mn.us/stormwater/local-surface.asp>

Stormwater and Water Quality Monitoring - Results and Data Analysis

2006 Water Resources Report

The Minneapolis Park & Recreation Board's (MPRB) annual *2006 Water Resources Report* is a comprehensive technical reference of water quality information for the citizens of Minneapolis. Due to the length of the 2006 Water Resources Report, only its NPDES stormwater runoff monitoring and BMP monitoring sections are included in this *2007 Stormwater Management Program and Annual Report* (also known as the *Annual NPDES Report*), which is prepared by the City of Minneapolis in collaboration with the Minneapolis Park & Recreation Board. Electronic copies of the *2006 Water Resources Report* are available on the MPRB website at <http://www.minneapolisparcs.org/default.asp?PageID=791>. The whole report can be found in the "Caring for Our Parks - Lakes & Water Resources- Water Quality" section of the website. Reports are also available to be checked out from every public library in Minneapolis. A CD-ROM copy of the entire report can be obtained by contacting the MPRB Water Quality Section.

Minneapolis Lake Trends

In 2006, MPRB scientists monitored 13 of the city's most heavily used lakes. The data collected were used to estimate the fertility or trophic state index (TSI) of the lakes. Changes in lake water quality can be tracked by looking for trends in TSI scores over time. These values are especially important for monitoring long-term trends (5-10 years). Historical trends in TSI scores are used by lake managers to assess improvement or degradation in water quality.

All the lakes in Minneapolis fall into either the mesotrophic or eutrophic category, which is as expected for lakes in a fully developed urban area. Calhoun, Cedar, Harriet and Wirth Lakes are mesotrophic with moderately clear water and some algae. Brownie, Isles, Hiawatha, Nokomis, Webber, Loring and Powderhorn Lakes are eutrophic with higher amounts of algae. Trends in lake water quality can be seen by using the annual average TSI score over the last 14 years.

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Lakes showing water quality improvement

- Lake Calhoun
- Cedar Lake
- Lake Harriet
- Loring Pond
- Powderhorn Lake
- Wirth Lake

Lakes with stable water quality

- Brownie Lake
- Lake Nokomis
- Lake Hiawatha
- Lake of the Isles
- Powderhorn Lake

Lakes showing water quality enrichment

- Webber Pond

Storm Drain System and Drainage Areas Inventory

Minneapolis contributes stormwater runoff to Minnehaha Creek, Bassett Creek, Shingle Creek, and Mississippi River watersheds. The Minneapolis storm drain system handles runoff from over 50 square miles and is the key element in ongoing efforts for flood protection and programs to improve and maintain water quality for the City's wetlands, lakes and streams. The system includes main line storm drain piping, deep drainage storm tunnels, catch basin runs, outfall control structures, pump stations, grit chambers, and stormwater detention ponds. Not included in the City system are facilities owned and operated by MNDOT, Hennepin County, the University of Minnesota or other agencies.

From 1870 to 1922, all Minneapolis sewers were constructed as combined sewers, designed for conveying both sanitary sewage and stormwater. In 1922, Minneapolis began construction of a separate storm drain system for newly developing areas, however combined sewers remained the only drainage system for older areas until 1960, when the City began separating combined sewers.

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Seasonal loads are reported in Appendix A and were calculated on the following basis:

Season	Inclusive dates	Precipitation, National Weather Service
Winter/snowmelt	01/01/06 - 03/31/06	3.03 inches (0.077 m)
Spring	04/01/06 - 05/31/06	7.63 inches (0.194 m)
Summer	06/01/06 - 08/31/06	11.00 inches (0.279 m)
Fall	09/01/06 - 12/31/06	5.90 inches (0.150 m)

The Minneapolis Local Surface Water Management Plan

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The LSWMP was prepared to guide the City in conserving, protecting, and managing its surface water resources, and meeting agency review requirements. The LSWMP brings together all water resources issues and activities, and identifies improvements, gaps or overlaps that will help to better manage the City's water resources and attain overall goals. The LSWMP content of the LSWMP is in large part determined by Minnesota Statute 103B and Rules 8410. Web links are provided throughout the document to allow the user to access the wealth of local water resources information available on the Internet. Contributors included various City departments, MPRB, MCES, and the four watershed organizations in Minneapolis. The Plan can be accessed at the City's Stormwater website: <http://www.ci.minneapolis.mn.us/stormwater>