
ANNUAL NPDES REPORT
2008 MINNEAPOLIS STORMWATER MANAGEMENT PROGRAM & 2007 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.

2007 Highlights and 2008 Work Plan

Storm Drain System Operational Management and Maintenance Program

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. Routine maintenance in 2007 included 329 minor repairs and four major repairs to the storm drain system. In

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2008, the program will continue to perform its routine functions, respond to emergencies or random events, and aim for removing inflow sources from the sanitary sewer system.

Structural Controls Operational Management and Maintenance Program

Within the City's storm drain system are structural controls that affect system flow rates and water quality discharges. Structural controls include grit removal structures, stormwater retention and detention ponds, storm drain inlets and outfalls, level control weirs, and pump stations. These components are routinely inspected and maintained to ensure proper operation and reliability.

In 2007, 113 of 387 (or about 30%) storm drain outfalls were inspected, and 12 were judged to be in need of maintenance. Of the outfalls needing maintenance, 9 had repairs completed in 2007 with the remaining scheduled for repairs in early 2008. In 2008, in addition to routine operational management and maintenance, we are focusing on improvements to consistency of pond and pump maintenance, and on improving the condition assessment of, and long-term budgeting for, pump station operations and maintenance.

Disposal of Removed Substances Program

A key component of this program is to minimize the discharge of pollutants by proper collection and disposal. Targeted pollutants are collected from grit removal structures, inlet structures, system piping, detention ponds, and deep drainage tunnels. In 2007, the removed material consisted primarily of sand and vegetative matter collected from grit removal structures. Contaminated substances are disposed of at an MPCA-approved site. Non-contaminated removed materials are combined for disposal with similar materials from street sweeping operations (see 'Roadways', below). In 2007 the inorganic materials were sent to Becker MN for use as landfill daily cover, and a Hutchinson MN contractor used the organic materials in production of compost for resale. Disposal of removed substances will continue, however because of budgetary constraints, there is currently a reduced effort in removing substances from system piping and deep drainage tunnels.

Stormwater Management for New Developments and Construction Program

The objective of this stormwater management program is to minimize the discharge of pollutants through the regulation of construction projects and new developments. Proposed construction activities are reviewed through the City's Development Review process for compliance with the Erosion & Sediment Control Ordinance, Minneapolis Code of Ordinances [MCO] Chapter 52. Development projects are reviewed for long-term stormwater management strategies including ongoing operation and maintenance commitments, in compliance with the Stormwater Management Ordinance, MCO Chapter

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54. Projects are also reviewed for any combined sewer issues (in part, MCO Chapter 56) and for any flooding and capacity issues.

Redevelopment of existing sites provides an opportunity to lessen the impacts of urbanization on the Mississippi River and other Minneapolis water resources. During 2007, over 190 site plans were reviewed in connection with stormwater management requirements (down from over 250 in 2006, with the reduction apparently due to the economic downturn for housing and other development projects). During 2007, projects that had been reviewed during the Minneapolis Development Review process installed 52 Stormwater Best Management Practices (BMPs) on 35 sites (down from approximately 100 BMPs in 2006 on 70 sites, again with the reduction apparently due to an economic downturn for housing and other development projects). BMP types included rain gardens, pervious pavement, infiltration areas, ponds, and underground detention facilities. It is estimated that these BMPs will provide rate control and water quality improvement for approximately 75 acres of land.

In 2008, a proposal is under consideration to require construction bonds to be posted from contractors to assure effective erosion and sediment control compliance and site completion, and also to facilitate the removal of temporary erosion controls at the completion of construction activities. Our 2008 workplan also includes improved data collection, tracking and analysis for improved understanding of water quality impacts and costs.

Roadways Program

The objective of this stormwater management program is to minimize the discharge of pollutants through the proper operation and maintenance of public streets, alleys, and municipal equipment yards.

Street Sweeping

Minneapolis employs several street sweeping approaches in Minneapolis. Curb-to-curb sweeping operations occur citywide every year in the spring and fall. At those times, all City streets and alleys are swept systematically, and temporary parking bans are enforced to aid with sweeping operations. During the summer, between the spring and fall sweep events, sweepers are used for periodic sweeping of maintenance districts, downtown and other high traffic commercial areas, the Chain of Lakes drainage areas, and the Minneapolis Parkway System. In Fall 2007, over 3,300 tons of leaves were collected during the fall citywide sweeping and were sent to processing as compost. During Spring and Summer 2007, over 17,000 tons of materials were collected. A portion of this volume is assumed to be reclamation of sand applied to roadways for snow and ice control.

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Snow and Ice Control

The Street Maintenance section applies salt and sand to City roadways every winter. Salt can cause damage to various types of infrastructures, as well as be harmful to groundwater, surface water, plants, and trees. The 2006-2007 winter season was colder than the year before with a number of large snow events along with fewer minor events. In 2007, the EPA approved a Total Maximum Daily Load study for chlorides (salt) that are an impairment to Shingle Creek, and the improved snow and ice control practices that the City had developed for Shingle Creek are also being implemented citywide. In 2008, the City will continue to be watchful for any new technologies and pilot study opportunities.

Storage of De-icing Materials

In 2007 and 2008, a new, consolidated maintenance yard is being designed that will employ the most effective Best Management Practices (BMPs) available, including runoff collection systems that would be installed around salt and sand stockpiles, and truck washing areas.

Flood Control Program

The NPDES Permit objective of this 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.

The Flood Mitigation Program began in 1998 and was originally scheduled to run through 2009. However, due to the state of the City's available finances, this Program has been temporarily suspended. Due to changes that the anticipated Total Maximum Daily Load (TMDL) standards will impose on new designs, current flood mitigation strategies are changing. The new type of project tries to achieve the three R's or the three *REDUCTIONS* of *VOLUME*, *RATE* and *LOAD*. This is a dramatic change in design development and a departure from past strategies of enlarging pipes to drain more stormwater faster. New techniques focus on green initiatives that treat stormwater where it falls and try to avoid the need for new or larger pipes.

In 2007, the City completed construction of three flood mitigation projects. In 2008, planning is underway for two additional flood mitigation projects.

The City's Flood Control Program is a companion to the Combined Sewer Overflow (CSO) Program and the Infiltration and Inflow (I & I) Program. Studies show that the City has a problem with inflow (stormwater that drains to the sanitary sewer system). Unfortunately, successful completion of CSO and I & I projects can be a burden for the Flood Control Program, because of additional volume. In

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2007, the City removed 137-acre feet of inflow, thus the storm sewer system received 137 more acre-feet of runoff that had previously discharged to the sanitary sewer.

Pesticides and Fertilizer Control Program

The objective of this stormwater management program is to minimize the discharge of pollutants by controlling the application of pesticides and fertilizers.

The MPRB manages 6,400 acres of park land in the City of Minneapolis (approximately 18% of the City's 35,244 total land acres). In 2007, 205 MPRB employees held pesticide applicator licenses through the Minnesota Department of Agriculture.

In 2007, populations of beetles released for purple loosestrife control continued to maintain themselves, reducing the need for chemical spraying. Also in 2007, many Minneapolis suppliers are offering a wider range of zero-phosphorus turf fertilizers. In 2008, MPRB is expanding its documentation regarding the use of pesticides and fertilizers by City departments and agencies will be expanded. This information already exists for MPRB facilities. Information is being collected for other facilities within the City, including those managed by the Minneapolis Community Planning & Economic Development Department (CPED) and Property Services Division of Public Works, the Minneapolis Public Housing Authority, and the Minneapolis School Board.

Illicit Discharges and Improper Disposal to Storm Sewer System Program

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 an appropriate permit be obtained for non-stormwater discharges.

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, and 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, or the use of absorbents or other media to collect hazardous waste for disposal.

In 2007, 100 calls for emergency response were successfully addressed, including containment of spills and response to chemical dumping, illegal disposal or handling of regulated or hazardous materials. In 2007 and 2008, GIS mapping is being implemented as a tool to support these activities.

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Storm Sewer Design for New Construction Program

The City currently has a five-year focus on the reduction of inflow (stormwater directly connected to the sanitary sewer, streets, roof drains, foundation drains, etc.) and infiltration (groundwater leaks through sewer pipe joints and cracks, tree roots in the sanitary sewer system). The program focus is due to the Metropolitan Council Environmental Services (MCES) Inflow & Infiltration (I&I) Surcharge Program introduced in 2006 that established a mitigation fee (a “surcharge”) of \$350,000 per million gallons per day (MGD) of excess flow in the sanitary sewer system to the MCES treatment plant. At that time MCES determined that the City had 112.7 million MGD of excess flow. To forgo the surcharge, the City needs to identify and eliminate the sources of inflow and infiltration. The surcharge program requires that the City make progress in removing 20 percent of the excess flow each year from 2007 to 2011.

Based on volume, roughly half of the sources of the inflow have been identified. The principal work is elimination of public and private stormwater inlets or rainleaders connected to the sanitary sewer. The work of identifying the remaining sources is continuing. The City’s success with the reducing I & I into the sanitary sewer system has increased the flow rates in the stormwater management system.

During the next five years, the removal of I & I from the sanitary sewer system, including Combined Sewer Overflow (CSO projects), will be the primary concentration. Mitigation begins with an effort to reduce the volume of runoff. Options that reduce volume must have space within the right-of-way or must have an off-site area, with suitable soils for volume reduction in either case. Next, load reduction options are investigated, using recognized Best Management Practices (BMPs) such as prefabricated swirl-type grit chambers, biofiltration or ponds. Space constraints in fully developed urban areas like Minneapolis limit the majority of projects to use of compact prefabricated BMPs for load reduction.

In 2008, Minneapolis is also studying the feasibility of incorporating pervious concrete and underground stormwater storage as a pilot project along a four-block segment of West 54th Street. This approach is designed to reduce stormwater volume discharging to Minnehaha Creek by increasing evapotranspiration and infiltration, to control rate of stormwater discharge, and also to remove pollutants from the stormwater prior to discharge to the creek.

Public Education Program

The City of Minneapolis and the MPRB’s Public Education Program promotes, publicizes, and facilitates proper management of stormwater discharges to the storm sewer system. The program’s main focus is to educate Minneapolis residents, business owners, employees and visitors about stormwater. The program’s goals include showing how *everyone’s* actions affect the quality of our lakes, wetlands,

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streams and the Mississippi River, and how to reduce the discharge of pollutants to our receiving waters. The desired result is to change behavior in ways that will improve water quality.

Ongoing activities 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 pollution.

Year 2007 highlights included ongoing use of popular mobile, multi-language water education kiosks, development of a multi-language/multi-cultural watershed education video, the Sewer Rats Program at 21 recreation centers, Earth Day Watershed Clean-up, naturalist activities, a rain barrel program, rain garden workshops, and launching of a campaign to 'get your butt off the street' - targeting cigarette butt litter in downtown Minneapolis.

In 2008 most of these activities will continue. Release of the Multi-Cultural Watershed Education Video is targeted for Fall 2008. Additionally, interpretive signage is being designed for installation at key public stormwater management sites, with project information and a self-guided tour of the sites that will appear on the City's web site.

Public Participation Process Program

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, the City holds a public hearing at a meeting of the Transportation & Public Works Committee of the City Council. The hearing provides an opportunity for public testimony regarding the Program and Annual Report prior to report submittal to the Minnesota Pollution Control Agency.

A notice of the availability of the draft Report for review and public comment was sent to all 81 Minneapolis neighborhood organizations, to the governmental entities that have jurisdiction over activities relating to stormwater management, and to other interested parties. The notice was sent by e-mail and included information for accessing or obtaining the draft Report, and for providing comments either in writing or in person at the public hearing. Once finalized, the Annual Report is also made available on the web site for viewing or downloading. The City Clerk's office also keeps copies of the Annual Report on hand for examination by the public, prior to the hearing date and for a period thereafter.

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The public hearing was held on May 6, 2008. No testimony or questions were presented. Written comments were accepted until Friday, May 9, 2008. Only one question was submitted, as follows:

If you have 6 crews of 2 people each for cleaning storm water pipes and they cleaned 4.91 miles of pipe and it only cost \$3,473 per mile (less than \$15,000) seems like there is a disconnect.

Where are the people and truck costs?

If you have 2 crews of 2 people each to televise pipe and they televised 1.17 miles at 1.19 per foot (\$7.351.34) where are the people and truck costs?

Minneapolis Public Works prepared the following response:

This question pertains to wording of the DRAFT Annual Report, Section II., Storm Drain System Operational Management and Maintenance (Performance Measures).

For the first part of the question, the draft language stated, "Miles of storm drain cleaned per year: 4.91 miles @ \$3,473/mile".

The final version has been corrected to state, "Miles of storm drain cleaned per year utilizing hydro-jet washing: 4.91 miles @ \$3,473/mile."

Hydro-jet washing is one component of storm drain system cleaning. It is done with two people at roughly \$40/hr. and a truck at roughly \$20/hr., and is only used for certain small diameter pipes that have relatively small amounts of sand build-up in them. Additionally, cleaning the storm drain system consists of removing trash from catch basins, shoveling sand/grit from large diameter pipes, and removing trash and other solid debris from inside pipes.

For the second part of the question, the Annual Report (both the draft and the final versions) states, "Miles of storm drain televised per year: 1.17 miles @\$1.19".

The unit cost is for running a remote-controlled camera through a pipe. We do this work with two people and a truck, again at a cost of roughly \$40/hr. for each person and roughly \$20/hr. for a truck. The unit cost of \$1.19 per foot does not include cleaning, engineering evaluation or any other investigatory work.

Coordination with Other Governmental Entities Program

The objective of this program is to maximize stormwater management efforts through coordination and partnerships with other governmental entities. Coordination and partnerships of the City and the MPRB with other governmental entities include the four watershed organizations in Minneapolis: Bassett Creek Water Management Commission, Mississippi Watershed Management Organization, Minnehaha Creek Watershed District, and Shingle Creek Watershed Management Commission.

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Coordination activities and partnerships with other governmental entities also include MnDOT, MPCA, neighboring cities, the Metropolitan Council, and various other entities. The coordination can include the joint review of projects, joint studies, joint water quality projects, stormwater monitoring, water quality education, and investigation or enforcement activities. In 2007, participation with other governmental entities in Total Maximum Daily Load (TMDL) studies and implementation plans became a significant new Work Plan component, and this will continue into the foreseeable future.

In 2008, the City will submit its Minneapolis Local Surface Water Management Plan (LSWMP), adopted by the City in October 2006, to the Metropolitan Council as a component of the City's updated comprehensive plan, The Minneapolis Plan For Sustainable Growth. The LSWMP was developed to meet the requirements of Minnesota Statute 103B, as well as to provide a resource for City staff. The LSWMP plan serves as a guidance manual for handling regulatory requirement issues, planning for and managing surface water resources and stormwater and sanitary sewer infrastructure, and also for 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. Contributors included various City departments, MPRB, MCES, and the four watershed organizations in Minneapolis. 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.

Stormwater and Water Quality Monitoring - Results and Data Analysis Program

The Minneapolis Park & Recreation Board's annual [2007 Water Resources Report](#) is a comprehensive technical reference of water quality information for the citizens of Minneapolis. Due to the length of this document, only excerpts related to the NPDES stormwater runoff monitoring and BMP monitoring sections are included in the Annual NPDES Report. Electronic copies of the [2007 Water Resources Report](#) are available on the MPRB web page at www.minneapolisparcs.org. 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 at (612) 230-6400.

For required NPDES monitoring sites, storm event samples were collected May through November, and two snowmelt grab samples were collected in February and March. The target frequency for sample collection was once a month. The total volume sampled for each site, and the total recorded volume, is given in Table 23B of Appendix A, along with the percentage sampled per season. For

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detailed information on sampling events see Table 23C of Appendix A. The parameters listed in the Limits and Monitoring Requirements section of the permit were monitored for each sample collected. Multiple bacteria grab samples were taken throughout the season, using standard protocols.

Best Management Practices (BMPs) include procedures and structures designed to help reduce water pollution. For monitoring of BMPs, in 2007 the MPRB monitored two of the City of Minneapolis' stormwater ponds located in north Minneapolis at Heritage Park. Monitoring will continue and expand in 2008. These data will be used to assess and give an indication of the baseline efficacy of the Heritage Park and Heritage Common BMPs and will be compared to data collected in later years.

For lake monitoring, in 2007 the MPRB scientists monitored 12 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. 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, and Harriet Lakes are mesotrophic with moderately clear water and some algae. Brownie, Isles, Hiawatha, Nokomis, Spring, Loring and Powderhorn Lakes are eutrophic with higher amounts of algae. Wirth Lake and Webber Pond fluctuate between these two categories. Trends in lake water quality can be seen by using the annual average TSI score over the last 14 years. Lakes showing water quality improvement included Calhoun, Cedar, Harriet, Powderhorn, Wirth and Webber Pond. Lakes with stable water quality included Brownie, Nokomis, Hiawatha, Isles and Spring.

Storm Drain System and Drainage Areas Inventory Program

The City of Minneapolis storm drain system handles runoff from approximately 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 City contributes stormwater runoff to Minnehaha Creek, Bassett Creek, Shingle Creek and Mississippi River watersheds.

The system includes main line storm drain piping, deep drainage storm tunnels, catch basin runs, outfall control structures, pump stations, and numerous Best Management Practices (BMPs) including ponds, wetlands, grit chambers and so on. The total replacement cost of the City's storm drain system exceeds \$860 million (based on year 2000 dollars). Not included in the City system are facilities owned and operated by MnDOT, Hennepin County, and the University of Minnesota.

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Calculations of seasonal loads for 2007 were calculated on the following basis:

Season	Inclusive dates	Precipitation, National Weather Service
Winter/snowmelt	01/01/07 – 03/31/07	5.32 inches (0.135 m)
Spring	04/01/07 – 05/31/07	3.10 inches (0.079 m)
Summer	06/01/07 – 08/31/07	14.66 inches (0.372 m)
Fall	09/01/07 – 12/31/07	11.24 inches (0.285 m)

For a summary of activities and responsible departments for each Section of this Report, refer to Appendix A45.