NPDES MS4 Phase I Permit Annual Report for 2010 Activities
City of Minneapolis and the Minneapolis Park & Recreation Board

NPDES MS4 Phase I Permit No. MN0061018 Annual Report
Prepared by:
Minneapolis Public Works Department in conjunction with the Minneapolis Park & Recreation Board

Submitted:
September 28, 2011

Minneapolis Park & Recreation Board

Minneapolis
City of Lakes

minneapolis
city of lakes

NPDES MS4 Phase I Permit Annual Report for 2010 Activities

September 28, 2011

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

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Acknowledgements

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Appendix A – Supplemental Documents

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Acronyms

BCWMC	Bassett Creek Water Management Commission
BMP	Best Management Practices
CB	Catch Basin
CSO	Combined Sewer Overflow
CWA	Clean Water Act
DNR	Department of Natural Resources
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
FWMC	Flow Weighted Mean Concentration
LAURI	Lake Aesthetic and User Recreation Index
I & I	Inflow & Infiltration
LID	Low Impact Design
MCES	Metropolitan Council Environmental Services
MCWD	Minnehaha Creek Watershed District
MECA	Minnesota Erosion Control Association
MH	Manhole
MDR	Minneapolis Development Review
MnDOT	Minnesota Department of Transportation
MOU	Memorandum Of Understanding
MPCA	Minnesota Pollution Control Agency
MPRB	Minneapolis Park & Recreation Board
MPW	Minneapolis Public Works
MWMO	Mississippi Watershed Management Organization
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NURP	Nationwide Urban Runoff Program
RDP	Rainleader Disconnect Program
SCWMC	Shingle Creek Watershed Management Commission
SOP	Standard Operating Procedure
SSO	Sanitary Sewer Overflow
SW	Stormwater
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
XP-SWMM	Stormwater Modeling design software
WMO	Watershed Management Organization

I. Executive Summary

Report Objective

This report is prepared in compliance with the requirements of NPDES (National Pollutant Discharge Elimination System) Permit No. MN0061018 issued on December 1, 2000. (The Permit was reissued in January 2011, however this Annual Report is in compliance with the 2000 Permit. Concurrently with this Annual Report, a new Stormwater Management Program is being submitted which is in compliance with the 2011 Permit.)

Background

The National Pollutant Discharge Elimination System (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 surface waters including lakes, streams, wetlands, and rivers. 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.

This report is prepared in compliance with the requirements of the MPCA NPDES and State Disposal System (SDS) Permit MN0061018 which is a Municipal Separate Storm Sewer System (MS4) Phase I permit issued to City of Minneapolis and the Minneapolis Park & Recreation Board (MPRB) as co-permittees on December 1, 2000. In January 2011, the MPCA re-issued Municipal Separate Storm Sewer System (MS4) NPDES Permit No. MN0061018 to the City of Minneapolis and the Minneapolis Park & Recreation Board (MPRB) as co-permittees in January 2011. The Permit requires the implementation of approved stormwater management activities, referred to as Best Management Practices (BMPs). A new Stormwater Management Program (SWMP), documenting the BMPs the City and the MPRB have or will put in place for the re-issued 2011 permit, is being submitted to the MPCA for approval at the same time as submission of this Annual Report, September 28, 2011. Typically the Annual Report is due in June of each year, however the due date was changed for 2011, to September 28, because of the additional preparation of the SWMP in accordance with the re-issued permit.

The Minneapolis NPDES Stormwater Management program is developed and administered by the City and MPRB departments/agencies that are responsible for permit activities. Primarily included are the City's Public Works and Regulatory Services Departments and the MPRB. These stakeholders are jointly responsible for the completion of the required Permit submittals. Public Works provides program management and completes each Annual Report.

This Report provides documentation and analysis of the activities conducted during the previous year, 2010. Public input into the development of the priorities and programs is required, as is adoption by City Resolution of the Annual Report. The draft Annual Report was distributed to neighborhood organizations, watershed organizations, the Citizens Environmental Advisory Committee (CEAC) and numerous other interested parties for their review and comment. A public hearing was held on Tuesday, September 13 at 9:30 AM in Council Chambers of City Hall, 350 South Fifth Street, at the meeting of the Transportation & Public Works Committee of the City Council.

II. Storm Drain System Operational Management and Maintenance

Program Objective

The objective of the NPDES stormwater management 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:

- Sediment
- Nutrients
- Floatable Garbage

Program Overview

The City's storm drain system is operationally managed and maintained by the Operations section of the Public Works Department Surface Water and Sewers Division. Design engineering and regulatory issues are managed by the division's Capital and Regulatory sections.

The current authorized staffing level of the Operations section is approximately 70 full-time employees. Of these, there are currently 50 permanent, full-time and 9 seasonal employee(s) working directly within the operations and maintenance area, and the remainder work within the construction area. General operations and maintenance efforts include pump station and pipeline inspections, pipeline cleaning, system repairs, rehabilitation or reconstruction, inspection and operation of control structures, operation of pump stations, cleaning of water quality structures, and operational management of stormwater detention ponds.

The table below shows the base operational functions along with the corresponding staffing:

Crews	Staff/crew	Type	Tasks
4	2	Route Truck	Daily pipe line system inspections, complaint response, and resolution to minor system operational problems
6	2	Jet Truck	"As-requested" cleaning of storm system components, routine cleaning of sanitary system pipes, and "as-requested" cleaning of pump/lift stations. Hydro jet-wash technique.
2	2	TV Truck	Televise and inspect storm drain and sanitary sewer system components. Log and assess condition of televised lines to determine and prioritize rehabilitation and/or repair needs to storm drain and sanitary sewer system components.
2	2	Repair Truck	Perform medium-sized repairs, requiring minimum excavation, to storm drain and sanitary sewer system pipeline components. May assist in the repair or reconstruction of larger repair/ reconstruction jobs.
2	2	Vacuum Truck	Vacuum-cleaning of water quality structures, manholes, and catch basins within the storm drain system. Assist in sanitary sewer cleaning by vacuum removal of sludge and debris build-up. Assist in repair/ construction activities using vacuum excavation process. Assist in erosion control compliance using vacuum cleanup of eroded soils and/or cleaning of erosion control structures.
1	2	Rod Truck	Remove roots and foreign objects from sanitary sewer system. Remove large debris from storm drain pipes and free ice from frozen catch basin leads.
1	3	Pond & Pump	Operate, maintain, and repair sanitary lift station and stormwater pump stations. Operate and maintain stormwater detention basins.
1	1	Shop	Perform general maintenance and repair to specialty use vehicles and emergency response equipment. Fabricate, as needed, custom metal and wood objects for sewer and storm drain operations. Provide field deliveries of materials, tools, and equipment. Maintain material inventory and fleet management data.

Previous Year Activities

Some of the noteworthy 2010 cleaning and repair statistics are summarized in the following list:

- Responded to 492 complaints of plugged or backed-up catch basins
- Responded to 56 complaints of cave-ins around catch basins and manholes
- Performed 211 minor repairs to storm drain lines, catch basins or manholes
- Completed 2 major repairs to the storm drain system
- Cleaned 3.66 miles of storm drain utilizing hydro-jet washing
- Televised and condition assessed 1.56 miles of storm drain pipe line
- Performed baseline inspection of 65,142 feet of deep stormwater drainage tunnels
- Reconstructed 593 feet of storm tunnel
- Repaired 200 feet of storm tunnel

In December 2010, the City Council approved an additional $5.2 million for tunnel repair and construction. This work on the 10th Avenue SE tunnel will improve the condition of the structure and reduce the sandstone outside of the tunnel from eroding, which will decrease transport of solids the Mississippi River.

Performance Measures

- Miles of storm drain televised in 2010: 1.56 miles
- Miles of storm drain cleaned in 2010 utilizing hydro-jet washing: 3.66 miles

III. Structural Controls Operational Management and Maintenance

Program Objective

The objective of this NPDES MS4 stormwater management program is to minimize the discharge of pollutants through the proper operational management and maintenance of the City's storm drain system. Within the City's storm drain system are structural controls that affect system flow rates and water quality discharges.

Structural controls include:

- Grit Removal Chambers
- Outfall Structures
- Pump Stations and Level Control Weirs
- Stormwater Ponds, Stormwater Wetlands and Bio-(in)filtration (Rain Gardens)
- Catch Basins

Targeted pollutants include:

- Sediment
- Nutrients
- Floatable Garbage

Program Overview

Structural controls that are part of the City's overall storm drainage system are operationally managed and maintained by the Operations section of the Public Works Surface Water & Sewers Division. These components are routinely inspected and maintained to ensure proper operation and reliability. Frequency of inspections and assigned maintenance efforts are based on both operational experience and incurred environmental events. Structural controls are separated into five separate categories:

1. Grit Removal Structures

These are devices that have been installed for sediment, debris, and oil collection. The City continues with its effort to increase the number of grit chambers installed. The devices are inspected in the spring and fall of each year, and then cleaned, if required. The amount of sediment removed, the presence of floatables, and the dates that devices were cleaned are recorded on log sheets, and then added to a database. Appendix A35 contains a list of these devices, and maintenance dates.

2. Storm Drain Outfalls

These are the structural ends of system pipelines where conveyance of stormwater runoff is discharged into receiving water bodies. Outfalls are inspected on a 5-year schedule where 20% of the outfalls are inspected each year. Site inspections evaluate the general condition of structures, determine if any significant erosion has occurred and observe any contaminant discharges. When indications of illicit or otherwise contaminated discharges are observed, they are immediately reported to Minneapolis Regulatory Services for reporting to the Minnesota Duty Officer and for further investigation and resolution. Any identified structural repair or maintenance work is prioritized and scheduled within the constraints of available personnel, budget funding, and coordination with other essential operations. Appendix A36 contains maintenance information for these devices.

3. Pumps & Weirs

These are structural devices that mechanically affect the flow of stormwater runoff through the storm drain system. Pump stations are inspected on a regular basis for routine operational checks and are inspected annually for detailed condition assessment. Maintenance and/or repairs are performed with routine items being completed as needed and larger items being coordinated into a budgeted pump station operation program. Weirs and outlet structures are inspected and repaired as needed to facilitate their proper operational working order.

4. Ponds and Bio-(in)filtration (Rain Gardens)

These are structural devices that detain stormwater runoff, and in some cases improve the water quality. They are regularly maintained for volume and functionality, and also for their park-like amenities including native plantings, turf grass, pathways, benches, and lighting. Based on current level of experience, the need for dredging of sediment buildup appears to be in a 15- to 20-year cycle. At present, only a few of the City's holding ponds are at or near this age such that the need for sediment removal from them is considerable.

5. Catch Basins

These are structural devices located along the City's street system that provide entrance of stormwater runoff into the storm drainage system. There is no formalized inspection schedule, however Surface Water & Sewers crews and Street maintenance crews both routinely look for plugged or damaged structures. Reported damages and/ or plugs are given a priority for repair and/or cleaning. Cleaning catch basins, while ensuring proper runoff conveyance from City streets, also removes accumulated sediments, trash, and debris. Augmenting this effort is the street sweeping program carried out by the Street maintenance section that targets the pick-up of street sands, leaves, and debris prior to their reaching catch basins. Repair of damaged catch basins is also a priority, given their location in city streets and ultimate impact to the traveling public.

Previous Year Activities

- Monitored and maintained 25 pump stations.
- Performed 186 grit chamber inspections on 120 individual structures (some were inspected more than once). Performed 136 cleanings on 96 of the structures (some were cleaned more than once, some did not need cleaning). A total of 468.25 cubic yards of material was removed from grit chambers. Another 149 cubic yards was removed from storm drains storm drain tunnels for a total of 617.25 cubic yards. The majority of the grit chambers are both maintained and owned/operated by Public Works, however some are owned and operated by others, but cleaned by Public Works under contract.
- Maintained 11 stormwater holding ponds
- Inspected 86 of 387 storm drain outfalls in 2010 inspection program. Of the 86 outfalls inspected, 3 were found to be in need of repair or maintenance. Of those, 1 of the issue was taken care of. We also did repairs to 1 outfall from the previous year's inspections, leaving 11 outfalls that are in need of repair or maintenance that we will address as soon as time and access allow.

Performance Measures

Structures operated and maintained annually:

- 25 pump stations
- 11 stormwater holding ponds
- 136 grit chamber cleanings

IV. Disposal of Removed Substances

Program Objective

The objective of this NPDES MS4 stormwater management 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 is the collection and disposal of targeted pollutants in a manner that will prevent pollution and that will comply with applicable regulations. Targeted pollutants include:

- Sediment
- Nutrients
- Floatable Garbage

Program Overview

Targeted pollutants are collected from grit removal structures, catch basins, system piping, detention ponds, and deep drainage tunnels. Removed substances are screened for visual or olfactory indications of contamination. If contamination of the material is suspected, the Engineering Laboratory will select representative samples for an environmental analysis. Contaminated substances are disposed of in a landfill or another site that is approved by the Minnesota Pollution Control Agency (MPCA). Non-contaminated targeted pollutants are disposed of the same way as street sweepings, as reported in **Section VI. Roadways**. During cleaning and disposing operations, erosion control measures are applied when needed to prevent removed material from re-entering the storm drain system.

Previous Year Activities

Approximately 617 cubic yards of sediment and debris were removed from storm drain system facilities by Minneapolis Public Works crews in 2010. Minneapolis Public Works maintains the city's system and also facilities for other agencies, such as Hennepin County and the Minnesota Department of Transportation. The removed material consisted primarily of sand and vegetative matter collected from grit removal chambers. See **Section III. Structural Control Operational Management and Maintenance** for operation and maintenance details.

Work Plan

Disposal of removed substances will continue as in years past.

Performance Measures

- Quantity of materials removed: 617 cubic yards
- Surface Water & Sewers Operations responded to, and subsequently mitigated, 2 contaminated substance/ hazardous waste spills in 2010.

V. Stormwater Management for New Developments and Construction

Program Objective

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 and sediment control, and approval of stormwater management including ongoing operation and maintenance commitments. Targeted pollutants include:

- Phosphorus
- TSS[1]

Program Overview

Minneapolis Code of Ordinances, Title 3, Air Pollution and Environmental Protection, Chapter 52 (Erosion and Sediment Control and Drainage) and Chapter 54 (Stormwater Management), contain erosion and sediment control requirements and stormwater management instructions for new developments and other land-disturbing construction activities.

Site Plan Review

Construction activities and new development projects are reviewed through the City's site plan review process. The Minneapolis Development Review (MDR) section of the Regulatory Services Department facilitates this process where a Development Coordinator directs a preliminary, multi-disciplinary review of the submitted plans. This review provides comments that are integrated into a final plan submittal that is subsequently routed to the City's Licensing, Building Plan Review, Fire, and Community Crime Prevention units, and to the Public Works Department (Street, Traffic, Sidewalk, Water, Right of Way, and Surface Water & Sewers sections), for review of compliance issues. The Surface Water & Sewers Division reviews project plans for compliance with the Minneapolis Erosion & Sediment Control Ordinance (Minneapolis Code of Ordinances [MCO] Chapter 52), Stormwater Management Ordinance (MCO Chapter 54), and flooding and capacity issues.

[1] Total Suspended Solids

Erosion Control

Ordinance

In 1996 the Minneapolis City Council amended Title 3 of the Minneapolis Code of Ordinances relating to Air Pollution and Environmental Protection by adding Chapter 52, entitled *Erosion and Sediment Control for Land Disturbance Activities (*now *Erosion and Sediment Control and Drainage)*. The ordinance was designed with the intent of regulating topsoil disturbances, thus limiting soil from entering the storm drain system.

Requirements

The ordinance addresses development sites, demolition projects, and other land disturbing activities. Sites disturbing more than five cubic yards, or 500 square feet, are required to have an erosion control permit. Erosion & Sedimentation Control (ESC) Permits must be acquired prior to commencement of work, and must be obtained before a building permit will be issued for the site. If there will be a disturbance of greater than 5,000 square feet, demolition and construction sites also require an approved erosion control plan before the ESC Permit can be issued.

Enforcement

Ongoing site inspections are performed by Regulatory Services inspectors. Inspectors may issue citations. Failure of the permittee to comply with the ordinance will constitute a violation (pursuant to Section 52.300). If there is a demonstrated failure to comply, the City reserves the right to terminate an ESC permit at any time. The City then has the option of proceeding with the necessary restoration of the site. This restoration would be done at the expense of the owner/permittee.

Ongoing Stormwater Management (following completion of construction projects)

Ordinance

In 1999 the Minneapolis City Council amended Title 3 of the Minneapolis Code of Ordinances (relating to Air Pollution and Environmental Protection) by adding Chapter 54, which is entitled *Stormwater Management*. The ordinance establishes requirements for permanent stormwater management for projects on sites that are greater than one acre.

Plan Review

Stormwater management plans are required for all construction projects on sites greater than 1 acre in size. These plans are reviewed through the Minneapolis Development Review (MDR) process and approved by the Minneapolis Public Works Surface Water & Sewers Division. Sites less than 1 acre are also encouraged to incorporate stormwater BMPs in their design as a means of satisfying other city codes such as green space requirements.

Registration

Stormwater devices are registered with the City of Minneapolis Department of Regulatory Services, with an annual permit required for each stormwater device registered. An annual maintenance and inspection program is included in the permitting process.

Goals

The Minneapolis Stormwater Ordinance specifies that stormwater management standards be set according to the receiving water body. These standards include but are not limited to:

- Reductions of TSS for discharges to all receiving water bodies
- In addition to TSS, controlled rate of runoff for discharges to streams, areas prone to flooding, and areas with infrastructure limitations
- In addition to TSS, a reduction in nutrients for stormwater that discharges to lakes and wetlands
- Provision for on-site, off-site, or regional stormwater facilities
- Maximizing infiltration by minimizing the amount of impervious surface
- Employing natural drainage and vegetation

Previous Year Activities

Site Plan Review

During 2010, Minneapolis Public Works took part in the preliminary review of 145 site plans. Of those 145 site plans, 102 received final approval with the appropriate permits issued. Continued attention to erosion control plan submittals along with increased awareness in the industry provided for better compliance during site inspections.

During 2010, Minneapolis Public Works took part in reviewing the Central Corridor LRT project. Hennepin County and the University of Minnesota also took part. The parties worked closely and successfully with the project to include mitigation for pollutants in stormwater runoff. Improvements will include several several bio-filtration sites, installation of a large grit chamber, and probably most notably, re-routing of stormwater to allow elimination of seven outfalls to the Mississippi River that had been causing considerable riverbank erosion.

Erosion Control

Increased awareness of the ordinance, improving plan submittals and a continued compliance-based inspection program resulted in a continued rise in compliance. A summary of the 2010 inspections is as follows:

- 1943 site inspections completed
- Successfully responded to all public complaints (number not tracked)
- 194 enforcement actions issued to gain site compliance
- 33 citations for non-compliance after enforcement action
- Coordinated inspections with Minnehaha Creek Watershed District (MCWD)

During 2010, Public Works Surface Water & Sewers staff continued to work with internal and county staff on erosion compliance providing site inspections for Street, Bridge, Traffic, Sewer and Water construction forces improving overall compliance.

Ongoing Stormwater Management

Redevelopment of existing sites provides an opportunity to lessen the impacts of urbanization on the Mississippi River and other Minneapolis water resources. During 2010, 138 Stormwater Best Management Practices (BMPs) were installed on sites reviewed through the Minneapolis Development Review process. BMP types included:

- Rain gardens
- Pervious pavement
- Infiltration areas
- Ponds
- Green roofs
- Underground infiltration chambers/pipe galleries
- Underground storage/detention chambers
- Proprietary filter chambers
- Vegetated swales

These BMPs will provide rate control and water quality for approximately 86 acres of land, including 62 acres of impervious area.

Performance Measures

Current performance measures include:

1. Number of sites captured in 2010 under Stormwater Management Ordinance: 40
2. Number of erosion control inspections in 2010: 1943

VI. Roadways

Program Objective

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. Targeted pollutants include:

- TSS[2]
- BOD5[3]
- COD[4]
- Phosphorus
- Chlorides

Program Overview

Street Sweeping

Minneapolis employs several street sweeping approaches in Minneapolis. Some are citywide, and some vary by area or land use. 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. Operational routines and special methods are employed to address seasonal conditions, and to optimize cleaning. Flusher trucks apply pressurized water to the streets in an effort to push sediment and debris to the gutters. Street sweepers follow behind the flusher trucks and clean the gutters. During the fall, leaves are first bunched into piles, and then the leaves are picked up before flushing and sweeping occurs. During the summer, between the spring and fall sweep events, sweepers are assigned to maintenance districts for periodic 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

[2] Total Suspended Solids
[3] Biochemical Oxygen Demand of wastewater during decomposition occurring over a 5-day period
[4] Chemical Oxygen Demand

Water Partnership project. Two sweepers are dedicated to cleaning drainage areas around the Chain of Lakes, and one sweeper is devoted to the Minneapolis Parkway System.

The materials collected from Street Sweeping are received at two different locations, based on time of the year and nature of the material. The inorganic materials go to a construction demolition landfill site in Becker, Minnesota, to be used as daily cover. A five-year 2008 contract states that the organic materials, which are collected mostly in the fall of the year, go to Carver County Minnesota to be composted and converted to a retail mulch material that is then distributed by a company called RW Farms, LLC, Organic Technologies.

Snow and Ice Control

The Street Maintenance section 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 realized in a reduction of the overall amount of materials used. Salt is harmful to groundwater and to most plant and tree species. Salt causes corrosive damage to bridges, reinforcement rods in concrete streets, metal structures and pipes in the street, and vehicles. Sand harms lakes and streams by disturbing the ecosystems, and in depositing pollutants that bind to sand particles in lake bottoms and streambeds. An accumulation of sand calls for more frequent cleaning of catch basins and grit chambers. In 2007, the EPA approved a Total Maximum Daily Load (TMDL) study that places limits on chlorides (salt) discharged to Shingle Creek which had been assessed as impaired for chlorides. Consequently, the City developed improved snow and ice control practices, and they are being implemented not only in the Shingle Creek drainage area but also citywide. Maintenance supervisors are trained in winter maintenance techniques through sessions that are sponsored by the Local Road Research Board (LRRB), a training partnership of Mn/DOT and the University of Minnesota. Specific topics covered include guidelines for sand and salt application rates that are based on weather conditions, application techniques, and spreader calibration. Plans for future training sessions will include those actual equipment operators. Material spreaders are calibrated annually before the winter season. Maintenance yard housekeeping practices are designed to minimize salt/sand runoff. The materials that are used are tallied on a daily basis.

Storage of De-icing Materials

Salt stockpiles are stored under cover to minimize potential groundwater contamination and runoff. Opened in Summer 2010, a new maintenance facility constructed at Hiawatha Avenue and E. 26th St. consolidated some stockpile activities. The storage shed at the 44th St. E. & Snelling Ave. maintenance yard is closed. For its permanent facilities, the new maintenance yard employs runoff collection systems installed around salt and sand stockpiles. Two temporary storage locations are scheduled to be eliminated when funding is available from the sale of several city facilities.

Previous Year Activities

The 2010-2011 winter season was warmer at the start but colder at the end, with many large and minor snow events. There were 25 notable events with 91.5 inches for the season, as compared to an average of 48 inches. The most snowfall was observed in December, but significant snowfalls were also in each of the other winter months. There were eight declared snow emergencies, as compared to an average of 3.5, and there were 162 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. Street sweepings are counted by volume (truckload). These counts are converted to material weight by taking an average of a random weighting of trucks, and by then multiplying that number by the number of truckloads hauled. Leaves picked up are weighed at certified scales that are located at City facilities in Minneapolis. The statistics for last year’s program are as follows:

- 13,976 tons of salt applied to roadways
- 9,503 tons of sand applied to roadways
- 19,250 tons of materials reclaimed during spring and summer street sweeping operations
- 4,930 tons of leaves collected for composting during the fall City-wide sweeping
- 22 staff members attended an eight-hour refresher for the 40-hour hazardous materials training class
- 5 Foremen and 2 Supervisors attended training on the use of salt at the annual salt symposium
- All division shift–staff attended the annual review of procedures. The review covers the recognition and response to hazardous materials or situations.

Performance Measures

- Amount of materials recovered as a percentage of materials applied: 82%
- Amount of salt and sand applied relative to total snowfall: 257 tons/inch

VII. Flood Control

Program Objective

The objective of the Minneapolis stormwater management 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
- Total Suspended Solids (TSS)

Program Overview

In July 1997, Minneapolis experienced torrential rainstorms that exceeded the capacity of the City's existing storm drain system and caused flooding throughout the City, causing physical damage to homes, businesses & vehicles. In response, Minneapolis Public Works established the Flood Mitigation Program to develop potential solutions and a plan for implementation for each of 39 areas that experienced flooding and/or property damage as a result of the 1997 storms.

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 was temporarily suspended. New flooding areas continue to be identified by residents, or through continued analysis of the system. These additional project areas will be considered for future implementation. The design storm is unchanged. Storm drains are still designed to accommodate open channel flow during a 10-year, 24-hour design[5] and provide protection to homes from the 100-year, 24-hour design event. However due to ever-increasing emphasis on water quality and Total Maximum Daily Load (TMDL) standards, flood mitigation strategies have changed. The mitigation techniques have a much different priority now. Anticipated TMDL standards require a new type of flood management project. The new type of project tries to achieve the three R's or the three ***REDUCTIONS*** of ***VOLUME***, ***LOAD*** and ***RATE***.

[5] City of Minneapolis 10-year design based on 4.2" of rainfall in a 24-hour event and 100-year design based on 5.9" of rainfall in a 24-hour event.

With this current strategy, the designer first looks for ***VOLUME REDUCTION***. This is a successful approach for responding to TMDL targets, because these volume reducing techniques do not concentrate the phosphorus or suspended solids, so there is a corresponding ***LOAD REDUCTION***. Next the designer looks for ***RATE REDUCTION***. This too is a successful approach for responding to TMDL targets, because the techniques slow the water down at its source, thereby reducing the initial amount of sediment that reaches the stormwater system. 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 this approach develops options that eliminate or at least minimize the need for new or larger pipes. Examples of the new ***Three "R"*** techniques include:

- A proposal to use street right-of-way for infiltration is a ***Three "R"*** project because phosphorus-laden suspended solids would be filtered by porous media and then infiltrate into the soil
- Another proposal to use street right-of-way in areas with heavy soil is a ***Three "R"*** project because, once again, phosphorus-laden suspended solids would be filtered by porous media to an underground reservoir that feeds tree roots for evapotranspiration
- When volume-reducing strategies are precluded by soil conditions, rate control systems such as underground storage are used

In many cases, adding catch basins or augmenting inlet capacity has the negative effect of increasing the runoff rate. New strategies would look for volume-reducing techniques upstream so the existing system would then have capacity for existing flows. Here are other strategies to help control flooding:

- Installation of backup generators for existing pump stations
- Increased inspection and maintenance of catch basin inlets and storm drains that are located within flood-sensitive areas
- Inclusion of various Best Management Practices (BMPs), including grit chambers, rain gardens, permeable pavers, etc.

Previous Year Activities

In December 2009, the city began construction on a new flood control project for Flood Area 5. This is the part of Minneapolis that drains to Crystal Lake in Robbinsdale. It is roughly bounded by Lowry

Avenue N., Dowling Avenue N., Humboldt Avenue N., and Victory Memorial Drive. Overall, the Minneapolis portion of the drainage area is approximately 450 acres.

After a large event the city's stormwater conveyance system is backed up, causing water to overtop curbs, and in some cases rise to a level that allows flow to enter homes through window wells or across thresholds. The condition occurs primarily because this area is underlain by heavy clay soils that do not allow much water to soak into yards and other green spaces, but rather most of the water that falls on even the planted areas runs off into the street, due to the impermeability of the soils. The original concept for Flood Area 5 under the 1997 Flood Program was to enlarge the pipe system, so that the area could drain faster. Since that time, Crystal Lake has been classified as an impaired water, with an approved TMDL for nutrients. To drain the area faster by simply enlarging pipes would not be appropriate as it could negatively impact Crystal Lake. Therefore the City's project is using primarily underground storage, with some filtration basin (rain garden) storage, to detain the water until the system can convey it downstream. The storage is being designed to also remove pollutants, thus improving the water quality of the runoff before it is discharged to the lake.

The construction that commenced in December 2009 and finished in August 2010 was for the first phase (approximately 45 acres or 10%) of the total project, which is roughly bounded by 36th Avenue N., Dowling Avenue N., Knox Avenue N., and Penn Avenue N. The 2010 work modified some of the north-south storm drains, and added a grit chamber. The second part of this phase, scheduled to begin Summer 2011, will create the “37th Avenue Greenway” which is replacing an existing street with filtration rain gardens straddling a bike/pedestrian trail. Underneath the trail, underground storage vaults are being installed, approximately 20 feet wide and 10 feet deep, for a length of five city blocks.

The remaining mitigation for the balance of the 450 acre flood area is only tentatively scheduled at this time. It is envisioned as a continuation of the approach described above, using underground storage vaults, filtration rain gardens, grit chambers, and additional “greenway” work.

Performance Measures

While most citizens will measure success by whether there is reduced neighborhood flooding, the Flood Control work now also targets water quality. Many of the projects are intended to determine and demonstrate technology that works specifically for this City. Continuing the objectives of previous years, the goal is increased water quality of lakes, river and streams in Minneapolis. The Flood Mitigation Program Projects now focus more on treating stormwater where it falls and making ***VOLUME REDUCTION*** the common element of systems, because volume-reducing systems provide for reduction of TSS, nutrients, litter, and other pollutants, as well as providing some ***RATE CONTROL***.

VIII. Pesticides and Fertilizer Control

Program Objective

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

- Pesticides (insecticides, herbicides, fungicides etc.)
- Nutrients (phosphorus, nitrogen etc.)

Program Overview

Integrated Pest Management (IPM) Policy and Procedures

The Minneapolis Park and Recreation Board's (MPRB) IPM policy, which is used for golf courses and general park areas, is included in the MPRB's General Operating Procedures. Specific areas where IPM is used include the Cowles Conservatory, the Minneapolis Sculpture Garden, and the major display gardens at Lyndale Park, Loring Park, and Minnehaha Falls Park. Plant Health Care/Integrated Pest Management Action Forms are filed when there are specific plant health problems for these garden areas. These forms document the specific problems and the recommended course of corrective action.

Each golf course foreman is responsible for the IPM decisions at his/her course. The golf course foremen, along with other select maintenance staff, attend the annual Minnesota Green Expo in January. There they receive updated information on the newest turf and other related research as it applies to fertilizers, pesticides, biocontrols, etc.

MPRB Staff Pesticide Applicator Licensing and Continuing Education

All recent hires for position of park keeper, Mobile Equipment Operator (MEO), gardener, golf course park keeper, and arborist are required to obtain their Minnesota Non-Commercial Pesticide Applicator license within one year of being hired. Every two years, as mandated by the Minnesota Department of Agriculture, staff attends re-certification training, offered and coordinated by the University of Minnesota. This effort is in conjunction with the Agronomy Services Division of the Minnesota Department of Agriculture.

Use of Pesticides and Fertilizers on Park Lands

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).

Pesticide Use

Use of pesticides to control turf weeds is not a regular practice of park maintenance. Weed control pesticides may be used when a park is being renovated, or when athletic fields and surrounding areas are being sodded/seeded. It may also be used when weeds exceed 50% of the ground "turf" cover. These procedures for general grounds and athletic fields are included in the MPRB's General Operating Procedures.

The MPRB actively manages Eurasian watermilfoil and purple loosestrife, which are two non-native invasive plant species. Eurasian watermilfoil, an aquatic weed, is harvested mechanically on Lakes Harriet, Wirth, Cedar, Isles and Calhoun throughout the summer months. The MPRB has established (in its General Operating Procedures) that no chemical application will be used to control aquatic weeds. Eurasian watermilfoil harvesting is permitted through the Minnesota Department of Natural Resources, Division of Ecological Services. Coordination of control programs for Eurasian watermilfoil are determined, and supervised, by the Environmental Operations Section.

The MPRB does use biocontrols and herbicides to control certain problem invasive species in natural areas. Purple loosestrife, an invasive emergent plant in wetlands, is controlled using a leaf-feeding beetle. Purple loosestrife is the only invasive plant where a biocontrol agent has been successful at controlling the spread of the invasive species. In particular situations where the biocontrol agent is not as effective in controlling purple loosestrife, spot-spraying or hand-pulling is done by park maintenance staff. Common and glossy buckthorn are two woody invasive species controlled in woodlands through herbicide applications. Control of these species is done on a limited basis by Environmental Operations staff and by Forestry staff. Park Maintenance, Forestry and Environmental Operations staff document chemical applications made through our electronic database "PF Manager".

MPRB staff produce and maintain the necessary records of all pest management activities as required by the Minnesota Department of Agriculture. Annual records are kept by the District or Golf Course office.

Since the 1980s, golf course foremen and park maintenance staff have documented the type, amount, and locations of the chemicals that are stored at park storage facilities. These chemical inventories provide detailed information to the fire department as to how to deal with a possible fire at these sites. The plans identify how the fires are best extinguished, and how to protect surface water in the surrounding area. The plans were put into place in the early 1980's, following a chemical company fire in north Minneapolis that resulted in the contamination of Shingle Creek.

Fertilizer Use

In September 2001, the Minneapolis City Council amended Title 3 of the Minneapolis Code of Ordinances (relating to Air Pollution and Environmental Protection) by adding Chapter 55, Lawn Fertilizer. Under the ordinance, since January 1, 2002 the use of fertilizer containing any amount of phosphorus or other compound containing phosphorus, such as phosphates, is prohibited in Minneapolis, except as allowed by Minnesota Statute 18C.60 Phosphorus Turf Fertilizer Use Restrictions. The Minnesota Statute allows the use of phosphorus turf fertilizer if:

- An approved and recent test indicates that the level of available phosphorus in the soil is insufficient
- The fertilizer is being applied to newly established turf, and only during the first growing season

The fertilizer is for use on a golf course under certain conditions specified in the Statute

Fertilization of turf on Minneapolis Park & Recreation Board Property is performed for golf courses, around athletic fields, and in areas of heavy traffic. Golf course managers and maintenance foremen are instructed that no phosphorus can be used for turf fertilization unless a current soil test has demonstrated the need for this nutrient. MPRB staff is required to complete a report for every turf fertilizer application. These records are maintained for a period of 5 years, per state law.

Previous Year Activities

Staff Pesticide Applicator Licensing and Continuing Education

Currently 179 MPRB employees hold pesticide applicator licenses, through the Minnesota Department of Agriculture (MDA).

Audubon Cooperative Sanctuary Program (ACSP) for Golf Courses

Audubon International provides comprehensive conservation and environmental education assistance, to golf course superintendents and industry professionals, through collaborative efforts with the United States Golf Association (USGA). The ACSP seeks to address environmental concerns while maximizing golf course opportunities thereby providing open space benefits. An important component of this program is the implementation of IPM procedures, and the reduction of chemical and fertilizer use to protect water quality and provide a healthier habitat for wildlife.

Participation in the program requires that golf course staff address environmental concerns related to the potential impacts of water consumption, and chemical use on local water sources, wildlife species, and native habitats. Additionally, the program provides assistance in comprehensive environmental management, enhancement and protection of existing wildlife habitats, and recognition for those who are engaged in environmentally responsible projects.

Audubon International provides information to help golf courses with:

- Environmental Planning
- Wildlife and Habitat Management
- Water Conservation
- Water Quality Management
- Outreach and Education

By completing projects in each of the above, the golf course receives national recognition as a Certified Audubon Cooperative Sanctuary. MPRB Operations staff, working with Theodore Wirth and Meadowbrook Golf Course foremen, received the ACSP certification for both courses. MPRB staff conducts yearly water quality and aquatic vegetation monitoring at the courses.

Performance Measures

- Number of MPRB staff with pesticide applicator licenses: 179

IX. Illicit Discharges and Improper Disposal to Storm Sewer System

Program Objective

The objective of this stormwater management program is to minimize the discharge of pollutants by implementing a program to detect and mitigate illicit discharges, and to encourage that an NPDES General Industrial Stormwater Permit or other such permit be obtained for non-stormwater discharges, as well as an NPDES Industrial Stormwater Permit for non-stormwater discharges (process water or de-watering) if applicable. Targeted pollutants include:

- All pollutants

Program Overview

Hazardous Spills

Training for emergency spill procedures is coordinated among all of the following: the Operations section of the Public Works Surface Water & Sewers Division, the Street Maintenance section of the Public Works Transportation Maintenance & Repair Division, the Minneapolis Fire Department, and the Regulatory Services Department.

Typical Spill Response

Regulatory Services and Minneapolis Fire Department personnel typically serve as the first responders to an emergency spill event. The immediate goals of this response are safety, containment of the spill, 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:

1) Recovery for disposal
2) The use of absorbents or other media to collect hazardous waste for disposal

The life cycle of an event requires City personnel to work as a team, utilizing available resources to protect residents, the environment and property. Events are followed by a post-action debriefing to determine the cause of the event, to identify measures to improve the City's response, and to determine the means to limit future occurrences.

The protocol used by the Street Maintenance section for handling spills is documented in Appendix 32: Standard Operating Procedure for Vehicle Related Spills (VRS).

Small Spills

Street Maintenance will dispatch personnel with appropriate equipment to apply sand. Once the sand has absorbed the spill, it is removed by a street sweeper. The contaminated sand is removed from the street sweeper, and then deposited in a leak-proof container.

Large or Hazardous Spills

For large or extremely hazardous spills, the small spill process is followed with the exception that additional resources are expended. The Fire Department's Hazardous Materials Response Team is mobilized in lieu of the local fire station. As the assessment of the event occurs, other City departments become involved; additionally, outside agencies and private emergency response contractors are incorporated as needed. Spills that fall within the minimum reporting requirements are reported to the Minnesota Pollution Control Agency (MPCA) Public Safety Duty Officer. For these spills, an Oil and Hazardous Materials Spill Data form must be completed within 24 hours, or by the next business day. The completed forms are used to document the type of spill, as well as the response to the spill. Emergency Preparedness is responsible for coordinating long-term recovery efforts with other regulatory agencies. Qualifying spills are also reported to the National Duty Officer as required by law.

Emergency Response Program

The Department of Regulatory Services operates a boat for use on the Mississippi River and other Minneapolis water bodies, to be able to respond to spills that could impact our valuable water resources. The presence of a properly equipped boat facilitates addressing these events on the Mississippi River as well as on City lakes. Regulatory Services and Public Works staff are trained in the river deployment of booms, have field experience in placement of both containment and absorbent types of booms, and have years of experience on the water. These skills, coupled with an extensive level of knowledge of the Mississippi River, City lakes, landings and outfalls, provide a high level of protection for our precious natural resources.

Additionally, Regulatory Services uses the boat for the placement of monitoring and sampling equipment used for tracking water quality, identifying points of illegal discharges, illegal sewer connections, infiltration from a sanitary sewers or water mains, assessment of outfalls, and investigation of complaints that are inaccessible from shore.

Unauthorized Discharges

Regulatory Services personnel are responsible for pollution prevention and control. Results are achieved through educational efforts, inspections, and coordinated community outreach events. These activities may include enforcement, pursuant to Chapter 48[6] and other applicable City codes, and coordination with other regulatory agencies at the county, state and federal levels. Enforcement yields identification of the responsible party, documentation of clean-up activities, and also endeavors to reduce the flow of pollutants from illegal dumping and disposal. Response is made to reports of unauthorized discharges and illicit connections. Complaints are received from the public, City and private contractors, City staff and other government agencies, by the following means:

- Environmental Management Complaint Form
- Confidential calls to Minneapolis Information & Services. Within Minneapolis, the phone number is 311. Outside of Minneapolis, the phone number is 612-673-3000
- Reports from sewer maintenance crews, plumbing inspectors, and other City personnel
- Direct contact to Environmental Services staff at 612-673-3867

Non-Stormwater Discharges

Environmental Services reviews non-stormwater permits and renewals while working with the MPCA permitting authority to address local concerns. Environmental Services also reviews alleged violations to a permit or code. If permits are violated, or if conditions indicate that the permit should be revised, Environmental Services staff will assist MPCA permitting staff in updating or revoking the permit.

Additional control measures are implemented within the City of Minneapolis to minimize impacts on receiving waters due to the non-stormwater discharges listed below:

[6] Minneapolis Code of Ordinances, Chapter 48 Minneapolis Watershed Management Authority.

a.	NPDES permitted non-stormwater discharges	Permits are reviewed and registration is required. Ordinances: Title 3, Chapter 50.
b.	Water line flushing and other discharges from a potable water distribution system	Minneapolis Department of Public Works, Water Distribution & Treatment Division implements procedures for de-chlorination prior to discharge to the storm drain system.
c.	Landscape irrigation and lawn watering	Pollutants are controlled through City ordinances: Title 11, Chapter 230 and Title 3, Chapters 48 and 55.
d.	Irrigation water	Same as above.
e.	Diverted stream flows	Regulated by state statute and adopted in the City Charter. Diversions require approval by the City and other regulatory agencies.
f.	Rising ground water	The Minneapolis Brownfield Program addresses relevant contamination issues through requirements in City Ordinance Title 3, Chapter 48.
g.	Foundation and footing drains	Contribute to I/I problems, and ultimately to Combined Sewer Overflows. Clear water connection requirements enforced by state plumbing code and through City ordinance Title 3, Chapter 56.
h.	Water from basement sump pumps	Not a significant source of pollution. Contribute to I/I problems, and potentially to Combined Sewer Overflows.
i.	Air conditioning condensation	Not a significant source of pollution.
j.	Springs	Not a significant source of pollution.
k.	Individual residential and fund-raising car washings	Not a significant source of pollution.
l.	Flows from riparian habitats and wetlands	Not a significant source of pollution.
m.	Swimming pool discharges	Regulated by City ordinances: Title 5, Chapter 111 and Title 11, Chapter 231.
n.	Flows from fire-fighting	Minneapolis Fire Department and Public Works Surface Water & Sewers Operations section cooperate to control fire-fighting flows. Emergency Preparedness gets involved if there are chemicals on site.
o.	Lawn fertilizer use, application and sale	Minneapolis Environmental Services provides education and enforcement of MCO 55 Lawn Fertilizer.

Detection and Removal Screening Program

The field screening program to detect and investigate contaminated flows in the storm drain system is an integral part of Sewer Operations and Regulatory Services daily operations. Sewer Maintenance crews routinely inspect and clean storm drain structures throughout the City. In addition, inspections of flows that generate unusual odors, stains, and deposits are included in the annual tunnel inspection, outfall inspection, and grit chamber inspection and cleaning programs. Any suspect flows are then reported to Regulatory Services inspectors for further investigation. Regulatory Services personnel also receive reports of alleged illicit discharges to the storm drain system from the public, other City departments, and various agencies. These combined efforts result in an annual screening of more than 20% of City drainage areas. The City partners with the Mississippi Watershed Management Organization to conduct a joint sampling program of the storm drainage system that drains to the Mississippi River. The intent of this partnership is to detect illegal discharges, and to establish a baseline of chemical, physical, and biological parameters. The best avenue for a continued effective screening program in the City of Minneapolis, without duplication of services, is to continue to use current practices, and to explore the development of certain aspects of the program to improve enforcement results.

Facility Inspection Program

Inspectors perform site visits of facilities that store large quantities of regulated and hazardous materials. In addition, site plan inspections yield the following information:

- Drainage patterns from the site to the nearest drain or water body
- Watershed destination and outlet location
- Handling, storage, and transfer procedures as they relate to the site

Previous Year Activities

- Addressed 91 calls for emergency response (containment of spills, chemical dumping, illegal disposal or handling of regulated or hazardous materials)
- 42 direct connections (registrations) to the storm drain (NPDES Permits)
- 220 permanent stormwater management devices at 153 sites were registered
- Investigated 589 water and land pollution complaints (illegal dumping, improper storage of material, and chemical storage)
- Inspected 21 contaminated soil complaints
- Approved installation of 6 contaminated soil and ground water remediation systems and temporary storage of contaminated soil, resulting in 23 active systems on 17 sites
- Approved 11 limited duration sanitary sewer and storm drain discharge permits
- Approved 73 storage tank permits: Above ground, 13 installed and 23 removed. Underground, 3 installed, 32 removed and 18 abandoned in place

- Conducted 20 outfall sampling days on the Mississippi River

The Public Works Surface Water & Sewers Operations section also responded to x incidents of alleged illicit discharges to the storm drain system.

Performance Measures

- Resolution of all reported or discovered non-compliant activities in previous year: 955 of 1207 events
- Erosion control permit non-compliance incidents that were addressed: 194

X. Storm Sewer Design for New Construction

Program Objective

There is a continuing effort to minimize the discharge of pollutants to public waters. This 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 stormwater discharged.

Targeted pollutants include:

- Total Suspended Solids (TSS)
- Phosphorus
- Chloride
- Fertilizers

Program Overview

In 2010 the City of Minneapolis continued its program to reduce sanitary sewer inflow (stormwater and other clear water sources connected directly to the sanitary sewer) and infiltration (groundwater that enters the sanitary sewer usually through pipe and system defects). The program is continuing a focus that the city has had since the 1960s when the city began a 40-year residential paving program.

The principal work is elimination of known public and private stormwater inlets or rainleaders connected to the sanitary sewer. Additionally the City is using a targeted sanitary sewer flow metering program to identify other sources. The flow metering program includes follow-up smoke testing where a smoke-like vapor is blown into the sanitary sewer in order to expose openings where inflow is entering the sanitary sewer.

The City's success with reducing I & I is transferring a problem from the sanitary sewer system to the stormwater management system, because there is rarely storm sewer capacity for the inflow removed from the sanitary sewer. Management techniques are required for volume reduction or rate reduction, and the techniques vary with each project. Most projects range from the equivalent area of one lot to a 2.5-acre drainage area. By themselves, these inflow areas may not be serious problems but cumulatively, the runoff becomes significant.

At this time, 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, bio-filtration or ponds. Space constraints in fully developed urban areas like Minneapolis limit many projects to use of compact prefabricated BMPs for load reduction.

For street renovation or reconstruction projects, whenever storm drain upgrades are required, installations of volume reduction systems are considered first, load-reducing facilities next, and finally rate reduction BMPs.

Previous Year Activities

The storm drain project areas for 2010, and associated water quality impacts, are referenced in the following table:

PROJECT AREA	PROJECT DESCRIPTION	STORMWATER RUNOFF BENEFITS
CSO Area RLD010 (16 6th Street N)	Provided a public storm sewer so that a rainleader could be disconnected	Eliminated CSO area of 0.10 acres
CSO Area 038 (Chicago Ave S, E 34th St to E 35th St)	Redirected catch basins from the sanitary sewer to the storm sewer	Eliminated CSO area of 1.26 acres
CSO Area 122 (Fillmore at RR south of 36-1/2 Av NE)	Redirected catch basins from the sanitary sewer to the storm sewer	Eliminated CSO area of 0.30 acres
CSO Area 126	Redirected catch basins from the sanitary sewer to the storm sewer	Eliminated CSO area of 2.98 acres
CSO Area RLD010 (16 6th Street N)	Redirected catch basins from the sanitary sewer to the storm sewer	Eliminated CSO area of 1.20 acres

Performance Measures

- At end of 2010, cumulative total of approximately 41 green infrastructure[7] regional stormwater facilities[8] on 22 sites
- At end of 2010, cumulative total of approximately 155 pre-treatment grit chambers
- At end of 2010, progress continued toward GIS system that will (among many other benefits) allow calculations of watershed acres in the City of Minneapolis that are receiving water quality treatment

[7] "Green infrastructure" refers generally to stormwater ponds, stormwater wetlands, major bioretention facilities ("rain gardens"), mini-reservoirs for underground detention with water quality treatment, and the like. Not included in this figure are three major dry basins that were built for flood control. Although not designed for volume control or water quality, they do provide some infiltration..

[8] "Regional stormwater facilities" refers to treatment of runoff from multiple areas including some portions of right-of-way

XI. Public Education

Program Objective

The objective of this stormwater management program is to educate the public regarding point and non-point source stormwater pollution. Targeted pollutants include:

- All pollutants

Program Overview

In addition to work done by watershed organizations and other entities, the City of Minneapolis and the Minneapolis Park & Recreation Board (MPRB) implement their Public Education Program to promote, publicize, and facilitate the proper management of stormwater discharges to the storm sewer system. The program's 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, streams and the Mississippi River, and how to control pollutants at the sources to reduce the discharge of pollutants to our receiving waters. The desired result is to change behavior in ways that will improve water quality. Many of the components of the program can be found on the City of Minneapolis Stormwater web site: http://www.ci.minneapolis.mn.us/stormwater/.

Previous Year Activities

Metro Blooms Rain Garden Workshop Program

A. Ongoing Program: In 2010, the City and others again sponsored a multi-part stormwater education workshop program conducted by Metro Blooms, a non-profit organization that grew out of the City's Committee on the Urban Environment (CUE). The goals of the workshop program are to reduce stormwater runoff, prevent stormwater pollution that damages our watersheds and improve the environmental and visual quality of the urban landscape. The two-part workshops serve to inform, coach and offer consultation to Minneapolis residents protecting the upper Mississippi River watershed by installing properly designed bio-infiltration areas (rain gardens), redirecting downspouts and using native plants. The ***Part A*** workshop focuses on watershed education, various types of rain garden design, and native plant choices. Attendees can then attend a ***Part B*** workshop, which offers practical, hands-on design sessions where participants bring pictures, measurements and sketches of their sites and receive plant and one-on-one design advice. One of the means of publicizing the workshops is a utility bill insert that reaches most of the approximately 100,000 households in Minneapolis. In 2010, 8 ***Part A*** and 6 ***Part B*** workshops were held within Minneapolis, attended by a total of 432 Minneapolis residents.

B. Powderhorn Lake "Neighborhood of Rain Gardens" Project: 2010 was the second year of a three-year project being carried out by Metro Blooms, in partnership with the City of Minneapolis, Minneapolis Park and Recreation Board, and the Minnehaha Creek Watershed District, and funded primarily by a grant from the Environment and Natural Resources Trust Fund of the Minnesota Legislative-Citizen Commission on Minnesota's Resources (LCCMR). The project is to (a) work with residents in one of the subwatersheds that drains to Powderhorn Lake to install up to 150 residential rain gardens, and (b) before, during and after installation of the rain gardens, monitor both the quantity and quality of water being conveyed from the subwatershed to the lake through storm pipes, in order to study the impact of the project on water quality in Powderhorn Lake. The monitoring data from the "test" subwatershed will be compared with monitoring data from a "control" subwatershed (one without the rain garden initiative) of similar size and land use characteristics.

Minneapolis Park & Recreation Board Education Activities and Events

In 2010 Minneapolis Park & Recreation Board (MPRB) staff provided water quality education programs throughout the City. Environmental Operations naturalist staff participated in 62 Minneapolis community festivals,, neighborhood events[9], and concerts at Lake Harriet, Father Hennepin Park (along the Mississippi River) and Minnehaha Park. Hands-on water quality educational displays focused on neighborhood watersheds and how human activities impact local water bodies. Printed materials, bookmarks, and water bottles with educational messages were distributed to adults and children.

To give people of all ages a better understanding of how stormwater negatively impacts local waterbodies, MPRB staff led guided canoe trips on local lakes and ponds. The MPRB provided canoes, paddles, lifejackets, and paddling instruction. Water quality education programs using canoes were held at 9 lakes[10] in Minneapolis a total of 53 times. Participants paddled by stormwater outfalls and observed alluvial fans, floating debris, and adjacent erosion. Participants were also able to use secchi disks to determine lake and pond clarity. Depending on the location of the waterbody, some participants were also able to view Best Management Practices (BMPs) including stormwater holding ponds, grit chambers

[9] Neighborhood event sites (several sites had multiple events): Parks: Armatage, Audubon, Beltrami, Bottineau, Bryant Square, Corcoran, Creekview, Diamond Lake/Pearl, Dowling School, Farview, Folwell, Harrison, Kenny, King, Lake Harriet, Lake Hiawatha, Lake of the Isles, Linden Hills, Loring, McRae, Minnehaha, Lake Nokomis, Northeast, Pershing, Powderhorn, Sibley, Van Cleve, and Victory Memorial Parkway

and vegetated swales. Direct observation of how Minneapolis residents' actions and inactions impact our lakes and ponds was very motivating for participants. Providing paddling experiences at neighborhood parks with smaller water bodies such as Powderhorn Lake and Webber Pond continued to attract a high percentage of minority participants.

<u>Canines for Clean Water</u>

More than 100,000 dogs reside in the City of Minneapolis and **<u>each day</u>** they generate an estimated 41,000 pounds of solid waste. This new water quality education program targeting dog owners was piloted in 2009.

*Canines for Clean Wat*er combined recreational activities with education to change the actions of dog owners to improve water quality. The project goals were to inform dog owners about the impacts that improperly disposed pet waste has on water bodies and on the people who swim, sail, and fish; and then to change the behavior of dog owners so they always pick up after their pooch. *Canines for Clean Water* offered a five-part series of dog-themed movies at Minneapolis parks including Father Hennepin Park (along the river), McRae and Luxton Parks. Dog owners and their pets were invited to attend and to commit to the "clean water pledge" – dog owners signed the pledge form and dogs left a paw print. The movie at McRae was part of a larger dog themed annual event, Paws in the Park.

A ripple effect of the <u>2009</u> Canines for Clean Water movie series and pledge form was the development of educational posters featuring dogs. Dog owners were asked to submit their top ten reasons for picking up after their dog. The over-riding theme was that "stepping in dog doo really stinks". This became the tag line for a series of posters. The message along the bottom states that dog poop contains millions of e.coli bacteria which directly affects water quality of lakes, creeks and the river when not disposed of properly.

The featured dogs are owned by the humans who submitted the best answers. The posters were printed in 2010 and distributed throughout the Minneapolis park system and at pet clinics and retail stores. A number of volunteers participated in the initiative.

[10] **Canoe sites (multiple programs at all sites):** Diamond Lake, Lake Calhoun , Lake Harriet, Lake Hiawatha, Lake Nokomis, Lake of the Isles, Powderhorn Lake, Webber Pond, Wirth Lake.

Teen Teamworks & the Mississippi River Green Team

MPRB Environmental Operations staff provided water quality education to all site supervisors of the Teen Teamworks summer youth employment program. The site supervisors were charged with sharing the information with their youth crews. Throughout the summer these 27 crews were responsible for removing debris from storm drains along the park perimeters. At park sites with a water amenity the crews also cleaned up around storm water outlets.

This was the third year of a youth employment program to involve teens in more intensive environmental work projects. Two crews of 10 youth known as the Mississippi River Green Team each spent the summer doing conservation and restoration work at Powderhorn Park, Heritage Park, North Mississippi Park, and Hennepin Island. The crews also worked at several stormwater holding ponds owned by the City of Minneapolis. The crews removed invasive species and planted native species that are required to support monarch butterflies and other native pollinators.

The Mississippi River Green Team continued to work with the City of Minneapolis and MetroBlooms to help improve water quality in the pond at Powderhorn Park. In June the youth crews learned about watersheds, stormwater runoff, and how rain gardens can help improve water quality. The crews then worked alongside a Minnesota Conservation Corps crew to install rain gardens at more than 100 homes within a subwatershed of Powderhorn Pond. Water quality staff from the Park Board are monitoring the stormwater outlet and pond for any changes.

The Mississippi River Green Team education days focused on gaining new skills and knowledge related to the environment. Teens learned about erosion and then planted bulrushes along the shoreline and island of Powderhorn Park, learned to use Newcomb's guide to key out native and invasive plant species, gained knowledge about watersheds and the Mississippi River, learned how aquatic insects are indicator of water quality, paddled the Mississippi River in voyageur canoes with Wilderness Inquiry and the National Park Service, and were active participants in President Obama's America's Great Outdoors Youth Listening Session.

The Mississippi River Green Team youth crews are made possible through the collaborative efforts of the Minneapolis Park and Recreation Board, the Mississippi Water Management Organization, and the Minneapolis Employment and Training Program.

Earth Day Watershed Clean-Up Event

Earth Day is a collaborative effort between the City of Minneapolis and the Minneapolis Park & Recreation Board. The 2010 Minneapolis Earth Day Watershed Clean Up was held Saturday April 17, at 38 locations throughout Minneapolis. More than 3,000 volunteers participated. Volunteers removed more than 15, 000 pounds of trash during the two and a half hour event, compared to 30,000lbs in 2009.

Staff surmises that because of an early snow melt in 2010, park maintenance staff had several weeks to pick up debris and trash prior to Earth Day. This resulted in fewer pounds being picked up by volunteers.

Multi-Cultural Watershed Education Video

Minneapolis Public Works partnered with the Mississippi Watershed Management Organization (MWMO) to create an educational water quality Digital Video (DVD) called ***The Nature of Water***. The DVD uses a spoken language approach, educating people about watersheds and water quality, and includes bonus features about drinking water and rain gardens. It includes five languages, with subtitles in English and Hmong, and audio tracks in Hmong, Vietnamese, Lao, Khmer (Cambodian) and English. The DVD was created in a way that will allow the content to be modified for use in other cultural communities such the Latino or African immigrant communities at a later date. The production for this DVD was completed late in 2009, followed in 2010 by duplication and distribution. Approximately 1,500 copies were distributed.

Storm Drain Inlet Stenciling

Stenciling of storm drain inlets, also called catch basins, educates the people painting stormwater messages on the storm drains, and also shares an environmentally friendly message for people passing by. A great team building exercise, it allows volunteer organizations to educate people about simple steps they can take to help improve the quality of Minnesota’s lakes, rivers and streams.

In 2010, the City continued the program, maintain four self-contained stenciling kits, each containing everything needed to stencil storm drains: stencils, map with catch basin locations, stenciling paint, traffic cones, facemasks, a broom for prepping the site, gloves and trash bags, safety vests and glasses, and door hangers to explain the stenciling to nearby residents. By providing educational stormwater door hangers to distribute to residents, dialogue is encouraged between the stencilers and people who live nearby.

The stencils vary by the type of receiving waterbody, thus referring to “Mississippi River”, “lake”, or “creek” as the case may be. The City has three versions of the “Mississippi River” stencils: in English, Spanish and Somali languages. The “lake” and “creek” stencils are only in English.

Safety is important, so we include traffic cones, and suggest to groups that they stencil on low volume streets to provide a safe environment. If children are part of the group, we request at least one adult be present to supervise. Trash bags and gloves are provided to pick up trash in the areas around the storm drain inlets, especially on the upstream side. Efforts of the organizations doing the stenciling are tracked, including the locations of the stenciled catch basins, the number of volunteers, and the number of door hangers distributed. In 2010, the City furnished the kits for 6 stenciling events, with 74 participants painting approximately 657 catch basins.

Web sites

STORM & SURFACE WATER MANAGEMENT – The City provides the following primary web site for information about Storm and Surface Water Management:
http://www.ci.minneapolis.mn.us/stormwater/

2010 statistics for the above web location (multiple pages and topics are included):

Total visits:	**44,683**
Number of pages:	**405**
Percentage of visitors who visited more than once:	**51%**
Average time per web page:	**1:07**

ENVIRONMENTAL MANAGEMENT – The Department of Regulatory Services maintains the following web site for additional information about the its initiatives and programs: http://www.ci.minneapolis.mn.us/environment

ANNUAL NPDES REPORT – The City and MPRB work with local watershed organizations, internal agencies, and other government agencies to partner with these organizations as a requirement of the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit. The current and prior annual reports that can be reviewed at the following web site provide education to interested parties about the City's authorization to discharge stormwater via its NPDES MS4 Permit: http://www.ci.minneapolis.mn.us/stormwater/NPDESAnnualReportDocuments.asp

LOCAL SURFACE WATER MANAGEMENT PLAN – The City's comprehensive approach can be reviewed at the following web site: http://www.ci.minneapolis.mn.us/stormwater/local-surface.asp

REGULATORY CONTROLS OF SURFACE WATER MANAGEMENT – The City of Minneapolis provides information regarding pesticides, fertilizers, illicit discharges, improper disposal and other water quality issues via the following City web site: http://www.ci.minneapolis.mn.us/stormwater/regulatory-controls.asp

STORMWATER MONITORING PROGRAM – The MPRB provides the following web site to educate interested parties regarding their Stormwater Monitoring Program: http://www.minneapolisparks.org/default.asp?PageID=833

FLOOD CONTROL INFORMATION – The City web site provides educational information regarding flood control. For information on flooding and safety precautions, the following web site can be viewed by interested parties: http://www.ci.minneapolis.mn.us/stormwater/flood-information/index.asp

COMBINED SEWER OVERFLOW (CSO) PROGRAM – The City maintains a web site to educate Minneapolis residents and property owners about the City's CSO program to eliminate Combined Sewer Overflows: http://www.ci.minneapolis.mn.us/cso/

STORMWATER UTILITY FEE and BEST MANAGEMENT PRACTICES (BMPs) – As a component of the City's Stormwater Utility Fee, the City web site encourages the implementation of various Best Management Practices (BMPs) such as rain gardens, rain swales and pervious pavement that would reduce the overall amount of impervious surface area throughout the City. These practices would also filter and cleanse stormwater. The City also maintains a link to the following Metropolitan Council and MPCA BMP web sites, where numerous BMP suggestions are available for small scale implementation:

> ***Urban Small Sites Best Management Practice Manual:***
> http://www.metrocouncil.org/environment/watershed/bmp/manual.htm

Minnesota Stormwater Manual:

http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/stormwater-management/minnesota-s-stormwater-manual.html

PUBLIC EDUCATION & OUTREACH – Additional information about how the City and MPRB advance stormwater education activities can be found at the following web sites:

City of Minneapolis – http://www.ci.minneapolis.mn.us/stormwater/outreach.asp

Minneapolis Park & Recreation Board – http://www.minneapolisparks.org/home.asp

Erosion and Sediment Control Education for Contractors and Developers

During Minneapolis Development Review and the Site Plan Review processes, and during on-site inspections, Public Works and Regulatory Services personnel provided Erosion and Sediment Control (ESC) education and guidance to contractors and developers. This education included information regarding the City's ordinances, and local, state and federal regulations.

XII. Public Participation Process

Program Objective

The objective of this stormwater management program is to maximize the effectiveness of the City's NPDES program by seeking input from the public. Targeted pollutants include:

- All pollutants

Program Overview

The City of Minneapolis and the MPRB are the joint holders of the NPDES MS4 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. The MPCA re-issued Municipal Separate Storm Sewer System (MS4) NPDES Permit No. MN0061018 to the City of Minneapolis and the MPRB as co-permittees in January 2011. The Permit requires the implementation of approved stormwater management activities, referred to as Best Management Practices (BMPs). A new Stormwater Management Program (SWMP), documenting the BMPs the City and the MPRB have or will put in place for the re-issued 2011 permit, is being submitted to the MPCA for public comment and approval at the same time as submission of this Annual Report. This 2010 Annual Report is prepared in compliance with the previous version of Permit No. MN0061018, issued in December, 2000. Information in the Annual Report provides documentation and analysis of the activities conducted in the previous year. Typically the Annual Report is due in June of each year, however the due date was changed for 2011, to September 28, because of the additional preparation of the SWMP in accordance with the re-issued permit.

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. The hearing is officially noticed in the Finance and Commerce publication, and also publicized through public service announcements on the City cable television channel. This year's public hearing date was September 13, 2011 at 9:30 AM in Council Chambers, Room 317 City Hall, 350 S 5th Street, Minneapolis, MN.

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 on August 19, 2011, announcing the web site link to the draft Report, and informing that written comments [are being] accepted until September 15, 2011 for the SWMP and until September 21, 2011 for the Annual Report, or in person at the public hearing on September 13.

The notice explained that emails or faxes were the preferred methods for submitting written comments, rather than conventional mail due to the additional time involved. The contact information for written comments was listed as:

City of Minneapolis, Department of Public Works
Surface Water & Sewers Division c/o Lois Eberhart
NPDES MS4 REPORT COMMENTS
300 City of Lakes Building, 309 2nd Avenue S, Room 300
Minneapolis MN 55401-2268
Phone: 612-673-3260 Fax: 612-673-2048
E-mail: lois.eberhart@minneapolismn.gov

The draft Annual Report is made available for viewing or downloading from the City's Storm and Surface Water Management web site prior to finalization. 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 public hearing date and for a period thereafter.

All testimony presented at the public hearing, and all written comments received, are recorded and given due consideration. A response to those public comments is then included with the Annual Report as Appendix C. A copy of the council resolution adopting the Stormwater Management Program and Annual Report Activities is included each year with the submission to the Minnesota Pollution Control Agency

Performance Measures

- Number of interested parties that were directly notified of public hearing and Annual Report availability: 97 (includes 81 neighborhood organizations)

XIII. Coordination with Other Governmental Entities

Program Objective

The objective of this Stormwater Management Program is to maximize stormwater management efforts through coordination and partnerships with other governmental entities.

Program Overview

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. Coordination activities and partnerships with other governmental entities also include MnDOT, MPCA, neighboring cities, the Metropolitan Council and various other entities.

The coordination and partnership activities can include the joint review of projects, joint studies, joint water quality projects, stormwater monitoring, water quality education, and investigation or enforcement activities.

Coordination with the Bassett Creek Water Management Commission (BCWMC)

The BCWMC approved its Second Generation Watershed Management Plan in September 2004, and plans to commence its Third Generation planning efforts in 2011. Under the current plan, required are stormwater management, erosion control practices and floodplain management for redevelopment projects that are greater than 5 acres. Minneapolis provides yearly financial contributions to the BCWMC annual operations budget. The City and the MPRB are also stakeholders with other BCWMC joint power cities in development of several Total Maximum Daily Load (TMDL) studies and implementation plans.

Coordination with the Mississippi Watershed Management Organization (MWMO)

The MWMO adopted its Second Generation Watershed Management Plan in June 2000, and was near finalization of its Third Generation Plan at the end of 2010. The City and MPRB participated in its planning committees. The MWMO delegates stormwater management requirements for new developments to its member cities and does not provide separate project review and approval. The MWMO receives revenue through direct taxation against properties within its jurisdiction..

Coordination with the Minnehaha Creek Watershed District (MCWD)

The MCWD adopted its Third Generation Plan in 2006. The District administers state mandated wetland protection rules and Department of Natural Resources regulations, as well as District rules relating to erosion control (land disturbance of 5,000 square feet or greater), floodplain alteration, wetland protection, dredging, shoreline & stream bank improvements, stream and lake crossings and stormwater management. The MCWD receives revenue through direct taxation against properties within its jurisdiction. The City of Minneapolis and the MPRB are stakeholders in development of TMDL studies and implementation plans, in collaboration with the MCWD and other stakeholders.

Coordination with the Shingle Creek Watershed Management Commission (SCWMC)

The SCWMC adopted its Second Generation Watershed Management Plan in August 2004, and plans to commence its Third Generation planning efforts in 2011. SCWMC reviews plans of any land development adjacent to or within a lake, wetland, or a natural waterway, within the 100-year floodplain, 15 acres or larger (for single-family detached housing use) and 5 acres or larger for all other land uses. SCWMC requires these developments to provide erosion protection during construction, in addition to on-site detention and treatment. Developments also have the option of demonstrating that adequate detention and treatment is available via a regional facility. Minneapolis provides yearly financial contributions to the SCWMC annual operations budget. The City of Minneapolis and the MPRB are stakeholders with other SCWMC joint power cities in development of TMDL studies and implementation plans.

Coordination with the Minnesota Department of Transportation

The City of Minneapolis coordinates with the Minnesota Department of Transportation (MnDOT) in the following ways:

- Erosion control review, inspections, and enforcement
- Plan review of storm and water quality improvements associated with road projects
- Roadway and storm drain maintenance agreements (including deep storm tunnels)

Coordination with the Metropolitan Council Environmental Services)

The City of Minneapolis coordinates with Metropolitan Council Environmental Services (MCES) in the following ways:

- Review of non-stormwater permit applications
- Inspection of existing infrastructure and regulators
- Joint permittees for Combined Sewer Overflow (CSO)

Previous Year Activities

Ongoing Coordination Efforts

The Minneapolis Park and Recreation Board (MPRB) and the City of Minneapolis coordinate stormwater management efforts, and coordinate with the watershed management organizations, the watershed district, and other governmental agencies on a number of water quality projects. Minneapolis Public Works maintains communications with all watershed management organizations and the watershed district within the City boundaries. Interactions take several forms to facilitate communication and provide support:

- Attend selected local board and special issues meetings
- Attend selected education and public outreach committee meetings
- Take part in Technical Advisory Committee (TAC) meetings
- Inform the organizations of upcoming City capital projects in an effort to identify projects that may benefit from partnerships
- Provide developers (who submit projects for site plan review) with information and contacts to meet watershed requirements
- Share information and data regarding storm drainage system infrastructure, watershed characteristics, flooding problems, modeling data, etc.

The Environmental Services Division of the Minneapolis Regulatory Services Department coordinates with the MPCA and the MCES regarding investigations and enforcement for incidents of illegal dumping or illicit discharges to the storm drain system.

The MPRB coordinates with the watershed organizations and the MCES on watershed outlet monitoring. The MPRB and the City coordinate and partner with the watershed organizations on capital projects and water quality programs. The MPRB also works with the DNR and surrounding suburbs on various capital projects and programs. The City and the MPRB coordinate with the MPCA, the watershed organizations and stakeholders for Total Maximum Daily Load (TMDL) studies and implementation plans.

Current Capital Project and Program Partnerships

Bassett Creek Water Management Commission (BCWMC)

Wirth Lake is impaired for phosphorus and a TMDL Study is underway. Wirth Lake is located in the City of Golden Valley, but owned by the MPRB. Stakeholders include the MPRB, the Cities of Golden Valley and Minneapolis, MnDOT, Hennepin County and the BCWMC. The TMDL study includes a public outreach component. Within the BCWMC 10-year capital improvement program , there are identified Wirth Lake improvement projects with recommendations for implementation. The Capital Improvement Program (CIP) is funded through an *ad valorem* tax.

Shingle Creek Watershed Management Commission

TMDL studies for chloride impairment of Shingle Creek, nutrient impairment of Ryan Lake, and nutrient impairment for Crystal Lake, have been completed and approved by the MPCA and the EPA. A second TMDL study for Shingle Creek, for biota and dissolved oxygen, is underway. Minneapolis is partnering with the WMO and the other joint powers cities on these watershed-based initiatives.

Mississippi Watershed Management Organization

A TMDL study is underway for bacteria impairment of a portion of the Mississippi River. Additionally, a TMDL study is underway for turbidity impairment of the Mississippi River downstream of the junction with the Minnesota River (South Metro), and a TMDL study is underway for nutrient impairment of Lake Pepin, which is a portion of the Mississippi River. The geographic area for all of these studies is considerably larger than either the City of Minneapolis or the Mississippi Watershed Management Organization (MWMO). The City and the MPRB are engaged with the MWMO as well as numerous other stakeholders on both of these TMDL studies.

Minnehaha Creek Watershed District

The City and the MPRB were engaged with the MCWD and other stakeholders for a TMDL study that included Lake Nokomis in Minneapolis and has been submitted to the EPA for approval. The City and MPRB are engaged with the MCWD and other stakeholders for another TMDL study that includes Minnehaha Creek and one lake in Minneapolis: Lake Hiawatha.

XIV. Stormwater Monitoring - Results and Data Analysis

Stormwater Runoff Monitoring Results[11]

Storm event samples were collected from May through November. One snowmelt grab sample was collected from each site, three sites in February and one site in March. The target frequency for sample collection was once a month. If a sample was not taken one month more than one sample was taken the next month to catch up. The required number of samples was met or exceeded for the year. The total volume sampled at each site, and the total recorded volume is given in **Table 23B of Appendix A** along with the percentage sampled per season. For 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 and analyzed for the samples collected. Bacteria grab samples were taken throughout the season using standard protocols.

Sampled data for 2010 were similar to typical urban stormwater data (**Tables 23H** and **23I of Appendix A**, respectively). **Table 23H** shows median values for residential sampled sites. Results were similar or less than reported NURP values with the exception of TP and TKN values. Most MPRB land use category values collectively were similar to NURP values. All metals monitored were well below NURP levels.

Most 2010 parameters were similar to MPRB 2001-2009 data. Exceptions in 2010 where the data were higher than previous years were the residential TSS and metals, and composite land use Cu and Zn. In 2010 all three land use categories saw a decrease in median TP, TKN and cBOD concentrations. Note that the sites monitored between 2005-2010 are located in different watersheds and have similar but not identical land uses to those monitored from 2001-2004.

Data from MPRB Sites 1–5a (2001–2004) and 6–9 (2005–2009) were generally similar to Sites 6–9 in 2010. All measured parameters decreased or were roughly equal or lower in 2010. All mean parameter concentrations decreased in 2010.

[11]For tables referenced in this section, see Appendix A4 of this report. This section, as well as Appendix A4, are adapted from the 2010 Water Resources Report, which is produced by the Minneapolis Park & Recreation Board. These annual reports can be found at this Minneapolis Park & Recreation website.

Best Management Practices Monitoring Results[12]

Best management practices (BMPs) include procedures and structures designed to help reduce pollutants in stormwater runoff. In 2010 the MPRB monitored two of the City of Minneapolis' stormwater ponds located at Heritage Park in north Minneapolis. Heritage Park is a 140 acre large redevelopment project which was formerly public housing and a public park. It is now a mix of public and private housing, a public park and an innovative collection of stormwater treatment systems designed to create high quality ponds as a neighborhood amenity.

The treatment-train approach using grit chambers, trench forebays or sedimentation ponds, infiltration or filtration galleries, and stormwater ponds was designed for hydraulic mitigation purposes, to help reduce pollutants discharged to the Mississippi River and to create high quality amenities in an amenity-poor area of the City. Level spreaders and flow splitters are engaged to distribute flows. The stormwater ponds which are located north of the intersection of Olson Memorial Highway and Van White Memorial Boulevard are referred to as Heritage Park Pond and to the south as Heritage Commons Pond. Following construction Heritage Park Pond outlet auto-monitoring dates were 7/30/07–11/7/07, 5/8/08–9/1/08, 5/18/09–11/13/09, and 5/20/10–11/17/10. Heritage Park Pond outlet samples were collected by flow weighted auto-monitoring. Heritage Commons outlet auto-monitoring was performed from 6/3/08 – 8/5/08, 9/7/08 – 9/27/08, and 5/19/09–11/17/09, and 4/27/10–11/17/10. The brief break was caused by equipment failure.

In 2007-2010 44 storm events were sampled at the Heritage Park Pond outlet.

In 2007-2010 at Heritage Commons Pond, 42 storm events were sampled, at the Heritage Commons Pond north outlet.

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. The dates and lab results are presented in **Table 24A of Appendix A**. Statistics were calculated and are presented in **Table 24B of Appendix A**. Lab values reported below detection were divided in half for statistical calculations. Mean outlet values in **Table 24B** show the results for many water quality parameters. The fact that these data were collected with construction ongoing should be interpreted as a baseline of these "disturbed" systems and not as how these systems will ultimately work.

At Heritage Park Pond outlet the mean TP, TDP, Pb, and Zn appears to be increasing over time. The mean TSS and TDS appear to be decreasing over time. This system was significantly changed with

[12] For tables referenced in this section, see Appendix A5. This section, along with Appendix A5, are adapted from the 2007 Water Resources Report, which is produced by the Minneapolis Park & Recreation Board. These annual reports

the removal of the weir 9/3/08 so the data must be interpreted cautiously. These data could indicate that the system is functioning to remove solids (TSS) but some of the solids fraction are possibly being digested in the pond and later released (e.g., TDP).

At Heritage Commons north outlet the mean TP, NH_3, and $_cBOD$ and appear to be decreasing over time. The TDP, NO_2NO_3, Cl, TSS, TDS, and Pb appear to be holding reasonably steady. This may be the result of the pond/wetland system having time to chemically and biologically stabilize or may simply be due to the variable nature of stormwater.

Complete inlet data are not available from either Heritage Park or Heritage Commons to perform a mass balance comparison and make definitive conclusions as to the pond/wetland systems effectiveness.

Both Heritage Commons and Heritage Park systems had some functionality issues. Some of the infiltration basins/trench forebays at Heritage Park appear to be silting in. The design engineer was made aware of these issues and is investigating and initiating repairs. Sediment also appears to be circumventing upstream treatment where silt is being deposited in front of the level spreaders.

In comparing the 2007-2010 data sets Heritage Commons north outlet had higher median values for TP, TDP, TKN NH_3, Cl, Sp. Cond, and TDS. The Heritage Park outlet had higher median values for NO_2NO_3, TSS, VSS, Cu, Pb and Zn. It is unknown why Heritage Commons outlet had higher values for many parameters since it is a much smaller watershed. The higher NH_3 and Cl values may be the result of large goose and seagull populations defecating in the final ponds.

It is difficult to draw solid conclusions from this limited data set which included grab samples, limited inlet data and a dynamic system under construction. Further comprehensive study will be needed to explore and answer some of the questions raised.

Other Monitoring

The monitoring site at Minnehaha Creek at Xerxes Avenue South was added in 2009. Xerxes Avenue South crosses Minnehaha Creek at the border of Minneapolis and Edina. The station should allow Minneapolis to determine what is coming into the City from the upstream areas and help determine the impact of Minneapolis's stormwater on Minnehaha Creek.

The watershed discharge at Xerxes and Minnehaha Creek results from 3 sources. The initial runoff source is from the immediate watershed. The second runoff source is the watershed between the station and Lake Minnetonka. The third runoff source is baseflow when the dam discharges at Gray's

can be found at this Minneapolis Park & Recreation website.

Bay into Minnehaha Creek. The third source is intermittent because the outlet to Lake Minnetonka (at Gray's Bay) is adjustable so discharge rates vary.

2009 was the first year of comprehensive monitoring at the Xerxes Minnehaha Creek station. It will take a few years to develop an accurate rating curve over a variety of stage events. The difficult events to acquire in any rating curve are the rare larger events. The average 2010 stage was about two feet, but in early August and late September the creek reached a stage of over three feet. Unlike 2009, the creek bed never went dry in 2010.

The field equipment instrumentation was an ISCO 4150 datalogger, 3700 sampler and low profile A/V (area velocity) probe. The sampler was flow paced and the level feature of an A/V probe was used to obtain stage at the Xerxes station. Initially discharge was calculated with a weir discharge equation, approximating the relatively flat stream bottom, and the Xerxes bridge vertical cement wall restrictions, approximating as a broad crested weir with end contractions. When enough stage discharge readings were developed by stream gauging a datalogger look up table was used as the rating curve. It will take a few years to develop an accurate stage discharge rating curve at this site.

In 2010 one snowmelt event and five storms of varying intensity (minimum 0.18 in, maximum 2.32 in storm) were captured throughout the sampling season. The events were triggered on both stage and volume.

The Baseflow samples often had much lower concentrations of nutrients and metals than storm samples. Lead (Pb), zinc (Zn), and biological oxygen demand (cBOD) were all below the detection limit, and ammonia (NH_3), copper (Cu), and volatile suspended solids (VSS) were often below the detection limit for baseflow samples. All of the other chemical parameters stayed relative stable throughout the sampling season, until December when total Kjeldahl nitrogen (TKN), nitrates and nitrites (NO_3NO_2), chlorides (Cl), hardness, total dissolved solids (TDS), pH, and conductivity all spiked.

The majority of Minnehaha Creek storm events are from urban stormwater. For most events snowmelt had the highest water chemistry values seen in 2010. This is especially true for TKN, NO_3NO_2, NH_3, Cl, hardness, TDS, *E. coli*, Pb, and Zn. Spring snowmelt is a unique event in that pollutants accumulated over 4 to 5 months are released over a short period of time. The spring snowmelt was the only time that Pb was above detection. The source of the Cl in Minnehaha Creek is unknown but it may simply be road salt applied in winter that is continuously leaching from the soil. The increased Cl is likely the cause for the other elevated parameters of Sp. Cond. and TDS. The MPCA chronic stream Cl standard is 230mg/L for 4 days and an acute standard of 860 mg/L for 1 hour. With the exception of snowmelt the Xerxes Cl concentrations appear to be well below the chronic stream standard.

Minneapolis Lake Trends

In 2010, MPRB scientists monitored 14 of the city's most heavily used lakes. The data collected were used to calculate a Trophic State Index (TSI) score for each 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. Calhoun, Cedar, Harriet, and Wirth 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. Webber Pond fluctuates between these two categories. Trends in lake water quality can be seen by using the annual average TSI score over the last 19 years.

Lakes with increasing water quality indicators	Lakes with stable trend	Lakes with decreasing water quality indicators
➢ Lake Calhoun	➢ Brownie Lake	➢ Diamond Lake
➢ Cedar Lake	➢ Lake of the Isles	➢ Lake Hiawatha
➢ Lake Harriet	➢ Lake Nokomis	➢ Loring Pond
➢ Powderhorn Lake	➢ Webber Pond	➢ Spring Lake
➢ Wirth Lake		

2010 Water Resources Report

The Minneapolis Park & Recreation Board's annual ***2010 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 the NPDES stormwater runoff monitoring and BMP monitoring sections are included in **Appendix A** of this Annual Report. Electronic copies of the *2010 Water Resources Report* http://www.minneapolisparks.org/default.asp?PageID=791 are available on the MPRB web page at www.minneapolisparks.org. 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 Minneapolis public libraries.

XV. Storm Drain System and Drainage Areas Inventory

Storm Drain System Infrastructure

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.

History

From 1870 to 1922, all sewers built in Minneapolis were combined sewers intended to convey both sanitary sewage and stormwater runoff. In 1922, the City began construction of a separate storm drain system in newly developing areas of the City. In older previously developed areas, combined sewers continued as the only drainage system until 1960, when the City began actively separating combined sewers. From 1961 to 1984, construction of new storm drain piping proceeded in conjunction with the City of Minneapolis Residential Paving Program. In 1984, storm drain construction for sewer separation was accelerated because of development of a formalized Combined Sewer Separation program, called CSO Program, Phase I. There are currently approximately 600 miles of main line storm drain piping and 17 miles of deep drainage storm tunnels within the City of Minneapolis. This total does not include the State of Minnesota Department of Transportation, Hennepin County, the University of Minnesota or other agency systems. Approximately 91% of the City's storm drain system is constructed of reinforced concrete pipe (RCP). Service connections to catch basin inlets and private drains are mainly constructed of Polyvinyl Chloride (PVC). In 2003, the Minneapolis Public Works Department (MPW) was assigned to take over the storm drain system of the Minneapolis Park and Recreation Board (MPRB). This added roughly 17 miles of mainline piping and approximately 100 outfall control structures to the Minneapolis system (the exact number and delineation of areas drained is to be determined by a field survey). The total replacement cost of the City's storm drain system exceeds $860 million (based on year 2000 dollars). In addition to the main line piping, MPW also maintains approximately 151 miles of catch basin runs.

Structural Controls

The City of Minneapolis owns and operates 25 stormwater pump stations, 156 sedimentation (grit removal) structures, 387 outlets (exclusive of the added MPRB outlets noted above), and 28 stormwater ponds and wetlands. Grit removal structures, stormwater ponds, stormwater wetlands and outfall locations are displayed in Appendix B.

Drainage Areas and Discharges

Drainage Areas Inventory: The City of Minneapolis contributes stormwater runoff to Minnehaha Creek, Bassett Creek, Shingle Creek and Mississippi River watersheds. A map of the drainage areas that have been delineated according to topographic contours and the storm drain system is included in Appendix B. The population, size of drainage area, land uses, distribution, and runoff coefficients by body of receiving water are listed in Appendix A1.

Event Mean Concentration and Annual Pollutant Loadings

Calculated event mean concentrations and annual pollutant loading are included in Appendix A7. The following formula was used to calculate the total annual pollutant load:

L = [(**P**) (**Pj**) (**Rv**) (**C**/1000) (**A***4046.9)], where:

L = seasonal pollutant load, kilograms/season

P = seasonal precipitation, inches/season (meters/season)

Pj = correction factor for storms which do not produce runoff = 0.85

Rv = runoff coefficient

C = median event mean concentration of pollutants, mg/L

A = area, in acres

Conversion factors were used to convert acres to square meters, and to adjust the concentration data units. Conversion factors are as follows:

- 4,046.9 for acres → square meters
- 1,000 for liters → cubic meters

The Flow Weighted Mean Concentration (FWMC), expressed as a mean of all sites, was used for the annual load estimation calculations. The FWMC most accurately reflects stormwater loading on an annual basis. The seasonal loads were calculated from the pooled data using the median event mean concentration, as there were too few data points from each watershed. The median of the data set is a better representation of the runoff data than the mean values (Bannerman, et al, 1992). The annual load, and a summation of the seasonal loads, will not be equal due to this difference in calculation methods.

Seasonal loads were calculated on the following basis:

Storm Drain System and Drainage Areas Inventory

Season	Inclusive dates	Precipitation, National Weather Service
Winter/snowmelt	01/01/10 – 03/31/10	**1.89 inches (0.048 meters)**
Spring	04/01/10 – 05/31/10	**4.82 inches (0.122 meters)**
Summer	06/01/10 – 08/31/10	**14.19 inches (0.360 meters)**
Fall	09/01/10 – 12/31/10	**11.99 inches (0.305 meters)**
Total	01/01/10 – 12/31/10	**32.89 inches (0.84 meters)**

Appendix A

STORM DRAINAGE AREAS BY RECEIVING WATER BODY

Surface Water	Outfall	Total (acres)	Res. %	Comm. %	Ind. %	Public %	Open %	Rail %	Runoff Coeff.	Pop.
Mississippi River (Minneapolis)	10-xxx	18,077	0.53	0.16	0.16	0.04	0.07	0.04	0.46	263,400
Mississippi River (Columbia Heights)	10-100	348	0.48	0.11	0.33	0.00	0.08	0.00	0.37	2,765
Mississippi River (UofM)	15-xxx	100	0.00	0.00	0.00	1.00	0.00	0.00	0.55	0
Shingle Creek	20-xxx	1,365	0.62	0.17	0.06	0.03	0.04	0.07	0.44	11,493
Ryan Lake (Minneapolis)	21-xxx	49	1.00	0.00	0.00	0.00	0.05	0.00	0.45	388
Bassett Creek	40-xxx	2,293	0.58	0.12	0.13	0.03	0.08	0.05	0.44	26,756
New Bassett Creek Tunnel	41-xxx	219	0.22	0.26	0.26	0.04	0.10	0.11	0.45	669
Brownie Lake (Minneapolis)	51-xxx	34	0.99	0.00	0.01	0.00	0.00	0.00	0.45	193
Cedar Lake (Minneapolis)	52-xxx	224	0.79	0.01	0.00	0.00	0.17	0.03	0.38	1,674
Lake of the Isles	53-xxx	760	0.76	0.07	0.02	0.01	0.12	0.01	0.42	13,644
Lake Calhoun (Minneapolis)	54-xxx	1,249	0.69	0.11	0.03	0.10	0.07	0.00	0.46	13,640
Cemetary Lake	55-xxx	205	0.00	0.99	0.00	0.00	0.01	0.00	0.60	41
Sanctuary Pond	56-xxx	68	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
Lake Harriet	57-xxx	863	0.83	0.09	0.01	0.04	0.02	0.00	0.46	12,249
Hart Lake (Minneapolis)	61-xxx	3	0.32	0.68	0.00	0.00	0.00	0.00	0.55	0
Silver Lake (Minneapolis)	62-xxx	28	0.94	0.03	0.00	0.00	0.03	0.00	0.44	245
Crystal Lake (Minneapolis)	63-xxx	469	0.92	0.04	0.00	0.02	0.03	0.00	0.45	5,985
Legion Lake (Minneapolis)	64-xxx	49	1.00	0.00	0.00	0.00	0.00	0.00	0.45	332
Legion Lake (Richfield)	64-xxx	1,700	0.96	0.00	0.01	0.00	0.03	0.00	0.30	9,781
Richfield Lake (Minneapolis)	65-xxx	715	0.88	0.06	0.02	0.00	0.04	0.00	0.32	4,388
Richfield Lake (Richfield)	65-xxx	58	0.58	0.37	0.05	0.00	0.01	0.00	0.51	442
Wood Lake (Richfield)	66-xxx	627	0.75	0.05	0.02	0.00	0.18	0.00	0.29	7,316
Minnehaha Creek	70-xxx	3,213	0.85	0.07	0.01	0.04	0.03	0.00	0.44	38,399
Diamond Lake	71-xxx	685	0.72	0.11	0.09	0.03	0.05	0.00	0.47	6,456
Lake Nokomis	72-xxx	620	0.78	0.03	0.00	0.03	0.16	0.00	0.40	7,120
Taft Lake	73-xxx	100	0.76	0.00	0.00	0.00	0.24	0.00	0.37	675
Mother Lake (Minneapolis)	74-xxx	49	0.83	0.19	0.00	0.00	0.00	0.00	0.48	111
Mother Lake (Richfield)	74-xxx	245	0.71	0.09	0.00	0.00	0.20	0.00	0.30	2,025
Unnamed Wetland W of Mother Lake	75-xxx	41	0.91	0.00	0.00	0.00	0.00	0.09	0.41	344
Lake Hiawatha	76-xxx	1,008	0.87	0.07	0.02	0.03	0.02	0.00	0.46	14,707
Birch Pond	81-xxx	31	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
Powderhorn Lake	82-xxx	286	0.88	0.05	0.02	0.04	0.01	0.00	0.46	5,621
Grass Lake	83-xxx	386	0.90	0.04	0.00	0.05	0.02	0.00	0.46	4,128
Unnamed Wetland on Hwy 62	84-xxx	17	0.86	0.00	0.14	0.00	0.00	0.00	0.47	0
Unnamed Wetland on Ewing Ave S	85-xxx	22	0.86	0.00	0.14	0.00	0.00	0.00	0.47	0
GRAND TOTAL		**36,205**	**0.58**	**0.13**	**0.10**	**0.04**	**0.06**	**0.03**	**0.42**	**454,987**

Appendix A1 - Storm Drainage Areas by Receiving Water Body
Source: Minneapolis Public Works - Surface Water & Sewers

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
10-010	60	53rd Ave N.	113.55	0.90	0.03	0.00	0.00	0.07	0.00	0.42	1,208
10-020	42	51st Ave. N (Mississippi Ct.)	7.81	0.82	0.00	0.00	0.00	0.18	0.00	0.39	40
10-030	15	49th Ave N.	4.05	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-040	78	49th Ave. N	167.42	0.65	0.12	0.12	0.00	0.10	0.01	0.45	1,176
10-050	42	46th Ave N (I-94)	114.18	0.83	0.08	0.08	0.00	0.00	0.01	0.47	1,312
10-060	15	St. Anthony Pkwy & 36th Ave NE	10.50	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
10-070	72	41st Ave N & Sooline R.R. (sanitary overflow)	30.66	0.00	0.33	0.30	0.00	0.05	0.32	0.38	0
10-080	36	1st St. N approx. 39th Ave N	30.66	0.00	0.33	0.30	0.00	0.05	0.32	0.38	0
10-090A	18	39th Ave N (At River)	0.99	0.00	0.00	1.00	0.00	0.00	0.00	0.60	0
10-090B	18	37th Ave N (At River)	1.47	0.00	0.00	1.00	0.00	0.00	0.00	0.60	0
10-090C	24	37th Ave N (Sooline R.R.)	12.77	0.00	0.00	0.90	0.00	0.02	0.08	0.54	0
10-090D	30	36th Ave N (Sooline R.R.)	4.41	0.00	0.00	1.00	0.00	0.00	0.00	0.60	0
10-100	24	Marshall St (31st Ave NE)	1392.10	0.59	0.02	0.11	0.01	0.16	0.11	0.36	8,400
10-110	48	Dowling Ave N (At River)	300.11	0.78	0.17	0.01	0.01	0.03	0.00	0.47	3,205
10-120A,B	(A)48, (B)36	(A) Approx. 34th Ave N, (B) Approx. 33rd Ave N (At River)	372.78	0.75	0.04	0.10	0.01	0.07	0.03	0.43	4,883
10-130	24	27th Ave NE (Monroe St NE)	336.00	0.30	0.07	0.45	0.00	0.05	0.13	0.45	1,669
10-140A	36	Lowry Ave NE (At River) North	2.59	0.04	0.69	0.20	0.03	0.04	0.00	0.57	2,136
10-140B	18	Lowry Ave NE (At River) South	220.65	0.05	0.70	0.20	0.02	0.03	0.00	0.58	2,136
10-150	27	Marshall St NE (Lowry Ave NE)	157.15	0.63	0.20	0.13	0.00	0.03	0.01	0.48	1,476
10-160	48	31st Ave N (Pacific St N)	17.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
10-170	42	30th Ave N (Mill St Extended)	176.01	0.57	0.07	0.33	0.00	0.03	0.00	0.50	2,702
10-180	78	22nd Ave NE (Grand St NE)	284.26	0.60	0.14	0.10	0.05	0.05	0.06	0.45	3,214
10-190	30	27th Ave N (Mill St N)	14.58	0.00	0.53	0.45	0.00	0.02	0.00	0.59	0
10-200	36	Marshall St NE (18th Ave NE)	42.44	0.30	0.07	0.43	0.00	0.02	0.18	0.44	433
10-210	54	26th Ave N (Mill St N)	98.32	0.50	0.03	0.41	0.00	0.05	0.01	0.49	837
10-220	18	22nd Ave N	18.83	0.00	0.33	0.60	0.00	0.01	0.06	0.56	0
10-230	60	21st Ave N	235.02	0.60	0.18	0.12	0.05	0.04	0.01	0.48	4,455
10-240	42	West Broadway	103.83	0.42	0.32	0.18	0.03	0.05	0.00	0.51	985
10-250	72	12th Ave NE (Vacated)	242.96	0.64	0.09	0.17	0.06	0.03	0.01	0.48	2,674
10-260	24	17th Ave N	23.77	0.00	0.05	0.85	0.00	0.02	0.08	0.54	0
10-270	48	10th Ave NE	72.45	0.76	0.05	0.15	0.00	0.04	0.00	0.47	922
10-280	54	14th Ave (extended)	55.08	0.00	0.02	0.54	0.14	0.20	0.10	0.44	0
10-290	21	Plymouth Ave N	6.83	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-300	27	8th Ave NE	17.74	0.66	0.29	0.05	0.00	0.00	0.00	0.50	125
10-310	42	Ramsey St NE (extension)	60.29	0.85	0.08	0.01	0.05	0.01	0.00	0.47	523
10-320	84	3rd Ave NE	341.99	0.65	0.12	0.10	0.04	0.06	0.03	0.45	4,680
10-330	18x60	W River Pkwy approx. 500' SE of 4th Ave N	21.61	0.14	0.00	0.06	0.00	0.80	0.00	0.18	126
10-340	30X'60	W River Pkwy at 1st Ave N (extended)	20.74	0.00	0.12	0.59	0.00	0.21	0.08	0.45	8
10-350	36	1st Ave NE	28.16	0.00	0.50	0.50	0.00	0.00	0.00	0.60	20
10-360	36	East Hennepin (on Nicollet Isld)	29.02	0.02	0.50	0.46	0.00	0.02	0.00	0.59	9
10-370	21	East Hennepin Ave	14.46	0.00	0.52	0.38	0.07	0.03	0.00	0.59	331
10-380	30X67	W River Pkwy at 2nd Ave S (extended)	14.38	0.15	0.09	0.00	0.50	0.25	0.01	0.45	0
10-390	tunnel	3rd Ave SE	41.97	0.13	0.26	0.58	0.00	0.01	0.02	0.56	456
10-400A	30	2nd St S at 3rd Ave S	1.07	0.14	0.32	0.34	0.00	0.15	0.05	0.47	280
10-400B	108	2nd St S tunnel btwn Hennepin Ave and 3rd Ave	17.66	0.02	0.50	0.46	0.00	0.02	0.00	0.59	19

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
10-400C	108	12th Ave N approx.150' W of 3rd St. N	50.25	0.20	0.00	0.00	0.79	0.01	0.00	0.57	134
10-410A	24	Washington Ave S at Chicago Ave S	46.22	0.00	0.49	0.35	0.00	0.05	0.11	0.51	2
10-410B	30	2nd St at Park Ave S (extended)	21.29	0.00	0.00	0.41	0.00	0.59	0.00	0.31	2
10-410C	36	Washington Ave S at Portland Ave S	22.80	0.00	0.03	0.50	0.25	0.22	0.00	0.49	193
10-410D	30	Washington Ave S at 5th Ave S	27.34	0.00	0.13	0.30	0.33	0.00	0.24	0.46	423
10-410E	tunnel	Washington,Marquette,Nicollet Tunnel	220.65	0.04	0.70	0.20	0.03	0.04	0.00	0.58	2,136
10-410F	36	10th St S@ 2nd Ave S	37.92	0.06	0.42	0.51	0.00	0.01	0.00	0.59	118
10-420A	21	W River Pkwy approx 200' E of 11th Ave S (extended)	23.05	0.00	0.58	0.15	0.00	0.02	0.25	0.44	13
10-420B	15	Washington Ave S at 11th Ave S	10.06	0.00	0.74	0.25	0.00	0.01	0.00	0.60	0
10-420C	60 X 78	Washington Ave S at 11th Ave S	7.42	0.00	0.96	0.03	0.00	0.00	0.01	0.59	2
10-420D	48	5th St S at 11th Ave S	20.73	0.00	0.90	0.00	0.00	0.00	0.10	0.54	0
10-420E	60	11th Ave S at 5th St S	127.89	0.08	0.38	0.33	0.13	0.08	0.00	0.55	2,096
10-430A	24	I-35W @ 1st St S	7.07	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
10-430B	48	I-35W @ 4th St S	54.72	0.10	0.25	0.60	0.00	0.00	0.05	0.56	2,867
10-430C	MNDOT	14th Ave S @ St. Pacific RR Bridge	44.83	0.10	0.65	0.05	0.00	0.10	0.10	0.48	17
10-430D	72	9th St S @ 13th Ave S	85.79	0.64	0.15	0.15	0.05	0.01	0.00	0.50	3,540
10-430E	36	I -35W @ W side of Portland Ave S Bridge	86.66	0.25	0.60	0.05	0.00	0.10	0.00	0.51	0
10-430F	30	Middle of I-35W 300' W of Portland Ave Bridge	12.27	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-430G	54	E. 18th St @ Clinton Ave S	82.63	0.53	0.30	0.12	0.00	0.05	0.00	0.50	5,054
10-430H	MNDOT	I-94 @ W side of 1st Ave S Bridge	33.18	0.64	0.20	0.15	0.00	0.01	0.00	0.50	658
10-430I	48	Nicollet Ave S 100' S of E 16th St	32.61	0.07	0.10	0.10	0.70	0.03	0.00	0.57	42
10-430J	120	W 15th St @ Willow St	532.36	0.45	0.20	0.08	0.08	0.18	0.01	0.44	12,300
10-430K	48	W 27th St (extended) 200' E of I-35W	337.06	0.50	0.27	0.10	0.03	0.10	0.00	0.48	8,015
10-430L	42	E 31st St @ 2nd Ave S	84.40	0.87	0.04	0.04	0.00	0.05	0.00	0.44	1,696
10-430M	48	E 31st St @ Stevens Ave S	75.94	0.32	0.47	0.15	0.04	0.01	0.01	0.54	1,681
10-430N	24	E 34th St @ 2nd Ave S	26.43	0.84	0.09	0.02	0.03	0.02	0.00	0.46	17,919
10-430O	66	E 35th St @ 2nd Ave S	109.53	0.80	0.06	0.00	0.10	0.04	0.00	0.46	1,978
10-430P	78	E 35th St @ Stevens Ave S	212.53	0.90	0.08	0.01	0.00	0.01	0.00	0.46	4,545
10-430Q	30	I-35W @ N side of W 35th St Bridge	8.03	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-430R	84	E 39th St @ 2nd Ave S	150.32	0.79	0.15	0.02	0.02	0.02	0.00	0.47	2,269
10-430S	21	I-35W @ S side of E 39th St Bridge	5.15	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-430T	78	W 39th St @ Stevens Ave S	262.47	0.93	0.04	0.01	0.01	0.01	0.00	0.46	5,157
10-430U	78	I-35W @ W 39th St Bridge	431.37	0.83	0.11	0.00	0.06	0.00	0.00	0.48	5,600
10-430V	72	King's Hwy Holding Pond @ 700' S of W 38th St	329.11	0.86	0.06	0.02	0.04	0.02	0.00	0.46	6,929
10-440A	18	35W Btwn University Ave SE 4th St SE	23.18	0.65	0.15	0.11	0.00	0.09	0.00	0.46	443
10-440B	18	35W @ 9th St SE (extended),	34.23	0.56	0.21	0.00	0.23	0.00	0.00	0.52	0
10-440C&D	(C) 18, (D) 18	(C) 35W @ Winter St, (D) Johnson St 400' S of E Broadway	56.00	0.26	0.40	0.33	0.00	0.01	0.00	0.56	60
10-440E	18	E Broadway @ New Brighton Blvd	831.25	0.45	0.35	0.15	0.02	0.02	0.01	0.52	3,677
10-440F	96	35W @ 13th Ave NE (extended)	538.85	0.59	0.15	0.14	0.04	0.04	0.04	0.47	12,569
10-450A	18	10th Ave SE @ 2nd St SE	338.26	0.50	0.16	0.21	0.03	0.04	0.06	0.47	6,510
10-450B	18	10th Ave SE 50' N of Univ. Ave SE	3.41	0.56	0.20	0.00	0.24	0.00	0.00	0.52	60
10-450C	18	10th Ave SE 50' N of 4th St SE	55.64	0.90	0.00	0.10	0.00	0.00	0.00	0.47	304
10-450D	18	10th Ave SE @ 5th St SE	4.62	1.00	0.00	0.00	0.00	0.00	0.00	0.45	219
10-450E	18	10th Ave SE @ 6th St SE	3.20	0.98	0.00	0.00	0.00	0.02	0.00	0.44	212
10-450F	18	8th St SE @ 15th Ave SE	158.55	0.10	0.31	0.38	0.00	0.02	0.19	0.46	1,473

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
10-450G&H	(G) 18, (H) 18	(G)Como Av SE 100' E 35W E Front. Rd, (H)12 Ave SE @ SCL E Henn.	73.97	0.71	0.15	0.04	0.01	0.08	0.01	0.45	1,342
10-450I	18	E Hennepin @ Pierce St NE	243.64	0.36	0.32	0.21	0.00	0.03	0.08	0.48	2,263
10-450J	18	E Hennepin @ Garfield St NE	17.16	0.03	0.20	0.61	0.00	0.02	0.14	0.50	78
10-450K	18	Winter St NE @ Garfield St NE	37.01	0.11	0.26	0.62	0.00	0.01	0.00	0.58	153
10-450L	66	Arthur St NE @ Kennedy St NE	213.41	0.00	0.21	0.63	0.00	0.02	0.14	0.51	0
10-460A	18	300' S of University Ave SE	0.00								
10-460B	18	University Ave SE 100' SE of 14th Ave SE	7.29	0.09	0.70	0.00	0.10	0.00	0.11	0.52	0
10-460C&D	18	(C) 5th St SE @ 16th Ave SE, (D) 8th St SE @ 17th Ave SE	112.22	0.00	0.03	0.15	0.41	0.05	0.36	0.36	0
10-460E	18	18th Ave SE @ Elm St. SE	231.41	0.48	0.05	0.37	0.00	0.02	0.08	0.47	1,376
10-460F	18	18th Ave SE @ Alley S of Como Ave SE	14.75	0.70	0.08	0.00	0.22	0.00	0.00	0.50	137
10-460G	18	Talmage Ave SE 50' E of 18th Ave SE	79.66	0.37	0.10	0.21	0.25	0.03	0.04	0.51	1,711
10-460H	18	18th Ave SE 50 S of E Hennepin	12.35	0.03	0.17	0.60	0.00	0.02	0.18	0.48	90
10-460I	18	Stinson Blvd @ Traffic St NE	74.29	0.01	0.21	0.69	0.00	0.02	0.07	0.55	28
10-460J	18	Como Ave @ 19th Ave SE	5.36	0.91	0.00	0.09	0.00	0.00	0.00	0.46	0
10-460K	18	Como Ave @ 20th Ave SE	5.48	0.77	0.00	0.00	0.00	0.03	0.20	0.35	45
10-460L	18	Como Ave @ 21st Ave SE	3.50	0.44	0.50	0.00	0.00	0.06	0.00	0.50	3
10-460M	18	Como Ave @ 122nd Ave SE	9.55	0.81	0.18	0.01	0.00	0.00	0.00	0.48	67
10-460N	18	Como Ave @ 23rd Ave SE	3.85	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
10-460O	18	Como Ave @ 24th Ave SE	4.15	0.98	0.02	0.00	0.00	0.00	0.00	0.45	5
10-460P	18	25th Ave SE 100' S of Como Ave SE	4.34	1.00	0.00	0.00	0.00	0.00	0.00	0.45	76
10-460Q	18	Como Ave SE @ 27th Ave SE	19.73	0.10	0.07	0.77	0.00	0.00	0.06	0.55	62
10-460R	18	25th Ave SE 200' N of Talmadge	50.46	0.03	0.11	0.78	0.00	0.00	0.08	0.55	0
10-460S	60	Hoover St NE @ E Hennepin	233.54	0.00	0.17	0.75	0.00	0.02	0.06	0.55	0
10-465	12	West River Pkwy @ RR Bridge	8.56	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-470	24	West River Road 200' N of Washington Ave	25.60	0.70	0.00	0.12	0.00	0.13	0.05	0.40	407
10-480	60	West River Road 100' N of Washington Ave	39.66	0.15	0.05	0.10	0.69	0.01	0.00	0.57	0
10-485	12	West River Road 100' S of Washington Ave	7.27	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
10-490	84	West River Road @ 4th St S	150.96	0.45	0.20	0.15	0.01	0.18	0.01	0.44	1,822
10-500A	54	7th St S (vacated) 15' SE of 17th Ave S	26.21	0.00	0.34	0.10	0.00	0.00	0.56	0.27	571
10-500B	18	17th Ave S Under I-94	8.48	0.00	0.00	0.60	0.00	0.36	0.04	0.40	0
10-500C	72	East Franklin Av 250' E of Cedar Ave S	218.00	0.73	0.10	0.05	0.02	0.10	0.00	0.44	2,090
10-500D	12	Cedar Ave S 500' S of I-94	3.83	0.00	0.11	0.29	0.00	0.00	0.60	0.24	0
10-500E	24	19th Ave S	23.34	0.50	0.25	0.10	0.08	0.07	0.00	0.49	5,884
10-500F	48	E 18th St @ 14th Ave S	270.00	0.14	0.00	0.00	0.00	0.86	0.00	0.15	183
10-500G	60	E 24th St @ Snelling Ave S	112.94	0.67	0.09	0.18	0.03	0.03	0.00	0.48	2,090
10-505	12	West River Road below St Marys' Hospital	7.85	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-510	30X60	West River Road @ 27th Ave S (extended)	62.36	0.47	0.06	0.15	0.22	0.10	0.00	0.48	1,138
10-520	U of M	U of M Outfall	139.98	0.08	0.25	0.35	0.13	0.19	0.00	0.49	2,813
10-530	96	Oak St SE	116.15	0.15	0.23	0.23	0.12	0.25	0.02	0.44	789
10-540	30	West River Road @ I-94	53.90	0.05	0.00	0.00	0.00	0.95	0.00	0.12	72
10-550	36	West River Road @ E Franklin Av	25.83	0.90	0.07	0.02	0.00	0.01	0.00	0.46	629
10-560A&B	96	26th Ave SE Bridal Vail Creek Tunnel	600.63	0.18	0.27	0.28	0.02	0.05	0.20	0.43	2,921
10-570A	24	West River Road @ 33rd Ave S	14.64	1.00	0.00	0.00	0.00	0.00	0.00	0.45	93
10-570B	48	West River Road @ 33rd Ave S	228.18	0.58	0.14	0.10	0.03	0.15	0.00	0.44	2,847
10-580	30	Seymour Ave SE	73.39	1.00	0.00	0.00	0.00	0.00	0.00	0.45	760

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
10-600	36	Cecil St SE	89.24	0.75	0.15	0.00	0.00	0.10	0.00	0.44	859
10-610	12	East City Limits	25.60	0.88	0.08	0.02	0.00	0.00	0.02	0.46	239
10-630A	12	West River Rd @ 28th Ave S (extended)	9.80	0.95	0.02	0.00	0.03	0.00	0.00	0.46	1,641
10-630B	16	E 28th St @ Dorman Ave S	6.24	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
10-630C	60	E 28th St @ 42nd Ave S	4.68	1.00	0.00	0.00	0.00	0.00	0.00	0.45	102
10-630D	21	E 28th St @ 42nd Ave S	96.03	0.76	0.19	0.03	0.01	0.01	0.00	0.48	1,071
10-630E	16	28th Ave S	6.37	1.00	0.00	0.00	0.00	0.00	0.00	0.45	40
10-630F	16	E 28th St @ 38th Ave S	8.52	1.00	0.00	0.00	0.00	0.00	0.00	0.45	254
10-630G	60	E 28th St and 36th Ave S	17.56	0.40	0.60	0.00	0.00	0.00	0.00	0.54	170
10-630H	24	36th Ave S 100' S of E 27th St	5.90	1.00	0.00	0.00	0.00	0.00	0.00	0.45	58
10-630I	16	E 28th St @ 34th Ave S	25.63	0.42	0.05	0.14	0.00	0.00	0.39	0.30	196
10-630J	12	E 28th St @ Alleyway btwn 32nd & 33rd Ave S	12.48	0.42	0.00	0.43	0.00	0.00	0.15	0.45	52
10-630K	54	E 28th St @ 31st Ave S	95.29	0.36	0.12	0.38	0.00	0.09	0.05	0.47	440
10-630L	48	E 28th St @ 31st Ave S	100.42	0.48	0.40	0.07	0.04	0.01	0.00	0.52	1,201
10-630M	15	E 28th St @ 31st Ave S	11.71	0.65	0.00	0.33	0.00	0.02	0.00	0.49	67
10-630N	12	E 28th St @ 29th Ave S	8.45	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
10-630O	12	E 28th St @ Alley btwn 27th & 28th Ave S,	5.77	0.01	0.24	0.23	0.00	0.50	0.02	0.34	0
10-630P&Q	36	E 28th St @ 26th Ave S	66.45	0.01	0.28	0.09	0.00	0.60	0.02	0.29	0
10-630R	60	E 29th St @ 22nd Ave S	83.89	0.15	0.25	0.15	0.10	0.05	0.30	0.37	920
10-630S	21	E 29th St @ Layman Ave S	37.02	0.00	0.02	0.37	0.00	0.60	0.01	0.29	60
10-630T	16	E 29th St @ 21st Ave S	7.72	0.25	0.75	0.00	0.00	0.00	0.00	0.56	0
10-630U	16	Drill Hole along 29th Ave S	115.42	0.36	0.24	0.14	0.02	0.08	0.16	0.41	1,443
10-630V	36	E 29th St @ 14th Ave S	33.85	0.52	0.25	0.10	0.05	0.08	0.00	0.48	2,240
10-630W	16	14th Ave S @ E 28th St	23.68	0.62	0.08	0.24	0.00	0.03	0.03	0.47	458
10-630X	21	E 27th St @ 13th Ave S	14.78	0.83	0.05	0.02	0.02	0.08	0.00	0.44	549
10-630Y	60	E 27th St @ 12th Ave S	111.54	0.44	0.29	0.11	0.06	0.10	0.00	0.48	1,290
10-630Z	36	14th Ave S 200' S of E Lake St	45.66	0.82	0.11	0.04	0.02	0.01	0.00	0.47	950
10-640	40X72	W River Pkwy at E Lake St	258.18	0.83	0.07	0.03	0.03	0.02	0.02	0.45	2,980
10-650	12	W River Pkwy at E 32nd St	19.53	0.29	0.71	0.00	0.00	0.00	0.00	0.56	203
10-660	48X 72	W River Pkwy at E 33rd St	306.37	0.86	0.05	0.03	0.04	0.02	0.00	0.46	3,816
10-670	36	W River Pkwy at E 36th St	137.88	1.00	0.00	0.00	0.00	0.00	0.00	0.45	1,408
10-680	120	W River Pkwy at E 38th St	707.95	0.71	0.06	0.08	0.07	0.04	0.04	0.45	7,782
10-690	27	W River Pkwy at E 42nd St	70.63	0.66	0.04	0.00	0.30	0.00	0.00	0.50	654
10-700	60	W River Pkwy at E 44th St	222.07	0.87	0.05	0.04	0.03	0.01	0.00	0.46	2,606
10-710	36	W River Pkwy 250' S of E 46th St	29.95	0.60	0.02	0.00	0.00	0.38	0.00	0.32	244
10-720A	12	Riverview Rd 250' N of E 54th St	15.77	0.98	0.00	0.00	0.00	0.02	0.00	0.44	75
10-720B	66	E 53rd St at 48th Ave S	422.18	0.74	0.01	0.23	0.01	0.01	0.00	0.48	4,182
10-720C	24	E 52nd St at 47th Ave S	26.35	0.76	0.08	0.01	0.00	0.15	0.00	0.41	261
10-720D	21	E 54th at 38th Ave S	22.95	0.96	0.04	0.00	0.00	0.00	0.00	0.46	337
10-720E	12	Boardman Ave S at 35th Ave S (extended)	18.39	0.96	0.04	0.00	0.00	0.00	0.00	0.46	350
10-720F	84	E 55th at 33rd Ave S	317.75	0.80	0.20	0.00	0.00	0.00	0.00	0.48	3,710
10-720G	15	Hiawatha Ave at E 51st St	13.25	1.00	0.00	0.00	0.00	0.00	0.00	0.45	246
10-720H	12	Hiawatha Ave at 44th Ave S	4.55	1.00	0.00	0.00	0.00	0.00	0.00	0.45	71
10-720I	36	Hiawatha Ave at E 50th St	87.27	0.91	0.05	0.00	0.00	0.04	0.00	0.44	802
10-720J	12	Hiawatha Ave at 42nd Ave S	3.71	0.75	0.00	0.00	0.00	0.25	0.00	0.36	47

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
10-720K	12	Hiawatha Ave at E Minnehaha Pkwy	32.76	0.00	0.80	0.10	0.00	0.04	0.06	0.54	0
10-720L	12	E 59th St at 46th Ave S	5.00	1.00	0.00	0.00	0.00	0.00	0.00	0.45	102
20-010	18	Penn Ave N	93.99	0.89	0.00	0.00	0.00	0.11	0.00	0.41	990
20-020	12	52nd Ave N (Penn Av N)	15.09	0.95	0.00	0.00	0.00	0.05	0.00	0.43	170
20-030	21	52nd Ave N (Oliver Ave N)	7.95	1.00	0.00	0.00	0.00	0.00	0.00	0.45	65
20-040	12	Newton Ave N	6.79	0.80	0.00	0.00	0.00	0.20	0.00	0.38	37
20-050	12	51st Ave N (Newton Av N)	1.59	0.80	0.00	0.00	0.00	0.20	0.00	0.38	37
20-060	36	Knox Ave N	5.91	1.00	0.00	0.00	0.00	0.00	0.00	0.45	63
20-070	30	50th Ave N (Knox Ave N)	39.07	0.91	0.04	0.00	0.00	0.05	0.00	0.44	441
20-080	24	50th Ave N (James Ave N)	33.72	0.94	0.04	0.00	0.00	0.02	0.00	0.45	438
20-090	12	Alley W of Humboldt Ave N	9.95	0.32	0.00	0.00	0.68	0.00	0.00	0.55	85
20-100	54	49th Ave N (Ryan Creek)	0.99	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
20-110	21	49th Ave N (Humboldt Ave N)	216.04	0.13	0.04	0.23	0.00	0.15	0.45	0.24	370
20-120	24	48th Ave N (Humboldt Ave N)	10.22	0.89	0.06	0.00	0.05	0.00	0.00	0.47	55
20-130	12	47th Ave N (Shingle Crk Pkwy)	16.12	1.00	0.00	0.00	0.00	0.00	0.00	0.45	168
20-140	24	47th Ave N (Girard Ave N)	2.97	0.95	0.00	0.00	0.00	0.05	0.00	0.43	61
20-150	12	Malmquist Lane	14.48	1.00	0.00	0.00	0.00	0.00	0.00	0.45	182
20-160	12	Fremont Ave N (Shingle Crk Pkwy)	3.21	0.45	0.20	0.00	0.35	0.00	0.00	0.53	0
20-170	12	46th Ave N (Mamquist Lane)	4.94	0.74	0.00	0.00	0.00	0.26	0.00	0.36	44
20-180	12	46th Ave N (Shingle Crk Pkwy)	5.30	0.64	0.36	0.00	0.00	0.00	0.00	0.50	20
20-190	24	Dupont Ave N (Shingle Crk Pkwy)	1.35	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
20-200	60	45th Ave N (Dupont Ave N)	13.84	1.00	0.00	0.00	0.00	0.00	0.00	0.45	191
20-210A	60	44th Ave N (Soo Line RR)	92.90	0.96	0.00	0.00	0.00	0.03	0.01	0.44	710
20-210B	30	45th Ave N (Colfax Ave N)	620.78	0.62	0.32	0.03	0.03	0.00	0.00	0.51	5,932
20-220	24	43rd Ave N	26.38	0.60	0.10	0.20	0.00	0.10	0.00	0.46	202
20-230	24	Weber Pkwy (Aldrich Ave N)	21.16	1.00	0.00	0.00	0.00	0.00	0.00	0.45	115
20-240	21	Lyndale Ave N (S of Creek)	30.06	0.77	0.13	0.10	0.00	0.00	0.00	0.48	337
20-250	15	Lyndale Ave N (N of Creek)	6.28	0.00	0.80	0.10	0.00	0.10	0.00	0.55	0
20-260	60	I- 94 (S of Creek)	3.50	0.00	0.00	1.00	0.00	0.00	0.00	0.60	115
20-270	40	I-94 (E of I-94 at Creek)	42.81	0.75	0.02	0.03	0.20	0.00	0.00	0.49	665
20-280	24	I-94 (N of Creek)	8.98	0.00	0.90	0.00	0.00	0.05	0.05	0.55	0
20-290	54	47th Ave N @ Xerxes Ave N	8.41	0.00	0.50	0.40	0.00	0.10	0.00	0.55	0
21-010	96	14th Ave N @ Xerxes Ave N	49.49	1.00	0.00	0.00	0.00	0.05	0.00	0.45	388
40-010	future	Xerxes Ave N (S of T.H. 55)	719.17	0.87	0.05	0.01	0.02	0.05	0.00	0.44	10,605
40-020	36	Vincent Ave N (N. of T.H. 55)	15.36	1.00	0.00	0.00	0.00	0.00	0.00	0.45	85
40-030	42	Upton Ave N (N of T.H.)	51.02	0.91	0.00	0.00	0.00	0.09	0.00	0.42	426
40-040	15	T.H. 55 @ Upton Av N	65.39	0.93	0.02	0.00	0.00	0.05	0.00	0.44	987
40-050	12	100' N of 5th Av N @ Thomas Av N	10.28	1.00	0.00	0.00	0.00	0.00	0.00	0.45	65
40-060	future	S of Thomas Av N @ Inglewood St N	3.20	1.00	0.00	0.00	0.00	0.00	0.00	0.45	8
40-070	24	Thomas Av N (N of Chestnut Av N)	7.98	0.80	0.00	0.00	0.00	0.20	0.00	0.38	59
40-080	30	Queen Av N (N of Chestnut Av N)	60.51	0.81	0.00	0.00	0.00	0.19	0.00	0.38	376
40-090	15	Queen Av N -S of 2nd Av N	20.65	0.90	0.02	0.05	0.00	0.03	0.00	0.45	587
40-100	30	Oliver Av N - S of 2nd Av N	10.70	0.93	0.03	0.02	0.00	0.02	0.00	0.45	471
40-110	36	Newton Av N (S of Bassett Creek)	2.61	0.98	0.00	0.00	0.00	0.02	0.00	0.44	0
40-120	30	Morgan Av N (N of Bassett Creek)	65.87	0.87	0.04	0.03	0.00	0.03	0.03	0.44	644

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
40-130	66	Morgan Av N extended (S of Bassett Creek)	35.01	0.89	0.05	0.03	0.00	0.03	0.00	0.45	610
40-140	future	Irving Av N	125.46	0.27	0.36	0.00	0.00	0.05	0.32	0.34	572
40-150	18	2nd Av N - !00' Dupont Av N	24.31	0.38	0.16	0.33	0.00	0.05	0.08	0.47	181
40-160	36	Dupont Av N @ 2nd Av N	30.99	0.16	0.09	0.60	0.00	0.02	0.13	0.49	201
40-170	27	Glenwood Av N @ Dupont Av N (west MH)	194.89	0.12	0.29	0.14	0.03	0.25	0.17	0.36	131
40-180	42	Glenwood Av N @ Dupont Av N (east MH)	16.80	0.17	0.33	0.31	0.12	0.07	0.00	0.54	210
40-190	24	4th Av N @ Dupont Av N (west MH)	65.53	0.00	0.36	0.51	0.00	0.05	0.08	0.53	184
40-200	27	4th Av N @ Dupont Av N (east MH)	24.75	0.40	0.06	0.00	0.38	0.16	0.00	0.46	572
40-210	42	5th Av N @ Dupont Av N (west MH)	17.26	0.72	0.15	0.08	0.01	0.04	0.00	0.47	2,368
40-220	21	5th Av N @ Dupont Av N (east MH)	100.58	0.77	0.17	0.01	0.01	0.04	0.00	0.46	1,559
40-230	48	TH 55 @ Dupont Av N (west MH)	13.78	0.82	0.00	0.00	0.12	0.06	0.00	0.45	200
40-240	54	8th Av N @ Aldrich Av N	341.00	0.55	0.09	0.10	0.13	0.13	0.00	0.45	5,292
40-250	18	TH 55 @ Dupont Av N (east MH)	1.15	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
40-260	15	T H 55 (N frontage Rd) @ Dupont	3.49	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
40-270	21	T H 55 (West Bound) @ Sumner Av	9.59	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
40-280	48	Alley - NW of 8th Av N & 10th Av N	12.76	0.09	0.13	0.70	0.00	0.08	0.00	0.55	23
40-290	future	10th Av SE - 200' NE of 8th Av NE	13.73	0.04	0.66	0.15	0.00	0.08	0.07	0.51	0
40-300	42	6th St N - 100' N of 8th Av N	10.38	0.05	0.06	0.69	0.00	0.11	0.09	0.48	0
40-310	24	4th St N @ 8th Av N (extended) South MH	97.86	0.00	0.09	0.66	0.00	0.05	0.20	0.46	0
40-320	24	4th St N @ 8th Av N (extended) North MH	9.43	0.00	0.00	1.00	0.00	0.00	0.00	0.60	0
40-330	future	3rd St N @ 7th Av N (vacated) South MH	15.34	0.00	0.27	0.71	0.00	0.01	0.01	0.59	136
40-340	future	3rd St N -200' SE of 8th Av N	35.27	0.00	0.08	0.80	0.00	0.04	0.08	0.53	0
40-350	30	Washington Av N -200' S of 8th Av N	8.99	0.00	0.09	0.81	0.00	0.00	0.10	0.54	0
40-360	30	2nd St N - 100' SE of 8th Av N	8.09	0.00	0.03	0.97	0.00	0.00	0.00	0.60	0
40-370	18	1stSt N - 100' SE of 8th Av N	12.41	0.00	0.44	0.51	0.00	0.05	0.00	0.58	0
40-380	15	West River Parkway @ Bassett Creek (west curb)	24.92	0.13	0.12	0.40	0.00	0.25	0.10	0.40	204
40-390	15	Bassett Creek outlet to Mississippi River	5.72	0.00	0.96	0.00	0.00	0.04	0.00	0.58	0
40-400	60	I-394 at Penn Av S (Penn Av Holding Pond)	1.07	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
41-010	none	BNRR tracks at 16th St (extended)	94.73	0.50	0.15	0.10	0.00	0.10	0.15	0.39	142
41-020	72	Washington Av N at 3rd Av N	14.89	0.00	0.03	0.12	0.35	0.05	0.45	0.31	0
41-030	48	6th St at 2nd Av N	60.47	0.03	0.37	0.40	0.00	0.14	0.06	0.49	402
41-040	24	2nd Av N at 5th St N	35.59	0.00	0.35	0.45	0.10	0.10	0.00	0.55	125
41-050	15	2nd Av N at 4th St N	10.48	0.00	0.62	0.38	0.00	0.00	0.00	0.60	0
41-060	36	North edge of Brownie Lake	2.95	0.00	0.66	0.34	0.00	0.00	0.00	0.60	0
51-010	12	Cedar Lake Road - 250' SW of Lake View	29.63	0.99	0.00	0.01	0.00	0.00	0.00	0.45	162
51-020	21	W '21st St (extended)	4.00	1.00	0.00	0.00	0.00	0.00	0.00	0.45	31
52-010	12	Burnham Road @ Kenilworth Lagoon	45.29	0.53	0.00	0.00	0.00	0.36	0.11	0.27	147
52-020	12	Park Lane - 500' North of Burnham Road	6.09	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
52-030	12	Burnham Road - '100' North of Cedar Lake Pkwy	7.18	1.00	0.00	0.00	0.00	0.00	0.00	0.45	16
52-040	24	Cedar Lake Pkwy @ Depot	4.54	0.90	0.00	0.00	0.00	0.10	0.00	0.42	0
52-050	18	Cedar Lake Pkwy @ Chowen (extended)	15.30	0.95	0.00	0.00	0.00	0.05	0.00	0.43	74
52-060	36	Cedar Lake Pkwy @ Drew Ave S (extended)	3.22	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
52-070	24	Cedar Lake Pkwy @ Ewing Av S (extended	86.94	0.88	0.02	0.00	0.00	0.10	0.00	0.42	1,095
52-080	18	Cedar Lake Pkwy @ at Basswood Road	8.08	0.41	0.00	0.00	0.00	0.59	0.00	0.24	0
52-090	42	Cedar Lake Pkwy @ West 24th St	4.89	1.00	0.00	0.00	0.00	0.00	0.00	0.45	19

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
52-100	48	Cedar Lake Pkwy @ West 22nd St	11.89	0.58	0.00	0.00	0.00	0.39	0.03	0.30	92
52-110	24	Cedar Lake Pkwy @ West Franklin Av	8.84	0.99	0.00	0.00	0.00	0.01	0.00	0.45	45
52-120	8	Cedar Lake Pkwy @ Cedar Lake Road	14.74	1.00	0.00	0.00	0.00	0.00	0.00	0.45	168
52-130	12	Upton Av S @ West 26th St	7.18	0.70	0.00	0.00	0.00	0.00	0.30	0.32	18
53-010	24	West 26th St @ Lake of the Isles Parkway	7.03	1.00	0.00	0.00	0.00	0.00	0.00	0.45	66
53-020	15	Thomas Av S (Dean Blvd)	12.38	0.61	0.00	0.00	0.00	0.00	0.39	0.28	57
53-030	18	Lake of the Isles Parkway ('200' E of Russell Av S)	11.37	0.96	0.00	0.00	0.00	0.04	0.00	0.44	65
53-040	24	Lake of the Isles Parkway (West 24th ST)	2.78	1.00	0.00	0.00	0.00	0.00	0.00	0.45	71
53-050	30	Lake of the Isles Parkway (Penn Av S)	13.66	1.00	0.00	0.00	0.00	0.00	0.00	0.45	149
53-060	18	Lake of the Isles Parkway (Newton Av S)	20.37	1.00	0.00	0.00	0.00	0.00	0.00	0.45	284
53-070	24	Lake of the Isles Parkway (Oliver Av S)	4.89	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
53-080	24	West 21st St @ Lake of the Isles Blvd	5.81	0.84	0.00	0.00	0.00	0.16	0.00	0.39	36
53-090	24	Lake of the Isles Blvd @Franklin Av	59.59	0.68	0.01	0.00	0.03	0.28	0.00	0.36	1,555
53-100	12	Lake of the Isles Blvd @Franklin Av	107.81	0.54	0.01	0.00	0.00	0.45	0.00	0.29	634
53-110	36	Lake of the Isles Pkwy @ West 22nd St	4.59	0.81	0.00	0.00	0.00	0.19	0.00	0.38	26
53-120	12	Lake of the Isles Pkwy @ West 25th St	129.79	0.95	0.04	0.01	0.00	0.00	0.00	0.46	2,688
53-130	15	Lake of the Isles Pkwy @ West 26th St	5.02	1.00	0.00	0.00	0.00	0.00	0.00	0.45	14
53-140	42	Lake of the Isles Pkwy @ Euclid Place	6.36	1.00	0.00	0.00	0.00	0.00	0.00	0.45	60
53-150	54	Lake of the Isles Pkwy @ West 27th St	90.40	0.70	0.20	0.02	0.06	0.02	0.00	0.49	1,586
53-160	15	Lake of the Isles Pkwy @ '250' SW of James Av S	252.19	0.78	0.12	0.06	0.01	0.03	0.00	0.47	6,244
53-170	15	Lake of the Isles Pkwy @ '500' W of Lagoon	6.39	0.75	0.00	0.00	0.00	0.25	0.00	0.36	33
53-180	18	Lake of the Isles Pkwy @ West 28th St	8.09	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
53-190	36	E. Isles Pkwy at The Mall	11.41	0.57	0.00	0.00	0.00	0.43	0.00	0.30	76
54-010	42	E. Calhoun Pkwy at 33rd St. W	84.93	0.67	0.15	0.05	0.00	0.13	0.00	0.43	2,220
54-040	18	E. Calhoun Pkwy at 36th St W.	255.14	0.68	0.22	0.08	0.02	0.00	0.00	0.50	3,792
54-050	18	W. Calhoun Pkwy at Sheridan Av S.	9.27	0.21	0.00	0.00	0.00	0.79	0.00	0.17	27
54-060	30	W. Calhoun Pkwy at Vincent Av S	32.13	0.95	0.00	0.00	0.00	0.05	0.00	0.43	69
54-070	60	W. Calhoun Pwky at Xerxes Av S	60.80	0.74	0.00	0.00	0.00	0.26	0.00	0.36	595
54-080	12	W. Calhoun Pwky approx. '250' S. of W 36th St	414.26	0.89	0.03	0.01	0.05	0.02	0.00	0.46	4,180
54-090	36	W. Calhoun Pwky at W. 36th St	3.55	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
54-100	18	W. Calhoun Pwky at Rose Lane	114.24	0.20	0.00	0.00	0.78	0.02	0.00	0.56	134
54-110	24	W. Calhoun Pwky at Ivy Lane	24.55	1.00	0.00	0.00	0.00	0.00	0.00	0.45	20
54-120	12	W. Calhoun Pwky approx. '200' N of W 32nd St	62.08	0.76	0.08	0.01	0.09	0.06	0.00	0.46	378
54-130	30	W. Calhoun Pwky at Market Place (extended)	1.07	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
54-140	24	W. Calhoun Pwky at Calhoun Blvd (extended)	113.01	0.32	0.35	0.04	0.00	0.25	0.04	0.40	1,729
54-150	9	W. Calhoun Pwky at Dean Pwky	55.34	0.94	0.02	0.01	0.00	0.03	0.00	0.44	455
54-160	12	W. Calhoun Pwky approx. 200' E of Thomas Av S	2.62	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
54-170	12	W. Calhoun Pwky approx. 500' E of Thomas Av S	8.08	0.13	0.42	0.44	0.00	0.01	0.00	0.58	0
54-180	12	W. Calhoun Pwky approx 750' E of Thomas Av S	2.82	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
54-190	12	W. Calhoun Pwky approx. 1000' E of Thomas Av S	2.20	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
54-200	12	W. Calhoun Pwky approx. 1200' E of Thomas Av S	2.13	0.00	0.00	0.00	0.00	1.00	0.00	0.10	41
54-210	12	E. Calhoun Pkwy approx. 1000' NE of Wm Berry Pkwy	1.14	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
55-010	12	Lakewood Cemetary	14.98	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
55-020	12	Lake Harriet Pkwy at Roseway Rd	189.58	0.00	0.99	0.00	0.00	0.01	0.00	0.60	41
56-010	15	E. Harriet Pwky at 43rd St	67.62	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
57-010	36	E. Harriet Pwky at 44th St	26.10	0.44	0.56	0.00	0.00	0.00	0.00	0.53	130
57-020	12	E. Harriet Pwky at Kings Highway	143.08	0.95	0.02	0.00	0.03	0.00	0.00	0.46	1,641
57-030	24	E. Harriet Pwky at W 47th St	18.22	1.00	0.00	0.00	0.00	0.00	0.00	0.45	157
57-040	12	Harriet Pwky at Morgan Av S	39.88	0.71	0.00	0.00	0.00	0.29	0.00	0.35	390
57-050	24	Harriet Pwky at Oliver Ave S.	7.90	1.00	0.00	0.00	0.00	0.00	0.00	0.45	51
57-060	36	W. Harriet Pwky @ Queen Av S	26.11	0.91	0.08	0.01	0.00	0.00	0.00	0.46	436
57-070	12	W. Harriet Pwky @ Russel Av S	81.33	0.98	0.02	0.00	0.00	0.00	0.00	0.45	1,011
57-080	42	W. Harriet Pwky @ Thomas Av S	5.54	0.92	0.00	0.00	0.00	0.08	0.00	0.42	45
57-090	60	W. Harriet Pwky @ W. 47th St	77.77	0.85	0.05	0.01	0.09	0.00	0.00	0.47	833
57-100	12	W. Harriet Pwky @ W.46th St (extended)	313.43	0.81	0.11	0.02	0.06	0.00	0.00	0.48	3,458
57-110	30	W. Harriet Pwky @ W. 44th St.	21.60	0.40	0.60	0.00	0.00	0.00	0.00	0.54	275
57-120	18	W. Harriet Pwky @ approx. 400' N of W 44th St	62.08	0.81	0.11	0.02	0.06	0.00	0.00	0.48	3,458
57-130	18	W. Harriet Pwky @ approx. 500' S W 42nd St	1.16	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
57-140	15	W. Harriet Pwky @ W 42nd St	1.55	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
57-150	12	Lake Harriet Pkwy approx. 50' N of W 42nd St	35.68	0.88	0.02	0.00	0.00	0.10	0.00	0.42	364
57-160	future	Cleveland St NE at 37th Av NE	1.89	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
61-010	36	Silver Lake Stinson Blvd and 37th Av NE	2.86	0.32	0.68	0.00	0.00	0.00	0.00	0.55	0
62-010	66	Victory Pkwy @ Dowling Av N	27.84	0.94	0.03	0.00	0.00	0.03	0.00	0.44	245
63-010	24	W Broadwy Av at Xerxes Av N	455.67	0.92	0.04	0.00	0.02	0.02	0.00	0.45	5,985
63-020	24	Columbus Av S (extended) 200' S of E 61st St	13.62	0.75	0.00	0.00	0.00	0.25	0.00	0.36	0
64-100	12	Elliot Av S (extended) S side of Hwy 62	24.92	1.00	0.00	0.00	0.00	0.00	0.00	0.45	314
64-110	30	Oakland Av S (extended) @ 50' N of Hwy 62	6.01	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
64-120	12	Park Av S 300' E of Portland Av (at curve)	16.04	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
64-130	30	Mn Hwy 190 @ Hwy 62	2.44	1.00	0.00	0.00	0.00	0.00	0.00	0.45	18
65-010	33	W 62nd St (extended) @ State Hwy 190	18.97	0.86	0.00	0.14	0.00	0.00	0.00	0.47	0
65-020	12	W 54th @ France Av S	39.13	0.44	0.55	0.00	0.00	0.01	0.00	0.53	442
70 -265	21	Pratt St @ W M'haha Pkwy (north bank)	185.98	0.81	0.15	0.02	0.00	0.02	0.00	0.47	2,415
70-010	24	W 54th St 150' E of Zenith Av S	6.23	0.93	0.07	0.00	0.00	0.00	0.00	0.46	55
70-015	24	York Av S @ W 54th St (extended)	11.69	1.00	0.00	0.00	0.00	0.00	0.00	0.45	124
70-020	12	Xerxes Av S @ 54th St	37.55	1.00	0.00	0.00	0.00	0.00	0.00	0.45	576
70-025	18	Washburn Av S @ N Bank of Creek	3.67	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-030	12	Washburn Av S	13.48	1.00	0.00	0.00	0.00	0.00	0.00	0.45	106
70-035	12	Vincent Av S @ W 54th St	4.53	1.00	0.00	0.00	0.00	0.00	0.00	0.45	57
70-040	12	W 54th St 50' W of Upton Av S	2.42	1.00	0.00	0.00	0.00	0.00	0.00	0.45	55
70-045	18	Upton Av S - N Bank of Creek	0.22	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-050	60	W 54th St 250' E of Upton Av S	17.41	1.00	0.00	0.00	0.00	0.00	0.00	0.45	216
70-055	12	Forest Dale Rd 250' E of Upton Av S	333.43	0.87	0.09	0.00	0.02	0.02	0.00	0.46	3,186
70-060	12	Forest Dale Rd 750' E of Upton Av S	3.53	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-065	12	Forest Dale Rd @ Sheridan Av S (extended)	1.89	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-070	12	Queen Av S @ W 53rd St S	5.80	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-075	15	Penn Av S - S Bank of Creek	5.00	0.95	0.00	0.00	0.00	0.05	0.00	0.43	96
70-080	48	Morgan Av S 300' N of 53rd St	11.96	0.94	0.03	0.00	0.00	0.03	0.00	0.44	2,796
70-085	15	W 52nd St - W Bank of Creek	229.48	0.94	0.03	0.00	0.00	0.03	0.00	0.44	2,702
70-090	15	W 52nd St -E Bank of Creek	18.57	1.00	0.00	0.00	0.00	0.00	0.00	0.45	271
70-095	12	300' SE of Newton Av S @ W 51st St	9.99	1.00	0.00	0.00	0.00	0.00	0.00	0.45	129

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
70-100	12	Morgan Av S '500' N of W 52nd St	9.64	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-105	21	Morgan Av S @ 51st St	1.63	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-110	12	Logan Av S at W M' haha Pkwy (South bank)	18.13	1.00	0.00	0.00	0.00	0.00	0.00	0.45	217
70-115	21	Logan Av S at W M' haha Pkwy (north bank)	3.71	1.00	0.00	0.00	0.00	0.00	0.00	0.45	40
70-120	12	Knox Av S @ W M' haha Pkwy (south)	4.22	1.00	0.00	0.00	0.00	0.00	0.00	0.45	61
70-125	36	James Av S @ N Bank of Creek	5.23	1.00	0.00	0.00	0.00	0.00	0.00	0.45	66
70-130	12	Irving Av S @ W 51st St	34.29	0.70	0.23	0.00	0.07	0.00	0.00	0.50	218
70-135	12	Humboldt Av S @ N Bank of Creek	7.46	1.00	0.00	0.00	0.00	0.00	0.00	0.45	115
70-140	20	W 50th St @ W M' haha Pkwy	0.78	0.00	0.00	0.00	1.00	0.00	0.00	0.60	0
70-145	30	W 49th St @ Humboldt Av S (vacated)	9.19	0.00	0.60	0.00	0.40	0.00	0.00	0.60	0
70-150	15	Humboldt Av S '50' N of W 49th St	4.51	1.00	0.00	0.00	0.00	0.00	0.00	0.45	77
70-155	12	Harriet Pkwy @ Irving Av S	2.05	1.00	0.00	0.00	0.00	0.00	0.00	0.45	66
70-160	15	W 48th St @ Humboldt Av S	2.95	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-165	15	W 49th St @ W M'haha Pkwy	27.77	1.00	0.00	0.00	0.00	0.00	0.00	0.45	286
70-170	18	W 50th St @ W M' haha (east bank)	23.74	1.00	0.00	0.00	0.00	0.00	0.00	0.45	179
70-175	12	W M 'haha Pkwy 400' S of W 50th St	30.89	0.95	0.02	0.00	0.03	0.00	0.00	0.46	420
70-180	12	W 51st St @ Humboldt Av S	1.14	1.00	0.00	0.00	0.00	0.00	0.00	0.45	17
70-185	18	Humboldt Av S @ W M ' haha Pkwy (west bank)	1.53	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-190	21	Fremont Av S @ W M' haha Pkwy (east bank)	15.04	0.21	0.00	0.00	0.00	0.79	0.00	0.17	171
70-195	24	Girard Av S @ W M' haha Pkwy	46.02	0.96	0.04	0.00	0.00	0.00	0.00	0.46	554
70-200	12	W M 'haha Pkwy 250' W of Emerson Av S (east bank)	31.52	1.00	0.00	0.00	0.00	0.00	0.00	0.45	342
70-205	12	W M 'haha Pkwy @ Fremont Av S (extended)	1.39	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-210	12	Emerson Av S @ W M' haha	3.58	1.00	0.00	0.00	0.00	0.00	0.00	0.45	111
70-215	12	Dupont Av S @ W M' haha Pkwy (south bank)	5.93	1.00	0.00	0.00	0.00	0.00	0.00	0.45	60
70-220	12	Dupont Av S @ W M' haha Pkwy (northbank)	4.54	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-225	12	Colfax Av S @ W M 'haha Pkwy (north bank)	4.99	1.00	0.00	0.00	0.00	0.00	0.00	0.45	65
70-230	12	Bryant Av S @ W M' haha Pkwy (north bank)	4.72	1.00	0.00	0.00	0.00	0.00	0.00	0.45	66
70-235	30	Bryant Av S @ W M' haha Pkwy (south bank)	5.04	1.00	0.00	0.00	0.00	0.00	0.00	0.45	68
70-240	12	Aldrich Av S @ W M"haha Pkwy (north bank)	4.52	1.00	0.00	0.00	0.00	0.00	0.00	0.45	93
70-245	27	Lyndale Av S @ W M ' haha Pkwy (south bank)	9.98	0.95	0.00	0.00	0.00	0.05	0.00	0.43	187
70-250	24	Harriet Av S @ W M' haha Pkwy (north bank)	41.27	0.78	0.20	0.02	0.00	0.00	0.00	0.48	398
70-255	30	Gladstone Av S (ext) @ W M haha Pkwy (north bank)	45.37	1.00	0.00	0.00	0.00	0.00	0.00	0.45	388
70-260	48	Pleasant Av S @ W M'haha Pkwy (south bank)	24.90	0.94	0.00	0.06	0.00	0.00	0.00	0.46	341
70-270	24	W M 'haha Pkwy 250' W of Nicollet Ave S (east bank)	4.66	1.00	0.00	0.00	0.00	0.00	0.00	0.45	119
70-275	21	W M' haha Pkwy 300' S of Valley View (north bank)	4.28	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-280	18	Nicollet Ave S at M ' haha Pkwy (north bank)	9.39	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-285	12	E M' haha Pkwy 300' E of Nicollet Ave S (n bank)	19.03	1.00	0.00	0.00	0.00	0.00	0.00	0.45	60
70-290	15	E M ' haha Pkwy 50' W of Stevens Av S (south bank)	2.37	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-295	12	E M ' haha Pkwy 50' W of Stevens Av S (south bank)	7.18	1.00	0.00	0.00	0.00	0.00	0.00	0.45	90
70-300	12	E M ' haha Pkwy at Luverne Av S (north bank)	0.40	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
70-305	12	E M ' haha Pkwy at 3rd Av S (north bank)	12.68	0.99	0.00	0.00	0.00	0.01	0.00	0.45	118
70-310	21	E M ' haha Pkwy at 200' W of Tarrymore Av S (S bank)	5.36	0.82	0.00	0.00	0.00	0.18	0.00	0.39	0
70-315	36	E M ' haha Pkwy at E 50th St (north Bank)	5.79	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-320	9	E M ' haha Pkwy at 5th Av S (north bank)	2.32	0.82	0.00	0.00	0.00	0.18	0.00	0.39	394
70-325	54	E M ' haha Pkwy at 5th Av S (north bank)	2.35	1.00	0.00	0.00	0.00	0.00	0.00	0.45	394

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
70-330	18	E M ' haha Pkwy at 100' W of Portland Av S (s bank)	279.41	0.83	0.03	0.00	0.14	0.00	0.00	0.48	3,211
70-335	12	E M ' haha Pkwy at Portland Av S (s bank)	1.99	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-340	12	E M ' haha Pkwy at Oakland Av S (s bank)	21.97	0.12	0.12	0.40	0.00	0.25	0.11	0.39	204
70-345	60	E M ' haha Pkwy at Oakland Av S (n bank)	3.81	1.00	0.00	0.00	0.00	0.00	0.00	0.45	60
70-350	12	E M ' haha Pkwy at Park Av S (s bank)	314.40	0.70	0.25	0.01	0.04	0.00	0.00	0.50	4,075
70-355	42	E M ' haha Pkwy at Park Av S (s bank)	1.29	1.00	0.00	0.00	0.00	0.00	0.00	0.45	18
70-360	12	E M ' haha Pkwy at Columbus Av S (s bank)	131.96	0.96	0.02	0.01	0.01	0.00	0.00	0.46	1,253
70-365	21	E M ' haha Pkwy at Chicago Av S (n bank)	6.70	1.00	0.00	0.00	0.00	0.00	0.00	0.45	116
70-370	12	E M ' haha Pkwy at Chicago Av S (s bank)	3.75	0.96	0.00	0.00	0.00	0.04	0.00	0.44	33
70-375	15	E M' haha Pkwy at 11th Av S (s bank)	7.10	0.85	0.15	0.00	0.00	0.00	0.00	0.47	64
70-380	127	E M ' haha Pkwy 150 ' W of 11th Av S (n bank)	14.40	1.00	0.00	0.00	0.00	0.00	0.00	0.45	222
70-385	24	E M' haha Pkwy at 12th Av S (s bank)	14.97	1.00	0.00	0.00	0.00	0.00	0.00	0.45	243
70-390	30	E M' haha Pkwy at 12th Av S (n bank)	58.11	0.90	0.00	0.00	0.10	0.00	0.00	0.47	770
70-395	12	E 50th St at 13th Av S (s bank)	57.19	0.94	0.00	0.00	0.00	0.06	0.00	0.43	713
70-400	15	E 50th St at Bloomington Av S (south bank)	9.67	0.95	0.00	0.00	0.00	0.05	0.00	0.43	119
70-405	12	E 49th St at 16th Av S (south bank)	7.16	0.40	0.00	0.00	0.00	0.60	0.00	0.24	0
70-410	36x96	E M' haha Pkwy at 16th Av S (north bank)	5.80	0.90	0.00	0.00	0.00	0.10	0.00	0.42	67
70-415	15	E M' haha Pkwy at 18th Av S (south bank)	120.75	0.96	0.02	0.00	0.02	0.00	0.00	0.46	947
70-420	30	E M' haha Pkwy at Cedar Av S (north bank)	16.99	1.00	0.00	0.00	0.00	0.00	0.00	0.45	164
70-425	15	E M' haha Pkwy 1/2 mi. E of Longfellow Av (w bank)	20.63	0.59	0.34	0.07	0.00	0.00	0.00	0.51	163
70-430	18	E M' haha Pkwy 1/2 mi. E of Longfellow Av (e bank)	6.19	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
70-435	42	47th St E (extended) 1/2 mi. E Longfellow Av	9.16	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
70-440	12	28th Av S @ W 47th St (s bank)	34.48	0.68	0.06	0.06	0.20	0.00	0.00	0.50	236
70-445	12	28th Av S 500' S of 46th St E (n band)	5.60	1.00	0.00	0.00	0.00	0.00	0.00	0.45	65
70-450	12	29th Av S 500' N E M' haha Pkwy (s band)	2.65	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-455	12	29th Av S 500' S of 46th St E (n bank)	2.66	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-460	15	'30th Av S 500' N of E M ' haha Pkwy (s band)	2.67	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-465	15	30th Av S 500' S of E 46th St (n bank)	2.58	1.00	0.00	0.00	0.00	0.00	0.00	0.45	92
70-470	60	Nokomis Av 200' S of 46th St (n bank)	8.55	0.81	0.00	0.00	0.00	0.19	0.00	0.38	164
70-475	12	31st Av S @ E 46th St (n bank)	229.14	0.85	0.02	0.00	0.10	0.03	0.00	0.46	2,806
70-480	24	E 31st St 600' N of 47th St (s bank)	0.68	0.00	0.00	0.00	1.00	0.00	0.00	0.60	0
70-485	48	31st Av @ E 46th St (s bank)	13.36	1.00	0.00	0.00	0.00	0.00	0.00	0.45	140
70-490	15	32nd Av S @ E 46th St	48.75	0.85	0.00	0.00	0.15	0.00	0.00	0.47	466
70-495	12	32nd Av S 250' N of E M' haha Pkwy (s bank)	7.74	1.00	0.00	0.00	0.00	0.00	0.00	0.45	66
70-500	15	E 47th St 200' W of 32nd Av S	0.56	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-505	27	32nd Av S 300' N of E M' haha Pkwy (s bank)	8.12	0.89	0.00	0.00	0.00	0.11	0.00	0.41	110
70-510	30	33rd Av S '250' NE of E M' haha Pkwy (s bank)	41.82	0.99	0.01	0.00	0.00	0.00	0.00	0.45	360
70-515	18	34th Av S '150 N of E M' haha Pkwy (s bank)	62.73	0.86	0.14	0.00	0.00	0.00	0.00	0.47	778
70-520	15	35th Av S @ E M' haha Pkwy (s bank)	6.05	1.00	0.00	0.00	0.00	0.00	0.00	0.45	74
70-525	12	35th Av S @ e 47th St	6.23	1.00	0.00	0.00	0.00	0.00	0.00	0.45	110
70-530	24	35th Av S 100' S of Crosby Av S	1.67	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-535	12	35th Av S @ E 47th St (s bank)	30.24	0.75	0.05	0.00	0.00	0.20	0.00	0.39	370
70-540	12	36th Av S @ Crosby Av (n bank)	5.10	0.32	0.00	0.00	0.00	0.68	0.00	0.21	63
70-545	12	37th Av S 100' N of E 47th St (s bank)	1.89	1.00	0.00	0.00	0.00	0.00	0.00	0.45	55
70-550	12	37th Av S Crosby Av S	1.77	1.00	0.00	0.00	0.00	0.00	0.00	0.45	55

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
70-555	12	E 47th St @ 38th Av S (s bank)	1.73	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-560	12	E M' haha Pkwy @ 39th Av S (s bank)	3.33	1.00	0.00	0.00	0.00	0.00	0.00	0.45	39
70-565	12	39th Av S 250' N of E 49th St (s bank)	16.63	0.40	0.00	0.00	0.00	0.60	0.00	0.24	143
70-570	24	E 49th St @ 30th Av S	1.23	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
70-575	48	Godfrey Rd @ 46th Av S (extended)	15.39	1.00	0.00	0.00	0.00	0.00	0.00	0.45	175
70-580	12	Portland Av S 250' S of Diamond Lake Rd	119.93	0.73	0.10	0.05	0.00	0.12	0.00	0.43	1,025
71-010	18	E 55th St @ Portland Av S	1.12	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
71-020	24	E 56th St @ Park Av S	14.05	1.00	0.00	0.00	0.00	0.00	0.00	0.45	115
71-030	12	E 57th St @ Portland Av S	28.58	0.98	0.02	0.00	0.00	0.00	0.00	0.45	328
71-040	36	E 58th St @ Portland Av S	20.93	0.34	0.00	0.00	0.00	0.66	0.00	0.22	131
71-050	12	Diamond Lake Lane @ E 59th St	120.42	0.95	0.05	0.00	0.00	0.00	0.00	0.46	1,218
71-060	66	W 58th St @ Clinton Av S	3.11	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
71-070	54	E Diamond Lake Road @ Clinton Av S	386.69	0.60	0.15	0.15	0.05	0.05	0.00	0.49	3,657
71-080	12	Hampshire Drive @ E Diamond Lake Rd	101.79	0.85	0.10	0.05	0.00	0.00	0.00	0.47	938
71-090	12	Diamond Lake Rd 250' E of Hampshire Drive	6.50	0.99	0.00	0.00	0.00	0.01	0.00	0.45	69
71-100	21	Nokomis Pkwy at Parking Lot on North Shore	1.99	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-010	18	E Nokomis Pkwy approx. 100' N of 50th St	17.32	0.00	0.00	0.00	0.15	0.85	0.00	0.18	0
72-020	21	E Nokomis Pkwy approx 200 N of 52nd St E	24.70	0.77	0.05	0.00	0.00	0.18	0.00	0.39	205
72-030	36	E Nokomis Pkwy @ E 53rd St	5.25	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-040	18	E Nokomis Pkwy @ 54th St (extended)	166.54	0.80	0.04	0.00	0.03	0.13	0.00	0.42	1,911
72-050	36	E Nokomis Pkwy E 56th St	5.16	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-060	12	Cedar Av S 500' N of Nokomis Pkwy	113.04	0.69	0.00	0.00	0.04	0.27	0.00	0.36	947
72-070	12	W Nokomis Pkwy 500' W of Cedar Av S	2.21	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-080	73x115	Edgewater Blvd at Nokomis Lane	4.74	0.00	1.00	0.00	0.00	0.00	0.00	0.60	0
72-090	42	Edgewater Blvd 50' W of Nokomis Lane	68.71	0.92	0.00	0.00	0.05	0.03	0.00	0.45	717
72-100	12	Nokomis Pkwy 600' W of Cedar Av S	68.32	0.91	0.09	0.00	0.00	0.00	0.00	0.46	760
72-110	27	E Nokomis Pkwy at 54th St	3.22	1.00	0.00	0.00	0.00	0.00	0.00	0.45	610
72-120	30	Cedar Av S at E 52nd St	62.98	1.00	0.00	0.00	0.00	0.00	0.00	0.45	589
72-130	12	E Nokomis Pkwy at Parking Lot on NW Shore	58.06	0.96	0.04	0.00	0.00	0.00	0.00	0.46	706
72-140	24	Nokomis Pkwy at Parking Lot on N Shore	10.19	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-150	12	W Nokomis Pkwy 500' S of Minnehaha Creek	4.76	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
72-160	48	E 61st St @ Bloomington Av S	4.55	0.95	0.00	0.00	0.00	0.05	0.00	0.43	675
73-010	42	E 61st St @ Bloomington Av S	20.76	0.98	0.00	0.00	0.00	0.02	0.00	0.44	92
73-020	12	North Shore of Taft Lake	57.47	0.97	0.00	0.00	0.00	0.03	0.00	0.44	583
73-030	12	Hwy 62 at NW Shore of Mother Lake	21.56	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
74-010	18	59th St E at 26th Ave S	44.39	0.81	0.19	0.00	0.00	0.00	0.00	0.48	111
74-020	12	Highway 62 @ SW shore of Wetland	4.41	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
75-005	12	Highway 62 frontage Rd @ 15th Av S	12.39	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
75-010	12	E 60th St 50' W of 15th Av S	3.65	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
75-020	15	14th Av S @ E 59th St	1.53	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
75-030	15	E 59th St @ 12th Av S	8.38	1.00	0.00	0.00	0.00	0.00	0.00	0.45	35
75-040	60x69	E 43rd St @ 23rd Av S (extended)	14.74	1.00	0.00	0.00	0.00	0.00	0.00	0.45	309
76-010	42	27th Av S @ E44th St	907.31	0.86	0.07	0.02	0.03	0.02	0.00	0.46	13,563
76-020	15	E 44th St @ 27th Av S	88.62	0.96	0.04	0.00	0.00	0.00	0.00	0.46	1,074
76-030	15	E 45th St @ 28th Av S	7.55	1.00	0.00	0.00	0.00	0.00	0.00	0.45	70

STORM DRAINAGE AREAS CHARACTERIZATION

Outfall	Pipe Size(in)	Location of Outfall	Total(Ac)	Res	Comm	Ind	Public	Open	Rail	Runoff	Pop
76-040	15	E 46th St @ 28th Av S	4.67	0.25	0.00	0.00	0.00	0.75	0.00	0.19	0
81-010	18	Wirth Pkwy @ S side of Birch Pond	31.17	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
82-010	36	Powderhorn Terrace @ 12th Av S	23.53	0.72	0.22	0.06	0.00	0.00	0.00	0.49	457
82-020	36	15th Av S 300' S of E 34th St	73.45	0.94	0.03	0.01	0.02	0.00	0.00	0.46	1,285
82-030	30	E 35th St @ 13th Av S	90.04	0.91	0.04	0.01	0.02	0.02	0.00	0.45	1,998
82-040	36	10th Av S 200' S of E 33rd St	98.49	0.85	0.03	0.02	0.08	0.02	0.00	0.46	1,881
83-010		W 61st St @ Grass Lake Terrace	6.59	1.00	0.00	0.00	0.00	0.00	0.00	0.45	39
83-015	24	S Shore of Grass Lake @ Grass Lake Terrace	0.99	1.00	0.00	0.00	0.00	0.00	0.00	0.45	0
83-020	48	Road btwn W 61st St & Grass Lake Terrace	85.96	0.96	0.00	0.00	0.00	0.04	0.00	0.44	241
83-025	36	Road btwn W 61st St & Grass Lake Terrace	51.23	1.00	0.00	0.00	0.00	0.00	0.00	0.45	474
83-030	24	W Grass Lake Terr. @ SW corner of Grass Lake	0.82	0.00	0.00	1.00	0.00	0.00	0.00	0.60	0
83-040	32	W Grass Lake Terr. @ W shore of Grass Lake	1.08	0.00	0.00	0.00	0.00	1.00	0.00	0.10	0
83-050	24	W 59th St (extended) @ Grass Lake Terrace	40.40	0.99	0.00	0.01	0.00	0.00	0.00	0.45	295
83-060	15	Girard Av S 250' S Grass Lake Terrace	10.05	1.00	0.00	0.00	0.00	0.00	0.00	0.45	149
83-070	24	Girard Av S @ W 60th St	1.19	0.82	0.08	0.00	0.10	0.00	0.00	0.48	1,426
83-080	60	Girard Av S 250' N of Dupont Av S	178.63	0.82	0.08	0.00	0.10	0.00	0.00	0.48	1,426
83-090	15	Dupont Av S @ Girard Av S	9.16	0.85	0.00	0.00	0.00	0.15	0.00	0.40	78
84-010	12	Hwy 62 between 28th and 34th Ave S	16.93	0.86	0.00	0.14	0.00	0.00	0.00	0.47	0
85-010	12	Ewing Ave S & W 22nd St.	21.56	0.86	0.00	0.14	0.00	0.00	0.00	0.47	0

Appendix A-3: Sources of Pollutants in Stormwater Runoff[1]

	Coal Plants / Incinerators	Gasoline / Diesel Fuel Combustion	Metal Corrosion / Metal Protection	Road Salts	Deterioration of Brake Pads / Tires	Asphalt	Fertilizers / Pesticides / Soil Treatments	Wood Preservatives	Paints and Stains	Plastics	Soil Erosion	Sanitary Waste	Manufacturing	Animal Waste	Atmospheric Deposition	Grass Clippings, Leaves and other Plant Materials	Coal Tar Based Sealants for Parking Lots, Driveways
METALS																	
Copper [a, b]	X		X		X		X	X	X	X		X	X	X			
Lead [a]		X	X	X	X		X		X	X			X		X		
Zinc [a]			X	X	X		X		X	X			X	X			
OTHER POLLUTANTS																	
Arsenic [b]	X						X	X			X		X	X	X		
Bacteria: E. Coli [a]											X	X		X			
Cyanide		X	X	X					X	X		X					
Chloride, Total [a]	X	X		X						X		X		X			
Oil and Grease [a]		X			X	X							X				
Polycyclic Aromatic Hydrocarbons (PAH) [b]	X	X				X	X					X	X				X
Sulfate [a]	X	X				X			X	X		X		X	X		X
Volatile Organic Compounds (VOC)	X	X		X		X	X		X	X		X	X	X	X		
SEDIMENT AND OTHER SOLIDS																	
Total Dissolved Solids (TDS) [a]	X			X		X	X					X		X	X	X	
Total Suspended Solids (TSS) [a]	X		X	X	X	X	X			X	X	X	X	X	X	X	
NUTRIENTS																	
Nitrate / Nitrite [a]		X					X				X	X	X	X	X	X	
Nitrogen, Ammonia Un-Ionized [a]	X	X	X				X					X		X	X	X	
Nitrogen, Total Kjeldahl (TKN) [a]							X				X	X		X	X	X	
Phosphorus, Total [a]	X	X			X	X	X				X	X	X	X	X	X	
Phosphorus, Total Dissolved [a]	X	X					X				X	X		X	X	X	
LABORATORY ANALYSIS PARAMETERS																	
Biochemical Oxygen Demand (BOD_5) [a]							X				X	X		X	X	X	
pH [a]	X		X	X													

[a] MS4 Monitored Parameter
[b] Stormwater Pond Dredging Parameter

[1] Sources:

Massachusetts Department of Environmental Protection, Source Water Assessment Program, DRAFT Land Use/Associated Contaminants Matrix, 1999

Mississippi Watershed Management Organization, 2006 Annual Report, Appendix C, Table 4

MPCA, Managing Dredged Materials in the State of Minnesota, Figure 2, 2009

Texas Commission on Environmental Quality (TCEQ) Source Water Assessment and Protection (SWAP) Program's List of Potential Source of Contamination Types and Subtypes Detailed Listing, Descriptions, and Applied Contaminants, 2009

24. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MONITORING

BACKGROUND

The Minneapolis Park and Recreation Board (MPRB) and Minneapolis Public Works (MPW) Department are co-signatories on the National Pollutant Discharge Elimination System (NPDES) stormwater permit. The MPRB has historically performed stormwater monitoring. The purpose of the stormwater monitoring is to characterize the impacts of stormwater discharges to receiving waters. In 2010 four different Minneapolis land use sites (residential, commercial/industrial, mixed use, and parkland) were monitored for stormwater runoff quantity and quality. These watersheds represent the major land uses in Minneapolis. The representative sampling is mathematically extrapolated to calculate contaminant loading on a citywide scale.

At the begining of the NPDES permit (2001-2004) the MPRB and MPW partnered with the City of St. Paul to fulfill the NPDES monitoring requirements. Five (Minneapolis and St. Paul) sites were monitored between 2001–2004. In 2005 four new sites, only in Minneapolis, were selected for monitoring. In 2006 new sites were again chosen in Minneapolis to comply with the original NPDES permit and to assist MPW with their modeling and load allocation efforts.

METHODS

The summary below includes descriptions of equipment installation at each site, parameters monitored, field quality assurance sampling, data handling, validation, and reporting.

Site Installation

The equipment installed at each site included an ISCO 3700 sampler, a low profile area/velocity pressure transducer, and ISCO 4150 datalogger. The dataloggers were flow-paced and adjusted throughout the year to collect samples over the entire hydrograph.

Sites 6 (22nd/Aldrich) and 9 (61st/Lyndale) were installed on 4/14/10. Site 7 (14th/Park) was installed 4/22/10 and 8a (Pershing Park) was installed on 4/16/10. Equipment installation began when freezing spring temperatures were no longer a concern to prevent transducer damage. See **Table 24-1** for site characteristics. See **Figure 24-1** for a map of site locations.

Monitored Parameters

In 2010 storm event samples were collected from May through November. One snowmelt grab sample was collected in 2010 from each site. Snowmelt was collected at Sites 6, 7, and 9 on 2/18/10 and at site 8a on 3/10/10. The target frequency for storm event sample collection was once a month. If a sample was missed one month due to lack of precipitation events, then two were taken the next month. Total volume sampled for each site and total recorded volumes in 2010 are given in **Table 24-2** along with the seasonal aggregate percentage sampled. Detailed information on sampling events is shown in **Table 24-3**.

Table 24-4 shows the parameters tested as part of the NPDES permit for each sample collected. **Table**

24-5 gives the approved method used for analysis, reporting limit, and holding time for each parameter as reported by the contract laboratory Instrumental Research, Inc. (IRI). Legend Technical Services Laboratory analyzed all metals samples.

Grab samples were taken quarterly during the season from all sites except at site 8a which was inaccessible for grab sampling following snowmelt. E. coli and pH samples were collected from grab samples (spring, summer, and fall). All required sampling was successfully accomplished and checked in 2010. The pH was measured in the field using an Oakton Waterproof pHTestr 2™ or at the laboratory IRI. The pH meter was calibrated each sampling trip.

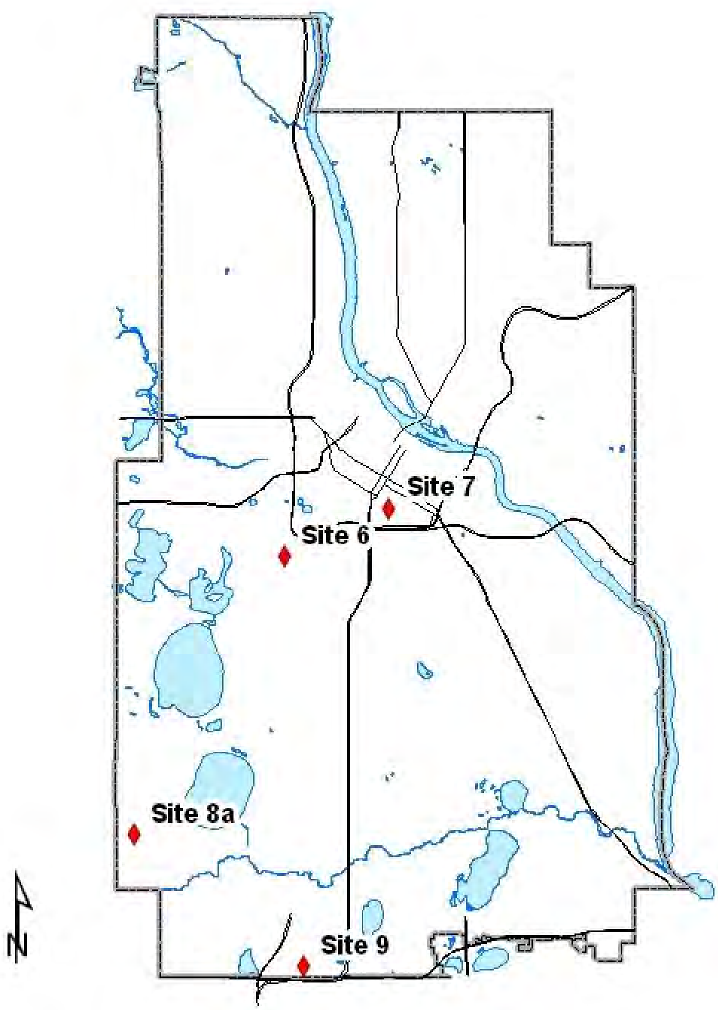

Figure 24-1. Map of the 2010 NPDES sites located in Minneapolis.

Table 24-1. 2010 NPDES stormwater monitoring sites for Minneapolis.

Site ID	Site 6	Site 7	Site 8a	Site 9
Location	22nd St & Aldrich Ave S	E 14th St & Park Ave S	Pershing Field east of 49th St & Chowen Ave	335 ft east of 61st St & Harriet Ave S
Land Use	Multi–Family Residential	Commercial/Industrial/ High Rise Residential	Recreational/Parkland	Commercial/Industrial
Area (acres)	8.9	13.1	2.5	34.9
Pipe Diameter (inches)	18	42	12	36
Outfall ID#	10 – 430J	10 – 430D	57 – 100A/B	71 – 070

Table 24-2. NPDES site volume totals for the sampling period 4/15/10 – 10/25/10.

	Site 6	Site 7	Site 8a	Site 9
Total volume of sampled events (cf)	35,345	275,355	11,924	351,359
Total volume recorded for 2010 (cf)	161,032	686,841	46,527	1,050,350
% sampled ANNUAL	22%	40%	26%	33%
% sampled SPRING (April- June)	7%	7%	3%	15%
% sampled SUMMER (July- September)	13%	30%	17%	8%
% sampled FALL (October- November)	3%	3%	5%	11%

Table 24-3. 2010 precipitation event data and samples collected for NDPES sites. A precipitation event is defined as being greater than 0.10 inches and separated by 8 hours. The rain gage is located at 3800 Bryant Ave. S., Minneapolis, MN.

Event	Start Date/Time	End Date/Time	Precip (inches)	Duration (hours)	Intensity (in/hr)	Sample Type	2010 NPDES Events Collected			
							Site 6 22nd/Aldrich	Site 7 14th/Park	Site 8a Pershing	Site 9 61st/Lyndale
+1	2/18/2010	n/a	n/a	n/a	n/a	grab	X(w/Ecoli)	X(w/Ecoli)		X(w/Ecoli)
+2	3/18/2010	n/a	n/a	n/a	n/a	grab			X(w/Ecoli)	
3	4/15/2010 200	4/15/2010 545	0.47	3.75	0.125	composite	X			X
4	4/24/2010 715	4/24/2010 1200	0.43	4.75	0.091	composite		X(lmtd)	X(lmtd)	
5	5/5/2010 1645	5/8/2010 245	0.67	58.00	0.012	composite	X(lmtd)	X		X(lmtd)
6	5/10/2010 545	5/11/2010 1830	0.63	38.75	0.016	composite	X	X	X	
7	5/25/2010 2000	5/25/2010 2130	0.28	1.50	0.187	composite	X	X	X	X
8	6/1/2010 1515	6/2/2010 630	0.16	16.25	0.010	composite	X	X		X
9	6/3/2010 2245	6/4/2010 345	0.35	5.00	0.070	composite			X	
10	6/7/2010 2345	6/8/2010 1600	0.81	16.25	0.050	grab	X(Ecoli only)	X(Ecoli only)		X(Ecoli only)
11	7/7/2010 1530	7/7/2010 1715	0.28	1.75	0.160	composite	X		X(lmtd)	X
12	7/17/2010 1645	7/17/2010 2130	0.68	4.75	0.143	composite			X(lmtd)	
13	8/8/2010 115	8/8/2010 300	0.12	2.75	0.044	composite	X(lmtd)	X(lmtd)	X(lmtd)	X(lmtd)
14	8/10/2010 1000	8/10/2010 2330	2.52	13.50	0.187	composite	X	X(lmtd)	X	X
15	8/12/2010 2030	8/13/2010 515	1.15	8.75	0.131	composite	X	X		
16	9/15/2010 515	9/16/2010 0000	0.81	18.75	0.043	grab/composite	X(w/Ecoli)	X(Ecoli only)	X	X(Ecoli only)
17	9/22/2010 1600	9/23/2010 2000	2.32	28.00	0.083	composite				X
18	10/24/2010 145	10/24/2010 315	0.47	1.50	0.313	composite	X(lmtd)	X	X(lmtd)	X(lmtd)
19	10/25/2010 1615	10/26/2010 1615	1.01	24.00	0.042	composite	X	X	X	X
		Totals	**10.52**				**8**	**7**	**6**	**7**

+snowmelt event

n/a = not applicable

X(lmtd) = event sampled with limited parameters generally due to holding times

X(w/Ecoli) = event sampled with fecal coliform

X(Ecoli only) = only fecal coliform sampled

Table 24-4. The list of monitored chemical parameters for the NPDES permit. BOD is biochemical oxygen demand.

Parameter	Abbreviation	Units	Sample Type
BOD –carbonaceous, 5 Day	cBOD	mg/L	Composite
Chloride, Total	Cl	mg/L	Composite
Specific Conductivity	Sp. Cond	µmhos/cm	Composite
Escherichia coliform	E. coli	MPN/100mL	Grab (3X year)
Copper, Total	Cu	µg/L	Composite
Lead, Total	Pb	µg/L	Composite
Zinc, Total	Zn	µg/L	Composite
Nitrite+Nitrate, Total as N	NO_2NO_3	mg/L	Composite
Ammonia, Un-ionized as N	NH_3	mg/L	Composite
Kjeldahl Nitrogen, Total	TKN	mg/L	Composite
pH	pH	standard unit	Grab (3X year)
Phosphorus, Total Dissolved	TDP	mg/L	Composite
Phosphorus, Total	TP	mg/L	Composite
Solids, Total Dissolved	TDS	mg/L	Composite
Solids, Total Suspended	TSS	mg/L	Composite
Solids, Volatile Suspended	VSS	mg/L	Composite

Table 24-5. Analysis method, reporting limit, and holding times for parameters used by Instrumental Research, Inc.

Parameter	Method	Reporting Limit	Holding Times
cBOD, carbonaceous, 5 Day (20°C)	SM 5210 B	1.0 mg/L	24 hours
Chloride, Total	SM 4500-Cl^- B	2.0 mg/L	28 days
Specific Conductivity	SM 2510 B	10 µmhos/cm	28 days
E. coli (*Escherichia Coliform*)	SM 9223B	1 MPN per 100mL	< 24hrs
Copper, Total	EPA 200.9	1.4 µg/L	6 months
Lead, Total	SM 3500-Pb B	3 µg/L	6 months
Zinc, Total	SM 3500-Zn B	2 µg/L	6 months
Nitrite+Nitrate, Total as N	SM 4500-NO_3 E	0.030 mg/L	28 days
Ammonia, Un-ionized as N	SM 4500-NH_3 F	0.500 mg/L	7 days
Kjeldahl Nitrogen, Total	SM 4500-Norg B	0.500 mg/L	7 days
Phosphorus, Total Dissolved	SM 4500-P A, B, G	0.010 mg/L	48 hours
Phosphorus, Total	SM 4500-P A, B, E	0.010 mg/L	48 hours
Solids, Total Dissolved	SM 2540 C	10.0 mg/L	7 days
Solids, Total Suspended	SM 2540 D	1.0 mg/L	7 days
Solids, Volatile Suspended	SM 2540 E	2.0 mg/L	7 days

When flow and time were sufficient E. coli grab samples were collected three times per year. Three sites were collected three times, One site (Pershing) was collected once for a total of ten E. coli grabs in 2010.

In 2010 limited parameters were collected fourteen times. These samples were recovered after more than 24 hours (and parameters with short holding times were not analyzed e.g. cBOD, TDP) or there was limited composite volume.

FIELD QUALITY ASSURANCE SAMPLES

Ten percent of samples were used as laboratory quality assurance samples (e.g. duplicates, spikes). Field blanks consisted of deionized water which accompanied samples from the sites to the analytical laboratory. One field blank was used for each sampling trip and was analyzed for all NPDES parameters. All field blank parameters from each trip were below the minimum detection limits (**Table 24-5**).

An equipment blank (~ 2 L sample) was collected at Heritage Park North Outlet 11/13/09. This site mirrors the set up and equipment as NPDES stormwater monitoring. To collect the equipment blank a large bottle of deionized water was placed at the strainer end of the sampler tubing. The intake line was filled and flushed with deionized water simulating the pre-sample flush. The flush water was back-pumped to waste and then a sample of deionized water was collected. The sample was of sufficient volume to allow analysis of all parameters. All analytes came back from the laboratory below the minimum detection limits.

As part of the overall QA/QC program, blind monthly performance samples were made for all monitored parameters and delivered to IRI (**Table 24-4**).

Manual transcription of data was minimized to reduce any errors. A minimum of 10% of the final data were checked by hand against the raw data sent by the laboratory to ensure there were no errors entering, manipulating, or transferring the data. See **Section 30**, Quality Assurance Assessment Report for details.

Field measurements were recorded on the Field Measurement Form in the Field Log Book and then entered into a computer database. Computerized data from the laboratory were forwarded to the MPRB in pre-formatted spreadsheets via email. Computerized data from the laboratory were checked and passed laboratory quality assurance procedures. Protocols for data validity followed those defined in the Storm Water Monitoring Program Manual (MPRB, 2001). For data reported below the reporting limit the reporting limit value was divided in half and then used for all statistical calculations.

A Chain of Custody (sample receipt) form accompanied each set of sample bottles delivered to the lab. Each sampler tray or container(s) were labeled indicating the date and time of collection, site location, and the field personnel initials. The time that each (composite) sample was collected was recorded from the ISCO sampler onto field sheets. The ultimate collection date and time assigned to the sample was when the last sample of the composite was collected. A complete description of methods can be found in the Storm Water Monitoring Program Manual (MPRB, 2001).

Statistics for event mean concentrations were calculated using Microsoft Excel. The computer model P8 v2.41 was calibrated and verified and used to estimate snowmelt runoff. The P8 snowmelt estimated runoff, ISCO Flowlink measured runoff and chemistry data were put into the computer program FLUX32 v2.95 and were used to calculate flow-weighted mean concentrations.

A description of P8 as described in the software's introduction:

> P8 is a model for predicting the generation and transport of stormwater runoff

pollutants in small urban catchments. Simulations are driven by hourly rainfall and daily air-temperature time series.

A description of FLUX32 as described in the help menu (US Army Corps, 2009):

> The theory and the file formats described in this original manual, as well as much of the software's operation and menu structure is still applicable to Flux.
>
> This version of FLUX for the Win32 environment is a major revision to the original DOS/FORTRAN program authored by William W. Walker Ph.D.
>
> Flux32 is interactive software designed for use in estimating the transport (load) of nutrients or other water quality constituents past a tributary sampling station over a given period of time. The basic approach of Flux32 is to use several calculation techniques to map the flow/concentration relationship developed (modeled) from the sample record onto the entire flow record. This provides an estimate of total mass transport for the whole period of study with associated error statistics. Note that this approach does NOT focus on estimating changes in loads over time (i.e. time series).
>
> An important option within Flux32 is the ability to stratify the data into groups based upon flow, date, and/or season. This is a key feature of the FLUX approach and one of its greatest strengths. In many (most) cases, stratifying the data increases the accuracy and precision of loading estimates.

RESULTS & DISCUSSION

The land uses monitored for the NPDES permit are as follows: Site 6 is residential, Site 7 mixed use, Site 8a parkland, and Site 9 industrial.

In 2010 three NPDES chemical data records were flagged for errors. The April copper (Cu), lead (Pb) and zinc (Zn) blind monthly performance standards failed to achieve proper recovery. The April Cu, Pb and Zn recovery was 128%, 134% and 137% respectively. The data were flagged as possibly suspect but were still used in calculations because the values were deemed reasonable. Further quality assurance protocols can be found in **Section 30**.

Event data concentrations are listed in **Table 24-6**. These data generally show peaks during snowmelt and early spring for many parameters, but at some sites there are examples of peaks occurring late summer. When looking at this raw data, it is interesting to note that site 6 (22nd & Aldrich) had a marked increase in Pb (lead) when compared to the other sites. This is a residential watershed and it is unknown where this Pb is originating. Pb levels in stormwater have historically been decreasing since it was removed from gasoline in the 1990's.

TDS and TSS generally tend to be high during winter and spring months with the exception of Site 8a. High TSS values in snowmelt and spring might be attributed to wash off of accumulated sand applied to icy roads. A small amount of sand can lead to very high TSS values. The VSS data show a significant portion of the TSS number is inert and likely sand (**Table 24-6**). Almost all maximum metal values followed the same trend as TSS. This is as expected since metals tend to stick to organic solids. It is interesting to note lead was below the detection limit for half of Site 8a events and continues to generally decrease in the environment.

Table 24-7 lists each sites statistical calculations for all measured parameters. Most of the geometric mean maximums occurred at two sites. Site 6 (22nd & Aldrich) had geometric mean maximums for TP, TDP, TKN, BOD and Pb. Site 9 (61st and Lyndale) had geometric mean maximums for NH3, TSS, VSS, TDS, E. coli, Cu, and Zn. It is unknown why site 6, which is a residential watershed, had a maximum phosphorus and BOD. It may be the vegetation and leaf canopy available in the watershed. Site 9 is an industrial site and one would expect it to be higher for many of the solids and metals parameters.

Most snowmelt samples were brown to dark brown and very turbid except Site 8a which was relatively clear. The snowmelt clarity of site 8a is most likely due to the filtering effect of the parkland turf as this site has mostly park overland flow runoff and has little or no street runoff.

High Cl concentrations are typical for during winter snowmelt and early spring stormwater. Road salt is used throughout the winter and subsequently washed off the streets and gutters during snowmelt and early spring rains. But Site 9 showed small amounts of chloride continuously washing off throughout the summer months. There are many commercial industries surrounding Site 9 which may be contributing to increased chloride levels during the summer months. Site 9 also has a small baseflow indicating that there is discharge or infiltration coming from an unknown source (**Table 24-7**).

E. coli values were lowest for the snowmelt event and peaked during summer. This result is expected since temperature plays a significant role in bacterial growth and survival. There currently is no standard for *E. coli* in stormwater.

Table 24-6. 2010 NDPES sampled event data by site.

Date	Time	Site ID & Location	Type	TP	TDP	TKN	NO_3NO_2	NH_3	Cl	Hardness	TSS	VSS	TDS	cBOD	E. coli	Cu	Pb	Zn
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	ug/L	ug/L	ug/L
2/18/2010	13:40	Site #6, 22nd & Aldrich	Grab	1.55	0.034	4.91	0.558	1.09	3607	130	604	256	5618	19	2	110	290	870
4/15/2010	6:16	Site #6, 22nd & Aldrich	Composite	0.461	0.092	2.41	0.407	0.840	<2.0	28	102	38	57	13		28	52	120
5/7/2010	15:30	Site #6, 22nd & Aldrich	Composite	0.475		2.73	0.074	0.549	<2.0	28	112	45	44			26	50	120
5/11/2010	10:26	Site #6, 22nd & Aldrich	Composite	0.209	0.023	1.32	0.399	0.528	<2.0	16	44	19	52	6		14	22	51
5/25/2010	22:17	Site #6, 22nd & Aldrich	Composite	0.751	0.080	4.17	<0.030	1.11	3.80	36	139	55	76	32		34	55	120
6/2/2010	6:55	Site #6, 22nd & Aldrich	Composite	1.10	0.330	7.24	<0.030	1.23	8.40	40	203	78	129	103		50	63	180
6/8/2010	10:30	Site #6, 22nd & Aldrich	Grab												4106			
7/7/2010	17:59	Site #6, 22nd & Aldrich	Composite	0.345	0.067	2.02	0.415	0.527	<2.0	30	124	38	48	6		22	57	100
8/8/2010	2:59	Site #6, 22nd & Aldrich	Composite	0.441		2.88	0.470	0.924	<2.0	32	109	42	56			27	48	120
8/10/2010	21:56	Site #6, 22nd & Aldrich	Composite	0.428	0.069	1.83	0.263	<0.500	<2.0	22	198	50	22	4		25	130	130
8/13/2010	5:15	Site #6, 22nd & Aldrich	Composite	0.138	0.057	0.761	0.237	<0.500	<2.0	13	36	12	28	2		14	21	41
9/15/2010	13:15	Site #6, 22nd & Aldrich	Grab												2143			
9/15/2010	23:41	Site #6, 22nd & Aldrich	Composite	0.191	0.050	1.25	0.342	<0.500	<2.0	18	40	17	34	4		13	20	60
10/24/2010	2:45	Site #6, 22nd & Aldrich	Composite	2.41	1.40													
10/26/2010	1:13	Site #6, 22nd & Aldrich	Composite	0.436	0.146	1.87	0.052	<0.500	4.70	30	44	31	54	25	4106	17	12	46
2/18/2010	14:00	Site #7, 14th & Park	Grab	0.530	0.023	2.25	0.368	<0.500	2102	98	160	71	3190	7	<1	43	30	260
4/24/2010	11:38	Site #7, 14th & Park	Composite	0.303		1.80	0.465	0.792	5.8	20	84	26	38			28	15	110
5/7/2010	9:04	Site #7, 14th & Park	Composite	0.723	0.101		0.798	0.633	19		137	45	103			70	26	600
5/7/2010	15:22	Site #7, 14th & Park	Composite	0.166		1.00	0.236	<0.500	3.9	16	38	14	33			22	8	74
5/11/2010	8:27	Site #7, 14th & Park	Composite	0.120	0.032	1.03	0.550	0.560	3.9	16	18	9	38	5		13	3	43
5/25/2010	22:07	Site #7, 14th & Park	Composite	0.410	0.069	2.42	0.482	0.785	6.6	28	97	38	58	10		37	16	120
6/2/2010	6:58	Site #7, 14th & Park	Composite	0.446	0.104	2.54	0.595	0.656	3.3	34	196	61	27	17		42	33	170
6/8/2010	10:40	Site #7, 14th & Park	Grab												6499			
8/8/2010	3:06	Site #7, 14th & Park	Composite	0.209		1.82	0.510	0.813	2.2	20	45	19	14			20	10	86
8/10/2010	11:11	Site #7, 14th & Park	Composite	0.176		1.25	0.423	0.552	5.6	24	45	19	45			24	8	87
8/10/2010	21:57	Site #7, 14th & Park	Composite	0.167	0.034	0.898	0.250	<0.500	<2.0	16	73	19	30	3		33	13	85
8/13/2010	4:27	Site #7, 14th & Park	Composite	0.041	0.030	0.606	0.254	<0.500	<2.0	18	27	10	24	3		14	6	30
9/15/2010	13:30	Site #7, 14th & Park	Grab												2119			
10/24/2010	3:27	Site #7, 14th & Park	Composite	0.589	0.238	2.60	0.272	0.884	9.0	32	65	38				29	11	110
10/26/2010	1:21	Site #7, 14th & Park	Composite	0.126	0.034	0.849	0.346	0.504	<2.0	20	17	9	15	4	4352	13	5	30
3/10/2010	11:45	Site #8a, Pershing	Grab	0.186	0.026	1.32	0.297	<0.500	5.5	26	31	11	34	12	6	<5	<3	<20
4/24/2010	8:02	Site #8a, Pershing	Composite	0.318		1.83	0.389	0.585	<2.0	24	70	26	19			12	5	100
5/13/2010	12:48	Site #8a, Pershing	Composite	0.110	0.024	0.801	0.201	<0.500	<2.0	20	38	12	20	3		8	4	21
5/25/2010	21:52	Site #8a, Pershing	Composite	0.725	0.345	3.23	0.141	1.56	<2.0	28	41	21	63	17		24	4	54
6/4/2010	3:52	Site #8a, Pershing	Composite	0.255	0.121	1.25	0.435	0.588	<2.0	16	27	13	36	9		16	<3	23
7/7/2010	17:26	Site #8a, Pershing	Composite	0.148	0.077		0.655		<2.0	20	16	5	23			12	<3	<20
7/17/2010	21:54	Site #8a, Pershing	Composite	0.311		1.13	0.422	0.588	<2.0	34	25	10	12			10	<3	30
8/8/2010	1:44	Site #8a, Pershing	Composite	0.454		2.53	0.394	0.652	11.4	30	168	55	62			33	15	140
8/10/2010	22:56	Site #8a, Pershing	Composite	0.297	0.116	1.51	0.244	<0.500	<2.0	22	84	24	27	3		12	8	49
9/15/2010	20:44	Site #8a, Pershing	Composite	0.121	0.051	0.868	0.298	<0.500	<2.0	13	22	8	16	3		7	<3	25
10/24/2010	3:24	Site #8a, Pershing	Composite	0.751		2.31	0.032	0.558	5.6	34	40	31	58			16	3	31
10/26/2010	1:18	Site #8a, Pershing	Composite	0.274	0.114	0.894	<0.030	<0.500	<2.0	38	11	8	34	12		9	<3	<20

Table 24-6. 2010 NDPES sampled event data by site. (Continued)

Date	Time	Site ID & Location	Type	TP	TDP	TKN	NO_3NO_2	NH_3	Cl	Hardness	TSS	VSS	TDS	cBOD	E. coli	Cu	Pb	Zn
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	ug/L	ug/L	ug/L
2/18/2010	13:15	Site #9, 61st & Lyndale	Grab	0.415	0.072	2.55	1.97	0.620	1878	168	179	57	3043	13	<1	32	12	110
4/15/2010	5:31	Site #9, 61st & Lyndale	Composite	0.512	0.045	2.05	0.481	0.626	30.2	44	262	50	100	6		39	23	190
5/7/2010	9:29	Site #9, 61st & Lyndale	Composite	0.504	0.067		0.752	0.824	56.2	72	123	38	215	14		43	14	140
5/26/2010	7:14	Site #9, 61st & Lyndale	Composite	0.485	0.052	1.66	0.618	0.514	17.1	50	206	43	88	8		29	13	120
6/2/2010	6:52	Site #9, 61st & Lyndale	Composite	0.364	0.044	2.39	0.995	0.944	21.7	52	189	39	125	11		37	13	130
6/8/2010	10:00	Site #9, 61st & Lyndale	Grab												15531			
7/7/2010	19:58	Site #9, 61st & Lyndale	Composite	0.289	0.022	1.49	0.820	0.700	9.2	50	194	34	70	3		31	14	120
8/8/2010	2:34	Site #9, 61st & Lyndale	Composite	0.558		2.04	0.258	0.572	16.7	60	325	56	111			39	19	230
8/10/2010	11:20	Site #9, 61st & Lyndale	Composite	0.574	0.163	1.75	0.412	<0.500	19.8	46	280	47	97	8		29	15	170
9/15/2010	12:50	Site #9, 61st & Lyndale	Grab												111990			
9/15/2010	23:51	Site #9, 61st & Lyndale	Composite	0.199						36						20	6	97
9/24/2010	1:25	Site #9, 61st & Lyndale	Composite	0.130	0.027	<0.500	0.142	<0.500	6.8	30	51	15	34	2		12	4	54
10/24/2010	10:14	Site #9, 61st & Lyndale	Composite	0.431		1.82	0.459	0.580	8.5	40	128	35	62			21	12	110
10/26/2010	8:53	Site #9, 61st & Lyndale	Composite	0.306	0.064	0.916	0.493	<0.500	11.4	36	50	19	64	6	4611	16	5	58

Note: Underlined data failed the blind monthly performance standard and was flagged.

Table 24-7. 2010 event concentration statistics.

Site ID	Statistical Function	TP	TDP	TKN	NO_3NO_2	NH_3	Cl	Hardness	TSS	VSS	TDS	cBOD	E. coli	Cu	Pb	Zn
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	ug/L	ug/L	ug/L
6	MEAN (geometric)	0.494	0.094	2.32	0.162	0.545	3	29	103	41	73	11	518	26	47	108
6	MEAN (arithmetic)	0.687	0.213	2.78	0.271	0.650	303	35	146	57	518	21	2589	32	68	163
6	MAX	2.41	1.40	7.24	0.558	1.23	3607	130	604	256	5618	103	4106	110	290	870
6	MIN	0.000	0.138	0.023	0.761	0.015	0	1	13	36	12	22	2	1	13	12
6	MEDIAN	0.441	0.069	2.22	0.303	0.539	1	29	111	40	53	10	3125	26	51	120
6	STDEV	0.650	0.403	1.84	0.191	0.373	1041	31	155	65	1606	30	1957	27	76	226
6	NUMBER	13	11	12	12	12	12	12	12	12	12	10	4	12	12	12
6	COV	0.945	1.89	0.662	0.706	0.574	3.44	0.877	1.06	1.15	3.10	1.42	0.756	0.845	1.12	1.39
7	MEAN (geometric)	0.238	0.055	1.42	0.399	0.526	6	24	59	23	48	6	416	26	11	97
7	MEAN (arithmetic)	0.308	0.074	1.59	0.427	0.577	167	29	77	29	301	7	3243	30	14	139
7	MAX	0.723	0.238	2.60	0.798	0.884	2102	98	196	71	3190	17	6499	70	33	600
7	MIN	0.138	0.023	0.761	0.015	0.250	1	13	36	12	22	2	2	13	12	41
7	MEDIAN	0.209	0.034	1.53	0.423	0.597	4	20	65	19	35	5	3236	28	11	87
7	STDEV	0.212	0.069	0.733	0.164	0.229	582	23	57	20	910	5	2805	16	10	152
7	NUMBER	13	9	12	13	12	13	12	13	13	12	7	4	13	13	13
7	COV	0.686	0.933	0.462	0.385	0.396	3.49	0.798	0.733	0.703	3.02	0.721	0.865	0.531	0.688	1.09
8a	MEAN (geometric)	0.275	0.078	1.45	0.205	0.437	1.63	24	36	15	29	7	6	11	3	29
8a	MEAN (arithmetic)	0.329	0.109	1.61	0.294	0.526	2.63	25	48	19	34	8	6	13	4	42
8a	MAX	0.751	0.345	3.23	0.655	1.56	11.4	38	168	54	63	17	6	33	15	140
8a	MIN	0.232	0.057	1.32	0.091	0.378	1.27	23	29	12	26	5	6	9	2	22
8a	MEDIAN	0.286	0.096	1.32	0.298	0.558	1.00	25	35	13	31	9	6	12	2	28
8a	STDEV	0.214	0.103	0.786	0.183	0.384	3.27	8	43	14	18	5		8	4	40
8a	NUMBER	12	8	11	12	11	12	12	12	12	12	7	1	12	12	12
8a	COV	0.651	0.944	0.489	0.622	0.732	1.25	0.302	0.910	0.742	0.540	0.653	0.000	0.610	1.01	0.954
9	MEAN (geometric)	0.367	0.053	1.47	0.544	0.507	25	51	156	37	120	7	1415	27	11	118
9	MEAN (arithmetic)	0.397	0.062	1.69	0.673	0.557	189	57	181	39	364	8	33033	29	12	127
9	MAX	0.574	0.163	2.55	1.97	0.944	1878	168	325	57	3043	14	111990	43	23	230
9	MIN	0.130	0.022	0.250	0.142	0.250	7	30	50	15	34	2	1	12	4	54
9	MEDIAN	0.423	0.052	1.79	0.493	0.580	17	48	189	39	97	8	10071	30	13	120
9	STDEV	0.142	0.042	0.684	0.495	0.231	560	37	88	14	890	4	53039	10	6	51
9	NUMBER	12	9	10	11	11	11	12	11	11	11	9	4	12	12	12
9	COV	0.358	0.674	0.405	0.736	0.415	2.97	0.645	0.489	0.344	2.44	0.540	1.61	0.341	0.451	0.398
All	MEAN (geometric)	0.331	0.069	1.64	0.289	0.504	5	31	75	26	58	8	468	21	11	78
All	MEAN (arithmetic)	0.433	0.120	1.93	0.411	0.579	165	37	111	36	303	12	11959	26	25	118
All	MAX	2.41	1.40	7.24	1.97	1.56	3607	168	604	256	5618	103	111990	110	290	870
All	MIN	0.041	0.022	0.250	0.015	0.250	1	13	11	5	12	2	1	3	2	10
All	MEDIAN	0.355	0.067	1.82	0.397	0.566	4	30	78	31	48	7	4106	24	13	100
All	STDEV	0.392	0.229	1.22	0.316	0.306	647	29	107	37	1009	18	30344	18	45	143
All	NUMBER	50	37	45	48	46	48	48	48	48	47	33	13	49	49	49
All	COV	0.904	1.91	0.631	0.770	0.529	3.93	0.789	0.962	1.04	3.33	1.49	2.54	0.685	1.84	1.21

All = all 4 sites, STDEV = standard deviation, COV = coefficient of variation.

Table 24-8 shows median residential values for MPRB 2010 sites sampled. In comparison they were similar or less than reported NURP values with the notable exception of TP and TKN values. Most MPRB land use category values collectively were similar to the Nationwide Urban Runoff Program (NURP) values and all metals were well below NURP values. The NURP studies were done in the 1980's when lead was widely used in gasoline (from the 1920's to 1990's) and banned after 1996. This lead (Pb) drop off is clearly seen in the data sets. Most 2010 parameters were comparable or lower to the data from 2001-2009. Exceptions in 2010 where the data were higher than previous years were the residential TSS and metals, and composite land use Cu and Zn. In 2010 all three land use categories saw a decrease in median TP, TKN and cBOD concentrations. It is important to note that the new sites monitored in 2005-2010 are located in different watersheds and have similar but not identical land uses to those monitored in 2001-2004.

Table 24-8 Typical Median stormwater sampled concentrations.

Land Use	Residential			Mixed			Composite of all categories		
Location	MPRB[1]	MPRB[2]	NURP	MPRB[3]	MPRB[4]	NURP	MPRB[5]	MPRB[6]	NURP
Year(s)	2010	2001–2009		2010	2001–2009		2010	2001–2009	
TP (mg/L)	0.411	0.452	0.383	0.209	0.284	0.263	0.355	0.375	0.33
TKN (mg/L)	2.22	2.47	1.9	1.53	1.62	1.288	1.82	2.15	1.5
NO_3NO_2 (mg/L)	0.303	0.356	0.736	0.423	0.414	0.558	0.397	0.409	0.68
cBOD (mg/L)	10	11	10	5	10	7.8	7	11	9
TSS (mg/L)	111	85	101	65	68	67	78	86	100
Cu (µg/L)	26	17	33	28	19	27	24	18	30
Pb (µg/L)	51	24	144	11	16	114	13	16	140
Zn (µg/L)	120	77	135	87	93	154	100	82	160

[1] Site 6 data.
[2] Sites 1 and 2 data, (Site 6, 2005-2009).
[3] Site 7 data.
[4] Sites 5 and 5a data, (Site 7, 2005-2009).
[5] Sites 6 – 9 data.
[6] Sites 1 – 5a data, (Site 6 – 9, 2005-2009).
NURP = median event mean concentrations as reported by the Nationwide Urban Runoff Program (USEPA, 1996).
MPRB = median values calculated by the MPRB for the identified year(s).

Sampled data were comparable to typical urban stormwater data from the Nationwide Urban Runoff Program (NURP), Center for Watershed Protection (CWP), and Bannerman **Table 24-9**. Most MPRB mean concentrations were comparable to other studies as listed in **Table 24-9** below. Data from MPRB Sites 1–5a (2001–2004) and 6–9 (2005–2010) were generally similar to Sites 6–9 in 2010. All measured parameters decreased or were roughly equal or lower in 2010. All mean parameter concentrations decreased in 2010.

Table 24-9. Typical MEAN urban stormwater concentrations. " -- " = not reported.

Parameter	NURP[1]	CWP[2]	Bannerman *et al.*[3]	Mpls PW[4]	St. Paul[5]	MPRB[6] 2001–2009	MPRB[7] 2010
TP (mg/L)	0.5	0.3	0.66	0.417	0.484	0.484	0.433
TDP (mg/L)	--	--	0.27	0.251	--	0.139	0.120
TKN (mg/L)	2.3	--	--	--	2.46	2.97	1.93
NO_3NO_2 (mg/L)	0.86	--	--	--	0.362	0.533	0.411
NH_3 (mg/L)	--	--	--	0.234	--	1.09	0.579
Cl (mg/L)	--	230 (winter)	--	--	--	296	165
BOD (mg/L)	12	--	--	14.9	25	16	12
TDS (mg/L)	--	--	--	73.3	78	540	303
TSS (mg/L)	239	80	262	77.6	129.2	126	111
Cu (µg/L)	50	10	16	26.7	30	26.5	26.1
Pb (µg/L)	240	18	32	75.5	233	26.5	24.5
Zn (µg/L)	350	140	204	148	194	129	118

[1] USEPA (1996)
[2] Center for Watershed Protection (2000)
[3] Monroe study area of Bannerman *et al*. (1993)
[4] City of Minneapolis Public Works Department (1992) – average from a combination of land uses
[5] City of St. Paul 1994 stormwater data – average from a combination of land uses
[6] MPRB arithmetic mean data calculated from NPDES Sites 1 – 5a (2001 – 2004), 6 – 9 (2005 – 2009)
[7] MPRB arithmetic mean data calculated from NPDES Sites 6 – 9 (2010)

The P8 model was used to estimate daily flows for snowmelt events and grab samples from January through early May. Average daily flows (using both P8 and Flowlink measurements) and collected chemical data were used as input for the interactive program FLUX32. Daily temperature and hourly precipitation files obtained from the National Oceanic and Atmospheric Administration (NOAA) National Data Center (NDC) were used as input for P8. The heated rain gauge (for snowmelt water equivalent) is located at the Minneapolis/St. Paul International Airport.

Large rain events can lead to pipe surcharges. Surcharges occur when the water backs up in pipes and creates a hydrostatic pressure head which can result in inaccurate daily flow calculations which should be considered when evaluating flow-weighted mean concentrations. These events usually happen during storm events with high precipitation totals or high intensity. With the exception of Site 8a, most of the surcharging events were storms greater than 2 inches. The following surcharges occurred at the NPDES sites in 2010:

- Site 6 (22nd and Aldrich): 6/25, 8/11, 9/2.
- Site 7 (Park and 14th): 6/25, 8/11.
- Site 8a (Pershing): 4/24, 6/8, 6/11, 6/26, 7/6, 7/18, 7/24, 7/28, 8/11, 8/13, 8/31, 9/2, 9/11, 9/23, 10/24.
- Site 9 (61st and Lyndale): 6/25.

If surcharge water inundated the auto-sampler tray the samples are considered contaminated and dumped.

It should be noted that rainfall measurement during a storm can be highly variable across land areas. The precipitation values are from one location, 3800 Bryant Ave. S. Minneapolis, MN. Site 8a had fifteen surcharges in 2010, storms as small as 0.25 inches or as large as 2.32 inches caused surcharging. At the site two pipes and overland flow enter the manhole basin and the outlet at the bottom is a 12 inch PVC pipe. This entire area of Minneapolis is lower in elevation than the surrounding areas causing a regular back up of many storm sewers in the system. Minneapolis Public Works is aware of this problem and doing its best to remediate it. The surcharges at this site do not appear to have caused any flooding problems. Site 8a samples appear to not be significantly effected by surcharging.

The flow-weighted mean concentrations presented in **Table 24-10** were calculated using FLUX32. FLUX32 calculates flow-weighted mean concentrations and associated error statistics based on six different calculation methods. Calculation methods 1-Direct Mean Loading, and 5-Regression, Second-Order were ignored because they are inappropriate for storm sewer applications where the daily flow file contains a significant number of zero flows (Bruce Wilson, MPCA Research Scientist, personal communication, 2001). In general calculation methods 2-Flow-Weighted Concentration and 6-Regression Applied to Individual Daily Flows were used. Sample concentrations and associated daily average flows were used as input for these calculations. The data were often stratified by flow or season to achieve the most accurate and precise results. The method and event mean concentration with the lowest coefficient of variation (CV) was chosen as the final value.

Table 24-10. Flow–weighted mean concentrations and related statistics for NPDES parameters in 2010.

Site	**TP (mg/L)**	**TDP (mg/L)**	**TKN (mg/L)**	**NH_3 (mg/L)**	**NO_3NO_2 (mg/L)**	**Cl* (mg/L)**	**cBOD (mg/L)**	**TSS (mg/L)**	**TDS* (mg/L)**	**Cu (µg/L)**	**Pb (µg/L)**	**Zn (µg/L)**
6	0.443	0.075	1.74	0.787	0.273	140	10	118	296	22	65	116
7	0.177	0.045	1.08	0.589	0.444	51	4	56	50	24	10	89
8a	0.282	0.076	1.46	0.617	0.352	6	7	54	30	11	4	40
9	0.460	0.058	1.84	0.671	0.585	43	9	201	118	34	16	153
MEAN	**0.341**	**0.063**	**1.53**	**0.67**	**0.414**	**60**	**7**	**107**	**124**	**23**	**24**	**100**
MEDIAN	**0.3625**	**0.066**	**1.60**	**0.64**	**0.398**	**47**	**8**	**87**	**84**	**23**	**13**	**103**
STANDEV	**0.135**	**0.015**	**0.340**	**0.088**	**0.134**	**57**	**2**	**69**	**121**	**9**	**28**	**48**

* Flow–weighted mean concentrations for Cl and TDS were difficult to estimate using FLUX32 due to large outliers from the two snowmelt samples; these estimates should be used with caution.
STANDEV= standard deviation.

Site 6 had the highest modeled concentrations of TDP, TKN, NH_3, and Pb. This may be due to its physical location between two heavily traveled dusty thoroughfares (Hennepin and Lyndale) and the large mature leaf canopy in this urban residential watershed filtering and collecting airborne material and depositing it following significant precipitation.

Site 7 is a densely developed mixed use watershed that had the lowest modeled TP, TDP, TKN, NH_3, and cBOD.

Site 8a is an open parkland watershed that had the lowest modeled Cl, TSS, TDS, Cu, Pb, and Zn.

Site 9 had the highest modeled concentration of TP, NO_3NO_2, TSS, Cu and, Zn. Site 9 is mainly commercial/industrial and therefore higher concentrations may be expected. Site 9 is located adjacent to a large cement aggregate mixing facility which may explain the higher TSS values. This site sometimes had a small baseflow which could be sampled during future monitoring to distinguish high concentrations from storm events or baseflow.

In 2010 the highest and lowest TP concentrations were modeled at Site 9 (0.460 mg/L) and 7 (0.177 mg/L), respectively. These are similar to historical data for these sites.

For comparison purposes **Table 24-11** includes flow-weighted mean pollutant concentrations of data collected in the 1980's and reported by the U.S. Geological Survey (USGS) for various sites within the Twin Cities (as cited in MPCA, 2000). The Yates watershed was a stabilized residential area. Iverson was a residential watershed under development while Sandberg was predominantly light industrial land-use area as reported by the USGS. Site 6 is more closely related to the Yates watershed land-use characteristics. Sites 7 and 9 are most comparable to the Sandberg watershed land-use characteristics.

When comparing the flow-weighted mean concentrations for these sites to MPRB monitoring sites (**Table 24-11)** Site 6 has similar concentrations with Yates for all parameters with the exception of TP and TKN. Compared to Sandberg Sites 7 and 9 have lower flow-weighted mean concentrations for almost all parameters except TKN and are well within the ranges shown in **Table 24-11**. The exception to this was Site 7 which had significantly lower TP, TKN, TSS, and Pb. The overall comparison (**Table 24-11)** of water quality at sites 6, 7, 8a, and 9 was the same or better.

Table 24-11. Flow–weighted mean stormwater pollutant concentrations (mg/L) and ranges as reported by the USGS (as cited in MPCA, 2000).

Pollutant		Monitoring Site		
		Yates area (stabilized residential)	**Iverson area (developing residential)**	**Sandburg area (light industrial)**
TSS	Mean Range	133 (2 – 758)	740 (17 – 26,610)	337 (7 – 4,388)
Pb	Mean Range	0.23 (0.015 – 1.8)	0.02 (0.008 – 0.31)	0.19 (0.003 – 1.5)
Zn	Mean Range	0.198 (0.02 – 2.2)	0.235 (0.028 – 0.53)	0.185 (0.02 – 0.81)
TKN	Mean Range	3.6 (0.6 – 28.6)	1.2 (1.0 – 29.2)	2.5 (0.4 – 16.0)
TP	Mean Range	0.63 (0.10 – 3.85)	0.62 (0.2 – 13.1)	0.63 (0.07 – 4.3)

Table 24-12 shows the flow weighted mean concentrations in 2010 compared to previous years. Flow-weighted mean concentrations for Cl and TDS were difficult to estimate using FLUX32 due to large outliers from the snowmelt samples. These estimates should be used with caution. When samples were below the MDL half of the MDL was used for calculations.

Cadmium was discontinued from monitoring in 2006 because Cd concentrations have typically been below detection for the Minneapolis/St. Paul area (**Table 24-12**) and it was not useful information. It should also be noted the detection limit for Cd has changed over time, in 2002 it was <0.500 µg/L, in 2003 it was <2.00 µg/L and in 2004 it was <5.00 µg/L.

Most parameters generally fell within the range of estimated flow-weighted mean concentration of previous years as seen in **Table 24-12**. The parameter TDS and Cl had some significant (snowmelt) outliers which affected the final flow–weighted mean concentration for these parameters.

Table 24-12. MPRB Flow–weighted mean concentration compared to previous years. Each year is the average flow–weighted mean concentration of all sites monitored that year.

	Flow-weighted mean concentrations									
	Sites 1-5a				**Site 6-9**					
Parameter	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
TP (mg/L)	0.470	0.337	0.474	0.332	0.354	0.548	0.472	0.486	0.583	0.341
TDP (mg/L)	0.112	0.095	0.114	0.121	0.123	0.135	0.108	0.139	0.249	0.063
TKN (mg/L)	2.21	1.60	2.10	1.94	3.48	3.54	4.43	3.22	3.61	1.53
NH_3(mg/L)	0.494	0.722	0.346	0.918	1.74	1.64	0.970	0.966	1.64	0.666
NO_3NO_2 (mg/L)	0.398	0.423	0.496	0.382	0.448	0.638	0.496	0.582	0.755	0.414
Cl (mg/L)	37	11	587	40	18	91	412	139	803	60
cBOD (mg/L)	12	8	16	20	9	9	17	25	53	7
TSS (mg/L)	116	83	116	70	108	156	180	148	121	107
TDS (mg/L)	306	85	725	130	252	183	737	507	3323	124
Cd (µg/L)	0.532	0.518	2.11	2.80	2.50	nc	nc	nc	nc	nc
Cu (µg/L)	15	31	23	15	19	29	36	16	40	23
Pb (µg/L)	23	17	22	14	41	31	34	28	23	24
Zn (µg/L)	180	76	107	76	86	94	133	132	204	100

nc = data not collected.

Chemical concentrations in stormwater are highly variable. Many things can cause fluctuations in chemical concentrations. **Table 24-12** illustrates the variability of stormwater from year to year due to three likely causes. First, the watersheds monitored for the designated land uses have occasionally changed. Secondly, the timing between street sweeping and sampling probably affect variability within the monitoring year and between years. Thirdly, precipitation frequency, intensity, and duration affect results.

Event-mean concentration seasonal statistics (snowmelt, spring, summer, and fall) for a combination of all sites were calculated and are listed in **Table 24-13**. Seasonal patterns are evident. Snowmelt had the highest geometric mean concentrations of all parameters except TDP. Summer had the highest levels of *E. coli* and lowest concentration of TP. Fall had the lowest concentrations of all parameters except TP and TDP.

Table 24-13. 2010 statistical summary of concentrations by season from all sites (6 –9).

2010 Season	Statistical Function	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Hardness mg/L	TSS mg/L	VSS mg/L	TDS mg/L	cBOD mg/L	E. coli MPN/100mL	Cu ug/L	Pb ug/L	Zn ug/L
SNOWMELT (February-March)	**MEAN (geometric)**	0.455	0.037	2.21	0.612	0.698	345	81	131	55	954	9	7	37	26	165
	MEAN (arithmetic)	0.655	0.041	2.64	0.811	0.738	1897	104	240	98	2967	11	1089	50	84	318
	MAX	1.55	0.072	4.91	1.97	1.09	3607	168	604	256	5618	19	4352	110	290	870
	MIN	0.126	0.023	0.849	0.346	0.504	1	20	17	9	15	4	1	13	5	30
	MEDIAN	0.473	0.034	2.40	0.463	0.620	1990	114	170	64	3117	10	1	38	21	185
	STDEV	0.620	0.021	1.69	0.779	0.310	1479	63	253	108	2295	6	2176	42	138	380
	NUMBER	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4
	COV	0.947	0.527	0.638	0.961	0.420	0.8	1	1	1	1	1	2	0.9	1.6	1.2
SPRING (April-May)	**MEAN (geometric)**	0.346	0.052	1.84	0.296	0.594	5	27	79	28	60	10		24	16	96
	MEAN (arithmetic)	0.418	0.085	2.03	0.401	0.694	10	30	101	32	67	11		28	21	132
	MAX	0.751	0.345	4.17	0.798	1.56	56	72	262	55	215	32		70	55	600
	MIN	0.110	0.023	0.801	0.015	0.250	1	16	18	9	19	3		8	3	21
	MEDIAN	0.461	0.067	1.83	0.407	0.626	4	28	97	38	57	9		28	15	120
	STDEV	0.213	0.090	0.962	0.233	0.327	15	16	67	15	49	9		16	18	137
	NUMBER	15	11	13	15	15	15	14	15	15	15	10		15	15	15
	COV	0.511	1.07	0.473	0.581	0.471	1.5	1	1	0.5	1	1		0.5	0.9	1.0
SUMMER (June-August)	**MEAN (geometric)**	0.290	0.073	1.69	0.343	0.499	3	28	87	26	41	7	7456	23	13	79
	MEAN (arithmetic)	0.355	0.095	2.00	0.425	0.569	6	30	124	33	52	14	8712	26	25	102
	MAX	1.10	0.33	7.24	1.00	1.23	22	60	325	78	129	103	15531	50	130	230
	MIN	0.041	0.022	0.606	0.015	0.250	1	13	16	5	12	2	4106	10	2	10
	MEDIAN	0.311	0.069	1.79	0.415	0.580	1	30	109	34	36	5	6499	25	14	100
	STDEV	0.232	0.082	1.46	0.227	0.288	7	14	94	21	38	28	6025	11	31	61
	NUMBER	19	13	18	19	18	19	19	19	19	19	12	3	19	19	19
	COV	0.655	0.861	0.731	0.533	0.506	1.2	0.4	1	1	1	2	1	0.4	1.2	0.6
FALL (Sept-Nov)	**MEAN (geometric)**	0.322	0.098	1.14	0.154	0.359	3	28	38	18	37	5	5893	15	5	47
	MEAN (arithmetic)	0.497	0.236	1.36	0.245	0.403	5	30	47	21	41	8	21554	16	7	57
	MAX	2.41	1.40	2.60	0.493	0.884	11	40	128	38	64	25	111990	29	20	110
	MIN	0.121	0.027	0.250	0.015	0.250	1	13	11	8	15	2	2119	7	2	10
	MEDIAN	0.290	0.064	1.08	0.285	0.250	5	32	42	18	34	4	4229	16	5	54
	STDEV	0.634	0.442	0.751	0.175	0.220	4	9	33	12	19	8	44318	6	6	35
	NUMBER	12	9	10	10	10	10	11	10	10	9	7	6	11	11	11
	COV	1.28	1.87	0.551	0.715	0.548	0.8	0.3	1	1	0.5	1	2	0.4	0.8	0.6

STDEV= standard deviation, COV= coefficient of variation

25. HERITAGE PARK BMP MONITORING

BACKGROUND

Best management practices (BMPs) include procedures and structures designed to help reduce water pollution. The monitoring of BMPs in Minneapolis is a part of the Federal NPDES stormwater permit activities.

In 2007 through 2010 the MPRB monitored two City of Minneapolis stormwater ponds at Heritage Park and Heritage Commons (**Figure 25-1**). For purposes of this report the stormwater ponds located to the north of the intersection of Olson Memorial Highway and Van White Memorial Boulevard are referred to as the Heritage Park Pond and the ponds to the south as the Heritage Commons Pond.

In 2010, the MPRB monitored the outfalls at two of the City of Minneapolis' stormwater ponds located at Heritage Park in north Minneapolis. Heritage Park is a 140-acre large redevelopment project which was formerly public housing and a public park. It is now a mix of public and private housing, two public parks and an innovative collection of stormwater treatment systems designed to create high quality ponds as a neighborhood amenity. The treatment-train approach using grit chambers, trench forebays or sedimentation ponds, level spreaders, flow splitters, and infiltration or filtration galleries, and stormwater ponds was designed for hydraulic mitigation purposes. These help reduce pollutants discharged to the Mississippi River and to create high quality amenities in an amenity-poor area of the City.

The drainage area to the Heritage Park Pond is 283 acres. Heritage Park has many innovative inlet treatment devices including 4 trench forebays, 9 CDS units, 8 infiltration basins, and 3 wetland ponds. The Heritage Park Pond system has one main outlet (**Figure 25-2)**.

The outlet weir elevation is designed to be at 805.80 mean sea level (msl) (**Figure 25-3**). It may have actually been 805.50 because there is no metal plate present which is referenced in plans. On 9/3/08 the internal weir was completely removed by Minneapolis Public Works (**Figure 25-4**). This significantly changed the hydrology of the pond system. The largest of the ponds was designed to have a high water depth of 5.5 ft which may now be significantly lower due to removal of the internal weir.

Heritage Commons Pond has a drainage area of 101 acres. It has many of the same structural BMP's (e.g. CDS units, trench forebays, ponds, etc.) as the larger Heritage Park system. Heritage Commons Pond has three inlets and two outlets. **Figure 25-1** shows the Heritage Commons inlets labeled A, B and C and the two outlets labeled N (north) and S (south).

At Heritage Commons Pond the inlet pipes (A, B and C) drain the adjacent streets. Each stormwater inlet is treated with CDS units prior to pond discharge. The two outlets are at different elevations. The main outlet is to the north (806.2 msl) and the emergency outlet is to the south (807.7 msl). The bottom of the pond was designed to have an elevation of 798.0 ft. an interim normal water depth of 4.9 ft., final high water depth of 11.9 ft., and a final normal water depth of 8.2 ft. Since construction has ceased, Heritage Commons is currently at final normal water depth.

Figure 25-1. Arial photograph of Heritage Park and Heritage Commons located in Minneapolis.

Figure 25-2. The Heritage Park Pond outlet.

METHODS

The stormwater ponds located north of the intersection of Olson Memorial Highway and Van White Memorial Boulevard are referred to as Heritage Park Pond and to the south as Heritage Commons Pond.

Other than snowmelt, all outlet samples were collected by flow weighted auto monitoring.

Heritage Park Pond outlet auto-monitoring sampling dates were 7/30/07–11/7/07, 5/8/08–9/1/08, 5/18/09–11/13/09, and 5/20/10–11/17/10. Auto-monitoring equipment consisted of an area/velocity pressure transducer with an ISCO 4150 datalogger coupled with an ISCO 3700 sampler. The Heritage Park Pond outlet is a large reinforced concrete vault which constricts to a 10' wide by 5' tall RCP box culvert pipe (**Figure 25-3**). The outlet weir was removed on 9/3/10 which significantly changed the outlet structure (**Figure 25-4**).

Figure 25-3. The Heritage Park Pond outlet weir is inside the 5' X 10' box culvert. Weir was removed on 9/3/08.

Figure 25-4. The Heritage Park Pond outlet following removal of the weir.

At Heritage Park outlet prior to 9/3/08 there was two to three feet of standing water. This configuration necessitated custom bracket fixtures to be designed, fabricated, and installed in order to monitor this site shown in **Figure 25-5**. The discharge was calculated using the level from the probe and a 10 foot broad crested weir equation. The outlet datalogger was flow paced and the pacing adjusted to collect samples over the entire hydrograph. Heritage Park Pond flow data were calculated using Flowlink 5.1. Statistics were calculated using an Excel spreadsheet.

Figure 25-5. Heritage Park Pond box culvert with monitoring equipment installed.

In 2010 at Heritage Park the area velocity probe failed on 8/31/10 and was replaced on 9/28/10. The delay for this site was due to the required manufacture of a custom cable from ISCO.

At Heritage Commons in 2007 only grab samples were collected. In 2008 Heritage Commons outlet auto-monitoring was performed from 6/3/08–8/5/08, 9/7/08–9/27/08, 5/19/09–11/17/09, and 4/27/10–11/17/10. The brief break in 2008 was caused by equipment failure.

In 2008 Heritage Commons inlets experienced significant issues with CDS units and pipe(s) surcharging and backing up. Specifically at inlet B this resulted in the accumulation of copious amounts of settled debris hundreds of yards up the pipe. In 2009 and 2010 no inlets were monitored at either Heritage Park or Heritage Commons.

The Heritage Commons north outlet auto-monitoring equipment consisted of an area/velocity pressure transducer with an ISCO 4150 datalogger coupled with an ISCO 3700 sampler. The south outlet consisted of a level transducer with a Sigma 900 sampler. Both outlets discharge were calculated using an 8 foot broad crested weir equation. Heritage Commons Pond flow data were calculated using Flowlink 5.1. Statistics were calculated using an Excel spreadsheet.

In 2010 NPDES parameters were analyzed at all sites. The chemical parameters monitored are listed in **Table 25.1**.

Table 25.1 NPDES parameters monitored at Heritage Park and Heritage Commons.

Parameter	Abbreviation	Units	Sample Type
BOD –carbonaceous, 5 Day	cBOD	mg/L	Composite
Chloride, Total	Cl	mg/L	Composite
Specific Conductivity	Sp. Cond	µmhos/cm	Composite
Fecal Coliform (before 2010)	F. coli	#/100mL	Grab (3X year)
Escherichia Coliform (after 2010)	E. coli	MPN/100mL	Grab (3X year)
Copper, Total	Cu	µg/L	Composite
Lead, Total	Pb	µg/L	Composite
Zinc, Total	Zn	µg/L	Composite
Nitrite+Nitrate, Total as N	NO_2NO_3	mg/L	Composite
Ammonia, Un-ionized as N	NH_3	mg/L	Composite
Kjeldahl Nitrogen, Total	TKN	mg/L	Composite
pH	pH	standard unit	Grab (3X year)
Phosphorus, Total Dissolved	TDP	mg/L	Composite
Phosphorus, Total	TP	mg/L	Composite
Solids, Total Dissolved	TDS	mg/L	Composite
Solids, Total Suspended	TSS	mg/L	Composite
Solids, Volatile Suspended	VSS	mg/L	Composite

Holding times for all parameters are listed in **Section 24 (Table 24-5)**.

RESULTS & DISCUSSION

Table 25-2 shows the 2007, 2008, 2009, and 2010 sampling schedule of both composite and grab samples taken at Heritage Commons outlet(s) and Heritage Park outlet.

At Heritage Commons Pond north outlet from 2007-2010 a total of 42 storm events were sampled. In 2007 at total of 11 grabs were taken. In 2008 at total of 1 snowmelt grab and 8 storm composite events taken. In 2009 a total of 1 snowmelt grab and 9 storm composites events taken. In 2010, 1 snowmelt grab and 10 storm composite events were taken.

At the Heritage Park Pond outlet from 2007-2010 a total of 44 storm events were sampled. In 2007 at total of 15 grabs were taken. In 2008 at total of 1 snowmelt grab and 6 storm composite events taken. In 2009 a total of 1 snowmelt grab and 13 storm composites events taken. In 2010, 1 snowmelt grab and 8 storm composite events were taken.

In monitoring both Heritage Park outlet and Heritage Commons, it was anticipated that these data were to give an indication of the baseline efficacy of both systems. As both systems stabilize and mature the Heritage Commons data should provide useful insight when compared to data collected in later years.

Sample dates and lab results are presented in **Table 25-3**. It should be noted that in 2010 the bacteria indicator changed from F. coli to *E. coli*.

In 2007 Heritage Commons was in the process of finishing construction plantings and stabilization when monitored. The earliest samples were collected with construction still ongoing, and were collected as an early baseline not as how these systems will ultimately work. In 2009, construction activity was considerably less than in 2007 or 2008. Since nothing has structurally changed at Heritage Commons, it is more of a true year-to-year comparison. **Figure 25-6** shows the Heritage Commons final treatment pond looking west.

An internal weir was removed at Heritage Park Outlet on 9/3/2008 which significantly changed the hydrology of the system. All equipment was removed from this site at that time. It may be difficult to apply this historical data set to future data collected at Heritage Park since there is a new baseline.

The Heritage Park system was finished one year before Heritage Commons and had more time to grow plants (terrestrial and wetland) and stabilize (**Figure 25-7**).

In 2008 and 2009 at Heritage Park the infiltration basin (near the outlet) was observed filled with standing water numerous times. On 10/2/09 following a 1.5" storm the infiltration basin over-topped and stood full for some time (**Figure 25-8)**. It is likely silted in and can not drain properly. Work was observed in both 2008 and 2009 to attempt to rehabilitate these and make them functional again. Standing water was again observed in 2010, and it appears they may require annual maintenance (**Figure 25-9**). The Heritage Park outlet structure is in need of maintenance as a large 2010 storm has pushed cattails and debris against the outlet screen partially plugging it (**Figure 25-10**).

Table 25-4 shows mean chemical concentrations for Heritage Commons. At Heritage Commons north outlet the mean TP, NH_3, $_c$BOD, and appear to be decreasing over time. The TDP, NO_2NO_3, Cl, TSS, TDS, and Pb appear to be holding reasonably steady. It is interesting to note in 2008 that many of the monitored parameters saw high values during the year. It may have been the weather or work in the watershed which caused these peak values.

Table 25-4 also shows the Heritage Park outlet mean concentrations. At Heritage Park Pond outlet the mean TP, TDP, Pb, and Zn appears to be increasing over time. The mean TSS, and TDS appear to be decreasing over time. This may be the result of the pond/wetland system having time to chemically and biologically stabilize or may simply be due to the variable nature of stormwater. This system was significantly changed with the removal of the weir 9/3/08 so the data must be interpreted cautiously. In 2008 Heritage Commons outlet north also saw high values during this year. It may have been the weather or work in the watershed which caused these peak values. But both systems Heritage Park outlet and Heritage Commons north outlet saw significant chemical mean increases in 2008.

The chemical mean, median, standard deviation, maximum, and minimum statistics for both systems are presented in **Table 25-5**. In comparing the 2007-2010 data sets Heritage Commons north outlet had higher median values for TP, TDP, TKN NH_3, Cl, Sp. Cond, and TDS. The Heritage Park outlet had higher median values for NO_2NO_3, TSS, VSS, Cu, Pb and Zn. It is unknown why Heritage Commons outlet had higher values for many parameters since it is a much smaller watershed. The higher NH_3 and Cl values may be the result of large goose and seagull populations defecating in the final ponds.

Figure 25-6. The Heritage Commons final pond looking west.

Table 25-2. Event data collected for Heritage Commons and Heritage Park systems from 2007-2010. A precipitation event was defined as greater than 0.10 inches separated by 8 hours.

Date	Time	Sample Type	Heritage Commons Outlet North	Heritage Park Outlet North
8/11/2007	23:00	Grab		X
8/14/2007	7:51	Grab		X
8/19/2007	21:45	Grab		X
8/21/2007	9:55	Grab	X	X
8/27/2007	9:15	Grab	X	X
8/28/2007	9:50	Grab	X	X
9/7/2007	8:45	Grab	X	X
9/18/2007	8:30	Grab	X(w/fecal)	X
9/20/2007	23:32	Grab		X(w/fecal)
9/21/2007	8:55	Grab	X(w/fecal)	
9/25/2007	11:35	Grab	X	X
10/2/2007	13:40	Grab	X	X
10/5/2007	11:50	Grab	X	X
10/8/2007	12:46	Grab		X
10/16/2007	8:50	Grab	X	X
10/18/2007	8:50	Grab	X	
10/19/2007	7:33	Grab		X
3/11/2008	14:10	Grab		X(w/fecal)
3/14/2008	14:05	Grab	X(w/fecal)	
5/31/2008	19:43	Composite		
6/1/2008	19:18	Composite		X(lmtd)
6/5/2008	16:47	Composite	X(lmtd)	
6/6/2008	1:42	Composite		X
6/12/2008	3:31	Composite	X	
7/11/2008	5:01	Composite		X(lmtd)
7/12/2008	1:21	Composite		X(lmtd)
7/19/2008	16:35	Composite		X(lmtd)
7/20/2008	1:50	Composite	X(lmtd)	
8/4/2008	7:58	Composite	X(lmtd)	
8/12/2008	20:27	Composite		
8/28/2008	11:30	Composite	X	X
				9/3, Weir Removed
9/8/2008	9:30	Composite	X(lmtd)	
9/11/2008	12:25	Grab	X(w/fecal)	
9/23/2008	18:48	Composite	X(w/fecal)	
10/7/2008	18:10	Composite		
10/8/2008	9:41	Composite	X	
2/9/2009	14:35	Grab		X(w/fecal)
2/10/2009	10:45	Grab	X(w/fecal)	
6/8/2009	8:10	Composite		X
6/16/2009	23:21	Composite	X	
6/17/2009	2:45	Composite		X
6/25/2009	22:39	Composite	X	X
6/27/2009	22:09	Composite	X(lmtd)	X(lmtd)
7/21/2009	12:45	Composite		X
8/1/2009	10:45	Composite	X(lmtd)	X(lmtd)
8/7/2009	10:05	Composite		X(fecal only)
8/8/2009	22:55	Composite	X(lmtd)	X(lmtd)
8/16/2009	15:19	Composite	X(lmtd)	X(lmtd)
8/19/2009	15:53	Composite	X	X
9/25/2009	16:30	Composite		X(lmtd)
10/1/2009	22:36	Composite	X(lmtd)	X(lmtd)
10/15/2009	13:56	Composite	X	X
3/2/2010	14:35	Grab		X(w/E.coli)
3/10/2010	12:30	Grab	X(w/E.coli)	
5/8/2010	7:53	Composite	X(lmtd)	
5/11/2010	21:47	Composite	X	
6/23/2010	18:32	Composite		X
6/24/2010	6:54	Composite	X(lmtd)	
6/25/2010	20:06	Composite	X(lmtd)	
7/4/2010	12:06	Composite		X(lmtd)
7/18/2010	3:19	Composite	X(lmtd)	X(lmtd)
8/10/2010	15:27	Composite		X(lmtd)
8/10/2010	22:58	Composite	X	X
8/24/2010	9:20	Composite	X	
8/31/2010	5:59	Composite		X
9/23/2010	12:51	Composite	X	
10/24/2010	13:27	Composite		X
10/25/2010	10:35	Composite	X	
10/26/2010	12:58	Composite	X	X

X(lmtd) = event sampled with limited parameters generally due to holding times
X(w/fecal) = event sampled with fecal coliform
X(fecal only) = only fecal coliform sampled
X(E.coli) = event samples with E. coli

Figure 25-7. The Heritage Park (pond 3) system after it was established.

Figure 25-8. The Heritage Park infiltration basin 10/2/09 following 1.5 inch storm.

Figure 25-9. The Heritage Park infiltration basin 10/25/2010.

Figure 25-10. The Heritage Park outlet 10/25/2010.

Both the Heritage Commons and the Heritage Park systems continue to have some functionality issues. It is difficult to draw solid conclusions from this limited data set which included grab samples, limited inlet data and a dynamic system still under some construction. Further comprehensive study will be needed to explore and answer some of the questions raised. The most important missing piece is complete inlet data which are not available to perform a mass balance comparison and make definitive conclusions as to the pond/wetland systems effectiveness.

Recommendations and suggestions for future work include:

- After repair of Heritage Commons Inlets A and C continue complete inlet and outlet monitoring to produce a mass balance.
- Obtain accurate inlet drainage areas and land use data the City or SRF.
- Investigate CDS unit performance and sizing at Heritage Commons inlets A and B.
- Investigate infiltration basin performance at Heritage Park.
- Measure depth of pond sedimentation to ensure proper function in future years.
- Investigate digestion of previously settled organic solids in the pond bottom and the possibility of later storm export as a dissolved fraction.
- Investigate any effects of in-ground automatic sprinkler systems at Heritage Park.
- Investigate any effects of waterfowl (geese and gulls) on pond water quality.

Table 25-3. Heritage Commons and Heritage Park Pond sampled event data for 2007 - 2010.

Date	Time	Site ID & Location	Sample Type	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Field pH	Sp.Cond. µmhos/cm	F. coli cfu/100mL	cBOD mg/L	TSS mg/L	VSS mg/L	TDS mg/L	Cu µg/L	Pb µg/L	Zn µg/L
9/18/2007	9:00	Heritage Commons Inlet A	Grab	0.194	0.068	0.949	0.353	<0.500	<2		78	8000	4	31		56	7.5	5.5	<50
9/21/2007	9:05	Heritage Commons Inlet A	Grab	0.076								900							
10/2/2007	13:25	Heritage Commons Inlet A	Grab	0.503	0.129	7.59	0.560	<0.500	9		185		10	222		109	18	19	<50
10/5/2007	12:00	Heritage Commons Inlet A	Grab	0.231	0.167	1.31	0.280	<0.500	6		213		2	10		232	9.6	<5.0	<50
10/16/2007	9:35	Heritage Commons Inlet A	Grab	0.260	0.204	0.539	0.377	<0.500	<2		78		4	27		40	<5.0	<5.0	<50
10/18/2007	8:35	Heritage Commons Inlet A	Grab	0.182	0.079	0.721	0.092	<0.500	<2		53		3	38		29	10	<5.0	<50
3/11/2008	14:10	Heritage Commons Inlet A	Grab	0.950	0.241	3.70	0.797	0.809	1163		2520	50	25	243		1329	27	30	215
5/31/2008	19:43	Heritage Commons Inlet A	Composite	0.511		3.11	0.648							147					
6/5/2008	16:47	Heritage Commons Inlet A	Composite	1.30	0.054	4.43	0.685	1.25	8		154		26	563		76	<5.0	33	442
6/12/2008	3:31	Heritage Commons Inlet A	Composite	0.262	0.065	1.03	0.412	<0.500	2		63		4	20		39	<5.0	8.7	<50
7/11/2008	5:01	Heritage Commons Inlet A	Composite	0.841	0.130	3.34	0.395	0.719	3		69		10	308		59	29	22	104
8/12/2008	20:27	Heritage Commons Inlet A	Composite	0.963		5.77	0.289							292		47	31	29	170
9/6/2008	19:29	Heritage Commons Inlet A	Composite	0.673		3.26	0.407	0.983	3		83			226		61	29	23	200
9/11/2008	12:25	Heritage Commons Inlet A	Grab									230							
9/23/2008	9:20	Heritage Commons Inlet A	Grab									160							
9/23/2008	18:48	Heritage Commons Inlet A	Composite	0.435	0.121	2.29	0.334	0.723	<2		54		7	166		26	16	16	110
10/7/2008	18:10	Heritage Commons Inlet A	Composite	0.199	0.090	0.946	0.331	<0.500	<2		68		5	22		12	9.7	4.1	59
9/18/2007	8:50	Heritage Commons Inlet B	Grab	0.279	0.182	0.927	0.366	<0.500	7		82	6500	9	18		56	7.3	5.1	<50
10/16/2007	9:30	Heritage Commons Inlet B	Grab	0.766	0.582	1.28	0.015	<0.500	<2		104		23	36		121	19	<5.0	<50
10/18/2007	8:31	Heritage Commons Inlet B	Grab	0.380	0.215	0.764	0.037	<0.500	4		63		16	39		34	9.3	<5.0	<50
3/11/2008	14:00	Heritage Commons Inlet B	Grab	1.42	0.392	7.89	0.810	2.76	1772		6060	420	37	300		3114	39	52	312
9/23/2008	9:05	Heritage Commons Inlet B	Grab	0.582	0.372	2.53	1.50	<0.500	31	7.9	275	64000	27	17		190	16	4.4	63
10/16/2007	11:00	Heritage Commons Inlet C	Grab	0.165	0.076	1.16	0.688	<0.500	<2		89		4	34		56	9.4	<5.0	<50
10/18/2007	8:30	Heritage Commons Inlet C	Grab	0.135	0.065	1.28	0.101	<0.500	<2		90		1	26		28	8.5	<5.0	<50
3/11/2008	13:45	Heritage Commons Inlet C	Grab	0.742	0.197	4.08	0.789	1.46	1265		4020	160	15	254		2188	37	28	101
6/5/2008	18:00	Heritage Commons Inlet C	Composite	1.28	0.055	3.55	0.405	0.556	<2		136		3	1306		52	31	32	200
7/11/2008	20:49	Heritage Commons Inlet C	Composite	1.44		1.38	0.322							485			30	24	104
7/19/2008	16:35	Heritage Commons Inlet C	Composite	0.306		1.01	0.133	<0.500	<2		56			166		34	13	11	<50
8/4/2008	0:12	Heritage Commons Inlet C	Composite	0.179	<0.010	1.06	0.253	0.638	<2		61		3	120		37	8.3	6.1	<50
8/12/2008	19:55	Heritage Commons Inlet C	Composite	0.243		1.36	0.182							135		55	16	9.1	<50
8/28/2008	0:27	Heritage Commons Inlet C	Composite	0.539	0.058	2.24	0.255	0.633	<2		93		5	384		193	18	29	100
9/11/2008	4:37	Heritage Commons Inlet C	Composite	0.175	<0.010	0.839	0.201	<0.500	<2		35		4	102		9	9.4	6.4	66
9/23/2008	8:50	Heritage Commons Inlet C	Grab									240000							
		Mean Inlet		**0.540**	**0.154**	**2.43**	**0.414**	**0.571**	**171**	**7.9**	**591**	**32042**	**11**	**198**		**307**	**16.6**	**14.8**	**92.7**
8/21/2007	9:55	Heritage Commons Outlet North	Grab	0.322	0.221	2.91	0.171	0.979	29		354		3	13		214	5.1	<5.0	55
8/27/2007	9:15	Heritage Commons Outlet North	Grab	0.323	0.180	3.12	0.259	2.20	40		354		10	27		255	6.9	<5.0	<50
8/28/2007	9:50	Heritage Commons Outlet North	Grab	0.449	0.325	2.22	0.347	0.613	15		236		5	30		156	<5.0	6.8	<50
9/7/2007	8:45	Heritage Commons Outlet North	Grab	0.592	0.362	3.26	0.154	1.75	15		266		11	32		187	6.9	<5.0	<50
9/18/2007	8:30	Heritage Commons Outlet North	Grab	0.319	0.226	1.84	0.061	0.534	18		288	1700	5	20		188	<5.0	<5.0	<50
9/21/2007	8:55	Heritage Commons Outlet North	Grab	0.383	0.286	1.75	0.242	0.970	8		237	12000	4	18		129	5.2	<5.0	<50
9/25/2007	11:35	Heritage Commons Outlet North	Grab	0.491	0.336	1.89	0.109	0.570	10		265		5	44		26	6.6	<5.0	<50
10/2/2007	13:40	Heritage Commons Outlet North	Grab	0.438	0.299	1.97	0.078	0.250	15		282		3	38		186	5.7	<5.0	<50
10/5/2007	11:50	Heritage Commons Outlet North	Grab	0.414	0.320	1.31	0.148	0.250	13		269		3	20		218	<5.0	<5.0	<50
10/16/2007	8:50	Heritage Commons Outlet North	Grab	0.439	0.338	1.43	0.107	0.682	14		310		2	13		208	<5.0	<5.0	<50
10/18/2007	8:50	Heritage Commons Outlet North	Grab	0.400	0.318	1.40	0.136	0.637	14		301		3	7		192	6.3	<5.0	<50
3/14/2008	14:05	Heritage Commons Outlet North	Grab	0.886	0.624	3.91	0.582	1.74	220		894	220	15	32		513	16	6.3	<50
6/5/2008	22:31	Heritage Commons Outlet North	Composite	0.780		1.42	0.379	<0.500	64		457		4	16		237	<5.0	<5.0	<50
6/12/2008	6:45	Heritage Commons Outlet North	Composite	0.300	0.259	3.48	0.079	0.553	190		916		3	51		478	7.1	<5.0	<50
7/20/2008	1:50	Heritage Commons Outlet North	Composite	0.296		1.40	<0.030	<0.500						9		190	12	<5.0	<50
8/4/2008	7:58	Heritage Commons Outlet North	Composite	0.413			<0.030						6	16		400	6.2	<5.0	<50
8/28/2008	11:30	Heritage Commons Outlet North	Composite	0.412	0.243	3.31	0.128	1.08	112		539		14	36		345	10	<3.0	39
9/8/2008	9:30	Heritage Commons Outlet North	Composite	0.531	0.327		<0.030		93		494			32		327	10	<3.0	22
9/11/2008	14:14	Heritage Commons Outlet North	Composite	0.940	0.396	7.54	<0.030	3.26	93	8.8	482	3800	47	79		297	12	<3.0	32
9/23/2008	21:33	Heritage Commons Outlet North	Composite	0.713	0.279	7.25	<0.030	0.745	73	8.8	456	4000	40	74		256	10	<3.0	30
10/8/2008	9:41	Heritage Commons Outlet North	Composite	0.288	0.150	2.03	0.068	0.814	73		438		3	14		216	88	<3.0	26
2/10/2009	10:45	Heritage Commons Outlet North	Grab	0.683	0.368	3.99	0.541	2.06	319	8.4	1415	1900	8	44	30	712	10	5.5	86
6/16/2009	23:21	Heritage Commons Outlet North	Composite	0.211	0.136	1.50	0.089	<0.500	538		1493		4	11		829	12	<3.0	37
6/25/2009	22:39	Heritage Commons Outlet North	Composite	0.347	0.182	2.68	<0.030	<0.500	362		1306		8	24		733	9.3	<3.0	26
6/27/2009	22:09	Heritage Commons Outlet North	Composite	0.290		2.74		0.772	316					18			9.7	<3.0	<20
8/1/2009	10:45	Heritage Commons Outlet North	Composite	0.318		3.57	<0.030	0.535	318		1152			31		677	7.7	<3.0	20
8/8/2009	22:55	Heritage Commons Outlet North	Composite	0.390		3.90		1.12			968			24		569	6.4	<3.0	<20
8/16/2009	15:19	Heritage Commons Outlet North	Composite	0.418		3.69	<0.030	0.899	157		766			28		465	6.7	<3.0	<20
8/19/2009	15:53	Heritage Commons Outlet North	Composite	0.469	0.260	3.65	<0.030	0.941	137		691		10	34		419	5	<3.0	21
10/1/2009	20:04	Heritage Commons Outlet North	Composite	0.450	0.168	4.02	0.131	1.52	106		442			28		321	4.9	<3.0	30
10/15/2009	13:50	Heritage Commons Outlet North	Composite	0.341	0.154	1.45	0.390	0.794	51		333		4	18		216	4.6	<3.0	33
3/10/2010	12:30	Heritage Commons Outlet North	Grab	0.609	0.489	1.74	0.660	0.772	257	8.4		64	3	8	6	630	5.2	1.4	16
5/8/2010	7:53	Heritage Commons Outlet North	Composite	0.228			0.083	<0.500	282					17	5	586	23	<3.0	<20
5/11/2010	21:47	Heritage Commons Outlet North	Composite	0.225	0.100	1.51	0.034	<0.500	267				5	16	6	550			
6/24/2010	6:54	Heritage Commons Outlet North	Composite		0.258		<0.030							30	17	316	15	<3.0	32
6/25/2010	20:06	Heritage Commons Outlet North	Composite	0.585		2.25	0.154	0.845	72					86	20	220	18	14	58
7/18/2010	0:47	Heritage Commons Outlet North	Composite	0.462		1.69	0.068	0.608	36					13	9	180	12	<3.0	<20
8/10/2010	23:09	Heritage Commons Outlet North	Composite	0.567	0.355	2.19	0.108	0.792	27				8	24	15	169	10	<3.0	<20
8/24/2010	9:20	Heritage Commons Outlet North	Composite	0.415	0.270		0.071		21					14	10	173			
9/23/2010	12:51	Heritage Commons Outlet North	Composite	0.373	0.162	2.16	0.061	0.948	15				7	20	14	163	9.9	<3.0	<20
10/25/2010	10:35	Heritage Commons Outlet North	Composite	0.210	0.048	1.55	0.151	0.504	21				5	15	8	188	11	<3.0	<20
10/26/2010	17:05	Heritage Commons Outlet North	Composite	0.318	0.130	2.13	0.035	0.536	22				10	12	8	187	13	<3.0	<20
		Mean Outlet		**0.440**	**0.268**	**2.70**	**0.144**	**0.862**	**116.6**	**8.61**	**586**		**9**	**27**	**12**	**330**	**10.5**	**2.51**	**25.7**

Note: "blank cells" = not collected due to limited sample volume or expired holding time.

Table 25-3. Heritage Commons and Heritage Park Pond sampled event data for 2007 – 2010 (continued).

Date	Time	Site ID & Location	Sample Type	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Field pH	Sp.Cond. µmhos/cm	F. coli cfu/100mL	cBOD mg/L	TSS mg/L	VSS mg/L	TDS mg/L	Cu µg/L	Pb µg/L	Zn µg/L
8/11/2007	23:00	Heritage Park North Outlet	Composite	0.400		2.02					304		n/c	59			17	6.0	<50
8/14/2007	7:51	Heritage Park North Outlet	Composite	0.457	0.171	1.65	0.271	0.580	10		202		21	138		133	18	<5.0	<50
8/19/2007	21:45	Heritage Park North Outlet	Composite	0.346	0.182	1.18	0.147	<0.500	13		222		3	36		158	9.3	5.6	<50
8/21/2007	9:03	Heritage Park North Outlet	Composite	0.331	0.174	2.02	0.240	<0.500	10		245		4	46		132	14	8.4	<50
8/27/2007	7:29	Heritage Park North Outlet	Composite	0.284	0.112	1.06	0.069	<0.500			194		11	38			7.4	5.7	<50
8/28/2007	5:00	Heritage Park North Outlet	Composite	0.603	0.179	1.74	0.361	<0.500	7		156		4	276		94	26	5.6	<50
9/7/2007	6:00	Heritage Park North Outlet	Composite	0.338	0.136	1.24	0.210	<0.500	17		247		6	57		148	7.6	<5.0	<50
9/18/2007	22:50	Heritage Park North Outlet	Composite	0.334	0.165	0.894	0.234	<0.500	9		172		3	59		99	12	8.4	<50
9/20/2007	23:32	Heritage Park North Outlet	Composite	0.459	0.153		0.333		4		150	8000		137		107	15	21	<50
9/25/2007	14:15	Heritage Park North Outlet	Composite	0.369	0.147	1.06	0.241	<0.500	11		207		5	83		129	13	14	<50
10/2/2007	19:17	Heritage Park North Outlet	Composite	0.302	0.133		0.097							35		147			
10/5/2007	9:02	Heritage Park North Outlet	Composite	0.364		1.16	0.209	<0.500	11		234			70		154	10	7.8	<50
10/8/2007	12:46	Heritage Park North Outlet	Composite	0.394	0.244	3.18	0.113	<0.500	9		254		11	35		160	9.8	<5.0	<50
10/16/2007	20:59	Heritage Park North Outlet	Composite	0.298	0.151									41					
10/19/2007	7:33	Heritage Park North Outlet	Composite	0.306		0.689	0.303	<0.500	10		226			46		128	10	5.3	<50
3/11/2008	14:20	Heritage Park North Outlet	Grab	0.902	0.421	3.89	0.926	1.27	1062		3680	40	15	153		2019	42	27	188
6/1/2008	19:18	Heritage Park North Outlet	Composite	0.293		1.34	0.084							16					
6/6/2008	1:42	Heritage Park North Outlet	Composite	0.200	0.144	1.06	<0.030	0.597	224		1024		2	4		541	<5.0	<5.0	65
7/11/2008	7:03	Heritage Park North Outlet	Composite	0.333		1.60	0.193							20		245	20	<5.0	62
7/12/2008	1:21	Heritage Park North Outlet	Composite	0.321		1.56	0.164							31			9.5	<5.0	62
7/19/2008	20:06	Heritage Park North Outlet	Composite	0.465		1.65	<0.030	<0.500						25		398	14	<5.0	<50
8/28/2008	6:47	Heritage Park North Outlet	Composite	0.437	0.106	2.36	<0.030	0.901	11		174		12	98		121	14	14	90
2/9/2009	14:35	Heritage Park North Outlet	Grab	0.589	0.196	3.84	0.677	2.30	2119	7.8	7240	700	26	41	22	3720	16	3.6	110
6/8/2009	8:10	Heritage Park North Outlet	Composite	0.502	0.347	1.89	0.160	0.726	175		714			27		400	12	3.5	53
6/17/2009	2:45	Heritage Park North Outlet	Composite	0.402	0.311	1.33	0.386	<0.500	44		275		5	10		172	16	34	81
6/25/2009	10:15	Heritage Park North Outlet	Composite	0.476	0.400	2.57	0.377	<0.500	46		376					232	12	<3.0	51
6/27/2009	10:41	Heritage Park North Outlet	Composite	0.352		1.63		0.563	30					5			13	<3.0	29
7/21/2009	12:45	Heritage Park North Outlet	Composite	0.293	0.143	1.37	<0.030	<0.500	27		240		12	19		152	8.5	<3.0	37
8/1/2009	2:35	Heritage Park North Outlet	Composite	0.559		1.44	<0.030	0.600	33		273			24		175	8.6	<3.0	36
8/7/2009	10:05	Heritage Park North Outlet	Composite							7.5		35000							
8/8/2009	12:33	Heritage Park North Outlet	Composite	0.300		1.04		<0.500			176			14		123	8.4	<3.0	36
8/16/2009	3:37	Heritage Park North Outlet	Composite	0.303		1.73	<0.030	<0.500	16		213			26		153	7.4	3.0	32
8/19/2009	14:50	Heritage Park North Outlet	Composite	0.289	0.128	1.25	0.154	<0.500	9		156		5	52		102	9.7	5.2	45
9/25/2009	16:30	Heritage Park North Outlet	Composite	0.332			<0.030		33		251					182	5.9	<3.0	52
10/1/2009	22:36	Heritage Park North Outlet	Composite	0.250	0.184	0.925	0.366	<0.500	15		158			16		116	5.3	<3.0	44
10/15/2009	13:56	Heritage Park North Outlet	Composite	0.195	0.143	0.666	<0.030	<0.500	25		234		15	3		138	7.1	<3.0	43
												E. coli MPN/100mL							
3/2/2010	14:35	Heritage Park North Outlet	Grab	0.547	0.157	2.62	0.396	0.978	1119	6.8		17	8	79	43	1934	24	13	120
6/23/2010	18:32	Heritage Park North Outlet	Composite	0.378	0.235	1.23	0.416	<0.500	34				6	10	4	196	8.1	<3.0	47
7/4/2010	12:06	Heritage Park North Outlet	Composite	0.326		1.36	0.292	<0.500	31					22	4	186	15	3.9	37
7/18/2010	3:19	Heritage Park North Outlet	Composite	0.544		1.18	0.335	<0.500	14					78	13	98	15	14	43
8/10/2010	15:27	Heritage Park North Outlet	Composite	0.311		1.31	0.434	0.946	15					9	5	125	13	<3.0	28
8/10/2010	22:58	Heritage Park North Outlet	Composite	0.264	0.124	0.986	0.227	<0.500	5				2	57	16	35	13	9.7	45
8/31/2010	5:59	Heritage Park North Outlet	Composite	0.491	0.136	1.72	0.370	<0.500	24				13	99	25	152	16	13	79
10/24/2010	13:27	Heritage Park North Outlet	Composite	1.22	0.817	2.98	<0.030	<0.500	49				23	42	24	248	15	6.0	55
10/26/2010	12:58	Heritage Park North Outlet	Composite	0.659	0.429	2.12	<0.030	<0.500	19				18	20	13	112	15	43	32
		Mean Outlet		**0.4118**	**0.220**	**1.66**	**0.223**	**0.443**	**151**	**7.4**	**643**		**10**	**51**	**17**	**360**	**13**	**7.6**	**48**

Table 25-4. Heritage Commons and Heritage Park Pond sampled event data for 2007 - 2010.

Date	Time	Site ID & Location	Sample Type	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Field pH	Sp.Cond. µmhos/cm	F. coli cfu/100mL	cBOD mg/L	TSS mg/L	VSS mg/L	TDS mg/L	Cu µg/L	Pb µg/L	Zn µg/L
8/21/2007	9:55	Heritage Commons Outlet North	Grab	0.322	0.221	2.91	0.171	0.979	29		354		3	13		214	5.1	2.5	55
8/27/2007	9:15	Heritage Commons Outlet North	Grab	0.323	0.180	3.12	0.259	2.20	40		354		10	27		255	6.9	2.5	25
8/28/2007	9:50	Heritage Commons Outlet North	Grab	0.449	0.325	2.22	0.347	0.613	15		236		5	30		156	2.5	6.8	25
9/7/2007	8:45	Heritage Commons Outlet North	Grab	0.592	0.362	3.26	0.154	1.75	15		266		11	32		187	6.9	2.5	25
9/18/2007	8:30	Heritage Commons Outlet North	Grab	0.319	0.226	1.84	0.061	0.534	18		288	1700	5	20		188	2.5	2.5	25
9/21/2007	8:55	Heritage Commons Outlet North	Grab	0.383	0.286	1.75	0.242	0.970	8		237	12000	4	18		129	5.2	2.5	25
9/25/2007	11:35	Heritage Commons Outlet North	Grab	0.491	0.336	1.89	0.109	0.570	10		265		5	44		26	6.6	2.5	25
10/2/2007	13:40	Heritage Commons Outlet North	Grab	0.438	0.299	1.97	0.078	0.250	15		282		3	38		186	5.7	2.5	25
10/5/2007	11:50	Heritage Commons Outlet North	Grab	0.414	0.320	1.31	0.148	0.250	13		269		3	20		218	2.5	2.5	25
10/16/2007	8:50	Heritage Commons Outlet North	Grab	0.439	0.338	1.43	0.107	0.682	14		310		2	13		208	2.5	2.5	25
10/18/2007	8:50	Heritage Commons Outlet North	Grab	0.400	0.318	1.40	0.136	0.637	14		301		3	7		192	6.3	2.5	25
3/14/2008	14:05	Heritage Commons Outlet North	Grab	0.886	0.624	3.91	0.582	1.74	220		894	220	15	32		513	16	6.3	25
6/5/2008	22:31	Heritage Commons Outlet North	Composite	0.780		1.42	0.379	0.250	64		457		4	16		237	2.5	2.5	25
6/12/2008	6:45	Heritage Commons Outlet North	Composite	0.3	0.259	3.48	0.079	0.553	190		916		3	51		478	7.1	2.5	25
7/20/2008	1:50	Heritage Commons Outlet North	Composite	0.296		1.40	0.015	0.250						9		190	12	2.5	25
8/4/2008	7:58	Heritage Commons Outlet North	Composite	0.413			0.015						6	16		400	6.2	2.5	25
8/28/2008	11:30	Heritage Commons Outlet North	Composite	0.412	0.243	3.31	0.128	1.08	112		539		14	36		345	10	1.5	39
9/8/2008	9:30	Heritage Commons Outlet North	Composite	0.531	0.327		0.015		93		494			32		327	10	1.5	22
9/11/2008	14:14	Heritage Commons Outlet North	Composite	0.940	0.396	7.54	0.015	3.26	93	8.8	482	3800	47	79		297	12	1.5	32
9/23/2008	21:33	Heritage Commons Outlet North	Composite	0.713	0.279	7.25	0.015	0.745	73	8.8	456	4000	40	74		256	10	1.5	30
10/8/2008	9:41	Heritage Commons Outlet North	Composite	0.288	0.150	2.03	0.068	0.814	73		438		3	14		216	88	1.5	26
2/10/2009	10:45	Heritage Commons Outlet North	Grab	0.683	0.368	3.99	0.541	2.06	319	8.4	1415	1900	8	44	30	712	10	5.5	86
6/16/2009	23:21	Heritage Commons Outlet North	Composite	0.211	0.136	1.50	0.089	0.25	538		1493		4	11		829	12	1.5	37
6/25/2009	22:39	Heritage Commons Outlet North	Composite	0.347	0.182	2.68	0.015	0.25	362		1306		8	24		733	9.3	1.5	26
6/27/2009	22:09	Heritage Commons Outlet North	Composite	0.290		2.74		0.772	316					18			9.7	1.5	10
8/1/2009	10:45	Heritage Commons Outlet North	Composite	0.318		3.57	0.015	0.535	318		1152			31		677	7.7	1.5	20
8/8/2009	22:55	Heritage Commons Outlet North	Composite	0.390		3.90		1.12			968			24		569	6.4	1.5	10
8/16/2009	15:19	Heritage Commons Outlet North	Composite	0.418		3.69	0.015	0.899	157		766			28		465	6.7	1.5	10
8/19/2009	15:53	Heritage Commons Outlet North	Composite	0.469	0.260	3.65	0.015	0.941	137		691		10	34		419	5	1.5	21
10/1/2009	20:04	Heritage Commons Outlet North	Composite	0.450	0.168	4.02	0.131	1.52	106		442			28		321	4.9	1.5	30
10/15/2009	13:50	Heritage Commons Outlet North	Composite	0.341	0.154	1.45	0.390	0.794	51		333		4	18		216	4.6	1.5	33
												E. coli MPN/100mL							
3/10/2010	12:30	Heritage Commons Outlet North	Grab	0.609	0.489	1.739	0.660	0.772	257	8.4		64	3	8	6	630	5.2	1.4	16
5/8/2010	7:53	Heritage Commons Outlet North	Composite	0.228			0.083	0.250	282					17	5	586	23	1.5	10
5/11/2010	21:47	Heritage Commons Outlet North	Composite	0.225	0.100	1.51	0.034	0.250	267				5	16	6	550			
6/24/2010	6:54	Heritage Commons Outlet North	Composite		0.258		0.015							30	17	316	15	1.5	32
6/25/2010	20:06	Heritage Commons Outlet North	Composite	0.585		2.25	0.154	0.845	72					86	20	220	18	14	58
7/18/2010	0:47	Heritage Commons Outlet North	Composite	0.462		1.69	0.068	0.608	36					13	9	180	12	1.5	10
8/10/2010	23:09	Heritage Commons Outlet North	Composite	0.567	0.355	2.19	0.108	0.792	27				8	24	15	169	10	1.5	10
8/24/2010	9:20	Heritage Commons Outlet North	Composite	0.415	0.270		0.071		21					14	10	173			
9/23/2010	12:51	Heritage Commons Outlet North	Composite	0.373	0.162	2.16	0.061	0.948	15				7	20	14	163	9.9	1.5	10
10/25/2010	10:35	Heritage Commons Outlet North	Composite	0.210	0.048	1.55	0.151	0.504	21				5	15	8	188	11	1.5	10
10/26/2010	17:05	Heritage Commons Outlet North	Composite	0.318	0.130	2.13	0.035	0.536	22				10	12	8	187	13	1.5	10
		Mean Outlet 2007-2010		**0.440**	**0.268**	**2.70**	**0.144**	**0.862**	**117**	**8.6**	**586**		**9**	**27**	**12**	**330**	**10.5**	**2.5**	**26**
		Mean 07 Outlet		**0.415**	**0.292**	**2.10**	**0.165**	**0.858**	**17**		**287**	**6850**	**5**	**24**		**178**	**4.8**	**2.9**	**28**
		Mean 08 Outlet		**0.519**	**0.276**	**3.78**	**0.081**	**0.993**	**100**	**8.8**	**540**	**3900**	**17**	**36**		**305**	**18**	**1.9**	**28**
		Mean 09 Outlet		**0.392**	**0.211**	**3.12**	**0.151**	**0.914**	**256**	**8.4**	**952**	**1900**	**7**	**26**	**30**	**549**	**7.6**	**1.9**	**28**
		Mean 10 Outlet		**0.399**	**0.227**	**1.90**	**0.131**	**0.612**	**102**	**8.4**		**64**	**6**	**23**	**11**	**306**	**13.0**	**2.9**	**18**

Note: "blank cells" = not collected due to limited sample volume or expired holding time.

Table 25-4. Heritage Commons and Heritage Park Pond sampled event data for 2007 – 2010 (continued).

Date	Time	Site ID & Location	Sample Type	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Field pH	Sp.Cond. μmhos/cm	F. coli cfu/100mL	cBOD mg/L	TSS mg/L	VSS mg/L	TDS mg/L	Cu μg/L	Pb μg/L	Zn μg/L
8/11/2007	23:00	Heritage Park North Outlet	Composite	0.400		2.02					304			59			17	6.0	25
8/14/2007	7:51	Heritage Park North Outlet	Composite	0.457	0.171	1.65	0.271	0.580	10		202		21	138		133	18	2.5	25
8/19/2007	21:45	Heritage Park North Outlet	Composite	0.346	0.182	1.18	0.147	0.250	13		222		3	36		158	9.3	5.6	25
8/21/2007	9:03	Heritage Park North Outlet	Composite	0.331	0.174	2.02	0.240	0.250	10		245		4	46		132	14	8.4	25
8/27/2007	7:29	Heritage Park North Outlet	Composite	0.284	0.112	1.06	0.069	0.250			194		11	38			7.4	5.7	25
8/28/2007	5:00	Heritage Park North Outlet	Composite	0.603	0.179	1.74	0.361	0.250	7		156		4	276		94	26	5.6	25
9/7/2007	6:00	Heritage Park North Outlet	Composite	0.338	0.136	1.24	0.210	0.250	17		247		6	57		148	7.6	2.5	25
9/18/2007	22:50	Heritage Park North Outlet	Composite	0.334	0.165	0.894	0.234	0.250	9		172		3	59		99	12	8.4	25
9/20/2007	23:32	Heritage Park North Outlet	Composite	0.459	0.153		0.333		4		150	8000		137		107	15	21	25
9/25/2007	14:15	Heritage Park North Outlet	Composite	0.369	0.147	1.06	0.241	0.250	11		207		5	83		129	13	14	25
10/2/2007	19:17	Heritage Park North Outlet	Composite	0.302	0.133		0.097							35		147			
10/5/2007	9:02	Heritage Park North Outlet	Composite	0.364		1.16	0.209	0.250	11		234			70		154	10	7.8	25
10/8/2007	12:46	Heritage Park North Outlet	Composite	0.394	0.244	3.18	0.113	0.250	9		254		11	35		160	10	2.5	25
10/16/2007	20:59	Heritage Park North Outlet	Composite	0.298	0.151									41					
10/19/2007	7:33	Heritage Park North Outlet	Composite	0.306		0.689	0.303	0.250	10		226			46		128	10	5.3	25
3/11/2008	14:20	Heritage Park North Outlet	Grab	0.902	0.421	3.89	0.926	1.27	1062		3680	40	15	153		2019	42	27	188
6/1/2008	19:18	Heritage Park North Outlet	Composite	0.293		1.34	0.084							16					
6/6/2008	1:42	Heritage Park North Outlet	Composite	0.200	0.144	1.06	0.015	0.597	224		1024		2	4		541	2.5	2.5	65
7/11/2008	7:03	Heritage Park North Outlet	Composite	0.333		1.60	0.193							20		245	20	2.5	62
7/12/2008	1:21	Heritage Park North Outlet	Composite	0.321		1.56	0.164							31			10	2.5	62
7/19/2008	20:06	Heritage Park North Outlet	Composite	0.465		1.65	0.015	0.250						25		398	14	2.5	25
8/28/2008	6:47	Heritage Park North Outlet	Composite	0.437	0.106	2.36	0.015	0.901	10.7		174		12	98		121	14	14	90
2/9/2009	14:35	Heritage Park North Outlet	Grab	0.589	0.196	3.84	0.677	2.30	2119	7.8	7240	700	26	41	22	3720	16	3.6	110
6/8/2009	8:10	Heritage Park North Outlet	Composite	0.502	0.347	1.89	0.160	0.726	175		714			27		400	12	3.5	53
6/17/2009	2:45	Heritage Park North Outlet	Composite	0.402	0.311	1.33	0.386	0.25	44		275		5	10		172	16	34	81
6/25/2009	10:15	Heritage Park North Outlet	Composite	0.476	0.400	2.57	0.377	0.25	46		376					232	12	1.5	51
6/27/2009	10:41	Heritage Park North Outlet	Composite	0.352		1.63		0.563	30					5			13	1.5	29
7/21/2009	12:45	Heritage Park North Outlet	Composite	0.293	0.143	1.37	0.015	0.25	27		240		12	19		152	8.5	1.5	37
8/1/2009	2:35	Heritage Park North Outlet	Composite	0.559		1.44	0.015	0.6	33		273			24		175	8.6	1.5	36
8/7/2009	10:05	Heritage Park North Outlet	Composite							7.5		35000							
8/8/2009	12:33	Heritage Park North Outlet	Composite	0.300		1.04		0.25			176			14		123	8.4	1.5	36
8/16/2009	3:37	Heritage Park North Outlet	Composite	0.303		1.73	0.015	0.25	16		213			26		153	7.4	3	32
8/19/2009	14:50	Heritage Park North Outlet	Composite	0.289	0.128	1.25	0.154	0.25	9		156		5	52		102	9.7	5.2	45
9/25/2009	16:30	Heritage Park North Outlet	Composite	0.332			0.015		33		251					182	5.9	1.5	52
10/1/2009	22:36	Heritage Park North Outlet	Composite	0.250	0.184	0.925	0.366	0.25	15		158			16		116	5.32	1.5	44
10/15/2009	13:56	Heritage Park North Outlet	Composite	0.195	0.143	0.666	0.015	0.25	25		234		15	3		138	7.1	1.5	43
												E. coli MPN/100mL							
3/2/2010	14:35	Heritage Park North Outlet	Grab	0.547	0.157	2.620	0.396	0.978	1119	6.82		17	8	79	43	1934	24.0	13	120
6/23/2010	18:32	Heritage Park North Outlet	Composite	0.378	0.235	1.230	0.416	0.250	34				6	10	4	196	8.1	1.5	47
7/4/2010	12:06	Heritage Park North Outlet	Composite	0.326		1.360	0.292	0.250	31					22	4	186	15.0	3.9	37
7/18/2010	3:19	Heritage Park North Outlet	Composite	0.544		1.180	0.335	0.250	14					78	13	98	15.0	14	43
8/10/2010	15:27	Heritage Park North Outlet	Composite	0.311		1.310	0.434	0.946	15					9	5	125	13.0	1.5	28
8/10/2010	22:58	Heritage Park North Outlet	Composite	0.264	0.124	0.986	0.227	0.250	5				2	57	16	35	13.0	9.7	45
8/31/2010	5:59	Heritage Park North Outlet	Composite	0.491	0.136	1.720	0.37	0.250	24				13	99	25	152	16.0	13	79
10/24/2010	13:27	Heritage Park North Outlet	Composite	1.220	0.817	2.980	0.015	0.250	49				23	42	24	248	15.0	6	55
10/26/2010	12:58	Heritage Park North Outlet	Composite	0.659	0.429	2.120	0.015	0.250	19				18	20	13	112	15.0	43	32
		Mean Outlet 2007-2010		**0.412**	**0.220**	**1.66**	**0.223**	**0.443**	**151**	**7.4**	**643**		**10**	**51**	**17**	**360**	**13**	**7.6**	**48**
		Mean 07 Outlet		**0.372**	**0.162**	**1.49**	**0.218**	**0.280**	**10**		**216**	**8000**	**8**	**77**		**132**	**13**	**7.3**	**25**
		Mean 08 Outlet		**0.422**	**0.224**	**1.92**	**0.202**	**0.755**	**432**		**1626**	**40**	**10**	**50**		**665**	**17**	**8.6**	**82**
		Mean 09 Outlet		**0.372**	**0.232**	**1.64**	**0.200**	**0.516**	**214**	**7.7**	**859**	**17850**	**12**	**21**	**22**	**472**	**10**	**4.7**	**50**
		Mean 10 Outlet		**0.527**	**0.316**	**1.72**	**0.278**	**0.408**	**146**	**6.8**		**17**	**12**	**46**	**16**	**343**	**15**	**11.7**	**54**

Note: "blank cells" = not collected due to limited sample volume or expired holding time.

Table 25-5. Concentration statistics for Heritage Commons and Heritage Park Pond in 2007- 2010.

Site ID & Location	Sample	TP	TDP	TKN	NO_3NO_2	NH_3	Cl	Field	Sp.Cond.	F. coli/E.coli	cBOD	TSS	VSS	TDS	Cu	Pb	Zn
2007-2010	**Type**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**pH**	**µmhos/cm**	**cfu/100mL**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**
Heritage Commons Outlet North	**MEAN**	0.440	0.268	2.70	0.144	0.862	117	8.6	586		9	27	12	330	10	2.5	26
Heritage Commons Outlet North	**MEDIAN**	0.413	0.265	2.19	0.086	0.759	68	8.6	449		5	22	9	237	7.4	1.5	25
Heritage Commons Outlet North	**STDEV**	0.172	0.117	1.45	0.163	0.637	130	0.2	380		10	18	7	196	13	2.2	15
Heritage Commons Outlet North	**MAXIMUM**	0.940	0.624	7.54	0.660	3.26	538	8.8	1493		47	86	30	829	88	14	86
Heritage Commons Outlet North	**MINIMUM**	0.210	0.048	1.31	0.015	0.250	8	8.4	236		2	7	5	26	2.5	1.4	10
Heritage Commons Outlet North	**NUMBER**	41	32	37	40	38	38	4	28		30	42	12	41	40	40	40
Heritage Park North Outlet	**MEAN**	0.412	0.220	1.66	0.223	0.443	151	7.4	643		10	51	17	360	13.1	7.6	48
Heritage Park North Outlet	**MEDIAN**	0.349	0.165	1.41	0.210	0.250	17	7.5	234		8	37	15	152	13.0	3.9	37
Heritage Park North Outlet	**STDEV**	0.183	0.148	0.774	0.195	0.414	426	0.5	1456		7	51	12	699	6.6	9.2	33
Heritage Park North Outlet	**MAXIMUM**	1.22	0.817	3.89	0.926	2.30	2119	7.8	7240		26	276	43	3720	42	43	188
Heritage Park North Outlet	**MINIMUM**	0.195	0.106	0.666	0.015	0.250	4	6.8	150		2	3	4	35	2.5	1.5	25
Heritage Park North Outlet	**NUMBER**	44	29	40	40	36	35	3	28		23	42	10	38	41	41	41

26. Minnehaha Creek at Xerxes Avenue Monitoring Station

Background

Minnehaha Creek originates at Lake Minnetonka and discharges into the Mississippi River below Minnehaha Falls (**Figure 26-1**). The creek carries significant amounts of stormwater from upstream suburban communities between Lake Minnetonka and Minneapolis. Approximately one third of Minnehaha Creek is located within Minneapolis.

Since 1999 the MPRB, City of Minneapolis, and Metropolitan Council Environmental Services (MCES) have partnered together to monitor the creek using a WOMP station near the end of the creek (see chapter 23 for more information on the Minnehaha Creek WOMP station). In 2009, the City of Minneapolis and MPRB added another monitoring station where Xerxes Avenue South crosses Minnehaha Creek (**Figure 26-2**).

The water in Minnehaha Creek at Xerxes has three main sources. The first is runoff from the immediate watershed. The second is runoff between Lake Minnetonka and Xerxes. Finally, Gray's Bay dam discharges intermittently into Minnehaha Creek. This source is intermittent because the outlet from Lake Minnetonka into the creek is adjustable so discharge rates vary.

Figure 26-1. Map of Minnehaha Creek showing Gray's Bay Dam, the sole outlet from Lake Minnetonka. Also shown are the two stations monitored by MPRB – Xerxes and the WOMP station.

Methods

To monitor the creek, an ISCO 4150 datalogger was programmed with Flowlink 5.1 coupled with an A/V level probe. The sampler was a flow paced ISCO 3700 equipped with 24 one liter bottles, 3/8" vinyl tubing, and an intake strainer. The sampler was programmed to take four flow-paced samples per bottle. Both the level probe and intake strainer were armored in flexible metal conduit and anchored to the northwest upstream Xerxes bridge abutment (**Figure 26-3**).

Stage readings were checked against tape downs from a consistent point in the middle of the bridge and a staff gauge. From the tape down point on the bridge to the stream bed is 18.00 ft, so 18 feet minus the distance from the bridge to the water will give the water depth (stage). The staff gauge reading minus 4.00

equals the stream depth in feet.

The level feature of the A/V probe was used to obtain stage. Initially discharge was calculated with a weir discharge equation approximating the relatively flat stream bottom and the Xerxes bridge vertical cement wall restrictions as a broad crested weir with end contractions. Later enough stage/discharge readings were developed by stream gauging a datalogger to develop a look-up table with a rating curve. The MPRB has been building a rating curve using standard methodology and a Marsh McBirney Flowmate™ velocity meter. The MPRB continued to add to the stage/discharge rating curve in 2010, gauging the stream several times at different stages.

Figure 26-2. Photo of the Xerxes monitoring station section of Minnehaha Creek. You can see the staff gauge as a vertical white line in the middle right. Samples are collected through an intake valve located on the left side of the photograph.

Figure 26-3. **Left:** Doghouse installation with sampler and datalogger. **Right:** Close up of intake strainer and level probe anchored to the northwest bridge abutment.

RESULTS & DISCUSSION

2010 was the second year of comprehensive monitoring at the Xerxes-Minnehaha Creek station. Stream stage (level) and discharge (cubic feet per second (cfs)) were highly correlated and fluctuated widely over the sampling season (**Figure 26-4**). The average stage was about two feet, but in early August and late September the creek reached a stage of over three feet. Unlike 2009, the creek bed never went dry in 2010. The lowest level recorded was roughly 17 inches.

The peaks in the graph were related to precipitation. Most of the storms are characterized by a sharp peak from the immediate watershed, followed by a sustained pulse of water from the larger watershed that can last two to four days (**Figure 26-4**).

At the end of the season, there was a large drop-off in both level and discharge (**Figure 26-4**). This is likely caused by Gray's Bay Dam closing for the season, cutting off discharge from the Lake Minnetonka headwaters.

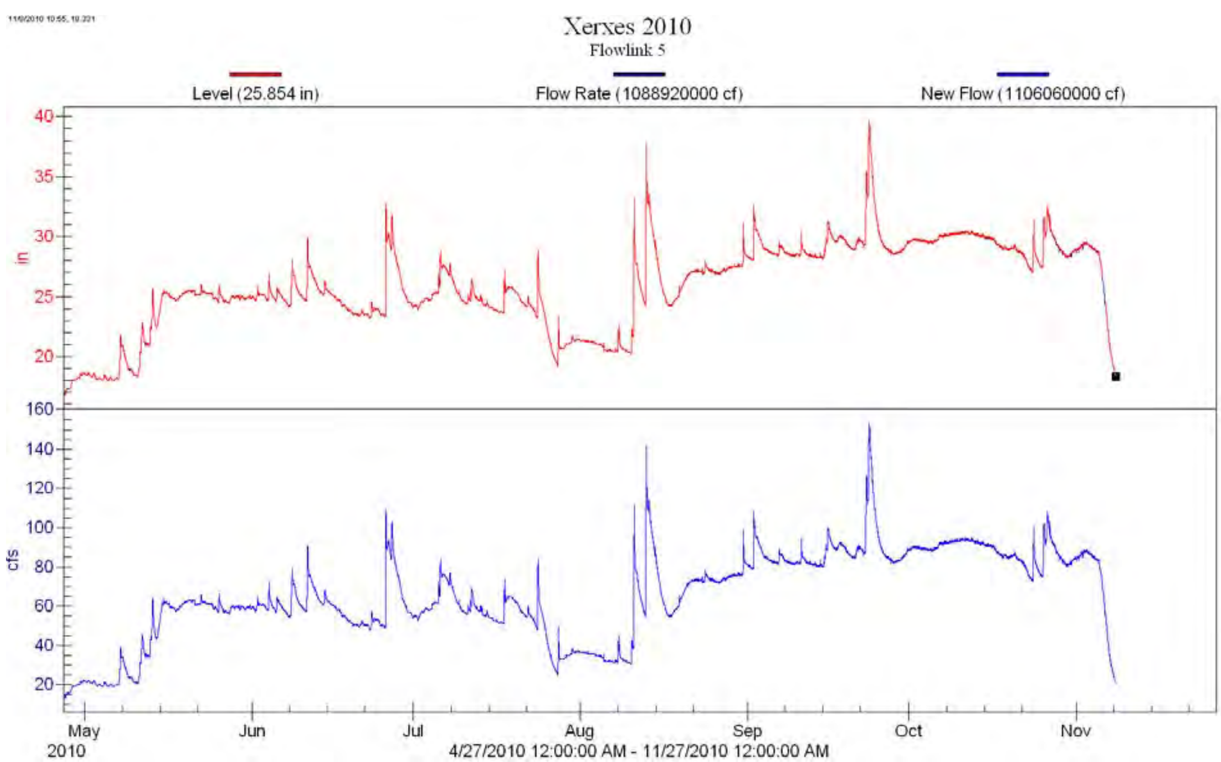

Figure 26-4. 2010 stage discharge graph of the Minnehaha Creek Xerxes monitoring station from late April to November. The (top) red line represents stage data (in), and the (bottom) blue line depicts discharge (cubic feet per second). Data were edited to take out unreasonable fluctuations that were likely due to interference of the level probe, and then discharge was calculated based on the level data (new flow).

In 2010 one snowmelt event and five storms of varying intensity (minimum 0.18 in, maximum 2.32 in storm) were captured throughout the sampling season (**Table 26-1**). The events were triggered on both stage and volume. The samplers were multiplexed and flow paced to capture the entire hydrograph. After precipitation ceased, the hydrograph continued to be high for 2-3 days due to the large watershed draining (**Table 26-1**).

Table 26-1. Six precipitation events were captured at Minnehaha Creek at Xerxes in 2010. A precipitation event is defined as greater than 0.10 inches, separated by eight hours or more from other precipitation. If the sample exceeded holding time, some parameters (e.g. TDP, cBOD) were dropped from analysis.

Event	Storm Start (Date, Time)	Storm End (Date, Time)	Last Xerxes Sample Collected	Precip (in)	Sample Type	Full sampling?
+1	3/10/10	N/A		N/A	grab	X
2	5/10/10 18:45	5/11/10 18:30	5/12/10 8:55	0.63	composite	X
3	6/26/10 20:30	6/26/10 23:45	6/28/10 8:49	0.36	composite	X
4	7/22/10 2:30	7/22/10 8:00	7/24/10 10:49	0.18	composite	X (lmtd)
5	7/22/10 20:00	7/27/10 20:45	7/27/10 22:39	0.52	composite	X (lmtd)
6	9/22/10 16:00	9/23/10 20:00	9/24/10 22:24	2.32	composite	X (lmtd)

+: snowmelt event
X: all parameters sampled
X (lmtd): holding time exceeded, so event sampled with limited parameters

Table 26-2 shows the raw data as reported. **Table 26-3** and **Table 26-4** show baseflow and event water chemistry statistics for each data set. The yellow cells highlighted are the less than values which were entered as half of the less than value for statistical analysis.

Table 26-2. Minnehaha Creek at Xerxes water chemistry data for precipitation events (Xerxes MHC - Composite) and baseflow (Xerxes Baseflow - Grab) in 2010. Blank cells indicate that samples exceeded holding time so time sensitive parameters such as TDP and cBOD were dropped or there was insufficient volume collected to run all of the parameters. Cells with "less than" values indicate that the concentration of that parameter was below detection limit.

Date	Time	Site Location	Type	TP (mg/L)	TDP (mg/L)	TKN (mg/L)	NO_3/NO_2 (mg/L)	NH_3 (mg/L)	Cl (mg/L)	Hardness (mg/L)	TSS (mg/L)	VSS (mg/L)	TDS (mg/L)	cBOD (mg/L)	*E. coli* (MPN/100mL)	Cu (µg/L)	Pb (µg/L)	Zn (µg/L)	pH (units)	Cond. (µhmos)
3/10/2010	12:00	Xerxes MHC	Grab	0.331	0.120	2.310	0.413	1.200	381	188	55.9	23.6	792	4.32	613	12	6.4	70	7.71	
5/12/2010	8:55	Xerxes MHC	Composite	0.058	0.018	0.790	0.069	<0.500	125	172	8.8	<2.0	337	2.08		12	<3	29		
6/17/2010	11:20	Xerxes Baseflow	Grab	0.057	0.039	0.772	0.035	0.670	85	160	2.4	<2.0	312	<1.00	86	49.25	<3	<20	7.69	
6/28/2010	8:49	Xerxes MHC	Composite	0.106	0.041	0.742	0.073	<0.500	67	136	28.5	5.5	209	<1.00		9	<3	<20		
7/23/2010	9:45	Xerxes Baseflow	Grab	0.066	0.037	0.888	0.114	<0.500	76	160	9	5	270	<1.00	142	<5	<3	<20	6.71	
7/24/2010	10:49	Xerxes MHC	Composite	0.121		0.940	0.168	<0.500	66	136	34.9	10.4	226			9.7	<3	<20		
7/27/2010	22:39	Xerxes MHC	Composite	0.138		0.940	0.151	<0.500	71	148	30.8	10	226			9.7	<3	<20		
8/5/2010	10:10	Xerxes Baseflow	Grab	0.060	0.032	0.824	0.083	<0.500	91	164	5.5	<2.0	299	<1.00	192	<5	<3	<20	6.63	
9/22/2010	14:15	Xerxes Baseflow	Grab	0.043	0.023	0.824	0.046	<0.500	67	148	3.7	<2.0	249	<1.00		<5	<3	<20		
9/24/2010	22:24	Xerxes MHC	Composite	0.088		0.858	0.094	<0.500	56	116	22.8	8.4	190			11	<3	22		
10/1/2010	13:00	Xerxes Baseflow	Grab	0.039	0.019	0.587	0.040	<0.500	71	156	3.8	2.1	259	<1.00		<5	<3	<20		
11/4/2010	13:15	Xerxes Baseflow	Grab	0.032	0.014	1.030	<0.030	0.580	54	172	3.8	2.0	261	<1.00	40	<5	<3	<20	6.29	396
12/2/2010	13:00	Xerxes Baseflow	Grab	0.048	0.027	2.170	0.260	2.040	267	284	4.4	2.4	643	<1.00	260	5.5	<3	<20	7.84	614

Table 26-3. Minnehaha Creek at Xerxes baseflow data showing water chemistry data collected during normal stream flow. Values highlighted in yellow were "less than data" transformed into half the reporting limit for statistical calculations (e.g. Pb <3 becomes 1.5).

Date	Time	Site Location	Type	TP (mg/L)	TDP (mg/L)	TKN (mg/L)	NO_3/NO_2 (mg/L)	NH_3 (mg/L)	Cl (mg/L)	Hardness (mg/L)	TSS (mg/L)	VSS (mg/L)	TDS (mg/L)	cBOD (mg/L)	*E. coli* (MPN/100mL)	Cu (µg/L)	Pb (µg/L)	Zn (µg/L)	pH (units)	Cond. (µhmos)
6/17/2010	11:20	Xerxes Baseflow	Grab	0.057	0.039	0.772	0.035	0.670	85	160	2.4	1	311.5	0.5	86	49.25	1.5	10.0	7.69	
7/23/2010	9:45	Xerxes Baseflow	Grab	0.066	0.037	0.888	0.114	0.250	76	160	9	5	270	0.5	142	2.5	1.5	10.0	6.71	
8/5/2010	10:10	Xerxes Baseflow	Grab	0.060	0.032	0.824	0.083	0.250	91	164	5.5	1	299	0.5	192	2.5	1.5	10.0	6.63	
9/22/2010	14:15	Xerxes Baseflow	Grab	0.043	0.023	0.824	0.046	0.250	67	148	3.7	1	249	0.5		2.5	1.5	10.0		
10/1/2010	13:00	Xerxes Baseflow	Grab	0.039	0.019	0.587	0.040	0.250	71	156	3.8	2.1	258.5	0.5		2.5	1.5	10.0		
11/4/2010	13:15	Xerxes Baseflow	Grab	0.032	0.014	1.030	0.015	0.580	54	172	3.8	2.0	261	0.5	40	2.5	1.5	10.0	6.29	396
12/2/2010	13:00	Xerxes Baseflow	Grab	0.048	0.027	2.170	0.260	2.040	267	284	4.4	2.4	643	0.5	260	5.5	1.5	10.0	7.84	614
			mean	0.049	0.027	1.014	0.085	0.613	102	178	4.7	2.1	327.4	0.5	144	9.6	1.5	10.0	7.03	505
			median	0.048	0.027	0.824	0.046	0.250	76	160	3.8	2.0	270.0	0.5	142	2.5	1.5	10.0	6.71	505
			stdev	0.0122	0.0093	0.5269	0.084	0.654	74	47	2.1	1.4	141.0	0.0	87	17.5	0.0	0.0	0.69	154
			max	0.066	0.039	2.170	0.260	2.040	267	284	9.0	5.0	643.0	0.5	260	49.3	1.5	10.0	7.84	614
			min	0.032	0.014	0.587	0.015	0.250	54	148	2.4	1.0	249.0	0.5	40	2.5	1.5	10.0	6.29	396
			number	7	7	7	7	7	7	7	7	7	7	7	5	7	7	7	5	2

Table 26-4. Minnehaha Creek at Xerxes precipitation event water chemistry data showing concentrations during or after a major precipitation event (defined as more than 0.10 inches). Values highlighted in yellow were “less than data” transformed into half the reporting limit for statistical calculations (e.g. Pb <3 becomes 1.5). *E. coli* and pH were excluded from statistics due to only having one value.

Date	Time	Site Location	Type	TP (mg/L)	TDP (mg/L)	TKN (mg/L)	NO_3/NO_2 (mg/L)	NH_3 (mg/L)	Cl (mg/L)	Hardness (mg/L)	TSS (mg/L)	VSS (mg/L)	TDS (mg/L)	cBOD (mg/L)	*E. coli* (MPN/100mL)	Cu (µg/L)	Pb (µg/L)	Zn (µg/L)	pH (units)
3/10/2010	12:00	Xerxes MHC	Grab	0.331	0.120	2.310	0.413	1.200	381	188	56	24	792	4.32	613	12	6.4	70	7.71
5/12/2010	8:55	Xerxes MHC	Composite	0.058	0.018	0.790	0.069	0.250	125	172	9	1	337	2.08		12	1.5	29	
6/28/2010	8:49	Xerxes MHC	Composite	0.106	0.041	0.742	0.073	0.250	67	136	29	6	209	0.50		9	1.5	10	
7/24/2010	10:49	Xerxes MHC	Composite	0.121		0.940	0.168	0.250	66	136	35	10	226			10	1.5	10	
7/27/2010	22:39	Xerxes MHC	Composite	0.138		0.940	0.151	0.250	71	148	31	10	226			10	1.5	10	
9/24/2010	22:24	Xerxes MHC	Composite	0.088		0.858	0.094	0.250	56	116	23	8	190			11	1.5	22	
			mean	0.140	0.060	1.097	0.161	0.408	128	149	30	10	330	2.30		11	2.3	25	
			median	0.114	0.041	0.899	0.123	0.250	69	142	30	9	226	2.08		10	1.5	16	
			stdev	0.097	0.054	0.600	0.130	0.388	126	26	15	8	232	1.92		1	2.0	23	
			max	0.331	0.120	2.310	0.413	1.200	381	188	56	24	792	4.32		12	6.4	70	
			min	0.058	0.018	0.742	0.069	0.250	56	116	9	1	190	0.50		9	1.5	10	
			number	6	3	6	6	6	6	6	6	6	6	3	1	6	6	6	1

Throughout the sampling season a total of seven baseflow samples were taken to determine background conditions in the stream (without stormwater impacts). In 2010 six flow weighted runoff events were collected (**Table 26-2**). On 3/10/10, a snowmelt *E. coli* grab sample was collected. The *E. coli* concentration was approximately 350 organisms per MPN/100 mL greater than on any other date (**Table 26-2**). This is likely due to animal waste being washed into the stream with snowmelt.

Baseflow conditions in the stream were markedly different from precipitation conditions (**Tables 26-3, 26-4**). Baseflow samples often had much lower concentrations of nutrients and metals than storm samples. Lead (Pb), zinc (Zn), and biological oxygen demand (cBOD) were all below the detection limit, and ammonia (NH_3), copper (Cu), and volatile suspended solids (VSS) were often below the detection limit in baseflow samples (**Table 26-3**). All of the other chemical parameters stayed relative stable throughout the sampling season, until December when total Kjeldahl nitrogen (TKN), nitrates and nitrites (NO_3NO_2), chlorides (Cl), hardness, total dissolved solids (TDS), pH, and conductivity all spiked. For three of the four days prior to collecting the 12/2/10 baseflow sample, temperatures were above freezing. This suggests that these odd values were likely due to a smaller mid-winter snowmelt event.

For most events snowmelt had the highest water chemistry values seen in 2010. This is especially true for TKN, NO_3NO_2, NH_3, Cl, hardness, TDS, *E. coli*, Pb, and Zn (**Table 26-4**). Spring snowmelt is a unique event in that pollutants accumulated over 4 to 5 months are released over a short period of time. The spring snowmelt was the only time that Pb was above detection, Cl was ~250 mg/L higher than other dates (excluding the mini-snowmelt in December), and Zn was ~40 µg/L higher than any other date. After snowmelt, precipitation events were characterized by elevated Cu, Zn, TP, NO_3/NO_2, and TSS values (**Tables 26-3, 26-4**).

Chloride values were relatively high during the whole sampling season (**Table 26-2**). The source of low level chronic Cl in Minnehaha Creek is likely caused by winter road salt (NaCl) continuously leaching from the upstream soils. The MPCA chronic stream chloride standard is 230 mg/L for four days and an acute standard of 860 mg/L for 1 hour. The two snowmelts (March and December) were above the 230 standard, but the other values were well below the chronic stream standard.

After three to five years of data collection at Xerxes, it will be possible to compare Minnehaha Creek at Xerxes to the Minnehaha Creek WOMP station data. Baseflow grab and composite storm sampling will continue in 2011. It is important to understand both background and year to year variations in stream chemistry.

2010 ANNUAL POLLUTANT LOADINGS BY RECEIVING WATER

2010 ANNUAL POLLUTANT LOADINGS BY RECEIVING WATER - KILOGRAMS PER YEAR (estimated using FLUX)

WATERSHED	RUNOFF	AREA	BOD	TSS	TDS	TKN	NH3-N	NO2-NO3	TP	TDP	Cu	Pb	Zn
	COEFF.		mg\l	mg\l	mg\l	mg\l	mg\l	mg\l	mg\l	mg\l	mg\l	mg\l	mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7.00	107	124	1.53	0.670	0.414	0.341	0.063	0.023	0.024	0.100
Mississippi River (Minneapolis)	0.46	18077	167,463.3	2,559,795.5	2,966,491.9	36,602.7	16,028.6	9,904.3	8,157.9	1,507.2	550.2	574.2	2,392.3
Shingle Creek	0.44	1365	12,144.5	185,637.8	380,230.2	2,654.4	1,162.4	718.3	591.6	109.3	39.9	41.6	173.5
Ryan Lake (Minneapolis)	0.45	49	450.7	6,889.6	14,111.6	98.5	43.1	26.7	22.0	4.1	1.5	1.5	6.4
Bassett Creek	0.44	2293	20,297.7	310,265.3	635,496.9	4,436.5	1,942.8	1,200.5	988.8	182.7	66.7	69.6	290.0
New Bassett Creek Tunnel	0.45	219	1,977.5	30,227.4	61,913.0	432.2	189.3	117.0	96.3	17.8	6.5	6.8	28.2
Brownie Lake (Minneapolis)	0.45	34	305.3	4,666.9	9,559.0	66.7	29.2	18.1	14.9	2.7	1.0	1.0	4.4
Cedar Lake (Minneapolis)	0.38	224	1,693.0	25,878.7	53,005.7	370.0	162.0	100.1	82.5	15.2	5.6	5.8	24.2
Lake of the Isles	0.42	760	6,442.8	98,482.3	201,715.1	1,408.2	616.7	381.0	313.9	58.0	21.2	22.1	92.0
Lake Calhoun (Minneapolis)	0.46	1249	11,493.5	175,686.6	359,847.8	2,512.2	1,100.1	679.8	559.9	103.4	37.8	39.4	164.2
Cemetary Lake	0.60	205	2,449.8	37,447.6	76,701.7	535.5	234.5	144.9	119.3	22.0	8.0	8.4	35.0
Sanctuary Pond	0.60	68	816.1	12,475.2	25,552.1	178.4	78.1	48.3	39.8	7.3	2.7	2.8	11.7
Lake Harriet	0.46	863	8,042.2	122,930.4	251,790.6	1,757.8	769.8	475.6	391.8	72.4	26.4	27.6	114.9
Hart Lake (Minneapolis)	0.55	3	31.8	485.4	994.3	6.9	3.0	1.9	1.5	0.3	0.1	0.1	0.5
Silver Lake (Minneapolis)	0.44	28	248.6	3,800.8	7,784.9	54.3	23.8	14.7	12.1	2.2	0.8	0.9	3.6
Crystal Lake (Minneapolis)	0.45	469	4,250.2	64,967.2	133,068.1	929.0	406.8	251.4	207.0	38.3	14.0	14.6	60.7
Legion Lake (Minneapolis)	0.45	49	447.3	6,836.7	14,003.2	97.8	42.8	26.5	21.8	4.0	1.5	1.5	6.4
Richfield Lake (Minneapolis)	0.32	715	4,602.5	70,351.9	144,097.3	1,006.0	440.5	272.2	224.2	41.4	15.1	15.8	65.7
Minnehaha Creek	0.44	3213	28,520.3	435,953.8	892,936.7	6,233.7	2,729.8	1,686.8	1,389.3	256.7	93.7	97.8	407.4
Diamond Lake	0.47	685	6,420.9	98,147.7	201,029.8	1,403.4	614.6	379.7	312.8	57.8	21.1	22.0	91.7
Lake Nokomis	0.40	620	5,008.1	76,552.9	156,798.5	1,094.6	479.3	296.2	244.0	45.1	16.5	17.2	71.5
Taft Lake	0.37	100	736.4	11,257.1	23,057.3	161.0	70.5	43.6	35.9	6.6	2.4	2.5	10.5
Mother Lake (Minneapolis)	0.48	49	475.0	7,260.4	14,871.0	103.8	45.5	28.1	23.1	4.3	1.6	1.6	6.8
Unnamed Wetland W of Mother Lake	0.41	41	335.5	5,127.9	10,503.2	73.3	32.1	19.8	16.3	3.0	1.1	1.2	4.8
Lake Hiawatha	0.46	1008	9,312.6	142,349.9	291,566.4	2,035.5	891.4	550.8	453.7	83.8	30.6	31.9	133.0
Birch Pond	0.10	31	62.7	958.4	1,963.1	13.7	6.0	3.7	3.1	0.6	0.2	0.2	0.9
Powderhorn Lake	0.46	286	2,648.7	40,487.7	82,928.4	578.9	253.5	156.7	129.0	23.8	8.7	9.1	37.8
Grass Lake	0.46	386	3,554.9	54,338.6	111,298.4	777.0	340.3	210.2	173.2	32.0	11.7	12.2	50.8
Unnamed Wetland on Hwy 62	0.47	17	160.2	2,448.4	5,015.0	35.0	15.3	9.5	7.8	1.4	0.5	0.5	2.3
Unnamed Wetland on Ewing Ave S	0.47	22	204.3	3,122.4	6,395.4	44.6	19.6	12.1	10.0	1.8	0.7	0.7	2.9
ANNUAL TOTAL KILOGRAMS - Minneapolis		33,127.7	300,596.4	4,594,830.6	7,134,726.7	65,701.8	28,771.4	17,778.1	14,643.3	2,705.4	987.7	1,030.6	4,294.2

National Weather Service, Annual Precipitation =32.89 inches 0.84 meters

Appendix A7, Part A: 2010 Annual Pollutant Loadings by Receiving WAter
Source Minneapolis Park and Recreation Board

ESTIMATES OF ANNUAL AND SEASONAL POLLUTANT LOADS

Statistics for event mean concentrations were calculated using Microsoft Excel spreadsheets. FLUX32 and P8 were used to calculate flow-weighted mean concentrations and snowmelt runoffs respectively.

All flow weighted mean concentrations were calculated using the model FLUX32. FLUX32 calculates total mass discharge and associated error statistics based on six different calculation methods. Calculation methods 1-Direct Mean Loading and 5-Regression, Second-Order were ignored because they are inappropriate for storm sewer applications where the daily flow file contains a significant number of zero flows (Bruce Wilson, personal communication, 2001). Sample concentrations and associated daily average flows were used as input for these calculations. In order to achieve the most accurate and precise results, the data was often stratified by flow or by season.

The model P8 was used to calculate daily flows for the snowmelt events during January through April. Daily temperature and hourly precipitation files obtained from the National Oceanic and Atmospheric Administration (NOAA) National Data Center (NNDC) were used as input for P8.
2009 was the first year FLUX32 was used.

A description of FLUX32 as described in the help menu (US Army Corps, 2009):

> The theory and the file formats described in this original manual, as well as much of the software's operation and menu structure is still applicable to Flux.
>
> This version of FLUX for the Win32 environment is a major revision to the original DOS/FORTRAN program authored by William W. Walker Ph.D.
>
> Flux32 is interactive software designed for use in estimating the transport (load) of nutrients or other water quality constituents past a tributary sampling station over a given period of time.
> The basic approach of Flux32 is to use several calculation techniques to map the flow/concentration relationship developed (modeled) from the sample record onto the entire flow record. This provides an estimate of total mass transport for the whole period of study with associated error statistics. Note that this approach does NOT focus on estimating changes in loads over time (i.e. time series).
>
> An important option within Flux32 is the ability to stratify the data into groups based upon flow, date, and/or season. This is a key feature of the FLUX approach and one of its greatest strengths. In many (most) cases, stratifying the data increases the accuracy and precision of loading estimates.

A description of P8 as described in the software's introduction:

> "P8 is a model for predicting the generation and transport of stormwater runoff pollutants in small urban catchments. Simulations are driven by hourly rainfall and daily air-temperature time series."

The following formula was used to calculate the total annual pollutant load. Conversion factors were used to convert acres to square meters and adjust units for concentration.

$$L = \left[(P)\ (Pj)\ (Rv)\ (C/1000)\ (A*4046.9)\right]$$

where: L = seasonal pollutant load, kilograms/season
P = seasonal precipitation, inches/season (meters/season)
Pj = correction factor for storms which do not produce runoff = 0.85
Rv = runoff coefficient
C = median event mean concentration of pollutants, mg/L
A = area, acres
Conversion factors 4046.9 for acres to square meters
1000 for liters to cubic meters

The flow weighted mean concentration (FWMC) expressed as a mean of all sites was used for the annual load estimation calculations as it most accurately reflects storm water loadings on an annual basis. The seasonal loadings were calculated from the pooled data using the median event mean concentration as there were too few data points from each watershed to use FLUX32 to determine with a reasonable degree of accuracy a seasonal FWMC for each site. The median of the data set is a better representation of the runoff data than the mean values (Bannerman et al., 1992). The annual load and a summation of the seasonal loads will not be equal due to this difference in calculation methods.

Seasonal loads were calculated on the following basis.

Season	Inclusive dates	Precipitation for period
Winter/snowmelt	01/01/10 – 03/31/10	1.89 inches (0.048 m)
Spring	04/01/10 – 05/31/10	4.82 inches (0.122 m)
Summer	06/01/10 – 08/31/10	14.19 inches (0.360 m)
Fall	09/01/10 – 12/31/10	11.99 inches (0.305 m)

$$L = \left[(P)\ (Pj)\ (Rv)\ (C/1000)\ (A*4046.9)\right]$$

where: L = seasonal pollutant load, kilograms/season
P = seasonal precipitation, inches/season (meters/season)
Pj = correction factor for storms which do not produce runoff = 0.85
Rv = runoff coefficient
C = median event mean concentration of pollutants, mg/L
A = area, acres
Conversion factors 4046.9 for acres to square meters
1000 for liters to cubic meters

Flow–weighted mean concentrations and related statistics for NPDES parameters in 2010.

Site	TP (mg/L)	TDP (mg/L)	TKN (mg/L)	NH_3 (mg/L)	NO_3NO_2 (mg/L)	Cl* (mg/L)	cBOD (mg/L)	TSS (mg/L)	TDS* (mg/L)	Cu (µg/L)	Pb (µg/L)	Zn (µg/L)
6	0.443	0.075	1.74	0.787	0.273	140	10	118	296	22	65	116
7	0.177	0.045	1.08	0.589	0.444	51	4	56	50	24	10	89
8a	0.282	0.076	1.46	0.617	0.352	6	7	54	30	11	4	40
9	0.460	0.058	1.84	0.671	0.585	43	9	201	118	34	16	153
MEAN	**0.341**	**0.063**	**1.53**	**0.67**	**0.414**	**60**	**7**	**107**	**124**	**23**	**24**	**100**
MEDIAN	**0.3625**	**0.066**	**1.60**	**0.64**	**0.398**	**47**	**8**	**87**	**84**	**23**	**13**	**103**
STANDEV	**0.135**	**0.015**	**0.340**	**0.088**	**0.134**	**57**	**2**	**69**	**121**	**9**	**28**	**48**

* Flow–weighted mean concentrations for Cl and TDS were difficult to estimate using FLUX32 due to large outliers from the two snowmelt samples; these estimates should be used with caution.

STANDEV= standard deviation.

Statistical summary for event mean concentrations by season in 2010. Statistics were calculated from all sites (6-9). STDEV= standard deviation, COV= coefficient of variance.

2010 Season	Statistical Function	TP mg/L	TDP mg/L	TKN mg/L	NO_3NO_2 mg/L	NH_3 mg/L	Cl mg/L	Hardness mg/L	TSS mg/L	VSS mg/L	TDS mg/L	cBOD mg/L	E. coli MPN/100mL	Cu ug/L	Pb ug/L	Zn ug/L
SNOWMELT (February-March)	**MEAN (geometric)**	0.455	0.037	2.21	0.612	0.698	345	81	131	55	954	9	7	37	26	165
	MEAN (arithmetic)	0.655	0.041	2.64	0.811	0.738	1897	104	240	98	2967	11	1089	50	84	318
	MAX	1.55	0.072	4.91	1.97	1.09	3607	168	604	256	5618	19	4352	110	290	870
	MIN	0.126	0.023	0.849	0.346	0.504	1	20	17	9	15	4	1	13	5	30
	MEDIAN	0.473	0.034	2.40	0.463	0.620	1990	114	170	64	3117	10	1	38	21	185
	STDEV	0.620	0.021	1.69	0.779	0.310	1479	63	253	108	2295	6	2176	42	138	380
	NUMBER	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4
	COV	0.947	0.527	0.638	0.961	0.420	0.8	1	1	1	1	1	2	0.9	1.6	1.2
SPRING (April-May)	**MEAN (geometric)**	0.346	0.052	1.84	0.296	0.594	5	27	79	28	60	10		24	16	96
	MEAN (arithmetic)	0.418	0.085	2.03	0.401	0.694	10	30	101	32	67	11		28	21	132
	MAX	0.751	0.345	4.17	0.798	1.56	56	72	262	55	215	32		70	55	600
	MIN	0.110	0.023	0.801	0.015	0.250	1	16	18	9	19	3		8	3	21
	MEDIAN	0.461	0.067	1.83	0.407	0.626	4	28	97	38	57	9		28	15	120
	STDEV	0.213	0.090	0.962	0.233	0.327	15	16	67	15	49	9		16	18	137
	NUMBER	15	11	13	15	15	15	14	15	15	15	10		15	15	15
	COV	0.511	1.07	0.473	0.581	0.471	1.5	1	1	0.5	1	1		0.5	0.9	1.0
SUMMER (June-August)	**MEAN (geometric)**	0.290	0.073	1.69	0.343	0.499	3	28	87	26	41	7	7456	23	13	79
	MEAN (arithmetic)	0.355	0.095	2.00	0.425	0.569	6	30	124	33	52	14	8712	26	25	102
	MAX	1.10	0.33	7.24	1.00	1.23	22	60	325	78	129	103	15531	50	130	230
	MIN	0.041	0.022	0.606	0.015	0.250	1	13	16	5	12	2	4106	10	2	10
	MEDIAN	0.311	0.069	1.79	0.415	0.580	1	30	109	34	36	5	6499	25	14	100
	STDEV	0.232	0.082	1.46	0.227	0.288	7	14	94	21	38	28	6025	11	31	61
	NUMBER	19	13	18	19	18	19	19	19	19	19	12	3	19	19	19
	COV	0.655	0.861	0.731	0.533	0.506	1.2	0.4	1	1	1	2	1	0.4	1.2	0.6
FALL (Sept-Nov)	**MEAN (geometric)**	0.322	0.098	1.14	0.154	0.359	3	28	38	18	37	5	5893	15	5	47
	MEAN (arithmetic)	0.497	0.236	1.36	0.245	0.403	5	30	47	21	41	8	21554	16	7	57
	MAX	2.41	1.40	2.60	0.493	0.884	11	40	128	38	64	25	111990	29	20	110
	MIN	0.121	0.027	0.250	0.015	0.250	1	13	11	8	15	2	2119	7	2	10
	MEDIAN	0.290	0.064	1.08	0.285	0.250	5	32	42	18	34	4	4229	16	5	54
	STDEV	0.634	0.442	0.751	0.175	0.220	4	9	33	12	19	8	44318	6	6	35
	NUMBER	12	9	10	10	10	10	11	10	10	9	7	6	11	11	11
	COV	1.28	1.87	0.551	0.715	0.548	0.8	0.3	1	1	0.5	1	2	0.4	0.8	0.6

Supporting Documents

Bannerman, R.T., D.W. Owens, R. Dodds, and P. Hughes. 1992. Sources of Pollutants in Wisconsin Stormwater. WI Dept. of Natural Resources, Madison, WI.

Walker, W. W., 1996. *Simplified Procedures for Eutrophication Assessment and Prediction: User Manual*. Instruction Report W-96-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
10-010	0.43	113.55	985.4	15,062.8	17,456.0	215.4	94.3	58.3	48.0	8.9	3.2	3.4	14.1
10-020	0.45	7.81	70.7	1,080.6	1,252.3	15.5	6.8	4.2	3.4	0.6	0.2	0.2	1.0
10-030	0.10	4.05	8.1	124.5	144.3	1.8	0.8	0.5	0.4	0.1	0.0	0.0	0.1
10-040	0.45	167.42	1,505.0	23,004.6	26,659.5	328.9	144.0	89.0	73.3	13.5	4.9	5.2	21.5
10-050	0.46	114.18	1,045.5	15,981.5	18,520.6	228.5	100.1	61.8	50.9	9.4	3.4	3.6	14.9
10-060	0.60	10.5	126.7	1,937.1	2,244.9	27.7	12.1	7.5	6.2	1.1	0.4	0.4	1.8
10-070	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-080	0.38	30.66	235.7	3,602.6	4,175.0	51.5	22.6	13.9	11.5	2.1	0.8	0.8	3.4
10-090A	0.00	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090B	0.00	1.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090C	0.54	12.77	139.1	2,126.3	2,464.1	30.4	13.3	8.2	6.8	1.3	0.5	0.5	2.0
10-090D	0.00	4.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-100	0.36	1392.1	10,157.3	155,261.3	179,928.9	2,220.1	972.2	600.7	494.8	91.4	33.4	34.8	145.1
10-110	0.47	300.11	2,816.4	43,051.1	49,891.0	615.6	269.6	166.6	137.2	25.3	9.3	9.7	40.2
10-120A/B	0.44	372.78	3,263.9	49,890.6	57,817.2	713.4	312.4	193.0	159.0	29.4	10.7	11.2	46.6
10-130	0.45	336.46	3,055.9	46,712.2	54,133.8	667.9	292.5	180.7	148.9	27.5	10.0	10.5	43.7
10-140a	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-140a,b	0.58	220.65	2,554.1	39,040.6	45,243.3	558.2	244.5	151.1	124.4	23.0	8.4	8.8	36.5
10-150	0.47	157.15	1,482.2	22,656.4	26,256.0	324.0	141.9	87.7	72.2	13.3	4.9	5.1	21.2
10-160	0.00	17	0.9	13.1	15.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-170	0.50	176.01	1,781.7	27,234.5	31,561.5	389.4	170.5	105.4	86.8	16.0	5.9	6.1	25.5
10-180	0.45	284.26	2,546.3	38,922.7	45,106.7	556.6	243.7	150.6	124.0	22.9	8.4	8.7	36.4
10-190	0.59	14.58	173.5	2,652.8	3,074.3	37.9	16.6	10.3	8.5	1.6	0.6	0.6	2.5
10-200	0.40	42.44	339.0	5,181.2	6,004.4	74.1	32.4	20.0	16.5	3.1	1.1	1.2	4.8
10-210	0.49	98.32	972.2	14,861.2	17,222.3	212.5	93.1	57.5	47.4	8.8	3.2	3.3	13.9
10-220	0.56	18.83	211.8	3,237.0	3,751.3	46.3	20.3	12.5	10.3	1.9	0.7	0.7	3.0
10-230	0.47	235.02	2,234.7	34,159.5	39,586.7	488.4	213.9	132.2	108.9	20.1	7.3	7.7	31.9
10-240	0.51	103.83	1,072.9	16,400.7	19,006.4	234.5	102.7	63.5	52.3	9.7	3.5	3.7	15.3
10-250	0.49	242.96	2,389.2	36,520.1	42,322.4	522.2	228.7	141.3	116.4	21.5	7.9	8.2	34.1
10-260	0.56	23.77	266.4	4,072.1	4,719.1	58.2	25.5	15.8	13.0	2.4	0.9	0.9	3.8
10-270	0.47	72.45	690.6	10,556.0	12,233.2	150.9	66.1	40.8	33.6	6.2	2.3	2.4	9.9
10-280	0.44	55.08	491.7	7,516.6	8,710.8	107.5	47.1	29.1	24.0	4.4	1.6	1.7	7.0
10-290	0.10	6.83	13.7	210.0	243.4	3.0	1.3	0.8	0.7	0.1	0.0	0.0	0.2
10-300	0.36	17.74	128.7	1,966.9	2,279.4	28.1	12.3	7.6	6.3	1.2	0.4	0.4	1.8
10-310	0.47	60.29	572.7	8,754.2	10,145.1	125.2	54.8	33.9	27.9	5.2	1.9	2.0	8.2
10-320	0.45	341.99	3,107.9	47,506.1	55,053.8	679.3	297.5	183.8	151.4	28.0	10.2	10.7	44.4
10-330	0.35	21.61	152.8	2,336.1	2,707.3	33.4	14.6	9.0	7.4	1.4	0.5	0.5	2.2
10-340	0.45	20.74	188.2	2,877.4	3,334.6	41.1	18.0	11.1	9.2	1.7	0.6	0.6	2.7
10-350	0.60	28.16	339.3	5,185.7	6,009.6	74.2	32.5	20.1	16.5	3.1	1.1	1.2	4.8
10-360	0.59	29.02	346.0	5,288.4	6,128.6	75.6	33.1	20.5	16.9	3.1	1.1	1.2	4.9
10-370	0.59	14.46	171.5	2,621.3	3,037.8	37.5	16.4	10.1	8.4	1.5	0.6	0.6	2.4
10-380	0.45	14.38	128.8	1,968.4	2,281.1	28.1	12.3	7.6	6.3	1.2	0.4	0.4	1.8
10-390	0.49	41.97	416.3	6,363.0	7,374.0	91.0	39.8	24.6	20.3	3.7	1.4	1.4	5.9
10-400A	0.10	1.07	2.2	32.9	38.1	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-400B	0.47	17.66	167.5	2,560.8	2,967.7	36.6	16.0	9.9	8.2	1.5	0.6	0.6	2.4
10-400C	0.57	50.25	571.9	8,741.9	10,130.8	125.0	54.7	33.8	27.9	5.1	1.9	2.0	8.2
10-410A	0.50	46.22	462.9	7,075.1	8,199.2	101.2	44.3	27.4	22.5	4.2	1.5	1.6	6.6
10-410B	0.32	21.29	135.5	2,071.2	2,400.3	29.6	13.0	8.0	6.6	1.2	0.4	0.5	1.9
10-410C	0.53	22.8	242.1	3,700.2	4,288.1	52.9	23.2	14.3	11.8	2.2	0.8	0.8	3.5
10-410D	0.60	27.34	330.1	5,046.0	5,847.6	72.2	31.6	19.5	16.1	3.0	1.1	1.1	4.7
10-410E	0.58	256.04	2,963.7	45,302.3	52,499.8	647.8	283.7	175.3	144.4	26.7	9.7	10.2	42.3
10-410F	0.59	37.92	448.7	6,858.5	7,948.2	98.1	42.9	26.5	21.9	4.0	1.5	1.5	6.4
10-420A	0.27	23.05	126.4	1,931.4	2,238.2	27.6	12.1	7.5	6.2	1.1	0.4	0.4	1.8
10-420B	0.00	10.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420C	0.00	7.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420D	0.00	20.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420E	0.59	127.89	1,509.7	23,076.4	26,742.8	330.0	144.5	89.3	73.5	13.6	5.0	5.2	21.6
10-430A	0.00	8.14	0.4	6.3	7.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430B	0.53	54.72	588.2	8,990.4	10,418.8	128.6	56.3	34.8	28.7	5.3	1.9	2.0	8.4
10-430C	0.48	44.83	433.2	6,621.9	7,674.0	94.7	41.5	25.6	21.1	3.9	1.4	1.5	6.2
10-430D	0.49	85.79	848.4	12,968.0	15,028.3	185.4	81.2	50.2	41.3	7.6	2.8	2.9	12.1
10-430E	0.56	86.66	972.0	14,858.2	17,218.8	212.5	93.0	57.5	47.4	8.7	3.2	3.3	13.9
10-430F	0.10	377.97	760.3	11,621.9	13,468.4	166.2	72.8	45.0	37.0	6.8	2.5	2.6	10.9
10-430G	0.50	125.89	1,255.0	19,183.6	22,231.4	274.3	120.1	74.2	61.1	11.3	4.1	4.3	17.9
10-430H	0.49	33.18	328.0	5,013.2	5,809.7	71.7	31.4	19.4	16.0	3.0	1.1	1.1	4.7
10-430I	0.59	32.61	386.1	5,902.1	6,839.8	84.4	37.0	22.8	18.8	3.5	1.3	1.3	5.5
10-430J	0.43	532.36	4,647.1	71,033.9	82,319.6	1,015.7	444.8	274.8	226.4	41.8	15.3	15.9	66.4
10-430K	0.48	337.06	3,238.6	49,503.9	57,369.0	707.9	310.0	191.5	157.8	29.1	10.6	11.1	46.3
10-430L	0.45	84.4	765.3	11,697.8	13,556.3	167.3	73.2	45.3	37.3	6.9	2.5	2.6	10.9
10-430M	0.54	75.94	828.5	12,664.7	14,676.9	181.1	79.3	49.0	40.4	7.5	2.7	2.8	11.8
10-430N	0.44	26.43	236.0	3,607.6	4,180.8	51.6	22.6	14.0	11.5	2.1	0.8	0.8	3.4
10-430O	0.00	109.53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430P	0.00	229.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430Q	0.10	8.03	16.2	246.9	286.1	3.5	1.5	1.0	0.8	0.1	0.1	0.1	0.2
10-430R	0.47	150.32	1,413.5	21,606.8	25,039.6	309.0	135.3	83.6	68.9	12.7	4.6	4.8	20.2
10-430S	0.10	5.15	10.4	158.4	183.5	2.3	1.0	0.6	0.5	0.1	0.0	0.0	0.1
10-430T	0.46	262.47	2,413.5	36,891.8	42,753.1	527.5	231.0	142.7	117.6	21.7	7.9	8.3	34.5
10-430U	0.47	431.37	4,077.1	62,320.9	72,222.3	891.1	390.2	241.1	198.6	36.7	13.4	14.0	58.2
10-430V	0.46	329.11	3,077.3	47,039.2	54,512.7	672.6	294.5	182.0	149.9	27.7	10.1	10.6	44.0
10-440A	0.46	23.18	213.6	3,265.3	3,784.1	46.7	20.4	12.6	10.4	1.9	0.7	0.7	3.1
10-440B	0.49	34.23	339.3	5,186.8	6,010.8	74.2	32.5	20.1	16.5	3.1	1.1	1.2	4.8
10-440C/D	0.00	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-440E	0.51	831.25	8,598.6	131,435.7	152,318.0	1,879.4	823.0	508.5	418.9	77.4	28.3	29.5	122.8
10-440F	0.46	538.85	4,988.5	76,252.7	88,367.6	1,090.3	477.5	295.0	243.0	44.9	16.4	17.1	71.3
10-450A	0.00	343.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-450B	0.52	3.41	35.4	541.7	627.8	7.7	3.4	2.1	1.7	0.3	0.1	0.1	0.5
10-450C	0.59	55.64	664.6	10,159.6	11,773.8	145.3	63.6	39.3	32.4	6.0	2.2	2.3	9.5

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
10-450D	0.45	4.62	41.8	639.3	740.8	9.1	4.0	2.5	2.0	0.4	0.1	0.1	0.6
10-450E	0.44	3.2	28.5	434.9	504.0	6.2	2.7	1.7	1.4	0.3	0.1	0.1	0.4
10-450F	0.46	158.55	1,465.3	22,397.7	25,956.2	320.3	140.2	86.7	71.4	13.2	4.8	5.0	20.9
10-450G/H	0.48	75.02	725.1	11,083.7	12,844.6	158.5	69.4	42.9	35.3	6.5	2.4	2.5	10.4
10-450I	0.49	243.64	2,407.5	36,800.0	42,646.8	526.2	230.4	142.4	117.3	21.7	7.9	8.3	34.4
10-450J	0.49	17.16	167.6	2,561.6	2,968.5	36.6	16.0	9.9	8.2	1.5	0.6	0.6	2.4
10-450K	0.58	37.01	431.3	6,592.0	7,639.3	94.3	41.3	25.5	21.0	3.9	1.4	1.5	6.2
10-450L	0.51	213.41	2,168.2	33,142.0	38,407.5	473.9	207.5	128.2	105.6	19.5	7.1	7.4	31.0
10-460	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460A	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460B	0.52	7.29	75.8	1,158.4	1,342.4	16.6	7.3	4.5	3.7	0.7	0.2	0.3	1.1
10-460C/D/F	0.00	159.87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460E	0.49	231.41	2,298.8	35,139.1	40,722.0	502.5	220.0	136.0	112.0	20.7	7.6	7.9	32.8
10-460F	0.49	14.75	146.8	2,243.7	2,600.2	32.1	14.0	8.7	7.2	1.3	0.5	0.5	2.1
10-460G	0.51	79.66	818.5	12,511.6	14,499.4	178.9	78.3	48.4	39.9	7.4	2.7	2.8	11.7
10-460H	0.48	12.35	119.1	1,820.5	2,109.7	26.0	11.4	7.0	5.8	1.1	0.4	0.4	1.7
10-460I	0.00	72.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460J	0.46	5.36	50.0	764.2	885.6	10.9	4.8	3.0	2.4	0.4	0.2	0.2	0.7
10-460K	0.36	5.48	39.7	606.1	702.4	8.7	3.8	2.3	1.9	0.4	0.1	0.1	0.6
10-460L	0.46	3.5	32.6	498.7	578.0	7.1	3.1	1.9	1.6	0.3	0.1	0.1	0.5
10-460M	0.48	9.55	91.9	1,405.4	1,628.6	20.1	8.8	5.4	4.5	0.8	0.3	0.3	1.3
10-460N	0.45	3.85	34.9	532.7	617.3	7.6	3.3	2.1	1.7	0.3	0.1	0.1	0.5
10-460O	0.45	4.15	37.9	578.9	670.9	8.3	3.6	2.2	1.8	0.3	0.1	0.1	0.5
10-460P	0.45	4.34	39.3	600.5	695.9	8.6	3.8	2.3	1.9	0.4	0.1	0.1	0.6
10-460Q	0.56	19.73	223.9	3,422.6	3,966.3	48.9	21.4	13.2	10.9	2.0	0.7	0.8	3.2
10-460R	0.00	51.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460S	0.56	233.54	2,651.0	40,521.9	46,959.9	579.4	253.7	156.8	129.1	23.9	8.7	9.1	37.9
10-465	0.10	8.56	17.2	263.2	305.0	3.8	1.6	1.0	0.8	0.2	0.1	0.1	0.2
10-470	0.38	25.6	196.5	3,004.1	3,481.4	43.0	18.8	11.6	9.6	1.8	0.6	0.7	2.8
10-480	0.58	39.66	462.9	7,075.1	8,199.2	101.2	44.3	27.4	22.5	4.2	1.5	1.6	6.6
10-485	0.00	7.27	0.4	5.6	6.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-490	0.43	150.96	1,316.5	20,122.9	23,320.0	287.7	126.0	77.9	64.1	11.8	4.3	4.5	18.8
10-500A	0.26	26.21	138.4	2,115.1	2,451.1	30.2	13.2	8.2	6.7	1.2	0.5	0.5	2.0
10-500B	0.46	8.48	78.5	1,200.2	1,390.8	17.2	7.5	4.6	3.8	0.7	0.3	0.3	1.1
10-500C	0.44	111.36	975.2	14,907.1	17,275.5	213.2	93.3	57.7	47.5	8.8	3.2	3.3	13.9
10-500D	0.24	3.83	18.3	280.4	324.9	4.0	1.8	1.1	0.9	0.2	0.1	0.1	0.3
10-500E	0.53	23.34	250.0	3,821.1	4,428.2	54.6	23.9	14.8	12.2	2.2	0.8	0.9	3.6
10-500F	0.49	12.04	119.6	1,828.0	2,118.5	26.1	11.4	7.1	5.8	1.1	0.4	0.4	1.7
10-500G	0.00	112.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-505	0.10	7.85	15.8	241.4	279.7	3.5	1.5	0.9	0.8	0.1	0.1	0.1	0.2
10-510	0.51	62.36	638.0	9,753.0	11,302.5	139.5	61.1	37.7	31.1	5.7	2.1	2.2	9.1
10-520	0.00	139.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-530	0.45	116.15	1,053.2	16,099.0	18,656.8	230.2	100.8	62.3	51.3	9.5	3.5	3.6	15.0
10-540	0.12	53.9	128.4	1,962.7	2,274.5	28.1	12.3	7.6	6.3	1.2	0.4	0.4	1.8
10-550	0.46	25.83	239.0	3,652.8	4,233.1	52.2	22.9	14.1	11.6	2.2	0.8	0.8	3.4
10-560A/B	0.44	600.63	5,285.8	80,797.2	93,634.1	1,155.3	505.9	312.6	257.5	47.6	17.4	18.1	75.5
10-570A	0.54	14.64	160.1	2,447.8	2,836.8	35.0	15.3	9.5	7.8	1.4	0.5	0.5	2.3
10-570B	0.44	228.18	2,003.6	30,626.4	35,492.3	437.9	191.8	118.5	97.6	18.0	6.6	6.9	28.6
10-580	0.45	73.39	662.6	10,128.3	11,737.5	144.8	63.4	39.2	32.3	6.0	2.2	2.3	9.5
10-600	0.48	89.24	868.1	13,270.0	15,378.3	189.7	83.1	51.3	42.3	7.8	2.9	3.0	12.4
10-610	0.46	25.6	236.0	3,607.9	4,181.2	51.6	22.6	14.0	11.5	2.1	0.8	0.8	3.4
10-620	0.00	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630A	0.10	6.24	12.6	191.9	222.4	2.7	1.2	0.7	0.6	0.1	0.0	0.0	0.2
10-630B	0.45	4.68	42.4	647.6	750.4	9.3	4.1	2.5	2.1	0.4	0.1	0.1	0.6
10-630C	0.48	96.03	933.3	14,265.8	16,532.3	204.0	89.3	55.2	45.5	8.4	3.1	3.2	13.3
10-630D	0.45	6.37	57.7	881.4	1,021.4	12.6	5.5	3.4	2.8	0.5	0.2	0.2	0.8
10-630E	0.45	8.52	77.1	1,178.9	1,366.2	16.9	7.4	4.6	3.8	0.7	0.3	0.3	1.1
10-630F	0.54	17.56	190.8	2,917.0	3,380.4	41.7	18.3	11.3	9.3	1.7	0.6	0.7	2.7
10-630G	0.45	5.9	53.4	816.4	946.1	11.7	5.1	3.2	2.6	0.5	0.2	0.2	0.8
10-630H	0.30	25.63	156.1	2,386.8	2,766.1	34.1	14.9	9.2	7.6	1.4	0.5	0.5	2.2
10-630I	0.47	12.48	116.7	1,784.5	2,068.0	25.5	11.2	6.9	5.7	1.1	0.4	0.4	1.7
10-630J	0.55	14.69	163.6	2,500.9	2,898.2	35.8	15.7	9.7	8.0	1.5	0.5	0.6	2.3
10-630K	0.47	95.29	907.2	13,867.3	16,070.5	198.3	86.8	53.7	44.2	8.2	3.0	3.1	13.0
10-630L	0.52	100.42	1,052.4	16,087.1	18,643.0	230.0	100.7	62.2	51.3	9.5	3.5	3.6	15.0
10-630M	0.50	11.71	117.0	1,787.8	2,071.8	25.6	11.2	6.9	5.7	1.1	0.4	0.4	1.7
10-630N	0.45	8.45	76.5	1,169.2	1,355.0	16.7	7.3	4.5	3.7	0.7	0.3	0.3	1.1
10-630O	0.36	5.77	42.3	645.9	748.6	9.2	4.0	2.5	2.1	0.4	0.1	0.1	0.6
10-630P/Q	0.00	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630R	0.33	83.89	563.6	8,615.0	9,983.7	123.2	53.9	33.3	27.5	5.1	1.9	1.9	8.1
10-630S	0.22	37.02	161.9	2,474.4	2,867.6	35.4	15.5	9.6	7.9	1.5	0.5	0.6	2.3
10-630T	0.56	7.72	87.4	1,335.2	1,547.4	19.1	8.4	5.2	4.3	0.8	0.3	0.3	1.2
10-630U	0.52	115.42	1,214.5	18,564.2	21,513.7	265.5	116.2	71.8	59.2	10.9	4.0	4.2	17.3
10-630V	0.11	33.85	71.9	1,099.1	1,273.8	15.7	6.9	4.3	3.5	0.6	0.2	0.2	1.0
10-630W	0.47	23.68	225.6	3,449.1	3,997.1	49.3	21.6	13.3	11.0	2.0	0.7	0.8	3.2
10-630X	0.44	14.78	131.5	2,010.5	2,329.9	28.7	12.6	7.8	6.4	1.2	0.4	0.5	1.9
10-630Y	0.00	112.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630Z	0.47	45.66	432.4	6,609.7	7,659.9	94.5	41.4	25.6	21.1	3.9	1.4	1.5	6.2
10-640	0.46	258.18	2,375.2	36,307.4	42,075.8	519.2	227.3	140.5	115.7	21.4	7.8	8.1	33.9
10-650	0.56	19.53	218.8	3,345.0	3,876.5	47.8	20.9	12.9	10.7	2.0	0.7	0.8	3.1
10-660	0.46	306.37	2,855.0	43,640.1	50,573.6	624.0	273.3	168.9	139.1	25.7	9.4	9.8	40.8
10-670	0.45	137.88	1,246.3	19,050.0	22,076.7	272.4	119.3	73.7	60.7	11.2	4.1	4.3	17.8
10-680	0.46	707.95	6,529.6	99,810.3	115,668.1	1,427.2	625.0	386.2	318.1	58.8	21.5	22.4	93.3
10-690	0.50	70.63	710.8	10,864.8	12,591.0	155.4	68.0	42.0	34.6	6.4	2.3	2.4	10.2
10-700	0.46	222.07	2,074.3	31,707.3	36,745.0	453.4	198.5	122.7	101.0	18.7	6.8	7.1	29.6
10-710	0.33	29.95	200.7	3,067.8	3,555.2	43.9	19.2	11.9	9.8	1.8	0.7	0.7	2.9
10-720A	0.44	15.77	140.7	2,150.1	2,491.8	30.7	13.5	8.3	6.9	1.3	0.5	0.5	2.0
10-720B	0.48	422.18	4,091.5	62,541.2	72,477.6	894.3	391.6	242.0	199.3	36.8	13.4	14.0	58.4

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
10-720C	0.43	26.35	227.6	3,479.1	4,031.8	49.7	21.8	13.5	11.1	2.0	0.7	0.8	3.3
10-720D	0.46	22.95	210.2	3,212.7	3,723.1	45.9	20.1	12.4	10.2	1.9	0.7	0.7	3.0
10-720E	0.46	18.39	168.6	2,577.0	2,986.4	36.8	16.1	10.0	8.2	1.5	0.6	0.6	2.4
10-720F	0.48	317.75	3,066.8	46,878.6	54,326.6	670.3	293.5	181.4	149.4	27.6	10.1	10.5	43.8
10-720G	0.00	13.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-720H	0.45	4.55	41.2	629.6	729.6	9.0	3.9	2.4	2.0	0.4	0.1	0.1	0.6
10-720I	0.45	87.27	782.9	11,966.7	13,868.0	171.1	74.9	46.3	38.1	7.0	2.6	2.7	11.2
10-720J	0.36	3.71	26.7	407.5	472.3	5.8	2.6	1.6	1.3	0.2	0.1	0.1	0.4
10-720K	0.55	32.76	361.8	5,531.0	6,409.8	79.1	34.6	21.4	17.6	3.3	1.2	1.2	5.2
10-720L	0.45	4.57	41.4	632.3	732.8	9.0	4.0	2.4	2.0	0.4	0.1	0.1	0.6
20-010	0.42	93.99	793.7	12,132.5	14,060.0	173.5	76.0	46.9	38.7	7.1	2.6	2.7	11.3
20-020	0.44	15.09	133.2	2,035.3	2,358.7	29.1	12.7	7.9	6.5	1.2	0.4	0.5	1.9
20-030	0.45	7.95	72.0	1,100.0	1,274.8	15.7	6.9	4.3	3.5	0.6	0.2	0.2	1.0
20-040	0.37	6.79	50.9	778.4	902.1	11.1	4.9	3.0	2.5	0.5	0.2	0.2	0.7
20-050	0.00	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-060	0.45	5.91	53.5	817.7	947.7	11.7	5.1	3.2	2.6	0.5	0.2	0.2	0.8
20-070	0.44	39.07	348.5	5,326.5	6,172.8	76.2	33.4	20.6	17.0	3.1	1.1	1.2	5.0
20-080	0.45	33.72	307.5	4,700.9	5,447.7	67.2	29.4	18.2	15.0	2.8	1.0	1.1	4.4
20-090	0.55	9.95	110.6	1,691.1	1,959.8	24.2	10.6	6.5	5.4	1.0	0.4	0.4	1.6
20-100	0.10	0.99	2.0	30.4	35.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-110	0.24	216.04	1,042.6	15,937.5	18,469.6	227.9	99.8	61.7	50.8	9.4	3.4	3.6	14.9
20-120	0.47	10.22	96.1	1,468.9	1,702.3	21.0	9.2	5.7	4.7	0.9	0.3	0.3	1.4
20-130	0.45	16.12	145.9	2,230.5	2,584.8	31.9	14.0	8.6	7.1	1.3	0.5	0.5	2.1
20-140	0.44	2.97	26.4	403.0	467.1	5.8	2.5	1.6	1.3	0.2	0.1	0.1	0.4
20-150	0.45	14.48	131.1	2,003.6	2,321.9	28.6	12.5	7.8	6.4	1.2	0.4	0.4	1.9
20-160	0.54	3.21	34.9	533.3	618.0	7.6	3.3	2.1	1.7	0.3	0.1	0.1	0.5
20-170	0.37	4.94	37.0	565.9	655.8	8.1	3.5	2.2	1.8	0.3	0.1	0.1	0.5
20-180	0.51	5.3	54.0	824.8	955.8	11.8	5.2	3.2	2.6	0.5	0.2	0.2	0.8
20-190	0.45	1.35	12.2	186.8	216.5	2.7	1.2	0.7	0.6	0.1	0.0	0.0	0.2
20-200	0.45	13.84	125.3	1,915.0	2,219.2	27.4	12.0	7.4	6.1	1.1	0.4	0.4	1.8
20-210A	0.44	92.9	820.9	12,547.8	14,541.4	179.4	78.6	48.5	40.0	7.4	2.7	2.8	11.7
20-210B	0.50	620.78	6,300.6	96,309.3	111,610.8	1,377.1	603.1	372.6	306.9	56.7	20.7	21.6	90.0
20-220	0.46	26.38	244.6	3,739.5	4,333.7	53.5	23.4	14.5	11.9	2.2	0.8	0.8	3.5
20-230	0.00	21.46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-240	0.48	30.06	291.3	4,453.2	5,160.8	63.7	27.9	17.2	14.2	2.6	1.0	1.0	4.2
20-250	0.57	6.28	72.2	1,104.0	1,279.4	15.8	6.9	4.3	3.5	0.7	0.2	0.2	1.0
20-260	0.60	3.5	42.2	645.7	748.3	9.2	4.0	2.5	2.1	0.4	0.1	0.1	0.6
20-270	0.48	42.81	410.5	6,275.1	7,272.1	89.7	39.3	24.3	20.0	3.7	1.3	1.4	5.9
20-280	0.54	8.98	97.1	1,484.0	1,719.8	21.2	9.3	5.7	4.7	0.9	0.3	0.3	1.4
20-290	0.00	4.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-010	0.45	49.49	446.2	6,821.1	7,904.9	97.5	42.7	26.4	21.7	4.0	1.5	1.5	6.4
40-010	0.45	719.17	6,482.7	99,092.5	114,836.1	1,416.9	620.5	383.4	315.8	58.3	21.3	22.2	92.6
40-020	0.45	15.36	139.0	2,125.3	2,463.0	30.4	13.3	8.2	6.8	1.3	0.5	0.5	2.0
40-030	0.42	51.02	428.7	6,553.5	7,594.7	93.7	41.0	25.4	20.9	3.9	1.4	1.5	6.1
40-040	0.43	65.39	571.1	8,730.0	10,117.0	124.8	54.7	33.8	27.8	5.1	1.9	2.0	8.2
40-050	0.45	10.28	93.1	1,422.4	1,648.4	20.3	8.9	5.5	4.5	0.8	0.3	0.3	1.3
40-060	0.45	3.2	29.0	442.8	513.1	6.3	2.8	1.7	1.4	0.3	0.1	0.1	0.4
40-070	0.38	7.98	60.7	928.3	1,075.8	13.3	5.8	3.6	3.0	0.5	0.2	0.2	0.9
40-080	0.41	60.51	497.1	7,598.4	8,805.6	108.6	47.6	29.4	24.2	4.5	1.6	1.7	7.1
40-090	0.46	20.65	193.1	2,951.7	3,420.7	42.2	18.5	11.4	9.4	1.7	0.6	0.7	2.8
40-100	0.00	20.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-110	0.44	2.61	23.3	356.2	412.8	5.1	2.2	1.4	1.1	0.2	0.1	0.1	0.3
40-120	0.44	65.87	580.7	8,876.8	10,287.1	126.9	55.6	34.3	28.3	5.2	1.9	2.0	8.3
40-130	0.45	35.01	318.2	4,864.4	5,637.2	69.6	30.5	18.8	15.5	2.9	1.0	1.1	4.5
40-140	0.35	125.46	877.6	13,414.4	15,545.6	191.8	84.0	51.9	42.8	7.9	2.9	3.0	12.5
40-150	0.47	24.31	231.7	3,541.1	4,103.7	50.6	22.2	13.7	11.3	2.1	0.8	0.8	3.3
40-160	0.49	30.99	308.2	4,710.6	5,459.1	67.4	29.5	18.2	15.0	2.8	1.0	1.1	4.4
40-170	0.00	194.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-180	0.54	16.8	181.9	2,780.9	3,222.8	39.8	17.4	10.8	8.9	1.6	0.6	0.6	2.6
40-190	0.53	65.53	697.0	10,654.4	12,347.1	152.3	66.7	41.2	34.0	6.3	2.3	2.4	10.0
40-200	0.46	24.75	230.2	3,518.3	4,077.3	50.3	22.0	13.6	11.2	2.1	0.8	0.8	3.3
40-210	0.54	17.26	189.2	2,891.6	3,351.0	41.3	18.1	11.2	9.2	1.7	0.6	0.6	2.7
40-220	0.47	100.58	945.8	14,457.7	16,754.7	206.7	90.5	55.9	46.1	8.5	3.1	3.2	13.5
40-230	0.44	13.78	123.3	1,884.8	2,184.2	27.0	11.8	7.3	6.0	1.1	0.4	0.4	1.8
40-240	0.00	340.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-250	0.60	1.15	13.9	212.2	245.9	3.0	1.3	0.8	0.7	0.1	0.0	0.0	0.2
40-260	0.45	3.49	31.6	482.9	559.6	6.9	3.0	1.9	1.5	0.3	0.1	0.1	0.5
40-270	0.45	9.59	86.8	1,326.9	1,537.8	19.0	8.3	5.1	4.2	0.8	0.3	0.3	1.2
40-280	0.53	12.76	135.0	2,063.3	2,391.1	29.5	12.9	8.0	6.6	1.2	0.4	0.5	1.9
40-290	0.51	13.73	141.4	2,161.6	2,505.1	30.9	13.5	8.4	6.9	1.3	0.5	0.5	2.0
40-300	0.52	10.38	108.8	1,662.9	1,927.1	23.8	10.4	6.4	5.3	1.0	0.4	0.4	1.6
40-310	0.45	97.86	891.0	13,620.2	15,784.1	194.8	85.3	52.7	43.4	8.0	2.9	3.1	12.7
40-320	0.60	9.43	113.8	1,739.7	2,016.1	24.9	10.9	6.7	5.5	1.0	0.4	0.4	1.6
40-330	0.59	15.34	182.9	2,795.6	3,239.8	40.0	17.5	10.8	8.9	1.6	0.6	0.6	2.6
40-340	0.53	35.27	378.1	5,779.5	6,697.7	82.6	36.2	22.4	18.4	3.4	1.2	1.3	5.4
40-350	0.60	8.99	108.5	1,658.6	1,922.1	23.7	10.4	6.4	5.3	1.0	0.4	0.4	1.6
40-360	0.60	8.09	97.6	1,492.5	1,729.6	21.3	9.3	5.8	4.8	0.9	0.3	0.3	1.4
40-370	0.58	12.41	144.4	2,207.3	2,558.0	31.6	13.8	8.5	7.0	1.3	0.5	0.5	2.1
40-380	0.39	24.92	197.2	3,014.6	3,493.6	43.1	18.9	11.7	9.6	1.8	0.6	0.7	2.8
40-390	0.58	5.72	66.7	1,020.0	1,182.1	14.6	6.4	3.9	3.3	0.6	0.2	0.2	1.0
40-400	0.10	1.07	2.2	32.9	38.1	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
41-010	0.38	94.73	719.2	10,994.2	12,740.9	157.2	68.8	42.5	35.0	6.5	2.4	2.5	10.3
41-020	0.00	14.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-030	0.50	60.47	610.6	9,333.6	10,816.5	133.5	58.4	36.1	29.7	5.5	2.0	2.1	8.7
41-040	0.57	35.59	410.2	6,270.5	7,266.7	89.7	39.3	24.3	20.0	3.7	1.3	1.4	5.9
41-050	0.60	10.48	126.5	1,933.4	2,240.6	27.6	12.1	7.5	6.2	1.1	0.4	0.4	1.8
41-060	0.60	2.95	35.6	544.2	630.7	7.8	3.4	2.1	1.7	0.3	0.1	0.1	0.5

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
51-010	0.45	29.63	269.0	4,112.0	4,765.3	58.8	25.7	15.9	13.1	2.4	0.9	0.9	3.8
51-020	0.45	4.55	41.2	629.6	729.6	9.0	3.9	2.4	2.0	0.4	0.1	0.1	0.6
52-010	0.28	45.29	251.8	3,848.4	4,459.8	55.0	24.1	14.9	12.3	2.3	0.8	0.9	3.6
52-020	0.45	6.09	55.1	842.7	976.5	12.0	5.3	3.3	2.7	0.5	0.2	0.2	0.8
52-030	0.45	7.18	65.0	993.5	1,151.3	14.2	6.2	3.8	3.2	0.6	0.2	0.2	0.9
52-040	0.41	4.54	37.7	577.0	668.7	8.3	3.6	2.2	1.8	0.3	0.1	0.1	0.5
52-050	0.44	15.3	133.9	2,046.5	2,371.7	29.3	12.8	7.9	6.5	1.2	0.4	0.5	1.9
52-060	0.10	3.22	6.5	99.0	114.7	1.4	0.6	0.4	0.3	0.1	0.0	0.0	0.1
52-070	0.42	86.94	740.1	11,312.7	13,110.0	161.8	70.8	43.8	36.1	6.7	2.4	2.5	10.6
52-080	0.24	8.08	39.3	601.3	696.8	8.6	3.8	2.3	1.9	0.4	0.1	0.1	0.6
52-090	0.45	4.89	44.3	676.6	784.1	9.7	4.2	2.6	2.2	0.4	0.1	0.2	0.6
52-100A/B	0.27	11.89	63.8	974.8	1,129.6	13.9	6.1	3.8	3.1	0.6	0.2	0.2	0.9
52-110	0.45	8.84	79.4	1,213.4	1,406.1	17.3	7.6	4.7	3.9	0.7	0.3	0.3	1.1
52-120	0.45	14.74	133.4	2,039.5	2,363.6	29.2	12.8	7.9	6.5	1.2	0.4	0.5	1.9
52-130	0.31	7.18	45.5	694.9	805.3	9.9	4.4	2.7	2.2	0.4	0.1	0.2	0.6
53-010	0.45	7.03	63.6	972.7	1,127.3	13.9	6.1	3.8	3.1	0.6	0.2	0.2	0.9
53-020	0.28	12.38	68.8	1,052.0	1,219.2	15.0	6.6	4.1	3.4	0.6	0.2	0.2	1.0
53-030	0.44	11.37	99.9	1,527.3	1,770.0	21.8	9.6	5.9	4.9	0.9	0.3	0.3	1.4
53-040	0.45	2.78	25.2	384.7	445.8	5.5	2.4	1.5	1.2	0.2	0.1	0.1	0.4
53-050	0.45	13.66	123.7	1,890.1	2,190.4	27.0	11.8	7.3	6.0	1.1	0.4	0.4	1.8
53-060	0.45	20.37	184.4	2,818.5	3,266.3	40.3	17.6	10.9	9.0	1.7	0.6	0.6	2.6
53-070	0.45	4.89	44.3	676.6	784.1	9.7	4.2	2.6	2.2	0.4	0.1	0.2	0.6
53-080	0.39	5.81	46.1	704.2	816.1	10.1	4.4	2.7	2.2	0.4	0.2	0.2	0.7
53-090	0.46	59.59	550.4	8,413.3	9,750.0	120.3	52.7	32.6	26.8	5.0	1.8	1.9	7.9
53-100	0.00	107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-110	0.38	4.59	35.5	543.2	629.5	7.8	3.4	2.1	1.7	0.3	0.1	0.1	0.5
53-120A/B	0.46	129.79	1,189.5	18,182.7	21,071.6	260.0	113.9	70.4	57.9	10.7	3.9	4.1	17.0
53-130	0.45	5.02	45.4	694.6	805.0	9.9	4.3	2.7	2.2	0.4	0.1	0.2	0.6
53-140	0.45	6.36	57.6	880.0	1,019.8	12.6	5.5	3.4	2.8	0.5	0.2	0.2	0.8
53-150	0.48	90.4	879.8	13,448.3	15,584.9	192.3	84.2	52.0	42.9	7.9	2.9	3.0	12.6
53-160	0.47	252.19	2,398.3	36,660.5	42,485.0	524.2	229.6	141.8	116.8	21.6	7.9	8.2	34.3
53-170	0.36	6.39	46.4	709.0	821.7	10.1	4.4	2.7	2.3	0.4	0.2	0.2	0.7
53-180	0.10	8.09	16.3	248.8	288.3	3.6	1.6	1.0	0.8	0.1	0.1	0.1	0.2
53-190	0.30	11.41	69.0	1,054.3	1,221.8	15.1	6.6	4.1	3.4	0.6	0.2	0.2	1.0
54-010A/B	0.44	84.93	743.3	11,362.0	13,167.2	162.5	71.1	44.0	36.2	6.7	2.4	2.5	10.6
54-040A/B	0.49	255.14	2,540.2	38,828.5	44,997.5	555.2	243.1	150.2	123.7	22.9	8.3	8.7	36.3
54-050	0.17	9.27	32.4	495.6	574.4	7.1	3.1	1.9	1.6	0.3	0.1	0.1	0.5
54-060	0.44	32.13	283.9	4,339.6	5,029.1	62.1	27.2	16.8	13.8	2.6	0.9	1.0	4.1
54-070	0.36	60.8	438.6	6,703.6	7,768.7	95.9	42.0	25.9	21.4	3.9	1.4	1.5	6.3
54-080A/B/C	0.46	414.26	3,809.0	58,223.0	67,473.4	832.5	364.6	225.3	185.6	34.3	12.5	13.1	54.4
54-090	0.10	3.55	7.1	109.2	126.5	1.6	0.7	0.4	0.3	0.1	0.0	0.0	0.1
54-100A/B	0.60	114.24	1,368.9	20,925.0	24,249.5	299.2	131.0	81.0	66.7	12.3	4.5	4.7	19.6
54-110	0.45	24.55	222.2	3,396.9	3,936.6	48.6	21.3	13.1	10.8	2.0	0.7	0.8	3.2
54-120	0.46	62.08	570.6	8,722.4	10,108.2	124.7	54.6	33.7	27.8	5.1	1.9	2.0	8.2
54-130	0.10	1.07	2.2	32.9	38.1	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
54-140A/B	0.41	113.01	927.3	14,175.0	16,427.1	202.7	88.8	54.8	45.2	8.3	3.0	3.2	13.2
54-150	0.45	55.34	495.7	7,577.8	8,781.7	108.4	47.4	29.3	24.1	4.5	1.6	1.7	7.1
54-160	0.60	2.62	31.6	483.4	560.2	6.9	3.0	1.9	1.5	0.3	0.1	0.1	0.5
54-170	0.59	8.08	96.6	1,477.3	1,712.0	21.1	9.3	5.7	4.7	0.9	0.3	0.3	1.4
54-180	0.60	2.82	34.0	520.3	602.9	7.4	3.3	2.0	1.7	0.3	0.1	0.1	0.5
54-190	0.10	2.2	4.4	67.6	78.4	1.0	0.4	0.3	0.2	0.0	0.0	0.0	0.1
54-200	0.10	2.13	4.3	65.5	75.9	0.9	0.4	0.3	0.2	0.0	0.0	0.0	0.1
54-210	0.10	1.14	2.3	35.1	40.6	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
55-010	0.60	14.98	180.8	2,763.6	3,202.7	39.5	17.3	10.7	8.8	1.6	0.6	0.6	2.6
55-020	0.60	189.58	2,273.2	34,748.1	40,268.8	496.9	217.6	134.4	110.7	20.5	7.5	7.8	32.5
56-010	0.60	67.62	816.1	12,475.2	14,457.2	178.4	78.1	48.3	39.8	7.3	2.7	2.8	11.7
57-010	0.53	26.1	280.1	4,281.2	4,961.4	61.2	26.8	16.6	13.6	2.5	0.9	1.0	4.0
57-020	0.00	142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-030	0.45	18.22	164.9	2,521.0	2,921.6	36.0	15.8	9.8	8.0	1.5	0.5	0.6	2.4
57-040	0.35	39.88	279.9	4,279.0	4,958.9	61.2	26.8	16.6	13.6	2.5	0.9	1.0	4.0
57-050	0.45	7.9	71.5	1,093.1	1,266.8	15.6	6.8	4.2	3.5	0.6	0.2	0.2	1.0
57-060	0.46	26.11	242.9	3,712.7	4,302.6	53.1	23.2	14.4	11.8	2.2	0.8	0.8	3.5
57-070	0.45	81.33	738.0	11,280.3	13,072.5	161.3	70.6	43.6	35.9	6.6	2.4	2.5	10.5
57-080	0.42	5.54	47.1	720.0	834.4	10.3	4.5	2.8	2.3	0.4	0.2	0.2	0.7
57-090	0.47	77.77	734.2	11,222.4	13,005.4	160.5	70.3	43.4	35.8	6.6	2.4	2.5	10.5
57-100A/B	0.47	313.43	2,978.5	45,528.1	52,761.5	651.0	285.1	176.2	145.1	26.8	9.8	10.2	42.5
57-110	0.54	21.6	235.0	3,591.7	4,162.4	51.4	22.5	13.9	11.4	2.1	0.8	0.8	3.4
57-120A/B/C	0.00	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-130	0.10	1.16	2.3	35.7	41.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
57-140	0.10	1.55	3.1	47.7	55.2	0.7	0.3	0.2	0.2	0.0	0.0	0.0	0.0
57-150	0.43	35.68	309.8	4,735.1	5,487.4	67.7	29.6	18.3	15.1	2.8	1.0	1.1	4.4
57-160	0.10	1.89	3.8	58.1	67.3	0.8	0.4	0.2	0.2	0.0	0.0	0.0	0.1
61-010	0.55	2.86	31.7	485.2	562.3	6.9	3.0	1.9	1.5	0.3	0.1	0.1	0.5
62-010	0.45	27.84	253.2	3,869.9	4,484.8	55.3	24.2	15.0	12.3	2.3	0.8	0.9	3.6
63-010	0.45	388.79	3,536.0	54,050.3	62,637.7	772.9	338.4	209.1	172.3	31.8	11.6	12.1	50.5
63-020	0.00	11.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64-100	0.45	24.92	225.4	3,444.9	3,992.2	49.3	21.6	13.3	11.0	2.0	0.7	0.8	3.2
64-110	0.45	6.01	54.4	831.6	963.7	11.9	5.2	3.2	2.7	0.5	0.2	0.2	0.8
64-120	0.45	16.04	145.2	2,219.4	2,572.0	31.7	13.9	8.6	7.1	1.3	0.5	0.5	2.1
64-130	0.45	2.44	22.1	337.6	391.3	4.8	2.1	1.3	1.1	0.2	0.1	0.1	0.3
65-010	0.00	18.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65-020	0.53	38.46	409.4	6,257.7	7,251.9	89.5	39.2	24.2	19.9	3.7	1.3	1.4	5.8
70-010	0.46	6.23	57.5	878.5	1,018.1	12.6	5.5	3.4	2.8	0.5	0.2	0.2	0.8
70-015	0.45	11.69	105.8	1,617.5	1,874.5	23.1	10.1	6.3	5.2	1.0	0.3	0.4	1.5
70-020	0.45	37.55	339.9	5,195.7	6,021.2	74.3	32.5	20.1	16.6	3.1	1.1	1.2	4.9
70-025	0.00	3.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-030	0.45	13.48	121.9	1,863.7	2,159.8	26.6	11.7	7.2	5.9	1.1	0.4	0.4	1.7

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
70-035	0.45	4.53	41.0	626.8	726.4	9.0	3.9	2.4	2.0	0.4	0.1	0.1	0.6
70-040	0.45	2.42	21.9	334.8	388.0	4.8	2.1	1.3	1.1	0.2	0.1	0.1	0.3
70-045	0.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-050	0.45	17.41	157.6	2,409.0	2,791.7	34.4	15.1	9.3	7.7	1.4	0.5	0.5	2.3
70-055	0.46	333.43	3,112.9	47,582.8	55,142.7	680.4	297.9	184.1	151.6	28.0	10.2	10.7	44.5
70-060	0.45	3.53	32.0	488.4	566.0	7.0	3.1	1.9	1.6	0.3	0.1	0.1	0.5
70-065	0.45	1.89	17.1	261.5	303.1	3.7	1.6	1.0	0.8	0.2	0.1	0.1	0.2
70-070	0.45	5.8	52.5	802.5	930.0	11.5	5.0	3.1	2.6	0.5	0.2	0.2	0.8
70-075	0.43	5	43.4	663.2	768.6	9.5	4.2	2.6	2.1	0.4	0.1	0.1	0.6
70-080	0.46	11.96	111.1	1,698.9	1,968.9	24.3	10.6	6.6	5.4	1.0	0.4	0.4	1.6
70-085	0.45	229.48	2,064.5	31,557.3	36,571.1	451.2	197.6	122.1	100.6	18.6	6.8	7.1	29.5
70-090	0.45	18.57	168.1	2,569.5	2,977.7	36.7	16.1	9.9	8.2	1.5	0.6	0.6	2.4
70-095	0.45	9.99	90.4	1,382.3	1,601.9	19.8	8.7	5.3	4.4	0.8	0.3	0.3	1.3
70-100	0.45	9.64	87.3	1,333.9	1,545.8	19.1	8.4	5.2	4.3	0.8	0.3	0.3	1.2
70-105	0.45	1.63	14.8	225.5	261.4	3.2	1.4	0.9	0.7	0.1	0.0	0.1	0.2
70-110	0.45	18.13	164.1	2,508.6	2,907.2	35.9	15.7	9.7	8.0	1.5	0.5	0.6	2.3
70-115	0.45	3.71	33.6	513.3	594.9	7.3	3.2	2.0	1.6	0.3	0.1	0.1	0.5
70-120	0.45	4.22	38.2	583.9	676.7	8.3	3.7	2.3	1.9	0.3	0.1	0.1	0.5
70-125	0.00	5.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-130	0.49	34.29	340.5	5,205.3	6,032.3	74.4	32.6	20.1	16.6	3.1	1.1	1.2	4.9
70-135	0.45	7.46	67.5	1,032.2	1,196.2	14.8	6.5	4.0	3.3	0.6	0.2	0.2	1.0
70-140	0.60	0.78	9.4	143.9	166.8	2.1	0.9	0.6	0.5	0.1	0.0	0.0	0.1
70-145	0.60	9.19	110.9	1,695.5	1,964.8	24.2	10.6	6.6	5.4	1.0	0.4	0.4	1.6
70-150	0.45	4.51	40.8	624.0	723.2	8.9	3.9	2.4	2.0	0.4	0.1	0.1	0.6
70-155	0.45	2.05	18.6	283.7	328.7	4.1	1.8	1.1	0.9	0.2	0.1	0.1	0.3
70-160	0.45	2.95	26.7	408.2	473.0	5.8	2.6	1.6	1.3	0.2	0.1	0.1	0.4
70-165	0.45	27.77	251.4	3,842.4	4,452.9	54.9	24.1	14.9	12.2	2.3	0.8	0.9	3.6
70-170	0.45	23.74	214.9	3,284.8	3,806.7	47.0	20.6	12.7	10.5	1.9	0.7	0.7	3.1
70-175	0.46	30.89	284.1	4,342.7	5,032.7	62.1	27.2	16.8	13.8	2.6	0.9	1.0	4.1
70-180	0.45	1.14	10.3	157.7	182.8	2.3	1.0	0.6	0.5	0.1	0.0	0.0	0.1
70-185	0.45	1.53	13.8	211.7	245.3	3.0	1.3	0.8	0.7	0.1	0.0	0.0	0.2
70-190	0.17	15.04	52.1	795.9	922.3	11.4	5.0	3.1	2.5	0.5	0.2	0.2	0.7
70-195	0.45	46.02	418.8	6,402.4	7,419.6	91.5	40.1	24.8	20.4	3.8	1.4	1.4	6.0
70-200	0.45	31.52	285.3	4,361.3	5,054.2	62.4	27.3	16.9	13.9	2.6	0.9	1.0	4.1
70-205	0.45	1.39	12.6	192.3	222.9	2.8	1.2	0.7	0.6	0.1	0.0	0.0	0.2
70-210	0.45	3.58	32.4	495.4	574.1	7.1	3.1	1.9	1.6	0.3	0.1	0.1	0.5
70-215	0.45	5.93	53.7	820.5	950.9	11.7	5.1	3.2	2.6	0.5	0.2	0.2	0.8
70-220	0.45	4.54	41.1	628.2	728.0	9.0	3.9	2.4	2.0	0.4	0.1	0.1	0.6
70-225	0.45	4.99	45.2	690.5	800.1	9.9	4.3	2.7	2.2	0.4	0.1	0.2	0.6
70-230	0.45	4.72	42.7	653.1	756.9	9.3	4.1	2.5	2.1	0.4	0.1	0.1	0.6
70-235	0.45	5.04	45.6	697.4	808.2	10.0	4.4	2.7	2.2	0.4	0.1	0.2	0.7
70-240	0.45	4.52	40.9	625.4	724.8	8.9	3.9	2.4	2.0	0.4	0.1	0.1	0.6
70-245	0.44	9.98	88.1	1,347.1	1,561.1	19.3	8.4	5.2	4.3	0.8	0.3	0.3	1.3
70-250	0.48	41.27	400.4	6,121.0	7,093.5	87.5	38.3	23.7	19.5	3.6	1.3	1.4	5.7
70-255	0.45	45.37	410.8	6,279.6	7,277.3	89.8	39.3	24.3	20.0	3.7	1.3	1.4	5.9
70-260	0.46	24.9	229.3	3,504.7	4,061.5	50.1	21.9	13.6	11.2	2.1	0.8	0.8	3.3
70-265A/B	0.00	183.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-270	0.45	4.66	42.2	644.8	747.2	9.2	4.0	2.5	2.1	0.4	0.1	0.1	0.6
70-275	0.45	4.28	38.7	592.2	686.3	8.5	3.7	2.3	1.9	0.3	0.1	0.1	0.6
70-280	0.45	9.39	85.1	1,301.5	1,508.3	18.6	8.1	5.0	4.1	0.8	0.3	0.3	1.2
70-285	0.45	19.03	172.1	2,630.3	3,048.1	37.6	16.5	10.2	8.4	1.5	0.6	0.6	2.5
70-290	0.45	2.37	21.3	325.1	376.8	4.6	2.0	1.3	1.0	0.2	0.1	0.1	0.3
70-295	0.45	7.18	65.0	993.5	1,151.3	14.2	6.2	3.8	3.2	0.6	0.2	0.2	0.9
70-300	0.10	0.4	0.8	12.3	14.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-305	0.45	12.68	113.7	1,738.7	2,015.0	24.9	10.9	6.7	5.5	1.0	0.4	0.4	1.6
70-310	0.00	5.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-315	0.30	5.79	34.9	534.1	618.9	7.6	3.3	2.1	1.7	0.3	0.1	0.1	0.5
70-320	0.44	2.32	20.5	313.3	363.1	4.5	2.0	1.2	1.0	0.2	0.1	0.1	0.3
70-325	0.00	2.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-330	0.47	279.41	2,647.5	40,469.1	46,898.8	578.7	253.4	156.6	129.0	23.8	8.7	9.1	37.8
70-335	0.45	1.99	18.0	275.4	319.1	3.9	1.7	1.1	0.9	0.2	0.1	0.1	0.3
70-340	0.39	22.25	176.1	2,691.6	3,119.3	38.5	16.9	10.4	8.6	1.6	0.6	0.6	2.5
70-345	0.45	3.81	34.5	527.2	610.9	7.5	3.3	2.0	1.7	0.3	0.1	0.1	0.5
70-350	0.49	314.4	3,125.0	47,767.7	55,357.0	683.0	299.1	184.8	152.2	28.1	10.3	10.7	44.6
70-355	0.45	1.29	11.7	178.5	206.9	2.6	1.1	0.7	0.6	0.1	0.0	0.0	0.2
70-360	0.45	131.96	1,206.5	18,441.9	21,371.9	263.7	115.5	71.4	58.8	10.9	4.0	4.1	17.2
70-365	0.45	6.7	60.6	927.1	1,074.3	13.3	5.8	3.6	3.0	0.5	0.2	0.2	0.9
70-370	0.44	3.75	33.4	510.8	591.9	7.3	3.2	2.0	1.6	0.3	0.1	0.1	0.5
70-375	0.47	7.1	67.5	1,031.8	1,195.8	14.8	6.5	4.0	3.3	0.6	0.2	0.2	1.0
70-380	0.45	14.4	130.3	1,992.5	2,309.0	28.5	12.5	7.7	6.3	1.2	0.4	0.4	1.9
70-385	0.45	14.97	135.5	2,071.4	2,400.4	29.6	13.0	8.0	6.6	1.2	0.4	0.5	1.9
70-390	0.46	58.11	541.5	8,277.0	9,592.0	118.4	51.8	32.0	26.4	4.9	1.8	1.9	7.7
70-395	0.43	57.19	494.1	7,553.2	8,753.2	108.0	47.3	29.2	24.1	4.4	1.6	1.7	7.1
70-400	0.44	9.67	85.4	1,304.8	1,512.1	18.7	8.2	5.0	4.2	0.8	0.3	0.3	1.2
70-405	0.25	7.16	36.0	550.6	638.1	7.9	3.4	2.1	1.8	0.3	0.1	0.1	0.5
70-410	0.43	5.8	50.0	764.8	886.3	10.9	4.8	3.0	2.4	0.5	0.2	0.2	0.7
70-415	0.45	120.75	1,102.7	16,854.8	19,532.7	241.0	105.5	65.2	53.7	9.9	3.6	3.8	15.8
70-420	0.45	16.99	153.8	2,350.9	2,724.4	33.6	14.7	9.1	7.5	1.4	0.5	0.5	2.2
70-425	0.51	20.63	212.1	3,241.4	3,756.4	46.3	20.3	12.5	10.3	1.9	0.7	0.7	3.0
70-430	0.10	6.19	12.5	190.3	220.6	2.7	1.2	0.7	0.6	0.1	0.0	0.0	0.2
70-435	0.10	9.16	18.4	281.7	326.4	4.0	1.8	1.1	0.9	0.2	0.1	0.1	0.3
70-440	0.50	34.48	344.5	5,266.1	6,102.8	75.3	33.0	20.4	16.8	3.1	1.1	1.2	4.9
70-445	0.45	5.6	50.7	774.9	898.0	11.1	4.9	3.0	2.5	0.5	0.2	0.2	0.7
70-450	0.45	2.65	24.0	366.7	424.9	5.2	2.3	1.4	1.2	0.2	0.1	0.1	0.3
70-455	0.00	2.66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-460	0.45	2.67	24.2	369.4	428.1	5.3	2.3	1.4	1.2	0.2	0.1	0.1	0.3
70-465	0.45	2.58	23.4	357.0	413.7	5.1	2.2	1.4	1.1	0.2	0.1	0.1	0.3

2010 POLLUTANT LOADINGS BY OUTFALL

2010 POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS PER YEAR (estimated using FLUX

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.67	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation (meters)	0.84												
70-470	0.38	8.55	66.1	1,009.7	1,170.1	14.4	6.3	3.9	3.2	0.6	0.2	0.2	0.9
70-475	0.46	229.14	2,121.8	32,433.2	37,586.1	463.8	203.1	125.5	103.4	19.1	7.0	7.3	30.3
70-480	0.60	0.31	3.7	57.2	66.3	0.8	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-485	0.45	13.36	120.9	1,848.6	2,142.3	26.4	11.6	7.2	5.9	1.1	0.4	0.4	1.7
70-490	0.47	48.75	460.3	7,035.7	8,153.5	100.6	44.1	27.2	22.4	4.1	1.5	1.6	6.6
70-495	0.45	7.74	70.1	1,071.0	1,241.1	15.3	6.7	4.1	3.4	0.6	0.2	0.2	1.0
70-500	0.45	0.56	5.1	77.5	89.8	1.1	0.5	0.3	0.2	0.0	0.0	0.0	0.1
70-505	0.41	8.12	67.2	1,027.8	1,191.1	14.7	6.4	4.0	3.3	0.6	0.2	0.2	1.0
70-510	0.45	41.82	379.8	5,805.4	6,727.8	83.0	36.4	22.5	18.5	3.4	1.2	1.3	5.4
70-515	0.47	62.73	593.0	9,064.1	10,504.2	129.6	56.8	35.1	28.9	5.3	1.9	2.0	8.5
70-520	0.45	6.05	54.8	837.1	970.1	12.0	5.2	3.2	2.7	0.5	0.2	0.2	0.8
70-525	0.45	6.23	56.4	862.0	999.0	12.3	5.4	3.3	2.7	0.5	0.2	0.2	0.8
70-530	0.45	1.67	15.1	231.1	267.8	3.3	1.4	0.9	0.7	0.1	0.0	0.1	0.2
70-535	0.45	30.24	274.4	4,193.9	4,860.3	60.0	26.3	16.2	13.4	2.5	0.9	0.9	3.9
70-540	0.21	5.1	21.9	334.8	387.9	4.8	2.1	1.3	1.1	0.2	0.1	0.1	0.3
70-545	0.45	1.89	17.1	261.5	303.1	3.7	1.6	1.0	0.8	0.2	0.1	0.1	0.2
70-550	0.26	1.3	6.8	103.5	119.9	1.5	0.6	0.4	0.3	0.1	0.0	0.0	0.1
70-555	0.45	1.73	15.7	239.4	277.4	3.4	1.5	0.9	0.8	0.1	0.1	0.1	0.2
70-560	0.45	3.33	30.1	460.8	534.0	6.6	2.9	1.8	1.5	0.3	0.1	0.1	0.4
70-565	0.24	16.63	80.5	1,230.1	1,425.5	17.6	7.7	4.8	3.9	0.7	0.3	0.3	1.1
70-570	0.45	1.23	11.1	170.2	197.2	2.4	1.1	0.7	0.5	0.1	0.0	0.0	0.2
70-575	0.45	15.39	139.2	2,127.3	2,465.3	30.4	13.3	8.2	6.8	1.3	0.5	0.5	2.0
70-580	0.43	119.93	1,046.5	15,996.8	18,538.3	228.7	100.2	61.9	51.0	9.4	3.4	3.6	15.0
71-010	0.10	1.12	2.3	34.4	39.9	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
71-020	0.45	14.05	127.2	1,944.1	2,252.9	27.8	12.2	7.5	6.2	1.1	0.4	0.4	1.8
71-030	0.45	28.58	260.1	3,976.1	4,607.9	56.9	24.9	15.4	12.7	2.3	0.9	0.9	3.7
71-040	0.22	20.93	92.4	1,412.5	1,637.0	20.2	8.8	5.5	4.5	0.8	0.3	0.3	1.3
71-050	0.46	120.42	1,109.4	16,958.2	19,652.5	242.5	106.2	65.6	54.0	10.0	3.6	3.8	15.8
71-060	0.45	3.11	28.2	430.3	498.7	6.2	2.7	1.7	1.4	0.3	0.1	0.1	0.4
71-070	0.00	386.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-080	0.46	101.79	934.3	14,280.9	16,549.9	204.2	89.4	55.3	45.5	8.4	3.1	3.2	13.3
71-090	0.45	6.5	58.3	890.5	1,032.0	12.7	5.6	3.4	2.8	0.5	0.2	0.2	0.8
71-100	0.10	1.99	4.0	61.2	70.9	0.9	0.4	0.2	0.2	0.0	0.0	0.0	0.1
72-010	0.18	17.32	61.0	932.5	1,080.7	13.3	5.8	3.6	3.0	0.5	0.2	0.2	0.9
72-020	0.40	24.7	196.3	3,001.0	3,477.8	42.9	18.8	11.6	9.6	1.8	0.6	0.7	2.8
72-030	0.10	5.25	10.6	161.4	187.1	2.3	1.0	0.6	0.5	0.1	0.0	0.0	0.2
72-040	0.42	166.54	1,395.4	21,329.9	24,718.8	305.0	133.6	82.5	68.0	12.6	4.6	4.8	19.9
72-050	0.10	5.16	10.4	158.7	183.9	2.3	1.0	0.6	0.5	0.1	0.0	0.0	0.1
72-060	0.36	113.04	822.5	12,572.6	14,570.1	179.8	78.7	48.6	40.1	7.4	2.7	2.8	11.8
72-070	0.10	2.21	4.4	68.0	78.7	1.0	0.4	0.3	0.2	0.0	0.0	0.0	0.1
72-080	0.60	4.74	57.2	874.5	1,013.4	12.5	5.5	3.4	2.8	0.5	0.2	0.2	0.8
72-090	0.45	68.71	618.1	9,447.4	10,948.4	135.1	59.2	36.6	30.1	5.6	2.0	2.1	8.8
72-100	0.46	68.32	636.3	9,726.4	11,271.7	139.1	60.9	37.6	31.0	5.7	2.1	2.2	9.1
72-110	0.10	3.22	6.5	99.0	114.7	1.4	0.6	0.4	0.3	0.1	0.0	0.0	0.1
72-120	0.45	62.98	570.1	8,714.3	10,098.9	124.6	54.6	33.7	27.8	5.1	1.9	2.0	8.1
72-130	0.46	58.06	533.0	8,146.6	9,440.9	116.5	51.0	31.5	26.0	4.8	1.8	1.8	7.6
72-140	0.10	10.19	20.5	313.3	363.1	4.5	2.0	1.2	1.0	0.2	0.1	0.1	0.3
72-150	0.10	4.76	9.6	146.4	169.6	2.1	0.9	0.6	0.5	0.1	0.0	0.0	0.1
72-160	0.10	4.55	9.2	139.9	162.1	2.0	0.9	0.5	0.4	0.1	0.0	0.0	0.1
73-010	0.44	20.76	183.3	2,801.5	3,246.7	40.1	17.5	10.8	8.9	1.6	0.6	0.6	2.6
73-020	0.44	57.47	511.6	7,820.8	9,063.4	111.8	49.0	30.3	24.9	4.6	1.7	1.8	7.3
73-030	0.10	21.56	43.4	662.9	768.3	9.5	4.2	2.6	2.1	0.4	0.1	0.1	0.6
74-010	0.48	44.39	427.4	6,533.4	7,571.4	93.4	40.9	25.3	20.8	3.8	1.4	1.5	6.1
74-020	0.45	4.41	39.9	610.2	707.1	8.7	3.8	2.4	1.9	0.4	0.1	0.1	0.6
75-005	0.45	12.39	112.0	1,712.3	1,984.4	24.5	10.7	6.6	5.5	1.0	0.4	0.4	1.6
75-010	0.60	3.65	44.1	673.4	780.4	9.6	4.2	2.6	2.1	0.4	0.1	0.2	0.6
75-020	0.45	1.53	13.8	211.7	245.3	3.0	1.3	0.8	0.7	0.1	0.0	0.0	0.2
75-030	0.45	8.38	75.9	1,159.5	1,343.7	16.6	7.3	4.5	3.7	0.7	0.2	0.3	1.1
75-040	0.45	14.74	133.4	2,039.5	2,363.6	29.2	12.8	7.9	6.5	1.2	0.4	0.5	1.9
76-010	0.46	907.31	8,465.6	129,402.8	149,962.1	1,850.3	810.3	500.7	412.4	76.2	27.8	29.0	120.9
76-020	0.46	88.62	812.3	12,416.7	14,389.5	177.5	77.7	48.0	39.6	7.3	2.7	2.8	11.6
76-030	0.45	7.55	68.3	1,044.7	1,210.6	14.9	6.5	4.0	3.3	0.6	0.2	0.2	1.0
76-040	0.19	4.67	17.5	267.3	309.7	3.8	1.7	1.0	0.9	0.2	0.1	0.1	0.2
76-050	0.00	2.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-010	0.10	31.17	62.7	958.4	1,110.7	13.7	6.0	3.7	3.1	0.6	0.2	0.2	0.9
82-010	0.49	23.53	230.3	3,520.4	4,079.7	50.3	22.0	13.6	11.2	2.1	0.8	0.8	3.3
82-020	0.45	73.45	672.0	10,271.8	11,903.8	146.9	64.3	39.7	32.7	6.0	2.2	2.3	9.6
82-030	0.45	90.04	823.6	12,588.7	14,588.7	180.0	78.8	48.7	40.1	7.4	2.7	2.8	11.8
82-040	0.46	98.49	919.1	14,048.9	16,280.9	200.9	88.0	54.4	44.8	8.3	3.0	3.2	13.1
83-010	0.45	6.59	59.7	911.8	1,056.7	13.0	5.7	3.5	2.9	0.5	0.2	0.2	0.9
83-015	0.45	0.99	9.0	137.0	158.7	2.0	0.9	0.5	0.4	0.1	0.0	0.0	0.1
83-020	0.43	85.96	751.8	11,491.6	13,317.4	164.3	72.0	44.5	36.6	6.8	2.5	2.6	10.7
83-025	0.45	51.23	463.7	7,088.5	8,214.8	101.4	44.4	27.4	22.6	4.2	1.5	1.6	6.6
83-030	0.60	0.82	9.9	151.3	175.3	2.2	0.9	0.6	0.5	0.1	0.0	0.0	0.1
83-040	0.10	1.08	2.2	33.2	38.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
83-050	0.45	40.4	366.7	5,605.3	6,495.9	80.2	35.1	21.7	17.9	3.3	1.2	1.3	5.2
83-060	0.45	10.05	91.0	1,390.6	1,611.5	19.9	8.7	5.4	4.4	0.8	0.3	0.3	1.3
83-070	0.10	1.19	2.4	36.6	42.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
83-080	0.48	178.63	1,708.4	26,113.8	30,262.7	373.4	163.5	101.0	83.2	15.4	5.6	5.9	24.4
83-090	0.41	9.16	75.5	1,154.2	1,337.5	16.5	7.2	4.5	3.7	0.7	0.2	0.3	1.1
84-010	0.47	21.56	204.0	3,118.0	3,613.4	44.6	19.5	12.1	9.9	1.8	0.7	0.7	2.9
85-010	0.10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANNUAL SUMMATION (kg)			271,718.67	4,153,413.94	4,813,302.13	59,389.94	26,007.36	16,070.22	13,236.58	2,445.47	892.79	931.61	3,881.70

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
10-010	0.43	113.55	72.8	1,059.6	7,716.5	17.9	5.6	5.0	3.7	0.3	0.3	0.2	1.3
10-020	0.45	7.81	5.2	76.0	553.6	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-030	0.10	4.05	0.6	8.8	63.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-040	0.45	167.42	111.2	1,618.3	11,784.9	27.3	8.6	7.6	5.6	0.5	0.5	0.3	2.0
10-050	0.46	114.18	77.2	1,124.2	8,187.1	19.0	6.0	5.3	3.9	0.3	0.3	0.2	1.4
10-060	0.60	10.5	9.4	136.3	992.4	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
10-070	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-080	0.38	30.66	17.4	253.4	1,845.6	4.3	1.4	1.2	0.9	0.1	0.1	0.1	0.3
10-090A	0.00	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090B	0.00	1.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090C	0.54	12.77	10.3	149.6	1,089.3	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
10-090D	0.00	4.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-100	0.36	1392.1	750.4	10,921.9	79,538.0	184.3	58.2	51.0	37.9	3.1	3.1	2.2	13.8
10-110	0.47	300.11	208.1	3,028.4	22,054.4	51.1	16.1	14.1	10.5	0.9	0.9	0.6	3.8
10-120A/B	0.44	372.78	241.1	3,509.6	25,558.2	59.2	18.7	16.4	12.2	1.0	1.0	0.7	4.4
10-130	0.45	336.46	225.8	3,286.0	23,929.9	55.4	17.5	15.4	11.4	0.9	0.9	0.7	4.1
10-140a	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-140a,b	0.58	220.65	188.7	2,746.3	19,999.9	46.3	14.6	12.8	9.5	0.8	0.8	0.5	3.5
10-150	0.47	157.15	109.5	1,593.8	11,606.5	26.9	8.5	7.4	5.5	0.5	0.5	0.3	2.0
10-160	0.00	17	0.1	0.9	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-170	0.50	176.01	131.6	1,915.8	13,951.8	32.3	10.2	9.0	6.7	0.5	0.5	0.4	2.4
10-180	0.45	284.26	188.1	2,738.0	19,939.5	46.2	14.6	12.8	9.5	0.8	0.8	0.5	3.4
10-190	0.59	14.58	12.8	186.6	1,359.0	3.1	1.0	0.9	0.6	0.1	0.1	0.0	0.2
10-200	0.40	42.44	25.0	364.5	2,654.2	6.1	1.9	1.7	1.3	0.1	0.1	0.1	0.5
10-210	0.49	98.32	71.8	1,045.4	7,613.1	17.6	5.6	4.9	3.6	0.3	0.3	0.2	1.3
10-220	0.56	18.83	15.6	227.7	1,658.3	3.8	1.2	1.1	0.8	0.1	0.1	0.0	0.3
10-230	0.47	235.02	165.1	2,403.0	17,499.4	40.5	12.8	11.2	8.3	0.7	0.7	0.5	3.0
10-240	0.51	103.83	79.3	1,153.7	8,401.8	19.5	6.1	5.4	4.0	0.3	0.3	0.2	1.5
10-250	0.49	242.96	176.5	2,569.0	18,708.7	43.3	13.7	12.0	8.9	0.7	0.7	0.5	3.2
10-260	0.56	23.77	19.7	286.5	2,086.1	4.8	1.5	1.3	1.0	0.1	0.1	0.1	0.4
10-270	0.47	72.45	51.0	742.6	5,407.7	12.5	4.0	3.5	2.6	0.2	0.2	0.1	0.9
10-280	0.44	55.08	36.3	528.8	3,850.6	8.9	2.8	2.5	1.8	0.1	0.1	0.1	0.7
10-290	0.10	6.83	1.0	14.8	107.6	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-300	0.36	17.74	9.5	138.4	1,007.6	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
10-310	0.47	60.29	42.3	615.8	4,484.7	10.4	3.3	2.9	2.1	0.2	0.2	0.1	0.8
10-320	0.45	341.99	229.6	3,341.8	24,336.6	56.4	17.8	15.6	11.6	0.9	0.9	0.7	4.2
10-330	0.35	21.61	11.3	164.3	1,196.8	2.8	0.9	0.8	0.6	0.0	0.0	0.0	0.2
10-340	0.45	20.74	13.9	202.4	1,474.1	3.4	1.1	0.9	0.7	0.1	0.1	0.0	0.3
10-350	0.60	28.16	25.1	364.8	2,656.5	6.2	1.9	1.7	1.3	0.1	0.1	0.1	0.5
10-360	0.59	29.02	25.6	372.0	2,709.2	6.3	2.0	1.7	1.3	0.1	0.1	0.1	0.5
10-370	0.59	14.46	12.7	184.4	1,342.9	3.1	1.0	0.9	0.6	0.1	0.1	0.0	0.2
10-380	0.45	14.38	9.5	138.5	1,008.4	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
10-390	0.49	41.97	30.8	447.6	3,259.7	7.6	2.4	2.1	1.6	0.1	0.1	0.1	0.6
10-400A	0.10	1.07	0.2	2.3	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-400B	0.47	17.66	12.4	180.1	1,311.9	3.0	1.0	0.8	0.6	0.1	0.1	0.0	0.2
10-400C	0.57	50.25	42.2	615.0	4,478.4	10.4	3.3	2.9	2.1	0.2	0.2	0.1	0.8
10-410A	0.50	46.22	34.2	497.7	3,624.5	8.4	2.7	2.3	1.7	0.1	0.1	0.1	0.6
10-410B	0.32	21.29	10.0	145.7	1,061.1	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
10-410C	0.53	22.8	17.9	260.3	1,895.6	4.4	1.4	1.2	0.9	0.1	0.1	0.1	0.3
10-410D	0.60	27.34	24.4	355.0	2,585.0	6.0	1.9	1.7	1.2	0.1	0.1	0.1	0.4
10-410E	0.58	256.04	218.9	3,186.8	23,207.7	53.8	17.0	14.9	11.1	0.9	0.9	0.6	4.0
10-410F	0.59	37.92	33.1	482.5	3,513.5	8.1	2.6	2.3	1.7	0.1	0.1	0.1	0.6
10-420A	0.27	23.05	9.3	135.9	989.4	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
10-420B	0.00	10.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420C	0.00	7.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420D	0.00	20.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420E	0.59	127.89	111.5	1,623.3	11,821.7	27.4	8.6	7.6	5.6	0.5	0.5	0.3	2.0
10-430A	0.00	8.14	0.0	0.4	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430B	0.53	54.72	43.4	632.4	4,605.7	10.7	3.4	3.0	2.2	0.2	0.2	0.1	0.8
10-430C	0.48	44.83	32.0	465.8	3,392.3	7.9	2.5	2.2	1.6	0.1	0.1	0.1	0.6
10-430D	0.49	85.79	62.7	912.2	6,643.3	15.4	4.9	4.3	3.2	0.3	0.3	0.2	1.1
10-430E	0.56	86.66	71.8	1,045.2	7,611.6	17.6	5.6	4.9	3.6	0.3	0.3	0.2	1.3
10-430F	0.10	377.97	56.2	817.5	5,953.7	13.8	4.4	3.8	2.8	0.2	0.2	0.2	1.0
10-430G	0.50	125.89	92.7	1,349.5	9,827.4	22.8	7.2	6.3	4.7	0.4	0.4	0.3	1.7
10-430H	0.49	33.18	24.2	352.7	2,568.2	5.9	1.9	1.6	1.2	0.1	0.1	0.1	0.4
10-430I	0.59	32.61	28.5	415.2	3,023.5	7.0	2.2	1.9	1.4	0.1	0.1	0.1	0.5
10-430J	0.43	532.36	343.3	4,996.9	36,389.6	84.3	26.6	23.3	17.4	1.4	1.4	1.0	6.3
10-430K	0.48	337.06	239.2	3,482.4	25,360.1	58.7	18.6	16.3	12.1	1.0	1.0	0.7	4.4
10-430L	0.45	84.4	56.5	822.9	5,992.6	13.9	4.4	3.8	2.9	0.2	0.2	0.2	1.0
10-430M	0.54	75.94	61.2	890.9	6,487.9	15.0	4.7	4.2	3.1	0.3	0.3	0.2	1.1
10-430N	0.44	26.43	17.4	253.8	1,848.1	4.3	1.4	1.2	0.9	0.1	0.1	0.1	0.3
10-430O	0.00	109.53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430P	0.00	229.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430Q	0.10	8.03	1.2	17.4	126.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-430R	0.47	150.32	104.4	1,519.9	11,068.8	25.6	8.1	7.1	5.3	0.4	0.4	0.3	1.9
10-430S	0.10	5.15	0.8	11.1	81.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
10-430T	0.46	262.47	178.3	2,595.2	18,899.1	43.8	13.8	12.1	9.0	0.7	0.7	0.5	3.3
10-430U	0.47	431.37	301.2	4,384.0	31,926.0	74.0	23.4	20.5	15.2	1.2	1.2	0.9	5.5
10-430V	0.46	329.11	227.3	3,309.0	24,097.5	55.8	17.6	15.5	11.5	0.9	0.9	0.7	4.2
10-440A	0.46	23.18	15.8	229.7	1,672.8	3.9	1.2	1.1	0.8	0.1	0.1	0.0	0.3
10-440B	0.49	34.23	25.1	364.9	2,657.1	6.2	1.9	1.7	1.3	0.1	0.1	0.1	0.5

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
10-440C/D	0.00	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-440E	0.51	831.25	635.2	9,245.9	67,332.5	156.0	49.3	43.2	32.1	2.6	2.6	1.8	11.6
10-440F	0.46	538.85	368.5	5,364.0	39,063.1	90.5	28.6	25.1	18.6	1.5	1.5	1.1	6.8
10-450A	0.00	343.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-450B	0.52	3.41	2.6	38.1	277.5	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
10-450C	0.59	55.64	49.1	714.7	5,204.6	12.1	3.8	3.3	2.5	0.2	0.2	0.1	0.9
10-450D	0.45	4.62	3.1	45.0	327.5	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
10-450E	0.44	3.2	2.1	30.6	222.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-450F	0.46	158.55	108.2	1,575.6	11,474.0	26.6	8.4	7.4	5.5	0.4	0.4	0.3	2.0
10-450G/H	0.48	75.02	53.6	779.7	5,678.0	13.2	4.2	3.6	2.7	0.2	0.2	0.2	1.0
10-450I	0.49	243.64	177.8	2,588.7	18,852.1	43.7	13.8	12.1	9.0	0.7	0.7	0.5	3.3
10-450J	0.49	17.16	12.4	180.2	1,312.3	3.0	1.0	0.8	0.6	0.1	0.1	0.0	0.2
10-450K	0.58	37.01	31.9	463.7	3,377.0	7.8	2.5	2.2	1.6	0.1	0.1	0.1	0.6
10-450L	0.51	213.41	160.2	2,331.4	16,978.1	39.3	12.4	10.9	8.1	0.7	0.7	0.5	2.9
10-460	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460A	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460B	0.52	7.29	5.6	81.5	593.4	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-460C/D/F	0.00	159.87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460E	0.49	231.41	169.8	2,471.9	18,001.2	41.7	13.2	11.5	8.6	0.7	0.7	0.5	3.1
10-460F	0.49	14.75	10.8	157.8	1,149.4	2.7	0.8	0.7	0.5	0.0	0.0	0.0	0.2
10-460G	0.51	79.66	60.5	880.1	6,409.5	14.8	4.7	4.1	3.1	0.2	0.2	0.2	1.1
10-460H	0.48	12.35	8.8	128.1	932.6	2.2	0.7	0.6	0.4	0.0	0.0	0.0	0.2
10-460I	0.00	72.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460J	0.46	5.36	3.7	53.8	391.5	0.9	0.3	0.3	0.2	0.0	0.0	0.0	0.1
10-460K	0.36	5.48	2.9	42.6	310.5	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
10-460L	0.46	3.5	2.4	35.1	255.5	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
10-460M	0.48	9.55	6.8	98.9	719.9	1.7	0.5	0.5	0.3	0.0	0.0	0.0	0.1
10-460N	0.45	3.85	2.6	37.5	272.9	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
10-460O	0.45	4.15	2.8	40.7	296.6	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
10-460P	0.45	4.34	2.9	42.2	307.6	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
10-460Q	0.56	19.73	16.5	240.8	1,753.3	4.1	1.3	1.1	0.8	0.1	0.1	0.0	0.3
10-460R	0.00	51.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460S	0.56	233.54	195.8	2,850.5	20,758.7	48.1	15.2	13.3	9.9	0.8	0.8	0.6	3.6
10-465	0.10	8.56	1.3	18.5	134.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-470	0.38	25.6	14.5	211.3	1,539.0	3.6	1.1	1.0	0.7	0.1	0.1	0.0	0.3
10-480	0.58	39.66	34.2	497.7	3,624.5	8.4	2.7	2.3	1.7	0.1	0.1	0.1	0.6
10-485	0.00	7.27	0.0	0.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-490	0.43	150.96	97.3	1,415.5	10,308.7	23.9	7.5	6.6	4.9	0.4	0.4	0.3	1.8
10-500A	0.26	26.21	10.2	148.8	1,083.5	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
10-500B	0.46	8.48	5.8	84.4	614.8	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-500C	0.44	111.36	72.0	1,048.6	7,636.7	17.7	5.6	4.9	3.6	0.3	0.3	0.2	1.3
10-500D	0.24	3.83	1.4	19.7	143.6	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-500E	0.53	23.34	18.5	268.8	1,957.5	4.5	1.4	1.3	0.9	0.1	0.1	0.1	0.3
10-500F	0.49	12.04	8.8	128.6	936.5	2.2	0.7	0.6	0.4	0.0	0.0	0.0	0.2
10-500G	0.00	112.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-505	0.10	7.85	1.2	17.0	123.7	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-510	0.51	62.36	47.1	686.1	4,996.3	11.6	3.7	3.2	2.4	0.2	0.2	0.1	0.9
10-520	0.00	139.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-530	0.45	116.15	77.8	1,132.5	8,247.3	19.1	6.0	5.3	3.9	0.3	0.3	0.2	1.4
10-540	0.12	53.9	9.5	138.1	1,005.5	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
10-550	0.46	25.83	17.7	257.0	1,871.3	4.3	1.4	1.2	0.9	0.1	0.1	0.1	0.3
10-560A/B	0.44	600.63	390.5	5,683.7	41,391.2	95.9	30.3	26.6	19.7	1.6	1.6	1.1	7.2
10-570A	0.54	14.64	11.8	172.2	1,254.0	2.9	0.9	0.8	0.6	0.0	0.0	0.0	0.2
10-570B	0.44	228.18	148.0	2,154.4	15,689.5	36.3	11.5	10.1	7.5	0.6	0.6	0.4	2.7
10-580	0.45	73.39	48.9	712.5	5,188.6	12.0	3.8	3.3	2.5	0.2	0.2	0.1	0.9
10-600	0.48	89.24	64.1	933.5	6,798.0	15.7	5.0	4.4	3.2	0.3	0.3	0.2	1.2
10-610	0.46	25.6	17.4	253.8	1,848.3	4.3	1.4	1.2	0.9	0.1	0.1	0.1	0.3
10-620	0.00	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630A	0.10	6.24	0.9	13.5	98.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
10-630B	0.45	4.68	3.1	45.6	331.7	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
10-630C	0.48	96.03	68.9	1,003.5	7,308.1	16.9	5.3	4.7	3.5	0.3	0.3	0.2	1.3
10-630D	0.45	6.37	4.3	62.0	451.5	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
10-630E	0.45	8.52	5.7	82.9	603.9	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-630F	0.54	17.56	14.1	205.2	1,494.3	3.5	1.1	1.0	0.7	0.1	0.1	0.0	0.3
10-630G	0.45	5.9	3.9	57.4	418.2	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
10-630H	0.30	25.63	11.5	167.9	1,222.7	2.8	0.9	0.8	0.6	0.0	0.0	0.0	0.2
10-630I	0.47	12.48	8.6	125.5	914.2	2.1	0.7	0.6	0.4	0.0	0.0	0.0	0.2
10-630J	0.55	14.69	12.1	175.9	1,281.1	3.0	0.9	0.8	0.6	0.0	0.0	0.0	0.2
10-630K	0.47	95.29	67.0	975.5	7,104.0	16.5	5.2	4.6	3.4	0.3	0.3	0.2	1.2
10-630L	0.52	100.42	77.7	1,131.6	8,241.2	19.1	6.0	5.3	3.9	0.3	0.3	0.2	1.4
10-630M	0.50	11.71	8.6	125.8	915.9	2.1	0.7	0.6	0.4	0.0	0.0	0.0	0.2
10-630N	0.45	8.45	5.7	82.2	599.0	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-630O	0.36	5.77	3.1	45.4	330.9	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
10-630P/Q	0.00	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630R	0.33	83.89	41.6	606.0	4,413.3	10.2	3.2	2.8	2.1	0.2	0.2	0.1	0.8
10-630S	0.22	37.02	12.0	174.1	1,267.6	2.9	0.9	0.8	0.6	0.0	0.0	0.0	0.2
10-630T	0.56	7.72	6.5	93.9	684.0	1.6	0.5	0.4	0.3	0.0	0.0	0.0	0.1
10-630U	0.52	115.42	89.7	1,305.9	9,510.2	22.0	7.0	6.1	4.5	0.4	0.4	0.3	1.6
10-630V	0.11	33.85	5.3	77.3	563.1	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
10-630W	0.47	23.68	16.7	242.6	1,766.9	4.1	1.3	1.1	0.8	0.1	0.1	0.0	0.3
10-630X	0.44	14.78	9.7	141.4	1,029.9	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
10-630Y	0.00	112.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630Z	0.47	45.66	31.9	465.0	3,386.1	7.8	2.5	2.2	1.6	0.1	0.1	0.1	0.6
10-640	0.46	258.18	175.5	2,554.0	18,599.7	43.1	13.6	11.9	8.9	0.7	0.7	0.5	3.2
10-650	0.56	19.53	16.2	235.3	1,713.6	4.0	1.3	1.1	0.8	0.1	0.1	0.0	0.3
10-660	0.46	306.37	210.9	3,069.9	22,356.2	51.8	16.4	14.3	10.7	0.9	0.9	0.6	3.9
10-670	0.45	137.88	92.1	1,340.1	9,759.0	22.6	7.1	6.3	4.7	0.4	0.4	0.3	1.7
10-680	0.46	707.95	482.4	7,021.2	51,131.3	118.4	37.4	32.8	24.4	2.0	2.0	1.4	8.8
10-690	0.50	70.63	52.5	764.3	5,565.9	12.9	4.1	3.6	2.7	0.2	0.2	0.2	1.0
10-700	0.46	222.07	153.2	2,230.5	16,243.2	37.6	11.9	10.4	7.7	0.6	0.6	0.4	2.8
10-710	0.33	29.95	14.8	215.8	1,571.6	3.6	1.1	1.0	0.7	0.1	0.1	0.0	0.3
10-720A	0.44	15.77	10.4	151.3	1,101.5	2.6	0.8	0.7	0.5	0.0	0.0	0.0	0.2
10-720B	0.48	422.18	302.3	4,399.5	32,038.9	74.2	23.4	20.6	15.3	1.2	1.2	0.9	5.5
10-720C	0.43	26.35	16.8	244.7	1,782.3	4.1	1.3	1.1	0.9	0.1	0.1	0.0	0.3
10-720D	0.46	22.95	15.5	226.0	1,645.8	3.8	1.2	1.1	0.8	0.1	0.1	0.0	0.3
10-720E	0.46	18.39	12.5	181.3	1,320.1	3.1	1.0	0.8	0.6	0.1	0.1	0.0	0.2
10-720F	0.48	317.75	226.6	3,297.7	24,015.2	55.6	17.6	15.4	11.5	0.9	0.9	0.7	4.2
10-720G	0.00	13.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-720H	0.45	4.55	3.0	44.3	322.5	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
10-720I	0.45	87.27	57.8	841.8	6,130.4	14.2	4.5	3.9	2.9	0.2	0.2	0.2	1.1
10-720J	0.36	3.71	2.0	28.7	208.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-720K	0.55	32.76	26.7	389.1	2,833.5	6.6	2.1	1.8	1.4	0.1	0.1	0.1	0.5
10-720L	0.45	4.57	3.1	44.5	323.9	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
20-010	0.42	93.99	58.6	853.5	6,215.3	14.4	4.5	4.0	3.0	0.2	0.2	0.2	1.1
20-020	0.44	15.09	9.8	143.2	1,042.7	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2
20-030	0.45	7.95	5.3	77.4	563.5	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
20-040	0.37	6.79	3.8	54.8	398.8	0.9	0.3	0.3	0.2	0.0	0.0	0.0	0.1
20-050	0.00	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-060	0.45	5.91	4.0	57.5	418.9	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
20-070	0.44	39.07	25.7	374.7	2,728.7	6.3	2.0	1.8	1.3	0.1	0.1	0.1	0.5
20-080	0.45	33.72	22.7	330.7	2,408.2	5.6	1.8	1.5	1.1	0.1	0.1	0.1	0.4
20-090	0.55	9.95	8.2	119.0	866.3	2.0	0.6	0.6	0.4	0.0	0.0	0.0	0.1
20-100	0.10	0.99	0.1	2.1	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-110	0.24	216.04	77.0	1,121.1	8,164.5	18.9	6.0	5.2	3.9	0.3	0.3	0.2	1.4
20-120	0.47	10.22	7.1	103.3	752.5	1.7	0.6	0.5	0.4	0.0	0.0	0.0	0.1
20-130	0.45	16.12	10.8	156.9	1,142.6	2.6	0.8	0.7	0.5	0.0	0.0	0.0	0.2
20-140	0.44	2.97	1.9	28.4	206.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-150	0.45	14.48	9.7	140.9	1,026.4	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2
20-160	0.54	3.21	2.6	37.5	273.2	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
20-170	0.37	4.94	2.7	39.8	289.9	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
20-180	0.51	5.3	4.0	58.0	422.5	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
20-190	0.45	1.35	0.9	13.1	95.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
20-200	0.45	13.84	9.3	134.7	981.0	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
20-210A	0.44	92.9	60.6	882.7	6,428.0	14.9	4.7	4.1	3.1	0.2	0.2	0.2	1.1
20-210B	0.50	620.78	465.5	6,774.9	49,337.8	114.3	36.1	31.7	23.5	1.9	1.9	1.3	8.5
20-220	0.46	26.38	18.1	263.1	1,915.7	4.4	1.4	1.2	0.9	0.1	0.1	0.1	0.3
20-230	0.00	21.46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-240	0.48	30.06	21.5	313.3	2,281.3	5.3	1.7	1.5	1.1	0.1	0.1	0.1	0.4
20-250	0.57	6.28	5.3	77.7	565.6	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
20-260	0.60	3.5	3.1	45.4	330.8	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
20-270	0.48	42.81	30.3	441.4	3,214.7	7.4	2.4	2.1	1.5	0.1	0.1	0.1	0.6
20-280	0.54	8.98	7.2	104.4	760.2	1.8	0.6	0.5	0.4	0.0	0.0	0.0	0.1
20-290	0.00	4.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-010	0.45	49.49	33.0	479.8	3,494.4	8.1	2.6	2.2	1.7	0.1	0.1	0.1	0.6
40-010	0.45	719.17	478.9	6,970.7	50,763.6	117.6	37.1	32.6	24.2	2.0	2.0	1.4	8.8
40-020	0.45	15.36	10.3	149.5	1,088.8	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
40-030	0.42	51.02	31.7	461.0	3,357.2	7.8	2.5	2.2	1.6	0.1	0.1	0.1	0.6
40-040	0.43	65.39	42.2	614.1	4,472.3	10.4	3.3	2.9	2.1	0.2	0.2	0.1	0.8
40-050	0.45	10.28	6.9	100.1	728.7	1.7	0.5	0.5	0.3	0.0	0.0	0.0	0.1
40-060	0.45	3.2	2.1	31.1	226.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
40-070	0.38	7.98	4.5	65.3	475.5	1.1	0.3	0.3	0.2	0.0	0.0	0.0	0.1
40-080	0.41	60.51	36.7	534.5	3,892.5	9.0	2.8	2.5	1.9	0.2	0.2	0.1	0.7
40-090	0.46	20.65	14.3	207.6	1,512.1	3.5	1.1	1.0	0.7	0.1	0.1	0.0	0.3
40-100	0.00	20.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-110	0.44	2.61	1.7	25.1	182.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
40-120	0.44	65.87	42.9	624.4	4,547.4	10.5	3.3	2.9	2.2	0.2	0.2	0.1	0.8
40-130	0.45	35.01	23.5	342.2	2,491.9	5.8	1.8	1.6	1.2	0.1	0.1	0.1	0.4
40-140	0.35	125.46	64.8	943.6	6,872.0	15.9	5.0	4.4	3.3	0.3	0.3	0.2	1.2
40-150	0.47	24.31	17.1	249.1	1,814.1	4.2	1.3	1.2	0.9	0.1	0.1	0.0	0.3
40-160	0.49	30.99	22.8	331.4	2,413.2	5.6	1.8	1.5	1.2	0.1	0.1	0.1	0.4
40-170	0.00	194.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-180	0.54	16.8	13.4	195.6	1,424.6	3.3	1.0	0.9	0.7	0.1	0.1	0.0	0.2
40-190	0.53	65.53	51.5	749.5	5,458.1	12.6	4.0	3.5	2.6	0.2	0.2	0.1	0.9
40-200	0.46	24.75	17.0	247.5	1,802.4	4.2	1.3	1.2	0.9	0.1	0.1	0.0	0.3
40-210	0.54	17.26	14.0	203.4	1,481.3	3.4	1.1	1.0	0.7	0.1	0.1	0.0	0.3
40-220	0.47	100.58	69.9	1,017.0	7,406.5	17.2	5.4	4.8	3.5	0.3	0.3	0.2	1.3
40-230	0.44	13.78	9.1	132.6	965.5	2.2	0.7	0.6	0.5	0.0	0.0	0.0	0.2
40-240	0.00	340.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-250	0.60	1.15	1.0	14.9	108.7	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
40-260	0.45	3.49	2.3	34.0	247.4	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
40-270	0.45	9.59	6.4	93.3	679.8	1.6	0.5	0.4	0.3	0.0	0.0	0.0	0.1
40-280	0.53	12.76	10.0	145.1	1,057.0	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
40-290	0.51	13.73	10.4	152.1	1,107.4	2.6	0.8	0.7	0.5	0.0	0.0	0.0	0.2
40-300	0.52	10.38	8.0	117.0	851.9	2.0	0.6	0.5	0.4	0.0	0.0	0.0	0.1
40-310	0.45	97.86	65.8	958.1	6,977.4	16.2	5.1	4.5	3.3	0.3	0.3	0.2	1.2
40-320	0.60	9.43	8.4	122.4	891.2	2.1	0.7	0.6	0.4	0.0	0.0	0.0	0.2
40-330	0.59	15.34	13.5	196.7	1,432.1	3.3	1.0	0.9	0.7	0.1	0.1	0.0	0.2
40-340	0.53	35.27	27.9	406.6	2,960.7	6.9	2.2	1.9	1.4	0.1	0.1	0.1	0.5
40-350	0.60	8.99	8.0	116.7	849.7	2.0	0.6	0.5	0.4	0.0	0.0	0.0	0.1
40-360	0.60	8.09	7.2	105.0	764.6	1.8	0.6	0.5	0.4	0.0	0.0	0.0	0.1
40-370	0.58	12.41	10.7	155.3	1,130.8	2.6	0.8	0.7	0.5	0.0	0.0	0.0	0.2
40-380	0.39	24.92	14.6	212.1	1,544.3	3.6	1.1	1.0	0.7	0.1	0.1	0.0	0.3
40-390	0.58	5.72	4.9	71.8	522.5	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
40-400	0.10	1.07	0.2	2.3	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-010	0.38	94.73	53.1	773.4	5,632.2	13.0	4.1	3.6	2.7	0.2	0.2	0.2	1.0
41-020	0.00	14.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-030	0.50	60.47	45.1	656.6	4,781.5	11.1	3.5	3.1	2.3	0.2	0.2	0.1	0.8
41-040	0.57	35.59	30.3	441.1	3,212.3	7.4	2.4	2.1	1.5	0.1	0.1	0.1	0.6
41-050	0.60	10.48	9.3	136.0	990.5	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
41-060	0.60	2.95	2.6	38.3	278.8	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
51-010	0.45	29.63	19.9	289.3	2,106.5	4.9	1.5	1.4	1.0	0.1	0.1	0.1	0.4
51-020	0.45	4.55	3.0	44.3	322.5	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
52-010	0.28	45.29	18.6	270.7	1,971.5	4.6	1.4	1.3	0.9	0.1	0.1	0.1	0.3
52-020	0.45	6.09	4.1	59.3	431.7	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
52-030	0.45	7.18	4.8	69.9	508.9	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
52-040	0.41	4.54	2.8	40.6	295.6	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
52-050	0.44	15.3	9.9	144.0	1,048.4	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2
52-060	0.10	3.22	0.5	7.0	50.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52-070	0.42	86.94	54.7	795.8	5,795.3	13.4	4.2	3.7	2.8	0.2	0.2	0.2	1.0
52-080	0.24	8.08	2.9	42.3	308.0	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
52-090	0.45	4.89	3.3	47.6	346.6	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
52-100A/B	0.27	11.89	4.7	68.6	499.4	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
52-110	0.45	8.84	5.9	85.4	621.6	1.4	0.5	0.4	0.3	0.0	0.0	0.0	0.1
52-120	0.45	14.74	9.9	143.5	1,044.8	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2
52-130	0.31	7.18	3.4	48.9	356.0	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-010	0.45	7.03	4.7	68.4	498.3	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
53-020	0.28	12.38	5.1	74.0	538.9	1.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1
53-030	0.44	11.37	7.4	107.4	782.4	1.8	0.6	0.5	0.4	0.0	0.0	0.0	0.1
53-040	0.45	2.78	1.9	27.1	197.1	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-050	0.45	13.66	9.1	133.0	968.3	2.2	0.7	0.6	0.5	0.0	0.0	0.0	0.2
53-060	0.45	20.37	13.6	198.3	1,443.9	3.3	1.1	0.9	0.7	0.1	0.1	0.0	0.2
53-070	0.45	4.89	3.3	47.6	346.6	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-080	0.39	5.81	3.4	49.5	360.8	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-090	0.46	59.59	40.7	591.8	4,310.0	10.0	3.2	2.8	2.1	0.2	0.2	0.1	0.7
53-100	0.00	107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-110	0.38	4.59	2.6	38.2	278.3	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
53-120A/B	0.46	129.79	87.9	1,279.1	9,314.7	21.6	6.8	6.0	4.4	0.4	0.4	0.3	1.6
53-130	0.45	5.02	3.4	48.9	355.8	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-140	0.45	6.36	4.3	61.9	450.8	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
53-150	0.48	90.4	65.0	946.0	6,889.4	16.0	5.0	4.4	3.3	0.3	0.3	0.2	1.2
53-160	0.47	252.19	177.2	2,578.9	18,780.6	43.5	13.7	12.0	9.0	0.7	0.7	0.5	3.2
53-170	0.36	6.39	3.4	49.9	363.2	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-180	0.10	8.09	1.2	17.5	127.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-190	0.30	11.41	5.1	74.2	540.1	1.3	0.4	0.3	0.3	0.0	0.0	0.0	0.1
54-010A/B	0.44	84.93	54.9	799.3	5,820.6	13.5	4.3	3.7	2.8	0.2	0.2	0.2	1.0
54-040A/B	0.49	255.14	187.7	2,731.4	19,891.3	46.1	14.6	12.8	9.5	0.8	0.8	0.5	3.4
54-050	0.17	9.27	2.4	34.9	253.9	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
54-060	0.44	32.13	21.0	305.3	2,223.1	5.2	1.6	1.4	1.1	0.1	0.1	0.1	0.4
54-070	0.36	60.8	32.4	471.6	3,434.2	8.0	2.5	2.2	1.6	0.1	0.1	0.1	0.6
54-080A/B/C	0.46	414.26	281.4	4,095.7	29,826.7	69.1	21.8	19.1	14.2	1.2	1.2	0.8	5.2
54-090	0.10	3.55	0.5	7.7	55.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-100A/B	0.60	114.24	101.1	1,472.0	10,719.6	24.8	7.8	6.9	5.1	0.4	0.4	0.3	1.9
54-110	0.45	24.55	16.4	239.0	1,740.2	4.0	1.3	1.1	0.8	0.1	0.1	0.0	0.3
54-120	0.46	62.08	42.2	613.6	4,468.3	10.4	3.3	2.9	2.1	0.2	0.2	0.1	0.8
54-130	0.10	1.07	0.2	2.3	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-140A/B	0.41	113.01	68.5	997.1	7,261.6	16.8	5.3	4.7	3.5	0.3	0.3	0.2	1.3
54-150	0.45	55.34	36.6	533.1	3,882.0	9.0	2.8	2.5	1.9	0.2	0.2	0.1	0.7
54-160	0.60	2.62	2.3	34.0	247.6	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
54-170	0.59	8.08	7.1	103.9	756.8	1.8	0.6	0.5	0.4	0.0	0.0	0.0	0.1
54-180	0.60	2.82	2.5	36.6	266.5	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
54-190	0.10	2.2	0.3	4.8	34.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-200	0.10	2.13	0.3	4.6	33.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-210	0.10	1.14	0.2	2.5	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55-010	0.60	14.98	13.4	194.4	1,415.8	3.3	1.0	0.9	0.7	0.1	0.1	0.0	0.2
55-020	0.60	189.58	167.9	2,444.4	17,800.9	41.2	13.0	11.4	8.5	0.7	0.7	0.5	3.1
56-010	0.60	67.62	60.3	877.6	6,390.8	14.8	4.7	4.1	3.0	0.2	0.2	0.2	1.1
57-010	0.53	26.1	20.7	301.2	2,193.2	5.1	1.6	1.4	1.0	0.1	0.1	0.1	0.4
57-020	0.00	142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-030	0.45	18.22	12.2	177.3	1,291.5	3.0	0.9	0.8	0.6	0.1	0.1	0.0	0.2
57-040	0.35	39.88	20.7	301.0	2,192.1	5.1	1.6	1.4	1.0	0.1	0.1	0.1	0.4
57-050	0.45	7.9	5.3	76.9	560.0	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
57-060	0.46	26.11	17.9	261.2	1,902.0	4.4	1.4	1.2	0.9	0.1	0.1	0.1	0.3
57-070	0.45	81.33	54.5	793.5	5,778.7	13.4	4.2	3.7	2.8	0.2	0.2	0.2	1.0

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
57-080	0.42	5.54	3.5	50.7	368.9	0.9	0.3	0.2	0.2	0.0	0.0	0.0	0.1
57-090	0.47	77.77	54.2	789.4	5,749.1	13.3	4.2	3.7	2.7	0.2	0.2	0.2	1.0
57-100A/B	0.47	313.43	220.0	3,202.7	23,323.3	54.0	17.1	15.0	11.1	0.9	0.9	0.6	4.0
57-110	0.54	21.6	17.4	252.7	1,840.0	4.3	1.3	1.2	0.9	0.1	0.1	0.1	0.3
57-120A/B/C	0.00	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-130	0.10	1.16	0.2	2.5	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-140	0.10	1.55	0.2	3.4	24.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-150	0.43	35.68	22.9	333.1	2,425.7	5.6	1.8	1.6	1.2	0.1	0.1	0.1	0.4
57-160	0.10	1.89	0.3	4.1	29.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-010	0.55	2.86	2.3	34.1	248.6	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
62-010	0.45	27.84	18.7	272.2	1,982.5	4.6	1.5	1.3	0.9	0.1	0.1	0.1	0.3
63-010	0.45	388.79	261.2	3,802.2	27,689.1	64.1	20.3	17.8	13.2	1.1	1.1	0.8	4.8
63-020	0.00	11.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64-100	0.45	24.92	16.6	242.3	1,764.8	4.1	1.3	1.1	0.8	0.1	0.1	0.0	0.3
64-110	0.45	6.01	4.0	58.5	426.0	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
64-120	0.45	16.04	10.7	156.1	1,137.0	2.6	0.8	0.7	0.5	0.0	0.0	0.0	0.2
64-130	0.45	2.44	1.6	23.7	173.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
65-010	0.00	18.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65-020	0.53	38.46	30.2	440.2	3,205.7	7.4	2.3	2.1	1.5	0.1	0.1	0.1	0.6
70-010	0.46	6.23	4.2	61.8	450.1	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-015	0.45	11.69	7.8	113.8	828.6	1.9	0.6	0.5	0.4	0.0	0.0	0.0	0.1
70-020	0.45	37.55	25.1	365.5	2,661.7	6.2	1.9	1.7	1.3	0.1	0.1	0.1	0.5
70-025	0.00	3.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-030	0.45	13.48	9.0	131.1	954.8	2.2	0.7	0.6	0.5	0.0	0.0	0.0	0.2
70-035	0.45	4.53	3.0	44.1	321.1	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-040	0.45	2.42	1.6	23.6	171.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-045	0.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-050	0.45	17.41	11.6	169.5	1,234.1	2.9	0.9	0.8	0.6	0.0	0.0	0.0	0.2
70-055	0.46	333.43	230.0	3,347.2	24,375.9	56.5	17.8	15.6	11.6	0.9	0.9	0.7	4.2
70-060	0.45	3.53	2.4	34.4	250.2	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-065	0.45	1.89	1.3	18.4	134.0	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-070	0.45	5.8	3.9	56.5	411.1	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-075	0.43	5	3.2	46.7	339.8	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-080	0.46	11.96	8.2	119.5	870.3	2.0	0.6	0.6	0.4	0.0	0.0	0.0	0.2
70-085	0.45	229.48	152.5	2,219.9	16,166.3	37.5	11.8	10.4	7.7	0.6	0.6	0.4	2.8
70-090	0.45	18.57	12.4	180.8	1,316.3	3.0	1.0	0.8	0.6	0.1	0.1	0.0	0.2
70-095	0.45	9.99	6.7	97.2	708.1	1.6	0.5	0.5	0.3	0.0	0.0	0.0	0.1
70-100	0.45	9.64	6.4	93.8	683.3	1.6	0.5	0.4	0.3	0.0	0.0	0.0	0.1
70-105	0.45	1.63	1.1	15.9	115.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-110	0.45	18.13	12.1	176.5	1,285.1	3.0	0.9	0.8	0.6	0.0	0.0	0.0	0.2
70-115	0.45	3.71	2.5	36.1	263.0	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-120	0.45	4.22	2.8	41.1	299.1	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
70-125	0.00	5.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-130	0.49	34.29	25.2	366.2	2,666.6	6.2	2.0	1.7	1.3	0.1	0.1	0.1	0.5
70-135	0.45	7.46	5.0	72.6	528.8	1.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1
70-140	0.60	0.78	0.7	10.1	73.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-145	0.60	9.19	8.2	119.3	868.6	2.0	0.6	0.6	0.4	0.0	0.0	0.0	0.2
70-150	0.45	4.51	3.0	43.9	319.7	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-155	0.45	2.05	1.4	20.0	145.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-160	0.45	2.95	2.0	28.7	209.1	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-165	0.45	27.77	18.6	270.3	1,968.4	4.6	1.4	1.3	0.9	0.1	0.1	0.1	0.3
70-170	0.45	23.74	15.9	231.1	1,682.8	3.9	1.2	1.1	0.8	0.1	0.1	0.0	0.3
70-175	0.46	30.89	21.0	305.5	2,224.7	5.2	1.6	1.4	1.1	0.1	0.1	0.1	0.4
70-180	0.45	1.14	0.8	11.1	80.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
70-185	0.45	1.53	1.0	14.9	108.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-190	0.17	15.04	3.8	56.0	407.7	0.9	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-195	0.45	46.02	30.9	450.4	3,279.8	7.6	2.4	2.1	1.6	0.1	0.1	0.1	0.6
70-200	0.45	31.52	21.1	306.8	2,234.2	5.2	1.6	1.4	1.1	0.1	0.1	0.1	0.4
70-205	0.45	1.39	0.9	13.5	98.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
70-210	0.45	3.58	2.4	34.8	253.8	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-215	0.45	5.93	4.0	57.7	420.3	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-220	0.45	4.54	3.0	44.2	321.8	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-225	0.45	4.99	3.3	48.6	353.7	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
70-230	0.45	4.72	3.2	45.9	334.6	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-235	0.45	5.04	3.4	49.1	357.3	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
70-240	0.45	4.52	3.0	44.0	320.4	0.7	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-245	0.44	9.98	6.5	94.8	690.1	1.6	0.5	0.4	0.3	0.0	0.0	0.0	0.1
70-250	0.48	41.27	29.6	430.6	3,135.7	7.3	2.3	2.0	1.5	0.1	0.1	0.1	0.5
70-255	0.45	45.37	30.3	441.7	3,216.9	7.5	2.4	2.1	1.5	0.1	0.1	0.1	0.6
70-260	0.46	24.9	16.9	246.5	1,795.4	4.2	1.3	1.2	0.9	0.1	0.1	0.0	0.3
70-265A/B	0.00	183.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-270	0.45	4.66	3.1	45.4	330.3	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
70-275	0.45	4.28	2.9	41.7	303.4	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
70-280	0.45	9.39	6.3	91.6	666.7	1.5	0.5	0.4	0.3	0.0	0.0	0.0	0.1
70-285	0.45	19.03	12.7	185.0	1,347.4	3.1	1.0	0.9	0.6	0.1	0.1	0.0	0.2
70-290	0.45	2.37	1.6	22.9	166.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-295	0.45	7.18	4.8	69.9	508.9	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
70-300	0.10	0.4	0.1	0.9	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-305	0.45	12.68	8.4	122.3	890.7	2.1	0.7	0.6	0.4	0.0	0.0	0.0	0.2
70-310	0.00	5.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-315	0.30	5.79	2.6	37.6	273.6	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
70-320	0.44	2.32	1.5	22.0	160.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-325	0.00	2.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-330	0.47	279.41	195.6	2,846.8	20,731.7	48.0	15.2	13.3	9.9	0.8	0.8	0.6	3.6
70-335	0.45	1.99	1.3	19.4	141.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-340	0.39	22.25	13.0	189.3	1,378.9	3.2	1.0	0.9	0.7	0.1	0.1	0.0	0.2
70-345	0.45	3.81	2.5	37.1	270.1	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-350	0.49	314.4	230.9	3,360.2	24,470.7	56.7	17.9	15.7	11.7	0.9	0.9	0.7	4.2
70-355	0.45	1.29	0.9	12.6	91.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
70-360	0.45	131.96	89.1	1,297.3	9,447.5	21.9	6.9	6.1	4.5	0.4	0.4	0.3	1.6
70-365	0.45	6.7	4.5	65.2	474.9	1.1	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-370	0.44	3.75	2.5	35.9	261.7	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-375	0.47	7.1	5.0	72.6	528.6	1.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1
70-380	0.45	14.4	9.6	140.2	1,020.7	2.4	0.7	0.7	0.5	0.0	0.0	0.0	0.2
70-385	0.45	14.97	10.0	145.7	1,061.1	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
70-390	0.46	58.11	40.0	582.2	4,240.2	9.8	3.1	2.7	2.0	0.2	0.2	0.1	0.7
70-395	0.43	57.19	36.5	531.3	3,869.4	9.0	2.8	2.5	1.8	0.2	0.2	0.1	0.7
70-400	0.44	9.67	6.3	91.8	668.4	1.5	0.5	0.4	0.3	0.0	0.0	0.0	0.1
70-405	0.25	7.16	2.7	38.7	282.1	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-410	0.43	5.8	3.7	53.8	391.8	0.9	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-415	0.45	120.75	81.5	1,185.7	8,634.5	20.0	6.3	5.5	4.1	0.3	0.3	0.2	1.5
70-420	0.45	16.99	11.4	165.4	1,204.3	2.8	0.9	0.8	0.6	0.0	0.0	0.0	0.2
70-425	0.51	20.63	15.7	228.0	1,660.5	3.8	1.2	1.1	0.8	0.1	0.1	0.0	0.3
70-430	0.10	6.19	0.9	13.4	97.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
70-435	0.10	9.16	1.4	19.8	144.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-440	0.50	34.48	25.5	370.4	2,697.7	6.2	2.0	1.7	1.3	0.1	0.1	0.1	0.5
70-445	0.45	5.6	3.7	54.5	396.9	0.9	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-450	0.45	2.65	1.8	25.8	187.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-455	0.00	2.66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-460	0.45	2.67	1.8	26.0	189.3	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-465	0.45	2.58	1.7	25.1	182.9	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-470	0.38	8.55	4.9	71.0	517.2	1.2	0.4	0.3	0.2	0.0	0.0	0.0	0.1
70-475	0.46	229.14	156.7	2,281.5	16,615.0	38.5	12.2	10.7	7.9	0.6	0.6	0.5	2.9
70-480	0.60	0.31	0.3	4.0	29.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-485	0.45	13.36	8.9	130.0	947.0	2.2	0.7	0.6	0.5	0.0	0.0	0.0	0.2
70-490	0.47	48.75	34.0	494.9	3,604.3	8.3	2.6	2.3	1.7	0.1	0.1	0.1	0.6
70-495	0.45	7.74	5.2	75.3	548.6	1.3	0.4	0.4	0.3	0.0	0.0	0.0	0.1
70-500	0.45	0.56	0.4	5.5	39.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-505	0.41	8.12	5.0	72.3	526.5	1.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1
70-510	0.45	41.82	28.1	408.4	2,974.0	6.9	2.2	1.9	1.4	0.1	0.1	0.1	0.5
70-515	0.47	62.73	43.8	637.6	4,643.4	10.8	3.4	3.0	2.2	0.2	0.2	0.1	0.8
70-520	0.45	6.05	4.0	58.9	428.8	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-525	0.45	6.23	4.2	60.6	441.6	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
70-530	0.45	1.67	1.1	16.3	118.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-535	0.45	30.24	20.3	295.0	2,148.5	5.0	1.6	1.4	1.0	0.1	0.1	0.1	0.4
70-540	0.21	5.1	1.6	23.5	171.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-545	0.45	1.89	1.3	18.4	134.0	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-550	0.26	1.3	0.5	7.3	53.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-555	0.45	1.73	1.2	16.8	122.6	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-560	0.45	3.33	2.2	32.4	236.0	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0
70-565	0.24	16.63	5.9	86.5	630.1	1.5	0.5	0.4	0.3	0.0	0.0	0.0	0.1
70-570	0.45	1.23	0.8	12.0	87.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
70-575	0.45	15.39	10.3	149.6	1,089.8	2.5	0.8	0.7	0.5	0.0	0.0	0.0	0.2
70-580	0.43	119.93	77.3	1,125.3	8,194.9	19.0	6.0	5.3	3.9	0.3	0.3	0.2	1.4
71-010	0.10	1.12	0.2	2.4	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-020	0.45	14.05	9.4	136.8	995.9	2.3	0.7	0.6	0.5	0.0	0.0	0.0	0.2
71-030	0.45	28.58	19.2	279.7	2,036.9	4.7	1.5	1.3	1.0	0.1	0.1	0.1	0.4
71-040	0.22	20.93	6.8	99.4	723.6	1.7	0.5	0.5	0.3	0.0	0.0	0.0	0.1
71-050	0.46	120.42	82.0	1,192.9	8,687.4	20.1	6.4	5.6	4.1	0.3	0.3	0.2	1.5
71-060	0.45	3.11	2.1	30.3	220.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
71-070	0.00	386.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-080	0.46	101.79	69.0	1,004.6	7,315.9	16.9	5.4	4.7	3.5	0.3	0.3	0.2	1.3
71-090	0.45	6.5	4.3	62.6	456.2	1.1	0.3	0.3	0.2	0.0	0.0	0.0	0.1
71-100	0.10	1.99	0.3	4.3	31.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-010	0.18	17.32	4.5	65.6	477.7	1.1	0.3	0.3	0.2	0.0	0.0	0.0	0.1
72-020	0.40	24.7	14.5	211.1	1,537.4	3.6	1.1	1.0	0.7	0.1	0.1	0.0	0.3
72-030	0.10	5.25	0.8	11.4	82.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
72-040	0.42	166.54	103.1	1,500.5	10,927.0	25.3	8.0	7.0	5.2	0.4	0.4	0.3	1.9
72-050	0.10	5.16	0.8	11.2	81.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
72-060	0.36	113.04	60.8	884.4	6,440.7	14.9	4.7	4.1	3.1	0.2	0.2	0.2	1.1
72-070	0.10	2.21	0.3	4.8	34.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-080	0.60	4.74	4.2	61.5	448.0	1.0	0.3	0.3	0.2	0.0	0.0	0.0	0.1
72-090	0.45	68.71	45.7	664.6	4,839.8	11.2	3.5	3.1	2.3	0.2	0.2	0.1	0.8
72-100	0.46	68.32	47.0	684.2	4,982.7	11.5	3.6	3.2	2.4	0.2	0.2	0.1	0.9
72-110	0.10	3.22	0.5	7.0	50.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-120	0.45	62.98	42.1	613.0	4,464.2	10.3	3.3	2.9	2.1	0.2	0.2	0.1	0.8
72-130	0.46	58.06	39.4	573.1	4,173.4	9.7	3.1	2.7	2.0	0.2	0.2	0.1	0.7
72-140	0.10	10.19	1.5	22.0	160.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-150	0.10	4.76	0.7	10.3	75.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
72-160	0.10	4.55	0.7	9.8	71.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
73-010	0.44	20.76	13.5	197.1	1,435.2	3.3	1.1	0.9	0.7	0.1	0.1	0.0	0.2
73-020	0.44	57.47	37.8	550.2	4,006.5	9.3	2.9	2.6	1.9	0.2	0.2	0.1	0.7

2010 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL

2009 WINTER/SNOWMELT POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (01/01/10 - 03/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Geometric Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation (meters)	0.048												
73-030	0.10	21.56	3.2	46.6	339.6	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.1
74-010	0.48	44.39	31.6	459.6	3,346.9	7.8	2.4	2.1	1.6	0.1	0.1	0.1	0.6
74-020	0.45	4.41	2.9	42.9	312.6	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.1
75-005	0.45	12.39	8.3	120.5	877.2	2.0	0.6	0.6	0.4	0.0	0.0	0.0	0.2
75-010	0.60	3.65	3.3	47.4	345.0	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.1
75-020	0.45	1.53	1.0	14.9	108.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
75-030	0.45	8.38	5.6	81.6	594.0	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
75-040	0.45	14.74	9.9	143.5	1,044.8	2.4	0.8	0.7	0.5	0.0	0.0	0.0	0.2
76-010	0.46	907.31	625.4	9,102.9	66,291.1	153.6	48.5	42.5	31.6	2.6	2.6	1.8	11.5
76-020	0.46	88.62	60.0	873.5	6,360.9	14.7	4.7	4.1	3.0	0.2	0.2	0.2	1.1
76-030	0.45	7.55	5.0	73.5	535.2	1.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1
76-040	0.19	4.67	1.3	18.8	136.9	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
76-050	0.00	2.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-010	0.10	31.17	4.6	67.4	491.0	1.1	0.4	0.3	0.2	0.0	0.0	0.0	0.1
82-010	0.49	23.53	17.0	247.6	1,803.4	4.2	1.3	1.2	0.9	0.1	0.1	0.0	0.3
82-020	0.45	73.45	49.6	722.6	5,262.1	12.2	3.9	3.4	2.5	0.2	0.2	0.1	0.9
82-030	0.45	90.04	60.8	885.6	6,449.0	14.9	4.7	4.1	3.1	0.3	0.3	0.2	1.1
82-040	0.46	98.49	67.9	988.3	7,197.0	16.7	5.3	4.6	3.4	0.3	0.3	0.2	1.2
83-010	0.45	6.59	4.4	64.1	467.1	1.1	0.3	0.3	0.2	0.0	0.0	0.0	0.1
83-015	0.45	0.99	0.7	9.6	70.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
83-020	0.43	85.96	55.5	808.4	5,887.0	13.6	4.3	3.8	2.8	0.2	0.2	0.2	1.0
83-025	0.45	51.23	34.3	498.6	3,631.3	8.4	2.7	2.3	1.7	0.1	0.1	0.1	0.6
83-030	0.60	0.82	0.7	10.6	77.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
83-040	0.10	1.08	0.2	2.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-050	0.45	40.4	27.1	394.3	2,871.5	6.7	2.1	1.8	1.4	0.1	0.1	0.1	0.5
83-060	0.45	10.05	6.7	97.8	712.4	1.7	0.5	0.5	0.3	0.0	0.0	0.0	0.1
83-070	0.10	1.19	0.2	2.6	18.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-080	0.48	178.63	126.2	1,837.0	13,377.7	31.0	9.8	8.6	6.4	0.5	0.5	0.4	2.3
83-090	0.41	9.16	5.6	81.2	591.3	1.4	0.4	0.4	0.3	0.0	0.0	0.0	0.1
84-010	0.47	21.56	15.1	219.3	1,597.3	3.7	1.2	1.0	0.8	0.1	0.1	0.0	0.3
85-010	0.10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINTER (SNOWMELT) SEASONAL SUMMATION (kg)			**20,072.93**	**292,172.61**	**2,127,730.31**	**4,929.02**	**1,556.77**	**1,364.96**	**1,014.80**	**82.52**	**82.52**	**57.99**	**368.00**

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
10-010	0.43	113.55	206.3	1,629.4	1,237.5	38.0	12.3	6.1	7.1	1.1	0.5	0.3	2.0
10-020	0.45	7.81	14.8	116.9	88.8	2.7	0.9	0.4	0.5	0.1	0.0	0.0	0.1
10-030	0.10	4.05	1.7	13.5	10.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-040	0.45	167.42	315.0	2,488.5	1,890.0	58.0	18.7	9.3	10.9	1.6	0.8	0.5	3.0
10-050	0.46	114.18	218.8	1,728.8	1,313.0	40.3	13.0	6.5	7.6	1.1	0.5	0.4	2.1
10-060	0.60	10.5	26.5	209.6	159.2	4.9	1.6	0.8	0.9	0.1	0.1	0.0	0.3
10-070	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-080	0.38	30.66	49.3	389.7	296.0	9.1	2.9	1.5	1.7	0.3	0.1	0.1	0.5
10-090A	0.00	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090B	0.00	1.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090C	0.54	12.77	29.1	230.0	174.7	5.4	1.7	0.9	1.0	0.2	0.1	0.0	0.3
10-090D	0.00	4.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-100	0.36	1392.1	2,126.0	16,795.5	12,756.1	391.2	126.3	62.9	73.6	11.1	5.1	3.4	20.4
10-110	0.47	300.11	589.5	4,657.1	3,537.0	108.5	35.0	17.4	20.4	3.1	1.4	0.9	5.7
10-120A/B	0.44	372.78	683.2	5,397.0	4,099.0	125.7	40.6	20.2	23.6	3.6	1.6	1.1	6.6
10-130	0.45	336.46	639.6	5,053.1	3,837.8	117.7	38.0	18.9	22.1	3.3	1.5	1.0	6.1
10-140a	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-140a,b	0.58	220.65	534.6	4,223.2	3,207.5	98.4	31.8	15.8	18.5	2.8	1.3	0.9	5.1
10-150	0.47	157.15	310.2	2,450.9	1,861.4	57.1	18.4	9.2	10.7	1.6	0.7	0.5	3.0
10-160	0.00	17	0.2	1.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-170	0.50	176.01	372.9	2,946.1	2,237.6	68.6	22.2	11.0	12.9	1.9	0.9	0.6	3.6
10-180	0.45	284.26	533.0	4,210.5	3,197.8	98.1	31.7	15.8	18.4	2.8	1.3	0.9	5.1
10-190	0.59	14.58	36.3	287.0	218.0	6.7	2.2	1.1	1.3	0.2	0.1	0.1	0.3
10-200	0.40	42.44	70.9	560.5	425.7	13.1	4.2	2.1	2.5	0.4	0.2	0.1	0.7
10-210	0.49	98.32	203.5	1,607.6	1,221.0	37.4	12.1	6.0	7.0	1.1	0.5	0.3	2.0
10-220	0.56	18.83	44.3	350.2	265.9	8.2	2.6	1.3	1.5	0.2	0.1	0.1	0.4
10-230	0.47	235.02	467.8	3,695.2	2,806.5	86.1	27.8	13.8	16.2	2.4	1.1	0.7	4.5
10-240	0.51	103.83	224.6	1,774.2	1,347.5	41.3	13.3	6.6	7.8	1.2	0.5	0.4	2.2
10-250	0.49	242.96	500.1	3,950.6	3,000.5	92.0	29.7	14.8	17.3	2.6	1.2	0.8	4.8
10-260	0.56	23.77	55.8	440.5	334.6	10.3	3.3	1.7	1.9	0.3	0.1	0.1	0.5
10-270	0.47	72.45	144.5	1,141.9	867.3	26.6	8.6	4.3	5.0	0.8	0.3	0.2	1.4
10-280	0.44	55.08	102.9	813.1	617.6	18.9	6.1	3.0	3.6	0.5	0.2	0.2	1.0
10-290	0.10	6.83	2.9	22.7	17.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-300	0.36	17.74	26.9	212.8	161.6	5.0	1.6	0.8	0.9	0.1	0.1	0.0	0.3
10-310	0.47	60.29	119.9	947.0	719.2	22.1	7.1	3.5	4.1	0.6	0.3	0.2	1.2
10-320	0.45	341.99	650.5	5,139.0	3,903.0	119.7	38.6	19.3	22.5	3.4	1.6	1.0	6.2
10-330	0.35	21.61	32.0	252.7	191.9	5.9	1.9	0.9	1.1	0.2	0.1	0.1	0.3
10-340	0.45	20.74	39.4	311.3	236.4	7.2	2.3	1.2	1.4	0.2	0.1	0.1	0.4
10-350	0.60	28.16	71.0	561.0	426.1	13.1	4.2	2.1	2.5	0.4	0.2	0.1	0.7
10-360	0.59	29.02	72.4	572.1	434.5	13.3	4.3	2.1	2.5	0.4	0.2	0.1	0.7
10-370	0.59	14.46	35.9	283.6	215.4	6.6	2.1	1.1	1.2	0.2	0.1	0.1	0.3
10-380	0.45	14.38	27.0	212.9	161.7	5.0	1.6	0.8	0.9	0.1	0.1	0.0	0.3
10-390	0.49	41.97	87.1	688.3	522.8	16.0	5.2	2.6	3.0	0.5	0.2	0.1	0.8
10-400A	0.10	1.07	0.5	3.6	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-400B	0.47	17.66	35.1	277.0	210.4	6.5	2.1	1.0	1.2	0.2	0.1	0.1	0.3
10-400C	0.57	50.25	119.7	945.7	718.2	22.0	7.1	3.5	4.1	0.6	0.3	0.2	1.1
10-410A	0.50	46.22	96.9	765.4	581.3	17.8	5.8	2.9	3.4	0.5	0.2	0.2	0.9
10-410B	0.32	21.29	28.4	224.1	170.2	5.2	1.7	0.8	1.0	0.1	0.1	0.0	0.3
10-410C	0.53	22.8	50.7	400.3	304.0	9.3	3.0	1.5	1.8	0.3	0.1	0.1	0.5
10-410D	0.60	27.34	69.1	545.9	414.6	12.7	4.1	2.0	2.4	0.4	0.2	0.1	0.7
10-410E	0.58	256.04	620.3	4,900.6	3,722.0	114.1	36.8	18.4	21.5	3.2	1.5	1.0	6.0
10-410F	0.59	37.92	93.9	741.9	563.5	17.3	5.6	2.8	3.2	0.5	0.2	0.2	0.9
10-420A	0.27	23.05	26.4	208.9	158.7	4.9	1.6	0.8	0.9	0.1	0.1	0.0	0.3
10-420B	0.00	10.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420C	0.00	7.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420D	0.00	20.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420E	0.59	127.89	316.0	2,496.3	1,895.9	58.1	18.8	9.4	10.9	1.6	0.8	0.5	3.0
10-430A	0.00	8.14	0.1	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430B	0.53	54.72	123.1	972.5	738.6	22.7	7.3	3.6	4.3	0.6	0.3	0.2	1.2
10-430C	0.48	44.83	90.7	716.3	544.1	16.7	5.4	2.7	3.1	0.5	0.2	0.1	0.9
10-430D	0.49	85.79	177.6	1,402.8	1,065.4	32.7	10.5	5.3	6.1	0.9	0.4	0.3	1.7
10-430E	0.56	86.66	203.5	1,607.3	1,220.7	37.4	12.1	6.0	7.0	1.1	0.5	0.3	2.0
10-430F	0.10	377.97	159.1	1,257.2	954.8	29.3	9.5	4.7	5.5	0.8	0.4	0.3	1.5
10-430G	0.50	125.89	262.7	2,075.2	1,576.1	48.3	15.6	7.8	9.1	1.4	0.6	0.4	2.5
10-430H	0.49	33.18	68.6	542.3	411.9	12.6	4.1	2.0	2.4	0.4	0.2	0.1	0.7
10-430I	0.59	32.61	80.8	638.5	484.9	14.9	4.8	2.4	2.8	0.4	0.2	0.1	0.8
10-430J	0.43	532.36	972.7	7,684.1	5,836.1	179.0	57.8	28.8	33.7	5.1	2.3	1.6	9.3
10-430K	0.48	337.06	677.9	5,355.1	4,067.2	124.7	40.3	20.1	23.5	3.5	1.6	1.1	6.5
10-430L	0.45	84.4	160.2	1,265.4	961.1	29.5	9.5	4.7	5.5	0.8	0.4	0.3	1.5
10-430M	0.54	75.94	173.4	1,370.0	1,040.5	31.9	10.3	5.1	6.0	0.9	0.4	0.3	1.7
10-430N	0.44	26.43	49.4	390.3	296.4	9.1	2.9	1.5	1.7	0.3	0.1	0.1	0.5
10-430O	0.00	109.53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430P	0.00	229.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430Q	0.10	8.03	3.4	26.7	20.3	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-430R	0.47	150.32	295.9	2,337.3	1,775.2	54.4	17.6	8.8	10.2	1.5	0.7	0.5	2.8

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
10-430S	0.10	5.15	2.2	17.1	13.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-430T	0.46	262.47	505.2	3,990.8	3,031.0	93.0	30.0	15.0	17.5	2.6	1.2	0.8	4.8
10-430U	0.47	431.37	853.4	6,741.6	5,120.2	157.0	50.7	25.3	29.5	4.4	2.0	1.4	8.2
10-430V	0.46	329.11	644.1	5,088.5	3,864.7	118.5	38.3	19.1	22.3	3.3	1.5	1.0	6.2
10-440A	0.46	23.18	44.7	353.2	268.3	8.2	2.7	1.3	1.5	0.2	0.1	0.1	0.4
10-440B	0.49	34.23	71.0	561.1	426.1	13.1	4.2	2.1	2.5	0.4	0.2	0.1	0.7
10-440C/D	0.00	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-440E	0.51	831.25	1,799.8	14,218.2	10,798.6	331.2	106.9	53.3	62.3	9.4	4.3	2.9	17.3
10-440F	0.46	538.85	1,044.1	8,248.7	6,264.8	192.1	62.0	30.9	36.1	5.4	2.5	1.7	10.0
10-450A	0.00	343.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-450B	0.52	3.41	7.4	58.6	44.5	1.4	0.4	0.2	0.3	0.0	0.0	0.0	0.1
10-450C	0.59	55.64	139.1	1,099.0	834.7	25.6	8.3	4.1	4.8	0.7	0.3	0.2	1.3
10-450D	0.45	4.62	8.8	69.2	52.5	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
10-450E	0.44	3.2	6.0	47.0	35.7	1.1	0.4	0.2	0.2	0.0	0.0	0.0	0.1
10-450F	0.46	158.55	306.7	2,422.9	1,840.2	56.4	18.2	9.1	10.6	1.6	0.7	0.5	2.9
10-450G/H	0.48	75.02	151.8	1,199.0	910.6	27.9	9.0	4.5	5.3	0.8	0.4	0.2	1.5
10-450I	0.49	243.64	503.9	3,980.9	3,023.4	92.7	29.9	14.9	17.4	2.6	1.2	0.8	4.8
10-450J	0.49	17.16	35.1	277.1	210.5	6.5	2.1	1.0	1.2	0.2	0.1	0.1	0.3
10-450K	0.58	37.01	90.3	713.1	541.6	16.6	5.4	2.7	3.1	0.5	0.2	0.1	0.9
10-450L	0.51	213.41	453.8	3,585.2	2,722.9	83.5	27.0	13.4	15.7	2.4	1.1	0.7	4.4
10-460	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460A	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460B	0.52	7.29	15.9	125.3	95.2	2.9	0.9	0.5	0.5	0.1	0.0	0.0	0.2
10-460C/D/F	0.00	159.87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460E	0.49	231.41	481.2	3,801.2	2,887.0	88.5	28.6	14.2	16.6	2.5	1.2	0.8	4.6
10-460F	0.49	14.75	30.7	242.7	184.3	5.7	1.8	0.9	1.1	0.2	0.1	0.0	0.3
10-460G	0.51	79.66	171.3	1,353.5	1,027.9	31.5	10.2	5.1	5.9	0.9	0.4	0.3	1.6
10-460H	0.48	12.35	24.9	196.9	149.6	4.6	1.5	0.7	0.9	0.1	0.1	0.0	0.2
10-460I	0.00	72.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460J	0.46	5.36	10.5	82.7	62.8	1.9	0.6	0.3	0.4	0.1	0.0	0.0	0.1
10-460K	0.36	5.48	8.3	65.6	49.8	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
10-460L	0.46	3.5	6.8	54.0	41.0	1.3	0.4	0.2	0.2	0.0	0.0	0.0	0.1
10-460M	0.48	9.55	19.2	152.0	115.5	3.5	1.1	0.6	0.7	0.1	0.0	0.0	0.2
10-460N	0.45	3.85	7.3	57.6	43.8	1.3	0.4	0.2	0.3	0.0	0.0	0.0	0.1
10-460O	0.45	4.15	7.9	62.6	47.6	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
10-460P	0.45	4.34	8.2	65.0	49.3	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
10-460Q	0.56	19.73	46.9	370.2	281.2	8.6	2.8	1.4	1.6	0.2	0.1	0.1	0.4
10-460R	0.00	51.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460S	0.56	233.54	554.9	4,383.5	3,329.2	102.1	33.0	16.4	19.2	2.9	1.3	0.9	5.3
10-465	0.10	8.56	3.6	28.5	21.6	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-470	0.38	25.6	41.1	325.0	246.8	7.6	2.4	1.2	1.4	0.2	0.1	0.1	0.4
10-480	0.58	39.66	96.9	765.4	581.3	17.8	5.8	2.9	3.4	0.5	0.2	0.2	0.9
10-485	0.00	7.27	0.1	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-490	0.43	150.96	275.5	2,176.8	1,653.3	50.7	16.4	8.2	9.5	1.4	0.7	0.4	2.6
10-500A	0.26	26.21	29.0	228.8	173.8	5.3	1.7	0.9	1.0	0.2	0.1	0.0	0.3
10-500B	0.46	8.48	16.4	129.8	98.6	3.0	1.0	0.5	0.6	0.1	0.0	0.0	0.2
10-500C	0.44	111.36	204.1	1,612.6	1,224.7	37.6	12.1	6.0	7.1	1.1	0.5	0.3	2.0
10-500D	0.24	3.83	3.8	30.3	23.0	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-500E	0.53	23.34	52.3	413.4	313.9	9.6	3.1	1.5	1.8	0.3	0.1	0.1	0.5
10-500F	0.49	12.04	25.0	197.7	150.2	4.6	1.5	0.7	0.9	0.1	0.1	0.0	0.2
10-500G	0.00	112.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-505	0.10	7.85	3.3	26.1	19.8	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-510	0.51	62.36	133.5	1,055.0	801.3	24.6	7.9	4.0	4.6	0.7	0.3	0.2	1.3
10-520	0.00	139.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-530	0.45	116.15	220.4	1,741.5	1,322.7	40.6	13.1	6.5	7.6	1.1	0.5	0.4	2.1
10-540	0.12	53.9	26.9	212.3	161.3	4.9	1.6	0.8	0.9	0.1	0.1	0.0	0.3
10-550	0.46	25.83	50.0	395.1	300.1	9.2	3.0	1.5	1.7	0.3	0.1	0.1	0.5
10-560A/B	0.44	600.63	1,106.4	8,740.3	6,638.2	203.6	65.7	32.7	38.3	5.8	2.7	1.8	10.6
10-570A	0.54	14.64	33.5	264.8	201.1	6.2	2.0	1.0	1.2	0.2	0.1	0.1	0.3
10-570B	0.44	228.18	419.4	3,313.0	2,516.2	77.2	24.9	12.4	14.5	2.2	1.0	0.7	4.0
10-580	0.45	73.39	138.7	1,095.6	832.1	25.5	8.2	4.1	4.8	0.7	0.3	0.2	1.3
10-600	0.48	89.24	181.7	1,435.5	1,090.2	33.4	10.8	5.4	6.3	0.9	0.4	0.3	1.7
10-610	0.46	25.6	49.4	390.3	296.4	9.1	2.9	1.5	1.7	0.3	0.1	0.1	0.5
10-620	0.00	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630A	0.10	6.24	2.6	20.8	15.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-630B	0.45	4.68	8.9	70.1	53.2	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
10-630C	0.48	96.03	195.3	1,543.2	1,172.1	35.9	11.6	5.8	6.8	1.0	0.5	0.3	1.9
10-630D	0.45	6.37	12.1	95.3	72.4	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
10-630E	0.45	8.52	16.1	127.5	96.9	3.0	1.0	0.5	0.6	0.1	0.0	0.0	0.2
10-630F	0.54	17.56	39.9	315.5	239.7	7.3	2.4	1.2	1.4	0.2	0.1	0.1	0.4
10-630G	0.45	5.9	11.2	88.3	67.1	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
10-630H	0.30	25.63	32.7	258.2	196.1	6.0	1.9	1.0	1.1	0.2	0.1	0.1	0.3
10-630I	0.47	12.48	24.4	193.0	146.6	4.5	1.5	0.7	0.8	0.1	0.1	0.0	0.2
10-630J	0.55	14.69	34.2	270.5	205.5	6.3	2.0	1.0	1.2	0.2	0.1	0.1	0.3
10-630K	0.47	95.29	189.9	1,500.1	1,139.3	34.9	11.3	5.6	6.6	1.0	0.5	0.3	1.8

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
10-630L	0.52	100.42	220.3	1,740.2	1,321.7	40.5	13.1	6.5	7.6	1.1	0.5	0.4	2.1
10-630M	0.50	11.71	24.5	193.4	146.9	4.5	1.5	0.7	0.8	0.1	0.1	0.0	0.2
10-630N	0.45	8.45	16.0	126.5	96.1	2.9	1.0	0.5	0.6	0.1	0.0	0.0	0.2
10-630O	0.36	5.77	8.8	69.9	53.1	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
10-630P/Q	0.00	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630R	0.33	83.89	118.0	931.9	707.8	21.7	7.0	3.5	4.1	0.6	0.3	0.2	1.1
10-630S	0.22	37.02	33.9	267.7	203.3	6.2	2.0	1.0	1.2	0.2	0.1	0.1	0.3
10-630T	0.56	7.72	18.3	144.4	109.7	3.4	1.1	0.5	0.6	0.1	0.0	0.0	0.2
10-630U	0.52	115.42	254.2	2,008.2	1,525.2	46.8	15.1	7.5	8.8	1.3	0.6	0.4	2.4
10-630V	0.11	33.85	15.1	118.9	90.3	2.8	0.9	0.4	0.5	0.1	0.0	0.0	0.1
10-630W	0.47	23.68	47.2	373.1	283.4	8.7	2.8	1.4	1.6	0.2	0.1	0.1	0.5
10-630X	0.44	14.78	27.5	217.5	165.2	5.1	1.6	0.8	1.0	0.1	0.1	0.0	0.3
10-630Y	0.00	112.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630Z	0.47	45.66	90.5	715.0	543.0	16.7	5.4	2.7	3.1	0.5	0.2	0.1	0.9
10-640	0.46	258.18	497.2	3,927.6	2,983.0	91.5	29.5	14.7	17.2	2.6	1.2	0.8	4.8
10-650	0.56	19.53	45.8	361.8	274.8	8.4	2.7	1.4	1.6	0.2	0.1	0.1	0.4
10-660	0.46	306.37	597.6	4,720.8	3,585.4	110.0	35.5	17.7	20.7	3.1	1.4	1.0	5.7
10-670	0.45	137.88	260.9	2,060.8	1,565.1	48.0	15.5	7.7	9.0	1.4	0.6	0.4	2.5
10-680	0.46	707.95	1,366.7	10,797.1	8,200.3	251.5	81.2	40.5	47.3	7.1	3.3	2.2	13.1
10-690	0.50	70.63	148.8	1,175.3	892.6	27.4	8.8	4.4	5.1	0.8	0.4	0.2	1.4
10-700	0.46	222.07	434.2	3,430.0	2,605.0	79.9	25.8	12.9	15.0	2.3	1.0	0.7	4.2
10-710	0.33	29.95	42.0	331.9	252.0	7.7	2.5	1.2	1.5	0.2	0.1	0.1	0.4
10-720A	0.44	15.77	29.4	232.6	176.7	5.4	1.7	0.9	1.0	0.2	0.1	0.0	0.3
10-720B	0.48	422.18	856.4	6,765.4	5,138.3	157.6	50.9	25.3	29.6	4.5	2.1	1.4	8.2
10-720C	0.43	26.35	47.6	376.4	285.8	8.8	2.8	1.4	1.6	0.2	0.1	0.1	0.5
10-720D	0.46	22.95	44.0	347.5	263.9	8.1	2.6	1.3	1.5	0.2	0.1	0.1	0.4
10-720E	0.46	18.39	35.3	278.8	211.7	6.5	2.1	1.0	1.2	0.2	0.1	0.1	0.3
10-720F	0.48	317.75	641.9	5,071.1	3,851.5	118.1	38.1	19.0	22.2	3.3	1.5	1.0	6.2
10-720G	0.00	13.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-720H	0.45	4.55	8.6	68.1	51.7	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
10-720I	0.45	87.27	163.9	1,294.5	983.2	30.2	9.7	4.9	5.7	0.9	0.4	0.3	1.6
10-720J	0.36	3.71	5.6	44.1	33.5	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.1
10-720K	0.55	32.76	75.7	598.3	454.4	13.9	4.5	2.2	2.6	0.4	0.2	0.1	0.7
10-720L	0.45	4.57	8.7	68.4	52.0	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
20-010	0.42	93.99	166.1	1,312.4	996.8	30.6	9.9	4.9	5.7	0.9	0.4	0.3	1.6
20-020	0.44	15.09	27.9	220.2	167.2	5.1	1.7	0.8	1.0	0.1	0.1	0.0	0.3
20-030	0.45	7.95	15.1	119.0	90.4	2.8	0.9	0.4	0.5	0.1	0.0	0.0	0.1
20-040	0.37	6.79	10.7	84.2	64.0	2.0	0.6	0.3	0.4	0.1	0.0	0.0	0.1
20-050	0.00	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-060	0.45	5.91	11.2	88.5	67.2	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
20-070	0.44	39.07	72.9	576.2	437.6	13.4	4.3	2.2	2.5	0.4	0.2	0.1	0.7
20-080	0.45	33.72	64.4	508.5	386.2	11.8	3.8	1.9	2.2	0.3	0.2	0.1	0.6
20-090	0.55	9.95	23.2	182.9	138.9	4.3	1.4	0.7	0.8	0.1	0.1	0.0	0.2
20-100	0.10	0.99	0.4	3.3	2.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-110	0.24	216.04	218.2	1,724.1	1,309.4	40.2	13.0	6.5	7.6	1.1	0.5	0.3	2.1
20-120	0.47	10.22	20.1	158.9	120.7	3.7	1.2	0.6	0.7	0.1	0.0	0.0	0.2
20-130	0.45	16.12	30.5	241.3	183.3	5.6	1.8	0.9	1.1	0.2	0.1	0.0	0.3
20-140	0.44	2.97	5.5	43.6	33.1	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.1
20-150	0.45	14.48	27.4	216.7	164.6	5.0	1.6	0.8	0.9	0.1	0.1	0.0	0.3
20-160	0.54	3.21	7.3	57.7	43.8	1.3	0.4	0.2	0.3	0.0	0.0	0.0	0.1
20-170	0.37	4.94	7.7	61.2	46.5	1.4	0.5	0.2	0.3	0.0	0.0	0.0	0.1
20-180	0.51	5.3	11.3	89.2	67.8	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
20-190	0.45	1.35	2.6	20.2	15.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-200	0.45	13.84	26.2	207.2	157.3	4.8	1.6	0.8	0.9	0.1	0.1	0.0	0.3
20-210A	0.44	92.9	171.8	1,357.4	1,030.9	31.6	10.2	5.1	5.9	0.9	0.4	0.3	1.6
20-210B	0.50	620.78	1,318.8	10,418.3	7,912.7	242.7	78.3	39.0	45.6	6.9	3.2	2.1	12.7
20-220	0.46	26.38	51.2	404.5	307.2	9.4	3.0	1.5	1.8	0.3	0.1	0.1	0.5
20-230	0.00	21.46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-240	0.48	30.06	61.0	481.7	365.9	11.2	3.6	1.8	2.1	0.3	0.1	0.1	0.6
20-250	0.57	6.28	15.1	119.4	90.7	2.8	0.9	0.4	0.5	0.1	0.0	0.0	0.1
20-260	0.60	3.5	8.8	69.9	53.1	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
20-270	0.48	42.81	85.9	678.8	515.6	15.8	5.1	2.5	3.0	0.4	0.2	0.1	0.8
20-280	0.54	8.98	20.3	160.5	121.9	3.7	1.2	0.6	0.7	0.1	0.0	0.0	0.2
20-290	0.00	4.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-010	0.45	49.49	93.4	737.9	560.4	17.2	5.5	2.8	3.2	0.5	0.2	0.1	0.9
40-010	0.45	719.17	1,356.9	10,719.4	8,141.3	249.7	80.6	40.2	46.9	7.1	3.3	2.2	13.0
40-020	0.45	15.36	29.1	229.9	174.6	5.4	1.7	0.9	1.0	0.2	0.1	0.0	0.3
40-030	0.42	51.02	89.7	708.9	538.4	16.5	5.3	2.7	3.1	0.5	0.2	0.1	0.9
40-040	0.43	65.39	119.5	944.4	717.2	22.0	7.1	3.5	4.1	0.6	0.3	0.2	1.1
40-050	0.45	10.28	19.5	153.9	116.9	3.6	1.2	0.6	0.7	0.1	0.0	0.0	0.2
40-060	0.45	3.2	6.1	47.9	36.4	1.1	0.4	0.2	0.2	0.0	0.0	0.0	0.1
40-070	0.38	7.98	12.7	100.4	76.3	2.3	0.8	0.4	0.4	0.1	0.0	0.0	0.1
40-080	0.41	60.51	104.0	822.0	624.3	19.1	6.2	3.1	3.6	0.5	0.2	0.2	1.0
40-090	0.46	20.65	40.4	319.3	242.5	7.4	2.4	1.2	1.4	0.2	0.1	0.1	0.4
40-100	0.00	20.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
40-110	0.44	2.61	4.9	38.5	29.3	0.9	0.3	0.1	0.2	0.0	0.0	0.0	0.0
40-120	0.44	65.87	121.6	960.3	729.3	22.4	7.2	3.6	4.2	0.6	0.3	0.2	1.2
40-130	0.45	35.01	66.6	526.2	399.6	12.3	4.0	2.0	2.3	0.3	0.2	0.1	0.6
40-140	0.35	125.46	183.7	1,451.1	1,102.1	33.8	10.9	5.4	6.4	1.0	0.4	0.3	1.8
40-150	0.47	24.31	48.5	383.1	290.9	8.9	2.9	1.4	1.7	0.3	0.1	0.1	0.5
40-160	0.49	30.99	64.5	509.6	387.0	11.9	3.8	1.9	2.2	0.3	0.2	0.1	0.6
40-170	0.00	194.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-180	0.54	16.8	38.1	300.8	228.5	7.0	2.3	1.1	1.3	0.2	0.1	0.1	0.4
40-190	0.53	65.53	145.9	1,152.5	875.4	26.8	8.7	4.3	5.0	0.8	0.4	0.2	1.4
40-200	0.46	24.75	48.2	380.6	289.1	8.9	2.9	1.4	1.7	0.3	0.1	0.1	0.5
40-210	0.54	17.26	39.6	312.8	237.6	7.3	2.4	1.2	1.4	0.2	0.1	0.1	0.4
40-220	0.47	100.58	198.0	1,564.0	1,187.8	36.4	11.8	5.9	6.8	1.0	0.5	0.3	1.9
40-230	0.44	13.78	25.8	203.9	154.9	4.7	1.5	0.8	0.9	0.1	0.1	0.0	0.2
40-240	0.00	340.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-250	0.60	1.15	2.9	23.0	17.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
40-260	0.45	3.49	6.6	52.2	39.7	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
40-270	0.45	9.59	18.2	143.5	109.0	3.3	1.1	0.5	0.6	0.1	0.0	0.0	0.2
40-280	0.53	12.76	28.3	223.2	169.5	5.2	1.7	0.8	1.0	0.1	0.1	0.0	0.3
40-290	0.51	13.73	29.6	233.8	177.6	5.4	1.8	0.9	1.0	0.2	0.1	0.0	0.3
40-300	0.52	10.38	22.8	179.9	136.6	4.2	1.4	0.7	0.8	0.1	0.1	0.0	0.2
40-310	0.45	97.86	186.5	1,473.4	1,119.0	34.3	11.1	5.5	6.5	1.0	0.4	0.3	1.8
40-320	0.60	9.43	23.8	188.2	142.9	4.4	1.4	0.7	0.8	0.1	0.1	0.0	0.2
40-330	0.59	15.34	38.3	302.4	229.7	7.0	2.3	1.1	1.3	0.2	0.1	0.1	0.4
40-340	0.53	35.27	79.1	625.2	474.8	14.6	4.7	2.3	2.7	0.4	0.2	0.1	0.8
40-350	0.60	8.99	22.7	179.4	136.3	4.2	1.3	0.7	0.8	0.1	0.1	0.0	0.2
40-360	0.60	8.09	20.4	161.5	122.6	3.8	1.2	0.6	0.7	0.1	0.0	0.0	0.2
40-370	0.58	12.41	30.2	238.8	181.3	5.6	1.8	0.9	1.0	0.2	0.1	0.0	0.3
40-380	0.39	24.92	41.3	326.1	247.7	7.6	2.5	1.2	1.4	0.2	0.1	0.1	0.4
40-390	0.58	5.72	14.0	110.3	83.8	2.6	0.8	0.4	0.5	0.1	0.0	0.0	0.1
40-400	0.10	1.07	0.5	3.6	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-010	0.38	94.73	150.5	1,189.3	903.3	27.7	8.9	4.5	5.2	0.8	0.4	0.2	1.4
41-020	0.00	14.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-030	0.50	60.47	127.8	1,009.7	766.8	23.5	7.6	3.8	4.4	0.7	0.3	0.2	1.2
41-040	0.57	35.59	85.9	678.3	515.2	15.8	5.1	2.5	3.0	0.4	0.2	0.1	0.8
41-050	0.60	10.48	26.5	209.2	158.8	4.9	1.6	0.8	0.9	0.1	0.1	0.0	0.3
41-060	0.60	2.95	7.5	58.9	44.7	1.4	0.4	0.2	0.3	0.0	0.0	0.0	0.1
51-010	0.45	29.63	56.3	444.8	337.8	10.4	3.3	1.7	1.9	0.3	0.1	0.1	0.5
51-020	0.45	4.55	8.6	68.1	51.7	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
52-010	0.28	45.29	52.7	416.3	316.2	9.7	3.1	1.6	1.8	0.3	0.1	0.1	0.5
52-020	0.45	6.09	11.5	91.2	69.2	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
52-030	0.45	7.18	13.6	107.5	81.6	2.5	0.8	0.4	0.5	0.1	0.0	0.0	0.1
52-040	0.41	4.54	7.9	62.4	47.4	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
52-050	0.44	15.3	28.0	221.4	168.1	5.2	1.7	0.8	1.0	0.1	0.1	0.0	0.3
52-060	0.10	3.22	1.4	10.7	8.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
52-070	0.42	86.94	154.9	1,223.8	929.4	28.5	9.2	4.6	5.4	0.8	0.4	0.2	1.5
52-080	0.24	8.08	8.2	65.0	49.4	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
52-090	0.45	4.89	9.3	73.2	55.6	1.7	0.6	0.3	0.3	0.0	0.0	0.0	0.1
52-100A/B	0.27	11.89	13.3	105.4	80.1	2.5	0.8	0.4	0.5	0.1	0.0	0.0	0.1
52-110	0.45	8.84	16.6	131.3	99.7	3.1	1.0	0.5	0.6	0.1	0.0	0.0	0.2
52-120	0.45	14.74	27.9	220.6	167.6	5.1	1.7	0.8	1.0	0.1	0.1	0.0	0.3
52-130	0.31	7.18	9.5	75.2	57.1	1.8	0.6	0.3	0.3	0.0	0.0	0.0	0.1
53-010	0.45	7.03	13.3	105.2	79.9	2.5	0.8	0.4	0.5	0.1	0.0	0.0	0.1
53-020	0.28	12.38	14.4	113.8	86.4	2.7	0.9	0.4	0.5	0.1	0.0	0.0	0.1
53-030	0.44	11.37	20.9	165.2	125.5	3.8	1.2	0.6	0.7	0.1	0.1	0.0	0.2
53-040	0.45	2.78	5.3	41.6	31.6	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.1
53-050	0.45	13.66	25.9	204.5	155.3	4.8	1.5	0.8	0.9	0.1	0.1	0.0	0.2
53-060	0.45	20.37	38.6	304.9	231.6	7.1	2.3	1.1	1.3	0.2	0.1	0.1	0.4
53-070	0.45	4.89	9.3	73.2	55.6	1.7	0.6	0.3	0.3	0.0	0.0	0.0	0.1
53-080	0.39	5.81	9.6	76.2	57.9	1.8	0.6	0.3	0.3	0.1	0.0	0.0	0.1
53-090	0.46	59.59	115.2	910.1	691.2	21.2	6.8	3.4	4.0	0.6	0.3	0.2	1.1
53-100	0.00	107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-110	0.38	4.59	7.4	58.8	44.6	1.4	0.4	0.2	0.3	0.0	0.0	0.0	0.1
53-120A/B	0.46	129.79	249.0	1,966.9	1,493.9	45.8	14.8	7.4	8.6	1.3	0.6	0.4	2.4
53-130	0.45	5.02	9.5	75.1	57.1	1.8	0.6	0.3	0.3	0.0	0.0	0.0	0.1
53-140	0.45	6.36	12.1	95.2	72.3	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
53-150	0.48	90.4	184.1	1,454.8	1,104.9	33.9	10.9	5.5	6.4	1.0	0.4	0.3	1.8
53-160	0.47	252.19	502.0	3,965.8	3,012.0	92.4	29.8	14.9	17.4	2.6	1.2	0.8	4.8
53-170	0.36	6.39	9.7	76.7	58.3	1.8	0.6	0.3	0.3	0.1	0.0	0.0	0.1
53-180	0.10	8.09	3.4	26.9	20.4	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
53-190	0.30	11.41	14.4	114.0	86.6	2.7	0.9	0.4	0.5	0.1	0.0	0.0	0.1
54-010A/B	0.44	84.93	155.6	1,229.1	933.5	28.6	9.2	4.6	5.4	0.8	0.4	0.2	1.5
54-040A/B	0.49	255.14	531.7	4,200.3	3,190.1	97.8	31.6	15.7	18.4	2.8	1.3	0.9	5.1
54-050	0.17	9.27	6.8	53.6	40.7	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
54-060	0.44	32.13	59.4	469.4	356.5	10.9	3.5	1.8	2.1	0.3	0.1	0.1	0.6
54-070	0.36	60.8	91.8	725.2	550.8	16.9	5.5	2.7	3.2	0.5	0.2	0.1	0.9

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
54-080A/B/C	0.46	414.26	797.3	6,298.3	4,783.5	146.7	47.4	23.6	27.6	4.1	1.9	1.3	7.7
54-090	0.10	3.55	1.5	11.8	9.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
54-100A/B	0.60	114.24	286.5	2,263.6	1,719.2	52.7	17.0	8.5	9.9	1.5	0.7	0.5	2.8
54-110	0.45	24.55	46.5	367.5	279.1	8.6	2.8	1.4	1.6	0.2	0.1	0.1	0.4
54-120	0.46	62.08	119.4	943.6	716.6	22.0	7.1	3.5	4.1	0.6	0.3	0.2	1.1
54-130	0.10	1.07	0.5	3.6	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-140A/B	0.41	113.01	194.1	1,533.4	1,164.6	35.7	11.5	5.7	6.7	1.0	0.5	0.3	1.9
54-150	0.45	55.34	103.8	819.7	622.6	19.1	6.2	3.1	3.6	0.5	0.2	0.2	1.0
54-160	0.60	2.62	6.6	52.3	39.7	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
54-170	0.59	8.08	20.2	159.8	121.4	3.7	1.2	0.6	0.7	0.1	0.0	0.0	0.2
54-180	0.60	2.82	7.1	56.3	42.7	1.3	0.4	0.2	0.2	0.0	0.0	0.0	0.1
54-190	0.10	2.2	0.9	7.3	5.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
54-200	0.10	2.13	0.9	7.1	5.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
54-210	0.10	1.14	0.5	3.8	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55-010	0.60	14.98	37.8	299.0	227.1	7.0	2.2	1.1	1.3	0.2	0.1	0.1	0.4
55-020	0.60	189.58	475.8	3,758.9	2,854.9	87.5	28.3	14.1	16.5	2.5	1.1	0.8	4.6
56-010	0.60	67.62	170.8	1,349.5	1,024.9	31.4	10.1	5.1	5.9	0.9	0.4	0.3	1.6
57-010	0.53	26.1	58.6	463.1	351.7	10.8	3.5	1.7	2.0	0.3	0.1	0.1	0.6
57-020	0.00	142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-030	0.45	18.22	34.5	272.7	207.1	6.4	2.1	1.0	1.2	0.2	0.1	0.1	0.3
57-040	0.35	39.88	58.6	462.9	351.6	10.8	3.5	1.7	2.0	0.3	0.1	0.1	0.6
57-050	0.45	7.9	15.0	118.2	89.8	2.8	0.9	0.4	0.5	0.1	0.0	0.0	0.1
57-060	0.46	26.11	50.8	401.6	305.0	9.4	3.0	1.5	1.8	0.3	0.1	0.1	0.5
57-070	0.45	81.33	154.5	1,220.3	926.8	28.4	9.2	4.6	5.3	0.8	0.4	0.2	1.5
57-080	0.42	5.54	9.9	77.9	59.2	1.8	0.6	0.3	0.3	0.1	0.0	0.0	0.1
57-090	0.47	77.77	153.7	1,214.0	922.0	28.3	9.1	4.5	5.3	0.8	0.4	0.2	1.5
57-100A/B	0.47	313.43	623.4	4,925.0	3,740.5	114.7	37.0	18.5	21.6	3.2	1.5	1.0	6.0
57-110	0.54	21.6	49.2	388.5	295.1	9.0	2.9	1.5	1.7	0.3	0.1	0.1	0.5
57-120A/B/C	0.00	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-130	0.10	1.16	0.5	3.9	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-140	0.10	1.55	0.7	5.2	3.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-150	0.43	35.68	64.8	512.2	389.0	11.9	3.9	1.9	2.2	0.3	0.2	0.1	0.6
57-160	0.10	1.89	0.8	6.3	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-010	0.55	2.86	6.6	52.5	39.9	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
62-010	0.45	27.84	53.0	418.6	317.9	9.8	3.1	1.6	1.8	0.3	0.1	0.1	0.5
63-010	0.45	388.79	740.1	5,846.9	4,440.7	136.2	44.0	21.9	25.6	3.8	1.8	1.2	7.1
63-020	0.00	11.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64-100	0.45	24.92	47.2	372.7	283.0	8.7	2.8	1.4	1.6	0.2	0.1	0.1	0.5
64-110	0.45	6.01	11.4	90.0	68.3	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
64-120	0.45	16.04	30.4	240.1	182.3	5.6	1.8	0.9	1.1	0.2	0.1	0.0	0.3
64-130	0.45	2.44	4.6	36.5	27.7	0.9	0.3	0.1	0.2	0.0	0.0	0.0	0.0
65-010	0.00	18.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65-020	0.53	38.46	85.7	676.9	514.1	15.8	5.1	2.5	3.0	0.4	0.2	0.1	0.8
70-010	0.46	6.23	12.0	95.0	72.2	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
70-015	0.45	11.69	22.1	175.0	132.9	4.1	1.3	0.7	0.8	0.1	0.1	0.0	0.2
70-020	0.45	37.55	71.1	562.0	426.9	13.1	4.2	2.1	2.5	0.4	0.2	0.1	0.7
70-025	0.00	3.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-030	0.45	13.48	25.5	201.6	153.1	4.7	1.5	0.8	0.9	0.1	0.1	0.0	0.2
70-035	0.45	4.53	8.6	67.8	51.5	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-040	0.45	2.42	4.6	36.2	27.5	0.8	0.3	0.1	0.2	0.0	0.0	0.0	0.0
70-045	0.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-050	0.45	17.41	33.0	260.6	197.9	6.1	2.0	1.0	1.1	0.2	0.1	0.1	0.3
70-055	0.46	333.43	651.6	5,147.3	3,909.3	119.9	38.7	19.3	22.5	3.4	1.6	1.0	6.3
70-060	0.45	3.53	6.7	52.8	40.1	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-065	0.45	1.89	3.6	28.3	21.5	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-070	0.45	5.8	11.0	86.8	65.9	2.0	0.7	0.3	0.4	0.1	0.0	0.0	0.1
70-075	0.43	5	9.1	71.7	54.5	1.7	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-080	0.46	11.96	23.3	183.8	139.6	4.3	1.4	0.7	0.8	0.1	0.1	0.0	0.2
70-085	0.45	229.48	432.1	3,413.7	2,592.7	79.5	25.7	12.8	15.0	2.2	1.0	0.7	4.1
70-090	0.45	18.57	35.2	278.0	211.1	6.5	2.1	1.0	1.2	0.2	0.1	0.1	0.3
70-095	0.45	9.99	18.9	149.5	113.6	3.5	1.1	0.6	0.7	0.1	0.0	0.0	0.2
70-100	0.45	9.64	18.3	144.3	109.6	3.4	1.1	0.5	0.6	0.1	0.0	0.0	0.2
70-105	0.45	1.63	3.1	24.4	18.5	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-110	0.45	18.13	34.4	271.4	206.1	6.3	2.0	1.0	1.2	0.2	0.1	0.1	0.3
70-115	0.45	3.71	7.0	55.5	42.2	1.3	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-120	0.45	4.22	8.0	63.2	48.0	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
70-125	0.00	5.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-130	0.49	34.29	71.3	563.1	427.7	13.1	4.2	2.1	2.5	0.4	0.2	0.1	0.7
70-135	0.45	7.46	14.1	111.7	84.8	2.6	0.8	0.4	0.5	0.1	0.0	0.0	0.1
70-140	0.60	0.78	2.0	15.6	11.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-145	0.60	9.19	23.2	183.4	139.3	4.3	1.4	0.7	0.8	0.1	0.1	0.0	0.2
70-150	0.45	4.51	8.5	67.5	51.3	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-155	0.45	2.05	3.9	30.7	23.3	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-160	0.45	2.95	5.6	44.2	33.5	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.1
70-165	0.45	27.77	52.6	415.7	315.7	9.7	3.1	1.6	1.8	0.3	0.1	0.1	0.5

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
70-170	0.45	23.74	45.0	355.3	269.9	8.3	2.7	1.3	1.6	0.2	0.1	0.1	0.4
70-175	0.46	30.89	59.5	469.8	356.8	10.9	3.5	1.8	2.1	0.3	0.1	0.1	0.6
70-180	0.45	1.14	2.2	17.1	13.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-185	0.45	1.53	2.9	22.9	17.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-190	0.17	15.04	10.9	86.1	65.4	2.0	0.6	0.3	0.4	0.1	0.0	0.0	0.1
70-195	0.45	46.02	87.7	692.6	526.0	16.1	5.2	2.6	3.0	0.5	0.2	0.1	0.8
70-200	0.45	31.52	59.7	471.8	358.3	11.0	3.5	1.8	2.1	0.3	0.1	0.1	0.6
70-205	0.45	1.39	2.6	20.8	15.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-210	0.45	3.58	6.8	53.6	40.7	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-215	0.45	5.93	11.2	88.8	67.4	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
70-220	0.45	4.54	8.6	68.0	51.6	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-225	0.45	4.99	9.5	74.7	56.7	1.7	0.6	0.3	0.3	0.0	0.0	0.0	0.1
70-230	0.45	4.72	8.9	70.6	53.7	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-235	0.45	5.04	9.5	75.4	57.3	1.8	0.6	0.3	0.3	0.0	0.0	0.0	0.1
70-240	0.45	4.52	8.6	67.7	51.4	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-245	0.44	9.98	18.4	145.7	110.7	3.4	1.1	0.5	0.6	0.1	0.0	0.0	0.2
70-250	0.48	41.27	83.8	662.1	502.9	15.4	5.0	2.5	2.9	0.4	0.2	0.1	0.8
70-255	0.45	45.37	86.0	679.3	515.9	15.8	5.1	2.5	3.0	0.4	0.2	0.1	0.8
70-260	0.46	24.9	48.0	379.1	287.9	8.8	2.9	1.4	1.7	0.2	0.1	0.1	0.5
70-265A/B	0.00	183.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-270	0.45	4.66	8.8	69.8	53.0	1.6	0.5	0.3	0.3	0.0	0.0	0.0	0.1
70-275	0.45	4.28	8.1	64.1	48.7	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
70-280	0.45	9.39	17.8	140.8	106.9	3.3	1.1	0.5	0.6	0.1	0.0	0.0	0.2
70-285	0.45	19.03	36.0	284.5	216.1	6.6	2.1	1.1	1.2	0.2	0.1	0.1	0.3
70-290	0.45	2.37	4.5	35.2	26.7	0.8	0.3	0.1	0.2	0.0	0.0	0.0	0.0
70-295	0.45	7.18	13.6	107.5	81.6	2.5	0.8	0.4	0.5	0.1	0.0	0.0	0.1
70-300	0.10	0.4	0.2	1.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-305	0.45	12.68	23.8	188.1	142.9	4.4	1.4	0.7	0.8	0.1	0.1	0.0	0.2
70-310	0.00	5.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-315	0.30	5.79	7.3	57.8	43.9	1.3	0.4	0.2	0.3	0.0	0.0	0.0	0.1
70-320	0.44	2.32	4.3	33.9	25.7	0.8	0.3	0.1	0.1	0.0	0.0	0.0	0.0
70-325	0.00	2.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-330	0.47	279.41	554.1	4,377.8	3,324.9	102.0	32.9	16.4	19.2	2.9	1.3	0.9	5.3
70-335	0.45	1.99	3.8	29.8	22.6	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-340	0.39	22.25	36.9	291.2	221.1	6.8	2.2	1.1	1.3	0.2	0.1	0.1	0.4
70-345	0.45	3.81	7.2	57.0	43.3	1.3	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-350	0.49	314.4	654.1	5,167.3	3,924.5	120.4	38.9	19.4	22.6	3.4	1.6	1.0	6.3
70-355	0.45	1.29	2.4	19.3	14.7	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-360	0.45	131.96	252.5	1,995.0	1,515.2	46.5	15.0	7.5	8.7	1.3	0.6	0.4	2.4
70-365	0.45	6.7	12.7	100.3	76.2	2.3	0.8	0.4	0.4	0.1	0.0	0.0	0.1
70-370	0.44	3.75	7.0	55.3	42.0	1.3	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-375	0.47	7.1	14.1	111.6	84.8	2.6	0.8	0.4	0.5	0.1	0.0	0.0	0.1
70-380	0.45	14.4	27.3	215.5	163.7	5.0	1.6	0.8	0.9	0.1	0.1	0.0	0.3
70-385	0.45	14.97	28.4	224.1	170.2	5.2	1.7	0.8	1.0	0.1	0.1	0.0	0.3
70-390	0.46	58.11	113.3	895.4	680.0	20.9	6.7	3.4	3.9	0.6	0.3	0.2	1.1
70-395	0.43	57.19	103.4	817.1	620.6	19.0	6.1	3.1	3.6	0.5	0.2	0.2	1.0
70-400	0.44	9.67	17.9	141.1	107.2	3.3	1.1	0.5	0.6	0.1	0.0	0.0	0.2
70-405	0.25	7.16	7.5	59.6	45.2	1.4	0.4	0.2	0.3	0.0	0.0	0.0	0.1
70-410	0.43	5.8	10.5	82.7	62.8	1.9	0.6	0.3	0.4	0.1	0.0	0.0	0.1
70-415	0.45	120.75	230.8	1,823.3	1,384.8	42.5	13.7	6.8	8.0	1.2	0.6	0.4	2.2
70-420	0.45	16.99	32.2	254.3	193.1	5.9	1.9	1.0	1.1	0.2	0.1	0.1	0.3
70-425	0.51	20.63	44.4	350.6	266.3	8.2	2.6	1.3	1.5	0.2	0.1	0.1	0.4
70-430	0.10	6.19	2.6	20.6	15.6	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-435	0.10	9.16	3.9	30.5	23.1	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-440	0.50	34.48	72.1	569.7	432.7	13.3	4.3	2.1	2.5	0.4	0.2	0.1	0.7
70-445	0.45	5.6	10.6	83.8	63.7	2.0	0.6	0.3	0.4	0.1	0.0	0.0	0.1
70-450	0.45	2.65	5.0	39.7	30.1	0.9	0.3	0.1	0.2	0.0	0.0	0.0	0.0
70-455	0.00	2.66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-460	0.45	2.67	5.1	40.0	30.4	0.9	0.3	0.1	0.2	0.0	0.0	0.0	0.0
70-465	0.45	2.58	4.9	38.6	29.3	0.9	0.3	0.1	0.2	0.0	0.0	0.0	0.0
70-470	0.38	8.55	13.8	109.2	83.0	2.5	0.8	0.4	0.5	0.1	0.0	0.0	0.1
70-475	0.46	229.14	444.1	3,508.5	2,664.7	81.7	26.4	13.1	15.4	2.3	1.1	0.7	4.3
70-480	0.60	0.31	0.8	6.2	4.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-485	0.45	13.36	25.3	200.0	151.9	4.7	1.5	0.7	0.9	0.1	0.1	0.0	0.2
70-490	0.47	48.75	96.3	761.1	578.0	17.7	5.7	2.9	3.3	0.5	0.2	0.2	0.9
70-495	0.45	7.74	14.7	115.9	88.0	2.7	0.9	0.4	0.5	0.1	0.0	0.0	0.1
70-500	0.45	0.56	1.1	8.4	6.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-505	0.41	8.12	14.1	111.2	84.4	2.6	0.8	0.4	0.5	0.1	0.0	0.0	0.1
70-510	0.45	41.82	79.5	628.0	477.0	14.6	4.7	2.4	2.8	0.4	0.2	0.1	0.8
70-515	0.47	62.73	124.1	980.5	744.7	22.8	7.4	3.7	4.3	0.6	0.3	0.2	1.2
70-520	0.45	6.05	11.5	90.6	68.8	2.1	0.7	0.3	0.4	0.1	0.0	0.0	0.1
70-525	0.45	6.23	11.8	93.3	70.8	2.2	0.7	0.3	0.4	0.1	0.0	0.0	0.1
70-530	0.45	1.67	3.2	25.0	19.0	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-535	0.45	30.24	57.4	453.7	344.6	10.6	3.4	1.7	2.0	0.3	0.1	0.1	0.6
70-540	0.21	5.1	4.6	36.2	27.5	0.8	0.3	0.1	0.2	0.0	0.0	0.0	0.0

2010 SPRING POLLUTANT LOADINGS BY OUTFALL

2010 SPRING POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (04/01/10- 05/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Spring Median Event Geometric Mean Concentration			10.0	79	60	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation (meters)	0.122												
70-545	0.45	1.89	3.6	28.3	21.5	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-550	0.26	1.3	1.4	11.2	8.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-555	0.45	1.73	3.3	25.9	19.7	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-560	0.45	3.33	6.3	49.8	37.9	1.2	0.4	0.2	0.2	0.0	0.0	0.0	0.1
70-565	0.24	16.63	16.8	133.1	101.1	3.1	1.0	0.5	0.6	0.1	0.0	0.0	0.2
70-570	0.45	1.23	2.3	18.4	14.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-575	0.45	15.39	29.1	230.1	174.8	5.4	1.7	0.9	1.0	0.2	0.1	0.0	0.3
70-580	0.43	119.93	219.0	1,730.5	1,314.3	40.3	13.0	6.5	7.6	1.1	0.5	0.4	2.1
71-010	0.10	1.12	0.5	3.7	2.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-020	0.45	14.05	26.6	210.3	159.7	4.9	1.6	0.8	0.9	0.1	0.1	0.0	0.3
71-030	0.45	28.58	54.4	430.1	326.7	10.0	3.2	1.6	1.9	0.3	0.1	0.1	0.5
71-040	0.22	20.93	19.3	152.8	116.1	3.6	1.1	0.6	0.7	0.1	0.0	0.0	0.2
71-050	0.46	120.42	232.2	1,834.5	1,393.3	42.7	13.8	6.9	8.0	1.2	0.6	0.4	2.2
71-060	0.45	3.11	5.9	46.6	35.4	1.1	0.4	0.2	0.2	0.0	0.0	0.0	0.1
71-070	0.00	386.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-080	0.46	101.79	195.6	1,544.9	1,173.3	36.0	11.6	5.8	6.8	1.0	0.5	0.3	1.9
71-090	0.45	6.5	12.2	96.3	73.2	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
71-100	0.10	1.99	0.8	6.6	5.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-010	0.18	17.32	12.8	100.9	76.6	2.3	0.8	0.4	0.4	0.1	0.0	0.0	0.1
72-020	0.40	24.7	41.1	324.6	246.6	7.6	2.4	1.2	1.4	0.2	0.1	0.1	0.4
72-030	0.10	5.25	2.2	17.5	13.3	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-040	0.42	166.54	292.1	2,307.4	1,752.4	53.7	17.3	8.6	10.1	1.5	0.7	0.5	2.8
72-050	0.10	5.16	2.2	17.2	13.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-060	0.36	113.04	172.2	1,360.0	1,032.9	31.7	10.2	5.1	6.0	0.9	0.4	0.3	1.7
72-070	0.10	2.21	0.9	7.4	5.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
72-080	0.60	4.74	12.0	94.6	71.8	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
72-090	0.45	68.71	129.4	1,022.0	776.2	23.8	7.7	3.8	4.5	0.7	0.3	0.2	1.2
72-100	0.46	68.32	133.2	1,052.2	799.1	24.5	7.9	3.9	4.6	0.7	0.3	0.2	1.3
72-110	0.10	3.22	1.4	10.7	8.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
72-120	0.45	62.98	119.3	942.7	716.0	22.0	7.1	3.5	4.1	0.6	0.3	0.2	1.1
72-130	0.46	58.06	111.6	881.3	669.3	20.5	6.6	3.3	3.9	0.6	0.3	0.2	1.1
72-140	0.10	10.19	4.3	33.9	25.7	0.8	0.3	0.1	0.1	0.0	0.0	0.0	0.0
72-150	0.10	4.76	2.0	15.8	12.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-160	0.10	4.55	1.9	15.1	11.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
73-010	0.44	20.76	38.4	303.1	230.2	7.1	2.3	1.1	1.3	0.2	0.1	0.1	0.4
73-020	0.44	57.47	107.1	846.0	642.6	19.7	6.4	3.2	3.7	0.6	0.3	0.2	1.0
73-030	0.10	21.56	9.1	71.7	54.5	1.7	0.5	0.3	0.3	0.0	0.0	0.0	0.1
74-010	0.48	44.39	89.5	706.8	536.8	16.5	5.3	2.6	3.1	0.5	0.2	0.1	0.9
74-020	0.45	4.41	8.4	66.0	50.1	1.5	0.5	0.2	0.3	0.0	0.0	0.0	0.1
75-005	0.45	12.39	23.4	185.2	140.7	4.3	1.4	0.7	0.8	0.1	0.1	0.0	0.2
75-010	0.60	3.65	9.2	72.8	55.3	1.7	0.5	0.3	0.3	0.0	0.0	0.0	0.1
75-020	0.45	1.53	2.9	22.9	17.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
75-030	0.45	8.38	15.9	125.4	95.3	2.9	0.9	0.5	0.5	0.1	0.0	0.0	0.2
75-040	0.45	14.74	27.9	220.6	167.6	5.1	1.7	0.8	1.0	0.1	0.1	0.0	0.3
76-010	0.46	907.31	1,771.9	13,998.3	10,631.6	326.0	105.3	52.4	61.3	9.2	4.3	2.8	17.0
76-020	0.46	88.62	170.0	1,343.2	1,020.1	31.3	10.1	5.0	5.9	0.9	0.4	0.3	1.6
76-030	0.45	7.55	14.3	113.0	85.8	2.6	0.8	0.4	0.5	0.1	0.0	0.0	0.1
76-040	0.19	4.67	3.7	28.9	22.0	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
76-050	0.00	2.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-010	0.10	31.17	13.1	103.7	78.7	2.4	0.8	0.4	0.5	0.1	0.0	0.0	0.1
82-010	0.49	23.53	48.2	380.8	289.2	8.9	2.9	1.4	1.7	0.3	0.1	0.1	0.5
82-020	0.45	73.45	140.7	1,111.2	843.9	25.9	8.4	4.2	4.9	0.7	0.3	0.2	1.4
82-030	0.45	90.04	172.4	1,361.8	1,034.3	31.7	10.2	5.1	6.0	0.9	0.4	0.3	1.7
82-040	0.46	98.49	192.4	1,519.7	1,154.2	35.4	11.4	5.7	6.7	1.0	0.5	0.3	1.8
83-010	0.45	6.59	12.5	98.6	74.9	2.3	0.7	0.4	0.4	0.1	0.0	0.0	0.1
83-015	0.45	0.99	1.9	14.8	11.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
83-020	0.43	85.96	157.4	1,243.1	944.1	29.0	9.3	4.7	5.4	0.8	0.4	0.3	1.5
83-025	0.45	51.23	97.1	766.8	582.4	17.9	5.8	2.9	3.4	0.5	0.2	0.2	0.9
83-030	0.60	0.82	2.1	16.4	12.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
83-040	0.10	1.08	0.5	3.6	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-050	0.45	40.4	76.8	606.4	460.5	14.1	4.6	2.3	2.7	0.4	0.2	0.1	0.7
83-060	0.45	10.05	19.0	150.4	114.2	3.5	1.1	0.6	0.7	0.1	0.0	0.0	0.2
83-070	0.10	1.19	0.5	4.0	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-080	0.48	178.63	357.6	2,824.9	2,145.5	65.8	21.2	10.6	12.4	1.9	0.9	0.6	3.4
83-090	0.41	9.16	15.8	124.9	94.8	2.9	0.9	0.5	0.5	0.1	0.0	0.0	0.2
84-010	0.47	21.56	42.7	337.3	256.2	7.9	2.5	1.3	1.5	0.2	0.1	0.1	0.4
85-010	0.10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPRING SEASONAL SUM (kg)			**56,873.29**	**449,299.03**	**341,239.77**	**10,464.69**	**3,378.27**	**1,683.45**	**1,967.82**	**295.74**	**136.50**	**91.00**	**545.98**

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
10-010	0.43	113.55	425.1	5,283.6	2,490.0	102.6	30.3	20.8	17.6	4.4	1.4	0.8	4.8
10-020	0.45	7.81	30.5	379.1	178.6	7.4	2.2	1.5	1.3	0.3	0.1	0.1	0.3
10-030	0.10	4.05	3.5	43.7	20.6	0.8	0.3	0.2	0.1	0.0	0.0	0.0	0.0
10-040	0.45	167.42	649.3	8,069.4	3,802.8	156.8	46.3	31.8	26.9	6.8	2.1	1.2	7.3
10-050	0.46	114.18	451.0	5,605.9	2,641.8	108.9	32.2	22.1	18.7	4.7	1.5	0.8	5.1
10-060	0.60	10.5	54.7	679.5	320.2	13.2	3.9	2.7	2.3	0.6	0.2	0.1	0.6
10-070	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-080	0.38	30.66	101.7	1,263.7	595.5	24.5	7.2	5.0	4.2	1.1	0.3	0.2	1.1
10-090A	0.00	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090B	0.00	1.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090C	0.54	12.77	60.0	745.8	351.5	14.5	4.3	2.9	2.5	0.6	0.2	0.1	0.7
10-090D	0.00	4.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-100	0.36	1392.1	4,382.0	54,461.4	25,665.7	1,057.9	312.4	214.7	181.5	45.7	14.4	8.1	49.5
10-110	0.47	300.11	1,215.0	15,101.2	7,116.6	293.3	86.6	59.5	50.3	12.7	4.0	2.3	13.7
10-120A/B	0.44	372.78	1,408.1	17,500.3	8,247.3	339.9	100.4	69.0	58.3	14.7	4.6	2.6	15.9
10-130	0.45	336.46	1,318.4	16,385.4	7,721.8	318.3	94.0	64.6	54.6	13.7	4.3	2.4	14.9
10-140a	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-140a,b	0.58	220.65	1,101.8	13,694.4	6,453.7	266.0	78.5	54.0	45.6	11.5	3.6	2.0	12.4
10-150	0.47	157.15	639.4	7,947.2	3,745.2	154.4	45.6	31.3	26.5	6.7	2.1	1.2	7.2
10-160	0.00	17	0.4	4.6	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-170	0.50	176.01	768.6	9,553.1	4,502.0	185.6	54.8	37.7	31.8	8.0	2.5	1.4	8.7
10-180	0.45	284.26	1,098.5	13,653.0	6,434.2	265.2	78.3	53.8	45.5	11.5	3.6	2.0	12.4
10-190	0.59	14.58	74.9	930.5	438.5	18.1	5.3	3.7	3.1	0.8	0.2	0.1	0.8
10-200	0.40	42.44	146.2	1,817.4	856.5	35.3	10.4	7.2	6.1	1.5	0.5	0.3	1.7
10-210	0.49	98.32	419.4	5,212.9	2,456.6	101.3	29.9	20.6	17.4	4.4	1.4	0.8	4.7
10-220	0.56	18.83	91.4	1,135.5	535.1	22.1	6.5	4.5	3.8	1.0	0.3	0.2	1.0
10-230	0.47	235.02	964.1	11,982.2	5,646.8	232.8	68.7	47.2	39.9	10.1	3.2	1.8	10.9
10-240	0.51	103.83	462.9	5,752.9	2,711.1	111.8	33.0	22.7	19.2	4.8	1.5	0.9	5.2
10-250	0.49	242.96	1,030.7	12,810.3	6,037.0	248.8	73.5	50.5	42.7	10.7	3.4	1.9	11.6
10-260	0.56	23.77	114.9	1,428.4	673.1	27.7	8.2	5.6	4.8	1.2	0.4	0.2	1.3
10-270	0.47	72.45	297.9	3,702.8	1,745.0	71.9	21.2	14.6	12.3	3.1	1.0	0.6	3.4
10-280	0.44	55.08	212.1	2,636.6	1,242.5	51.2	15.1	10.4	8.8	2.2	0.7	0.4	2.4
10-290	0.10	6.83	5.9	73.7	34.7	1.4	0.4	0.3	0.2	0.1	0.0	0.0	0.1
10-300	0.36	17.74	55.5	689.9	325.1	13.4	4.0	2.7	2.3	0.6	0.2	0.1	0.6
10-310	0.47	60.29	247.1	3,070.7	1,447.1	59.7	17.6	12.1	10.2	2.6	0.8	0.5	2.8
10-320	0.45	341.99	1,340.8	16,663.8	7,853.1	323.7	95.6	65.7	55.5	14.0	4.4	2.5	15.1
10-330	0.35	21.61	65.9	819.4	386.2	15.9	4.7	3.2	2.7	0.7	0.2	0.1	0.7
10-340	0.45	20.74	81.2	1,009.3	475.7	19.6	5.8	4.0	3.4	0.8	0.3	0.2	0.9
10-350	0.60	28.16	146.4	1,819.0	857.2	35.3	10.4	7.2	6.1	1.5	0.5	0.3	1.7
10-360	0.59	29.02	149.3	1,855.0	874.2	36.0	10.6	7.3	6.2	1.6	0.5	0.3	1.7
10-370	0.59	14.46	74.0	919.5	433.3	17.9	5.3	3.6	3.1	0.8	0.2	0.1	0.8
10-380	0.45	14.38	55.6	690.5	325.4	13.4	4.0	2.7	2.3	0.6	0.2	0.1	0.6
10-390	0.49	41.97	179.6	2,232.0	1,051.9	43.4	12.8	8.8	7.4	1.9	0.6	0.3	2.0
10-400A	0.10	1.07	0.9	11.5	5.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10-400B	0.47	17.66	72.3	898.3	423.3	17.4	5.2	3.5	3.0	0.8	0.2	0.1	0.8
10-400C	0.57	50.25	246.7	3,066.4	1,445.1	59.6	17.6	12.1	10.2	2.6	0.8	0.5	2.8
10-410A	0.50	46.22	199.7	2,481.7	1,169.6	48.2	14.2	9.8	8.3	2.1	0.7	0.4	2.3
10-410B	0.32	21.29	58.5	726.5	342.4	14.1	4.2	2.9	2.4	0.6	0.2	0.1	0.7
10-410C	0.53	22.8	104.4	1,297.9	611.7	25.2	7.4	5.1	4.3	1.1	0.3	0.2	1.2
10-410D	0.60	27.34	142.4	1,770.0	834.1	34.4	10.2	7.0	5.9	1.5	0.5	0.3	1.6
10-410E	0.58	256.04	1,278.6	15,890.8	7,488.8	308.7	91.1	62.6	53.0	13.3	4.2	2.4	14.4
10-410F	0.59	37.92	193.6	2,405.8	1,133.8	46.7	13.8	9.5	8.0	2.0	0.6	0.4	2.2
10-420A	0.27	23.05	54.5	677.5	319.3	13.2	3.9	2.7	2.3	0.6	0.2	0.1	0.6
10-420B	0.00	10.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420C	0.00	7.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420D	0.00	20.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420E	0.59	127.89	651.3	8,094.6	3,814.7	157.2	46.4	31.9	27.0	6.8	2.1	1.2	7.4
10-430A	0.00	8.14	0.2	2.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430B	0.53	54.72	253.7	3,153.6	1,486.2	61.3	18.1	12.4	10.5	2.6	0.8	0.5	2.9
10-430C	0.48	44.83	186.9	2,322.8	1,094.7	45.1	13.3	9.2	7.7	1.9	0.6	0.3	2.1
10-430D	0.49	85.79	366.0	4,548.8	2,143.7	88.4	26.1	17.9	15.2	3.8	1.2	0.7	4.1
10-430E	0.56	86.66	419.3	5,211.8	2,456.2	101.2	29.9	20.5	17.4	4.4	1.4	0.8	4.7
10-430F	0.10	377.97	328.0	4,076.6	1,921.2	79.2	23.4	16.1	13.6	3.4	1.1	0.6	3.7
10-430G	0.50	125.89	541.4	6,729.1	3,171.2	130.7	38.6	26.5	22.4	5.6	1.8	1.0	6.1
10-430H	0.49	33.18	141.5	1,758.5	828.7	34.2	10.1	6.9	5.9	1.5	0.5	0.3	1.6
10-430I	0.59	32.61	166.6	2,070.3	975.7	40.2	11.9	8.2	6.9	1.7	0.5	0.3	1.9
10-430J	0.43	532.36	2,004.8	24,916.7	11,742.4	484.0	142.9	98.2	83.1	20.9	6.6	3.7	22.6
10-430K	0.48	337.06	1,397.2	17,364.6	8,183.3	337.3	99.6	68.5	57.9	14.6	4.6	2.6	15.8
10-430L	0.45	84.4	330.1	4,103.3	1,933.7	79.7	23.5	16.2	13.7	3.4	1.1	0.6	3.7
10-430M	0.54	75.94	357.4	4,442.4	2,093.6	86.3	25.5	17.5	14.8	3.7	1.2	0.7	4.0
10-430N	0.44	26.43	101.8	1,265.4	596.4	24.6	7.3	5.0	4.2	1.1	0.3	0.2	1.1
10-430O	0.00	109.53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430P	0.00	229.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430Q	0.10	8.03	7.0	86.6	40.8	1.7	0.5	0.3	0.3	0.1	0.0	0.0	0.1
10-430R	0.47	150.32	609.8	7,579.1	3,571.7	147.2	43.5	29.9	25.3	6.4	2.0	1.1	6.9
10-430S	0.10	5.15	4.5	55.5	26.2	1.1	0.3	0.2	0.2	0.0	0.0	0.0	0.1
10-430T	0.46	262.47	1,041.2	12,940.6	6,098.5	251.4	74.2	51.0	43.1	10.9	3.4	1.9	11.8

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
10-430U	0.47	431.37	1,758.9	21,860.5	10,302.1	424.6	125.4	86.2	72.9	18.3	5.8	3.3	19.9
10-430V	0.46	329.11	1,327.6	16,500.1	7,775.9	320.5	94.6	65.1	55.0	13.8	4.4	2.5	15.0
10-440A	0.46	23.18	92.2	1,145.4	539.8	22.2	6.6	4.5	3.8	1.0	0.3	0.2	1.0
10-440B	0.49	34.23	146.4	1,819.4	857.4	35.3	10.4	7.2	6.1	1.5	0.5	0.3	1.7
10-440C/D	0.00	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-440E	0.51	831.25	3,709.5	46,104.1	21,727.2	895.6	264.4	181.8	153.7	38.7	12.2	6.9	41.9
10-440F	0.46	538.85	2,152.1	26,747.4	12,605.1	519.6	153.4	105.5	89.2	22.4	7.1	4.0	24.3
10-450A	0.00	343.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-450B	0.52	3.41	15.3	190.0	89.6	3.7	1.1	0.7	0.6	0.2	0.1	0.0	0.2
10-450C	0.59	55.64	286.7	3,563.7	1,679.5	69.2	20.4	14.1	11.9	3.0	0.9	0.5	3.2
10-450D	0.45	4.62	18.0	224.2	105.7	4.4	1.3	0.9	0.7	0.2	0.1	0.0	0.2
10-450E	0.44	3.2	12.3	152.5	71.9	3.0	0.9	0.6	0.5	0.1	0.0	0.0	0.1
10-450F	0.46	158.55	632.1	7,856.5	3,702.5	152.6	45.1	31.0	26.2	6.6	2.1	1.2	7.1
10-450G/H	0.48	75.02	312.8	3,887.8	1,832.2	75.5	22.3	15.3	13.0	3.3	1.0	0.6	3.5
10-450I	0.49	243.64	1,038.6	12,908.4	6,083.3	250.8	74.0	50.9	43.0	10.8	3.4	1.9	11.7
10-450J	0.49	17.16	72.3	898.5	423.4	17.5	5.2	3.5	3.0	0.8	0.2	0.1	0.8
10-450K	0.58	37.01	186.0	2,312.3	1,089.7	44.9	13.3	9.1	7.7	1.9	0.6	0.3	2.1
10-450L	0.51	213.41	935.4	11,625.3	5,478.6	225.8	66.7	45.8	38.8	9.8	3.1	1.7	10.6
10-460	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460A	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460B	0.52	7.29	32.7	406.3	191.5	7.9	2.3	1.6	1.4	0.3	0.1	0.1	0.4
10-460C/D/F	0.00	159.87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460E	0.49	231.41	991.7	12,325.9	5,808.7	239.4	70.7	48.6	41.1	10.3	3.3	1.8	11.2
10-460F	0.49	14.75	63.3	787.0	370.9	15.3	4.5	3.1	2.6	0.7	0.2	0.1	0.7
10-460G	0.51	79.66	353.1	4,388.7	2,068.3	85.3	25.2	17.3	14.6	3.7	1.2	0.7	4.0
10-460H	0.48	12.35	51.4	638.6	300.9	12.4	3.7	2.5	2.1	0.5	0.2	0.1	0.6
10-460I	0.00	72.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460J	0.46	5.36	21.6	268.1	126.3	5.2	1.5	1.1	0.9	0.2	0.1	0.0	0.2
10-460K	0.36	5.48	17.1	212.6	100.2	4.1	1.2	0.8	0.7	0.2	0.1	0.0	0.2
10-460L	0.46	3.5	14.1	174.9	82.4	3.4	1.0	0.7	0.6	0.1	0.0	0.0	0.2
10-460M	0.48	9.55	39.7	493.0	232.3	9.6	2.8	1.9	1.6	0.4	0.1	0.1	0.4
10-460N	0.45	3.85	15.0	186.9	88.1	3.6	1.1	0.7	0.6	0.2	0.0	0.0	0.2
10-460O	0.45	4.15	16.3	203.1	95.7	3.9	1.2	0.8	0.7	0.2	0.1	0.0	0.2
10-460P	0.45	4.34	16.9	210.6	99.3	4.1	1.2	0.8	0.7	0.2	0.1	0.0	0.2
10-460Q	0.56	19.73	96.6	1,200.5	565.8	23.3	6.9	4.7	4.0	1.0	0.3	0.2	1.1
10-460R	0.00	51.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460S	0.56	233.54	1,143.7	14,214.0	6,698.5	276.1	81.5	56.0	47.4	11.9	3.8	2.1	12.9
10-465	0.10	8.56	7.4	92.3	43.5	1.8	0.5	0.4	0.3	0.1	0.0	0.0	0.1
10-470	0.38	25.6	84.8	1,053.8	496.6	20.5	6.0	4.2	3.5	0.9	0.3	0.2	1.0
10-480	0.58	39.66	199.7	2,481.8	1,169.6	48.2	14.2	9.8	8.3	2.1	0.7	0.4	2.3
10-485	0.00	7.27	0.2	2.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-490	0.43	150.96	567.9	7,058.6	3,326.5	137.1	40.5	27.8	23.5	5.9	1.9	1.1	6.4
10-500A	0.26	26.21	59.7	741.9	349.6	14.4	4.3	2.9	2.5	0.6	0.2	0.1	0.7
10-500B	0.46	8.48	33.9	421.0	198.4	8.2	2.4	1.7	1.4	0.4	0.1	0.1	0.4
10-500C	0.44	111.36	420.7	5,229.0	2,464.2	101.6	30.0	20.6	17.4	4.4	1.4	0.8	4.7
10-500D	0.24	3.83	7.9	98.4	46.3	1.9	0.6	0.4	0.3	0.1	0.0	0.0	0.1
10-500E	0.53	23.34	107.8	1,340.3	631.7	26.0	7.7	5.3	4.5	1.1	0.4	0.2	1.2
10-500F	0.49	12.04	51.6	641.2	302.2	12.5	3.7	2.5	2.1	0.5	0.2	0.1	0.6
10-500G	0.00	112.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-505	0.10	7.85	6.8	84.7	39.9	1.6	0.5	0.3	0.3	0.1	0.0	0.0	0.1
10-510	0.51	62.36	275.3	3,421.1	1,612.2	66.5	19.6	13.5	11.4	2.9	0.9	0.5	3.1
10-520	0.00	139.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-530	0.45	116.15	454.4	5,647.1	2,661.3	109.7	32.4	22.3	18.8	4.7	1.5	0.8	5.1
10-540	0.12	53.9	55.4	688.5	324.4	13.4	3.9	2.7	2.3	0.6	0.2	0.1	0.6
10-550	0.46	25.83	103.1	1,281.3	603.8	24.9	7.3	5.1	4.3	1.1	0.3	0.2	1.2
10-560A/B	0.44	600.63	2,280.3	28,341.5	13,356.3	550.5	162.6	111.7	94.5	23.8	7.5	4.2	25.7
10-570A	0.54	14.64	69.1	858.6	404.6	16.7	4.9	3.4	2.9	0.7	0.2	0.1	0.8
10-570B	0.44	228.18	864.4	10,742.9	5,062.8	208.7	61.6	42.4	35.8	9.0	2.8	1.6	9.8
10-580	0.45	73.39	285.9	3,552.7	1,674.3	69.0	20.4	14.0	11.8	3.0	0.9	0.5	3.2
10-600	0.48	89.24	374.5	4,654.8	2,193.6	90.4	26.7	18.4	15.5	3.9	1.2	0.7	4.2
10-610	0.46	25.6	101.8	1,265.6	596.4	24.6	7.3	5.0	4.2	1.1	0.3	0.2	1.1
10-620	0.00	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630A	0.10	6.24	5.4	67.3	31.7	1.3	0.4	0.3	0.2	0.1	0.0	0.0	0.1
10-630B	0.45	4.68	18.3	227.1	107.0	4.4	1.3	0.9	0.8	0.2	0.1	0.0	0.2
10-630C	0.48	96.03	402.6	5,004.0	2,358.2	97.2	28.7	19.7	16.7	4.2	1.3	0.7	4.5
10-630D	0.45	6.37	24.9	309.2	145.7	6.0	1.8	1.2	1.0	0.3	0.1	0.0	0.3
10-630E	0.45	8.52	33.3	413.5	194.9	8.0	2.4	1.6	1.4	0.3	0.1	0.1	0.4
10-630F	0.54	17.56	82.3	1,023.2	482.2	19.9	5.9	4.0	3.4	0.9	0.3	0.2	0.9
10-630G	0.45	5.9	23.0	286.4	135.0	5.6	1.6	1.1	1.0	0.2	0.1	0.0	0.3
10-630H	0.30	25.63	67.4	837.2	394.6	16.3	4.8	3.3	2.8	0.7	0.2	0.1	0.8
10-630I	0.47	12.48	50.4	625.9	295.0	12.2	3.6	2.5	2.1	0.5	0.2	0.1	0.6
10-630J	0.55	14.69	70.6	877.2	413.4	17.0	5.0	3.5	2.9	0.7	0.2	0.1	0.8
10-630K	0.47	95.29	391.4	4,864.3	2,292.4	94.5	27.9	19.2	16.2	4.1	1.3	0.7	4.4
10-630L	0.52	100.42	454.0	5,642.9	2,659.3	109.6	32.4	22.2	18.8	4.7	1.5	0.8	5.1
10-630M	0.50	11.71	50.5	627.1	295.5	12.2	3.6	2.5	2.1	0.5	0.2	0.1	0.6
10-630N	0.45	8.45	33.0	410.1	193.3	8.0	2.4	1.6	1.4	0.3	0.1	0.1	0.4
10-630O	0.36	5.77	18.2	226.6	106.8	4.4	1.3	0.9	0.8	0.2	0.1	0.0	0.2

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	**0.360**												
10-630P/Q	0.00	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630R	0.33	83.89	243.1	3,021.9	1,424.1	58.7	17.3	11.9	10.1	2.5	0.8	0.5	2.7
10-630S	0.22	37.02	69.8	868.0	409.0	16.9	5.0	3.4	2.9	0.7	0.2	0.1	0.8
10-630T	0.56	7.72	37.7	468.4	220.7	9.1	2.7	1.8	1.6	0.4	0.1	0.1	0.4
10-630U	0.52	115.42	523.9	6,511.8	3,068.8	126.5	37.3	25.7	21.7	5.5	1.7	1.0	5.9
10-630V	0.11	33.85	31.0	385.5	181.7	7.5	2.2	1.5	1.3	0.3	0.1	0.1	0.4
10-630W	0.47	23.68	97.3	1,209.8	570.2	23.5	6.9	4.8	4.0	1.0	0.3	0.2	1.1
10-630X	0.44	14.78	56.7	705.2	332.3	13.7	4.0	2.8	2.4	0.6	0.2	0.1	0.6
10-630Y	0.00	112.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630Z	0.47	45.66	186.5	2,318.5	1,092.6	45.0	13.3	9.1	7.7	1.9	0.6	0.3	2.1
10-640	0.46	258.18	1,024.7	12,735.6	6,001.9	247.4	73.0	50.2	42.5	10.7	3.4	1.9	11.6
10-650	0.56	19.53	94.4	1,173.3	553.0	22.8	6.7	4.6	3.9	1.0	0.3	0.2	1.1
10-660	0.46	306.37	1,231.7	15,307.8	7,214.0	297.4	87.8	60.4	51.0	12.8	4.0	2.3	13.9
10-670	0.45	137.88	537.7	6,682.2	3,149.1	129.8	38.3	26.3	22.3	5.6	1.8	1.0	6.1
10-680	0.46	707.95	2,817.0	35,010.7	16,499.3	680.1	200.8	138.0	116.7	29.4	9.3	5.2	31.8
10-690	0.50	70.63	306.6	3,811.1	1,796.0	74.0	21.9	15.0	12.7	3.2	1.0	0.6	3.5
10-700	0.46	222.07	894.9	11,122.1	5,241.4	216.0	63.8	43.8	37.1	9.3	2.9	1.7	10.1
10-710	0.33	29.95	86.6	1,076.1	507.1	20.9	6.2	4.2	3.6	0.9	0.3	0.2	1.0
10-720A	0.44	15.77	60.7	754.2	355.4	14.7	4.3	3.0	2.5	0.6	0.2	0.1	0.7
10-720B	0.48	422.18	1,765.1	21,937.7	10,338.5	426.1	125.8	86.5	73.1	18.4	5.8	3.3	19.9
10-720C	0.43	26.35	98.2	1,220.4	575.1	23.7	7.0	4.8	4.1	1.0	0.3	0.2	1.1
10-720D	0.46	22.95	90.7	1,126.9	531.1	21.9	6.5	4.4	3.8	0.9	0.3	0.2	1.0
10-720E	0.46	18.39	72.7	903.9	426.0	17.6	5.2	3.6	3.0	0.8	0.2	0.1	0.8
10-720F	0.48	317.75	1,323.1	16,443.7	7,749.3	319.4	94.3	64.8	54.8	13.8	4.3	2.5	14.9
10-720G	0.00	13.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-720H	0.45	4.55	17.8	220.8	104.1	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
10-720I	0.45	87.27	337.7	4,197.6	1,978.2	81.5	24.1	16.5	14.0	3.5	1.1	0.6	3.8
10-720J	0.36	3.71	11.5	143.0	67.4	2.8	0.8	0.6	0.5	0.1	0.0	0.0	0.1
10-720K	0.55	32.76	156.1	1,940.1	914.3	37.7	11.1	7.6	6.5	1.6	0.5	0.3	1.8
10-720L	0.45	4.57	17.8	221.8	104.5	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
20-010	0.42	93.99	342.4	4,255.7	2,005.6	82.7	24.4	16.8	14.2	3.6	1.1	0.6	3.9
20-020	0.44	15.09	57.4	713.9	336.5	13.9	4.1	2.8	2.4	0.6	0.2	0.1	0.6
20-030	0.45	7.95	31.0	385.9	181.8	7.5	2.2	1.5	1.3	0.3	0.1	0.1	0.4
20-040	0.37	6.79	22.0	273.0	128.7	5.3	1.6	1.1	0.9	0.2	0.1	0.0	0.2
20-050	0.00	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-060	0.45	5.91	23.1	286.8	135.2	5.6	1.6	1.1	1.0	0.2	0.1	0.0	0.3
20-070	0.44	39.07	150.3	1,868.4	880.5	36.3	10.7	7.4	6.2	1.6	0.5	0.3	1.7
20-080	0.45	33.72	132.7	1,648.9	777.1	32.0	9.5	6.5	5.5	1.4	0.4	0.2	1.5
20-090	0.55	9.95	47.7	593.2	279.6	11.5	3.4	2.3	2.0	0.5	0.2	0.1	0.5
20-100	0.10	0.99	0.9	10.7	5.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
20-110	0.24	216.04	449.8	5,590.4	2,634.6	108.6	32.1	22.0	18.6	4.7	1.5	0.8	5.1
20-120	0.47	10.22	41.5	515.3	242.8	10.0	3.0	2.0	1.7	0.4	0.1	0.1	0.5
20-130	0.45	16.12	63.0	782.4	368.7	15.2	4.5	3.1	2.6	0.7	0.2	0.1	0.7
20-140	0.44	2.97	11.4	141.4	66.6	2.7	0.8	0.6	0.5	0.1	0.0	0.0	0.1
20-150	0.45	14.48	56.5	702.8	331.2	13.7	4.0	2.8	2.3	0.6	0.2	0.1	0.6
20-160	0.54	3.21	15.1	187.1	88.2	3.6	1.1	0.7	0.6	0.2	0.0	0.0	0.2
20-170	0.37	4.94	16.0	198.5	93.6	3.9	1.1	0.8	0.7	0.2	0.1	0.0	0.2
20-180	0.51	5.3	23.3	289.3	136.3	5.6	1.7	1.1	1.0	0.2	0.1	0.0	0.3
20-190	0.45	1.35	5.3	65.5	30.9	1.3	0.4	0.3	0.2	0.1	0.0	0.0	0.1
20-200	0.45	13.84	54.0	671.7	316.6	13.0	3.9	2.6	2.2	0.6	0.2	0.1	0.6
20-210A	0.44	92.9	354.1	4,401.4	2,074.2	85.5	25.2	17.4	14.7	3.7	1.2	0.7	4.0
20-210B	0.50	620.78	2,718.1	33,782.7	15,920.6	656.2	193.8	133.2	112.6	28.3	8.9	5.0	30.7
20-220	0.46	26.38	105.5	1,311.7	618.2	25.5	7.5	5.2	4.4	1.1	0.3	0.2	1.2
20-230	0.00	21.46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-240	0.48	30.06	125.7	1,562.1	736.1	30.3	9.0	6.2	5.2	1.3	0.4	0.2	1.4
20-250	0.57	6.28	31.2	387.2	182.5	7.5	2.2	1.5	1.3	0.3	0.1	0.1	0.4
20-260	0.60	3.5	18.2	226.5	106.7	4.4	1.3	0.9	0.8	0.2	0.1	0.0	0.2
20-270	0.48	42.81	177.1	2,201.1	1,037.3	42.8	12.6	8.7	7.3	1.8	0.6	0.3	2.0
20-280	0.54	8.98	41.9	520.6	245.3	10.1	3.0	2.1	1.7	0.4	0.1	0.1	0.5
20-290	0.00	4.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-010	0.45	49.49	192.5	2,392.7	1,127.6	46.5	13.7	9.4	8.0	2.0	0.6	0.4	2.2
40-010	0.45	719.17	2,796.7	34,758.9	16,380.6	675.2	199.4	137.0	115.9	29.2	9.2	5.2	31.6
40-020	0.45	15.36	60.0	745.5	351.3	14.5	4.3	2.9	2.5	0.6	0.2	0.1	0.7
40-030	0.42	51.02	185.0	2,298.8	1,083.3	44.7	13.2	9.1	7.7	1.9	0.6	0.3	2.1
40-040	0.43	65.39	246.4	3,062.3	1,443.1	59.5	17.6	12.1	10.2	2.6	0.8	0.5	2.8
40-050	0.45	10.28	40.1	498.9	235.1	9.7	2.9	2.0	1.7	0.4	0.1	0.1	0.5
40-060	0.45	3.2	12.5	155.3	73.2	3.0	0.9	0.6	0.5	0.1	0.0	0.0	0.1
40-070	0.38	7.98	26.2	325.6	153.4	6.3	1.9	1.3	1.1	0.3	0.1	0.0	0.3
40-080	0.41	60.51	214.5	2,665.3	1,256.1	51.8	15.3	10.5	8.9	2.2	0.7	0.4	2.4
40-090	0.46	20.65	83.3	1,035.4	487.9	20.1	5.9	4.1	3.5	0.9	0.3	0.2	0.9
40-100	0.00	20.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-110	0.44	2.61	10.1	124.9	58.9	2.4	0.7	0.5	0.4	0.1	0.0	0.0	0.1
40-120	0.44	65.87	250.5	3,113.7	1,467.4	60.5	17.9	12.3	10.4	2.6	0.8	0.5	2.8
40-130	0.45	35.01	137.3	1,706.3	804.1	33.1	9.8	6.7	5.7	1.4	0.5	0.3	1.5
40-140	0.35	125.46	378.6	4,705.4	2,217.5	91.4	27.0	18.6	15.7	3.9	1.2	0.7	4.3
40-150	0.47	24.31	99.9	1,242.1	585.4	24.1	7.1	4.9	4.1	1.0	0.3	0.2	1.1
40-160	0.49	30.99	132.9	1,652.4	778.7	32.1	9.5	6.5	5.5	1.4	0.4	0.2	1.5

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
40-170	0.00	194.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-180	0.54	16.8	78.5	975.5	459.7	18.9	5.6	3.8	3.3	0.8	0.3	0.1	0.9
40-190	0.53	65.53	300.7	3,737.3	1,761.2	72.6	21.4	14.7	12.5	3.1	1.0	0.6	3.4
40-200	0.46	24.75	99.3	1,234.1	581.6	24.0	7.1	4.9	4.1	1.0	0.3	0.2	1.1
40-210	0.54	17.26	81.6	1,014.3	478.0	19.7	5.8	4.0	3.4	0.9	0.3	0.2	0.9
40-220	0.47	100.58	408.0	5,071.4	2,390.0	98.5	29.1	20.0	16.9	4.3	1.3	0.8	4.6
40-230	0.44	13.78	53.2	661.1	311.6	12.8	3.8	2.6	2.2	0.6	0.2	0.1	0.6
40-240	0.00	340.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-250	0.60	1.15	6.0	74.4	35.1	1.4	0.4	0.3	0.2	0.1	0.0	0.0	0.1
40-260	0.45	3.49	13.6	169.4	79.8	3.3	1.0	0.7	0.6	0.1	0.0	0.0	0.2
40-270	0.45	9.59	37.5	465.5	219.4	9.0	2.7	1.8	1.6	0.4	0.1	0.1	0.4
40-280	0.53	12.76	58.2	723.7	341.1	14.1	4.2	2.9	2.4	0.6	0.2	0.1	0.7
40-290	0.51	13.73	61.0	758.2	357.3	14.7	4.3	3.0	2.5	0.6	0.2	0.1	0.7
40-300	0.52	10.38	46.9	583.3	274.9	11.3	3.3	2.3	1.9	0.5	0.2	0.1	0.5
40-310	0.45	97.86	384.4	4,777.6	2,251.5	92.8	27.4	18.8	15.9	4.0	1.3	0.7	4.3
40-320	0.60	9.43	49.1	610.3	287.6	11.9	3.5	2.4	2.0	0.5	0.2	0.1	0.6
40-330	0.59	15.34	78.9	980.6	462.1	19.0	5.6	3.9	3.3	0.8	0.3	0.1	0.9
40-340	0.53	35.27	163.1	2,027.3	955.4	39.4	11.6	8.0	6.8	1.7	0.5	0.3	1.8
40-350	0.60	8.99	46.8	581.8	274.2	11.3	3.3	2.3	1.9	0.5	0.2	0.1	0.5
40-360	0.60	8.09	42.1	523.5	246.7	10.2	3.0	2.1	1.7	0.4	0.1	0.1	0.5
40-370	0.58	12.41	62.3	774.3	364.9	15.0	4.4	3.1	2.6	0.6	0.2	0.1	0.7
40-380	0.39	24.92	85.1	1,057.4	498.3	20.5	6.1	4.2	3.5	0.9	0.3	0.2	1.0
40-390	0.58	5.72	28.8	357.8	168.6	7.0	2.1	1.4	1.2	0.3	0.1	0.1	0.3
40-400	0.10	1.07	0.9	11.5	5.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
41-010	0.38	94.73	310.3	3,856.5	1,817.4	74.9	22.1	15.2	12.9	3.2	1.0	0.6	3.5
41-020	0.00	14.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-030	0.50	60.47	263.4	3,274.0	1,542.9	63.6	18.8	12.9	10.9	2.7	0.9	0.5	3.0
41-040	0.57	35.59	177.0	2,199.5	1,036.6	42.7	12.6	8.7	7.3	1.8	0.6	0.3	2.0
41-050	0.60	10.48	54.6	678.2	319.6	13.2	3.9	2.7	2.3	0.6	0.2	0.1	0.6
41-060	0.60	2.95	15.4	190.9	90.0	3.7	1.1	0.8	0.6	0.2	0.1	0.0	0.2
51-010	0.45	29.63	116.1	1,442.4	679.7	28.0	8.3	5.7	4.8	1.2	0.4	0.2	1.3
51-020	0.45	4.55	17.8	220.8	104.1	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
52-010	0.28	45.29	108.6	1,349.9	636.2	26.2	7.7	5.3	4.5	1.1	0.4	0.2	1.2
52-020	0.45	6.09	23.8	295.6	139.3	5.7	1.7	1.2	1.0	0.2	0.1	0.0	0.3
52-030	0.45	7.18	28.0	348.5	164.2	6.8	2.0	1.4	1.2	0.3	0.1	0.1	0.3
52-040	0.41	4.54	16.3	202.4	95.4	3.9	1.2	0.8	0.7	0.2	0.1	0.0	0.2
52-050	0.44	15.3	57.8	717.9	338.3	13.9	4.1	2.8	2.4	0.6	0.2	0.1	0.7
52-060	0.10	3.22	2.8	34.7	16.4	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
52-070	0.42	86.94	319.3	3,968.2	1,870.1	77.1	22.8	15.6	13.2	3.3	1.0	0.6	3.6
52-080	0.24	8.08	17.0	210.9	99.4	4.1	1.2	0.8	0.7	0.2	0.1	0.0	0.2
52-090	0.45	4.89	19.1	237.3	111.8	4.6	1.4	0.9	0.8	0.2	0.1	0.0	0.2
52-100A/B	0.27	11.89	27.5	341.9	161.1	6.6	2.0	1.3	1.1	0.3	0.1	0.1	0.3
52-110	0.45	8.84	34.2	425.6	200.6	8.3	2.4	1.7	1.4	0.4	0.1	0.1	0.4
52-120	0.45	14.74	57.6	715.4	337.1	13.9	4.1	2.8	2.4	0.6	0.2	0.1	0.6
52-130	0.31	7.18	19.6	243.8	114.9	4.7	1.4	1.0	0.8	0.2	0.1	0.0	0.2
53-010	0.45	7.03	27.5	341.2	160.8	6.6	2.0	1.3	1.1	0.3	0.1	0.1	0.3
53-020	0.28	12.38	29.7	369.0	173.9	7.2	2.1	1.5	1.2	0.3	0.1	0.1	0.3
53-030	0.44	11.37	43.1	535.8	252.5	10.4	3.1	2.1	1.8	0.4	0.1	0.1	0.5
53-040	0.45	2.78	10.9	134.9	63.6	2.6	0.8	0.5	0.4	0.1	0.0	0.0	0.1
53-050	0.45	13.66	53.3	663.0	312.4	12.9	3.8	2.6	2.2	0.6	0.2	0.1	0.6
53-060	0.45	20.37	79.5	988.7	465.9	19.2	5.7	3.9	3.3	0.8	0.3	0.1	0.9
53-070	0.45	4.89	19.1	237.3	111.8	4.6	1.4	0.9	0.8	0.2	0.1	0.0	0.2
53-080	0.39	5.81	19.9	247.0	116.4	4.8	1.4	1.0	0.8	0.2	0.1	0.0	0.2
53-090	0.46	59.59	237.4	2,951.2	1,390.8	57.3	16.9	11.6	9.8	2.5	0.8	0.4	2.7
53-100	0.00	107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-110	0.38	4.59	15.3	190.5	89.8	3.7	1.1	0.8	0.6	0.2	0.1	0.0	0.2
53-120A/B	0.46	129.79	513.2	6,378.0	3,005.7	123.9	36.6	25.1	21.3	5.4	1.7	1.0	5.8
53-130	0.45	5.02	19.6	243.6	114.8	4.7	1.4	1.0	0.8	0.2	0.1	0.0	0.2
53-140	0.45	6.36	24.8	308.7	145.5	6.0	1.8	1.2	1.0	0.3	0.1	0.0	0.3
53-150	0.48	90.4	379.6	4,717.3	2,223.1	91.6	27.1	18.6	15.7	4.0	1.2	0.7	4.3
53-160	0.47	252.19	1,034.7	12,859.5	6,060.2	249.8	73.8	50.7	42.9	10.8	3.4	1.9	11.7
53-170	0.36	6.39	20.0	248.7	117.2	4.8	1.4	1.0	0.8	0.2	0.1	0.0	0.2
53-180	0.10	8.09	7.0	87.3	41.1	1.7	0.5	0.3	0.3	0.1	0.0	0.0	0.1
53-190	0.30	11.41	29.8	369.8	174.3	7.2	2.1	1.5	1.2	0.3	0.1	0.1	0.3
54-010A/B	0.44	84.93	320.7	3,985.5	1,878.2	77.4	22.9	15.7	13.3	3.3	1.1	0.6	3.6
54-040A/B	0.49	255.14	1,095.9	13,620.0	6,418.6	264.6	78.1	53.7	45.4	11.4	3.6	2.0	12.4
54-050	0.17	9.27	14.0	173.9	81.9	3.4	1.0	0.7	0.6	0.1	0.0	0.0	0.2
54-060	0.44	32.13	122.5	1,522.2	717.4	29.6	8.7	6.0	5.1	1.3	0.4	0.2	1.4
54-070	0.36	60.8	189.2	2,351.4	1,108.2	45.7	13.5	9.3	7.8	2.0	0.6	0.4	2.1
54-080A/B/C	0.46	414.26	1,643.2	20,423.0	9,624.6	396.7	117.1	80.5	68.1	17.1	5.4	3.1	18.5
54-090	0.10	3.55	3.1	38.3	18.0	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.0
54-100A/B	0.60	114.24	590.6	7,339.9	3,459.0	142.6	42.1	28.9	24.5	6.2	1.9	1.1	6.7
54-110	0.45	24.55	95.9	1,191.5	561.5	23.1	6.8	4.7	4.0	1.0	0.3	0.2	1.1
54-120	0.46	62.08	246.2	3,059.6	1,441.9	59.4	17.5	12.1	10.2	2.6	0.8	0.5	2.8
54-130	0.10	1.07	0.9	11.5	5.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
54-140A/B	0.41	113.01	400.1	4,972.2	2,343.2	96.6	28.5	19.6	16.6	4.2	1.3	0.7	4.5
54-150	0.45	55.34	213.9	2,658.1	1,252.7	51.6	15.2	10.5	8.9	2.2	0.7	0.4	2.4

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
54-160	0.60	2.62	13.6	169.6	79.9	3.3	1.0	0.7	0.6	0.1	0.0	0.0	0.2
54-170	0.59	8.08	41.7	518.2	244.2	10.1	3.0	2.0	1.7	0.4	0.1	0.1	0.5
54-180	0.60	2.82	14.7	182.5	86.0	3.5	1.0	0.7	0.6	0.2	0.0	0.0	0.2
54-190	0.10	2.2	1.9	23.7	11.2	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
54-200	0.10	2.13	1.8	23.0	10.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
54-210	0.10	1.14	1.0	12.3	5.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
55-010	0.60	14.98	78.0	969.4	456.8	18.8	5.6	3.8	3.2	0.8	0.3	0.1	0.9
55-020	0.60	189.58	980.7	12,188.7	5,744.1	236.8	69.9	48.1	40.6	10.2	3.2	1.8	11.1
56-010	0.60	67.62	352.1	4,375.9	2,062.2	85.0	25.1	17.3	14.6	3.7	1.2	0.7	4.0
57-010	0.53	26.1	120.8	1,501.7	707.7	29.2	8.6	5.9	5.0	1.3	0.4	0.2	1.4
57-020	0.00	142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-030	0.45	18.22	71.2	884.3	416.7	17.2	5.1	3.5	2.9	0.7	0.2	0.1	0.8
57-040	0.35	39.88	120.8	1,501.0	707.4	29.2	8.6	5.9	5.0	1.3	0.4	0.2	1.4
57-050	0.45	7.9	30.9	383.4	180.7	7.4	2.2	1.5	1.3	0.3	0.1	0.1	0.3
57-060	0.46	26.11	104.8	1,302.3	613.7	25.3	7.5	5.1	4.3	1.1	0.3	0.2	1.2
57-070	0.45	81.33	318.4	3,956.8	1,864.7	76.9	22.7	15.6	13.2	3.3	1.0	0.6	3.6
57-080	0.42	5.54	20.3	252.6	119.0	4.9	1.4	1.0	0.8	0.2	0.1	0.0	0.2
57-090	0.47	77.77	316.7	3,936.5	1,855.1	76.5	22.6	15.5	13.1	3.3	1.0	0.6	3.6
57-100A/B	0.47	313.43	1,284.9	15,970.0	7,526.1	310.2	91.6	63.0	53.2	13.4	4.2	2.4	14.5
57-110	0.54	21.6	101.4	1,259.9	593.7	24.5	7.2	5.0	4.2	1.1	0.3	0.2	1.1
57-120A/B/C	0.00	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-130	0.10	1.16	1.0	12.5	5.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
57-140	0.10	1.55	1.3	16.7	7.9	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
57-150	0.43	35.68	133.6	1,661.0	782.7	32.3	9.5	6.5	5.5	1.4	0.4	0.2	1.5
57-160	0.10	1.89	1.6	20.4	9.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
61-010	0.55	2.86	13.7	170.2	80.2	3.3	1.0	0.7	0.6	0.1	0.0	0.0	0.2
62-010	0.45	27.84	109.2	1,357.5	639.7	26.4	7.8	5.4	4.5	1.1	0.4	0.2	1.2
63-010	0.45	388.79	1,525.5	18,959.4	8,934.9	368.3	108.7	74.7	63.2	15.9	5.0	2.8	17.2
63-020	0.00	11.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64-100	0.45	24.92	97.2	1,208.4	569.5	23.5	6.9	4.8	4.0	1.0	0.3	0.2	1.1
64-110	0.45	6.01	23.5	291.7	137.5	5.7	1.7	1.2	1.0	0.2	0.1	0.0	0.3
64-120	0.45	16.04	62.6	778.5	366.9	15.1	4.5	3.1	2.6	0.7	0.2	0.1	0.7
64-130	0.45	2.44	9.5	118.4	55.8	2.3	0.7	0.5	0.4	0.1	0.0	0.0	0.1
65-010	0.00	18.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65-020	0.53	38.46	176.6	2,195.0	1,034.4	42.6	12.6	8.7	7.3	1.8	0.6	0.3	2.0
70-010	0.46	6.23	24.8	308.2	145.2	6.0	1.8	1.2	1.0	0.3	0.1	0.0	0.3
70-015	0.45	11.69	45.7	567.4	267.4	11.0	3.3	2.2	1.9	0.5	0.1	0.1	0.5
70-020	0.45	37.55	146.6	1,822.5	858.9	35.4	10.5	7.2	6.1	1.5	0.5	0.3	1.7
70-025	0.00	3.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-030	0.45	13.48	52.6	653.7	308.1	12.7	3.7	2.6	2.2	0.5	0.2	0.1	0.6
70-035	0.45	4.53	17.7	219.9	103.6	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
70-040	0.45	2.42	9.5	117.5	55.4	2.3	0.7	0.5	0.4	0.1	0.0	0.0	0.1
70-045	0.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-050	0.45	17.41	68.0	845.0	398.2	16.4	4.8	3.3	2.8	0.7	0.2	0.1	0.8
70-055	0.46	333.43	1,342.9	16,690.7	7,865.8	324.2	95.7	65.8	55.6	14.0	4.4	2.5	15.2
70-060	0.45	3.53	13.8	171.3	80.7	3.3	1.0	0.7	0.6	0.1	0.0	0.0	0.2
70-065	0.45	1.89	7.4	91.7	43.2	1.8	0.5	0.4	0.3	0.1	0.0	0.0	0.1
70-070	0.45	5.8	22.6	281.5	132.7	5.5	1.6	1.1	0.9	0.2	0.1	0.0	0.3
70-075	0.43	5	18.7	232.6	109.6	4.5	1.3	0.9	0.8	0.2	0.1	0.0	0.2
70-080	0.46	11.96	47.9	595.9	280.8	11.6	3.4	2.3	2.0	0.5	0.2	0.1	0.5
70-085	0.45	229.48	890.6	11,069.5	5,216.6	215.0	63.5	43.6	36.9	9.3	2.9	1.7	10.1
70-090	0.45	18.57	72.5	901.3	424.8	17.5	5.2	3.6	3.0	0.8	0.2	0.1	0.8
70-095	0.45	9.99	39.0	484.9	228.5	9.4	2.8	1.9	1.6	0.4	0.1	0.1	0.4
70-100	0.45	9.64	37.6	467.9	220.5	9.1	2.7	1.8	1.6	0.4	0.1	0.1	0.4
70-105	0.45	1.63	6.4	79.1	37.3	1.5	0.5	0.3	0.3	0.1	0.0	0.0	0.1
70-110	0.45	18.13	70.8	879.9	414.7	17.1	5.0	3.5	2.9	0.7	0.2	0.1	0.8
70-115	0.45	3.71	14.5	180.1	84.9	3.5	1.0	0.7	0.6	0.2	0.0	0.0	0.2
70-120	0.45	4.22	16.5	204.8	96.5	4.0	1.2	0.8	0.7	0.2	0.1	0.0	0.2
70-125	0.00	5.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-130	0.49	34.29	146.9	1,825.9	860.5	35.5	10.5	7.2	6.1	1.5	0.5	0.3	1.7
70-135	0.45	7.46	29.1	362.1	170.6	7.0	2.1	1.4	1.2	0.3	0.1	0.1	0.3
70-140	0.60	0.78	4.1	50.5	23.8	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.0
70-145	0.60	9.19	47.9	594.7	280.3	11.6	3.4	2.3	2.0	0.5	0.2	0.1	0.5
70-150	0.45	4.51	17.6	218.9	103.2	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
70-155	0.45	2.05	8.0	99.5	46.9	1.9	0.6	0.4	0.3	0.1	0.0	0.0	0.1
70-160	0.45	2.95	11.5	143.2	67.5	2.8	0.8	0.6	0.5	0.1	0.0	0.0	0.1
70-165	0.45	27.77	108.4	1,347.8	635.2	26.2	7.7	5.3	4.5	1.1	0.4	0.2	1.2
70-170	0.45	23.74	92.7	1,152.2	543.0	22.4	6.6	4.5	3.8	1.0	0.3	0.2	1.0
70-175	0.46	30.89	122.6	1,523.3	717.9	29.6	8.7	6.0	5.1	1.3	0.4	0.2	1.4
70-180	0.45	1.14	4.5	55.3	26.1	1.1	0.3	0.2	0.2	0.0	0.0	0.0	0.1
70-185	0.45	1.53	6.0	74.3	35.0	1.4	0.4	0.3	0.2	0.1	0.0	0.0	0.1
70-190	0.17	15.04	22.5	279.2	131.6	5.4	1.6	1.1	0.9	0.2	0.1	0.0	0.3
70-195	0.45	46.02	180.7	2,245.8	1,058.4	43.6	12.9	8.9	7.5	1.9	0.6	0.3	2.0
70-200	0.45	31.52	123.1	1,529.8	721.0	29.7	8.8	6.0	5.1	1.3	0.4	0.2	1.4
70-205	0.45	1.39	5.4	67.5	31.8	1.3	0.4	0.3	0.2	0.1	0.0	0.0	0.1
70-210	0.45	3.58	14.0	173.8	81.9	3.4	1.0	0.7	0.6	0.1	0.0	0.0	0.2
70-215	0.45	5.93	23.2	287.8	135.6	5.6	1.7	1.1	1.0	0.2	0.1	0.0	0.3

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
70-220	0.45	4.54	17.7	220.4	103.8	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
70-225	0.45	4.99	19.5	242.2	114.1	4.7	1.4	1.0	0.8	0.2	0.1	0.0	0.2
70-230	0.45	4.72	18.4	229.1	108.0	4.5	1.3	0.9	0.8	0.2	0.1	0.0	0.2
70-235	0.45	5.04	19.7	244.6	115.3	4.8	1.4	1.0	0.8	0.2	0.1	0.0	0.2
70-240	0.45	4.52	17.7	219.4	103.4	4.3	1.3	0.9	0.7	0.2	0.1	0.0	0.2
70-245	0.44	9.98	38.0	472.5	222.7	9.2	2.7	1.9	1.6	0.4	0.1	0.1	0.4
70-250	0.48	41.27	172.8	2,147.1	1,011.8	41.7	12.3	8.5	7.2	1.8	0.6	0.3	1.9
70-255	0.45	45.37	177.2	2,202.7	1,038.1	42.8	12.6	8.7	7.3	1.8	0.6	0.3	2.0
70-260	0.46	24.9	98.9	1,229.4	579.4	23.9	7.1	4.8	4.1	1.0	0.3	0.2	1.1
70-265A/B	0.00	183.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-270	0.45	4.66	18.2	226.2	106.6	4.4	1.3	0.9	0.8	0.2	0.1	0.0	0.2
70-275	0.45	4.28	16.7	207.7	97.9	4.0	1.2	0.8	0.7	0.2	0.1	0.0	0.2
70-280	0.45	9.39	36.7	456.5	215.1	8.9	2.6	1.8	1.5	0.4	0.1	0.1	0.4
70-285	0.45	19.03	74.2	922.6	434.8	17.9	5.3	3.6	3.1	0.8	0.2	0.1	0.8
70-290	0.45	2.37	9.2	114.1	53.7	2.2	0.7	0.4	0.4	0.1	0.0	0.0	0.1
70-295	0.45	7.18	28.0	348.5	164.2	6.8	2.0	1.4	1.2	0.3	0.1	0.1	0.3
70-300	0.10	0.4	0.3	4.3	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-305	0.45	12.68	49.1	609.9	287.4	11.8	3.5	2.4	2.0	0.5	0.2	0.1	0.6
70-310	0.00	5.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-315	0.30	5.79	15.1	187.3	88.3	3.6	1.1	0.7	0.6	0.2	0.0	0.0	0.2
70-320	0.44	2.32	8.8	109.9	51.8	2.1	0.6	0.4	0.4	0.1	0.0	0.0	0.1
70-325	0.00	2.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-330	0.47	279.41	1,142.2	14,195.5	6,689.8	275.8	81.4	56.0	47.3	11.9	3.8	2.1	12.9
70-335	0.45	1.99	7.8	96.6	45.5	1.9	0.6	0.4	0.3	0.1	0.0	0.0	0.1
70-340	0.39	22.25	76.0	944.1	444.9	18.3	5.4	3.7	3.1	0.8	0.2	0.1	0.9
70-345	0.45	3.81	14.9	184.9	87.1	3.6	1.1	0.7	0.6	0.2	0.0	0.0	0.2
70-350	0.49	314.4	1,348.2	16,755.6	7,896.3	325.5	96.1	66.1	55.9	14.1	4.4	2.5	15.2
70-355	0.45	1.29	5.0	62.6	29.5	1.2	0.4	0.2	0.2	0.1	0.0	0.0	0.1
70-360	0.45	131.96	520.5	6,468.9	3,048.6	125.7	37.1	25.5	21.6	5.4	1.7	1.0	5.9
70-365	0.45	6.7	26.2	325.2	153.2	6.3	1.9	1.3	1.1	0.3	0.1	0.0	0.3
70-370	0.44	3.75	14.4	179.2	84.4	3.5	1.0	0.7	0.6	0.2	0.0	0.0	0.2
70-375	0.47	7.1	29.1	361.9	170.6	7.0	2.1	1.4	1.2	0.3	0.1	0.1	0.3
70-380	0.45	14.4	56.2	698.9	329.4	13.6	4.0	2.8	2.3	0.6	0.2	0.1	0.6
70-385	0.45	14.97	58.5	726.6	342.4	14.1	4.2	2.9	2.4	0.6	0.2	0.1	0.7
70-390	0.46	58.11	233.6	2,903.3	1,368.2	56.4	16.7	11.4	9.7	2.4	0.8	0.4	2.6
70-395	0.43	57.19	213.2	2,649.4	1,248.6	51.5	15.2	10.4	8.8	2.2	0.7	0.4	2.4
70-400	0.44	9.67	36.8	457.7	215.7	8.9	2.6	1.8	1.5	0.4	0.1	0.1	0.4
70-405	0.25	7.16	15.5	193.1	91.0	3.8	1.1	0.8	0.6	0.2	0.1	0.0	0.2
70-410	0.43	5.8	21.6	268.3	126.4	5.2	1.5	1.1	0.9	0.2	0.1	0.0	0.2
70-415	0.45	120.75	475.7	5,912.2	2,786.2	114.8	33.9	23.3	19.7	5.0	1.6	0.9	5.4
70-420	0.45	16.99	66.3	824.6	388.6	16.0	4.7	3.3	2.7	0.7	0.2	0.1	0.7
70-425	0.51	20.63	91.5	1,137.0	535.8	22.1	6.5	4.5	3.8	1.0	0.3	0.2	1.0
70-430	0.10	6.19	5.4	66.8	31.5	1.3	0.4	0.3	0.2	0.1	0.0	0.0	0.1
70-435	0.10	9.16	7.9	98.8	46.6	1.9	0.6	0.4	0.3	0.1	0.0	0.0	0.1
70-440	0.50	34.48	148.6	1,847.2	870.5	35.9	10.6	7.3	6.2	1.5	0.5	0.3	1.7
70-445	0.45	5.6	21.9	271.8	128.1	5.3	1.6	1.1	0.9	0.2	0.1	0.0	0.2
70-450	0.45	2.65	10.3	128.6	60.6	2.5	0.7	0.5	0.4	0.1	0.0	0.0	0.1
70-455	0.00	2.66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-460	0.45	2.67	10.4	129.6	61.1	2.5	0.7	0.5	0.4	0.1	0.0	0.0	0.1
70-465	0.45	2.58	10.1	125.2	59.0	2.4	0.7	0.5	0.4	0.1	0.0	0.0	0.1
70-470	0.38	8.55	28.5	354.2	166.9	6.9	2.0	1.4	1.2	0.3	0.1	0.1	0.3
70-475	0.46	229.14	915.4	11,376.7	5,361.4	221.0	65.3	44.9	37.9	9.5	3.0	1.7	10.3
70-480	0.60	0.31	1.6	20.1	9.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-485	0.45	13.36	52.2	648.4	305.6	12.6	3.7	2.6	2.2	0.5	0.2	0.1	0.6
70-490	0.47	48.75	198.6	2,467.9	1,163.0	47.9	14.2	9.7	8.2	2.1	0.7	0.4	2.2
70-495	0.45	7.74	30.2	375.7	177.0	7.3	2.2	1.5	1.3	0.3	0.1	0.1	0.3
70-500	0.45	0.56	2.2	27.2	12.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-505	0.41	8.12	29.0	360.5	169.9	7.0	2.1	1.4	1.2	0.3	0.1	0.1	0.3
70-510	0.45	41.82	163.8	2,036.4	959.7	39.6	11.7	8.0	6.8	1.7	0.5	0.3	1.8
70-515	0.47	62.73	255.8	3,179.4	1,498.4	61.8	18.2	12.5	10.6	2.7	0.8	0.5	2.9
70-520	0.45	6.05	23.6	293.6	138.4	5.7	1.7	1.2	1.0	0.2	0.1	0.0	0.3
70-525	0.45	6.23	24.3	302.4	142.5	5.9	1.7	1.2	1.0	0.3	0.1	0.0	0.3
70-530	0.45	1.67	6.5	81.1	38.2	1.6	0.5	0.3	0.3	0.1	0.0	0.0	0.1
70-535	0.45	30.24	118.4	1,471.1	693.3	28.6	8.4	5.8	4.9	1.2	0.4	0.2	1.3
70-540	0.21	5.1	9.4	117.4	55.3	2.3	0.7	0.5	0.4	0.1	0.0	0.0	0.1
70-545	0.45	1.89	7.4	91.7	43.2	1.8	0.5	0.4	0.3	0.1	0.0	0.0	0.1
70-550	0.26	1.3	2.9	36.3	17.1	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-555	0.45	1.73	6.8	84.0	39.6	1.6	0.5	0.3	0.3	0.1	0.0	0.0	0.1
70-560	0.45	3.33	13.0	161.6	76.2	3.1	0.9	0.6	0.5	0.1	0.0	0.0	0.1
70-565	0.24	16.63	34.7	431.5	203.3	8.4	2.5	1.7	1.4	0.4	0.1	0.1	0.4
70-570	0.45	1.23	4.8	59.7	28.1	1.2	0.3	0.2	0.2	0.1	0.0	0.0	0.1
70-575	0.45	15.39	60.0	746.2	351.7	14.5	4.3	2.9	2.5	0.6	0.2	0.1	0.7
70-580	0.43	119.93	451.5	5,611.2	2,644.4	109.0	32.2	22.1	18.7	4.7	1.5	0.8	5.1
71-010	0.10	1.12	1.0	12.1	5.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
71-020	0.45	14.05	54.9	681.9	321.4	13.2	3.9	2.7	2.3	0.6	0.2	0.1	0.6
71-030	0.45	28.58	112.2	1,394.7	657.3	27.1	8.0	5.5	4.6	1.2	0.4	0.2	1.3
71-040	0.22	20.93	39.9	495.5	233.5	9.6	2.8	2.0	1.7	0.4	0.1	0.1	0.4

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL

2010 SUMMER POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (06/01/10 - 08/31/10)

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Summer Median Event Geometric Mean Concentration			7.0	87	41	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation (meters)	0.360												
71-050	0.46	120.42	478.6	5,948.5	2,803.3	115.6	34.1	23.5	19.8	5.0	1.6	0.9	5.4
71-060	0.45	3.11	12.1	150.9	71.1	2.9	0.9	0.6	0.5	0.1	0.0	0.0	0.1
71-070	0.00	386.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-080	0.46	101.79	403.1	5,009.4	2,360.7	97.3	28.7	19.7	16.7	4.2	1.3	0.7	4.5
71-090	0.45	6.5	25.1	312.4	147.2	6.1	1.8	1.2	1.0	0.3	0.1	0.0	0.3
71-100	0.10	1.99	1.7	21.5	10.1	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-010	0.18	17.32	26.3	327.1	154.2	6.4	1.9	1.3	1.1	0.3	0.1	0.0	0.3
72-020	0.40	24.7	84.7	1,052.7	496.1	20.4	6.0	4.2	3.5	0.9	0.3	0.2	1.0
72-030	0.10	5.25	4.6	56.6	26.7	1.1	0.3	0.2	0.2	0.0	0.0	0.0	0.1
72-040	0.42	166.54	602.0	7,482.0	3,526.0	145.3	42.9	29.5	24.9	6.3	2.0	1.1	6.8
72-050	0.10	5.16	4.5	55.7	26.2	1.1	0.3	0.2	0.2	0.0	0.0	0.0	0.1
72-060	0.36	113.04	354.8	4,410.1	2,078.3	85.7	25.3	17.4	14.7	3.7	1.2	0.7	4.0
72-070	0.10	2.21	1.9	23.8	11.2	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
72-080	0.60	4.74	24.7	306.7	144.6	6.0	1.8	1.2	1.0	0.3	0.1	0.0	0.3
72-090	0.45	68.71	266.6	3,313.9	1,561.7	64.4	19.0	13.1	11.0	2.8	0.9	0.5	3.0
72-100	0.46	68.32	274.5	3,411.8	1,607.8	66.3	19.6	13.5	11.4	2.9	0.9	0.5	3.1
72-110	0.10	3.22	2.8	34.7	16.4	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0
72-120	0.45	62.98	245.9	3,056.8	1,440.5	59.4	17.5	12.1	10.2	2.6	0.8	0.5	2.8
72-130	0.46	58.06	229.9	2,857.6	1,346.7	55.5	16.4	11.3	9.5	2.4	0.8	0.4	2.6
72-140	0.10	10.19	8.8	109.9	51.8	2.1	0.6	0.4	0.4	0.1	0.0	0.0	0.1
72-150	0.10	4.76	4.1	51.3	24.2	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.0
72-160	0.10	4.55	3.9	49.1	23.1	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.0
73-010	0.44	20.76	79.1	982.7	463.1	19.1	5.6	3.9	3.3	0.8	0.3	0.1	0.9
73-020	0.44	57.47	220.7	2,743.3	1,292.8	53.3	15.7	10.8	9.1	2.3	0.7	0.4	2.5
73-030	0.10	21.56	18.7	232.5	109.6	4.5	1.3	0.9	0.8	0.2	0.1	0.0	0.2
74-010	0.48	44.39	184.4	2,291.7	1,080.0	44.5	13.1	9.0	7.6	1.9	0.6	0.3	2.1
74-020	0.45	4.41	17.2	214.0	100.9	4.2	1.2	0.8	0.7	0.2	0.1	0.0	0.2
75-005	0.45	12.39	48.3	600.6	283.1	11.7	3.4	2.4	2.0	0.5	0.2	0.1	0.5
75-010	0.60	3.65	19.0	236.2	111.3	4.6	1.4	0.9	0.8	0.2	0.1	0.0	0.2
75-020	0.45	1.53	6.0	74.3	35.0	1.4	0.4	0.3	0.2	0.1	0.0	0.0	0.1
75-030	0.45	8.38	32.7	406.7	191.7	7.9	2.3	1.6	1.4	0.3	0.1	0.1	0.4
75-040	0.45	14.74	57.6	715.4	337.1	13.9	4.1	2.8	2.4	0.6	0.2	0.1	0.6
76-010	0.46	907.31	3,652.1	45,391.0	21,391.1	881.7	260.3	179.0	151.3	38.1	12.0	6.8	41.2
76-020	0.46	88.62	350.4	4,355.4	2,052.6	84.6	25.0	17.2	14.5	3.7	1.2	0.7	4.0
76-030	0.45	7.55	29.5	366.4	172.7	7.1	2.1	1.4	1.2	0.3	0.1	0.1	0.3
76-040	0.19	4.67	7.5	93.8	44.2	1.8	0.5	0.4	0.3	0.1	0.0	0.0	0.1
76-050	0.00	2.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-010	0.10	31.17	27.0	336.2	158.4	6.5	1.9	1.3	1.1	0.3	0.1	0.1	0.3
82-010	0.49	23.53	99.4	1,234.9	581.9	24.0	7.1	4.9	4.1	1.0	0.3	0.2	1.1
82-020	0.45	73.45	289.9	3,603.1	1,698.0	70.0	20.7	14.2	12.0	3.0	1.0	0.5	3.3
82-030	0.45	90.04	355.3	4,415.8	2,081.0	85.8	25.3	17.4	14.7	3.7	1.2	0.7	4.0
82-040	0.46	98.49	396.5	4,928.0	2,322.4	95.7	28.3	19.4	16.4	4.1	1.3	0.7	4.5
83-010	0.45	6.59	25.7	319.8	150.7	6.2	1.8	1.3	1.1	0.3	0.1	0.0	0.3
83-015	0.45	0.99	3.9	48.0	22.6	0.9	0.3	0.2	0.2	0.0	0.0	0.0	0.0
83-020	0.43	85.96	324.3	4,030.9	1,899.6	78.3	23.1	15.9	13.4	3.4	1.1	0.6	3.7
83-025	0.45	51.23	200.1	2,486.5	1,171.8	48.3	14.3	9.8	8.3	2.1	0.7	0.4	2.3
83-030	0.60	0.82	4.3	53.1	25.0	1.0	0.3	0.2	0.2	0.0	0.0	0.0	0.0
83-040	0.10	1.08	0.9	11.6	5.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
83-050	0.45	40.4	158.2	1,966.2	926.6	38.2	11.3	7.8	6.6	1.6	0.5	0.3	1.8
83-060	0.45	10.05	39.2	487.8	229.9	9.5	2.8	1.9	1.6	0.4	0.1	0.1	0.4
83-070	0.10	1.19	1.0	12.8	6.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
83-080	0.48	178.63	737.0	9,160.0	4,316.8	177.9	52.5	36.1	30.5	7.7	2.4	1.4	8.3
83-090	0.41	9.16	32.6	404.8	190.8	7.9	2.3	1.6	1.3	0.3	0.1	0.1	0.4
84-010	0.47	21.56	88.0	1,093.7	515.4	21.2	6.3	4.3	3.6	0.9	0.3	0.2	1.0
85-010	0.10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUMMER SEASONAL SUM (kg)			**117,222.18**	**1,456,904.22**	**686,587.05**	**28,300.78**	**8,356.27**	**5,743.89**	**4,856.35**	**1,222.46**	**385.16**	**217.70**	**1,322.94**

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
10-010	0.43	113.55	40.4	307.4	299.3	9.2	2.9	1.2	2.6	0.8	0.1	0.0	0.4
10-020	0.45	7.81	2.9	22.1	21.5	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-030	0.10	4.05	0.3	2.5	2.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-040	0.45	167.42	61.8	469.4	457.1	14.1	4.4	1.9	4.0	1.2	0.2	0.1	0.6
10-050	0.46	114.18	42.9	326.1	317.5	9.8	3.1	1.3	2.8	0.8	0.1	0.0	0.4
10-060	0.60	10.5	5.2	39.5	38.5	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-070	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-080	0.38	30.66	9.7	73.5	71.6	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-090A	0.00	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090B	0.00	1.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-090C	0.54	12.77	5.7	43.4	42.2	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
10-090D	0.00	4.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-100	0.36	1392.1	416.9	3,168.2	3,084.8	95.0	29.9	12.8	26.8	8.2	1.3	0.4	3.9
10-110	0.47	300.11	115.6	878.5	855.4	26.4	8.3	3.6	7.4	2.3	0.3	0.1	1.1
10-120A/B	0.44	372.78	134.0	1,018.0	991.3	30.5	9.6	4.1	8.6	2.6	0.4	0.1	1.3
10-130	0.45	336.46	125.4	953.2	928.1	28.6	9.0	3.9	8.1	2.5	0.4	0.1	1.2
10-140a	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-140a,b	0.58	220.65	104.8	796.6	775.7	23.9	7.5	3.2	6.8	2.1	0.3	0.1	1.0
10-150	0.47	157.15	60.8	462.3	450.1	13.9	4.4	1.9	3.9	1.2	0.2	0.1	0.6
10-160	0.00	17	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-170	0.50	176.01	73.1	555.7	541.1	16.7	5.3	2.3	4.7	1.4	0.2	0.1	0.7
10-180	0.45	284.26	104.5	794.2	773.3	23.8	7.5	3.2	6.7	2.0	0.3	0.1	1.0
10-190	0.59	14.58	7.1	54.1	52.7	1.6	0.5	0.2	0.5	0.1	0.0	0.0	0.1
10-200	0.40	42.44	13.9	105.7	102.9	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-210	0.49	98.32	39.9	303.2	295.3	9.1	2.9	1.2	2.6	0.8	0.1	0.0	0.4
10-220	0.56	18.83	8.7	66.1	64.3	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
10-230	0.47	235.02	91.7	697.0	678.7	20.9	6.6	2.8	5.9	1.8	0.3	0.1	0.9
10-240	0.51	103.83	44.0	334.7	325.9	10.0	3.2	1.4	2.8	0.9	0.1	0.0	0.4
10-250	0.49	242.96	98.1	745.2	725.6	22.4	7.0	3.0	6.3	1.9	0.3	0.1	0.9
10-260	0.56	23.77	10.9	83.1	80.9	2.5	0.8	0.3	0.7	0.2	0.0	0.0	0.1
10-270	0.47	72.45	28.3	215.4	209.7	6.5	2.0	0.9	1.8	0.6	0.1	0.0	0.3
10-280	0.44	55.08	20.2	153.4	149.3	4.6	1.4	0.6	1.3	0.4	0.1	0.0	0.2
10-290	0.10	6.83	0.6	4.3	4.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-300	0.36	17.74	5.3	40.1	39.1	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-310	0.47	60.29	23.5	178.6	173.9	5.4	1.7	0.7	1.5	0.5	0.1	0.0	0.2
10-320	0.45	341.99	127.6	969.4	943.9	29.1	9.2	3.9	8.2	2.5	0.4	0.1	1.2
10-330	0.35	21.61	6.3	47.7	46.4	1.4	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-340	0.45	20.74	7.7	58.7	57.2	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
10-350	0.60	28.16	13.9	105.8	103.0	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-360	0.59	29.02	14.2	107.9	105.1	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-370	0.59	14.46	7.0	53.5	52.1	1.6	0.5	0.2	0.5	0.1	0.0	0.0	0.1
10-380	0.45	14.38	5.3	40.2	39.1	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-390	0.49	41.97	17.1	129.8	126.4	3.9	1.2	0.5	1.1	0.3	0.1	0.0	0.2
10-400A	0.10	1.07	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-400B	0.47	17.66	6.9	52.3	50.9	1.6	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-400C	0.57	50.25	23.5	178.4	173.7	5.4	1.7	0.7	1.5	0.5	0.1	0.0	0.2
10-410A	0.50	46.22	19.0	144.4	140.6	4.3	1.4	0.6	1.2	0.4	0.1	0.0	0.2
10-410B	0.32	21.29	5.6	42.3	41.2	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
10-410C	0.53	22.8	9.9	75.5	73.5	2.3	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-410D	0.60	27.34	13.5	103.0	100.3	3.1	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-410E	0.58	256.04	121.6	924.4	900.1	27.7	8.7	3.7	7.8	2.4	0.4	0.1	1.1
10-410F	0.59	37.92	18.4	140.0	136.3	4.2	1.3	0.6	1.2	0.4	0.1	0.0	0.2
10-420A	0.27	23.05	5.2	39.4	38.4	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-420B	0.00	10.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420C	0.00	7.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420D	0.00	20.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-420E	0.59	127.89	62.0	470.9	458.5	14.1	4.4	1.9	4.0	1.2	0.2	0.1	0.6
10-430A	0.00	8.14	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430B	0.53	54.72	24.1	183.5	178.6	5.5	1.7	0.7	1.6	0.5	0.1	0.0	0.2
10-430C	0.48	44.83	17.8	135.1	131.6	4.1	1.3	0.5	1.1	0.3	0.1	0.0	0.2
10-430D	0.49	85.79	34.8	264.6	257.7	7.9	2.5	1.1	2.2	0.7	0.1	0.0	0.3
10-430E	0.56	86.66	39.9	303.2	295.2	9.1	2.9	1.2	2.6	0.8	0.1	0.0	0.4
10-430F	0.10	377.97	31.2	237.2	230.9	7.1	2.2	1.0	2.0	0.6	0.1	0.0	0.3
10-430G	0.50	125.89	51.5	391.4	381.1	11.7	3.7	1.6	3.3	1.0	0.2	0.1	0.5
10-430H	0.49	33.18	13.5	102.3	99.6	3.1	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-430I	0.59	32.61	15.8	120.4	117.3	3.6	1.1	0.5	1.0	0.3	0.0	0.0	0.1
10-430J	0.43	532.36	190.7	1,449.5	1,411.3	43.5	13.7	5.9	12.3	3.7	0.6	0.2	1.8
10-430K	0.48	337.06	132.9	1,010.1	983.6	30.3	9.5	4.1	8.6	2.6	0.4	0.1	1.2
10-430L	0.45	84.4	31.4	238.7	232.4	7.2	2.3	1.0	2.0	0.6	0.1	0.0	0.3
10-430M	0.54	75.94	34.0	258.4	251.6	7.8	2.4	1.0	2.2	0.7	0.1	0.0	0.3
10-430N	0.44	26.43	9.7	73.6	71.7	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-430O	0.00	109.53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430P	0.00	229.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430Q	0.10	8.03	0.7	5.0	4.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430R	0.47	150.32	58.0	440.9	429.3	13.2	4.2	1.8	3.7	1.1	0.2	0.1	0.5
10-430S	0.10	5.15	0.4	3.2	3.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-430T	0.46	262.47	99.1	752.8	733.0	22.6	7.1	3.1	6.4	1.9	0.3	0.1	0.9

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
10-430U	0.47	431.37	167.3	1,271.7	1,238.2	38.2	12.0	5.2	10.8	3.3	0.5	0.2	1.6
10-430V	0.46	329.11	126.3	959.9	934.6	28.8	9.1	3.9	8.1	2.5	0.4	0.1	1.2
10-440A	0.46	23.18	8.8	66.6	64.9	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
10-440B	0.49	34.23	13.9	105.8	103.1	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
10-440C/D	0.00	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-440E	0.51	831.25	352.9	2,682.0	2,611.4	80.5	25.3	10.9	22.7	6.9	1.1	0.4	3.3
10-440F	0.46	538.85	204.7	1,556.0	1,515.0	46.7	14.7	6.3	13.2	4.0	0.6	0.2	1.9
10-450A	0.00	343.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-450B	0.52	3.41	1.5	11.1	10.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-450C	0.59	55.64	27.3	207.3	201.9	6.2	2.0	0.8	1.8	0.5	0.1	0.0	0.3
10-450D	0.45	4.62	1.7	13.0	12.7	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-450E	0.44	3.2	1.2	8.9	8.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-450F	0.46	158.55	60.1	457.0	445.0	13.7	4.3	1.9	3.9	1.2	0.2	0.1	0.6
10-450G/H	0.48	75.02	29.8	226.2	220.2	6.8	2.1	0.9	1.9	0.6	0.1	0.0	0.3
10-450I	0.49	243.64	98.8	750.9	731.2	22.5	7.1	3.0	6.4	1.9	0.3	0.1	0.9
10-450J	0.49	17.16	6.9	52.3	50.9	1.6	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-450K	0.58	37.01	17.7	134.5	131.0	4.0	1.3	0.5	1.1	0.3	0.1	0.0	0.2
10-450L	0.51	213.41	89.0	676.3	658.5	20.3	6.4	2.7	5.7	1.7	0.3	0.1	0.8
10-460	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460A	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460B	0.52	7.29	3.1	23.6	23.0	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-460C/D/F	0.00	159.87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460E	0.49	231.41	94.3	717.0	698.2	21.5	6.8	2.9	6.1	1.8	0.3	0.1	0.9
10-460F	0.49	14.75	6.0	45.8	44.6	1.4	0.4	0.2	0.4	0.1	0.0	0.0	0.1
10-460G	0.51	79.66	33.6	255.3	248.6	7.7	2.4	1.0	2.2	0.7	0.1	0.0	0.3
10-460H	0.48	12.35	4.9	37.1	36.2	1.1	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-460I	0.00	72.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460J	0.46	5.36	2.1	15.6	15.2	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-460K	0.36	5.48	1.6	12.4	12.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-460L	0.46	3.5	1.3	10.2	9.9	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-460M	0.48	9.55	3.8	28.7	27.9	0.9	0.3	0.1	0.2	0.1	0.0	0.0	0.0
10-460N	0.45	3.85	1.4	10.9	10.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-460O	0.45	4.15	1.6	11.8	11.5	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-460P	0.45	4.34	1.6	12.3	11.9	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-460Q	0.56	19.73	9.2	69.8	68.0	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-460R	0.00	51.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-460S	0.56	233.54	108.8	826.9	805.1	24.8	7.8	3.4	7.0	2.1	0.3	0.1	1.0
10-465	0.10	8.56	0.7	5.4	5.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10-470	0.38	25.6	8.1	61.3	59.7	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
10-480	0.58	39.66	19.0	144.4	140.6	4.3	1.4	0.6	1.2	0.4	0.1	0.0	0.2
10-485	0.00	7.27	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-490	0.43	150.96	54.0	410.6	399.8	12.3	3.9	1.7	3.5	1.1	0.2	0.1	0.5
10-500A	0.26	26.21	5.7	43.2	42.0	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
10-500B	0.46	8.48	3.2	24.5	23.8	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-500C	0.44	111.36	40.0	304.2	296.2	9.1	2.9	1.2	2.6	0.8	0.1	0.0	0.4
10-500D	0.24	3.83	0.8	5.7	5.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10-500E	0.53	23.34	10.3	78.0	75.9	2.3	0.7	0.3	0.7	0.2	0.0	0.0	0.1
10-500F	0.49	12.04	4.9	37.3	36.3	1.1	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-500G	0.00	112.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-505	0.10	7.85	0.6	4.9	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-510	0.51	62.36	26.2	199.0	193.8	6.0	1.9	0.8	1.7	0.5	0.1	0.0	0.2
10-520	0.00	139.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-530	0.45	116.15	43.2	328.5	319.9	9.9	3.1	1.3	2.8	0.8	0.1	0.0	0.4
10-540	0.12	53.9	5.3	40.0	39.0	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
10-550	0.46	25.83	9.8	74.5	72.6	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-560A/B	0.44	600.63	216.9	1,648.7	1,605.3	49.5	15.6	6.7	14.0	4.3	0.7	0.2	2.0
10-570A	0.54	14.64	6.6	49.9	48.6	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-570B	0.44	228.18	82.2	624.9	608.5	18.7	5.9	2.5	5.3	1.6	0.2	0.1	0.8
10-580	0.45	73.39	27.2	206.7	201.2	6.2	2.0	0.8	1.8	0.5	0.1	0.0	0.3
10-600	0.48	89.24	35.6	270.8	263.7	8.1	2.6	1.1	2.3	0.7	0.1	0.0	0.3
10-610	0.46	25.6	9.7	73.6	71.7	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-620	0.00	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630A	0.10	6.24	0.5	3.9	3.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630B	0.45	4.68	1.7	13.2	12.9	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-630C	0.48	96.03	38.3	291.1	283.4	8.7	2.8	1.2	2.5	0.8	0.1	0.0	0.4
10-630D	0.45	6.37	2.4	18.0	17.5	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0
10-630E	0.45	8.52	3.2	24.1	23.4	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-630F	0.54	17.56	7.8	59.5	58.0	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
10-630G	0.45	5.9	2.2	16.7	16.2	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
10-630H	0.30	25.63	6.4	48.7	47.4	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-630I	0.47	12.48	4.8	36.4	35.5	1.1	0.3	0.1	0.3	0.1	0.0	0.0	0.0
10-630J	0.55	14.69	6.7	51.0	49.7	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-630K	0.47	95.29	37.2	283.0	275.5	8.5	2.7	1.1	2.4	0.7	0.1	0.0	0.3
10-630L	0.52	100.42	43.2	328.3	319.6	9.8	3.1	1.3	2.8	0.8	0.1	0.0	0.4
10-630M	0.50	11.71	4.8	36.5	35.5	1.1	0.3	0.1	0.3	0.1	0.0	0.0	0.0
10-630N	0.45	8.45	3.1	23.9	23.2	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-630O	0.36	5.77	1.7	13.2	12.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
10-630P/Q	0.00	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630R	0.33	83.89	23.1	175.8	171.2	5.3	1.7	0.7	1.5	0.5	0.1	0.0	0.2
10-630S	0.22	37.02	6.6	50.5	49.2	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-630T	0.56	7.72	3.6	27.2	26.5	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
10-630U	0.52	115.42	49.8	378.8	368.8	11.4	3.6	1.5	3.2	1.0	0.1	0.0	0.5
10-630V	0.11	33.85	3.0	22.4	21.8	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
10-630W	0.47	23.68	9.3	70.4	68.5	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-630X	0.44	14.78	5.4	41.0	39.9	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.1
10-630Y	0.00	112.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-630Z	0.47	45.66	17.7	134.9	131.3	4.0	1.3	0.5	1.1	0.3	0.1	0.0	0.2
10-640	0.46	258.18	97.5	740.9	721.4	22.2	7.0	3.0	6.3	1.9	0.3	0.1	0.9
10-650	0.56	19.53	9.0	68.3	66.5	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
10-660	0.46	306.37	117.2	890.5	867.1	26.7	8.4	3.6	7.5	2.3	0.4	0.1	1.1
10-670	0.45	137.88	51.1	388.7	378.5	11.7	3.7	1.6	3.3	1.0	0.2	0.1	0.5
10-680	0.46	707.95	268.0	2,036.7	1,983.1	61.1	19.2	8.3	17.3	5.3	0.8	0.3	2.5
10-690	0.50	70.63	29.2	221.7	215.9	6.7	2.1	0.9	1.9	0.6	0.1	0.0	0.3
10-700	0.46	222.07	85.1	647.0	630.0	19.4	6.1	2.6	5.5	1.7	0.3	0.1	0.8
10-710	0.33	29.95	8.2	62.6	61.0	1.9	0.6	0.3	0.5	0.2	0.0	0.0	0.1
10-720A	0.44	15.77	5.8	43.9	42.7	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
10-720B	0.48	422.18	167.9	1,276.2	1,242.6	38.3	12.1	5.2	10.8	3.3	0.5	0.2	1.6
10-720C	0.43	26.35	9.3	71.0	69.1	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
10-720D	0.46	22.95	8.6	65.6	63.8	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
10-720E	0.46	18.39	6.9	52.6	51.2	1.6	0.5	0.2	0.4	0.1	0.0	0.0	0.1
10-720F	0.48	317.75	125.9	956.6	931.4	28.7	9.0	3.9	8.1	2.5	0.4	0.1	1.2
10-720G	0.00	13.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-720H	0.45	4.55	1.7	12.8	12.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
10-720I	0.45	87.27	32.1	244.2	237.8	7.3	2.3	1.0	2.1	0.6	0.1	0.0	0.3
10-720J	0.36	3.71	1.1	8.3	8.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
10-720K	0.55	32.76	14.9	112.9	109.9	3.4	1.1	0.5	1.0	0.3	0.0	0.0	0.1
10-720L	0.45	4.57	1.7	12.9	12.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
20-010	0.42	93.99	32.6	247.6	241.1	7.4	2.3	1.0	2.1	0.6	0.1	0.0	0.3
20-020	0.44	15.09	5.5	41.5	40.4	1.2	0.4	0.2	0.4	0.1	0.0	0.0	0.1
20-030	0.45	7.95	3.0	22.4	21.9	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
20-040	0.37	6.79	2.1	15.9	15.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-050	0.00	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-060	0.45	5.91	2.2	16.7	16.2	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-070	0.44	39.07	14.3	108.7	105.8	3.3	1.0	0.4	0.9	0.3	0.0	0.0	0.1
20-080	0.45	33.72	12.6	95.9	93.4	2.9	0.9	0.4	0.8	0.2	0.0	0.0	0.1
20-090	0.55	9.95	4.5	34.5	33.6	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
20-100	0.10	0.99	0.1	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-110	0.24	216.04	42.8	325.2	316.7	9.8	3.1	1.3	2.8	0.8	0.1	0.0	0.4
20-120	0.47	10.22	3.9	30.0	29.2	0.9	0.3	0.1	0.3	0.1	0.0	0.0	0.0
20-130	0.45	16.12	6.0	45.5	44.3	1.4	0.4	0.2	0.4	0.1	0.0	0.0	0.1
20-140	0.44	2.97	1.1	8.2	8.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
20-150	0.45	14.48	5.4	40.9	39.8	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.1
20-160	0.54	3.21	1.4	10.9	10.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
20-170	0.37	4.94	1.5	11.5	11.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
20-180	0.51	5.3	2.2	16.8	16.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
20-190	0.45	1.35	0.5	3.8	3.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-200	0.45	13.84	5.1	39.1	38.0	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
20-210A	0.44	92.9	33.7	256.0	249.3	7.7	2.4	1.0	2.2	0.7	0.1	0.0	0.3
20-210B	0.50	620.78	258.6	1,965.2	1,913.5	59.0	18.6	8.0	16.7	5.1	0.8	0.3	2.4
20-220	0.46	26.38	10.0	76.3	74.3	2.3	0.7	0.3	0.6	0.2	0.0	0.0	0.1
20-230	0.00	21.46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-240	0.48	30.06	12.0	90.9	88.5	2.7	0.9	0.4	0.8	0.2	0.0	0.0	0.1
20-250	0.57	6.28	3.0	22.5	21.9	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
20-260	0.60	3.5	1.7	13.2	12.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
20-270	0.48	42.81	16.8	128.0	124.7	3.8	1.2	0.5	1.1	0.3	0.1	0.0	0.2
20-280	0.54	8.98	4.0	30.3	29.5	0.9	0.3	0.1	0.3	0.1	0.0	0.0	0.0
20-290	0.00	4.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-010	0.45	49.49	18.3	139.2	135.5	4.2	1.3	0.6	1.2	0.4	0.1	0.0	0.2
40-010	0.45	719.17	266.1	2,022.0	1,968.8	60.7	19.1	8.2	17.1	5.2	0.8	0.3	2.5
40-020	0.45	15.36	5.7	43.4	42.2	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
40-030	0.42	51.02	17.6	133.7	130.2	4.0	1.3	0.5	1.1	0.3	0.1	0.0	0.2
40-040	0.43	65.39	23.4	178.1	173.5	5.3	1.7	0.7	1.5	0.5	0.1	0.0	0.2
40-050	0.45	10.28	3.8	29.0	28.3	0.9	0.3	0.1	0.2	0.1	0.0	0.0	0.0
40-060	0.45	3.2	1.2	9.0	8.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
40-070	0.38	7.98	2.5	18.9	18.4	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.0
40-080	0.41	60.51	20.4	155.0	151.0	4.7	1.5	0.6	1.3	0.4	0.1	0.0	0.2
40-090	0.46	20.65	7.9	60.2	58.6	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
40-100	0.00	20.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-110	0.44	2.61	1.0	7.3	7.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
40-120	0.44	65.87	23.8	181.1	176.4	5.4	1.7	0.7	1.5	0.5	0.1	0.0	0.2
40-130	0.45	35.01	13.1	99.3	96.6	3.0	0.9	0.4	0.8	0.3	0.0	0.0	0.1
40-140	0.35	125.46	36.0	273.7	266.5	8.2	2.6	1.1	2.3	0.7	0.1	0.0	0.3
40-150	0.47	24.31	9.5	72.3	70.4	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
40-160	0.49	30.99	12.6	96.1	93.6	2.9	0.9	0.4	0.8	0.2	0.0	0.0	0.1

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
40-170	0.00	194.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-180	0.54	16.8	7.5	56.7	55.3	1.7	0.5	0.2	0.5	0.1	0.0	0.0	0.1
40-190	0.53	65.53	28.6	217.4	211.7	6.5	2.1	0.9	1.8	0.6	0.1	0.0	0.3
40-200	0.46	24.75	9.4	71.8	69.9	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
40-210	0.54	17.26	7.8	59.0	57.5	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
40-220	0.47	100.58	38.8	295.0	287.3	8.9	2.8	1.2	2.5	0.8	0.1	0.0	0.4
40-230	0.44	13.78	5.1	38.5	37.4	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
40-240	0.00	340.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-250	0.60	1.15	0.6	4.3	4.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40-260	0.45	3.49	1.3	9.9	9.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
40-270	0.45	9.59	3.6	27.1	26.4	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
40-280	0.53	12.76	5.5	42.1	41.0	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
40-290	0.51	13.73	5.8	44.1	42.9	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
40-300	0.52	10.38	4.5	33.9	33.0	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
40-310	0.45	97.86	36.6	277.9	270.6	8.3	2.6	1.1	2.4	0.7	0.1	0.0	0.3
40-320	0.60	9.43	4.7	35.5	34.6	1.1	0.3	0.1	0.3	0.1	0.0	0.0	0.0
40-330	0.59	15.34	7.5	57.0	55.5	1.7	0.5	0.2	0.5	0.1	0.0	0.0	0.1
40-340	0.53	35.27	15.5	117.9	114.8	3.5	1.1	0.5	1.0	0.3	0.0	0.0	0.1
40-350	0.60	8.99	4.5	33.8	33.0	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
40-360	0.60	8.09	4.0	30.5	29.7	0.9	0.3	0.1	0.3	0.1	0.0	0.0	0.0
40-370	0.58	12.41	5.9	45.0	43.9	1.4	0.4	0.2	0.4	0.1	0.0	0.0	0.1
40-380	0.39	24.92	8.1	61.5	59.9	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
40-390	0.58	5.72	2.7	20.8	20.3	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
40-400	0.10	1.07	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-010	0.38	94.73	29.5	224.3	218.4	6.7	2.1	0.9	1.9	0.6	0.1	0.0	0.3
41-020	0.00	14.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-030	0.50	60.47	25.1	190.5	185.4	5.7	1.8	0.8	1.6	0.5	0.1	0.0	0.2
41-040	0.57	35.59	16.8	128.0	124.6	3.8	1.2	0.5	1.1	0.3	0.1	0.0	0.2
41-050	0.60	10.48	5.2	39.5	38.4	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
41-060	0.60	2.95	1.5	11.1	10.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
51-010	0.45	29.63	11.0	83.9	81.7	2.5	0.8	0.3	0.7	0.2	0.0	0.0	0.1
51-020	0.45	4.55	1.7	12.8	12.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
52-010	0.28	45.29	10.3	78.5	76.5	2.4	0.7	0.3	0.7	0.2	0.0	0.0	0.1
52-020	0.45	6.09	2.3	17.2	16.7	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
52-030	0.45	7.18	2.7	20.3	19.7	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
52-040	0.41	4.54	1.5	11.8	11.5	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
52-050	0.44	15.3	5.5	41.8	40.7	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
52-060	0.10	3.22	0.3	2.0	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52-070	0.42	86.94	30.4	230.8	224.8	6.9	2.2	0.9	2.0	0.6	0.1	0.0	0.3
52-080	0.24	8.08	1.6	12.3	11.9	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
52-090	0.45	4.89	1.8	13.8	13.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
52-100A/B	0.27	11.89	2.6	19.9	19.4	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
52-110	0.45	8.84	3.3	24.8	24.1	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
52-120	0.45	14.74	5.5	41.6	40.5	1.2	0.4	0.2	0.4	0.1	0.0	0.0	0.1
52-130	0.31	7.18	1.9	14.2	13.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-010	0.45	7.03	2.6	19.8	19.3	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
53-020	0.28	12.38	2.8	21.5	20.9	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
53-030	0.44	11.37	4.1	31.2	30.3	0.9	0.3	0.1	0.3	0.1	0.0	0.0	0.0
53-040	0.45	2.78	1.0	7.8	7.6	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
53-050	0.45	13.66	5.1	38.6	37.6	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
53-060	0.45	20.37	7.6	57.5	56.0	1.7	0.5	0.2	0.5	0.1	0.0	0.0	0.1
53-070	0.45	4.89	1.8	13.8	13.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-080	0.39	5.81	1.9	14.4	14.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-090	0.46	59.59	22.6	171.7	167.2	5.2	1.6	0.7	1.5	0.4	0.1	0.0	0.2
53-100	0.00	107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-110	0.38	4.59	1.5	11.1	10.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
53-120A/B	0.46	129.79	48.8	371.0	361.3	11.1	3.5	1.5	3.1	1.0	0.1	0.0	0.5
53-130	0.45	5.02	1.9	14.2	13.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-140	0.45	6.36	2.4	18.0	17.5	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0
53-150	0.48	90.4	36.1	274.4	267.2	8.2	2.6	1.1	2.3	0.7	0.1	0.0	0.3
53-160	0.47	252.19	98.4	748.1	728.4	22.4	7.1	3.0	6.3	1.9	0.3	0.1	0.9
53-170	0.36	6.39	1.9	14.5	14.1	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
53-180	0.10	8.09	0.7	5.1	4.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53-190	0.30	11.41	2.8	21.5	20.9	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
54-010A/B	0.44	84.93	30.5	231.8	225.7	7.0	2.2	0.9	2.0	0.6	0.1	0.0	0.3
54-040A/B	0.49	255.14	104.3	792.3	771.5	23.8	7.5	3.2	6.7	2.0	0.3	0.1	1.0
54-050	0.17	9.27	1.3	10.1	9.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
54-060	0.44	32.13	11.7	88.6	86.2	2.7	0.8	0.4	0.8	0.2	0.0	0.0	0.1
54-070	0.36	60.8	18.0	136.8	133.2	4.1	1.3	0.6	1.2	0.4	0.1	0.0	0.2
54-080A/B/C	0.46	414.26	156.3	1,188.1	1,156.8	35.6	11.2	4.8	10.1	3.1	0.5	0.2	1.5
54-090	0.10	3.55	0.3	2.2	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-100A/B	0.60	114.24	56.2	427.0	415.7	12.8	4.0	1.7	3.6	1.1	0.2	0.1	0.5
54-110	0.45	24.55	9.1	69.3	67.5	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
54-120	0.46	62.08	23.4	178.0	173.3	5.3	1.7	0.7	1.5	0.5	0.1	0.0	0.2
54-130	0.10	1.07	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-140A/B	0.41	113.01	38.1	289.2	281.6	8.7	2.7	1.2	2.5	0.7	0.1	0.0	0.4
54-150	0.45	55.34	20.3	154.6	150.6	4.6	1.5	0.6	1.3	0.4	0.1	0.0	0.2

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
54-160	0.60	2.62	1.3	9.9	9.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
54-170	0.59	8.08	4.0	30.1	29.4	0.9	0.3	0.1	0.3	0.1	0.0	0.0	0.0
54-180	0.60	2.82	1.4	10.6	10.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
54-190	0.10	2.2	0.2	1.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-200	0.10	2.13	0.2	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54-210	0.10	1.14	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55-010	0.60	14.98	7.4	56.4	54.9	1.7	0.5	0.2	0.5	0.1	0.0	0.0	0.1
55-020	0.60	189.58	93.3	709.1	690.4	21.3	6.7	2.9	6.0	1.8	0.3	0.1	0.9
56-010	0.60	67.62	33.5	254.6	247.9	7.6	2.4	1.0	2.2	0.7	0.1	0.0	0.3
57-010	0.53	26.1	11.5	87.4	85.1	2.6	0.8	0.4	0.7	0.2	0.0	0.0	0.1
57-020	0.00	142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-030	0.45	18.22	6.8	51.4	50.1	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
57-040	0.35	39.88	11.5	87.3	85.0	2.6	0.8	0.4	0.7	0.2	0.0	0.0	0.1
57-050	0.45	7.9	2.9	22.3	21.7	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
57-060	0.46	26.11	10.0	75.8	73.8	2.3	0.7	0.3	0.6	0.2	0.0	0.0	0.1
57-070	0.45	81.33	30.3	230.2	224.1	6.9	2.2	0.9	2.0	0.6	0.1	0.0	0.3
57-080	0.42	5.54	1.9	14.7	14.3	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
57-090	0.47	77.77	30.1	229.0	223.0	6.9	2.2	0.9	1.9	0.6	0.1	0.0	0.3
57-100A/B	0.47	313.43	122.2	929.0	904.6	27.9	8.8	3.8	7.9	2.4	0.4	0.1	1.1
57-110	0.54	21.6	9.6	73.3	71.4	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
57-120A/B/C	0.00	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-130	0.10	1.16	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-140	0.10	1.55	0.1	1.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57-150	0.43	35.68	12.7	96.6	94.1	2.9	0.9	0.4	0.8	0.2	0.0	0.0	0.1
57-160	0.10	1.89	0.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-010	0.55	2.86	1.3	9.9	9.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
62-010	0.45	27.84	10.4	79.0	76.9	2.4	0.7	0.3	0.7	0.2	0.0	0.0	0.1
63-010	0.45	388.79	145.1	1,102.9	1,073.9	33.1	10.4	4.5	9.3	2.8	0.4	0.1	1.4
63-020	0.00	11.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64-100	0.45	24.92	9.2	70.3	68.4	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
64-110	0.45	6.01	2.2	17.0	16.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
64-120	0.45	16.04	6.0	45.3	44.1	1.4	0.4	0.2	0.4	0.1	0.0	0.0	0.1
64-130	0.45	2.44	0.9	6.9	6.7	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
65-010	0.00	18.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65-020	0.53	38.46	16.8	127.7	124.3	3.8	1.2	0.5	1.1	0.3	0.1	0.0	0.2
70-010	0.46	6.23	2.4	17.9	17.5	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0
70-015	0.45	11.69	4.3	33.0	32.1	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
70-020	0.45	37.55	14.0	106.0	103.2	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
70-025	0.00	3.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-030	0.45	13.48	5.0	38.0	37.0	1.1	0.4	0.2	0.3	0.1	0.0	0.0	0.0
70-035	0.45	4.53	1.7	12.8	12.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-040	0.45	2.42	0.9	6.8	6.7	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-045	0.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-050	0.45	17.41	6.5	49.2	47.9	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
70-055	0.46	333.43	127.8	970.9	945.4	29.1	9.2	3.9	8.2	2.5	0.4	0.1	1.2
70-060	0.45	3.53	1.3	10.0	9.7	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-065	0.45	1.89	0.7	5.3	5.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-070	0.45	5.8	2.2	16.4	15.9	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-075	0.43	5	1.8	13.5	13.2	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-080	0.46	11.96	4.6	34.7	33.8	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
70-085	0.45	229.48	84.7	643.9	627.0	19.3	6.1	2.6	5.5	1.7	0.3	0.1	0.8
70-090	0.45	18.57	6.9	52.4	51.1	1.6	0.5	0.2	0.4	0.1	0.0	0.0	0.1
70-095	0.45	9.99	3.7	28.2	27.5	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
70-100	0.45	9.64	3.6	27.2	26.5	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
70-105	0.45	1.63	0.6	4.6	4.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-110	0.45	18.13	6.7	51.2	49.8	1.5	0.5	0.2	0.4	0.1	0.0	0.0	0.1
70-115	0.45	3.71	1.4	10.5	10.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-120	0.45	4.22	1.6	11.9	11.6	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-125	0.00	5.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-130	0.49	34.29	14.0	106.2	103.4	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
70-135	0.45	7.46	2.8	21.1	20.5	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-140	0.60	0.78	0.4	2.9	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-145	0.60	9.19	4.6	34.6	33.7	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
70-150	0.45	4.51	1.7	12.7	12.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-155	0.45	2.05	0.8	5.8	5.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-160	0.45	2.95	1.1	8.3	8.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-165	0.45	27.77	10.3	78.4	76.3	2.4	0.7	0.3	0.7	0.2	0.0	0.0	0.1
70-170	0.45	23.74	8.8	67.0	65.3	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
70-175	0.46	30.89	11.7	88.6	86.3	2.7	0.8	0.4	0.8	0.2	0.0	0.0	0.1
70-180	0.45	1.14	0.4	3.2	3.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-185	0.45	1.53	0.6	4.3	4.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-190	0.17	15.04	2.1	16.2	15.8	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-195	0.45	46.02	17.2	130.6	127.2	3.9	1.2	0.5	1.1	0.3	0.1	0.0	0.2
70-200	0.45	31.52	11.7	89.0	86.7	2.7	0.8	0.4	0.8	0.2	0.0	0.0	0.1
70-205	0.45	1.39	0.5	3.9	3.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-210	0.45	3.58	1.3	10.1	9.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-215	0.45	5.93	2.2	16.7	16.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	0.305												
70-220	0.45	4.54	1.7	12.8	12.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-225	0.45	4.99	1.9	14.1	13.7	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-230	0.45	4.72	1.8	13.3	13.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-235	0.45	5.04	1.9	14.2	13.9	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-240	0.45	4.52	1.7	12.8	12.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-245	0.44	9.98	3.6	27.5	26.8	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
70-250	0.48	41.27	16.4	124.9	121.6	3.7	1.2	0.5	1.1	0.3	0.0	0.0	0.2
70-255	0.45	45.37	16.9	128.1	124.8	3.8	1.2	0.5	1.1	0.3	0.1	0.0	0.2
70-260	0.46	24.9	9.4	71.5	69.6	2.1	0.7	0.3	0.6	0.2	0.0	0.0	0.1
70-265A/B	0.00	183.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-270	0.45	4.66	1.7	13.2	12.8	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-275	0.45	4.28	1.6	12.1	11.8	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-280	0.45	9.39	3.5	26.6	25.9	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
70-285	0.45	19.03	7.1	53.7	52.3	1.6	0.5	0.2	0.5	0.1	0.0	0.0	0.1
70-290	0.45	2.37	0.9	6.6	6.5	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-295	0.45	7.18	2.7	20.3	19.7	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-300	0.10	0.4	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-305	0.45	12.68	4.7	35.5	34.5	1.1	0.3	0.1	0.3	0.1	0.0	0.0	0.0
70-310	0.00	5.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-315	0.30	5.79	1.4	10.9	10.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-320	0.44	2.32	0.8	6.4	6.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-325	0.00	2.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-330	0.47	279.41	108.7	825.8	804.1	24.8	7.8	3.3	7.0	2.1	0.3	0.1	1.0
70-335	0.45	1.99	0.7	5.6	5.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-340	0.39	22.25	7.2	54.9	53.5	1.6	0.5	0.2	0.5	0.1	0.0	0.0	0.1
70-345	0.45	3.81	1.4	10.8	10.5	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-350	0.49	314.4	128.3	974.7	949.1	29.2	9.2	4.0	8.3	2.5	0.4	0.1	1.2
70-355	0.45	1.29	0.5	3.6	3.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-360	0.45	131.96	49.5	376.3	366.4	11.3	3.6	1.5	3.2	1.0	0.1	0.0	0.5
70-365	0.45	6.7	2.5	18.9	18.4	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.0
70-370	0.44	3.75	1.4	10.4	10.1	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-375	0.47	7.1	2.8	21.1	20.5	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-380	0.45	14.4	5.3	40.7	39.6	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.1
70-385	0.45	14.97	5.6	42.3	41.2	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
70-390	0.46	58.11	22.2	168.9	164.5	5.1	1.6	0.7	1.4	0.4	0.1	0.0	0.2
70-395	0.43	57.19	20.3	154.1	150.1	4.6	1.5	0.6	1.3	0.4	0.1	0.0	0.2
70-400	0.44	9.67	3.5	26.6	25.9	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0
70-405	0.25	7.16	1.5	11.2	10.9	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-410	0.43	5.8	2.1	15.6	15.2	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-415	0.45	120.75	45.3	343.9	334.9	10.3	3.2	1.4	2.9	0.9	0.1	0.0	0.4
70-420	0.45	16.99	6.3	48.0	46.7	1.4	0.5	0.2	0.4	0.1	0.0	0.0	0.1
70-425	0.51	20.63	8.7	66.1	64.4	2.0	0.6	0.3	0.6	0.2	0.0	0.0	0.1
70-430	0.10	6.19	0.5	3.9	3.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-435	0.10	9.16	0.8	5.7	5.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-440	0.50	34.48	14.1	107.5	104.6	3.2	1.0	0.4	0.9	0.3	0.0	0.0	0.1
70-445	0.45	5.6	2.1	15.8	15.4	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0
70-450	0.45	2.65	1.0	7.5	7.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-455	0.00	2.66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-460	0.45	2.67	1.0	7.5	7.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-465	0.45	2.58	1.0	7.3	7.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-470	0.38	8.55	2.7	20.6	20.1	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-475	0.46	229.14	87.1	661.8	644.4	19.9	6.3	2.7	5.6	1.7	0.3	0.1	0.8
70-480	0.60	0.31	0.2	1.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-485	0.45	13.36	5.0	37.7	36.7	1.1	0.4	0.2	0.3	0.1	0.0	0.0	0.0
70-490	0.47	48.75	18.9	143.6	139.8	4.3	1.4	0.6	1.2	0.4	0.1	0.0	0.2
70-495	0.45	7.74	2.9	21.9	21.3	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-500	0.45	0.56	0.2	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-505	0.41	8.12	2.8	21.0	20.4	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-510	0.45	41.82	15.6	118.5	115.3	3.6	1.1	0.5	1.0	0.3	0.0	0.0	0.1
70-515	0.47	62.73	24.3	185.0	180.1	5.5	1.7	0.7	1.6	0.5	0.1	0.0	0.2
70-520	0.45	6.05	2.2	17.1	16.6	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-525	0.45	6.23	2.3	17.6	17.1	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
70-530	0.45	1.67	0.6	4.7	4.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-535	0.45	30.24	11.3	85.6	83.3	2.6	0.8	0.3	0.7	0.2	0.0	0.0	0.1
70-540	0.21	5.1	0.9	6.8	6.7	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-545	0.45	1.89	0.7	5.3	5.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
70-550	0.26	1.3	0.3	2.1	2.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-555	0.45	1.73	0.6	4.9	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-560	0.45	3.33	1.2	9.4	9.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
70-565	0.24	16.63	3.3	25.1	24.4	0.8	0.2	0.1	0.2	0.1	0.0	0.0	0.0
70-570	0.45	1.23	0.5	3.5	3.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-575	0.45	15.39	5.7	43.4	42.3	1.3	0.4	0.2	0.4	0.1	0.0	0.0	0.1
70-580	0.43	119.93	43.0	326.4	317.8	9.8	3.1	1.3	2.8	0.8	0.1	0.0	0.4
71-010	0.10	1.12	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-020	0.45	14.05	5.2	39.7	38.6	1.2	0.4	0.2	0.3	0.1	0.0	0.0	0.0
71-030	0.45	28.58	10.7	81.1	79.0	2.4	0.8	0.3	0.7	0.2	0.0	0.0	0.1
71-040	0.22	20.93	3.8	28.8	28.1	0.9	0.3	0.1	0.2	0.1	0.0	0.0	0.0

2010 FALL POLLUTANT LOADINGS BY OUTFALL - KILOGRAMS (09/01/10 - 12/31/10

OUTFALL	RUNOFF COEFF.	ACRES	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Fall Median Event Geometric Mean Concentration			5.0	38	37	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation (meters)	**0.305**												
71-050	0.46	120.42	45.5	346.0	336.9	10.4	3.3	1.4	2.9	0.9	0.1	0.0	0.4
71-060	0.45	3.11	1.2	8.8	8.5	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
71-070	0.00	386.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-080	0.46	101.79	38.3	291.4	283.7	8.7	2.8	1.2	2.5	0.8	0.1	0.0	0.4
71-090	0.45	6.5	2.4	18.2	17.7	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0
71-100	0.10	1.99	0.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-010	0.18	17.32	2.5	19.0	18.5	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.0
72-020	0.40	24.7	8.1	61.2	59.6	1.8	0.6	0.2	0.5	0.2	0.0	0.0	0.1
72-030	0.10	5.25	0.4	3.3	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-040	0.42	166.54	57.3	435.2	423.8	13.1	4.1	1.8	3.7	1.1	0.2	0.1	0.5
72-050	0.10	5.16	0.4	3.2	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-060	0.36	113.04	33.8	256.5	249.8	7.7	2.4	1.0	2.2	0.7	0.1	0.0	0.3
72-070	0.10	2.21	0.2	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-080	0.60	4.74	2.3	17.8	17.4	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0
72-090	0.45	68.71	25.4	192.8	187.7	5.8	1.8	0.8	1.6	0.5	0.1	0.0	0.2
72-100	0.46	68.32	26.1	198.5	193.2	6.0	1.9	0.8	1.7	0.5	0.1	0.0	0.2
72-110	0.10	3.22	0.3	2.0	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-120	0.45	62.98	23.4	177.8	173.1	5.3	1.7	0.7	1.5	0.5	0.1	0.0	0.2
72-130	0.46	58.06	21.9	166.2	161.9	5.0	1.6	0.7	1.4	0.4	0.1	0.0	0.2
72-140	0.10	10.19	0.8	6.4	6.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0
72-150	0.10	4.76	0.4	3.0	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72-160	0.10	4.55	0.4	2.9	2.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73-010	0.44	20.76	7.5	57.2	55.7	1.7	0.5	0.2	0.5	0.1	0.0	0.0	0.1
73-020	0.44	57.47	21.0	159.6	155.4	4.8	1.5	0.6	1.4	0.4	0.1	0.0	0.2
73-030	0.10	21.56	1.8	13.5	13.2	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
74-010	0.48	44.39	17.5	133.3	129.8	4.0	1.3	0.5	1.1	0.3	0.1	0.0	0.2
74-020	0.45	4.41	1.6	12.5	12.1	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
75-005	0.45	12.39	4.6	34.9	34.0	1.0	0.3	0.1	0.3	0.1	0.0	0.0	0.0
75-010	0.60	3.65	1.8	13.7	13.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
75-020	0.45	1.53	0.6	4.3	4.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75-030	0.45	8.38	3.1	23.7	23.0	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
75-040	0.45	14.74	5.5	41.6	40.5	1.2	0.4	0.2	0.4	0.1	0.0	0.0	0.1
76-010	0.46	907.31	347.4	2,640.5	2,571.0	79.2	24.9	10.7	22.4	6.8	1.0	0.3	3.3
76-020	0.46	88.62	33.3	253.4	246.7	7.6	2.4	1.0	2.1	0.7	0.1	0.0	0.3
76-030	0.45	7.55	2.8	21.3	20.8	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
76-040	0.19	4.67	0.7	5.5	5.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
76-050	0.00	2.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-010	0.10	31.17	2.6	19.6	19.0	0.6	0.2	0.1	0.2	0.1	0.0	0.0	0.0
82-010	0.49	23.53	9.5	71.8	69.9	2.2	0.7	0.3	0.6	0.2	0.0	0.0	0.1
82-020	0.45	73.45	27.6	209.6	204.1	6.3	2.0	0.8	1.8	0.5	0.1	0.0	0.3
82-030	0.45	90.04	33.8	256.9	250.1	7.7	2.4	1.0	2.2	0.7	0.1	0.0	0.3
82-040	0.46	98.49	37.7	286.7	279.1	8.6	2.7	1.2	2.4	0.7	0.1	0.0	0.4
83-010	0.45	6.59	2.4	18.6	18.1	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.0
83-015	0.45	0.99	0.4	2.8	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-020	0.43	85.96	30.9	234.5	228.3	7.0	2.2	1.0	2.0	0.6	0.1	0.0	0.3
83-025	0.45	51.23	19.0	144.6	140.8	4.3	1.4	0.6	1.2	0.4	0.1	0.0	0.2
83-030	0.60	0.82	0.4	3.1	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-040	0.10	1.08	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-050	0.45	40.4	15.0	114.4	111.4	3.4	1.1	0.5	1.0	0.3	0.0	0.0	0.1
83-060	0.45	10.05	3.7	28.4	27.6	0.9	0.3	0.1	0.2	0.1	0.0	0.0	0.0
83-070	0.10	1.19	0.1	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83-080	0.48	178.63	70.1	532.9	518.8	16.0	5.0	2.2	4.5	1.4	0.2	0.1	0.7
83-090	0.41	9.16	3.1	23.6	22.9	0.7	0.2	0.1	0.2	0.1	0.0	0.0	0.0
84-010	0.47	21.56	8.4	63.6	62.0	1.9	0.6	0.3	0.5	0.2	0.0	0.0	0.1
85-010	0.10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FALL SEASONAL SUM (kg)			**11,151.63**	**84,752.36**	**82,522.03**	**2,542.57**	**800.69**	**343.47**	**718.16**	**218.57**	**33.45**	**11.15**	**104.83**

Comparision of Seasonal-based Loadings and Annual-based Outfall Loadings

Season	Precipitation meters	Precipitation inches	BOD mg\l	TSS mg\l	TDS mg\l	TKN mg\l	NH3-N mg\l	NO2-NO3 mg\l	TP mg\l	TDP mg\l	Cu mg\l	Pb mg\l	Zn mg\l
Winter/snowmelt Median Event Mean Concentration			9.0	131	954	2.21	0.698	0.612	0.455	0.037	0.037	0.026	0.165
Precipitation	**0.048**	**1.89**											
Winter/snowmelt Season Sum (kilograms)			20,073	292,173	2,127,730	4,929	1,557	1,365	1,015	83	83	58	368
Spring Median Event Mean Concentration			10.0	79	60.0	1.84	0.594	0.296	0.346	0.052	0.024	0.016	0.096
Precipitation	**0.122**	**4.82**											
Spring Season Sum (kilograms)			56,873	449,299	341,240	10,465	3,378	1,683	1,968	296	136	91	546
Summer Median Event Mean Concentration			7.0	87	41.0	1.69	0.499	0.343	0.290	0.073	0.023	0.013	0.079
Precipitation	**0.360**	**14.19**											
Summer Season Sum (kilograms)			117,222	1,456,904	686,587	28,301	8,356	5,744	4,856	1,222	385	218	1,323
Fall Median Event Mean Concentration			5.0	38.0	37.0	1.14	0.359	0.154	0.322	0.098	0.015	0.005	0.047
Precipitation	**0.305**	**11.99**											
Fall Season Sum (kilograms)			11,152	84,752	82,522	2,543	801	343	718	219	33	11	105
Summation of Season Totals (kilograms)	**0.835**	**32.89**	205,320	2,283,128	3,238,079	46,237	14,092	9,136	8,557	1,819	638	378	2,342
Mean Flow Weighted Mean Concentration - all 2010 sites			7	107	124	1.53	0.670	0.414	0.341	0.063	0.023	0.024	0.100
Precipitation	**0.835**	**32.89**											
ANNUAL SUMMATION (kilograms)			271,719	4,153,414	4,813,302	59,390	26,007	16,070	13,237	2,445	893	932	3,882
ANNUAL POLLUTANT LOADINGS BY RECEIVING WATER (kilograms)			300,596	4,594,831	7,134,727	65,702	28,771	17,778	14,643	2,705	988	1,031	4,294

City of Minneapolis
Stormwater Management Ordinance Summary

Ordinance: On November 24, 1999 the Minneapolis City Council amended Title 3 of the Minneapolis Code of Ordinances, relating to Air Pollution and Environmental Protection, by adding Chapter 54, entitled "*Stormwater Management*". The Chapter 54 ordinance establishes requirements for projects with land disturbing activities on sites greater than one (1) acre, including phased or connected actions, and for existing stormwater devices.

Goals: The purpose of this ordinance is to minimize negative impacts of stormwater runoff rates, volumes and quality on Minneapolis lakes, streams, wetlands, and the Mississippi River by guiding future significant development and redevelopment activity, and by assuring long-term effectiveness of existing and future stormwater management constructed facilities. The Chapter 54 Ordinance specifies that stormwater management standards be set according to the receiving water body, and the table below lists discharge requirements by receiving water. The standards include but are not limited to:

- Reductions of suspended solids for Mississippi River discharges
- Controlled rate of runoff for discharges to streams, areas prone to flooding and areas with infrastructure limitations
- A reduction in nutrients for stormwater discharging to Minneapolis lakes and wetlands

Minneapolis Development Review: Stormwater Management Plans are required for all construction projects greater than 1 acre in size. These plans are reviewed through the "Minneapolis Development Review" process. Responsibility for ongoing operation and maintenance is one component of the Stormwater Management Plan.

Registration: Stormwater devices shall be registered with the City of Minneapolis Department of Regulatory Services, with an annual permit being required for each registered stormwater device.

Stormwater 'Buyout' for off-site management, in lieu of on-site treatment:
This option is reserved for only those sites that demonstrate that performance of on-site stormwater management is not feasible. With approval of the City Engineer, the Chapter 54 Ordinance allows developers to contribute to the construction of a regional stormwater facility in lieu of on-site treatment/management. Final plan approval is conditional on payment received.

For the complete text of the *Chapter 54 Ordinance* requirements, see the Minneapolis Storm and Surface Water Management web site:
http://www.ci.minneapolis.mn.us/stormwater/stormwater-management-for-projects/CHAPTER54Ordinance.pdf

Receiving Waters	Total Discharge Requirements
All receiving waters	70% removal of total suspended solids
Brownie Lake	10% phosphorus load reduction
Cedar Lake	40% phosphorus load reduction
Lake of the Isles	20% phosphorus load reduction
Lake Calhoun	30% phosphorus load reduction
Lake Harriet	20% phosphorus load reduction
Powderhorn Lake	30% phosphorus load reduction
Lake Hiawatha	42% phosphorus load reduction
Lake Nokomis	25% phosphorus load reduction
Loring Park Pond	0% phosphorus load increase
Webber Pond	0% phosphorus load increase
Wirth Lake[1]	30% phosphorus load reduction
Spring Lake	30% phosphorus load reduction
Crystal Lake[2]	30% phosphorus load reduction
Diamond Lake	30% phosphorus load reduction
Grass Lake	30% phosphorus load reduction
Birch Pond	0% phosphorus load increase
Ryan Lake	30% phosphorus load reduction
Other wetlands	30% phosphorus load reduction
Mississippi River	70% removal of total suspended solids
Minneapolis streams	No increase in rate of runoff from site

[1] Wirth Lake is not within the limits of the City of Minneapolis
[2] Crystal Lake in located in Robbinsdale, but receives run-off from Minneapolis

City of Minneapolis

Erosion Control Site Inspection Form

Inspector: ________________________________

Site Plan ID	DATE	TIME

PROJECT

LOCATION

Site Status ☐ Open Site ☐ Complete – needs Final Inspection, permanent vegetation

Please check items that apply and inspector add site specific notations for all work items (All work items shall be completed within 24 hours (1 day) or permits may be revoked and/or Site Shut Down) (MCO 52.290):

☐ Failed or maintenance required perimeter controls; silt fence, bio filter, other_____________

☐ Failed or maintenance required rock construction entrance

☐ Failed or maintenance required inlet protection device(s)

☐ Clean streets, sidewalks or paved surfaces of sediment

☐ Other

☐ Comments:
____
____
____

If erosion or sediment loss is extreme and posing an environmental concern contact the **Public Works Erosion Control Inspector at 612-673-2738**

Site Contact:____________________________ Site Phone:________________________________

Site Supervisor Signature: ____

REV 5/09

City of Minneapolis

Erosion Control Site Inspection Form

Inspector: _________________________________

Site Plan ID	DATE	TIME

PROJECT

LOCATION

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Site Contact:_____________________________ Site Phone:_________________________________

Site Supervisor Signature: ____

REV 5/09

Impacts of Erosion and Sediment from Construction Sites

Each year 80 million tons of sediment from construction sites enters our lakes, streams and rivers. On an acre for acre usage, construction sites export sediment at 20 to 1,000 times the rate of other land uses.[1]

"***Erosion***" is the displacement of soil.
Once it has been displaced, it is considered to be "***Sediment***".

It is essential that construction projects prevent sediment from leaving the site. Minimizing erosion in the first place, through control techniques and good planning/phasing, is often key. Examples of activities that cause erosion include rain falling on unprotected slopes that have been cleared of vegetation, or driving on unprotected areas. Once erosion has occurred, sediment can become suspended in stormwater runoff, and it is extremely difficult to remove. Surface water runoff from vegetated areas generally does not exceed 10 to 20 percent of the rainfall. Without vegetation, surface water runoff is considerably higher.

- Excavating and clearing vegetation at the construction site increases the volume and velocity of the runoff and erosion. Attached to the sediment are fertilizers, pesticides, heavy metals, and oil and grease.
- Sediment suspended in runoff blocks sunlight needed by aquatic plants, reduces survival rates for fish eggs, interferes with fish breeding habits, and clogs and damages fish gills.[2]
- Phosphorus and nitrogen in fertilizer can stimulate overgrowth of aquatic plants resulting in the depletion of dissolved oxygen[3] and fish kills.
- Pesticides, metals, and oil and grease not only accumulate in the bottom of lakes, streams, and rivers but also in plants and other aquatic organisms.[4]
- Sediment also can build up in storm sewers, catch basins, and other storm drainage devices which will then require additional maintenance.[5]

Simple and easy-to-install and easy-to-maintain erosion control and sediment control devices can be found at the following web site:

Urban Small Sites Best Management Practice Manual, Chapter 3:
http://www.metrocouncil.org/environment/Watershed/bmp/manual.htm

For information on erosion control, or with additional questions, see the Minneapolis Erosion & Sediment Control section website: http://www.ci.minneapolis.mn.us/stormwater/erosioncontrol/index.asp or call (612) 673-2738.

[1] *Environmental Assessment for Proposed Effluent Guidelines and Standards for the Construction and Development Category.* United States Environmental Protection Agency. June 2002. Page 2-2.
http://www.epa.gov/guide/construction/envir/C&D_Envir_Assessmt_proposed.pdf

[2] *Construction Site Soil Erosion and Sediment Control.* Illinois Environmental Protection Agency. March 1999.

[3] *What's Your WQ-IQ?* Larimer County Engineering Department. July 2002.
http://www.co.larimer.co.us/engineering/NPDES/july2002web.pdf

[4] *Environmental Assessment for Proposed Effluent Guidelines and Standards for the Construction and Development Category.* United States Environmental Protection Agency. June 2002. Page 2-11 and 2-13.
http://www.epa.gov/guide/construction/envir/C&D_Envir_Assessmt_proposed.pdf

[5] 6. *Construction Site Soil Erosion and Sediment Control.* Illinois Environmental Protection Agency. March 1999.

52.100. Erosion and Sediment Control Plan. Land disturbance activities which are in excess of either five thousand (5,000) square feet or five hundred (500) cubic yards of earth moved require an erosion and sedimentation control plan approved by the City Engineer. These plans shall be drawn to an appropriate scale and shall include sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed grading on water resources, and measures proposed to minimize soil erosion and off-site sedimentation. The owner/developer shall perform all clearing, grading, drainage, construction, and development in strict accordance with the approved plan. In addition, the following information shall be included in any plan:

1. An indication of the scale used.
2. The name, address and telephone number of the developer, permit holder or responsible party of the property where the land disturbing activity is proposed.
3. A signed statement on the plan by the owner, developer, and contractor that all clearing, grading, construction, or development will be done pursuant to the plan.
4. Suitable contours for the existing and proposed topography.
5. The proposed grading or land disturbance activity including and specific limits of disturbance.
6. Clear and definite delineation of any areas of vegetation or trees to be saved.
7. Construction entrance, including details and location.
8. Standard Minneapolis Erosion Control Notes
9. Existing and proposed storm drainage system.
10. Erosion and sediment control provisions to minimize on-site erosion and prevent off-site sedimentation, including provisions to preserve topsoil and limit disturbance.
11. Design details for both temporary and permanent erosion control structures including inlet protection.
12. Construction of perimeter erosion control devices where need to prevent sediment from leaving the site.
13. Details of temporary and permanent stabilization measures to be implemented following initial soil disturbance or re-disturbance. This stabilization shall be completed within fourteen (14) days of disturbance.
14. Specifications for implementation and maintenance of final erosion control structures.
15. Removal of temporary erosion control devices after site has been stabilized.
16. The City Engineer may require any additional information or data deemed appropriate and/or may impose such conditions thereto as may be deemed necessary to ensure compliance with the provisions of this chapter, the Manual of Standards, or the preservation of public health and safety.

Also see http://www.ci.minneapolis.mn.us/government/ordinances.asp for complete listing of all plan sheet requirements.

The applicant may propose the use of any erosion and sediment control techniques in a Final Plan, provided such techniques are effective and approved by Minneapolis Public Works Surface Water & Sewers

MINNEAPOLIS STANDARD EROSION CONTROL NOTES (May 1, 2009) (Include on Plan)

1) Contractor must call for a pre-construction meeting 48 hours prior to any land disturbances 612-673-2738. Failure to do so may result in the revocation of permit and a stop work order being issued.
2) Install perimeter erosion control at the locations shown on the plans prior to beginning construction. (Hay bales are not an acceptable perimeter control)
3) Before beginning construction, install a temporary rock construction entrance at each point where vehicles exit the construction site. Use 2 inch or greater diameter rock in a layer at least 6 inches thick across the entire width of the entrance. Extend the rock entrance at least 50 feet into the construction zone. Use a geo-textile fabric beneath the aggregate in order to prevent migration of soil into the rock from below
4) Remove all soils and sediments tracked or otherwise deposited onto public and private pavement areas. Removal shall be on a daily basis when tracking occurs. Sweeping may be ordered by at any time if conditions warrant. Sweeping shall be maintained throughout the duration of the construction and done in a manner to prevent dust being blown to adjacent properties.
5) Install inlet protection at all public and private catch basin inlets, which receive runoff from the disturbed areas. Catch basin inserts are required in undisturbed areas that receive runoff from disturbed areas. NOTE: Hay bales or filter fabric wrapping the grates are not effective or an acceptable form of inlet protection.
6) Locate soil or dirt stockpiles no less than 25 feet from any public or private roadway or drainage channel. If remaining for more than seven days, stabilize the stockpiles by mulching, vegetative cover, tarps, or other means. Control erosion from all stockpiles by placing silt barriers around the piles. Temporary stockpiles located on paved surfaces must be no less than two feet from the drainage/gutter line and shall be covered if left more than 24 hours.
7) Maintain all temporary erosion and sediment control devices in place until the contributing drainage area has been stabilized. Inspect temporary erosion and sediment control devices on a daily basis and replace deteriorated, damaged, or rotted erosion control devices immediately.
8) Temporarily or permanently stabilize all construction areas which have been finish-graded, and all areas in which grading or site building construction operations are not actively underway against erosion due to rain, wind and running water within 7-14 days. Use seeding and mulching, erosion control matting, and/or sodding and staking in green space areas. Application of gravel base on areas to be paved recommended minimizing erosion potential.
9) Remove all temporary synthetic, structural, non-biodegradable erosion and sediment control devices after the site has undergone final stabilization and permanent vegetation has been established, minimum vegetation establishment is 70% cover, maintain all temporary erosion control devices until 70% established cover is achieved.
10) Ready mixed concrete and concrete batch plants prohibited within the public right of way, designate concrete mixing/washout locations in the erosion control Plan. Under no circumstances may washout water drain onto the public right of way or into the public storm sewer.

Erosion Control Inlet Protection Products & Links

This list of manufactured BMP's (Best Management Practice) may provide guidance for erosion control protection on existing storm drain inlets. Minneapolis Public Works Department does not endorse or approve the listed products for a specific application. Compliance with Chapter 52 of the Minneapolis Code *(Erosion and Sediment Control Ordinance)* is determined by the conditions found upon inspection. Additionally, hay bales are not an approved means of inlet protection and are not an approved BMP for construction projects in the City of Minneapolis.

Type A

Inlet protection to be utilized around field inlets until permanent stabilization methods has been established. Inlet protection Type A may also be utilized on pavement inlets before installation of curb and gutter or pavement:

- ***Road Drain*** – WIMCO, Shakopee, MN (952) 445-4071
- ***Stream Guard*** - Foss Environmental, Seattle, WA (800) 337-7455
- ***Erosion Control Shroud*** - Royal Concrete Pipe, Stacy, MN (651) 462-2130
- ***Silt Sack*** - ACF Environmental, Richmond, VA (804) 271-0633
- ***Stream Guard*** (sediment only) - Foss Environmental, Seattle, WA (800) 337-7455
- ***Verti-Pro*** - Alpine Stormwater Management, Grove City, OH (614) 801-9886

Type B

Inlet protection will be utilized without curb heads.

- ***Dandybag*** - Dandy Products, Grove City, OH (800) 591-2284

Type C

Inlet protection will be utilized on street inlets with curb heads.

- ***Beaver Dam*** - Dandy Products, Grove City, OH (800) 591-2284
- ***Road Drain Curb and Gutter*** - WIMCO, Shakopee, MN (952) 445-4071
- ***Silt Screen*** - Alpine Stormwater Management, Grove City, OH 614-801-9886

Type D

Inlet protection to be utilized at culvert inlets until permanent stabilization methods has been established.

Erosion Control Inlet Protection Products & Links

Product Web Links:

General

http://www.suntreetech.com/products/

http://www.emeraldseedandsupply.com/erosioncontrol/

http://www.stormwater-products.com/

Grate Inlet Protection

http://www.suntreetech.com/products/

http://stormdrainfilters.com/

Curb Inlet Protection

http://www.acfenvironmental.com/erosioncontrol.html

http://www.dandyproducts.com/

Inlet Inserts

http://www.suntreetech.com/products/

http://www.siltsaver.com/

Minneapolis Erosion and Sediment Control Reference Guide

Additional materials for compliance to Minneapolis Chapter 52 Erosion and Sediment Control Ordinance provided by Minneapolis erosion and sediment control inspections. The list below contains web page information of additional source data for erosion control design, products, certifications, educational opportunities, and other government agency requirements. This is not a complete listing of non-profits or government agency sites but provides the user a starting point in locating additional information about erosion and sediment control.
The information contained in the web pages is intended to serve as a resource guide and Minneapolis does not guarantee the content of the web pages. Each site is unique and may need to provide additional erosion and sediment controls to remain compliant.

Chapter 52 Erosion and Sediment Control for Land Disturbance Activities has been in effect since June 15, 1996. Site location or size may require additional erosion control permits from other agencies (MCWD, MPCA) or work in right of ways under the jurisdiction of other permitting authorities (MnDOT, Hennepin County, Metropolitan Council), to name a few, there may be other required permits that must be issued and not listed here, the contractor/owner is responsible to have all required permits clearly posted on site during normal working hours.

Metropolitan Council Erosion and Sediment Control/storm water management:
http://www.metrocouncil.org/environment/Watershed/bmp/manual.htm BMP Manual

Minnesota Pollution Control Agency Web Pages:
http://www.pca.state.mn.us/water/index.html
http://www.pca.state.mn.us/rulesregs/index.html rules and regulations
http://www.pca.state.mn.us/water/stormwater/stormwater-rules.html rule making changes pages
http://www.pca.state.mn.us/water/stormwater/stormwater-c.html NPDES permit info
http://www.pca.state.mn.us/water/stormwater/stormwater-c.html#factsheets fact sheets and guidance tools
http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html Protecting water quality in Urban Areas Manual

MnDOT
http://www.dot.state.mn.us/environment/erosioncontrol/index.html Erosion Control
http://www.dot.state.mn.us/environment/erosioncontrol/specs.html standard specifications
http://www.dot.state.mn.us/products/index.html approved products and sources
http://www.dot.state.mn.us/environment/erosioncontrol/seedmixes.html seed mixes
http://www.dot.state.mn.us/environment/tech_memos.html#erosion technical memorandums

American Public Works Association (APWA)
http://www.apwa.net several storm water available publications, erosion control, etc.

City of Minneapolis
http://www.ci.minneapolis.mn.us/stormwater/ storm water web page
http://www.ci.minneapolis.mn.us/cityhall/laws/ordinances/ Minneapolis ordinances

Minnesota Erosion Control Association Web Pages:
http://www.mnerosion.org/
Training and development non-profit organization promoting erosion and sediment control, listings of vendor resources for erosion and sediment control, etc.

Minnehaha Creek Watershed Web Page:
http://www.minnehahacreek.org/permit_req.php
http://www.minnehahacreek.org/rules.php rules
http://www.minnehahacreek.org/bmps.php best management practices
http://www.minnehahacreek.org/permit_links.php permit links for other agencies

University of Minnesota
http://www.erosion.umn.edu/ erosion and sediment control certification program

US EPA
http://www.epa.gov/owow/nps/roadshwys.html non point source pollution
http://cfpub1.epa.gov/npdes/pubs.cfm?program_id=6 US EPA Publications
http://cfpub1.epa.gov/npdes/docs.cfm?document_type_id=3&view=Fact%20Sheets%20and%20Outreach%20Materials&program_id=6&sort=name fact sheets and outreach materials

Board of Water and Soil Resources (BWSR)
http://www.bwsr.state.mn.us/

Minnesota Department of Natural Resources (DNR)
http://www.dnr.state.mn.us/index.html

United States Army Corps of Engineers (St Paul District)
http://www.mvp.usace.army.mil/

Certified Professionals in Erosion and Sediment Control (CPESC)
http://www.cpesc.net/ A national certification training program for erosion & sediment control design and inspection

International BMP Database:
http://www.bmpdatabase.org/ database of Best Management Practices

International Erosion Control Association: (IECA)
http://www.ieca.org/ global views and training sessions for ESC

Construction Industry Compliance Assistance
http://www.cicacenter.org/ EPA regulations, water, air, hazardous materials, links to state permits and requirements.

Chapter 54 Stormwater Management Plan Submittal Checklist

1) A cover sheet stamped and signed by a professional engineer, indicating that all plans and supporting documentation have been reviewed and approved, certifying the submitted plans comply with the requirements of the ordinance.
2) A narrative summary of the stormwater plan.
3) Maps of existing and proposed watersheds, sub-watersheds, Tc/Tt[1] flow paths, soil types, hydrologic soil groups, land uses/cover type and runoff curve numbers within the site and draining into the site from adjacent properties.
4) Location of existing and proposed stormwater discharge points.
5) Delineation and labeling of all proposed impervious areas and accompanying area computations in tabular form.
6) Pre-development, pre-settlement and post-development hydrology data for each watershed, including both peak flows and volume. All assumptions used in developing the input parameters shall be clearly stated and cross-referenced to the maps.
7) Final design drawings of all proposed stormwater BMPs with sufficient clarity for those responsible for site grading, including:
   A) Plan views showing the proposed BMP locations, in combination with the site plan map.
   B) Detailed cross-sections and profiles for each BMP showing critical design features, side slopes, structures, soil profiles and elevations, including seasonal water table.
   C) Detailed drawings or material specifications for inlets or outlets.
8) Detailed construction notes explaining necessary procedures for proper implementation of the plan, including planting and landscaping specifications, timing and sequencing of construction and any temporary measures needed to protect BMPs during the construction phase.
9) Detailed construction inspection plan, outlining the critical elements in the plan that need to be surveyed or inspected by a representative of the project engineer and the timing and notification requirements involved. (identification of responsible party).
10) Final operations and maintenance plan in accordance with ordinance requirements. For more information on stormwater BMP forms, please visit this website: http://www.ci.minneapolis.mn.us/stormwater/fee/bmp-forms.asp
11) Hydraulic data summaries for all proposed pipes or channels.
12) Location and dimensions of proposed drainage easements. Easements must be recorded to preserve major stormwater flow paths, specify maintenance responsibilities, restrict buildings/structures and prevent any grading, filling or other activities that might obstruct flow.
13) BMP design data for each proposed BMP, showing how it complies with applicable technical standards and the requirements of the Chapter 54

[1] Time of Concentration / Time of Travel

Minneapolis Water Resources and Sewers Plan Requirements

Overview

All projects reviewed through the Minneapolis Development Review's Planned Development Review (PDR) shall provide a general plan which sufficiently reflects both the existing and proposed conditions. Plans should clearly delineate what the improvements and scope of work proposed as well as site features which will remain unchanged. A complete plan submittal is a prerequisite for a final review and subsequent approval.

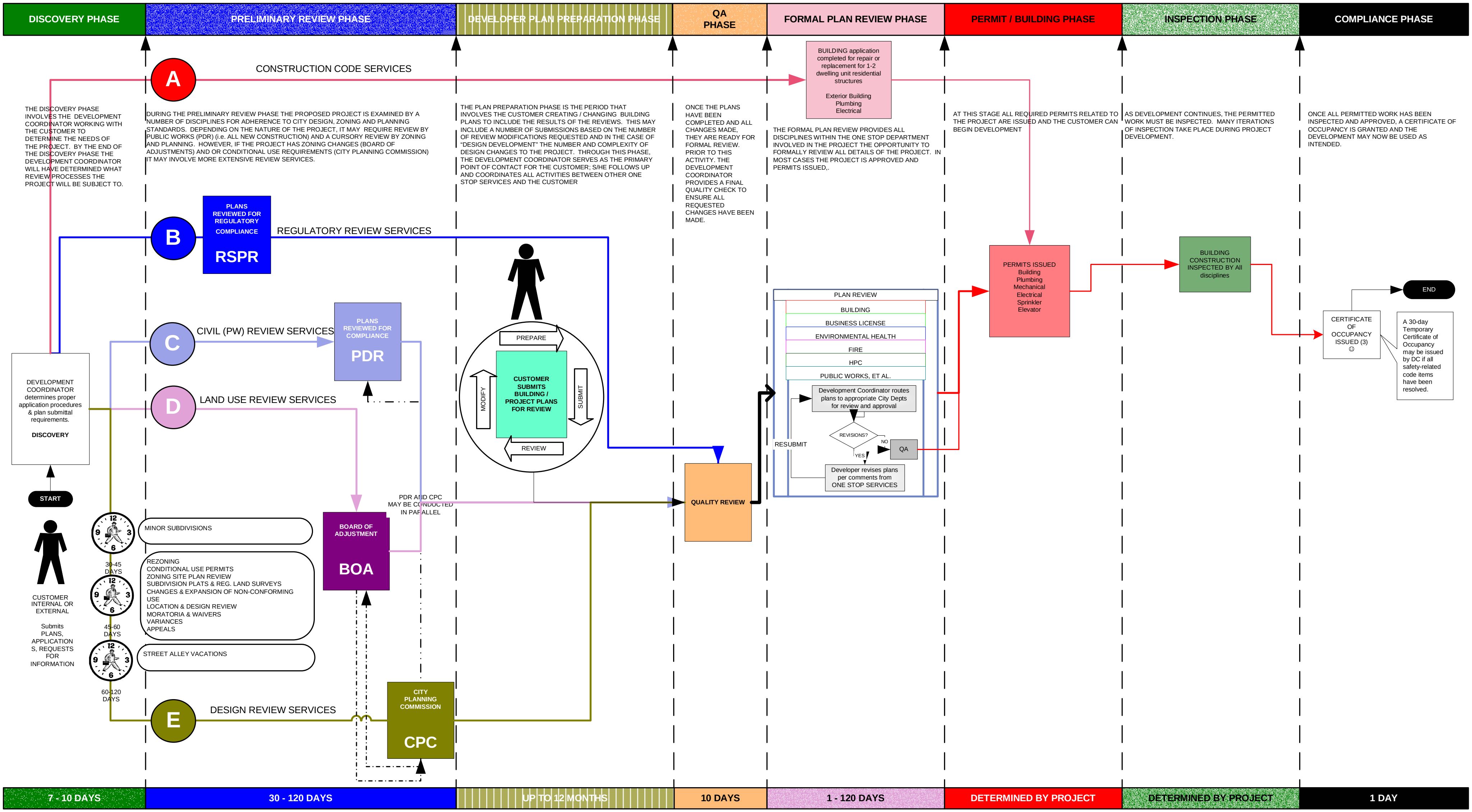
Site Plan Check List

Plan submittals must contain the following information prior to the commencement of a stormwater review.

1) Clearly show all site drainage including roof tops and interior drains through contours or spot elevations*. (Stormwater may not run over the public sidewalk, into the sanitary sewer or onto adjacent properties)*
2) Show all proposed, existing or abandoned storm and sanitary sewers, including pipe size and material *(all abandoned connections must be cut and plugged at the main and curb per city requirements.*)
3) Clear delineation and labeling of (property) area, existing impervious area, and proposed impervious area
4) Infrastructure. For public infrastructure records call (612) 673-2405.
   For Utility Connections records call (612)-673-2451.
   a) Public storm drains and catch basins adjacent to subject property
   b) Any existing or proposed on site storm drains or Best Management Practices (BMPs)
   c) Public sanitary sewers adjacent to subject property
   d) Private lateral sanitary sewer connection.
5) An erosion control permit is required for any site disturbing over 500 sq ft. In addition, for all sites disturbing more than 5000 sq. ft., an approved erosion control plan is required before a permit can be issued.
6) Include the *Minneapolis Standard Erosion Control Notes* on all land disturbing projects
7) Compliance with Chapter 54 of the Minneapolis Code of Ordinances Stormwater Management is required for projects on sites over one acre. Applicants must provide a stormwater management report that includes design details of all BMP's, calculations, operations and maintenance plans.
8) Low Impact Development (LID) techniques are encouraged on all new and redevelopment projects. These techniques minimize impervious areas and use natural vegetation and small-scale treatment systems to treat and infiltrate stormwater close to where it falls. LID practices include but are not limited to green roofs, rain gardens, pervious pavers or pavement, trees and soil amendments. For more information on stormwater design or low impact development please contact Minneapolis Water Resources Department at (612) 673-2406 or visit *Low Impact Development Urban Design*

For further information contact on Water Resource related requirements please contact:

Paul Chellsen, Supervising Engineering Technician II
Minneapolis Water Resources and Sewers
☎ *(612) 673.2406*
paul.chellsen@ci.minneapolis.mn.us



MINNEAPOLIS DEVELOPMENT REVIEW SERVICES

PROJECT	DESCRIPTION	FILENAME	PREPARED BY
MINNEAPOLIS DEVELOPMENT REVIEW	MDR PROCESSES - ROADMAP	ROADMAP 11X17.VSD	M. S. ALLEN
PROCESS ID	REVISED	PAGE	DATE
PROCESS ROADMAP	2/6/2007	1 OF 12	2/7/2005

Source: Minneapolis Development Review

2009R-594

RESOLUTION
Of the
CITY OF MINNEAPOLIS

By Ostrow

Designating the utility rates for …, …, stormwater, …, effective on and after January 1, 2010.

[EXCERPT}

Resolved by The City Council of The City of Minneapolis:

Stormwater Rate
The stormwater rate, subject to the provisions in Chapter 510, of the Minneapolis Code of Ordinances, is imposed on each and every Single-Family Residential Developed Property, Other Residential Developed Property, Non-Residential Developed Property, and Vacant Property, other than Exempt Property, and the owner and non-owner users, and is herby set as follows:

(a) The Equivalent Stormwater Unit (ESU) rate is **eleven dollars and nine cents ($11.09).** The ESU measurement is 1,530 square feet of impervious area.

(b) The stormwater rate imposed on Single-Family Residential Developed Properties shall be
categorized into three tiers based on the estimated amount of impervious area as follows:

High – Single-Family Residential Developed Property – greater than one thousand five hundred and seventy-eight (1,578) square feet of estimated impervious area. The ESU shall be 1.25 and the stormwater rate set at **thirteen dollars and eighty-six cents ($13.86).**

Medium – Single-Family Residential Developed Property – equal to or greater than one thousand four hundred and eighty-five (1,485) square feet and less than or equal to one thousand five hundred and seventy-eight (1,578) square feet of estimated impervious area. The ESU shall be 1.00 and the stormwater rate set at **eleven dollars and nine cents ($11.09).**

Low – Single-Family Residential Developed Property – less than one thousand four hundred and eighty-five (1,485) square feet of estimated impervious area. The ESU shall be .75 and the stormwater rate set at **eight dollars and thirty-two cents ($8.32).**

(c) Stormwater charges for all other properties will be based on the following calculation:
(Gross Lot Size in sq.ft. X Runoff Coefficient) ÷ 1,530 sq. ft.= # of ESU
# of ESU X **$ 11.09** = Monthly Fee

Source: Resolution dated December 7, 2009, Minneapolis City Council Official Proceedings

The runoff coefficient assumed for each land use category is shown below.

Land Use	Coefficient Applied
Bar-Rest.-Entertainment	.75
Car Sales Lot	.95
Cemetery w/Monuments	.20
Central Business District	1.00
Common Area	.20
Garage or Misc. Res.	.55
Group Residence	.75
Ind. Warehouse-Factory	.90
Industrial railway	.85
Institution-Sch.-Church	.90
Misc. Commercial	.90
Mixed Comm.-Res-Apt	.75
Multi-Family Apartment	.75
Multi-Family Residential	.40
Office	.91
Parks & Playgrounds	.20
Public Accommodations	.91
Retail	.91
Single Family Attached	.75
Single Family Detached	ESU
Sport or Rec. Facility	.60
Utility	.90
Vacant Land Use	.20
Vehicle Related Use	.90

CHAPTER 510. STORMWATER MANAGEMENT SYSTEM AND OPERATION OF A STORMWATER UTILITY

510.10. **Definitions.** In addition to the words, terms and phrases elsewhere defined in this chapter, the following words, terms and phrases as used in this chapter shall have the following meanings:

Bonds means revenue or general obligation bonds, notes, loans or other debt obligations heretofore or hereafter issued to finance the costs of improvements and/or operations and maintenance.

Building permit means a permit issued by the director of inspections that permits construction of a structure.

City means City of Minneapolis, Minnesota.

City council means governing body of the city.

Costs of capital improvements means costs incurred in providing capital improvements to the stormwater management system or any portion thereof including, without limitation, the cost of alteration, enlargement, extension, improvement, construction, reconstruction, testing and development of the stormwater management system; insurance premiums for insurance taken out and maintained during construction, professional services and studies connected thereto; principal and interest on bonds heretofore or hereafter issued, acquisition of real and personal property by purchase, lease, donation, condemnation or otherwise for the stormwater management system or for its protection; and costs associated with purchasing equipment, computers, furniture, etc., that are necessary for the operation of the system or the utility.

Debt service means an amount equal to the sum of (i) all interest payable on bonds during a fiscal year, plus (ii) any principal installments payable on the bonds during that fiscal year.

Developed property means real property, other than undisturbed property; provided that, property used for agricultural uses, upon which no dwelling unit is located, shall not constitute developed property for purposes of this chapter.

Director means the city engineer/director of the public works department for the City of Minneapolis or the director's designee.

Dwelling unit means one or more rooms, designed, occupied or intended for occupancy as a separate living quarter, with a single complete kitchen facility, sleeping area and bathroom provided within the unit for the exclusive use of a single household.

Equivalent stormwater unit (ESU) means a unit of measure that is equal to the average impervious area of single-family residential developed property that falls within the medium class, with a single-family detached dwelling unit located thereon and within the city's limits, as established by city council resolution or ordinance, as provided for herein.

Equivalent stormwater unit rate or *ESU rate* means the storm sewer charge imposed on single-family residential developed property within the medium class, as established by city council resolution or ordinance, as provided herein.

Exempt property means public rights-of-way, public trails, public streets, public alleys, public sidewalks, railroad tracks that are not in railroad yards, and also means public lands and/or easements upon which the stormwater management system is constructed and/or located.

Fiscal year means a twelve-month period commencing on the first day of January of any year or such other twelve-month period adopted as the fiscal year of the city.
Impervious area means the number of square feet of hard surface areas that either prevent or retard the entry of water into the soil matrix, as it entered under natural conditions as undisturbed property, and/or cause water to run off the surface in greater quantities or at an increased rate of flow from that present

under natural conditions as undisturbed property, including, but not limited to, roofs, roof extensions, driveways, pavement and athletic courts.

Other residential developed property means developed property upon which two (2) or more family and/or multi-family dwellings are located.

Non-residential developed property means developed property other than single residential developed property and other residential developed property.

Operating budget means the annual stormwater utility operating budget adopted by the city for the succeeding fiscal year.

Operations and maintenance means, without limitation, the current expenses, paid or secured, of operation, maintenance, repair and minor replacement of the system, as calculated in accordance with generally accepted accounting practice. This shall include, without limiting the generality of the foregoing, cost of studies related to the operation of the system; costs of the study performed heretofore in relation to establishing storm sewer charges for the stormwater utility and other start up costs of the stormwater utility; costs related to the national pollutant discharge elimination system permit study, application, negotiation and implementation, including public education and outreach, as mandated by federal and state laws and regulations and the costs of obtaining and complying with all other permits required by law, insurance premiums, administrative expenses, equipment costs, including professional services, labor costs and the cost of materials and supplies used for current operations.

Revenues means all rates, fees, assessments, rentals or other charges or other income received by the stormwater utility in connection with the management and operation of the system, including amounts received from the investment or deposit of monies in any fund or account, as calculated in accordance with generally accepted accounting practices.

Runoff coefficients means those numbers approved by the city council that are used to estimate the impervious area for each non-single family classified property. A list of the coefficients used for the city is found in Table 1 that is incorporated herein.

Single-family residential developed property means developed property upon which single-family detached dwellings are located.

Stormwater charge means a charge authorized by this chapter, Minnesota Statutes 2004, Section 444.075, and other applicable law, and further as set forth in resolution or ordinance heretofore or hereafter adopted or hereafter amended by the city council, which is established to pay operation and maintenance, costs of capital improvements, debt service associated with the stormwater management system and other costs included in the operating budget.

Stormwater management system, *sewer system* or *system* means storm sewers that exist at the time the ordinance codified in this chapter is adopted or that are hereafter established and all appurtenances necessary in the maintaining and operating of the same, including, but not limited to pumping stations; enclosed storm sewers; outfall sewers; surface drains; street, curb and alley improvements associated with storm or surface water improvements; natural and manmade wetlands; channels; ditches; rivers; streams; wet and dry bottom basins; pocket ponds; multiple pond systems; settling basins; infiltration trenches or basins; filter systems; bio-retention areas; dry or wet swales; grass channels; roof top detention; skimming devices; grit chambers and other flood control facilities; and works for the collection, transportation, conveyance, pumping, treatment, controlling, storing, managing, and disposing storm or surface water or pollutants originating from or carried by storm or surface water.

Stormwater utility or *utility* means the utility created by this chapter to operate, maintain and improve the stormwater management system and for all other purposes set forth in this chapter.

Undisturbed property means real property that has not been altered from its natural condition in a manner that disturbed or altered the topography or soils on the property to the degree that the entrance of water into the soil matrix is prevented or retarded.

Vacant land means real property upon which there is no structure, as shown in the records of the city assessor's office, which is not designed for or regularly used for commercial residential purposes, and which is not used in connection with another piece of property. Vacant land includes undisturbed property and land with no building used as a community garden. (2004-Or-132, § 1, 11-5-04)

510.20. Creation of stormwater utility. Pursuant to the provisions of Minnesota Statutes 2004, Section 444.075, the city's general home rule powers, its nuisance powers, police powers and all other authorized powers, the city council does establish a stormwater utility and stormwater management system and declares its intention to operate, construct, maintain, repair and replace the stormwater management system and operate the stormwater utility. (2004-Or-132, § 1, 11-5-04)

510.30. Findings and determinations. The city finds that the elements of the stormwater management system that provides for the collection, conveyance, detention/retention, treatment and release of stormwater, the reduction of hazard to property and life resulting from stormwater runoff, improvement in general health and welfare through reduction of undesirable stormwater conditions and improvement to the water quality in the storm and surface water system and its receiving waters are of benefit and provide services to all property within the city. It is further found, determined and declared that this chapter is in furtherance of and implements the goals and strategies of the local surface water management plan, the annual Combined Sewer Overflow (CSO) report and the city's National Pollutant Discharge Elimination System (NPDES) permit. (2004-Or-132, § 1, 11-5-04)

510.40. Administration. The stormwater utility, under the supervision of the director, shall have the power to:

(1) Administer the acquisition, design, construction, maintenance, operation, extension and replacement of the stormwater management system, including real and personal property that is or will become a part of or protect the system.

(2) Prepare regulations, as needed, to implement this chapter, and forward those regulations to the city council for consideration and adoption, and adopt those procedures, as are desirable, to implement adopted regulations or to carry out other responsibilities of the utility.

(3) Administer and enforce this chapter and all regulations, guidelines and procedures adopted relating to the design, construction, maintenance, operation and alteration of the stormwater management system, including, but not limited to, the flow rate, volume, quality and/or velocity of the stormwater conveyed thereby.

a. Advise the city council on matters relating to the stormwater management system.

b. Develop and review plans concerning creation, design, construction, extension and replacement of the system and make recommendations to the city council related thereto.

c. Inspect private systems, as necessary, to determine the compliance of those systems with this chapter and any regulations adopted pursuant hereto.

d. Make recommendations to the city council concerning the adoption of ordinances, resolutions, guidelines and regulations to protect and maintain water quality within the stormwater management system in compliance with water quality standards established by state, county, regional and/or federal agencies, as now adopted or hereafter adopted or amended.

e. Analyze the cost of services and benefits provided by the stormwater management system and the structure of fees, service charges, fines and other revenues of the stormwater utility at least once each year.

f. Make recommendations to the city council concerning the cost of service and benefits provided by the stormwater management system and structure of fees, service charges, fines and other revenues of the stormwater utility.

g. Analyze the appropriateness of providing credits against the stormwater charge for owners of property who employ structural or non-structural best management practices or other stormwater management practices on-site that significantly reduce the quantity or improve the quality of stormwater run-off from their property that enters the system and make recommendations to the city council regarding the provision of these credits.

h. Administer programs established pursuant hereto or pursuant to ordinances, resolutions, regulations or guidelines hereafter adopted by the city council that provide for credits and/or incentives that reduce stormwater charges imposed against properties. (2004-Or-132, § 1, 11-5-04)

510.50. Operating budget. The city shall, as part of its annual budget process, adopt an operating budget for the stormwater utility for the next following fiscal year. The operating budget shall be prepared in conformance with the state budget law, city policy and generally accepted accounting practices. The initial operating budget commences January 1, 2005, and ends December 31, 2005. (2004-Or-132, § 1, 11-5-04)

510.60. Stormwater charge. (a) *Stormwater charge established*. Subject to the provisions of this chapter, there is imposed on each and every single-family residential developed property, other residential developed property and non-residential developed property, and vacant property, other than exempt property, and the owner and non-owner users thereof, a stormwater charge. In the event the owner and non-owner user of a particular developed property are not the same, the liability for the owner and non-owner user for the stormwater charge attributable to the developed property shall be joint and several liability. This stormwater charge shall be determined and set by the provisions of this chapter in accordance with the ESU and ESU rate, which is established by ordinance or resolution of the city council and which may be amended from time to time by the city council.

(1) *Stormwater charge for single-family residential developed property.* Three (3) classes of single-family residential developed property are established to account for the wide range of the amount of impervious area that exists on individual single-family residential developed properties in the city. The three (3) single-family customer classes are based on statistical sampling of estimated impervious area as developed from the city assessor's single-family residential developed real estate property records which includes: foundation square footage, garage stalls, estimation of driveway square footage and foundation square footage of any outbuildings/other improvements. Classification of the single-family residential developed customer class properties into the three (3) customer classes is made based on estimated impervious area. Single-family residential developed properties will be assigned to one of three (3) single-family residential customer classes. The three (3) single-family residential customer classes are as follows:

a. Single-family residential developed property/high -- greater than one thousand five hundred seventy-eight (1,578) square feet of estimated impervious area.
b. Single-family residential developed property/medium -- equal to or greater than one thousand four hundred eighty-five (1,485) square feet and less than or equal to one thousand five hundred seventy-eight (1,578) square feet of estimated impervious area.
c. Single-family residential developed property/low -- less than one thousand four hundred eighty-five (1,485) square feet of estimated impervious area.

The stormwater charge for each of these classes shall be as follows:

TABLE INSET:

High..........	1.25 % of an ESU
Medium..........	1 ESU
Low..........	.75 % of an ESU

In the event of a newly constructed dwelling unit, the charge for the stormwater charge attributable to that dwelling unit shall commence upon the issuance of the building permit for that dwelling unit.

(2) *Stormwater charge for other residential developed property* . The stormwater charge for other residential developed property shall be the ESU rate multiplied by the numerical factor obtained by multiplying the gross area of a property by the runoff coefficient for the other residential developed property, as set forth in Table 1 (the actual coefficient will be defined at the time of the annual rate adoption) and then dividing the above product by the ESU, as this ESU is

established by City Council resolution or ordinance ((gross square footage X runoff coefficient)/ESU = ## ESU). In the event of a newly constructed dwelling unit, the stormwater charge attributable to that dwelling unit shall commence upon the issuance of the building permit for that dwelling unit.

(3) *Stormwater charge for non-residential developed property.* The stormwater charge for non-residential developed property shall be the ESU rate multiplied by the number of ESU's for each individual non-residential developed property. The number of ESU's for each individual non-residential developed property shall be obtained by multiplying the gross area of each individual property by the runoff coefficient for the customer class that is the most similar to the use to which that individual non-residential developed property is currently being put, as set forth in Table 1 (the actual coefficient will be defined at the time of the annual rate adoption) and then dividing the above product by the ESU, as this ESU is established by city council resolution or ordinance ((gross square footage X runoff coefficient)/ESU = ## ESU)). The minimum stormwater charge for any non-residential developed property shall be in an amount equal to that of one (1) ESU. In the event of newly developed non-residential developed property, the stormwater charge attributable to that development shall commence upon the issuance of the building permit. In the event of additional development to property that is already developed property, the charge for the stormwater charge attributable to that additional development shall commence upon the issuance of the building permit.

(4) *Stormwater charge for vacant property.* The stormwater charge for vacant property shall be the ESU rate multiplied by the number of ESU's for each individual vacant property. The number of ESU's for each individual vacant property shall be obtained by multiplying the gross area of each individual property by the runoff coefficient for the vacant property class, as set forth in Table 1 (the actual coefficient will be defined at the time of the annual rate adoption) and then dividing the above product by the ESU, as this ESU is established by city council resolution or ordinance ((gross square footage X runoff coefficient)/ESU = ## ESU)). There is no minimum stormwater charge for vacant property.

(b) *Stormwater charge calculation*. The director shall initially, and from time to time, determine the class of residential developed property into which each individual residential developed property falls to establish the stormwater charge, based on the impervious area of the parcel as shown in the single-family records maintained by the city assessor's office. The stormwater charge for other residential developed property, for non-residential developed property, and for vacant property in the city shall be calculated as provided for subsection (a)(2), (3) & (4). The director shall make the initial calculation with respect to existing other residential developed property, non-residential developed property, and vacant property and may from time to time change this calculation from the information and data deemed pertinent by the director. With respect to property proposed to be non-residential developed property, the applicant for development approval shall submit square footage impervious area calculations, in accordance with the submission requirements for the application being submitted, as set forth in the applicable section of Title 20 of this Code.

(c) *Stormwater charge credit*. A system of credits, which may reduce the stormwater charge that is imposed, as provided for above, is hereby established. A credit shall be granted for developed or undeveloped property pursuant to the rules provided for herein. The director shall, pursuant to the rules provided for herein, grant a credit to those owners or non-owner users of properties, against which stormwater charges are imposed, who employ structural or non-structural best management practices or other stormwater management practices on-site that significantly reduce the quantity or significantly improve the quality of stormwater run-off from their property that enters the system. The director shall propose rules providing guidelines for the awarding of credits. The council shall approve, or approve as modified, these rules for the awarding of credits. The rules shall be consistent with this section. A credit also shall be granted in a percentage amount set by said city council pursuant to the rules for properties with respect to which a final plan or final plat has been approved or other final development approval has been granted by the city, on or before the effective date of this ordinance, which requires the construction of an on-site structural or non-structural best management practices or other stormwater management practices that significantly reduce the quantity or improve the quality of stormwater run-off from their property that enters the system, provided that, the practices are constructed and/or operational within one (1)year from the date of the applicable final approval. The credit shall begin in the fiscal year that the practice becomes operational. The credit for the first year, however, shall be prorated to reflect the number of months of the first fiscal year that the practices are operational, where appropriate. (2004-Or-132, § 1, 11-5-04)

510.70. Appeal procedure. (a) Owners of residential developed property, non-residential developed property or vacant property, with respect to which a stormwater charge has been imposed, that disagree:

(1) With the class into which their single-family residential developed property is placed;
(2) With the calculation of the stormwater charge;
(3) With whether their property is benefited by the stormwater utility; or
(4) With whether their property is entitled to a credit or the continuation of a credit or on the amount of a credit;

may appeal the calculation or finding to a designee of the director by giving written notice of the appeal to the director at the director's customary offices within the (10) days of notice of that determination.

The director's designee assigned to hear such appeal shall not be a person that is regularly assigned to utility billing or the stormwater utility. Appeals from the calculation or finding to the designee of the director, as delineated herein above are separate and distinct from the billing complaint procedures established by Sections 509.920 and 509.930 of this Code.

(b) The director's designee shall give written notice of the time and place for the review requested, pursuant to subsection (a) hereof, to the appealing owner or non-owner user. The review shall be held within fifteen (15) days of receipt by the director of the written appeal. In addition to any oral presentation, appellant shall state all grounds supporting the appeal in writing, attaching any exhibits, such as photographs, drawings or maps and affidavits that support the claim. In addition, the appellant shall submit a land survey prepared by a registered surveyor showing dwelling units, total property area, type of surface material and impervious area, as appropriate, and any other information that the director shall designate in writing to the appellant. The director may waive the submission of a land survey, if director determines that the survey is not necessary to make a determination on the appeal.

(c) The burden of proof shall be on the appellant to demonstrate, by clear and convincing evidence, that the determination of the director, from which the appeal is being taken, is erroneous.

(d) The filing of a notice of appeal shall not stay the imposition, calculation or duty to pay the stormwater charge. The appellant shall pay the stormwater charge, as stated in the billing.

(e) Within fifteen (15) days of the review, the director's designee shall send a written copy of the designee's decision to the appellant with a copy to the director.

(f) If the appellant believes this decision is in error, the appellant may file a written request for a review by the city council based on the written record by filing a request with the city clerk with a copy to the director. The request for review shall be reviewed based on the written record by a committee or subcommittee of the city council, or by a person appointed by the city council, or any designated combination thereof, within thirty (30) days of the filing of the request. The report of the committee, subcommittee and/or other reviewer shall be referred to the full council and be acted upon by the full council within thirty (30) days of the review. The decision of the city council on appeal is subject to judicial review, as provided by the laws of the state.

(g) If the director's designee's determines, upon appeal, that appellant should not pay a charge, pay a charge amount less than the amount appealed from, receive a credit or receive a greater credit than the credit appealed from or the city council, upon appeal, so determines, the city shall issue a check to the appellant in the appropriate amount within ten (10) days of the date of the applicable decision, provided the charge has, as required herein, been paid by the appellant. (2004-Or-132, § 1, 11-5-04)

510.80. Stormwater charge collection.(a) The stormwater charge shall be billed and collected by the city. The stormwater charge shall be shown as a separate item on the billing from the sewer utility charge levied and assessed pursuant to Section 511.290. In the event the owner and non-owner of a particular developed property are not the same, the liability for the owner and non-owner user for the stormwater charge attributable to the developed property shall be joint and severable. The same administrative procedures for special assessments shall be applied to the stormwater charge, as are applied for water use under Chapter 509 of this Code.

(b) Pursuant to Minnesota Laws 1973, Chapter 320, whenever payment remains in default for a stormwater charge, the city council may annually levy an assessment equal to the unpaid costs, including penalty and interest against each developed property that is not exempt property and upon which the stormwater charge is unpaid. (2004-Or-132, § 1, 11-5-04)

510.90. Stormwater fund. Stormwater charges collected by the city shall be paid into a fund that is hereby created and shall be known as the "Stormwater Fund." This fund shall be used for the purpose of paying costs of capital improvements, administration of the stormwater utility, operation and maintenance and debt service of the stormwater management system and to carry out all other purposes of the utility. (2004-Or-132, § 1, 11-5-04)

510.100. Equivalent stormwater unit (ESU) rate. The ESU and the ESU rate that is used to determine the charge for each class of residential developed property, other residential developed property, non-residential developed property, and vacant property shall be as established in an ordinance or a resolution heretofore adopted or hereafter adopted by the city council, and as thereafter amended. (2004-Or-132, § 1, 11-5-04)

510.110. Severability. In the event that any portion or section of this chapter is determined to be invalid, illegal or unconstitutional by a court of competent jurisdiction, the decision shall in no manner affect the remaining portions or sections of this chapter, which shall remain in full force and effect.

Table 1 - Ordinance

TABLE INSET:

LAND USE	RANGE
Bar - Rest.- Entertainment	.60--.75
Car Sales Lot	.60--.95
Cemetery w/Monuments	.10--.25
Central Business District	.85--1.00
Common Area	.10--.25
Garage or Misc. Residential	.30--.55
Group Residence	.60--.75
Industrial Warehouse- Factory	.50--.90
Industrial Railway	.50--.90
Institution- School.- Church	.60--.95
Misc. Commercial	.60--.95
Mixed Commercial- Residential - Apt.	.60--.75
Multi-Family Apartment	.60--.75
Multi-Family Residential	.35--.50
Office	.60--.95
Parks & Playgrounds	.10--.25
Public Accommodations	.60--.95
Retail	.60--.95
Single Family Attached	.60--.75
Single Family Detached	ESU
Sport or Recreation Facility	.60--.95
Utility	.50--.90
Vacant Land Use	.10--.25
Vehicle Related Use	.60--.90

(2004-Or-132, § 1, 11-5-04; 2005-Or-102, § 1, 11-4-05)

Minneapolis Stormwater Utility Fee

Frequently Asked Questions

What is Stormwater?

Stormwater is runoff from a rainstorm or melting snow. City landscapes - unlike forests, wetlands, and grasslands that trap water and allow it to filter slowly into the ground - contain great areas of rooftops and impermeable asphalt and concrete surfaces that prevent water from seeping into the ground. Because of this, large amounts of water accumulate above the surface. Instead of soaking into the soil, much of this water will run off our properties and streets, drain into storm sewers, and be discharged into our lakes, rivers and streams.

Why is it important to manage stormwater?

Minneapolis, like other communities, needs to manage stormwater to protect people's homes and properties, the environment, lakes, streams, rivers. If this is not done, stormwater will cause flooding, pooling, erosion and pollution. Heavy rains that flood streets and yards can result in property damage. Stormwater runoff also picks up pollutants and debris from streets, parking lots, rooftops and yards carries the the pollutants into our streams, rivers and lakes.

What is the stormwater utility fee on my bill?

The stormwater utility fee pays for the City's stormwater system and annual maintenance costs. This helps to prevent and correct stormwater runoff problems throughout Minneapolis. All properties within the city limits, with very limited exceptions, are charged a monthly stormwater utility fee. This fee had existed in the past, but prior to 2005 had been included as part of a combined sanitary sewer/stormwater fee. By establishing a separate stormwater charge based on impervious area, the current system divides stormwater fees fairly among owners of different property types and charges only for the estimated demand that each property would place on the system.

How does the City's stormwater credit program encourage helpful environmental practices?

The stormwater fee incorporates opportunities for property owners to reduce their stormwater bill by taking environmentally friendly steps. Stormwater utility fee reductions, also called credits, are available to those who are using or installing stormwater management tools/practices on their properties. Installing rain gardens or other materials, such as pervious pavers, allows stormwater to soak into the ground, rather than run into storm sewers.

How can I get a stormwater credit on my utility bill?

Credit guidelines and application forms can be found on the on the City of Minneapolis stormwater web site. If you need additional information, please contact 612-673-2965.

How is the stormwater fee calculated?

The stormwater utility fee is charged on a per unit basis. Each ESU (**E**quivalent **S**tormwater **U**nit) is 1,530 square feet of impervious area on a property. The impervious area is estimated based on the size of the property, as well as the land use category. Single family properties are billed using one of the following rates:

High	1.25 ESU	$13.86
Medium	1.00 ESU	$11.09
Low	.75 ESU	$ 8.31

All other properties are billed as follows: (Gross Lot Size in square ft. X Runoff Coefficient) / 1,530 square ft = # of ESU's

What is impervious area: Surfaces where water can not flow through freely.

Examples of impervious surfaces include, but are not limited to the following:

- Building rooftops
- Driveways
- Sidewalks
- Parking lots
- Other paved areas

Impervious area may also include gravel and dirt areas that are compacted by frequent vehicular traffic or the frequent use of heavy equipment.

City of Minneapolis

Emergency Preparedness

Spill Response Protocol

1) Report to the State Duty Officer/911 Emergency Communications.

2) Assessment of the site/incident, determination of Incident Action Plan (IAP).

3) Secure appropriate City/ State/ Federal resources, as well as private contractors, for implementation of IAP.

4) Oversight of site incident remediation and recovery activities.

5) Investigation/determination of causation, potential penalties, and future prevention measures.

CITY OF MINNEAPOLIS
PUBLIC WORKS DEPARTMENT
Street Maintenance Division
Standard Operating Procedure for Vehicle Related Spills (VRS)
May, 2010

The purpose of this document is to provide detailed standard operating procedures for the Clean up of VRS sites and the management/disposal of the impacted spill debris.

DEFINITION of TERMS

MPCA: Minnesota Pollution Control Agency

MEM: Minneapolis Environmental Management (also historically known as Minneapolis Pollution Control)

MSMD: Minneapolis (Public Works) Street Maintenance Division

VRM: Vehicle Related Material: Petroleum products or other vehicle fluids that are inherently related to vehicular operations. This does not include materials that are being transported by a vehicle, unless the material is clearly labeled as being one of the aforementioned products.

VT: Volumetric Threshold: Minnesota has a 5 gallon minimum quantity for reporting petroleum spills. Spill of all other chemical or material in any quantity is reportable.

Spill debris: Sand that has been placed to absorb VRM and subsequently recovered for disposal.

Scenario Number 1: MPCA informs MEM of VRS

The driver of a vehicle involved in a spill is responsible for notifying the MPCA Duty Officer, if the VT is exceeded. The Duty Officer will immediately notify the MPCA Emergency Response Unit. If the spill is of the size and nature that the Emergency Response Unit determines should be handled by MEM, the MPCA will notify MEM and provide them with the details relating to the spill incident. The MEM representative will make a determination based on the information provided by the MPCA on how to proceed, and if appropriate (typically VRM in manageable quantities), contacts MSMD.

The MSMD will dispatch personnel with appropriate equipment to apply sand to the spill site. The sand will be given a period of time in which to absorb the VRM. The sand (spill debris) will then be removed by means of a street sweeper, and deposited at the established disposal site in a designated VRM spill debris pile. If a secondary sanding is required, the procedure will remain the same. Since the volume of the spill is greater than 5 gallons, a Hazardous Material Spill Data form (see Appendix A) must be completed as soon as possible (i.e. within 24 hours or the next business day). The completed form will be sent to the MEM as soon as possible. A final report on the action(s) taken will be sent to the MPCA from MEM.

Spill Debris Pile Management

Arrangements for disposal of the spill debris pile will be a collaborative effort by the MSMD and the Engineering Laboratory. As the spill debris pile reaches a size that becomes difficult to manage within the boundaries of the disposal site, the Engineering Laboratory will be contacted. The spill debris pile will be mechanically blended and the Laboratory will select representative samples for laboratory analysis, as required by MPCA regulations. The sampling and testing will require approximately one week to complete. After receiving the laboratory analysis data, the spill debris will be disposed of in a manner pre-approved by the MPCA and the Minneapolis Procurement Division.

Scenario Number II: The MSMD discovers a VRS

MSMD personnel discover a spill or are informed of a potential VRM spill from sources other than MEM or MPCA. After arriving at the scene, they will determine whether the incident is a VRM spill, (possibly from a vehicle collision, a spill from a labeled container, etc.) and will determine if the volume of the spill is greater than the VT (5 gallons).

- <u>Less than 5 gallons:</u> If the spill quantity is judged to be less than 5 gallons, no contact with MEM is necessary. Sand will be applied and the procedure will continue as described in Scenario I (i.e. subsequent sanding/sweeping and stockpiling into the spill debris pile). A Hazardous Materials Spill Data form must be completed for record and documentation purposes and retained at MSMD, <u>but is not to be sent to MEM.</u>

- <u>5 gallons or more:</u> If the MSMD representative determines that a volume of 5 gallons or more of VRM has been spilled, MSMD must contact MEM or MPCA. The same procedures for clean up and reporting (using the Hazardous Material Spill Data form) as in Scenario I will be followed. This form <u>must</u> be sent to MEM.

For both cases, the disposal of the VRM spill debris pile is as detailed in Scenario I.

Potential Modification to Scenario I and II

Regulatory officials may require separate stockpiling of spill debris from specific spill incidents. Separate sampling and laboratory analysis will be required in these cases. This may also be requested to create a distinct tracking mechanism of a given spill of significant quantities and/or from a billable source. This scenario will be determined on a case-by-case basis. The process for disposal will be the same as previous scenarios.

Scenario Number III: The MSMD becomes aware of a spill of unknown material or composition

The MSMD shall contact MEM before taking any action to clean up a spill of unknown composition. MEM will manage these spills through their contracts with private entities specializing in these activities, or manage and coordinate the cleanup with the MSMD. If MEM cannot be contacted, the MPCA Duty Officer should be contacted immediately.

ADDITIONAL INFORMATION

1. Currently the disposal site for spill debris is at the Linden Yards site. The material shall be placed in two 20 cubic-yard leak-proof roll-off containers with a counter-balanced lockable lids at the City Site.

2. List of Potential Contacts:

   - **Minnesota Pollution Control Agency (MPCA)**
     Duty Officer: 651-649-5451; 24 hours a day, seven days a week
   - **Minneapolis Environmental Management (MEM)**
     Steve Kennedy: 612-685-8528 (work)
     Tom Frame: 612-673-8501 (work)
     Emergency after-hours contacts:
     Tom Frame: 612-754-0762
   - **Engineering Laboratory**
     Paul Ogren: 612-673-2456
     Stephanie Malmberg: 612-673-3365
   - **Minneapolis Street Maintenance Division (MSMD)**
     Steve Collin: 612-673-5720 (work)
     Rick Jorgensen: 612-673-5720 (work)
     24 hours a day, 7 days a week: 612-673-5720

3. MSMD will be responsible for any billing of outside parties for services rendered for the clean up/disposal of a spill event. The MSMD, MEM and the Engineering Laboratory will develop a system for tracking cost associated with these operations. This information will be distributed, as it becomes available.

4. This is a statement of policies and procedures, which will be revised and updated as new information becomes available.

CITY OF MINNEAPOLIS - STREET DEPARTMENT

OIL AND HAZARDOUS MATERIAL SPILL DATA

DATE OF REPORT	TIME OF REPORT	NAME & ADDRESS OF RESPONSIBLE PARTY
DATE OF INCIDENT	TIME OF INCIDENT	
TYPE OF POLLUTANT	QUANTITY	CAUSE OF SPILL
PRECISE LOCATION		PERSON MAKING REPORT/PHONE NUMBER
AREAS AFFECTED		PARTY REPORTING SPILL TO STREET DEPT.
PROBABLE FLOW DIRECTION	SOIL TYPE	OTHERS CONTACTED: MPLS. PCA__________________________ MN PCA_____________________________ FIRE DEPT__________________________ POLICE_____________________________ OTHER______________________________
WATERS POTENTIALLY AFFECTED		
EFFECTS OF SPILL/ IMMEDIATE DANGER TO HUMAN LIFE, PROPERTY		PROXIMITY OF WELLS, SEWER, BASEMENTS
ACTION TAKEN TO DATE		IS THIS FIRST NOTICE REGARDING SPILL?
CONTAINMENT OF SPILL		WHO SHOULD BE CONTACTED FOR FURTHER INFORMATION? PHONE NO.
CLEAN-UP TO DATE: MATERIAL USED____________________ LOADER USED______________________ TRUCKS USED______________________ PICK-UP TRUCK USED _______________ MACHINE SWEEPER USED_____________ LABOR: FOREMAN HOURS_____________ SR. MAINT. MAN_____________ JR. MAINT. MAN_____________ OTHER_____________________		COMMENTS?

ORIGINAL: When job completed, send immediately to Street Accounting.
COPY 1 : Send to Street Accounting with daily time when labor/eq. first used.
COPY 2 : PCA NOTIFICATION COPY - send immediately(first available interoffice mailing) to Tom Frame, Licenses – Environmental Management, PSC, Room 414

STREET JOB#_____________

LABOR COST $___________
EQUIP COST $___________
MAT'L COST $___________
TOTAL COST $_______________

Source: Minneapolis Public Works – Street Maintenance

June, 2004

SPECIFICATION FOR DISPOSAL OF SPILL DEBRIS FROM VEHICLE RELATED SPILLS

City of Minneapolis
Department of Public Works

DEFINITIONS:

VRM: Vehicle Related Material: Petroleum products and other vehicle fluids that are inherently related to vehicular operations. This does not include materials that are being transported by a vehicle, unless the material is clearly labeled as being one of the aforementioned products.

SPILL DEBRIS: Sand that has been placed to absorb VRM and subsequently recovered for disposal.

CONTRACT PERIOD: The contract period shall be from July 1, 2004 to June 30, 2007.

SCOPE:

These specifications cover the loading, transportation and disposal of spill debris from a central site located within the City of Minneapolis. The "Contractor" for the purposes of this specification, refers to a permitted landfill facility that has been approved by the appropriate regulatory agencies.

GENERAL:

The City of Minneapolis expects to generate an estimated 500 cubic yards of spill debris during the contract period. This quantity is only an estimate of the City's requirement for said contract period, and may be increased or reduced in any amount without any adjustment in unit price. The primary source of this material is from the results of clean-up operations following vehicular collisions or accidental discharge from vehicles.

The spill debris will consist primarily of sand used to absorb VRM from City streets, as well as plastic sheeting used during the storage process. The Contractor will be required to transport and dispose of all such materials that have been stored at the City facility. The only acceptable disposal method for the spill debris shall be placement into or used as daily cover at a certified and fully permitted landfill facility.

SCOPE OF SERVICES:

The Contractor shall:

Provide two (2) 20 cubic-yard leak-proof roll-off containers with a counter-balanced lockable lid for the duration of the contract period at the City of Minneapolis Linden Yard Site, or any other designated site within the City of Minneapolis. The City of Minneapolis will provide Contractor access to this container throughout the contract period.

When a container is filled with spill debris, the City of Minneapolis will mechanically blend the material in the container and perform sampling and laboratory analysis in accordance with Minnesota Pollution Control Agency Guidance Documents. Any additional analyses required by the Contractor shall be stated in the proposal.

The City of Minneapolis will forward all pertinent analytical laboratory results to the Contractor.

The Contractor shall state in the proposal, the length of time needed, following receipt of the laboratory test results, before the full container is transported to the Contractors facility.

The City of Minneapolis will contact the Contractor, once a roll-off container is full and sampling/ analyses has begun. It shall be the responsibility of the Contractor to provide a replacement container for subsequent and interim spill debris storage. There must be, at all times, adequate space in a container available for the storage of spill debris at the City of Minneapolis facility.

The Contractor shall obtain all proper permits and manifests for the loading, transporting, and disposal of the spill debris. The contractor shall load and haul all such material to an approved disposal site. The disposal method shall be approved by the appropriate regulatory agency(s). The Contractor shall provide documentation of all required approvals to the City of Minneapolis prior to acceptance of the material. The Contractor shall also provide the City with any and all documentation required by regulatory agencies, following the disposal of the spill debris.

CONTENT OF PROPOSALS:

The following required information shall accompany each bid:

Location of landfill site.
Cost per ton of material for disposal, utilizing the aforementioned 20 cubic-yard roll-off containers.
Cost per ton of material for disposal when the material is stockpiled without the use of a roll-off container. (Minimum stockpile being 10 tons)
The cost per ton for Superfund/CERCLA indemnification (include limits).
Cost per day for two (2) 20 cubic-yard leak-proof roll-off containers with a counter-balanced lockable lid at the Minneapolis site.
Cost for the option, at the sole discretion of the city, of extending this agreement for each of two additional years.
List of subcontractors and functions.
Qualification and experience of Contractor and all subcontractors

The bid will be based on a per ton (2000 pound) basis, which will include all transportation, permitting and regulatory cost. All loads shall be weighed on scales certified by the State of Minnesota

GENERAL TERMS AND CONDITIONS:

The following are the general terms and conditions, supplemental to those contained elsewhere in these specifications, which responding Contractors must comply with in order to be consistent with the requirements for the specification. Any deviation from these or any other stated requirements must be listed as exceptions on the bid sheet.

Once the bid forms are submitted in response to these specifications, they become the property of the City of Minneapolis, whether or not the bid is accepted. The City shall have the right to use any ideas presented in any bid submitted.

Representatives of the City of Minneapolis will review all bids received. An interview may be part of the evaluation process. Factors, upon which the proposal will be judged include, but are not limited to, the following:

Residual risk to the City of Minneapolis following disposal.
Expressed understanding of the project objective.
Cost of disposal.
Project work plan, including level of detail.
Qualification of both the Contractors assigned personnel, and subcontractors.

CITY'S RIGHTS:

The City reserves the right to reject any or all proposals or parts of proposals, to accept part or all of proposal on the basis considerations other than lowest cost, and to create a project of lesser or based on the component prices submitted. The City also reserves the right to cancel the Agreement without penalty, if circumstances arise which prevent the City from completing the project. In addition, the City reserves the right to re-bid for any phase of this work.

HOLD HARMLESS:

The Contractor agrees to defend, indemnify and hold harmless the City, its officer and employees, from any liabilities, claims, damages, costs, judgments, and expenses, including attorney's fees, resulting directly or indirectly from an act or omission of the contractor, it's employees, agents or employees of subcontractors, in the performance of this contract or by reason of the failure of the contractor to fully perform, in any respect, all of its obligation under this contract.

The City agrees to defend and hold harmless insofar as the law allows the Contractor, its officers and employees, from any liabilities, claims, damages, cost, judgements, and expenses, including attorney's fees, resulting directly or indirectly from an act or omission of the City or its employees in the performance under this contract or by reason of the failure of the city to fully perform its obligations under this contract.

INTEREST OF MEMBERS OF CITY:

The Contractor represents and agrees that no member of the governing body, officer, employee or agency of the City has any interest, financial or otherwise, direct or indirect, in the Agreement.

EQUAL OPPORTUNITY STATEMENT:

Contractor agrees to comply with the provisions of all applicable federal, state and City of Minneapolis statutes, ordinances and regulations pertaining to civil rights and nondiscrimination including without limitation Minnesota Statute, Section 181.59 and Chapter 363 and Minneapolis code of Ordinances, Chapter 139, incorporated herein by reference.

AFFIRMATIVE ACTION:

Persons who are authorized to enter into contractual relationships with the City are encouraged to review the City's policies on Affirmative Action.

NON-DISCRIMINATION:

The Contractor will not discriminate against any employee or applicant for employment because of race, color, creed, religion, ancestry, sex, national origin, affectional preference, disability, age, marital status or status regard to public assistance or as a disabled veteran or veteran of the Vietnam era. Such prohibition against discrimination shall include, but no limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and section for training, including apprenticeship.

The Contractor shall agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the City, setting forth this nondiscrimination clause. In addition, the Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment with regard to race, creed, religion, ancestry, sex, national origin, affectional preference, disability, age, marital status or status wit regard to public assistance or status as a disabled veteran or veteran of the Vietnam era, and comply in all other aspects with the requirements of the Minneapolis Code, Chapter 139.

CONTRACT INCORPORATION OF PROPOSAL CONTENTS:

The contents of the proposal and any clarifications or modification to the contract thereof submitted by the successful proposer may, at the City's option, become part of the Agreement obligation and be incorporated by reference into the ensuing contract.

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INSURANCE:

This agreement shall be effective only upon the approval by the City of acceptable evidence of the insurance detailed below. Such insurance secured by the Contractor shall be issued by insurance companies acceptable to the City and admitted in Minnesota. The insurance specified may be in a policy or policies of insurance, primary or excess. Such insurance shall be in force on the date of the execution of the agreement and shall remain continuously in force for the duration of the contract period.

The Contractor and its subcontractors shall secure and maintain the following insurance:

a) Worker's Compensation insurance that meets the statutory obligations with Coverage B – Employer's Liability limits of at least $100,000 each accident, $500,000 disease – policy limit and $100,000 disease each employee.

b) Commercial General Liability insurance with limits of at least $500,000 general aggregate, $500,000 products – completed operations $500,000 personal and advertising injury, $500,000 each occurrence $50,000 fire damage, and $5,000 medical expense any one person. The policy shall be on an “occurrence” basis, shall include contractual liability coverage and the City shall be named an additional insured.

c) Commercial Automobile Liability insurance covering all owned, non-owned and hired automobiles with limits of at least $500,000 per accident.

Acceptance of the insurance by the City shall not relieve, limit or decrease the liability of the Contractor. Any policy deductible or retention shall be the responsibility of the Contractor. The Contractor shall control any special unusual hazards and be responsible for any damages that result from those hazards. The City does not represent that the insurance requirements are sufficient to protect the Contractor’s interest or provide adequate coverage.

Evidence of coverage is to be provided on a City provided Certificate or Insurance. A thirty- (30) day written notice is required if the policy is canceled, not renewed or materially changed.

The Contractor shall require all of its subcontractors to comply with this provision.

The Contractor shall not assign any interest in the Agreement, and shall not transfer any interest in the same (whether by assignment or novation) without the prior written approval of the City, provided, however, that claims for money due or to become due to the contractor may be assigned to a bank, trust company or other financial institution, or to a Trustee in Bankruptcy without such approval. Notice to any such assignment or transfer shall be furnished promptly to the City.

COMPLIANCE REQUIREMENTS

All Contractors hired by the City of Minneapolis are required to abide by the regulations of the Americans with Disabilities Act of 1990 (ADA) which prohibits discrimination against individuals with disabilities. The Contractor will not discriminate against any employee or applicant for employment because their disability and will take affirmative action to insure that all employment practices are free from such discrimination. Such employment practices include but are not limited to the following: Hiring, promotion, demotion, transfer, recruitment, or recruitment advertising, layoff, discharge, compensation and fringe benefits, classification referral and training. The ADA also requires contractor associated with the City of Minneapolis to provide qualified applicants and employees with disabilities with reasonable accommodations that do not impose undue hardship. Contractors also agree to post in conspicuous areas accessible to employees and applicants, notices of their policy on nondiscrimination.

In the event the Contractor’s noncompliance with the nondiscrimination clauses of this agreement, this agreement may be cancelled, terminated, or suspended, in whole or part, and the Contractor may be declared ineligible by the Minneapolis City Council from any further

Grit Chambers Cleaned and Inspected in 2010

Grit ID	Location	Route	Date Inspected	Date Cleaned
139	EWING AVE S @ W FRANKLIN AV	N	1/27/2010	
113	20' E OF VAN WHITE MEM BLVD (NB) & 5TH AV N (1016 - 5TH AV N)	N	2/4/2010	2/4/2010
88	ACROSS THE STREET FROM 702, NO. BD. VAN WHITE BLVD.	N	2/5/2010	
89	ACROSS THE STREET FROM 706, NO. BD. VAN WHITE BLVD.	N	2/5/2010	
90	10TH AVE. NO. & ALDRICH AVE. NO. (S.W.C.)	N	2/5/2010	
2	RUSSELL AVE N & 53RD AVE N	N	2/25/2010	
38	W 47TH ST & YORK AVE S	SW	3/1/2010	
14	JAMES AVE N, NORTH OF 49TH AVE N	N	3/2/2010	3/2/2010
97	29TH AVE. & LOGAN AVE. - NO. STORM WATER DET. POND (E & W)	N	3/2/2010	3/2/2010
96	8TH AVE. NO. & NO. BD. VAN WHITE BLVD. (N.E.C.)	N	3/3/2010	3/4/2010
114	DUPONT AVE. NO. & 4TH AVE. NO.	N	3/3/2010	
9	OLIVER AVE N & 51ST AVE N	N	3/9/2010	
109	22ND AVE N AND W RIVER ROAD	N	3/15/2010	3/15/2010
136	111 22ND AV N (ALLEY BTWN 1ST & 2ND ST N @ VACATED 21ST AV N)	N	3/15/2010	3/15/2010
150	W RIVER ROAD AND 23RD AVE N	N	3/15/2010	3/15/2010
47	E 55TH ST & PORTLAND AVE S	SW	3/16/2010	3/16/2010
123	COLUMBUS AVE S SOUTH OF E 37TH ST	SW	3/16/2010	
124	COLUMBUS AVE S - CHICAGO AVE S ALLEY	SW	3/16/2010	
125	COLUMBUS AVE S ACROSS FROM #3644	SW	3/16/2010	
126	E 37TH ST AND COLUMBUS S # 3640 COLUMBUS	SW	3/16/2010	3/16/2010
77	ALLEY - 38TH TO 39TH ST & NICOLLET TO BLAISDELL AVE	SW	3/17/2010	
85	3329 14TH AVE S	S	3/17/2010	3/17/2010
116	400' NORTH VAN WHITE MEM. BLVD (S.B.) AND 4TH AVE N	N	3/17/2010	3/18/2010
48	E 56TH ST & PORTLAND AVE S	SW	3/18/2010	3/18/2010
49	E 57TH ST & PORTLAND AVE S	SW	3/18/2010	3/18/2010
115	VAN WHITE MEMORIAL BLVD (S.B.) & 4TH AVE N	N	3/24/2010	3/24/2010
119	11TH AVE N AND VAN WHITE BLVD (N.B.)	N	3/24/2010	3/24/2010
24	DREW AVE S & W LAKE ST	SW	3/26/2010	
32	E 42ND ST & BLOOMINGTON AVE S	S	3/26/2010	
37	46TH AVE S & GODFREY RD	S	3/26/2010	3/26/2010
86	13TH AVE S & E 35TH ST	S	3/26/2010	3/26/2010
51	GIRARD AVE S BETWEEN W 59TH ST & W 60TH ST	SW	3/29/2010	3/29/2010
53	GIRARD AVE S & W 60TH ST	SW	3/29/2010	
57	GRASS LAKE SERVICE ROAD BEHIND #6077 JAMES AVE S	SW	3/29/2010	
58	GRASS LAKE SERVICE ROAD BEHIND #1416 W 61ST ST	SW	3/29/2010	
59	W 61ST ST & GRASS LAKE SERVICE ROAD	SW	3/29/2010	
71	THE MALL & E LAKE OF THE ISLES	SW	3/29/2010	
91	SO. BD. VAN WHITE BLVD., 200' SO. OF 8TH AVE. NO.	N	3/29/2010	3/29/2010
92	ACROSS THE STREET FROM 701, SO. BD. VAN WHITE BLVD.	N	3/29/2010	3/29/2010
93	SO. BD. VAN WHITE BLVD., 250' SO. OF 10TH AVE. NO.	N	3/29/2010	3/29/2010
118	200' NORTH (POND SIDE) OF VAN WHITE MEM BLVD (SB) & 10TH AV N	N	3/29/2010	3/29/2010
1	UPTON AVE N & 53RD AVE N	N	3/30/2010	3/30/2010

Source: Minneapolis Public Works - SWS Operations

Grit Chambers Cleaned and Inspected in 2010

Grit ID	Location	Route	Date Inspected	Date Cleaned
78	SHINGLE CREEK WETLAND - W SIDE	N	3/30/2010	3/30/2010
127	E 37TH ST AND COLUMBUS S # 3700 COLUMBUS	SW	3/31/2010	
5	PENN AVE N & 52ND AVE N	N	4/1/2010	4/1/2010
6	PENN AVE N & 52ND AVE N	N	4/1/2010	4/1/2010
30	YORK AVE S & W LAKE CALHOUN PARKWAY	SW	4/1/2010	4/23/2010
111	RICHFIELD RD. NEAR W. CORNER OF THE PARKING LOT	SW	4/1/2010	4/1/2010
112	W. 36TH ST. 30' W. OF CALHOUN PARKWAY	SW	4/1/2010	4/1/2010
62	HIAWATHA PARK REFECTORY TURN-A-ROUND	S	4/2/2010	4/2/2010
79	SHINGLE CREEK WETLAND - EAST SIDE	N	4/2/2010	4/2/2010
142	18TH AVE S SOUTH OF E LAKE ST	S	4/2/2010	
143	LONGFELLOW AVE S SOUTH OF E LAKE ST	S	4/2/2010	4/2/2010
8	NEWTON AVE N & SHINGLE CREEK	N	4/5/2010	
10	MORGAN AVE N & 51ST AVE N	N	4/5/2010	
11	KNOX AVE N & 51ST AVE N	N	4/5/2010	
4	RUSSELL AVE N NORTH OF 52ND AVE N	N	4/8/2010	
7	OLIVER AVE N & 52ND AVE N	N	4/8/2010	
12	KNOX AVE N & 50TH AVE N	N	4/8/2010	4/8/2010
36	E 46TH ST & 31ST AVE S	S	4/8/2010	4/8/2010
80	WOODLAWN BLVD & E 50TH ST	S	4/8/2010	4/8/2010
3	SHERIDAN AVE N, N OF 52ND AVE N	N	4/12/2010	4/12/2010
73	4552 KNOX AVE N (IN ALLEY BEHIND)	N	4/12/2010	
82	12TH AVE S & POWDERHORN TERRACE	S	4/15/2010	4/15/2010
17	XERXES AVE N & GLENWOOD AVE	N	4/16/2010	4/16/2010
98	MALMQUIST LN. & HUMBOLDT NO.	N	4/22/2010	4/22/2010
120	VAN WHITE MEM. BLVD (SB) (160' S of Fremont Av N on E side of the st)	N	4/22/2010	
121	50' N (E SIDE) OF VAN WHITE MEM BLVD (SB) AND FREMONT AV N	N	4/22/2010	4/29/2010
22	W 22ND ST & JAMES AVE S	SW	4/23/2010	4/23/2010
84	3421 15TH AVE S (180' W OF CL)	S	4/26/2010	4/26/2010
99	SHINGLE CREEK DR. & HUMBOLDT NO.	N	4/26/2010	4/26/2010
100	SO. OF 49TH AVE. NO. & HUMBOLDT NO.	N	4/26/2010	4/26/2010
11	KNOX AVE N & 51ST AVE N	N	4/27/2010	4/27/2010
83	13TH AVE S & POWDERHORN TERRACE	S	4/27/2010	4/27/2010
87	3318 10TH AVE S	S	4/27/2010	4/27/2010
101	NO. OF 49TH AVE. NO. & HUMBOLDT NO.	N	4/27/2010	4/27/2010
18	MORGAN AVE N & CHESNUT AVE	N	4/28/2010	4/28/2010
13	IRVING AVE N & 50TH AVE N	N	4/30/2010	4/30/2010
38	W 47TH ST & YORK AVE S	SW	4/30/2010	
39	W 47TH ST & WASHBURN AVE S	SW	4/30/2010	
44	SHERIDAN AVE S & W 50TH ST	SW	4/30/2010	4/30/2010
44	SHERIDAN AVE S & W 50TH ST	SW	4/30/2010	4/30/2010
61	E RIVER ROAD & CECIL ST	E	4/30/2010	5/3/2010
64	26TH AVE N & PACIFIC (N TRANSFER STATION)	N	4/30/2010	4/30/2010

Source: Minneapolis Public Works - SWS Operations

Grit Chambers Cleaned and Inspected in 2010

Grit ID	Location	Route	Date Inspected	Date Cleaned
66	MAPLE PLACE @ E ISLAND AVE	E	4/30/2010	
67	DELASALLE DR & E ISLAND	E	4/30/2010	
68	W ISLAND - 300' S OF MAPLE PLACE	E	4/30/2010	
69	EASTMAN AVE & W ISLAND	E	4/30/2010	
72	S OF 37TH AVE NE & ST ANTHONY PKWY	E	4/30/2010	5/3/2010
94	10TH AVE. NO. & NO. BD. VAN WHITE BLVD. (S.W.C.)	N	4/30/2010	4/30/2010
32	E 42ND ST & BLOOMINGTON AVE S	S	5/4/2010	
43	16TH AVE S & E MINNEHAHA PKWY	S	5/4/2010	5/4/2010
37	46TH AVE S & GODFREY RD	S	5/5/2010	5/5/2010
28	W 33RD ST & HOLMES AVE S	SW	5/17/2010	5/17/2010
29	W 33RD ST & GIRARD AVE S	SW	5/18/2010	5/18/2010
134	W 22ND ST @ E LAKE OF THE ISLES BLVD	SW	5/20/2010	5/20/2010
96	8TH AVE. NO. & NO. BD. VAN WHITE BLVD. (N.E.C.)	N	5/24/2010	5/24/2010
122	MINNEHAHA PARKWAY @ 39TH AVE S N SIDE OF PKWY	S	5/24/2010	5/24/2010
19	GIRARD AVE NO & CURRIE AVE NO	N	5/26/2010	5/26/2010
33	E 43RD ST & PARK AVE S	SW	5/27/2010	
35	E 44TH ST & OAKLAND AVE S	SW	5/27/2010	
55	GRASS LAKE TERRACE, GIRARD TO JAMES AVE S	SW	5/27/2010	5/28/2010
21	LAKE OF THE ISLES PKWY & LOGAN AVE	SW	6/3/2010	6/3/2010
24	DREW AVE S & W LAKE ST	SW	6/3/2010	6/3/2010
46	MORGAN AVE S & W 53RD ST	SW	6/7/2010	6/7/2010
95	WEST SIDE OF ALDRICH AVE. NO. & 9TH AVE. NO.	N	6/9/2010	6/9/2010
31	CHOWEN AVE S & W 41ST ST	SW	6/15/2010	6/15/2010
144	31ST AVE S NORTH OF E LAKE ST (Hennepin County const.. Lake St.)	S	6/16/2010	6/16/2010
76	MARKET PLAZA & EXCELSIOR BLVD	SW	6/17/2010	6/17/2010
141	W LAKE ST EAST OF 14TH AVE S (Hennepin County const. Lake St.)	S	6/21/2010	6/21/2010
145	CEDAR AVE S AND E MINNEHAHA PARKWAY	S	6/21/2010	6/21/2010
50	E 58TH ST & PORTLAND AVE S	SW	6/22/2010	6/22/2010
45	JAMES AVE S & MINNEHAHA CREEK	SW	6/23/2010	6/23/2010
34	W 44TH ST & LAKE HARRIET PARKWAY	SW	6/24/2010	6/24/2010
41	W 48TH ST & YORK AVE S	SW	6/24/2010	
63	33RD AVE N & 1ST ST N/RAILROAD TRACKS	N	6/25/2010	
70	ROYALSTON & 5TH AVE N	N	6/25/2010	
27	W 32ND ST & BRYANT AVE S	SW	7/1/2010	7/1/2010
82	12TH AVE S & POWDERHORN TERRACE	S	7/1/2010	7/1/2010
86	13TH AVE S & E 35TH ST	S	7/1/2010	7/1/2010
123	COLUMBUS AVE S SOUTH OF E 37TH ST	SW	7/2/2010	7/2/2010
124	COLUMBUS AVE S - CHICAGO AVE S ALLEY	SW	7/2/2010	7/2/2010
126	E 37TH ST AND COLUMBUS S	SW	7/2/2010	7/2/2010
22	W 22ND ST & JAMES AVE S	SW	7/15/2010	7/15/2010
134	W 22ND ST @ E LAKE OF THE ISLES BLVD	SW	7/16/2010	7/16/2010
24	DREW AVE S & W LAKE ST	SW	7/19/2010	

Source: Minneapolis Public Works - SWS Operations

Grit Chambers Cleaned and Inspected in 2010

Grit ID	Location	Route	Date Inspected	Date Cleaned
28	W 33RD ST & HOLMES AVE S	SW	7/19/2010	
29	W 33RD ST & GIRARD AVE S	SW	7/19/2010	
47	E 55TH ST & PORTLAND AVE S	SW	7/20/2010	
48	E 56TH ST & PORTLAND AVE S	SW	7/20/2010	7/20/2010
96	8TH AVE. NO. & NO. BD. VAN WHITE BLVD. (N.E.C.)	N	7/20/2010	7/20/2010
97	29TH AVE. & LOGAN AVE. - NO. STORM WATER DET. POND (E & W)	N	7/20/2010	7/20/2010
114	DUPONT AVE. NO. & 4TH AVE. NO.	N	7/21/2010	7/21/2010
52	E 59TH ST & 12TH AVE S	S	7/27/2010	7/27/2010
115	VAN WHITE MEMORIAL BLVD (S.B.) & 4TH AVE N	N	7/27/2010	7/27/2010
2	RUSSELL AVE N & 53RD AVE N	N	8/3/2010	8/3/2010
139	EWING AVE S @ W FRANKLIN AVE	N	8/3/2010	8/3/2010
30	YORK AVE S & W LAKE CALHOUN PARKWAY	SW	8/6/2010	8/6/2010
21	LAKE OF THE ISLES PKWY & LOGAN AVE	SW	8/16/2010	8/16/2010
31	CHOWEN AVE S & W 41ST ST	SW	8/16/2010	8/16/2010
55	GRASS LAKE TERRACE, GIRARD TO JAMES AVE S	SW	8/23/2010	8/23/2010
1	UPTON AVE N & 53RD AVE N	N	8/26/2010	8/26/2010
5	PENN AVE N & 52ND AVE N	N	8/26/2010	8/26/2010
6	PENN AVE N & 52ND AVE N	N	8/26/2010	
7	OLIVER AVE N & 52ND AVE N	N	8/26/2010	8/26/2010
46	MORGAN AVE S & W 53RD ST	SW	8/27/2010	8/27/2010
61	E RIVER ROAD & CECIL ST	E	9/1/2010	9/1/2010
66	MAPLE PLACE @ E ISLAND AVE	E	9/1/2010	
67	DELASALLE DR & E ISLAND	E	9/1/2010	
69	EASTMAN AVE & W ISLAND	E	9/1/2010	
92	ACROSS THE STREET FROM 701, SO. BD. VAN WHITE BLVD.	N	9/10/2010	9/10/2010
119	11TH AVE N AND VAN WHITE BLVD (N.B.)	N	9/13/2010	9/13/2010
118	200' N (POND SIDE) OF VAN WHITE MEM. BLVD (SB) & 10TH AV N	N	9/14/2010	9/14/2010
123	COLUMBUS AVE S SOUTH OF E 37TH ST	SW	9/21/2010	9/21/2010
124	COLUMBUS AVE S - CHICAGO AVE S ALLEY	SW	9/21/2010	9/21/2010
126	E 37TH ST AND COLUMBUS S	SW	9/21/2010	9/21/2010
24	DREW AVE S & W LAKE ST	SW	9/24/2010	9/24/2010
26	W LAKE ST & ALDRICH AVE S	SW	9/24/2010	9/24/2010
54	GIRARD AVE S, W 60TH ST - DUPONT AVE S	SW	9/27/2010	9/28/2010
78	SHINGLE CREEK WETLAND - W SIDE	N	9/28/2010	9/28/2010
137	W 44TH ST @ LAKE HARRIET PKWY EAST	SW	9/29/2010	9/29/2010
10	MORGAN AVE N & 51ST AVE N	N	10/4/2010	10/4/2010
16	XERXES AVE N & 14TH AVE N	N	10/4/2010	10/5/2010
40	W 47TH ST & LAKE HARRIET PARKWAY	SW	10/4/2010	10/4/2010
3	SHERIDAN AVE N, N OF 52ND AVE N	N	10/5/2010	
9	OLIVER AVE N & 51ST AVE N	N	10/5/2010	10/5/2010
71	THE MALL & E LAKE OF THE ISLES	SW	10/7/2010	10/13/2010
21	LAKE OF THE ISLES PKWY & LOGAN AVE	SW	10/12/2010	10/12/2010

Source: Minneapolis Public Works - SWS Operations

Grit Chambers Cleaned and Inspected in 2010

Grit ID	Location	Route	Date Inspected	Date Cleaned
17	XERXES AVE N & GLENWOOD AVE	N	10/13/2010	10/13/2010
73	4552 KNOX AVE N (IN ALLEY BEHIND)	N	10/13/2010	10/13/2010
11	KNOX AVE N & 51ST AVE N	N	10/14/2010	10/14/2010
18	MORGAN AVE N & CHESNUT AVE	N	10/14/2010	10/14/2010
22	W 22ND ST & JAMES AVE S	SW	10/15/2010	10/15/2010
134	W 22ND ST @ E LAKE OF THE ISLES BLVD	SW	10/15/2010	10/15/2010
38	W 47TH ST & YORK AVE S	SW	10/18/2010	10/18/2010
41	W 48TH ST & YORK AVE S	SW	10/18/2010	10/18/2010
15	21ST AVE N & 1ST ST N	N	10/19/2010	10/19/2010
76	MARKET PLAZA & EXCELSIOR BLVD	SW	10/19/2010	10/19/2010
48	E 56TH ST & PORTLAND AVE S	SW	10/21/2010	10/21/2010
60	IRVING AVE S & W 61ST ST	SW	10/22/2010	10/22/2010
56	GRASS LAKE SERVICE ROAD BEHIND #6035 JAMES AVE S	SW	10/25/2010	10/25/2010
30	YORK AVE S & W LAKE CALHOUN PARKWAY	SW	10/28/2010	10/28/2010
42	QUEEN AVE S & LAKE HARRIET PARKWAY	SW	11/1/2010	11/2/2010
112	W. 36TH ST. 30' W. OF CALHOUN PARKWAY	SW	11/9/2010	11/9/2010
96	8TH AVE. NO. & NO. BD. VAN WHITE BLVD. (N.E.C.)	N	11/16/2010	11/16/2010
43	16TH AVE S & E MINNEHAHA PKWY	S	11/29/2010	11/29/2010

Source: Minneapolis Public Works - SWS Operations

2010 Outfall Inspection and Cleaning Report

Outfall ID	Route	Location	Date
70-380	S	E M' haha Pkwy at 11th Av S (s bank)	3/17/2010
70-385	S	E M ' haha Pkwy 150 ' W of 11th Av S (n bank)	3/17/2010
70-390	S	E M' haha Pkwy at 12th Av S (s bank)	3/17/2010
70-395	S	E M' haha Pkwy at 12th Av S (n bank)	3/17/2010
70-400	S	E 50th St at 13th Av S (s bank)	3/17/2010
70-405	S	E 50th St at Bloomington Av S (s bank)	3/17/2010
70-410	S	E 49th St at 16th Av S (s bank)	3/17/2010
70-420	S	E M' haha Pkwy at 18th Av S (s bank)	3/17/2010
70-425	S	E M' haha Pkwy at Cedar Av S (n bank)	3/17/2010
70-430	S	E M' haha Pkwy 1/2 mi. E of Longfellow Av (w bank)	3/22/2010
70-435	S	E M' haha Pkwy 1/2 mi. E of Longfellow Av (e bank)	3/22/2010
70-440	S	47th St E (extended) 1/2 mi. E Longfellow Av	3/22/2010
10-220	N	22nd Ave N	3/23/2010
10-230	N	21st Ave N	3/23/2010
10-240	N	West Broadway	3/23/2010
10-260	N	17th Ave N	3/23/2010
10-290	N	Plymouth Ave N	3/23/2010
10-280	N	14th Ave (extended)	3/30/2010
10-330	N	W River Pkwy approx. 500' SE of 4th Ave N	3/30/2010
10-340	N	W River Pkwy at 1st Ave N (extended)	3/30/2010
10-380	N	W River Pkwy at 2nd Ave S (extended)	3/30/2010
20-010	N	52nd Ave N and Sheridan Ave N (extended)	3/30/2010
20-012	N	53rd Ave N and Russell Ave N (extended)	3/30/2010
20-013	N	52nd Ave N and Russell Ave N (extended)	3/30/2010
20-020	N	Penn Ave N and 52nd Ave N	3/31/2010
20-030	N	52nd Ave N (Penn Av N)	3/31/2010
20-040	N	52nd Ave N (Oliver Ave N)	3/31/2010
20-050	N	Newton Ave N and 51st Ave N	3/31/2010
20-060	N	51st Ave N (Newton Av N)	3/31/2010

Comments Or Repairs Needed: Corrugated pipe is deteriorated, needs replacement

Work Done: Put in 16' 10"PVC, river rock and rip-rap - completed 6/17/2010

20-070	N	Knox Ave N	3/31/2010
70-465	S	30th Av S 500' N of E M ' haha Pkwy (s bank)	4/8/2010
70-470	S	30th Av S 500' S of E 46th St (n bank)	4/8/2010
70-475	S	Nokomis Av 200' S of 46th St (n bank)	4/8/2010
52-020	SW	Burnham Road @ Kenilworth Lagoon	7/12/2010
52-030	SW	Park Lane - 500' North of Burnham Road	7/12/2010

Comments Or Repairs Needed: Pipe has a hole in top steel to PVC, fernco on hole

52-040	SW	Burnham Road - '100' North of Cedar Lake Pkwy	7/12/2010
52-050	SW	Cedar Lake Pkwy @ Depot	7/12/2010
52-060	SW	Cedar Lake Pkwy @ Chowen (extended)	7/12/2010
52-070	SW	Cedar Lake Pkwy @ Drew Ave S (extended)	7/12/2010

Source: Minneapolis Public Works - SWS Operations

2010 Outfall Inspection and Cleaning Report

Outfall ID	Route	Location	Date
52-080	SW	Cedar Lake Pkwy @ Ewing Av S (extended	7/12/2010
52-090	SW	Cedar Lake Pkwy @ at Basswood Road	7/12/2010

Comments Or Repairs Needed: Remove one section of corrugated pipe, and rusted off

52-100	SW	Cedar Lake Pkwy @ West 24th St	7/12/2010
52-110	SW	Cedar Lake Pkwy @ West 22nd St	7/12/2010
10-250	E	12th Ave NE (Vacated)	7/13/2010
10-270	E	10th Ave NE	7/13/2010
10-300	E	8th Ave NE	7/13/2010
52-120	SW	Cedar Lake Pkwy @ West Franklin Av	7/13/2010
53-020	SW	West 26th St @ Lake of the Isles Parkway	7/13/2010
53-030	SW	Thomas Av S (Dean Blvd)	7/13/2010
10-060	E	St. Anthony Pkwy & 36th Ave NE	7/26/2010
53-040	SW	Lake of the Isles Parkway ('200' E of Russell Av S)	10/5/2010
53-050	SW	Lake of the Isles Parkway (West 24th ST)	10/5/2010
53-060	SW	Lake of the Isles Parkway (Penn Av S)	10/5/2010
53-070	SW	Lake of the Isles Parkway (Newton Av S)	10/5/2010
53-080	SW	Lake of the Isles Parkway (Oliver Av S)	10/5/2010
53-090	SW	West 21st St @ Lake of the Isles Blvd	10/5/2010
53-100	SW	Lake of the Isles Blvd @Franklin Av	10/5/2010
53-110	SW	Lake of the Isles Blvd @Franklin Av	10/5/2010
53-120	SW	Lake of the Isles Pkwy @ West 22nd St	10/5/2010
53-130	SW	Lake of the Isles Pkwy @ West 25th St	10/5/2010
53-140	SW	Lake of the Isles Pkwy @ West 26th St	10/5/2010
53-150	SW	Lake of the Isles Pkwy @ Euclid Place	10/6/2010
53-160	SW	Lake of the Isles Pkwy @ West 27th St	10/6/2010
53-170	SW	Lake of the Isles Pkwy @ '250' SW of James Av S	10/6/2010
53-180	SW	Lake of the Isles Pkwy @ '500' W of Lagoon	10/6/2010
53-190	SW	Lake of the Isles Pkwy @ West 28th St	10/6/2010
54-010	SW	E. Isles Pkwy at The Mall	10/6/2010
54-040	SW	E. Calhoun Pkwy at 33rd St. W	10/12/2010
54-050	SW	E. Calhoun Pkwy at 36th St W.	10/12/2010
54-060	SW	W. Calhoun Pkwy at Sheridan Av S.	10/12/2010
54-070	SW	W. Calhoun Pkwy at Vincent Av S	10/12/2010
54-080	SW	W. Calhoun Pwky at Xerxes Av S	10/12/2010
54-090	SW	W. Calhoun Pwky approx. '250' S. of W 36th St	10/12/2010
54-100	SW	W. Calhoun Pwky at W. 36th St	10/12/2010
54-110	SW	W. Calhoun Pwky at Rose Lane	10/12/2010
54-120	SW	W. Calhoun Pwky at Ivy Lane	10/12/2010
10-035	E	W side of Nicollet Island; Island Ave and Grove St at River	10/13/2010
10-360	E	East Hennepin (on Nicollet Island)	10/13/2010
54-130	SW	W. Calhoun Pwky approx. '200' N of W 32nd St	10/13/2010
54-140	SW	W. Calhoun Pwky at Market Place (extended)	10/13/2010

Source: Minneapolis Public Works - SWS Operations

2010 Outfall Inspection and Cleaning Report

Outfall ID	Route	Location	Date
54-150	SW	W. Calhoun Pwky at Calhoun Blvd (extended)	10/13/2010
54-160	SW	W. Calhoun Pwky at Dean Pwky	10/13/2010
54-170	SW	W. Calhoun Pwky approx. 200' E of Thomas Av S	10/13/2010
54-190	SW	W. Calhoun Pwky approx 750' E of Thomas Av S	10/13/2010
54-200	SW	W. Calhoun Pwky approx. 1000' E of Thomas Av S	10/13/2010
54-210	SW	W. Calhoun Pwky approx. 1000' E of Thomas Av S	10/13/2010

Source: Minneapolis Public Works - SWS Operations

Street Maintenance 2004 Costs and 5-Yr Budget

(NPDES activities: Roadways and Illicit Discharges)

STREET MAINTENANCE 2010 COSTS

Code	Activity	2010 Actual
CL05	Spring Clean up	2,007,913
CL10	Summer Sweeping	817,619
CL15	Fall Clean up	2,052,808
CL20	Storm Water Activity	0
CL25	Sweep Loop & Bus Dist	188,142
CL45	Misc. Street Sweep	77,911
CL55	Clean Paved Cntr Islnd	58,303
CL145	WFU- Sweeping	278,629
	Subtotal	5,481,324
CL60	Mach. Sweep Alleys	298,087
	Subtotal	298,087
CL70	Clean CB's & Drains	75,234
CL30	Flood Control	0
	Subtotal	75,234
CL35	Special Events	22,409
CL90	Misc. (storms)	52,790
CL75	Waste Disposal	152,311
CL80	Dump Maint.	192,785
CL01	Supervision	62,194
A09	Work Comp Claims	0
CL08	HVSL (JV from Admin.)	460,064
CL83	Misc. Expense	62,099
CL95	Debris Pick Up	142,591
	Other Tasks	21,554
	Subtotal	1,168,797
	TOTAL	**7,023,442**
	APPROVED BUDGET	**7,887,440**
		863,998
	Percent change from prev. year	-3%

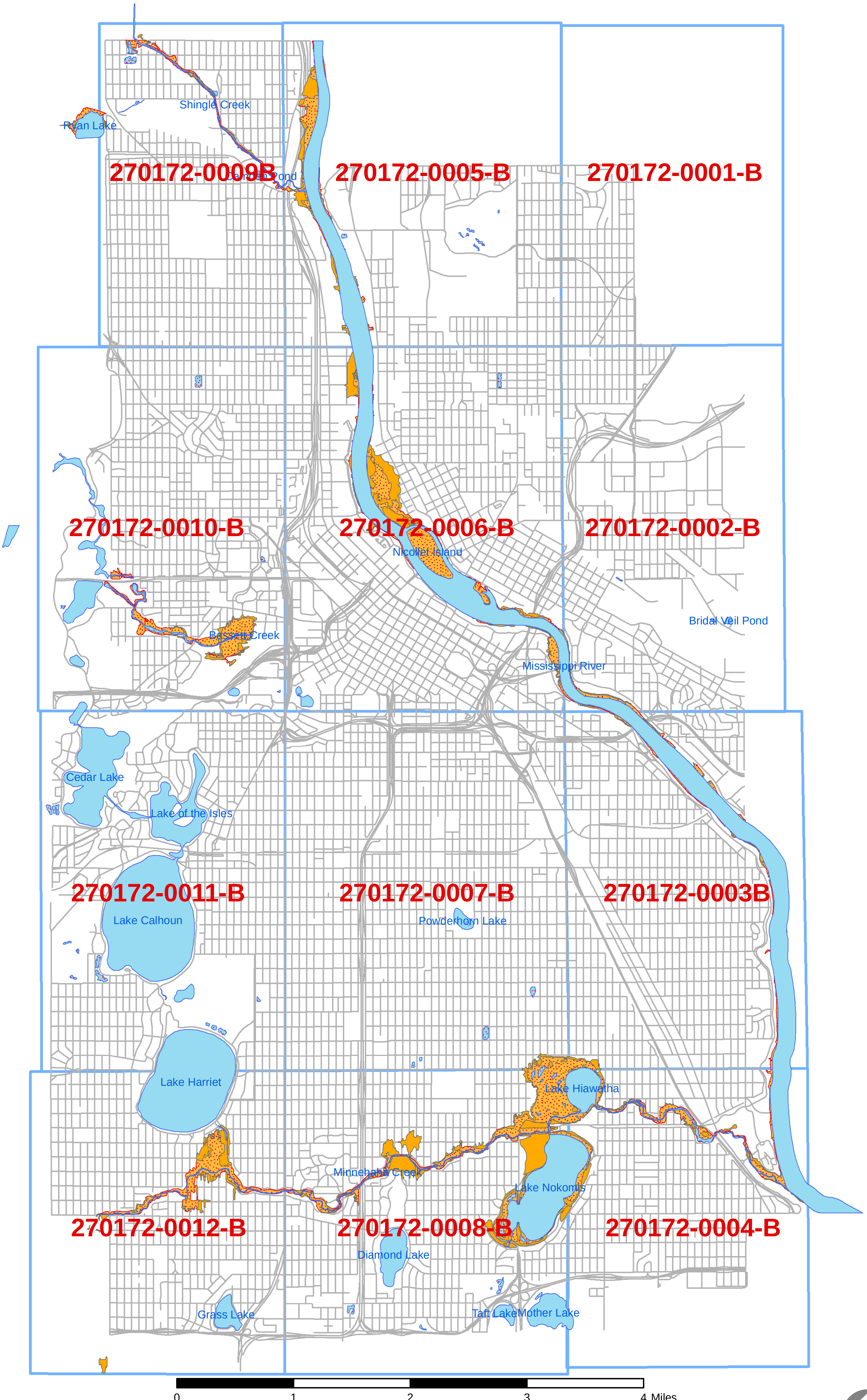
Source: Minneapolis Public Works - Steret Maintenance

Activities & Responsible Departments, by Section of Report

Structural Controls Maintenance and Operation	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Inspect controls (grit chambers, ponds, pump stations, other controls) at least 2 times a year. Adjust inspection frequency after 2 years to prevent pollutants being conveyed to the receiving water. Inspect 20% of outfalls on a rotating basis. Perform maintenance and repairs as needed, or provide a schedule for work required. Document inspection results, date, prior weather conditions, sediment storage and capacity remaining
Storm Sewer System Operation and Quality Control	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Maintain all facilities or systems in good working order and operate as efficiently as possible. Provide adequate operating staff to insure compliance with the conditions of this permit.
Disposal of Removed Substances from Structural Controls	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Dispose of removed substances in a way to prevent pollution and comply with applicable regulations. Document quantity of removed substances and categorize by structural control source, type of substance, and season.
New Developments and Construction	*Responsible department:* Regulatory Services Environmental Management, and Public Works Surface Water & Sewers Division
	Activities: Use a development review process to regulate construction, and require erosion control and stormwater management.
Roadways	*Responsible department:* Public Works Transportation Maintenance & Repair Division
	Activities: Sweep at least twice a year. Document frequency, methods, quantity of material picked up (categorize by season and/or material), disposal of materials. Use known practices to minimize runoff of deicing materials from application and handling activities. Document quantity of materials used each year. Minimize runoff of deicing materials from storage – document location and condition of all storage facilities, planned improvements.
Flood Control	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Design flood control projects to minimize the impacts on the water quality of the receiving water. When planning repairs, improvements, or changes for flood control devices, evaluate the feasibility of retrofitting the existing devices to provide additional pollutant removal from stormwater discharges.
Pesticides and Fertilizers	*Responsible department:* Minneapolis Park & Recreation Board
	Activities: Implement a citywide education program regarding the proper application of pesticides and fertilizers.
Illicit Discharges and Improper Disposal to Storm Sewer System	*Responsible department:* Regulatory Services Environmental Management, Public Works Transportation Maintenance & Repair Division, Public Works Surface Water & Sewers Division
	Activities: Provide appropriate control measures for non-stormwater discharges. Conduct field screening annually in 20% of the drainage areas. Prohibit disposal of motor vehicle fluids & household chemical wastes. Report number of spills and unauthorized discharges that occurred and the response to the spills. Educate staff regarding the duty to notify the Department of Public Safety Duty Officer. Adopt notification protocol for response and containment of materials.
Storm Sewer Design for New Construction	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Design & construct new storm drain and BMPs to capture runoff and pollutants.
Public Education	*Responsible department:* Public Works Surface Water & Sewers Division and Minneapolis Park & Recreation Board
	Activities: Conduct a public education program to promote, publicize, and facilitate the proper management of stormwater discharges.
Public Participation Process	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Adopt a process to allow for public input into the development of priorities and activities necessary to maintain compliance with this permit. Conduct a public hearing or other meeting where the opportunities for public testimony is available prior to annual report submittal & notify all governmental entities with jurisdiction over activities related to stormwater management in the area. Include a formal resolution from the City Council adopting the report with a summary of the public input received and the City's response.
Coordination with Other Governmental Entities	*Responsible department:* Public Works Surface Water & Sewers Division
	Activities: Submit an annual report by June of each year describing how the different governmental entities are cooperating and coordinating efforts in managing stormwater related activities in the drainage area including goals for each cooperative effort, where and how the activity will be performed, & schedule for implementation.
Stormwater Monitoring	*Responsible department:* Minneapolis Park & Recreation Board
	Activities: Conduct runoff monitoring. Provide analysis of data collected.

Appendix B

2008 F.E.M.A. DESIGNATED FLOOD ZONES



EFFECTIVE DATE FOR MAP PANEL 270172-0010-B IS DECEMBER 12, 2002

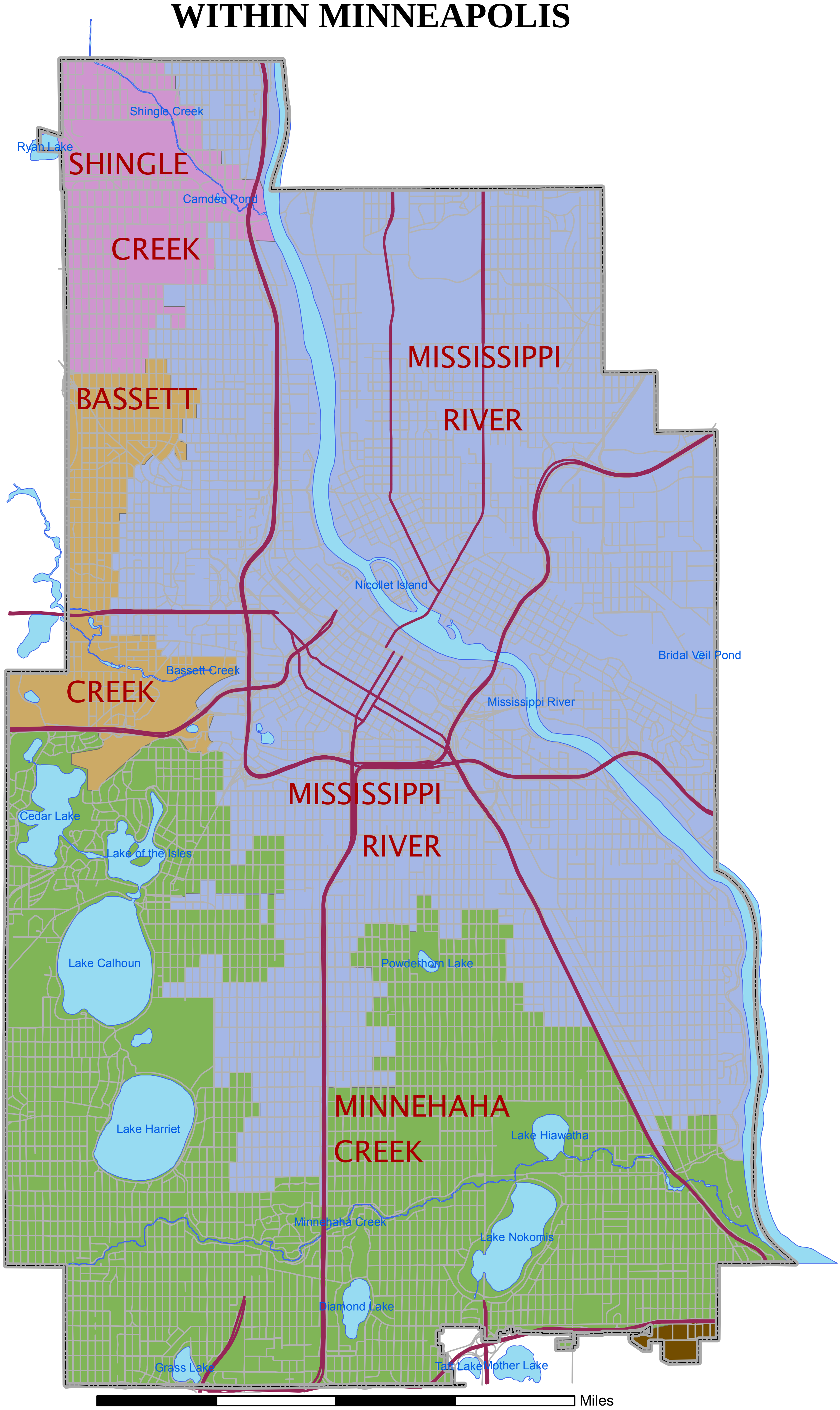
EFFECTIVE DATE FOR ALL OTHER MAP PANELS IS FEBRUARY 18, 1981

March, 2008

- Map Panels
- 100 Year Flood Zone
- 500 Year Flood Zone

MINNEAPOLIS PUBLIC WORKS
SURFACE WATER & SEWERS DIVISION

WATERSHED MANAGEMENT BOUNDARIES
WITHIN MINNEAPOLIS



Lakes & Streams

Bassett Creek Water Management Commission

Minneapolis/St. Paul International Airport

Minnehaha Creek Watershed District

Mississippi Watershed Management Organization

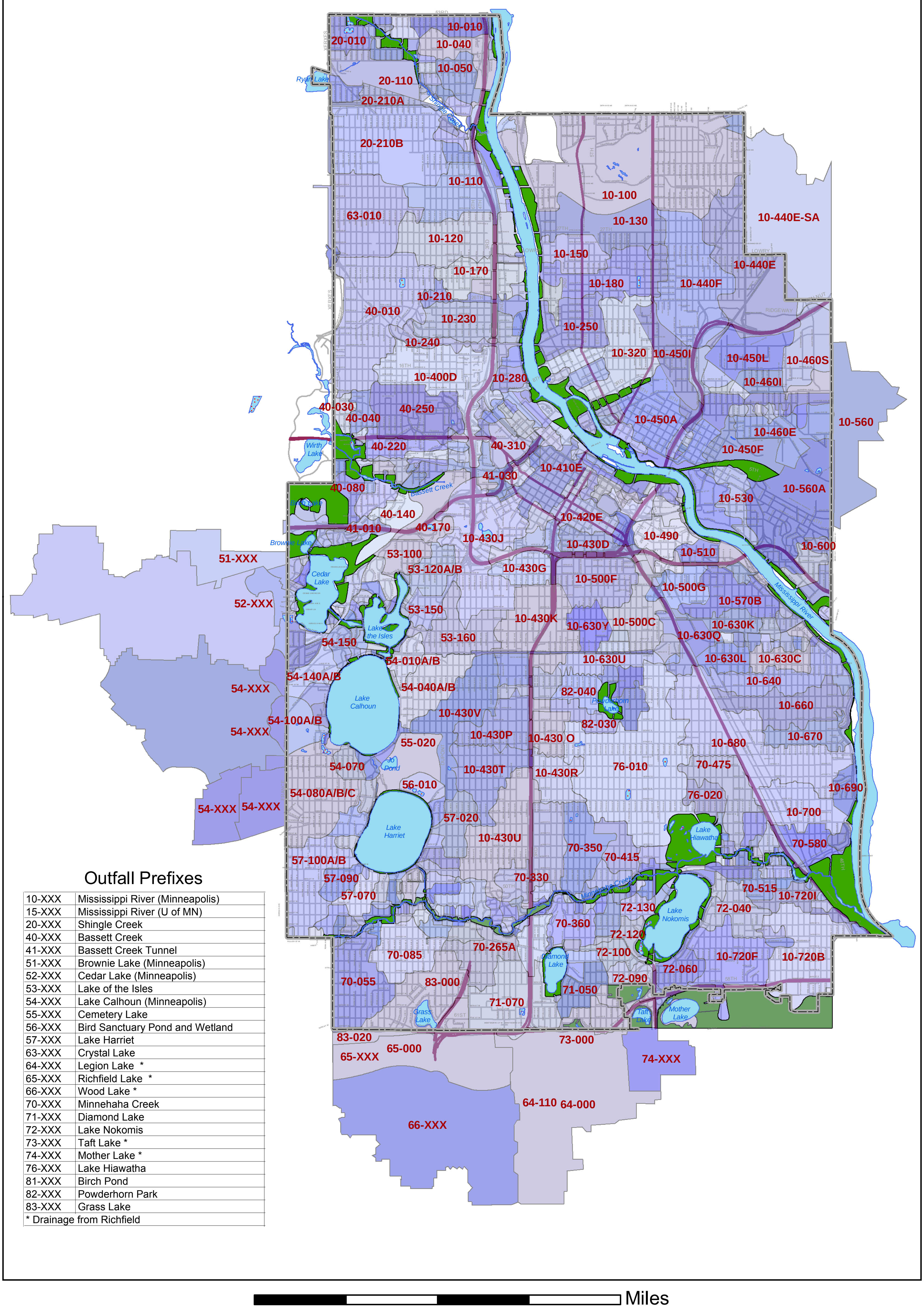
Shingle Creek Watershed Management Commission

MINNEAPOLIS PUBLIC WORKS
SURFACE WATER & SEWERS DIVISION

March, 2008

This Map was created from the City of Minneapolis Public Work's Geographic Information System (GIS), it is a compilation of information and data from various sources. This Map is not a surveyed or legally recorded document and is intended to be used as a reference. The City of Minneapolis and its Public Works Department is not responsible for any inaccuracies contained herein or any consequences resulting from the user's use of or reliance on this GIS data.

MINNEAPOLIS STORMWATER RUNOFF
DRAINAGE SUB-AREA BOUNDARIES



Outfall Prefixes

10-XXX	Mississippi River (Minneapolis)
15-XXX	Mississippi River (U of MN)
20-XXX	Shingle Creek
40-XXX	Bassett Creek
41-XXX	Bassett Creek Tunnel
51-XXX	Brownie Lake (Minneapolis)
52-XXX	Cedar Lake (Minneapolis)
53-XXX	Lake of the Isles
54-XXX	Lake Calhoun (Minneapolis)
55-XXX	Cemetery Lake
56-XXX	Bird Sanctuary Pond and Wetland
57-XXX	Lake Harriet
63-XXX	Crystal Lake
64-XXX	Legion Lake *
65-XXX	Richfield Lake *
66-XXX	Wood Lake *
70-XXX	Minnehaha Creek
71-XXX	Diamond Lake
72-XXX	Lake Nokomis
73-XXX	Taft Lake *
74-XXX	Mother Lake *
76-XXX	Lake Hiawatha
81-XXX	Birch Pond
82-XXX	Powderhorn Park
83-XXX	Grass Lake
* Drainage from Richfield	

March, 2008

MINNEAPOLIS PUBLIC WORKS
SURFACE WATER & SEWERS DIVISION

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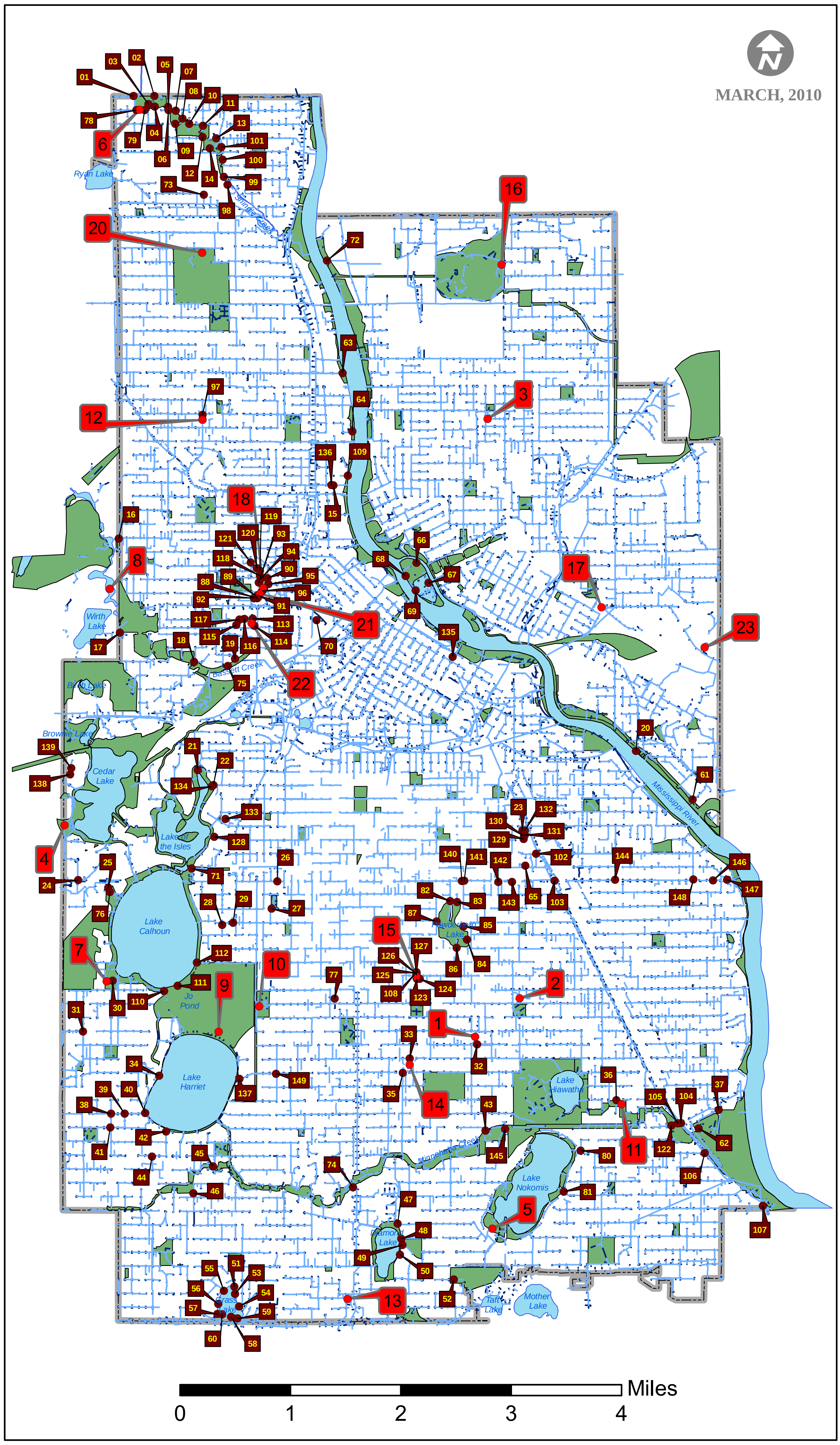
City of Minneapolis Grit Chambers & Stormwater Ponds

Grit Chambers

Chamber ID	Location	Year Built	Watershed
1	UPTON AV. N. & 53RD AV. N	1996	20-011 SHINGLE CREEK
2	RUSSELL AV. N. & 53RD AV.N.	1994	20-012 SHINGLE CREEK
3	SHERIDAN AV. N., NORTH OF 52ND AV.N.	1996	20-010 SHINGLE CREEK
4	RUSSELL AVE N, NORTH OF 52ND AVE N	1996	20-013 SHINGLE CREEK
5	PENN AV. N. & 52ND AV. N.	1996	20-020 SHINGLE CREEK
6	PENN AV. N. & 52ND AV. N.	1994	20-030 SHINGLE CREEK
7	OLIVER AV. N. & 52ND AV. N.	1994	20-040 SHINGLE CREEK
8	NEWTON AV. N. & SHINGLE CREEK	1994	20-050 SHINGLE CREEK
9	OLIVER AV. N. & 51ST AV. N.	1996	20-060 SHINGLE CREEK
10	MORGAN AV. N. & 51ST AV. N.	1994	20-070 SHINGLE CREEK
11	KNOX AV. N. & 51ST AV. N.	1994	20-070 SHINGLE CREEK
12	KNOX AV. N. & 50TH AV. N.	1996	20-080 SHINGLE CREEK
13	IRVING AV.N. & 50TH AV. N.	1994	20-090 SHINGLE CREEK
14	JAMES AV. N., NORTH OF 49TH AV. N.	1996	20-095 SHINGLE CREEK
15	21ST AV. N. & 1ST ST. N.	1994	10-230 MISSISSIPPI RIVER
16	XERXES AVE N & 14TH AV N	1977	40-010 BASSETT CREEK
17	XERXES AVE N & GLENWOOD AVE	1996	40-020 BASSETT CREEK
18	MORGAN AV. N. & CHESTNUT AV.	1994	40-130 BASSETT CREEK
19	GIRARD AV. N. & CURRIE AV. N.	1994	40-160 BASSETT CREEK
20	BRIDAL VEIL TUNNEL OUTLET	1994	10-560A MISSISSIPPI RIVER
21	LAKE OF THE ISLES PKWY. & LOGAN AV. S	1994	53-100 LAKE OF THE ISLES
22	W. 22ND ST. & JAMES AV. S.	2003	53-120A/B LAKE OF THE ISLES
23	YARD SUMPS, E. 26TH ST. & HIAWATHA	1996	10-630R MISSISSIPPI RIVER
24	DREW AV. S. & W. LAKE ST.	1995	52-070 CEDAR LAKE
25	EXCELSIOR BLVD. & MARKET PL	1995	54-140A/B LAKE CALHOUN
26	W LAKE ST & ALDRICH AVE S	1992	54-040A/B LAKE CALHOUN
27	W. 32ND ST. & BRYANT AV. S.	1992	10-430V LAKE CALHOUN
28	W. 33RD ST. & HOLMS AV. S.	1995	54-040A/B LAKE CALHOUN
29	W. 33RD ST. & GIRARD AV. S.	1992	54-040A/B LAKE CALHOUN
30	YORK AV. S. & W. LAKE CALHOUN PKWY	1980	54-080 LAKE CALHOUN
31	CHOWEN AV. S. & W. 41ST ST.	1994	54-080A/B/C LAKE CALHOUN
32	E. 42ND ST. & BLOOMINGTON AV. S.	1988	76-010 LAKE HIAWATHA
33	E. 43RD ST. & PARK AV. S.	1993	70-350 MINNEHAHA CREEK
34	W. 44TH ST. & W. LAKE HARRIET PKWY.	1996	57-100A/B/C LAKE HARRIET
35	E. 44TH ST. & OAKLAND AV. S.	1993	70-350 MINNEHAHA CREEK
36	E. 46TH ST. & 31ST AV. S.	1976	70-490 MINNEHAHA CREEK
37	46TH AV. S. & GODFREY ROAD	1975	70-580 MINNEHAHA CREEK
38	W. 47TH ST. & YORK AV. S.	1990	57-100A/B LAKE HARRIET
39	W. 47TH ST. & WASHBURN AV. S.	1990	57-100 A/B LAKE HARRIET
40	W. 47TH ST. & LAKE HARRIET PKWY.	1990	57-100A/B LAKE HARRIET
41	W. 48TH ST. & YORK AV. S.	1990	57-100A/B LAKE HARRIET
42	QUEEN AV. S. & LAKE HARRIET PKWY.	1995	57-070 LAKE HARRIET
43	16TH AV. S. & E. MINNEHAHA PKWY.	1990	70-415 MINNEHAHA CREEK
44	SHERIDAN AV. S. & W. 50TH ST.	1995	57-070 LAKE HARRIET
45	JAMES AV. S. & MINNEHAHA CREEK	1992	70-130 MINNEHAHA CREEK
46	MORGAN AV. S. & W. 53RD ST.	1992	70-085 MINNEHAHA CREEK
47	E. 55TH ST. & PORTLAND AV. S.	1992	71-020 DIAMOND LAKE
48	E. 56TH ST. & PORTLAND AV. S.	1992	71-030 DIAMOND LAKE
49	E. 57TH ST. & PORTLAND AV. S.	1992	71-040 DIAMOND LAKE
50	E. 58TH ST. & PORTLAND AV. S.	1992	71-050 DIAMOND LAKE
51	GIRARD AV. S. BETWEEN 59TH ST. & 60TH	1995	83-060 GRASS LAKE
52	E. 59TH ST. & 12TH AV. S.	1995	75-040 TAFT LAKE
53	GIRARD AV. S. & W. 60TH ST.	1995	83-070 GRASS LAKE
54	GIRARD AV. S. BETWEEN 60TH & DUPONT	1995	83-080 GRASS LAKE
55	GRASS LK. TERR. BETWEEN GIRARD & JAMES	1995	83-050 GRASS LAKE
56	GRASS LK. SERVICE RD. BEHIND 6035 JAMES	1995	83-040 GRASS LAKE
57	GRASS LK. SERVICE RD. BEHIND 6077 JAMES	1995	83-030 GRASS LAKE
58	GRASS LK. SERVICE RD. BEHIND 1416 W. 61ST	1995	83-015 GRASS LAKE
59	W. 61ST ST. & GRASS LAKE SERVICE ROAD	1995	83-010 GRASS LAKE
60	IRVING AVE SO. & W. 61ST ST.	1995	83-020 GRASS LAKE
61	E. RIVER RD. & CECIL ST.	1993	10-600 MISSISSIPPI RIVER
62	HIAWATHA PARK REFECTORY TURN-ROUND	1995	70-578 MINNEHAHA CREEK
63	33RD AV. N. & 1ST ST. N./ R.R. TRACKS	1936	10-120B MISSISSIPPI RIVER
64	NORTH TRANSFER STATION	1997	10-210 MISSISSIPPI RIVER
65	SOUTH TRANSFER STATION	1997	10-630R MISSISSIPPI RIVER
66	MAPLE PL & EAST ISLAND	1997	10-315 MISSISSIPPI RIVER
67	DE LASALLE DR. & EAST ISLAND	1997	10-360 MISSISSIPPI RIVER
68	W. ISLAND, 300' S. OF MAPLE PLACE	1997	10-316 MISSISSIPPI RIVER
69	EASTMAN AV. & WEST ISLAND	1997	10-345 MISSISSIPPI RIVER
70	ROYALTON & 5TH AV. N.	1997	40-310 MISSISSIPPI RIVER
71	THE MALL & E. LAKE OF THE ISLES	1998	54-104 A/B LAKE of the ISLES
72	S OF 37TH AVE NE & ST ANTHONY PKWY	1998	10-065 MISSISSPPI RIVER
73	4552 KNOX Av. N. (IN ALLEY BEHIND PROPERTY)	1995	20-210A SHINGLE CREEK
74	STEVENS AV. S. 300' S. OF MINNEHAHA CREEK	1995	70-295 MINNEHAHA CREEK
75	NO GRIT CHAMBER LOCATED HERE		REMOVED FROM LIST APRIL 06
76	MARKET PLAZA & EXCEL BLVD (PKING LOT)	1999	54-140 LAKE CALHOUN
77	ALLEY btwn NICOLLET & BLAISDELL(on 39th St)	1999	10-430T MISSISSIPPI RIVER
78	SHINGLE CREEK WETLANDS-WEST SIDE	1999	20-011 SHINGLE CREEK
79	SHINGLE CREEK WETLANDS-EAST SIDE	1999	20-011 SHINGLE CREEK
80	WOODLAWN BLVD & 50TH ST E	2000	72-020 LAKE NOKOMIS
81	WOODLAWN BLVD & 53 ST E	2000	72-040 LAKE NOKOMIS
82	12TH AVE S & POWDERHORN TERRACE	2002	82-010 MINNEHAHA CREEK
83	13TH AVE S & POWDERHORN TERRACE	2002	82-010 MINNEHAHA CREEK
84	3421 15TH AVE S(180' W OF CL)	2002	82-020 MINNEHAHA CREEK
85	3329 14TH AVE S	2002	82-020 MINNEHAHA CREEK
86	13TH AVE S & E 35TH ST	2002	82-030 MINNEHAHA CREEK
87	3318 10TH AVE S	2002	82-040 MINNEHAHA CREEK
88	702 Van White Blvd No. Bd. Lane	2003	BASSETT CREEK
89	706 Van White Blvd No. Bd. Lane	2003	BASSETT CREEK
90	10th AV. N. & Aldrich AV. N. (SWC)	2003	BASSETT CREEK
91	S. Bd. Van White Blvd. 200' S. of 8th AV. N.	2003	BASSETT CREEK
92	701 Van White Blvd So. Bd. Lane	2003	BASSETT CREEK
93	S. Bd. Van White Blvd 250' S. of 10th AV. N.	2003	BASSETT CREEK
94	10th AV. N. & N. Bd. Van White Blvd. (SWC)	2003	BASSETT CREEK
95	Aldrich AV. N. & 9th AV. N. West Side	2003	BASSETT CREEK
96	8th AV. N. & N. Bd. Van White Blvd. (NEC)	2003	BASSETT CREEK
97	29th AV @ Logan AV N-Storm Water Detention Pond	2003	BASSETT CREEK
98	Malmquist Lane @ Humboldt N	2003	Shingle Creek
99	Shingle Creek Dr @ Humboldt Av N	2003	Shingle Creek
100	S of 49th AV N @ Humboldt N	2003	Shingle Creek
101	N of 49th AV N @ Humboldt N	2003	Shingle Creek
102	28th ST E @ Hiawatha	2001	Mississippi River
103	Lake St E @ Hiawatha	2001	Mississippi River
104	Nawadha La / Service Rd @ Hiawatha	2002	Mississippi River
105	Minnehaha Pkway (N Side) S.B. Lane	2002	Mississippi River
106	50th ST E(SW COR) @ Hiawatha	2002	Mississippi River
107	54th ST E @ Riverview Rd	2002	Mississippi River
108	37th ST E @ Columbus AV Storm Pond	2004	76-010MINNEHAHA CREEK
109	NO GRIT CHAMBER LOCATED HERE		REMOVED FROM LIST APRIL 06
110	W Calhoun Pkwy 100' N of Richfield RD	2004	54-060 LAKE CALHOUN
111	Richfield RD at SW Cor Parking Lot	2004	LAKE CALHOUN
112	W 36th ST 30' E of East Calhoun PKWY	2004	54-050 LAKE CALHOUN
113	VAN WHITE MEM. BLVD (N.B.)(@ #1016 5TH AVE N)	2003	BASSETT CREEK
114	DUPONT AVE N AND 4TH AVE N	2003	BASSETT CREEK
115	VAN WHITE MEM. BLVD (S.B.) AND 4TH AVE N	2005	BASSETT CREEK
116	VAN WHITE MEM. BLVD (S.B.) AND 4TH AVE N	2004	BASSETT CREEK
117	VAN WHITE MEM. BLVD (S.B.) AND 4TH AVE N	2005	BASSETT CREEK
118	VAN WHITE MEM. BLVD (S.B.) AND 10TH AVE N	2004	BASSETT CREEK
119	11TH AVE N AND VAN WHITE MEM. BLVD (N.B.)	2004	BASSETT CREEK
120	VAN WHITE MEM. BLVD (S.B.) AND 11TH AVE N	2004	BASSETT CREEK
121	VAN WHITE MEM. BLVD (S.B.) AND FREMONT AVE N	2004	BASSETT CREEK
122	MINNEHAHA PKWY @ 39TH AVE S NORTH SIDE OF PKWY	2001	10-720 MISSISSIPPI RIVER
123	COLUMBUS AVE S SOUTH OF E 37TH ST REROUTE	2004	76-010 MINNEHAHA CREEK
124	COLUMBUS AVE S - CHICAGO AVE S ALLEY	2004	76-010 MINNEHAHA CREEK
125	COLUMBUS AVE S ACROSS FROM #3644	2004	76-010 MINNEHAHA CREEK
126	E 37TH ST AND COLUMBUS AVE S	2004	76-010 MINNEHAHA CREEK
127	E 37TH ST AND COLUMBUS AVE S	2004	76-010 MINNEHAHA CREEK
128	W 27TH ST AND LAKE OF THE ISLES PKWY	2004	53-160 LAKE OF THE ISLES
129	YARD SUMP, 26TH AND HIAWATHA	1996	10-630R MISSISSIPPI RIVER
130	YARD SUMP, 26TH AND HIAWATHA	1996	10-630R MISSISSIPPI RIVER
131	YARD SUMP, 26TH AND HIAWATHA	1996	10-630R MISSISSIPPI RIVER
132	YARD SUMP, 26TH AND HIAWATHA	1996	10-630R MISSISSIPPI RIVER
133	BETWEEN HUMBOLDT/IRVING AVE S AND W 25TH/26TH ST		Not applicable
134	W 22ND ST @ E LAKE OF THE ISLES BLVD	2003	53-120A/B LAKE OF THE ISLES
135	CHICAGO AVE S BETWEEN WASHINGTON AVE S AND 2ND ST S	2005	10-410 MISSISSIPPI RIVER
136	VACATED ALLEY BET. 1ST ST N AND 2ND ST N AT VACATED 21ST AVE N @ 111 22nd Ave N	2005	10-230 MISSISSIPPI RIVER
137	W 44TH ST @ LAKE HARRIET PKWY EAST	2006	57-020 LAKE HARRIET
138	EWING AVE S BETWEEN W. FRANKLIN AVE AND W 22ND ST	2006	85-010 WETLAND/CEDAR LAKE
139	EWING AVE S @ W FRANKLIN AVE	2006	85-010 WETLAND/CEDAR LAKE
140	E LAKE ST WEST OF 14TH AVE S	2006	10-630 MISSISSIPPI RIVER
141	E LAKE ST EAST OF 14TH AVE S	2006	10-630 MISSISSIPPI RIVER
142	18TH AVE S SOUTH OF E LAKE ST	2006	76-010 LAKE HIAWATHA
143	LONGFELLOW AVE S SOUTH OF E LAKE ST	2006	76-010 LAKE HIAWATHA
144	31ST AVE S NORTH OF E LAKE ST	2006	10-630 MISSISSIPPI RIVER
145	CEDAR AVE S @ E MINNEHAHA PKWY		70-425 MINNEHAHA CREEK
146	E LAKE ST W OF 46TH AVE S	2007	10-640 MISSISSIPPI RIVER
147	E LAKE ST W OF 47TH AVE S	2007	10-640 MISSISSIPPI RIVER
148	E LAKE ST W OF 42ND AVE S	2006	10-630C MISSISSIPPI RIVER
149	W 44TH ST AND ALDRICH AVE S	2007	57-020 LAKE HARRIET



Constructed Ponds & Wetlands

Pond ID	Pond Name	Type	Location
1	Bancroft Meadows	Dry Basin	Bloomington & 42nd St.E.
2	Sibley Pond	Pond	Longfellow Ave. & 39th St. E.
3	Edison	Dry Basin	Quincy & 22nd Ave. N.E.
4	Cedar Meadows	Ponds (MPRB)	France Ave. & 26th St. W.
5	Nokomis Wetlands	Ponds (MPRB)	South End Lake Nokomis
6	Shingle Creek	Pond	Upton Ave. N. & 52nd Ave. N.
7	Calhoun Wetlands	Ponds (MPRB)	Zenith Ave. S. & 38th St. W.
8	Wirth Wetlands	Wetlands	Theodore Wirth Park
9	Harriet- Roberts Bird Sanctuary	Wetland (MPRB)	Lake Harriet Pkwy & Rose Way
10	Kings Highway Detention Basin	Detention Basin	Park Board HQ - Harriet Av
11	SENA Wetlands	Filtration Wetland	31st Ave. So. & 46th St. E.
12	Logan Pond	Detention Basin	29th Ave N & Logan Ave N
13	Diamond Lake	Pond	1st Ave. S & 60th St. W
14	Park Avenue Holding Pond	Pond	Oakland Ave. & 44th St. W.
15	37th & Columbus	Pond	37th St E & Columbus Ave S
16	Columbia Park Ponds	Ponds (MPRB)	Columbia Park Golf Course
17	Toddlers Pond	Wet Pond	18th Ave SE & Elm
18	Heritage Park Greenway	Infiltration Ponds	Heritage Park
20	Crystal Lake Cemetary Pond	Pond	42nd Ave N and Morgan Ave N
21	Heritage Park Phase IV	Pond	Heritage Park
22	Heritage Park	Pond	Heritage Park
23	Kasota Stormwater Pond	Pond	Kasota Ave & Bridal Veil

Ponds & Wetlands
Grit Chambers
Storm Drain
Park & Green Space
Surface Water

MINNEAPOLIS PUBLIC WORKS
SURFACE WATER & SEWERS DIVISION

Appendix C: Public Comment

History

The Minneapolis stormwater management program endeavors to improve the water quality of Minneapolis lakes, streams, wetlands, rivers, and other surface waters, with the ultimate goal of preservation and enhancement of our natural and historic environment, while concurrently fulfilling regulatory requirements. The National Pollutant Discharge Elimination System (NPDES) is a program created in 1990 by the United States Environmental Protection Agency (EPA) to protect water quality through the regulating of discharges of pollutants to lakes, streams, wetlands and other surface waters. The Minnesota Pollution Control Agency (MPCA) is the Minnesota authority that is responsible for administering this program. Under this program, specific permits are issued in an effort to regulate municipal and industrial activities. The City of Minneapolis maintains two distinct NPDES permits:

- ***The Combined Sewer Overflow (CSO) permit***, which regulates combined storm and wastewater discharges from the sanitary sewer system (joint permittee with Metropolitan Council Environmental Services)
- The ***Municipal Separate Storm Sewer System (MS4) permit***, which regulates stormwater runoff discharges from the storm drain system (joint permittee with Minneapolis Park & Recreation Board).

Requirements for Annual Reporting, Public Comment, and Council Action

The MPCA issued an NPDES MS4 permit to the City of Minneapolis and the Minneapolis Park & Recreation Board (MPRB) on December 1, 2000. This Permit required the submittal of a Stormwater Management Program and Annual Report. This Annual Report provides documentation and analysis of the activities conducted in the previous year, and is a coordinated effort by various City departments, as well as the MPRB. Information in the report. The MS4 permit was re-issued on January 21, 2011. The 2011 Permit requires a new Stormwater Management Program. Therefore this Annual Report addresses only 2010 activities, while a separate new Stormwater Management Program was submitted to the MPCA concurrently with the Annual Report on September 28, 2011.

The Permit also requires an opportunity for public input into the development of the priorities and programs necessary for compliance, and also requires the adoption of the Report through a formal Resolution.

A Public Hearing notice was sent to interested parties, environmental groups, related governmental entities, and all Minneapolis neighborhood groups. A Public Hearing notice was also posted in Finance and Commerce. A summary of the public's input and the City's response to the comments along with the formal Resolution are required to be included with the Annual Report submittal. The public hearing was held on September 13, 2011. No testimony or questions were presented. Written comments were accepted until Wednesday September 21, 2011. No written comments were submitted.