STORMWATER POLLUTION PREVENTION PROGRAM

For Managing the City of Stillwater's Municipal Separate Storm Sewer System

October 2023

Prepared for:
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What is an MS4 and How to Protect our Lakes

If you ask an average citizen what an MS4 is they likely would not know what it was, but MS4 plays into daily life for each any every one of us whether you know it or not. MS4 stands for Municipal Separate Storm Sewer System. Examples of this can be well known from roads, curb, stormwater drainage systems, to less known but equally as important such as drainage ditches, conveyances and other man-made channels that stormwater moves throughout our cities. The stormwater that moves through these systems can be polluted, is untreated, and discharges directly to bodies of water such as lakes and rivers that we use every day. These bodies of water are used for recreation and sometimes a source of drinking water for people. Therefore, it is important to understand how daily activities can impact these water sources.

Total maximum daily load (TMDL) is the amount of pollutants that a water body can absorb daily before water quality standards are impaired. Minnesota currently has 6,168 bodies of water that are impaired with some type of restriction whether it be sediment, nutrients, heavy metals, or bacteria. So, how can your average citizen lower the pollutant load carried by these MS4 conveyances?

Start with your lawn, fertilizer can have a large impact on algae blooms and oxygenation of our lakes and rivers. Apply fertilizers at the correct rate of application per acre listed on the bag. Fertilizers in Minnesota are required to have less than .7% Phosphorus in the fertilizer mix. All fertilizer bags have a three number reading that contains nitrogen, phosphorus, and potassium in that order. Every second number on your fertilizer bag should have zero as the middle number, representing 0 phosphorus (ex 20-0-13). When applying fertilizer, ensure that any excess fertilizer on the pavement is cleaned up immediately to prevent washouts to stormwater discharge basins. Leaves and grass clippings can also contain these nutrients, so it is pivotal to sweep after lawn mowing. It is also important to clean up animal droppings to prevent nutrient loading of local water ways from excess pet waste.

Leaks and spills are sources of pollution that can be picked up and carried away with each rainfall event. Vehicle maintenance can be a large source of leaking and spills. When working on vehicles, try to work inside an area that is covered. Check to make sure that once work is done nothing has spilled or leaked. Spilled chemicals need to be cleaned up with absorbents and swept up immediately. Any leaked materials such as fuel, oil, solvents, or grease can carry unwanted chemicals to waterways that will damage water quality. Labels on containers that say caution, warning, danger, or poison need to be disposed of at a hazardous waste facility. Each county will have a hazardous waste drop off sites where chemicals or spilled materials can be disposed of properly.

Salting practices on your property are also a great way to minimize water quality impacts at home. Salt contains chloride which is a labeled impairment on fifty lakes and streams in Minnesota. Safe salting practices are a great way to mitigate the amount of salt that ends up in stormwater conveyances. One cup of salt will safely melt about 250 square feet of paved area and can be applied at that rate. Excess salt that has accumulated once ice is gone is no longer functional. Extra salt materials can be swept up and disposed of to prevent water quality damage and stop vegetation from dying off and degradation of cement on your property.

These are all simple preventative actions that can be implemented by everyone to protect our lakes and streams. Preventing pollutants from reaching these MS4 conveyances can uphold water quality for fishing and recreation in the land of 10,000 lakes.

Enforcement Response Procedures
for City of Stillwater

Sec. 35-26. - Stormwater management practices. (Updated)

Subd. 10. Penalty. Any person, firm or corporation violating any provision of this ordinance shall be fined not less than $5.00 nor more than $500.00 for each offense, and a separate offense shall be deemed committed on each day during or on which a violation occurs or continues. The timeframes to complete corrective actions and the name or position title of responsible person(s) for conducting enforcement will be documented in the notice for each MCM.

(a) Notice of violation. When the city determines that an activity is not being carried out in accordance with the requirements of this ordinance, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:
    (1) The name and address of the owner;
    (2) The address when available or a description of the land upon which the violation is occurring;
    (3) A statement specifying the nature of the violation;
    (4) A description of the remedial measures necessary to bring the development activity into compliance with this ordinance and a time schedule for the completion of such remedial action;
    (5) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed; and a statement that the determination of violation may be appealed to the city by filing a written notice of appeal within 15 days of services notice of violation.

(b) Stop work orders. Persons receiving a notice of violation will be required to halt all construction activities. This stop work order will be in effect until the city confirms that the land disturbing activity is in compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner may result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this ordinance.

(c) Civil and criminal penalties. In addition to or as an alternative to any penalty provided herein or by law, any person who violates the provisions of this ordinance shall be guilty of a misdemeanor and subject to prosecution. Such person shall be guilty of a separate offense for each day during which the violation occurs or continues.

(d) Restoration of lands. Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the city may take necessary corrective action, the cost of which may, after notice and opportunity for hearing, be specially assessed against the property and collected along with the ordinary taxes by the county.

(D) Methods of Discovery of Non-Compliance. Reports of a stormwater violation or non-compliance may come from one of the following several sources.

Enforcement Response Procedures
for City of Stillwater

(1) Reports from City Staff – Illicit discharges and discharges of sediment or other pollutants from the construction sites, facilities, or other sources within the City's MS4 may be observed by City staff as they conduct normal activities such as driving to or from job sites or when inspecting other activities. Such non-compliances could include water and wind erosion, sediment tracking onto local streets, poor housekeeping, incorrect location of concrete washouts, and failed or ineffective best management practices (BMPs).

(2) Permit Compliance Activities – Non-compliances may be discovered through Permit-required inspections or monitoring, including construction site inspections, dry weather screening, and stormwater sampling.

(3) Contractor Compliance Activities – A construction contractor's failure to comply with the State's Construction General Permit requirements such as conducting and submitting inspection reports, obtaining annual certifications, preparing and implementing Stormwater Pollution Prevention Plans (SWPPPs).

(4) Reports from the Public – Public complaints may come directly to City or through other local, state or federal government agencies.

(5) Construction and Post Construction Site Erosion and Sediment Enforcement. This section imposes the obligation of an applicant to perform their duties in an honest, diligent, and cooperative manner.

(a) Compliance Requirements

(i) Compliance with stormwater permits and laws on construction projects within the City's MS4 must be enforced according to these Enforcement Response Procedures.

(ii) Applicants are to comply with the State's NPDES CGP, City, and County permits for regulated construction projects, including the obligation to file a NOI and obtain authorization under the State CGP for each construction project or site. The applicant shall also file a NOT for each construction project or site, either terminating their responsibility if final stabilization has been achieved, or transferring it to another owner for completion.

(b) Construction Enforcement

(i) When stormwater non-compliance is identified by the City enforcement actions will be taken promptly but no later than 7 days following identification of the non-compliance. The City will take appropriate sanctions against the applicant based on the nature and severity of the situation. Non-compliances will be classified as minor or major violation. Major violations are generally those acts or omissions that lead to a discharge of pollutants to stormwater. Minor violations are generally

instances of non-compliance that do not directly result in such a discharge. Serious discharges or an imminent threat of discharge on a project may require an immediate escalation to a higher level of enforcement. The level of enforcement response will depend upon several of the following factors:

(ii) Severity of the violation: the duration, quality, and quantity of pollutants, and effect on public safety and the environment

(iii) The violator's knowledge (either negligent or intentional) of the regulations being violated

(iv) A history of violations and /or enforcement actions individual or contractor

(v) The potential deterrent value of the enforcement action

(c) The City will use a progressive enforcement policy, escalating the response when an applicant fails to respond in a timely manner. If the City identifies a deficiency in the implementation of the approved SWPPP or amendments and the deficiency is not corrected immediately or by a date requested by the City, the project is in non-compliance. The timeframes to complete corrective actions and the name or position title of responsible person(s) for conducting enforcement will be documented in the notice.

(6) Illicit Discharges and Connection Enforcement

(a) The Permit requires the City to implement and enforce a program that ensures that the City effectively prohibits non-stormwater discharges into its MS4. In addition, neighboring property owners are not allowed to occupy, use or interfere with public ROW without permission. Any discharge/connection without permission is an illegal encroachment on the City's MS4. A discharge/connection can be discovered in two ways, either through routine inspection or due to a complaint.

(b) Notification of observed illicit connections or discharges will be carried forward to the alleged illegal connector/discharger by the inspector or observer. The City will use the following progressive enforcement policy, escalating the response when a discharger fails to respond in a timely manner.

(7) Reporting Requirements and Documentation

(a) The City shall provide a list and description of all violations and their resolutions, including any enforcement actions taken against contractors, corporations, or

other entities in the Annual Report to MPCA. At a minimum, the inspector should document the source of the complaint, the date, the time, the contact person (if any), a description of the nature of the non-compliance or illicit discharge, actions taken, and final resolution.

(i) At a minimum, the City shall document the following for each MCM:

(1) name of the person responsible for violating the terms and conditions of the permittee's regulatory mechanism(s);
(2) date(s) and location(s) of the observed violation(s);
(3) description of the violation(s);
(4) corrective action(s) (including completion schedule) issued by the permittee;
(5) referrals to other regulatory organizations (if any); and
(6) date(s) violation(s) resolved.

(Ord. No. 996, § 1, 5-20-08; Ord. No. 1127, § 1, 6-18-19)

City of Stillwater MS4 Calendar

Introduction

When it rains or when snow melts in our communities, the water travels on impervious surfaces. Impervious surfaces are surfaces that don't allow water to soak into it. Examples of these surfaces include roads, sidewalks/trails, driveways, rooftops, and more.

Water travels on these surfaces into storm drains which directly discharge into lakes, rivers, streams, and wetlands. As the water travels, it can pick up pollutants with it such as oils, metals, road salt, trash, and more.

The system of storm drains that you see in your community is a municipal separate storm sewer system (MS4). It consists of roads with drainage systems, catch basins, curbs, gutters, ditches, channels, etc.

These systems are owned or operated by a public entity. This can include cities, counties, military bases, universities, and more. In Minnesota, these systems must satisfy the MS4 permit if they are at least one of the following:

- Located in an urbanized area and used by a population of 1,000 or more
- Owned by a municipality with a population of 10,000 or more
- Have a population of at least 5,000 and the system discharges to specially classified bodies of water.

The MS4 permit is designed to reduce the amount of pollutants entering state waters from stormwater systems. Public entities that own or operate a MS4 permit are required to implement a Stormwater Pollution Prevention Program (SWPPP) to reduce the amount of pollutants to the system. An effective SWPPP has six components called Minimum Control Measures (MCMs).

Contacts

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Andrew Coyne	Natural Resources Technician	651-430-8836	acoyne@ci.stillwater.mn.us

Schedule

Month	Topic	Month	Topic
January	Salt Use	*July*	Smart Irrigation
February	Pet Waste	*August*	Invasive Species
March	Illicit Discharge	*September*	Pet Waste
April	Adopt a Drain	*October*	Leaves
May	Landscaping	*November*	Salt Use
June	Fertilizers	*December*	Trash

January – Salt Use

To help melt snow and ice during the winter months, salt is applied to the roads. As the snow and ice melts, it travels into stormwater systems. Because of salt, the concentration of Chloride has increased in surface and ground water. Chloride does not degrade in soil and water, and it can create toxic conditions for fish and other animals that live in our lakes and streams.

Tips for residents:

- Support local and state winter maintenance crews in their efforts to reduce their salt use.
- Work together with local government, businesses, schools, churches and non-profits to find ways to reduce salt use in your community.
- **Shovel.** The more snow and ice you remove manually, the less salt you will have to use and the more effective it will be.
- **15 degrees F** is **too cold** for salt. Most salts stop working at this temperature. Use sand instead for traction, but remember that sand does not melt ice.
- **Slow down.** Drive for the conditions and make sure to give plow drivers plenty of space to do their work. Consider purchasing winter (snow) tires.
- **Be patient.** Just because you don't see salt on the road doesn't mean it hasn't been applied. These products take time to work.
- **Apply less.** More salt does not mean more melting. Use less than 4 pounds of salt per 1,000 square feet. One pound of salt is approximately a heaping 12-ounce coffee mug. Leave about a 3-inch space between granules. Consider purchasing a hand-held spreader to help you apply a consistent amount.
- **Sweep up extra.** If salt or sand is visible on dry pavement it is no longer doing any work and will be washed away. Use this salt or sand somewhere else or throw it away.
- **Hire a certified Smart Salting contractor**, visit the MPCA website for Smart Salting Training - Certificate Holders

- **Watch a video.** This video, produced by the Mississippi Watershed Management Organization, provides tips to homeowners about more environmentally friendly snow and ice removal — Improved Winter Maintenance: Good Choices for Clean Water

February – Pet Waste

When pet waste is left uncollected, it gets washed into the stormwater systems and into our lakes and rivers. It then decays in the water, releasing ammonia and depleting oxygen levels. This is harmful to fish and other animals. These nutrients also promote weed and algae growth, as well as elevated bacteria levels (E. Coli) that can cause unsafe conditions for recreational activities.

Tips for residents:

- Don't forget a plastic bag during your walk
- Picking up your pet's waste and depositing it in a trash can keeps it from washing into our local waterways
- Utilize pet waste stations if available or use your trash bin at home and remember to "Scoop the Poop"

March – Illicit Discharge

Storm sewer systems carry water directly into our lakes, rivers, and wetlands. If anything other than stormwater enters the system, it is an illicit discharge. Substances can include oil, chemicals, sediment, and more.

Tips for residents:

- Take used oil to a recycle center or a fast Oil-Change business
- Wash your car on the grass
- Revegetate bare or eroding areas
- Return old paint to the store where you purchased it
- Secure your trash when placed on the street
- Take all old chemicals, including paints and automobile fluids, contact the Washington County Environmental Center at 651-275-7475 or visit Hazardous Waste and Electronics | Washington County, MN - Official Website
- Do not pour fats, oils, and grease into your sink or sewer
- Do not over fertilize your lawn
- Pump your septic tank every 4 years
- Report any hazardous spills immediately

April – Adopt a Drain

Adopt-a-Drain is a program where residents can adopt a storm drain in their neighborhood. They are responsible to keep it clear of leaves, trash, and other debris to reduce water pollution. Residents volunteer fifteen minutes, twice a month, for cleaner waterways and healthier communities. Sign up online to Adopt a Drain in your neighborhood! Adopt-a-Drain - Minnesota

May – Landscaping

Many studies indicate that you and your neighbors believe having a lawn that is safe for the environment is very important. Unfortunately, some lawn care practices can create water quality problems. Many chemicals (nitrogen and phosphorus) found in fertilizers run off our properties into local waterbodies and create algal blooms that make for cloudy water and remove oxygen. Some simple things you can do to maintain your lawn and be safe for the environment are:

- **Choose the right grass seed.** Consider limiting lawn area and choose grass varieties that require less maintenance.
- **Don't overwater.** 1" of water per week is typically enough. Overwatering can lead to runoff and contaminants making it into our groundwater
- **Test your soil.** The U of M Extension will test your soil and will provide you with recommendations on your fertilizer needs. Test your soil and take the guesswork out of fertilizer recommendations | UMN Extension
- **Mow Smart.** Mow grass 3" or higher. Cut no more than 1/3 of the blade to encourage longer, stronger turf grass roots. Leave the clippings after mowing to provide a source of slow-release nutrients. Remove grass clippings from streets, sidewalks, and driveways. NEVER dispose of clippings in drainage areas, storm drains, wetlands or water bodies!

June – Fertilizers

It is important to schedule your lawn care maintenance during times that match the life cycle of the turfgrass.

1. Do not add fertilizer too early in the spring. This may encourage the grass to grow during a time when it should be slow or dormant.
2. Do not spray to control weeds when temperatures are warm. This increases the likelihood of damaging the lawn.
3. Do not fertilize in hot mid-summer months. This can cause irreversible damage to your lawn.
4. Crabgrass doesn't develop until late spring or early summer, so don't apply herbicide used to prevent pre-emerging crabgrass in the fall.
5. For more information visit: Lawn care calendar | UMN Extension

July – Smart Irrigation

July is Smart Irrigation Month. Due to the peak water use because of warm temperatures, little rainfall, and water restrictions, during the month of July it is important for the public to be aware of the value of water-use efficiency.

Tips for Residents

- Install a smart sprinkler system
- Collect & save rainwater for smaller gardens
- Water at the right time according to your location
- Replace turf with native plants
- Adhere to city's watering restrictions

August – Invasive Species

Did you know that invasive species cause $120 billion annually in damage nationwide? Invasive species are species that are not native to Minnesota and cause economic and environmental harm by causing the decline and extinction of native species; threaten fisheries, forestry and recreation; and reduce our property values. Some of the invasive species include zebra mussels, Eurasian watermilfoil, common buckthorn, and emerald ash borer. Invasive species are found on land and in the water.

Tips for residents:

- Use only local or certified hay and firewood
- Clean recreational equipment thoroughly
- Treat infestations on your property; methods vary by species
- Report new infestations to "Arrest the Pest" hotline - Arrest the Pest Flyer (state.mn.us)

September – Pet Waste

When pet waste is left uncollected, it gets washed into the stormwater systems and into our lakes and rivers. It then decays in the water, releasing ammonia and depleting oxygen levels. This is harmful to fish and other animals. These nutrients also promote weed and algae growth, as well as elevated bacteria levels (E. Coli) that can cause unsafe conditions for recreational activities.

Tips for residents:

- Don't forget a plastic bag during your walk
- Picking up your pet's waste and depositing it in a trash can keeps it from washing into our local waterways
- Utilize pet waste stations if available or use your trash bin at home and remember to "Scoop the Poop"

October - Leaves

Leaf litter and grass clippings left on street and sidewalk are one of the contributors to algal blooms in our lakes. When algae dies it decomposes at the bottom of our waterbodies and uses up oxygen that fish and native plants need.

Tips for residents:

- Rake the leaves that have accumulated along your curb, sidewalk, alley, etc. Consider organizing a community clean up for water quality to help others.
- Don't put your leaves in the trash (it's illegal) and don't burn them. Burning leaves releases lots of air pollution.
- Put your leaves in a backyard compost pile or bring them to a compost facility.
- Use leaves to mulch your garden and lawn. This helps your soil and reduces weeds.
- If available, consider curbside pickup by your garbage hauler.

November – Salt Use

To help melt snow and ice during the winter months, salt is applied to the roads. As the snow and ice melts, it travels into stormwater systems. Because of salt, the concentration of Chloride has increased in surface and ground water. Chloride does not degrade in soil and water, and it can create toxic conditions for fish and other animals that live in our lakes and streams.

Tips for residents:

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- Work together with local government, businesses, schools, churches and non-profits to find ways to reduce salt use in your community.
- **Shovel.** The more snow and ice you remove manually, the less salt you will have to use and the more effective it will be.
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- **Watch a video.** This video, produced by the Mississippi Watershed Management Organization, provides tips to homeowners about more environmentally friendly snow and ice removal — Improved Winter Maintenance: Good Choices for Clean Water

December – Trash

Trash on land frequently makes its way into our waterbodies. Trash such as cigarette butts, paper, fast food containers, plastic grocery bags, cans and bottles, used diapers, construction site debris, old tires, appliances, and more are significant pollutants to our Minnesota waterbodies.

Tips for residents:

- Throughout the year, pick up trash if you see it in your neighborhood.
- Make sure the lid on your garbage container is closed.
- Coordinate a neighborhood clean up
- Adopt a highway

Minimum Control Measure 1
Public Education and Outreach

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MINIMUM CONTROL MEASURE 1

1. INTRODUCTION

1.1 Basis for the Standard Operating Procedures (SOPs)

The MS4 General Permit requires the City of Stillwater (City) to develop and implement a public education and participation program for the purpose of informing the public of the impact stormwater discharges have on waterbodies and the actions they can take to reduce the discharge of pollutants to stormwater. This manual not only assists the City in meeting the MS4 Permit requirements, will help promote behavior change to improve the water quality of the City's water resources.

1.2 Objectives of the SOPs

The City of Stillwater or its designee will raise awareness to the audience involved by providing information on stormwater pollution prevention, effects of illicit discharges, best management practices, components of the SWPPP and outside entity resources available to City residents and business owners.

2. LOCATING PRIORITY AREAS

The City of Stillwater has identified potential priority topics for public education, outreach, and participation, primarily based on land use and overall population demographics. Consideration shall be given to low income, people of color, and non-English speaking people.

Priority items for public education identified:

- Pet waste
- Salt Storage and Deicing Materials
- Residential BMPs
- Yard waste
- Household chemicals
- Construction activities

The City of Stillwater evaluates their high priority education topics at least once during each five-year permit term and update as needed.

Coordination with and/or use of stormwater education and outreach between the City and the East Metro Water Resource Education Program (EMWREP) will be documented. Members of EMWREP include Brown's Creek Watershed District, Middle St. Croix Watershed Management Organization, South Washington Watershed District, Valley Branch Watershed District, City of Stillwater, Washington County and the Washington Conservation District.

3. DISTRIBUTION OF EDUCATIONAL MATERIALS

The City of Stillwater has identified a variety of opportunities to distribute educational materials to their residents and business owners (Appendix A). On an annual basis the City distributes at least two (2) educational information specifically selected for stormwater-related issues of high priority. At least once each calendar year, the City shall distribute educational materials or equivalent outreach focused on illicit discharge recognition and reporting illicit discharges to the City. The City is recommended to evaluate the distribution methods used annually during the permit term and update as needed.

At least once each calendar year, the City shall distribute educational materials or equivalent outreach to residents, businesses, commercial facilities, and institutions, focused on the following:

1. impacts of deicing salt use on receiving waters;
2. methods to reduce deicing salt use;
3. proper storage of salt or other deicing materials.
4. impacts of pet waste on receiving waters;
5. proper management of pet waste;
6. any existing City regulatory mechanism(s) for pet waste

Distribution of educational materials and information will primarily be done through the City's website, an annual newsletter, utility bill inserts, a City newspaper ad, a stormwater-related event, and the City's Facebook page. While the annual newsletter and City website will target residents, and local business, the stormwater-related event will target students.

The City of Stillwater will continue to annually distribute and make available education materials related to topics the City finds to be of high priority.

4. IMPLEMENTATION OF EDCATIONAL PROGRAMS

The City of Stillwater has an Education and Outreach Implementation Plan consisting of:

a. Identification of a target audience
    1. Residents
    2. Local businesses
    3. Students
    4. Developers
    5. Low-income residents
    6. People of color
    7. Non-native English-speaking residents

b. Designation of the responsible person(s) in charge of overall plan implementation.

1. East Metro Water Resource Education Program (EMWREP), Shawn Sanders Public Works Director

c. Specific activities and schedules to reach measurable goals for each target audience.
d. A description of any coordination with and/or use of other stormwater education and outreach programs being conducted by other entities, as applicable.
e. Tracking mechanisms to record estimated quantities of materials, estimate audience, etc.
f. An annual evaluation to measure the extent to which measurable goals for each target audience are attained.

5. DOCUMENTATION

The City of Stillwater has a procedure to document the public education and outreach program. The evaluates and assesses the effectiveness of the education program annually, during the permit term. The program documentation consists of the following:

a. Identification and description of any specific stormwater-related issues identified by the City recorded during each year of the permit coverage.

b. Specific activities and schedules to reach measurable goals for each target audience.

c. Information for any coordination with and/or use of other stormwater education and outreach programs being conducted by other entities, as applicable.

d. Annual evaluation of measurable goals.

e. A description of all specific stormwater-related issues the City identified in item 16.3.

f. All information required under the City's education and outreach plan in item 16.7.

g. Activities held, including dates, to reach each target audience.

h. Quantities and descriptions of educational materials distributed, including dates distributed.

i. Estimated audience (e.g., number of participants, viewers, readers, listeners, etc.) for each completed education and outreach activity.

The City of Stillwater shall conduct an annual assessment of the public education program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., education and outreach efforts, implementation of written plans, etc.) in Section 16 of the MS4 General Permit and determine how the program might be improved. The City shall perform the annual assessment prior to completion of each annual report and document any modifications made to the program because of the annual assessment.

Minimum Control Measure 2
Public Participation/Involvement

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MINIMUM CONTROL MEASURE 2

1. INTRODUCTION

1.1 Objectives of the SOPs

The MS4 General Permit requires the City of Stillwater to provide an annual opportunity to solicit public input on the SWPPP and involve the public in activities that improve or protect water quality.

2. ANNUAL OPPORTUNITY FOR PUBLIC COMMENT

The City of Stillwater will provide a minimum of one (1) opportunity annually for the public to provide input on the adequacy of the SWPPP. The City will conduct at least one public meeting annually and will provide public notice, per the City's public notice requirements, in advance of the meeting. The City shall provide this opportunity by posting a notification of the draft annual report and contact information to review the draft report and SWPPP document.

The City of Stillwater will provide public access to the SWPPP, annual reports, and other documentation intended to support the SWPPP through the City website.

The City of Stillwater shall provide a minimum of one opportunity for the public to provide input on the adequacy of the SWPPP. If input is submitted by the public, City staff will record the comment and the City's response. If any modifications are made to the SWPPP because of public input, the amendment will be documented and recorded with the SWPPP.

3. ANNUAL PUBLIC INVOLVEMENT ACTIVITY

Each year, the City of Stillwater will provide a minimum of one (1) public involvement activity that includes a pollution prevention or water quality theme. To meet this requirement, the City shall provide a clean-up event, storm drain stenciling, an Adopt a storm drain program, hazardous waste collection day, a Water Cutter program - Water quality educational event focused the importance of aquatic species, an open yard workshop with Brown's Creek Watershed District, and blue thumb rain garden workshop.

4. DOCUMENTATION

The program documentation consists of the following:

a. All relevant written input submitted by persons regarding the SWPPP.
b. All responses from the City to written input received regarding the SWPPP, including any modifications to the SWPPP because of written input received.

c. Dates, estimated attendance, and locations of events held for purposes of meeting permit requirements.
d. Notices provided to the public of any events scheduled to meet the permit requirements for public input and consideration.
e. Date(s), location(s), description of activities, and estimated number of participants at events held for the purpose of compliance with item 17.6.

The City of Stillwater shall conduct an annual assessment of the Public Participation/Involvement program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., public input and involvement opportunities, etc.)) in Section 17 of the MS4 General Permit and determine how the program might be improved. The City shall perform the annual assessment prior to completion of each annual report and document any modifications made to the program because of the annual assessment.

Minimum Control Measure 3
Illicit Discharge Detection and Elimination

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MINIMUM CONTROL MEASURE 3

1. INTRODUCTION

1.1 Basis for the Standard Operating Procedures (SOPs)

The Minnesota Pollution Control Agency reissues their National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The MS4 GP requires the City of Stillwater to develop written procedures for the purpose of eliminating non-stormwater discharges through the development of an Illicit Discharge Detection and Elimination Program.

This manual not only assists the City of Stillwater in meeting the Stormwater Phase II regulations but encourages the use of targeted best management practices (BMPs) to prevent the discharge of non-stormwater related discharges. This Guidelines and Standard Operating Procedures Manual helps promote behavior to improve the water quality of the City of Stillwater's water resources.

1.2 Objectives of the SOPs

This manual is intended to provide guidance on Illicit Discharge Detection and Elimination (IDDE) as follows:

- Provide guidance to communities regarding commonly found illicit discharges.
- Provide guidance to communities for prioritizing areas where illicit discharges are commonly found.
- Provides guidance in implementing a pet waste and salt storage regulatory mechanism.
    - Provide tools that require owners or custodians of pets to remove and properly dispose of feces on the City's owned land areas.
    - Provide tools that require proper salt storage at commercial, institutional, and non-NPDES permitted industrial facilities. At a minimum, the regulatory mechanism(s) must require the following:
        a. designated salt storage areas must be covered or indoors;
        b. designated salt storage areas must be located on an impervious surface; and
        c. implementation of practices to reduce exposure when transferring material in designated salt storage areas (e.g., sweeping, diversions, and/or containment).
- Provide tools for response to reported illicit discharges.

2. LOCATING PRIORITY AREAS

A map has been provided in Appendix A that identifies potential priority areas for detecting illicit discharges based on land use. The methodology for further establishing priority areas is detailed in **Section 2.1**. The City of Stillwater will complete the prioritization at least once during each five-year permit term.

The City will use the Natural Resource Technician as the responsible person(s) for investigating, locating, and eliminating an illicit discharge.

2.1 Review of Available Information

Activities and Definition

Priority areas for IDDE will vary depending on water quality conditions, land use associated with business or industrial activities, etc. A relatively simple desktop assessment of available community information can provide many clues as to where illicit discharges may be occurring for basing the prioritization.

The definition of illicit discharge includes any discharge to the MS4 storm sewer that is not stormwater including, leaking sanitary sewers or water mains, illegal sewage connections, illegal floor drain connections, seasonal draining of swimming pools (pools are recommended to be dechlorinated prior to discharge), break-out from failing septic systems, discharge of vehicle/equipment washing into the storm sewer, spills and dumping (Appendix B).

Maintain the following regulatory mechanism that prohibits non-stormwater discharges into the City's MS4:

- Ordinance
- Written policies

Preparation

The following is a list of resources that will be collected and reviewed and a brief description of factors to consider during the prioritization process:

a. Zoning Maps
   Industrial areas with high density development may have a high illicit discharge potential.
b. Locations of Previous Illicit Discharges
   Areas with historical illicit discharge reports or previous citizen complaints should be considered high priority.
c. Areas with Storage of Significant Materials
   Areas that have storage of significant materials, including but not limited to: raw materials, fuels, materials such as solvents, detergents and plastic pellets, etc. should be considered high priority.

2.2 Mapping Verification Process

a. The City of Stillwater shall incorporate illicit discharge detection into all

inspection and maintenance activities conducted.

b. The City shall maintain a written or mapped inventory of priority areas the City identifies as having a higher likelihood for illicit discharges. At a minimum, the City shall evaluate the following for potential inclusion in the inventory:
    - Land uses associated with business/industrial activities;
    - Areas where illicit discharges have been identified in the past; and
    - Areas with storage of significant materials that could result in an illicit discharge.
c. Using existing maps as a basis for locations, field personnel will perform a mapping verification process by walking all named waterbodies within a given area of the community and collecting outfall location and design information using global positioning system (GPS) equipment capable of sub-meter (approximately 3 foot) accuracy. Use of a data logger and data collection software will allow the generation of GIS files that will be useful for many years.
d. Maintain a storm sewer map system that includes:
    - All pipes 12 inches or greater in diameter, including stormwater flow direction in those pipes.
    - Outfalls, including a unique identification (ID) number, and an associated geographic coordinate.
    - Structural stormwater BMPs that are part of the City's small MS4.
    - All receiving waters.
e. Review and field check other structures such as catch basins, culverts, pipes, ditches, drain manholes, etc.
f. Collect dry weather inspection information whenever possible. Dry weather discharge information can either be collected on paper forms for manual entry into a separate database at a later time or can be directly entered into a database on a laptop or the data logger on-site.
g. Mark the outfall with its identifier for future location and easy reference using pre-manufactured signs.

2.3 Detection Process

An Outfall Inspection Form (Appendix C) can be used during mapping. The form should be completed whenever evidence of an illicit discharge is observed such as significant flow during dry weather, the presence of raw sewage indicators, staining, or residue. If using paper forms to document inspections, complete an Outfall Inspection Form (Appendix C) even if there is no evidence of an illicit discharge.

Long-term, regular inspections of outfalls are a primary part of an effective IDDE program. Regular inspections will not be significantly different from inspections conducted during mapping. The Outfall Inspection Form can be used (Appendix C). The major difference from mapping inspections will be that a crew or inspector will have historical data to work with to make assessments. These inspections can be recorded in an electronic database or paper forms can be kept.

Public works crews will conduct their regular duties in and around the storm drain system. A Program Manager may elect to have crews conduct outfall inspections on a formal basis (actually bringing an inspection form and equipment) while performing other work, or the Program Manager may elect to have crews informally "keep a look out" for illicit discharges. If an employee observes evidence of an illicit discharge during an informal or non-routine inspection, they should collect as much information about the potential illicit discharge as possible then contact their supervisor so that appropriate action can be taken.

It is important to collect as much information as possible at the time of initial observation because of the likelihood that a discharge may be transitory or intermittent. Initial identification of the likely or potential sources of the discharge is also very important.

Once an illicit discharge has been reported or detected through an inspection, the next step is to locate the source. Selection of tracing techniques will depend on the type of illicit discharge detected, the information collected during initial discovery and observation (whether through an inspection by a municipal employee or through a citizen call-in), and the resources/technology available. A single technique may be used or several techniques may need to be combined to identify the source of the discharge. There are three types of discharges:

a. Transitory illicit discharges: Typically, one-time events resulting from spills, breaks, dumping, or accidents. Transitory illicit discharges should be reported to the city through a citizen complaint line or following observation by a municipal employee during regular duties. Because they are not recurring, they are the most difficult to identify, trace, and remove. The best method to reduce transitory discharges is through general public education, education of municipal response personnel, tracking of discharge locations, and enforcement of an illicit discharge ordinance.
b. Intermittent illicit discharges occur occasionally over a period of time (several hours per day, or a few days per year). Intermittent discharges can result from legal connections to the storm drain system, such as a legal sump pump connection that is illegally discharging anything other than groundwater. Intermittent discharges can also result from activities such as drum washing in exterior areas. These types of discharges are more likely to be discovered, and are less difficult to trace and remove, but can still present significant challenges. These discharges can have large or small impacts on waterbodies depending on pollutant content and the size of the receiving water body.
c. Continuous illicit discharges are typically the result of a direct connection from a sanitary sewer, overflow from a malfunctioning septic system, inflow from a nearby subsurface sanitary sewer that is malfunctioning, or an illegal connection from a commercial or industrial facility. Continuous illicit discharges are usually easiest to trace and can have the greatest pollutant load (CWP 2004).

The investigative techniques used will depend on whether or not a potential source location was identified during the initial observation:

d. Potential source identified: If a potential source for the illicit discharge was initially identified, steps should be taken to investigate the potential source site, such as inspecting the site and storm drain system in the vicinity of the site. If floor drains, sumps, or other suspect discharge locations are observed during this inspection, dye testing, smoke testing, electronic location of subsurface pipes, or televising may be used. These techniques should definitively show whether the suspect site was the source of the illicit discharge.

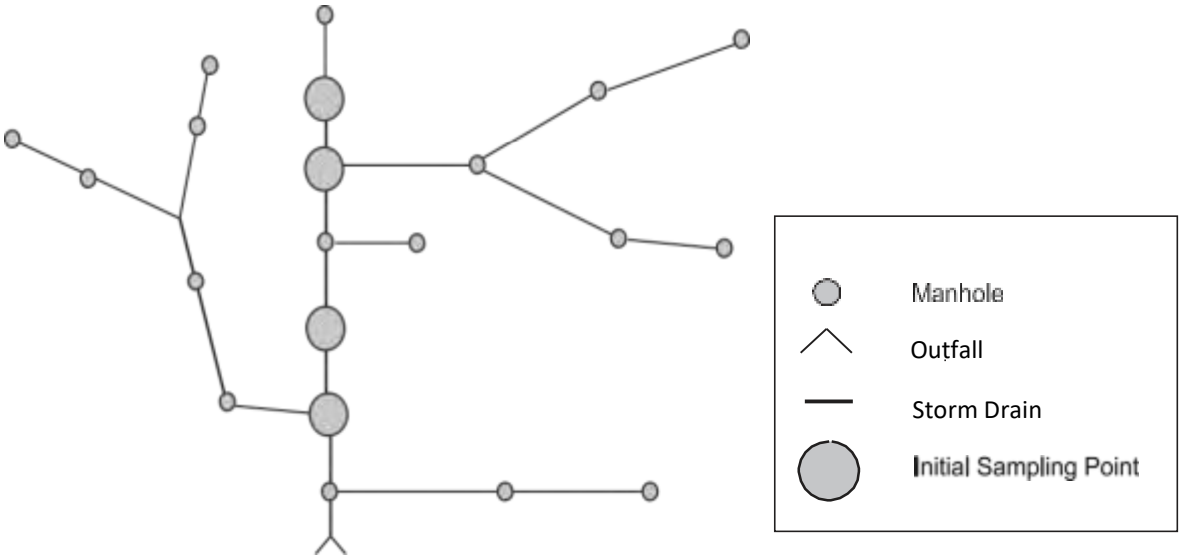
e. Potential source not identified: If no source site is suspected, and only the general area of the illicit discharge is known, it may be possible to trace the evidence of the illicit discharge by visual inspection of the storm drain access points. If this catch basin/manhole inspection technique is not fruitful, some interim steps could be taken to try to trap water from an intermittent discharge. For example, sand bagging and damming or block testing of selected storm drain access points, combined with installation of an optical brightener trap to assess if detergents are present in a discharge, can help reveal the source of the discharge. If these techniques have no positive result (no water pools behind the weir or sand bag), the discharge was likely transitory (one time only), and it may not be possible to determine its origin. In this case, the location of the originally reported illicit discharge should be added to a regular inspection program to provide for the possibility of future incidents. If the original report of the illicit discharge was severe or gross pollution, then smoke testing or televising of the storm drain system may be warranted.

It is necessary to understand the tracing technique and its limitation in order to select an effective tracing technique. The following is a brief summary of each of the tracing techniques that may be used to locate the source of an illicit discharge:

f. Visual Inspection at manholes/catch basins: This tracing technique is typically used when there is no suspected source site. It is the most cost effective and efficient method of tracing. Structures should be systematically inspected starting at the initial detection location, gradually working upstream through the system. If the crew is tracking a continuous discharge, the inspections may be relatively easy and the flow can be tracked back to its source. If the crew is attempting to track a transitory or intermittent discharge, the crew should make the following observations depending on the information provided from the initial identification: color and clarity of any discharges; staining or deposits on bottom of structure; oil sheen, scum, or foam on any standing fluids in sump of structure; odors, staining or deposits on inlet pipes and outlet pipes.

   Depending on what the crew is looking for and what they find, they will progressively inspect additional structures until either a potential source is found, or no further evidence is found. If no further evidence is found, the crew may elect to further assess some of the structures by installing sandbags or other

damming devices to determine if the discharge recurs. Crews should use standard safety procedures when conducting these inspections such as cone placement and safety vests in traffic areas, confined space entry techniques (if entry is necessary), steel-toed boots, etc.



g. Sampling flowing discharges: Samples should be collected only in the event a discharge is flowing through the outfall. Stagnant pools of water or sump water should not be sampled. If the municipal staff will be collecting the sample, the staff should be trained in safety and proper collection techniques. Table 1. lists the parameters that a sample may be analyzed for and provides a general discussion of how the results may be interpreted. This table was taken from the Center for Watershed Protection (CWP) manual (2004) which provides a more detailed discussion of sampling procedures and analysis of results. Sampling and analysis for many of the compounds should be completed by personnel trained in collection, handling, and preservation techniques to ensure accurate data. EPA guidance recommends collecting a sample when the discharge is initially found and after any source is removed. The sample collected after removing an illicit discharge can indicate if other illicit discharges are present.

h. Sandbagging or damming: Sandbagging and damming is typically only conducted when the discharge flow has ceased since initial detection. Application of this technique will show whether the discharge is one time only (no water pools behind the sandbag or dam) or intermittent (water pools behind the sandbag). CWP provides the following explanation:

1. This technique involves placement of sandbags or similar barriers such as caulk dams within strategic manholes in the storm drain network to form a temporary dam that collects any intermittent flows that may occur. Any flow collected behind the sandbag is then assessed using visual observations or by indicator sampling. Sandbags are lowered on a rope through the manhole to

form a dam along the bottom of the storm drain, taking care not to fully block the pipe (in case it rains before the sandbag is retrieved). Sandbags are typically installed at junctions in the network to eliminate contributing branches from further consideration. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of intermittent discharge. Sandbags are typically left in place for no more than 48 hours, and should only be installed when dry weather is forecast. Sandbags should not be left in place during a heavy rainstorm. They may cause a blockage in the storm drain or they may be washed downstream and lost. The biggest downside to sandbagging and damming is that it requires at least two trips to each manhole (CWP 2004, p. 157).

i. Optical brightener monitoring traps: Optical brightener monitoring (OBM) traps can be used to trace intermittent or transitory discharges that result from washwater with detergent. Detergents usually contain optical brighteners that can be detected at high concentrations using this method. However, the traps only detect highly concentrated discharges. The detergent concentration required to be detected by the light is approximately the same as pure washwater from a washing machine. Consequently, OBM traps may be best suited as a simple indicator of the presence or absence of intermittent flow or to detect the most concentrated flows. The traps can be made using easily acquired materials. The traps contain an absorbent, unbleached cotton pad or fabric swatch contained inside a wire mesh trap or section of small diameter (e.g., 2-inch) PVC pipe. The traps should be anchored to the inside of an outfall at the invert using wire or monofilament that is secured to the pipe itself. Rocks or bricks with holes can be used as temporary weights to hold the trap in place.

   Field crews can retrieve the OBM traps after 24 to 72 hours of dry weather. OBM traps need to be retrieved before coming into contact with stormwater, which will contaminate the trap or wash it away. When placed under a long wave fluorescent ultraviolet or “black” light, an OBM trap will indicate if it has been exposed to detergents. CWP reports that OBM traps have been used with some success in Massachusetts (Sargeant et al. 1998) and northern Virginia (Waye 2000). For more detailed guidance on how to use OBM traps and interpret the results, see the Reference section for World Wide Web links to the studies and guidance manuals cited above.

j. Dye testing: Dye testing is typically conducted when a potential source site has been identified, and the crew is trying to determine whether the site has floor drains or other locations that connect and discharge to the storm drain system. Permission to access the site must be obtained before dye testing can be conducted. Verbal or written requests are both acceptable. The crew should review available sanitary sewer and storm drain maps before conducting the dye testing. The dye testing procedure consists of two steps: (1) discharging the dye into the suspect location, and (2) opening nearby storm drain and sanitary sewer manhole covers to determine where the dye discharges to.

This procedure is fairly effective for confirming direct connections into the storm drain system for short reaches. If a longer pipe network is being evaluated, charcoal packets can be left in selected structures and later collected and analyzed for the presence of the dye. If dye testing on porcelain structures, tablets or charcoal should be wrapped in tissue before depositing. When dye testing, the crew should keep in mind that each structure (sink, toilet, etc.) should be tested separately. Many times a single utility in a basement may be incorrectly connected to a storm drain line instead of a sanitary line.

k. Televising: Televised video inspections are a useful technique when an illicit connection or infiltration from a nearby sanitary sewer is suspected, but little evidence of the illicit discharge remains behind. Two types of video cameras are available for use:
   1. A small camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or
   2. A larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe. Typically the operator of the camera has access to a keyboard or audio voice-over to record significant findings on the videotape that is produced for future review and evaluation.

l. Smoke testing: Smoke testing is a useful technique for tracing intermittent discharges or continuous discharges that have no apparent source site. Smoke is introduced into the storm drain system and emerges at locations that are connected to the system. Smoke testing works best for short reaches of pipe, or in situations where pipe diameters are too small for video testing.

   Notifying the public about the date and purpose of smoke testing before starting is critical. The smoke used is non-toxic, but can cause respiratory irritation, which can be a problem for some residents. Residents should be notified at least two weeks prior to testing, and should be provided the following information (Hurco Technologies, Inc. 2003):
   1. Date testing will occur.
   2. Reason for smoke testing
   3. Precautions they can take to prevent smoke from entering their homes or businesses.
   4. What they need to do if smoke enters their home or business, and any health concerns associated with the smoke
   5. A number of residents can call to relay any particular health concerns (e.g., chronic respiratory problems)

2.4 Citizen Call-In Program

Activities and Definition

a. A citizen call-in program is an effective way to identify illicit discharges. A citizen comment or complaint line will be publicized to the community. To maximize the effectiveness of citizen call-ins, dispatch personnel should be instructed on the use of the Illicit Discharge Detection and Elimination (IDDE) Inspection Form in order to collect as much information as possible at the time of the report (Appendix D). Administrative personnel should also be instructed as to where to direct the information gathered from the inspection form so that appropriate action is taken.
b. The Public Works Director should identify who should be trained, and where the call-in line will be publicized.

Preparation

a. Have a system in place to receive phone calls and collect information regarding suspected illicit discharges.

Process

a. Use the IDDE Inspection Form to collect the appropriate information from the caller (Appendix D). Then, transfer the inspection form to the Public Works Director.
b. The Public Works Director or their designee will promptly investigate reported incidents.
c. If an illicit discharge of an unknown source is confirmed, follow the procedure of Tracing Illicit Discharges.
d. If an illicit discharge known source is confirmed:

    1. City staff will seek to obtain voluntary compliance and removal from the responsible party. If the responsible party is unable or unwilling, the City will utilize various methods, such as a vac truck, street sweeper, etc., to recover the illicit discharge.
    2. For Non-Emergency Situations: Follow the Illicit Discharges and Connection Enforcement policy outlined in the City's Enforcement Response Procedures (Appendix E)
    3. For Spills and Emergency Situations: Follow the City's Spill Response Plan (Appendix F).

2.5 Tracking Illicit Discharges

a. Developing a long-term tracking program can help Program Managers better understand the origins of illicit discharges and identify maintenance issues for the storm drain system structures. A tracking program will also facilitate evaluation of the overall IDDE program and will expedite annual reporting. An effective tracking program should address illicit discharge and maintenance issues resulting from the following:

1. Citizen complaints
2. Opportunistic inspections
3. Regular longer-term inspections
4. Removal actions taken for illicit discharges

b. Stillwater's City Works system can be modified to include all the fields on the Outfall Inspection Form (Appendix C). The advantage to this tracking program is that the database can be easily linked to GIS data. Linking to GIS data allows mapping of illicit discharge locations, citizen complaint locations, and many other IDDE issues which can assist greatly in the overall program. Table 2 contains simple attributes that can be used in the database.

Table 2. Example Illicit Discharge Database Attributes

Date of Incident	Date Reported	Report Initiated by: Phone, drop-in, contact information (optional), etc.	Location of Discharge: If known - lat/long, stream address or outfall #, closest street address, nearby landmark, etc.	Description of Discharge: For example - dumping, wash water, suds, oil/solvents/chemicals, sewage, etc.	Actions to be taken: Who, What, Where, When, and How… (what should be done?)	Description of Resolution: Outcome of actions taken and any necessary follow-up (what was done)	Date Resolved

c. The City of Stillwater shall maintain written procedures for investigating, locating, and eliminating the source of illicit discharges. The procedures shall include:
    1. A timeframe in which the City will investigate a reported illicit discharge.
        - Illicit discharge found by the inspector will be documented through an IDDE inspection form and submitted to the maintenance supervisor within 48 hours.
    2. Use of visual inspections to detect and track the source of an illicit discharge.
    3. Tools to investigate and locate an illicit discharge.
d. Tools to investigate and locate an illicit discharge shall include:
    1. Mobile cameras
    2. Collecting and analyzing water samples
    3. Smoke testing
    4. Dye testing
    5. Optical brightener monitoring traps

2.6 Opportunistic Illicit Discharge Observation

Activities and Definition

Opportunistic illicit discharge observations are identified because of locating illicit discharges during routine City activities, which may include building inspections, system maintenance, etc.

Preparation

a. Be alert for potential illicit discharges to the municipal stormwater system while going about normal work activates.

Process

a. Notify the Public Works Director.
b. Assess the general area of the illicit discharge to see if the City can identify its source.
c. Whenever possible, take photographs of the suspected illicit discharge.
d. Responding stormwater department personnel or code enforcement officer will complete the following:
    1. Use the Outfall Inspection Form to document observations (Appendix C).
    2. Obtain sample for visual observation and complete the IDDE Inspection Form, if applicable (Appendix D).
    3. Follow the procedure of IDDE – Tracing Illicit Discharges.
e. If clean-up is required, use the following procedures:
    1. For Non-Emergency Situations: Follow the Illicit Discharges and Connection

Enforcement policy outlined in the City's Enforcement Response Procedures (Appendix E). The City shall require the responsible party to clean up illicit discharges. If they are unable or unwilling, the City will utilize a street sweeper, vac truck, floor-dry, or other means, as needed.

2. For Spills and Emergency Situations: Follow the City's Spill Response Plan (Appendix F).

Documentation

a. Date(s) conducted in accordance with items 18.7 and 18.11;
b. Reports of alleged illicit discharges received, including date(s) of the report(s), and any follow-up action(s) taken by the City;
c. Date(s) of discovery of all illicit discharges;
d. Identification of outfalls, or other areas, where illicit discharges have been discovered;
e. Sources (including a description and the responsible party) of illicit discharges (if known); and
f. Action(s) taken by the City, including date(s), to address discovered illicit discharges.
g. File all completed forms (i.e. Incident Tracking Form, Outfall Inspection Form, Catch Basin Cleaning Form, and or Storm Drain Cleaning Log.)
h. Document any further action taken.

2.7 Training

Activities and Definition

Training of City staff will be important so that they are aware of the importance of Illicit Discharge Detection and Elimination. This includes knowledge in identifying illicit discharges and procedures to report and document them.

Training of field staff will also be important in identifying illicit discharges and procedures to report and document them. At least once each calendar year, the City shall train all field staff in illicit discharge recognition (including conditions which could cause illicit discharges) and reporting illicit discharges for further investigation. Staff will be trained through emails and field training.

Previously trained individuals shall attend a refresher-training every three (3) calendar years following the initial training.
The following list gives the yearly training required for departments and the people involved.

a. Employees of City owned or operated facilities:
Prohibition against and the water quality impacts associated with illicit discharges

and improper disposal of waste.

b. MS4 engineers, development and plan review staff, land use planners:
   Post-construction stormwater control requirements and associated BMPs.
c. Office Staff:
   Illicit discharge reporting.
d. Field and Other Staff:
   Implementation of the construction stormwater program, including permitting, plan review, construction site inspections, and enforcement.
e. All employees:
   Employees who have primary construction, operation, or maintenance job functions that are likely to impact stormwater quality, in addition to law enforcement and emergency services personnel (e.g. fire department) who may be responsible for identifying illicit discharges.

Documentation

The City of Stillwater shall document training relating to permit item 18.8 and 18.9 including the following:

a. General subject matter covered
b. Names and departments of individuals in attendance
c. Dates of each event

2.8 Enforcement Response Procedure

Activities and Definition

To the extent allowable under state or local law, the City of Stillwater shall develop, implement, and enforce a regulatory mechanism(s) that prohibits non-stormwater discharges into the City's MS4, except those non-stormwater discharges authorized in item 3.2.

The City of Stillwater shall maintain written enforcement response procedures (ERPs) to compel compliance with the regulatory mechanism(s). Such enforcement tools include timeframes to complete corrective actions and the name or position title of responsible person(s) for conducting enforcement. The following enforcement tools are used:

a. Verbal warning
b. Notice of violation
c. Civil penalty
d. Removal of connection/discharge

Documentation

The City of Stillwater shall document the following relating to ERPs:

a. Name of the person responsible for violating the terms and conditions of the City's regulatory mechanism(s)
b. Date(s) and location(s) of the observed violation(s)
c. Description of the violation(s)
d. Corrective action(s) (including completion schedule) that the City issued
e. Referrals to other regulatory organizations (if any)
f. Date(s) violation(s) resolved.

The City shall conduct an annual assessment of the IDDE program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., trainings, inventory, inspections, enforcement, etc.)) in Section 18 of the MS4 General permit and determine how the program might be improved. The City shall perform the annual assessment prior to completion of each annual report and document any modifications made to the program because of the annual assessment.

REFERENCES

Center for Watershed Protection. 2004. Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments. Center for Watershed Protection, Ellicott City, MD & University of Alabama, Tuscaloosa, AL.

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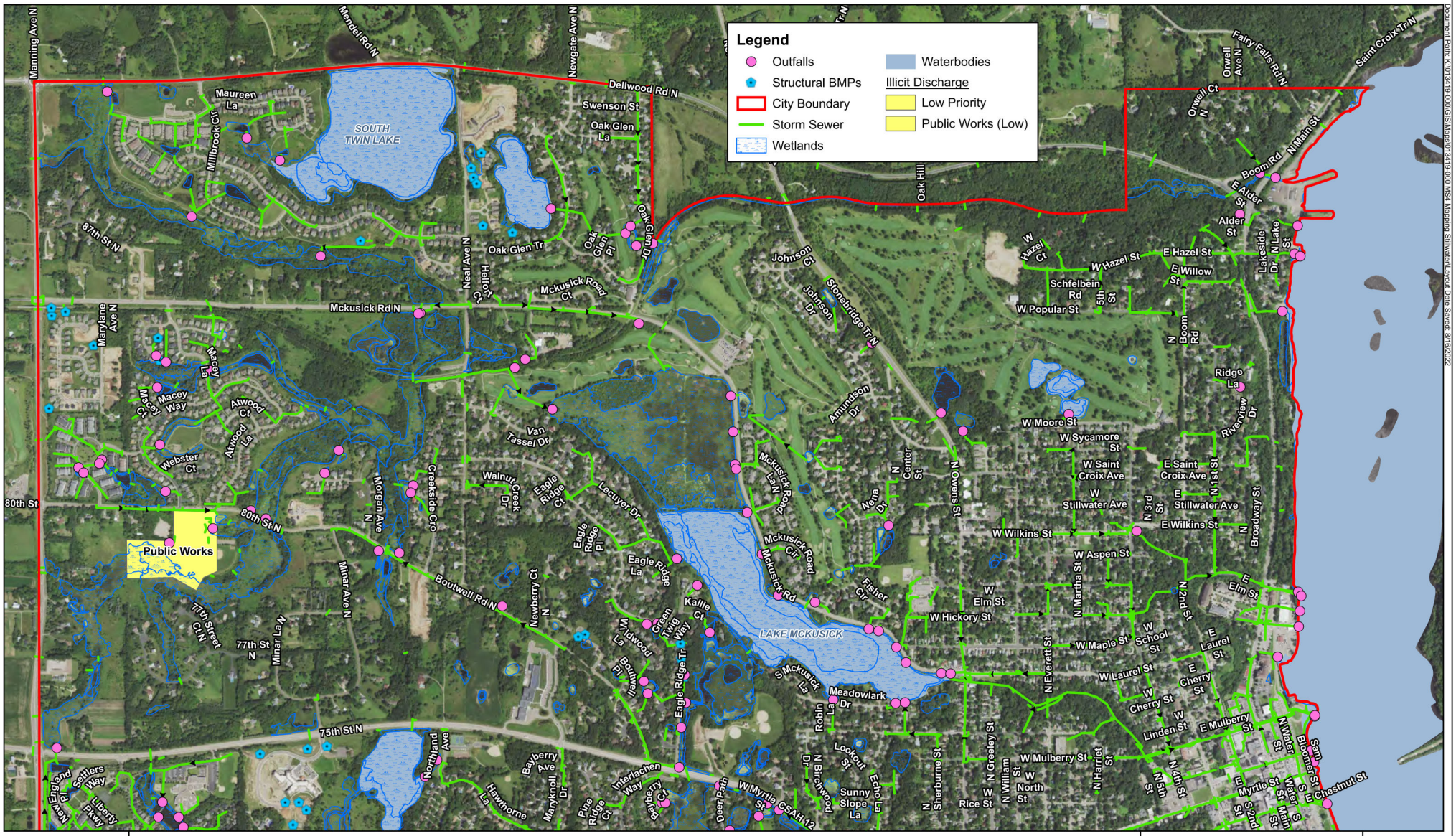
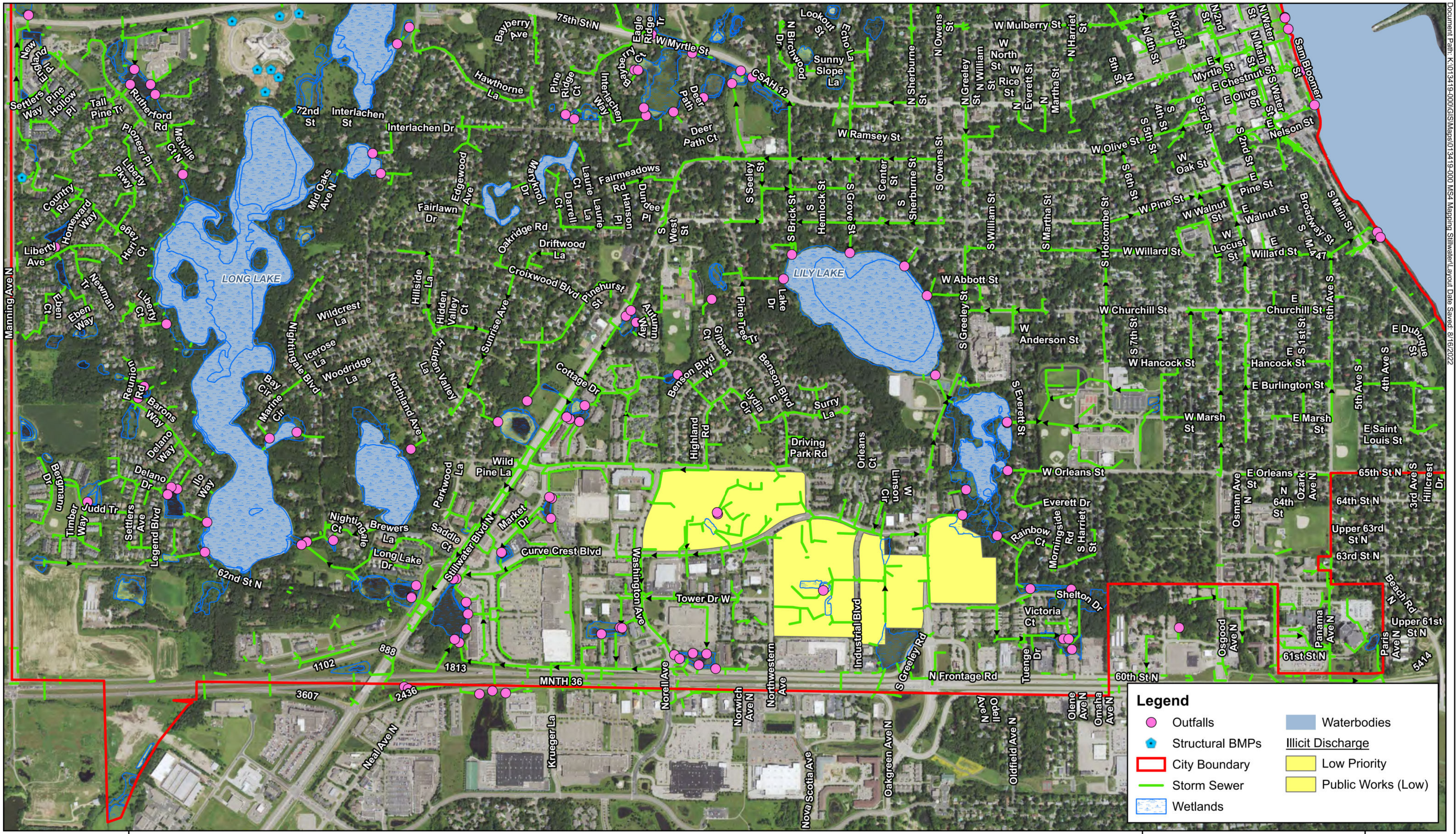


Stormwater & Illicit Discharge Map - North

Appendix A

MS4 Permit Mapping
City of Stillwater



Stormwater & Illicit Discharge Map - South

Appendix A

MS4 Permit Mapping
City of Stillwater

Appendix B - Definitions

Authorized Enforcement Agency: the City of Stillwater.

Best Management Practices (BMPs): schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act: The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity: Activities subject to NPDES Construction Permits. These include construction projects resulting in land disturbance of one acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials: Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Discharge: Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in this ordinance.

Illicit Discharge Types:

Transitory illicit discharges: Typically one-time events resulting from spills, breaks, dumping, or accidents. Transitory illicit discharges are often reported to an authority through a citizen complaint line or following observation by a municipal employee during regular duties. Because they are not recurring, they are the most difficult to identify, trace, and remove. The best method to reduce transitory discharges is through general public education, education of municipal response personnel, tracking of discharge locations, and enforcement of an illicit discharge ordinance.

Intermittent illicit discharges: Occur occasionally over a period of time (several hours per day, or a few days per year). Intermittent discharges can result from legal connections to the storm drain system, such as a legal sump pump connection that is illegally discharging anything other than groundwater. Intermittent discharges can also result from activities such as drum washing in exterior areas. These types of discharges are more likely to be discovered and are less difficult to trace and remove, but can still present significant challenges. These discharges can have large or small impacts on waterbodies depending on pollutant content and the size of the receiving water body.

Appendix B - Definitions

Continuous illicit discharges: These are typically the result of a direct connection from a sanitary sewer, overflow from a malfunctioning septic system, inflow from a nearby subsurface sanitary sewer that is malfunctioning, or an illegal connection from a commercial or industrial facility.Continuous illicit discharges are usually easiest to trace and can have the greatest pollutant load (CWP 2004).

Illicit Connections: An illicit connection is defined as any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Industrial Activity: Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).

Minnesota Pollution Control Agency (MPCA): The Minnesota Pollution Control Agency is a Minnesota state agency that monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations for the State of Minnesota.

Municipal Separate Storm Sewer Systems (MS4): A municipal separate storm sewer system is a conveyance or system of conveyances that is owned or operated by a public entity (which can include cities, townships, counties, military bases, hospitals, highway departments, universities, etc.) and is designed or used for collecting or conveying stormwater, which are not part of a publicly owned wastewater treatment system.

National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit: means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342 (b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual group, or general area-wide basis.

Non-Storm Water Discharge: Any discharge to the storm drain system that is not composed entirely of storm water.

Person: Any individual, association, organization, partnership, firm, corporation or other entity recognized by law and action as either the owner or as the owner's agent.

Pollutant: Anything which causes or contributes to pollution. Pollutants may include, but are not limited to paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, pesticides, herbicides, and fertilizers; hazardous substances and wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Appendix B - Definitions

Premises: Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

Standard Operating Procedures (SOPs): Established or prescribed methods to be followed routinely for the performance of designated MS4 operations or in designated situations.

Storm Drain System: Publicly owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

Stormwater: Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation and resulting from such precipitation.

Stormwater Pollution Prevention Plan: A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

Wastewater: Any water or other liquid, other than uncontaminated storm water, discharged from a facility.

Appendix C
City of Stillwater Outfall Inspection Form

General Information:

Outfall ID #_____	Inspected by:	Date: _____

Last Rain Date (if known):_____Amount:_____(inches)
Today's Rainfall Amount:_____(inches)

Address/Nearby Landmark: _____

Weather Conditions: ☐ Clear Skies ☐ Overcast ☐ Other: _____	Photos taken? ☐ Yes ☐ No

Outfall Data:

Outfall Type:	Outfall Condition:
☐ Manhole ☐ Flared End ☐ Swale ☐ Weir ☐ Flume ☐ Culvert ☐ Other	☐ Clear/Functioning ☐ Needs Maintenance/Cleaning ☐ Needs Repair ☐ Needs Replacement Immediate Action Needed? ☐ Yes ☐ No Other Notes:_____-

Discharge Data:

Visible Flow? ☐ Yes ☐ No ☐ Submerged	Flow Depth: _____(approx. inches)	Significant erosion and/or sedimentation? ☐ Yes ☐ No

If flow is present, describe and check all that apply:

☐ Colored Water _____	☐ Scum _____
☐ Odor _____	☐ Oily Sheen _____
☐ Murky, Turbid _____	☐ Sludge Present _____
☐ Floating objects _____	☐ Clear _____
	☐ Suds _____

Illicit Discharge Details:

☐ Follow-up Required	Yes / No	☐ ≥ 72 hours since last rainfall	Yes / No
☐ IDDE Source Identified	Yes / No	☐ Sample Collected?	Yes / No
☐ Responsible Party Name	_____	☐ Photos taken?	Yes / No
☐ Potential Pollutants?	Yes / No	☐ Corrective Action Required?	Yes / No
☐ Enforcement Response Followed	Yes / No		

Additional Information:

Comments / Corrective Action Conducted:

Appendix D

Illicit Discharge Detection and Elimination Inspection Form

General Information:

Inspector: _____	Inspection Date ___/___/___	Time: AM PM
Weather:	Within Priority Area: ☐ Yes ☐ No	Photos taken? ☐ Yes ☐ No
Inspection Reason: ☐ Regular Inspection ☐ Complaint ☐ Alleged illicit discharge	Last Rain Date:_____ Amount:_____(inches) Today's Rainfall Amount:_____(inches) Rainfall Data Source: on-site gauge weather station w/in 1 mi	

Citizen Call-In Information (*for citizen call-in incidents only*):

Call Taken By:	Date of Call:	Time of Call:	Contact Information for Caller *(optional):*
_____	___/___/___	_____AM/PM	_____

Incident Location *(Provide one or more below)*

Lat./Long.:_____ Outfall #:_____ Closest Street Address/Landmark**:** _____

Detection and Tracking:	**Type of Discharge:**	
☐ Visual inspection ☐ Mobile camera ☐ Sample Collected ☐ Other effective investigation tool: _____	☐ Illegal dumping ☐ Sanitary sewer ☐ Cross connection ☐ Floor drain connection to storm sewer ☐ Sanitary sewer overflow	☐ Inflow / infiltration ☐ Straight pipe sewer discharge ☐ Failing septic system ☐ Pump station failure ☐ Other: _____
☐ Inlet (City ID #_____)	☐ Outlet (City ID #_____)	

Description of Discharge:

☐ Flow present? ☐ Estimated discharge _____ ☐ Water Color _____ ☐ Odor _____	☐ Turbidity _____ ☐ Floatables _____ ☐ Sedimentation _____ ☐ Oil Sheen _____

Reporting:

Responsible Party:_____(if identified)	Follow-up Required? ☐Yes ☐ No
MN State Duty Officer Notified? ☐ Yes ☐ No (1-800-422-0798) Duty Officer Report # _____	Name of Staff to conduct Follow-up: _____
Corrective Actions:	

Appendix E
City of Stillwater IDDE Tracking Log

Date of Incident/ Date Reported:	**Report Initiated By**: Phone, drop-in, contact information (otional), etc.	**Location of Discharge:** If known - lat/long, outfall #, closest street address, nearby landmark, etc.	**Descrip. of Discharge:** For example - dumping, washwater, suds, oil, solvents, chemicals, sewage, etc.	**Actions to be taken:** Who, What, Where, When and How…(what should be done)	**Descrip. of Resolution:** Outcome of actions taken and any necessary follow-up (what was done)	**Date Resolved:**
Ex: 7/6/2022	*Drop-in, anonymous*	*1234 Maple Street*	*Motor oil*	*Neighbor was dumping motor oil into stormdrain in front of 1234 Maple Street. Public Works Director will send written warning to resident.*	*Public Works Director mailed a written warning to resident dumping motor oil on 7/9/2022.*	*7/9/2022*

Appendix F

City of Stillwater Spill Response Plan

Emergency Contact Information

Onsite Emergency Contact(s)	Public Works (Primary) – Monday-Friday, 7:00am-3:30pm (651) 275-4100 Washington County Dispatch (Secondary) – 24-hours 911
Emergency Response Contact(s)	Fire/Paramedics/Police: 911 Fire Non-Emergency Line: (651) 426-1080 MN Duty Officer: (651) 649-5451 MN Department of Health: (651) 201-5414 National Response Center: (800) 424-8802

Spill Response Plan

Step 1: Approach the Scene

- Use safety first in responding to spills. Do not endanger yourself or others by entering a hazardous environment. If there is a fire or medical attention is needed, call 911 immediately.
- Avoid exposure. Approach the spill from upwind and stay clear of spills, vapors, fumes and smoke.

Step 2: Secure the Scene

- Isolate the spill.
- Keep people away from the scene; divert traffic and pedestrians as needed.
- If possible, stop the source of the spill.
- Eliminate any ignition sources.

Step 3: Identify the Hazards

- Attempt to identify the spilled material.
    - Characteristics (odor, color, sheen), labels/markings, container type, activities in the area, hazard warnings, etc.

Step 4: Assess the Situation

- Determine the appropriate first response actions and if additional response help is needed
- The response will be dictated by the size of the spill and the hazard:
    - Is there a fire, a spill, or a leak?
    - Is there a potential for it to mix with something else?

- Observe your surroundings:
    - Who/what is at risk?
    - Is an evacuation necessary?
    - What resources are required and readily available to contain the spill?

Step 5: Report the Spill

- Report spills that may cause pollution, such as toxic, flammable, corrosive and dangerous industrial chemical spills.
    - Minnesota has a reporting threshold of greater than five gallons for petroleum spills. Spills of any quantity of all other chemicals or materials should be reported. When in doubt, report.
- Contact the Minnesota Department of Public Safety Duty Officer at 1-800-422-0798 (toll free) or 651-649-5451 (Metro area), if the spill of any substance or material may cause or has caused pollution of waters of the state.

Step 6: Contain the Spill

- Always wear the appropriate personal protective equipment, such as gloves, boots, and safety glasses. Know the limitations of the personal protective equipment.
- Place booms or available materials around the perimeter of the spill to keep it from spreading.
    - If the spill is a threat to any storm water conveyance, like street gutter, storm drain or inlet, swale, ditch, storm, or river, place absorbent between the spill and storm device.
- Apply absorbent materials starting from the downhill and outside edge of the spill.

Step 7: Clean Up the Spill

- If you have the proper training, small spills may be cleaned up according to the chemical label and your training.
    - Do not wash or hose down the spill into the street, ditch or storm drain.
    - If flammable liquid is spilled, ventilate the area and eliminate any possible sources of ignition.
    - Clean up the spills, leaks and drips quickly. Use “dry” clean-up methods, such as sweeping or shoveling. If the spill can be moved by wind, cover the material with sheeting to prevent spreading.
    - Place all clean-up waste in appropriate containers. If hazardous, ensure that material is placed in a hazardous waste container.
    - Dispose of spill material in compliance with all Federal, State and Local regulations.
- If you do not have proper training, or the spill is a large spill, leave the area and notify Emergency Responders (911). Give the operator the spill location, chemical spilled and approximate amount.

Step 8: Complete Spill Documentation and Follow-up

- Clean and decontaminate all reusable spill cleanup equipment.
- Be sure to restock your spill response materials and personal protection equipment as soon as possible.
- Update facility spill records.

Minimum Control Measure 4
Construction Site Erosion and Sediment Control

TABLE OF CONTENTS

APPENDICES

1. INTRODUCTION

1.1. Basis for the Standard Operating Procedures (SOPs)

The Minnesota Pollution Control Agency issues a National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The MS4 GP requires the City of Stillwater to develop written procedures for the purpose of eliminating pollutants associated with construction activity and due to new development and redevelopment on projects with land disturbance of greater than or equal to once acre, including projects that are less than one acre that are part of a common plan of development or sale.

This manual assists the City of Stillwater in meeting the Stormwater Phase II regulations, by incorporating guidance on the following:

- Plan review
- Training
- Inspections
- Long-term Operation and Maintenance

The Guidelines and Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Stillwater's lakes, ponds, and creeks as well as the St. Croix River.

1.2. Objectives of the SOPs

This manual is intended to provide guidance on Construction Site Erosion and Sediment Control:

- Provide guidance regarding plan review procedures.
- Provide guidance to communities for prioritizing where construction site inspections may need to occur on a more frequent basis.
- Provide guidance to City staff on what to look for during construction inspections.
- Provide guidance on how to enforce non-compliant construction sites.
- Provide guidance to City staff on proper procedures for BMP operation and maintenance.
- Provide guidance to municipalities for prioritizing where construction site inspections may need to occur on a more frequent basis.
- Provide guidance to municipal staff on what to look for during construction inspections.

2. PLAN REVIEW AND APPROVAL PROCESS

2.1. Plan Review

Activities and Definition

Plans that are submitted to the City for approval will have a review process to guarantee erosion and sediment control standards.

Maintain the following regulatory mechanism that prohibits non-stormwater discharges into the City's MS4, establishes erosion, sediment, and waste controls as stringent as the Construction Stormwater Permit requirements for construction sites:

- Ordinance
- Permits
- Written policies

Preparation

a. When the CSW Permit is reissued, the City shall revise their regulatory mechanism(s), if necessary, within 12 months of the issuance date of that permit, to be at least as stringent as the requirements for erosion, sediment, and waste controls described in the CSW Permit.
b. The City of Stillwater shall require that owners and operators of construction activity develop site plans that must be submitted to the City for review and confirmation that regulatory mechanism(s) requirements have been met, prior to the start of construction activity.
c. Review city ordinances 411, Comprehensive Water Resource Management Plan Policies 3.1.1, 3.1.2, and 3.2.2, the Middle St. Croix Watershed District, Brown's Creek Watershed District, and Carnelian Marine Watershed District erosion control and stormwater rule, and the MPCA Construction General Permit,.
d. Reviews of submitted plans, will utilize a check list to ensure accuracy (Appendix A).

Process

The regulatory mechanism(s) shall require the owners and operators of construction activity to keep site plans up-to-date with regard to stormwater runoff controls. The regulatory mechanism(s) must require that site plans incorporate the following erosion, sediment, and waste controls that are at least as stringent as described in the CSW Permit:

a. erosion prevention practices;
b. sediment control practices;
c. dewatering and basin draining;
d. inspection and maintenance;
e. pollution prevention management measures;
f. temporary sediment basins; and
g. termination conditions.

The following processes shall be done:

a. The City shall distribute written notifications to owners and operators of the need to apply for and obtain coverage under the CSW Permit.

b. The City shall provide a written checklist, consistent with the requirements of the regulatory mechanisms to document the adequacy of each site.
c. The City engineering and planning staff will review plans.
d. A check list will be used to ensure accuracy of submitted plans.
e. The City will defer to the Middle St. Croix Watershed District, Brown's Creek Watershed District, and Carnelian Marine Watershed District erosion control and stormwater rule for enforcement of their stormwater rules.

Follow-up

When comments are submitted by the applicant, the review committee will follow up in 7-10 business days to ensure all comments were addressed by applicant.

Documentation

a. Keep logs of the number of plan reviews per calendar year.
b. Document each plan review completed within the City's SWPPP tracking Excel table to help expedite the annual reporting process.
    - Project name
    - Location
    - Total acreage to be disturbed
    - Owner and operator of the proposed construction activity
    - Proof of notification to obtain coverage under the CSW Permit or proof of coverage under the CSW Permit
    - Any stormwater related comments and supporting completed checklist, as required in item 19.6, used by the City to determine project approval or denial.
c. Copies of plans, BMP quantities, and proposed BMPs will be forwarded to inspector or inspecting consultant.
d. Keep logs of all maintenance agreements that get filed with the watershed districts along with their BMP locations.

2.2. Training

Activities and Definition

Training of City staff will be important so that they are aware of the importance of good erosion and sediment control practices. This includes knowledge of installation and inspection techniques as well as record keeping and maintenance activities. It is important for City staff to be able to recognize deficiencies in BMPs on construction sites. Inspection staff will be responsible for tracking and enforcing permit requirements.

The employee training provided by the City will include stormwater 101 training sessions, training received through the University of Minnesota's erosion and sediment control, and a hands-on process to discuss the activities that are occurring in the field and how those

activities can impact the City's MS4 program. Including employees into the planning process will help them understand that they are part of the solution to improve water quality.

The City shall ensure that individuals receive training commensurate with their responsibilities as they relate to the City's Construction Site Stormwater Runoff Control program. Individuals includes, but is not limited to, individuals responsible for conducting site plan reviews, site inspections, and/or enforcement. The City shall ensure that previously trained individuals attend a refresher-training every three (3) calendar years following the initial training.

Documentation

The City of Stillwater shall document the training related to permit item 19.11:
1. General subject matter covered
2. Name(s) and departments of individuals in attendance
3. Date of each event

2.3. Inspections

Activities and Definition

Construction site inspections will determine compliance with the City's regulatory mechanism(s).

Preparation

a. Identify priority sites for inspection based on topography, soil characteristics, type of receiving water, stage of construction, compliance history, or weather conditions.
b. Ensure staff has proper training pertaining to Erosion and Sediment Control techniques.

Process

a. Identify sites that require erosion and sediment control inspection.
b. Perform inspection using the erosion control inspection check list (Appendix B).
c. Identify sites that are high-priority and low-priority sites for inspections based on the types of receiving water(s), stage of construction, and compliance history. Ensure inspections for high-priority sites are done once every seven (7) days, and inspections for low-priority sites are done once every thirty (30) days. Ensure the name(s) of individual(s) or position title(s) responsible for conducting site inspections is the Natural Resources Technician.
d. Document construction activities and follow up with site owner/City about findings from inspection. If feasible, prior to leaving the site talk to the responsible person to ensure corrections can be made in a timely fashion.
e. Perform a follow up inspection of site if deficiencies are found during initial inspection. Ensure that correction items have been completed.
f. Failure to comply with the permit requirements may require initiating. enforcement action as described in the City's Enforcement Response Procedures (ERPs) as follows:
    1) Verbal Warnings
    2) Notice of Violations
    3) Stop-Work Orders

Documentation

The City of Stillwater shall maintain written procedures for identifying high-priority and low-priority sites for inspection. At a minimum, the written procedures shall include:

a. Detailed explanation describing how sites will be categorized as either high-priority or low-priority;
b. A frequency at which the City will conduct inspections for high-priority sites;
c. A frequency at which the City will conduct inspections for low-priority sites; and
d. The name(s) of individual(s) or position title(s) responsible for conducting site inspections.

City staff shall record the following items in the City's SWPPP tracking system to document each site inspection when determining compliance with the City's regulatory mechanism(s):

a. Stabilization of exposed soils (including stockpiles)
b. Stabilization of ditch and swale bottoms
c. Sediment control BMPs on all downgradient perimeters of the project and upgradient of buffer zones
d. Storm drain inlet protection
e. Energy dissipation at pipe outlets
f. Vehicle tracking BMPs

g. Containment for all liquid and solid wastes generated by washout operations (e.g., concrete, stucco, paint, form release oils, curing compounds, and other construction materials)
h. BMPs maintained and functional

City staff shall record the following items in the City's SWPPP tracking system to document the status of erosion and sediment control violations, enforcement actions and follow-up:

a. Keep logs of the number of inspections.
b. Keep records of inspection reports and reports sent.
c. Keep records of escalation of penalties.
    1. Name of the person responsible for violating the terms and conditions of the City's regulatory mechanism(s)
    2. Date(s) and location(s) of the observed violation(s)
    3. Description of the violation(s)
    4. Corrective action(s) (including completion schedule) that the City issued
    5. Referrals to other regulatory organizations (if any)
    6. Date(s) violation(s) resolved

Noncompliance

The City of Stillwater shall maintain written procedures for receipt and consideration of reports of noncompliance or other stormwater related information on construction activity submitted by the public.
a. The public may submit concerns about construction violations through the City's website or by calling the City directly. Reports are investigated within one business day.

The City shall implement and enforce a regulatory mechanism(s) that establishes requirements for erosion, sediment, and waste controls that is at least as stringent as the Agency's most current Construction Stormwater General Permit (MNR100001).

Failure to comply with the permit requirements may require initiating enforcement action as described in the City's Enforcement Response Plan as follows:
1. Verbal Warnings
2. Notice of Violations
3. Stop Work Orders

2.4. City Projects Erosion and Sediment Control BMPs

Activities and Definition

City projects that will disturb any amount of soil will use proper erosion and sediment

control BMPs.

Preparation

a. Ensure extra BMPs are available for City projects including inlet protection, perimeter control, temporary and permanent stabilization methods.
b. Ensure staff has proper training pertaining to Erosion and Sediment Control techniques.

Process

a. Construction projects that have the potential to impact the MS4 system or any natural resource will have BMPs available prior to construction activity.
b. Install down gradient perimeter control where needed on the site.
c. Block adjacent inlets and outlets, if necessary to prevent sediment and debris from discharging into the storm sewer.
d. Stabilize all exposed soil areas upon completion of work. If work is not complete, temporary stabilization methods will be used.
e. After the work is complete, clean out any sediment that might have entered the MS4 system.

Documentation

a. Keep logs showing the BMPs were inspected and properly maintained during the active construction period until the period when final stabilization has been achieved.
b. Sites should be inspected weekly or after a rainfall event greater than 0.5 inches in 24 hours where the soil disturbance is 1 acre or greater.
c. If applicable, record the amount of waste collected, the number of catch basins cleaned, and the area they were cleaned in. Keep any notes or comments of any problems.
d. If applicable, document the final location of where the material was disposed, and any paperwork received from the disposal location.

2.5. Private Projects

Activities and Definition

Private projects that require a building permit, demolition permit, grading/excavation, and tree removal permit will use proper erosion and sediment control BMPs. Depending

on the proposed improvements these sites may also be required to install BMPs for post-construction stormwater management. Building officials will be responsible for inspection of building permit activities. Engineering staff will be responsible for inspecting sites that require a state NPDES permit.

The Middle St. Croix Watershed Management Organization (MSCWMO), Brown's Creek Watershed District (BCWD), and Carnelian Marine Watershed District (CMSCWD) require erosion control permit for the following activities:

- ≥10,000 sq. ft. disturbance
- Creation or full reconstruct of ≥ 5,000 sq. ft. (6,000 sq. ft. for MSCWMO) of impervious surface.
- ≥ 100 c.y. grading, excavation, filling or storing of soil or earth material (MSCWMO)
- ≥ 50 c.y. grading, excavation, filling or storing of soil or earth material (BCWD)

MSCWMO, BCWD, and CMSCWD have staff that actively inspects construction sites throughout the entire district. In an effort to inspect priority sites more often the City should contact the watershed to identify sites where the City could use their attendance. The City will also want to oversee the installation of BMPs for post-construction stormwater management.

Process

Any Private projects that are within the City limits will be inspected by a qualified City employee. Inspections will occur at a frequency that is commensurate of the activities taking place. The field inspector should use the field inspection checklist for guidance (Appendix B) and the inspection form (Appendix C). Using a standardized checklist for inspections will create consistency amount all inspectors.

Documentation

a. Keep logs of the number of inspections.
b. Keep records of inspection reports and reports sent.
c. Keep records of escalation of penalties.
    1. Verbal warnings
    2. Notice of Violation
    3. Stop work orders

The City of Stillwater shall conduct an annual assessment of the Construction Site Stormwater Runoff Control program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., inventory, trainings, site plan reviews, inspections, enforcement, etc.)) in Section 19 of the MS4 General Permit and determine how the program might be improved. The City shall perform the annual assessment prior to completion of each annual report and document any modifications made to the program because of the annual assessment.

Appendix A: Plan Review Checklist
City of Stillwater Site Plan Review

Address:		Permit No:	
PID:		Date Approved:	
Date Received:		Signature:	
Site Size (acres):		Area of Disturbance(acres):	
Existing Impervious (acres):		Proposed Impervious (acres):	

Submittals Received

Date	Document	Author

General Site Plan		
	Yes √	**No √**
Scale of Survey. Minimum scale 1" = 50'. Maximum size plan sheet 24" x 36"		
Survey signed by a registered survey with elevations in NGVD-1929 datum for the following locations:		
• Each lot corner		
• Grade elevation at the foundation and elevation of top of foundation of structures on adjacent lots		
• Grade elevation at the foundation, elevation of top of foundation and garage floor of proposed new construction		
• Lowest point of entry (i.e. door sill or top of window well) of proposed and existing construction		
• Lowest floor of proposed and existing construction		
Any proposed retaining wall must have a top and bottom elevation and bottom elevation would be finish grade. Also, no retaining wall is allowed to be built on private property		
Retaining walls greater than 4.0 feet in height have been designed and certified by a licensed professional engineer and a building permit has been acquired		
Easements are clear of any encroachments?		
New curb cuts proposed? If new curb cut is proposed, stamp all survey maps with the curb cut stamp. Also, write a note on the Residential Plan & Routing Approval form reminding the builder that a curb cut permit is required if the driveway is moved or a new driveway is added		
Low floor a minimum of 4.25' (feet) above the sanitary sewer invert elevation		

Comments:

_____

_____

_____

_____

Erosion Control Plan		
	Yes √	No √
SWPPP notes provided on the plan		
Temporary stabilization measures provided		
Erosion control blankets provided on all slopes greater than 3:1		
Perimeter Control i.e., Silt Fence, Filter Log, etc.		
Phasing for sites that are ≥ 1 acre		
CB Inlet Protection		
Dewatering		
Sediment control		
Waste control		
Concrete washout		
Rock entrance		
Street sweeping schedule		
Permanent restoration plan		
SWPPP includes an erosion and sediment control inspection schedule and person responsible for maintenance		

Comments:

_____

_____

_____

Stormwater Management Plan		
	Yes √	No √
Delineation map		
Modeling calculations for existing and proposed conditions		
• 2, 10, 100, Snowmelt		
• Modeled direct connected impervious separate		
Off-site drainage included		
Wetlands shown on plans and wetland permitting completed		
Pretreatment		
Skimmer structures provided on the outlets of all ponds.		
Soil borings		
Design Infiltration Rate Determination		
Seasonal High-Water Elevation		

Comments:

_____

_____

_____

Water Quality		
	Yes √	No √
Volume control provided as per the Watershed District		
Sequencing provided for alternatives where infiltration is infeasible		
Required Water Quality Volume:		
Provided Water Quality Volume:		

Comments:

_____

_____

_____

Rate Control		
	Yes √	**No √**
Peak Discharge Rates < Existing		

Comments:

_____

_____

_____

Freeboard		
	Yes √	**No √**
Building Opening:		
• 3’ above the critical 100-yr HWL of local basins, wetlands, & infiltration basins		
• 2’ above EOF of local basins, wetlands, & infiltration basins		
• 2’ above the 100-yr flow elevation of a swale or channel at the point where the swale channel is closest to the building		
Low Floor Elevation:		
• 2’ above the critical 100-yr HWL of major basins		
• 2’ above EOF of major basins		
• For landlocked basins: 2’ above the HWL from back-to-back 100-yr rainfalls or 2’ above the HWL from the 100-yr 10-day snowmelt, whichever is higher. Starting elevation of the basin/waterbody prior to runoff is one of the following:		
○ Existing Ordinary High-Water level established by the Minnesota Department of Natural Resources		
○ Annual water balance calculation approved by the City		
○ Local observation well records, as approved by the City		
○ Mottled soil		

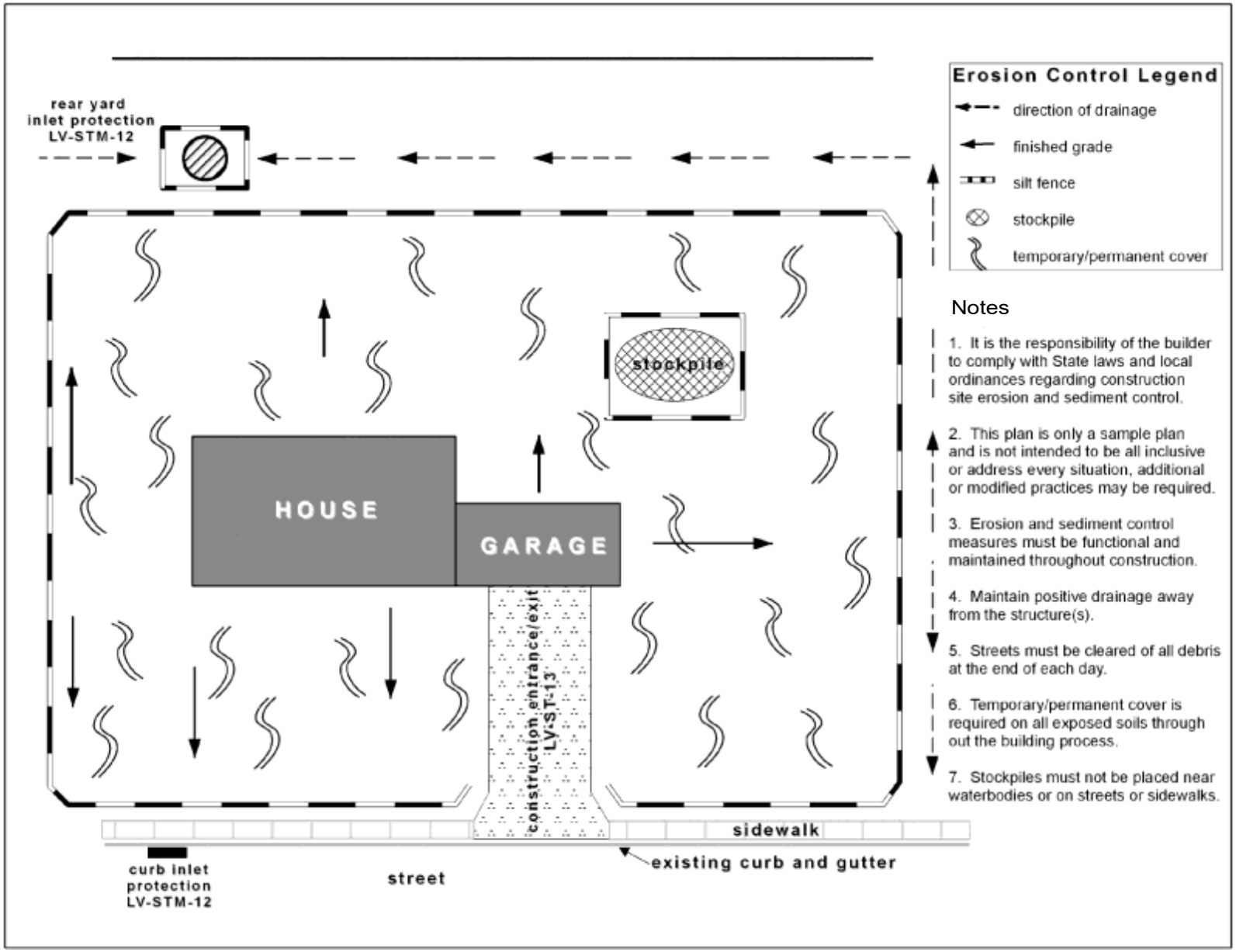
Comments:

_____

_____

_____

Individual Lot Erosion and Sediment Control



Appendix B: Plan Review Log

City of Stillwater Plan Review Log

Project No.	Contact Person Name	Contact Person Address	Contact Person Phone	Developer	Project Type	Project Location	Priority Area?	Size	Estimated Disturbed Area	Proposed Impervious	Proposed BMP Qty	Maintenance Agreement	Status
(example)	Joe Smith	1234 Maple Lane, Maple, MN, 12345	(123)456-7890	Smith Building	Residential SFH	1234 Maple Lane, Maple, MN, 12345	No	3 Acres	1 Acre	5%	20	Yes	Approved

Appendix C: Erosion & Sediment Control Inspection Form

Construction Site Stormwater Runoff ESC Inspection Form

Site Name:	**Permit No.:**	**Inspector(s):**
Address:	**Inspection Date:**_____/_____/ _____ **Time:**_____am/pm	**Photos Taken?** ☐Yes ☐No
Owner:	**Weather:**	**Date of Last Inspection:**_____/_____/ _____
Contractor:	**Priority Area:** ☐Yes ☐No	**Last Rain Date:**_____/_____/ _____ **Amount:**_____(inches)
Inspection Reason: ☐ Weekly ☐Rain Event ☐Complaint ☐Spot-Check	**Today's Rainfall** **Amount :**_____(inches)	**Rainfall Data Source :** ☐ On-site Gauge ☐Weather Station w/in 1 mile

	BMP	Compliant?	Maintenance Required?	Corrective Action(s) Needed & Notes	Date Corrected
1.	Perimeter controls installed/maintained?	☐ Yes ☐ No	☐ Yes ☐ No		
2.	Natural features are protected with a BMP?	☐ Yes ☐ No	☐ Yes ☐ No		
3.	Storm drain inlets are properly protected?	☐ Yes ☐ No	☐ Yes ☐ No		
4.	Stockpiles protected and not placed in a conveyance?	☐ Yes ☐ No	☐ Yes ☐ No		
5.	Construction entrance prevents tracking?	☐ Yes ☐ No	☐ Yes ☐ No		
6.	Trash/litter collected and contained?	☐ Yes ☐ No	☐ Yes ☐ No		
7.	Non-active disturbed areas are stabilized?	☐ Yes ☐ No	☐ Yes ☐ No		
8.	Discharge points are free of sediment deposits?	☐ Yes ☐ No	☐ Yes ☐ No		
9.	Washout facilities are available/used?	☐ Yes ☐ No	☐ Yes ☐ No		
10.	Vehicle fueling areas are free of leaks and spills?	☐ Yes ☐ No	☐ Yes ☐ No		
11.	Potential contaminants are protected?	☐ Yes ☐ No	☐ Yes ☐ No		

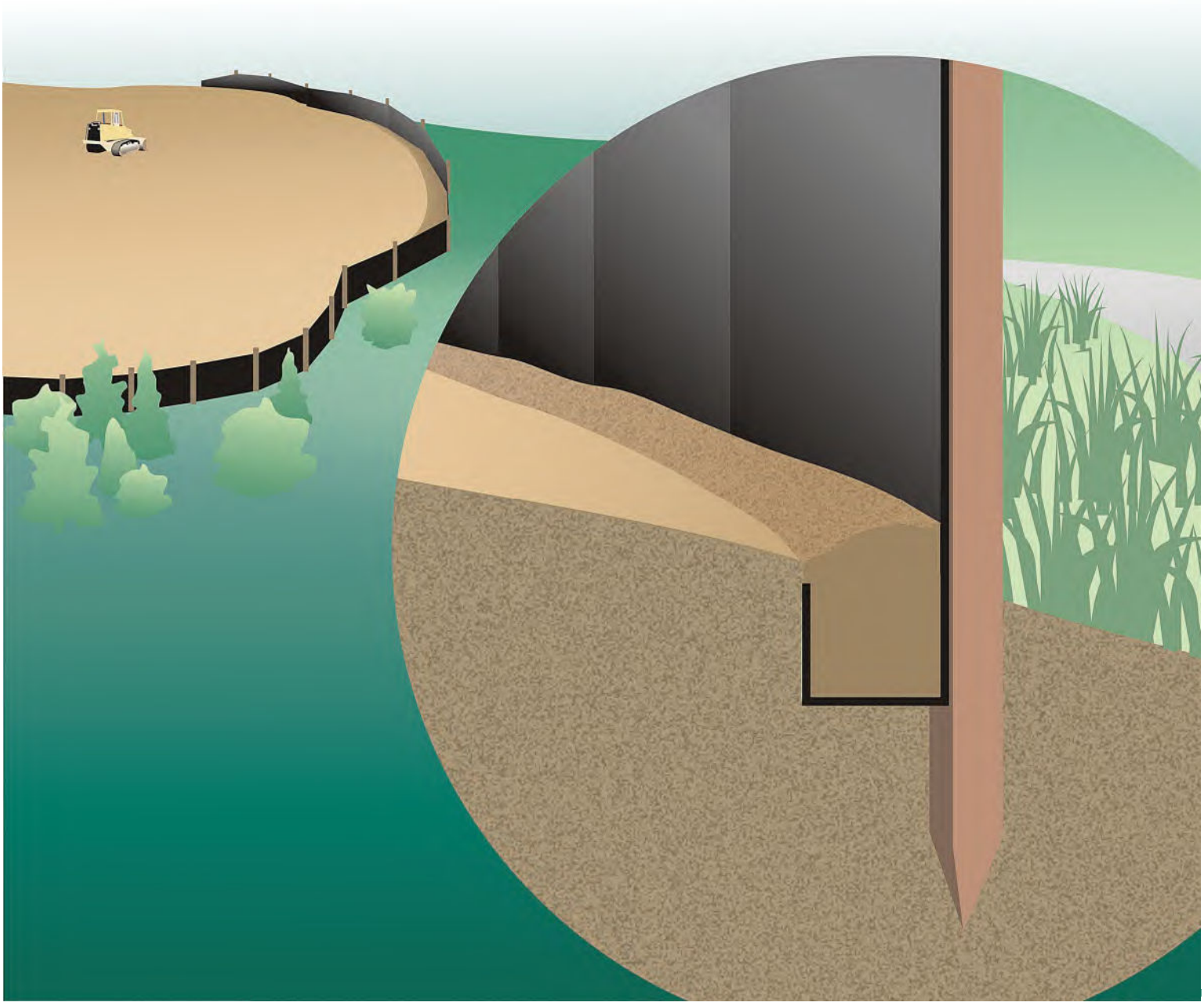
Appendix C: Erosion & Sediment Control Inspection Form

	BMP	Compliant?	Maintenance Required?	Corrective Action(s) Needed & Notes	Date Corrected
12.	Any evidence of discharges?	☐ Yes ☐ No	☐ Yes ☐ No		
13.	Portable toilets are upright and secure?	☐ Yes ☐ No	☐ Yes ☐ No		
15	Dewatering activities are using appropriate BMPs to avoid scour and selected chemicals are suited to soil types?	☐ Yes ☐ No	☐ Yes ☐ No		
16.	SWPPP on site?	☐ Yes ☐ No	☐ Yes ☐ No		
17.	Inspection reports available?	☐ Yes ☐ No	☐ Yes ☐ No		
18.	Training documentation is available?	☐ Yes ☐ No	☐ Yes ☐ No		
19.	Other:	☐ Yes ☐ No	☐ Yes ☐ No		
20.	Other:	☐ Yes ☐ No	☐ Yes ☐ No		
Additional Comments:					

Appendix D: Erosion & Sediment Control Inspection Log

City of Stillwater ESC Inspection Log

Builder	Address	Development	Inspection Date	Notice #	Comments	Acknowledgement Date,Time, w/Whom	Re-Inspection Date	Enforcement Action	Held Inspection Notice	Compliant Notice	Status
(Example)	1234 Maple Lane, Maple, MN, 12345	(example) Maple Place	6/12/2022	1234	Tracking in street/SF not installed	Emailed Smith at 9am on 6/12/2022	6/19/2022	Stop Work Order	6/19/2022	Not Sent	Suspended



Stormwater Construction Inspection Guide - Appendix E

MINNESOTA POLLUTION CONTROL AGENCY

October 2018

Acknowledgments

This guidance was developed under EPA Contract GS-10F-0268K, Task Order 1100 managed by Irvin J. Dzikowski, EPA Region V. The Minnesota Pollution Control Agency contract manager was Joyce Cieluch. The valuable assistance of Michael Findorff, Ken Moon, Reed Larson, and others from the MPCA in developing this guidance is gratefully acknowledged. Tetra Tech, Inc. drafted the guidance with John Kosco serving as project manager and primary author.

Comments welcome

This is the first edition of the Inspection Guide. We welcome comments and suggestions on how it might be changed in future editions to better assist stormwater inspectors. Send comments to:

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Table of Contents

Chapter 1

Introduction

Purpose of this inspection guide

This stormwater construction inspection guide is designed to assist construction site inspectors, such as staff representing various local units of government, in the procedures for conducting a compliance inspection at construction sites. The focus of this guide is on inspecting construction sites less than five disturbed acres; however, the principles of this inspection guide can be applied to construction sites of any size.

After a brief overview of the Minnesota Pollution Control Agency (MPCA) construction stormwater permit, this inspection guide covers three main topics: How to conduct a stormwater inspection, tips on inspecting BMPs, and information about referring enforcement cases to the MPCA.

Construction Stormwater Permit Overview

The MPCA issued the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Stormwater Permit for Construction Activity in August 2018. Owners and operators of construction activity disturbing one acre or more of land need to obtain the construction stormwater permit. Sites disturbing less than one acre within a larger common plan of development or sale that is more than one acre also need permit coverage.

Regulated parties are required to develop a stormwater pollution prevention plan (SWPPP) and submit a completed application and a $400 application fee. Application must be completed on-line by creating an e-Services account. Access the e-Services webpage by visiting https://rsp.pca.state.mn.us/TEMPO_RSP/Orchestrate.do?initiate=true.

What is a "larger common plan of development or sale?"

A common plan of development or sale means a contiguous area where multiple separate and distinct construction activities are occurring under one overall plan (e.g., the operator is building on three half-acre lots in a six-acre development). The "plan" in a common plan of development or sale is broadly defined as any announcement or documentation or physical demarcation indicating that construction activities may occur on a specific plot.

In addition to developing the SWPPP, regulated parties must implement the SWPPP, conduct regular inspections, and maintain best management practices (BMPs). Inspections are required once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours. The next inspection must be conducted within seven days after that. At the end of the project, after all disturbed surfaces are stabilized, the regulated party must submit a notice of termination/permit modification form to let the MPCA know that the construction activity is complete.

For most sites, construction may begin upon completing the payment process. For sites that are more than 50 acres and discharging to a special or impaired waters, the SWPPP and application materials must be submitted at least 30 days prior to commencing construction.

What are "special waters?"

Additional requirements apply to construction sites that discharge within one-mile of a special water. These waters can include:

- Wilderness areas (such as the Boundary Waters Canoe Area Wilderness, Voyageurs National Park, and parts of Kettle River and Rum River)
- Mississippi River (portions of)
- Scenic or recreational river segments (such as the Saint Croix River and Cannon River)
- Lake Superior
- Lake Trout lakes
- Trout lakes
- Scientific and natural areas
- Trout streams

(See Section 23 of the construction stormwater permit for more information or use the Special Waters Search tool on the MPCA construction stormwater webpage).

Changes in owner/operator

When the owner or operator or a portion of a site or entire site changes, the former owner or operator and the new owner or operator needs to submit a Notice of Termination (NOT) / Permit Modification to the MPCA. The form is available on the MPCA construction stormwater website and must be submitted within seven days of assuming operational control of the site, commencing work on their portion of the site, or of the legal transfer, sale or closing on the property.

For stormwater discharges from construction activities where the owner or operator changes, the new owner or operator can implement the original SWPPP created for the project or develop and implement their own SWPPP. Permittee(s) shall ensure either directly or through coordination with other permittee(s) that their SWPPP meets all terms and conditions of the permit and that their activities do not render another party's erosion prevention and sediment control BMPs ineffective.

Additional information on the MPCA's Stormwater Program is available on the web at *www.pca.state.mn.us/water/stormwater*.

Chapter 2

How to conduct a stormwater inspection

Construction Site Inspector: Role and responsibilities

The inspector determines compliance with permit conditions, applicable regulations, and other requirements and assesses the adequacy of best management practices to protect natural resources. This is primarily accomplished by reviewing on-site activities for permit compliance and the construction operator's SWPPP.

Legal responsibilities

Item 24.10 of the construction stormwater permit provides inspectors the authority to inspect construction sites. This section of the permit requires the construction operator to "allow representatives of the MPCA or any member, employee or agent thereof, when authorized by it, upon presentation of credentials, to enter upon any property, public or private, for the purpose of obtaining information or examination of records or conducting surveys or investigations." An inspector's first responsibility is to be familiar with the specific requirements in the general permit, and applicable regulations. Inspectors must always have and display their inspection credentials.

Professional responsibilities

Inspectors are expected to perform their duties with a high degree of professionalism. Facts are to be noted and reported completely, accurately and objectively. Inspectors should also be tactful, courteous and diplomatic when working with construction operators and other members of the public. During an inspection, inspectors should not speak derogatorily of any product, manufacturer or person.

When problems are found that are not significant, inspectors should provide technical assistance on approaches for dealing with minor issues that do not warrant a violation notice. This could include minor issues that, if not corrected, could lead to a violation. Technical assistance refers to providing general guidance on how to solve erosion and sediment control problems without providing specific design details. In other words, the inspector does not provide engineering advice.

Inspection procedures

An on-site construction site inspection will typically consist of the following components, followed by the development of an inspection report:

- Pre-Inspection Preparation
- Entry
- Records Review
- Site Inspection
- Exit Interview

Pre-inspection preparation

Plan your inspections by targeting construction sites in priority areas (i.e., sites discharging to special waters, sites near surface waters, areas undergoing rapid development), large construction sites, or sites with a history of compliance problems. Be flexible, and plan your inspections immediately prior to or during anticipated rain events, or immediately following actual rain events (this is the best time to conduct stormwater inspections!). Identify more inspection candidate sites than you can visit in a day so you have back-up sites in case changes occur.

Always keep safety in mind!

- Use safety equipment such as hard hats, reflective vests, and steel-toed shoes.
- Maintain safety equipment in good condition and proper working order.
- Watch where you are walking, and be careful of what is going on overhead.
- Never enter confined spaces, such as a ditch or manhole, unless properly trained, equipped, and certified.

In preparing for an inspection, also review available files such as permits, copies of SWPPPs or erosion and sediment control plans, past inspection reports, downstream water quality problems from monitoring/assessment reports, and other correspondence such as maintenance records on the construction sites you will be inspecting. Copy relevant information that may be useful in the field. This could include past inspection reports in order to verify that problems have been corrected. Use the special waters search on the MPCA website to determine whether any of the construction sites you plan to visit are located near special waters or impaired waters. Discharges to special waters, wetlands, and impaired waters have additional requirements that are described in Section 23 of the permit.

Find all the construction sites you'll be inspecting on a map to plan out your day. Group inspections by geographic area when possible to minimize your drive time.

Finally, be prepared for the inspection. Dress for the weather and take appropriate safety gear. Make sure you have the following: inspection credentials, digital camera, copies of inspection forms, copy of the general permit, logbook for taking notes, and personal protective equipment (steel-toed shoes, hard hat, safety vest). Always take extra copies of materials such as the general permit, inspection forms, and application forms.

Entry

Before entering the construction site, observe the surroundings and various stages of construction. Note areas for in-depth review and any clear violations. This is also a good time to view construction site vehicle exit locations and perimeter controls. Indicate on the inspection form the date/time and weather conditions (e.g., light rain, sunny, some rain in previous 24 hours).

What if the site does not have a permit?

If a construction site disturbing more than one-acre has not applied for the stormwater permit, notify your Regional MPCA construction contact. Explain to the site representative the requirement to apply for a stormwater permit, continue the inspection, and leave compliance assistance materials such as a copy of the permit and application. Note the violation on the inspection form.

When entering the site, review all postings and then ask for the owner or contractor whose name is on the application. If these people are not available, ask to speak with someone who is familiar with the construction site's SWPPP. Always note the names of the individuals with whom you meet. Present your credentials and explain the purpose of your inspection. Inform the individual of the typical sequence of events for the inspection (introductions, file review, site tour, exit interview, report preparation, delivery and follow-up). Ensure that the construction operator participates during the records review and accompanies you during the inspection. Ask if there are any specific safety issues or requirements for this site.

Records review

Ask to see a copy of their SWPPP and application for coverage under the general stormwater permit, including a copy of all construction site inspections (i.e. the weekly inspections owners/operators are required to make weekly as well as within 24 hours of a rain event greater than 0.5 inches in a 24-hour period).

What to do if denied entry?

Stay calm and explain that the permit provides the MPCA and MPCA representatives with the authority to conduct inspections. Inquire as to why you are denied entry and record this information in your notes. Explain that you will need this information so that you can accurately portray their reasons for denial to your supervisor. Evaluate what they said were their reasons and determine if there are ways you can mitigate their concerns. Many times their concerns are unfounded. In no case should you threaten or indicate that their denial may lead to future punitive penalties.

Review the SWPPP to ensure it addresses all the requirements in the permit. Specific items in the SWPPP to review and record in your notes include:

- The most recent date of the SWPPP, and who prepared it.
- Primary erosion prevention and sediment control BMPs used on-site.
- Inspection and maintenance records, which are required to be kept with the SWPPP. Operator is required to inspect the site once every seven days and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours.
- Permanent stormwater management practices.
- Pollution prevention practices (especially for fueling, solid waste, hazardous materials, and vehicle washing).
- Discharge points from the project to surface waters and wetlands.

Include in your notes a general narrative of the construction activity (e.g., construction of five single family homes on 2.5 acre parcel). Ask the construction operator to describe the project as you review the SWPPP. Questions you can ask include:

- How large is the project, how long has construction been underway, and when do you plan to complete construction?
- Do you store or use hazardous materials or waste fluids on-site? Do you refuel vehicles or equipment on-site?
- Does this project include concrete pouring, and how do you handle washout of concrete trucks?
- Does the project have a rain gage, and how do you track rainfall amounts?
- What procedures do you institute in advance of forecasted rain events?
- Where are the critical areas of protection?
- Where is the construction draining to?

The SWPPP must include a narrative describing the timing for installation of all erosion prevention and sediment control BMPs. The SWPPP must also address phasing.

Ask for a copy of the site map and the BMP list to determine if it is specific to the construction site you're inspecting. The site map and BMP list can be marked up during your inspection to indicate locations of potential violations and as a reminder to ensure that BMPs are implemented. Remember that these items are enforceable and that the permit requires them to fully implement their SWPPP.

Remember SWPPPs are dynamic documents; they should be updated when (Section 5):

- A change in design, construction, operation, maintenance, weather or seasonal conditions have a significant effect on stormwater discharges,
- Inspections indicate the SWPPP is not effective, or
- The SWPPP is not consistent with the terms of the permit.

The SWPPP must be on-site!

Item 20.2 of the permit requires that "the SWPPP, including all changes to it, and inspections and maintenance records at the site during normal working hours by permittees who have operational control of that portion of the site." The SWPPP can be kept in either the field office or in an on-site vehicle.

If the SWPPP is not available, ask why and note the response in your report. There are no legitimate excuses for not having stormwater paperwork on-site and available for review. Inform the construction operator that the permit requires the SWPPP to be on-site and available for review. If issues on-site indicate an in-depth review of the SWPPP is necessary, request that a copy of the SWPPP be submitted to the MPCA in the corrective actions.

Discuss with the site contact whether any amendments have been made to the SWPPP. The constantly changing conditions at a construction site (from rough grading to building construction) mean that the BMPs in the SWPPP must change as the site conditions change.

If their SWPPP is not available for review, this will make your inspection more difficult. Ask for a copy of a map of the construction site, if possible, and continue with your inspection. Note the lack of an on-site SWPPP on the inspection form.

Site inspection

A keen eye, an understanding of the construction sequencing process and accurate documentation are the keys to an effective construction site inspection. Use the inspection form, and take notes regarding the location and condition of BMPs, discharge points, and inlets. Use photos to document concerns/violations and indicate on a rough diagram where the photos were taken. Keep a written log of preliminary findings during your inspection to facilitate your exit interview. Bring extra copies of relevant documents (such as the permit, application form, and construction stormwater permit overview fact sheet) to explain the requirements, and to leave for the construction operator if they need it.

Seasonal considerations

During frozen ground conditions, construction activity may be suspended. BMPs must be in place; however, inspections may be suspended until runoff occurs at the site or when construction resumes. If possible, conduct inspections during the spring thaw period.

A note about construction activity:
Construction activity, by its very nature, is a "dirty" business. In many cases, land is cleared and graded to conform to the new site requirements. During a rain event, even the best-managed construction sites will look "muddy." Your role as a construction inspector is to ensure that sediment and other pollutants in stormwater leaving the site do not impact waters of the state. Become familiar with typical construction practices, terminology, and conditions and use this experience during your inspection.

A recommended construction inspection sequence follows:

1. ***Plan your inspection***

   Review the site map and plan how you will conduct the inspection (this is particularly important for large construction sites). Identify the significant pollutant sources and BMPs you want to inspect (silt fence installation, sediment basins, slope stabilization, material storage areas, etc.). Consider the direction stormwater will flow as you plan the inspection. Begin your inspection at the low point on the construction site, observing all discharge points and walk up the slope to inspect the rest of the site. Consider the current sequence of construction phasing when planning your inspection.

2. ***Inspect discharge points and downstream, off-site areas for signs of impact***

   When inspecting discharge points from the site, if it appears that sediment is leaving the site, walk downstream to document the extent of travel and impact on receiving waters or storm drain systems. Make sure you walk "down the street" if necessary to inspect off-site areas for signs of discharge. This is particularly important in areas with existing curbs and gutters. Inspect down-slope municipal catch basin inlets to ensure that they are adequately protected. Note on the inspection form all environmental impacts and document with photographs when possible.

In some limited situations, it may be useful to collect samples of stormwater discharges from construction sites. Contact your MPCA regional construction stormwater staff contact if you feel sampling may be useful in a specific situation.

3. ***Inspect perimeter controls***

   Note the type of perimeter controls installed at the site, and whether these have been properly installed and maintained. Inspect the construction exit to determine if there is excessive tracking of sediment from the site. Is street sweeping being used? If so, what is the frequency? Is there evidence of additional construction exits being used that are not in the SWPPP or are not stabilized?

   Check all sediment controls. All storm drains must be protected, temporary stockpiles must have sediment controls and cannot be placed in surface water, including stormwater conveyances.

4. ***Compare BMPs in the SWPPP with construction site conditions***

   Are all BMPs required by the SWPPP in place? Are additional BMPs needed? Evaluate whether BMPs have been adequately installed and maintained (see Chapter 3 for more information on inspecting BMPs). Describe in your notes the potential violations and their location. Look for areas where BMPs are needed, but are missing and are not included in the SWPPP.

5. ***Inspect disturbed areas not currently being worked***

   Disturbed areas need to be temporary or permanent cover when they are not being actively worked. All exposed soil areas must be stabilization initiated immediately to limit soil erosion whenever any construction activity has permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed no later than 14 calendar days after the construction activity in that portion of the site has temporarily or permanently ceased.

6. ***Inspect areas with final stabilization***

   Inspect any stabilized areas to ensure that excessive erosion is not occurring. Estimate whether the site has been stabilized with uniform perennial vegetative cover with a density of 70% over the entire pervious area. Temporary BMPs in areas with final stabilization must be removed and sediment must be cleaned out of all conveyances and temporary sediment basins that will be used as permanent water quality management basins. Areas where temporary BMPs have been removed must be stabilized and seeded.

7. ***Inspect wetted perimeter areas***

   The normal wetted perimeters of any temporary or permanent drainage ditch that drains water from a construction site, or diverts water around a site, must be stabilized within 200 lineal feet from the property edge, or from the point of discharge to any surface water. Stabilization must be completed within 24 hours of connecting to a surface water. The remainder of the ditch must be stabilized within 14 days.

Guidance on inspecting individual BMPs is discussed in Chapter 3.

Common compliance problems at construction sites

The following compliance problems are commonly found at small construction sites. Keep these common problems in mind as you conduct inspections.

Problem #1 – No temporary or permanent cover

All exposed soil areas must have stabilization initiated immediately to limit soil erosion whenever any construction activity has permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Ask the contractor when particular exposed soils were last worked to help you determine if there is compliance.

Problem #2 – No sediment controls on site

The permit requires established sediment control practices (e.g., sediment traps/basins, down-gradient silt fences or sediment barriers, check dams, etc.) on down-gradient perimeters before up-gradient land disturbing activities begin.

Problem #3 – No sediment control for temporary stock piles

Temporary stockpiles must have silt fence or other effective sediment controls, and cannot be placed in surface waters (or curb and gutter systems).

Problem #4 – No inlet protection

All storm drain inlets that receive a discharge from the construction site must be protected before construction begins, and must be maintained until the site is stabilized. Inlet protection may be removed for a particular inlet if a specific safety concern has been identified. Written correspondence must be documented in the SWPPP or available within 72 hours upon request.

Problem #5 – No BMPs to minimize vehicle tracking on to the road

Vehicle exits must use BMPs such as stone pads, concrete or steel wash racks, or equivalent systems to prevent vehicle tracking of sediment.

Problem #6 – Sediment on the road

If BMPs are not adequately keeping sediment off the street, then the permit requires tracked sediment to be removed (e.g., street sweeping).

Problem #7 – Improper solid waste or hazardous materials management

Solid waste must be disposed of properly, and hazardous materials (including oil, gasoline, and paint) must be properly stored (which includes secondary containment).

Problem #8 – Dewatering at the construction site

Typically dewatering occurs where building footings are being constructed. Have measures been taken to ensure that the pumped discharge is not causing erosion? Is the discharge turbid and if so is it treated before discharging from the site? Has ditching been used to dewater and if so is that water resulting in the discharge of sediment and causing water quality impairments?

Problem #9 – Concrete washout

All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner.

Taking photographs

A digital camera is extremely useful during an inspection. Take digital photographs to document your findings and provide a site overview as you write your report. Take photos of the site entry sign, all potential violations, and a general view(s) of the construction site. Be certain to photograph impacts to waters of the state and try to document with photos that the construction project is the only source of the impact (not other upstream sources), so take shots above and below the project at the impacted waterbody. Remember that you do not need to incorporate all of the photos you take into your inspection report. Photograph model BMPs that could be useful as examples to other construction operators.

On the site map, indicate approximate locations of where you took photos, and the direction of the photograph. Keep notes for each photograph you take, as you need to describe the potential violation in your report.

When taking a photograph, make sure you keep perspective in mind. If the viewer will have difficulty understanding how large something is (for example, a rill/gully), then use a prop such as a person, hardhat or other object for perspective.

Exit interview

Prior to conducting your exit interview, break away from the assembled group to gather your thoughts and prepare a list of preliminary findings. Review the inspection forms and determine the severity of any identified deficiencies. It is best to lead off your exit interview with one or more positive comments regarding the site and then list your negative findings in order of severity. Therefore, come up with a few positives examples of what they are doing right.

Debrief the person in charge. Explain that the results of the inspection are preliminary and are not final until all documents and photos have been reviewed and a supervisor has reviewed your report. Explain the identified deficiencies and any areas of concern (parts of SWPPP are missing, inspections are not being done, silt fence was down, etc.). Where possible, cite the section of the permit that requires these missing practices. While it is important that you provide a comprehensive site assessment, it is acceptable to indicate that you are uncertain about certain deficiencies/points and that additional review is required.

Leave copies of any compliance assistance information, such as the MPCA fact sheets "Overview of Minnesota's NPDES/SDS Construction Stormwater Permit" or "Sediment and Erosion Control for New Homeowners." Share information on permit compliance, and direct them to contact the MPCA office (contact phone numbers are noted on the bottom of the inspection forms), or explain how to obtain technical guidance materials.

Lastly, don't tell the construction operator which BMP to use. Explain the problem or the permit requirement that must be met, and describe how other construction sites have

addressed typical problems. Its OK to tell the construction operator about what typically works and what doesn't work in the field, but don't specify the BMP to use (especially if it is a proprietary BMP). Ultimately, it is up to the construction operator to decide which BMPs to use.

Report writing and follow-up

Inspection reports consist of inspection forms, a site map and a photo log. If possible, complete all the relevant fields on the inspection forms and write your inspection report while you are still on the construction site. This will allow you to double check any observations and ask follow-up questions.

Remember that your inspection report is a legal document. Write legibly, accurately and objectively. Report all violations observed at the site, and always cite the section of the permit that was violated. Be careful not to include any information that you are unsure of (i.e., product names). The inspection report may be the first step in a compliance process that could reasonably be expected to be contentious. Factual errors in the report will bring the entire report and inspection into question, and will hurt the inspector's credibility. Therefore, if there is any doubt about the information, it should be left out.

When writing the description of violations, items that were stated to occur but were not observed should always be attributed to the construction operator or their representative. For example, the representative may state that the street is swept daily, but you do not know this as an observed fact.

Be consistent when writing your inspection reports. Identify potential violations in such a way that another inspector can take your report and locate the problem area easily. Be specific when you describe your observations. Don't write "a discharge was entering the storm drain" but rather "a discharge was entering the storm drain on the east side of the project below the construction entrance." As a rule, descriptions of potential violations should be in past tense, i.e., "the silt fence was installed without being toed in."

The photo log provides an important visual link between the written inspection report and the actual inspection. The photo log will also help determine the severity of potential violations. The inspection checklist should reference the photo log.

Photo log should include:

1. Size the photos so that the shortest side is 3.5 inches. Center the photos and captions on the page. Generally, a page will have two landscape oriented photos or one portrait. See Attachment A, Page 28, for a sample photo log.
2. Include a photo(s) that illustrates general construction site conditions. A macro level shot provides insight into whether the site is generally in good shape or poorly maintained. For a site that is generally in compliance, the general construction site conditions photo may be the only picture in the log.
3. Provide photos for all potential violations. The photo serves as a record that the findings actually occurred and provides a means of comparing future site conditions with those on the day of inspection. Also, it's easier to resolve

potential disputes with the construction operator if findings are documented with photographs.

4. Photo captions should briefly describe what is observed in the picture. Avoid references to the "normal" conditions in that area ("per the construction operator" statements); these are better discussed in the inspection report.

5. Check to make sure the construction site name and NPDES/SDS permit number match the inspection report. The best way to do this is to create a new photo log for each construction site; problems seem to arise when inspectors recycle photo logs by erasing the photos from one site and add those from another.

Save the photo log as the nine digit NPDES/SDS permit number followed by the facility name, or first word of a long facility name (i.e., C00012345 Acme.doc). The NPDES/SDS permit number is the unique value used to organize the photo logs with the reports and make sure that none are missing.

Chapter 3

Tips on inspecting BMPs

Inspecting BMPs

The following BMPs are commonly implemented on small construction sites. Tips for inspecting these BMPs are described on the following pages. For more information on BMPs, see:

- Minnesota Stormwater Manual *https://stormwater.pca.state.mn.us/index.php/Main_Page*
- Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates, Metropolitan Council, 2001. *https://metrocouncil.org/Wastewater-Water/Planning/Water-Resources-Management/Water-Quality-Management-Key-Roles.aspx*

Both manuals provide details on the standards and specifications for installing and maintaining these and other stormwater BMPs.

The BMPs are generally organized by the order an inspector will typically encounter them in the field when conducting an inspection.

The BMPs in this list were selected because they are commonly found on construction sites disturbing less than five acres of soil.

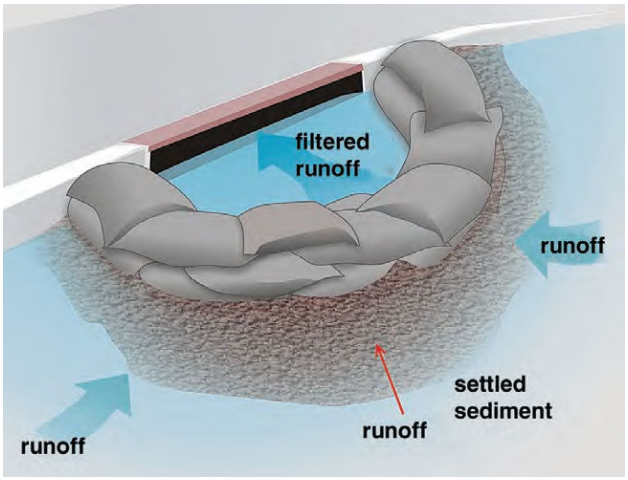

Figure 1. Sand or gravel bags can be used to filter stormwater runoff before entering a catch basin. Commercial products are also available that fit in front of or inside the catch basin.

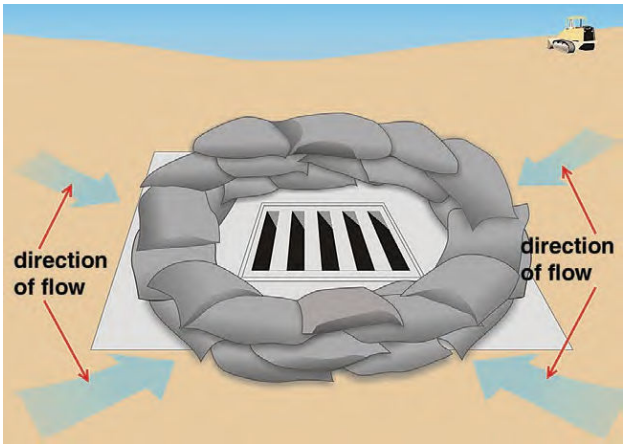

Figure 2. Sand or gravel bags used to protect a drop inlet.

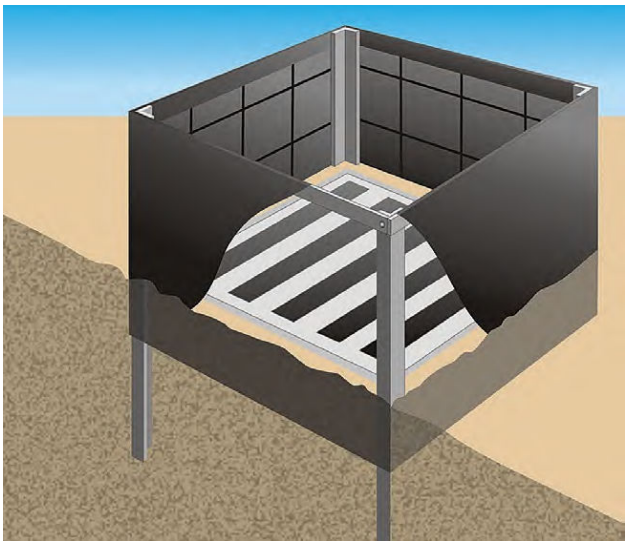

Figure 3. Silt fence can also be used to protect a drop

Storm drain inlet protection

Storm drain inlet protection prevents sediment from entering a storm drain by surrounding or covering the inlet with a filtering material. This allows sediment-laden runoff to pond and settle before entering the storm drain.

Several types of filters are commonly used for inlet protection: silt fence, sand bags or block and gravel. The type of filter used will depend on inlet type (curb inlet, drop inlet), slope, and amount of flow. Many different commercial inlet filters are also available. Some commercial inlet filters are placed in front of or on top of an inlet, others are placed inside the inlet and under the grate.

Permit requirements:

- All storm drain inlets must be protected by appropriate BMPs during construction until all sources with potential for discharging to the inlet have been stabilized. Inlet protection may be removed if a specific safety concern has been identified and the Permitee(s) have received written correspondence from the jurisdictional authority (Item 9.7).
- All sediment control BMPs must be inspected to ensure integrity and effectiveness. All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs. (Section 11).

Inspection tips:

- ✓ Inlet protection is a secondary BMP. Make sure that erosion controls or additional sediment controls are also in place.
- ✓ The inlet protection must not block the storm drain or cause flooding.
- ✓ Inlet protection must be in place immediately after storm drains are installed (or before land disturbance activities begin in an area with existing storm drains).
- ✓ Sediment accumulation must be removed after each storm event if it impedes flow through the filter.
- ✓ Make sure there are not any "gaps" allowing unfiltered stormwater to enter the inlet.

Stabilized construction exit

A rock construction exit can reduce the amount of sediment transported onto paved roads by vehicles. The construction exit does this by knocking mud off the vehicle tires before the vehicle enters a public road.

Permit requirements:

- Vehicle tracking of sediment from the construction site must be minimized by BMPs such as stone pads, concrete or steel wash racks, or equivalent systems. Street sweeping must be used if such BMPs are not adequate to prevent sediment from being tracked onto the street (Item 9.11).
- Construction site vehicle exit locations must be inspected for evidence of off-site sediment tracking onto paved surfaces. Permittees must use street sweeping if vehicle tracking BMPs are not adequate to prevent sediment tracking onto the street (Item 9.12).

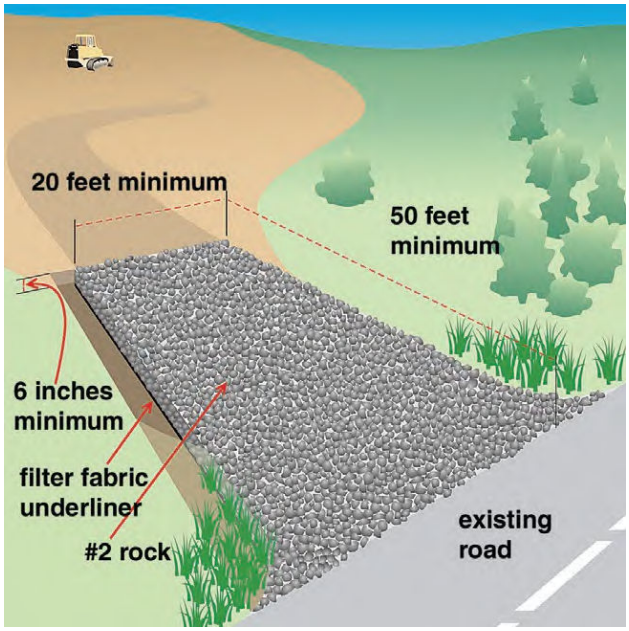

Figure 4. Stabilized construction exit.

Inspection tips:

- ✓ Is there evidence of sediment tracking from the site? (Street sweeping may be necessary if sediment tracking is evident).
- ✓ Is there evidence that vehicles are leaving the site from other locations, and not using the designated construction exits?
- ✓ Does the aggregate need to be replaced or replenished?
- ✓ Is the construction exit long enough to remove mud from the tires (50 ft. minimum)?
- ✓ Is the site graded away from the construction exit to prevent runoff from leaving the site?

Silt fence/other sediment barrier

A silt fence or sediment filter (such as a fiber roll or wattle) is a down-gradient barrier intended to intercept sheet flow runoff and settle out sediment upslope while allowing runoff to filter through.

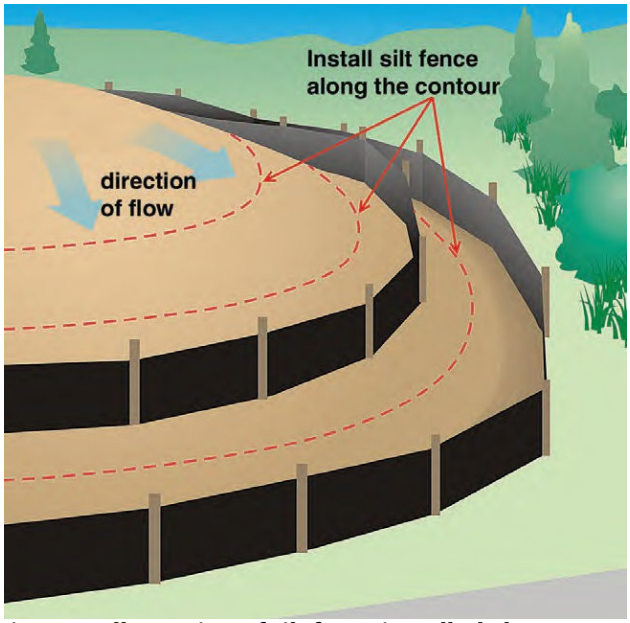

Figure 5. Illustration of silt fence installed along the contour.

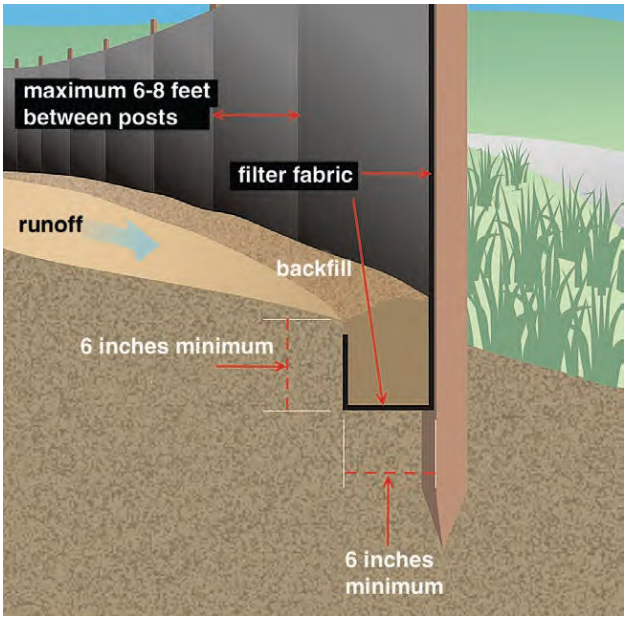

Figure 6. Detail of silt fence installation.

Figure 7. Illustration of "J-hooks" used during silt fence installation.

Permit requirements:

Sediment control practices must be established on all down-gradient perimeters before any upgradient land disturbing activities begin. These practices must remain in place until final stabilization has been established (Item 9.2). All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/2 of the height of the fence. These repairs must be made within 24 hours of discovery, or as soon as field conditions allow access (Item 11.4).

Inspection tips:

- ✓ Is the silt fence installed along the contour (on a level horizontal plane)?
- ✓ Are the ends turned up (J-hooks) to help pond the water behind the filter?
- ✓ Is the filter trenched-in with the stakes on the downhill side (trench must be six inches deep by six inches wide)?
- ✓ Has sediment been removed when it reaches 1/2 the height of the barrier?
- ✓ Sediment barriers should not be used as check dams or where concentrated flow is expected.

Key inspection area: Inadequate installation

- Soil should be compacted after trenching.
- The stakes used to hold the silt fence must be on the down-slope side.

Key inspection area: Improper placement

- A silt fence is not adequate protection for steep, long slopes. The drainage area must be no greater than ¼ acre per 100 feet of fence; i.e., silt fences must be spaced 60-110 ft. apart on long slopes.

Key inspection area: Maintenance

- Torn or degraded silt fence fabric must be replaced immediately.

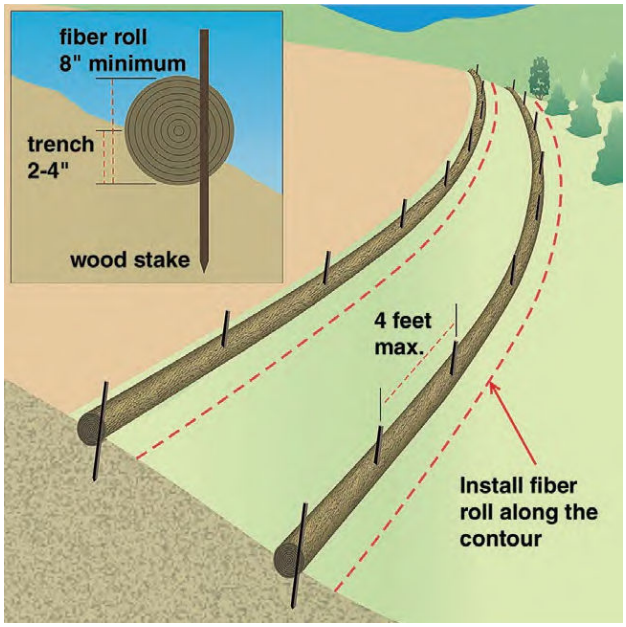

Figure 8. Fiber roll installation and detail.

Diversion ditches/berms

Diversion ditches or berms direct off-site runoff away from unprotected slopes or direct sediment-laden runoff to a sediment trapping structure. A diversion ditch can be located at the upslope side of a construction site to prevent surface runoff from entering the disturbed area. Ditches or berms on steeper slopes may need to consider erosive velocities. Also, ensure that the diverted water is released through a stable outlet and does not cause downstream flooding.

Inspection tips:

- ✓ Check to make sure the diversion discharges to a stable outlet or channel.
- ✓ Check to see if diversion ditches and berms have been seeded.
- ✓ Is the diversion eroding? (channel grades should be relatively flat).
- ✓ Check dams may be necessary if high velocity flows are present.

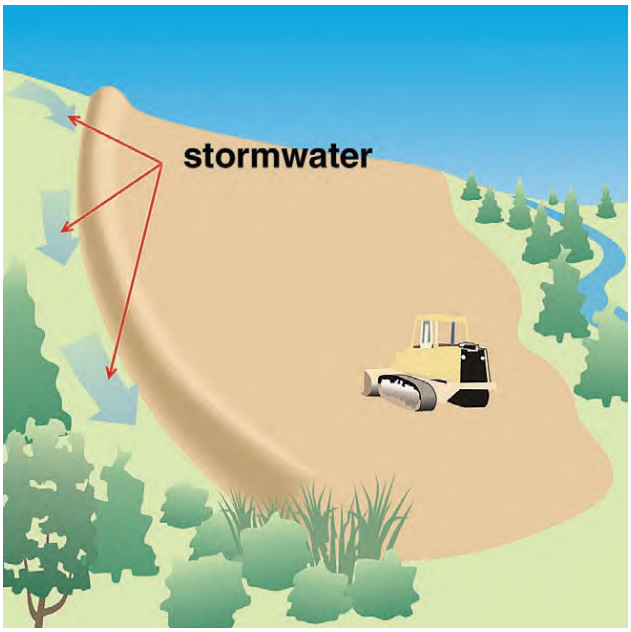

Figure 9. Diversions should be used to divert stormwater away from disturbed areas.

Mats, mulches, and blankets

Mats, mulches and blankets are used for temporary stabilization and establishing vegetation of disturbed soils. Mats and blankets are typically used on slopes or channels while mulches are effective in helping to protect the soil surface and foster the growth of vegetation.

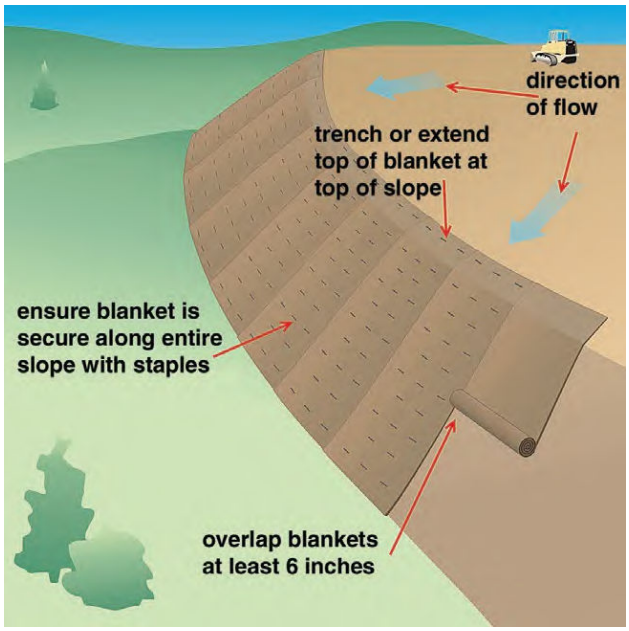

Figure 10. Erosion control blanket.

Inspection tips:

- ✓ The blanket or mat must come into complete contact with the soil.
- ✓ Check that the top of the blanket is trenched-in (there should be no evidence of water flowing under the blanket or mat).
- ✓ Mulch should not be placed in concentrated flow areas.
- ✓ Check to see if erosion is occurring in the mulched area (more mulch may need to be applied).
- ✓ Check blankets and mats to see if sections are overlapped 4-6 inches and staples are 12 inches apart on tops and 24 inches apart down the sides and in the middle.

Temporary sediment trap or pond

A temporary sediment trap or pond is a small, temporary ponding area formed by constructing an earthen embankment with an outlet across a swale. Temporary sediment traps are intended to detain sediment-laden runoff from small, disturbed areas long enough to allow the majority (at least 75%) of the sediment to settle out.

Sediment traps are designed for small areas. The volume of the trap must be at least 1,800 cubic feet per acre of contributing drainage.

Inspection tips:

- ✓ Check the location of the sediment trap. Failure of the trap should not pose a risk to life or property.
- ✓ Sediment in the trap should be removed after it reaches about 1/2 the design volume.
- ✓ The trap should not be installed in a main stream or near culvert outlets.
- ✓ Check the outlet for needed maintenance.

Vegetative stabilization

Vegetative stabilization includes temporary or permanent seeding and sodding. Vegetative stabilization helps prevent erosion at construction sites by reestablishing vegetation on exposed soils. Native and noninvasive species are highly preferred to introduced grasses.

Permit requirement (Item 8.4):
All exposed soil area must have stabilization initiated immediately to limit soil erosion. Stabilization must be completed no later than 14 calendar days after construction activity in that portion of the site has temporaily or permanetly ceased. Temporary stock piles without significant silt, clay or organic components and the constructed based components of the roads, pacing lots, and similar surface are exempt from this requirement.

Inspection tips:

- ✓ Are all exposed soil areas stabilized?
- ✓ Check for signs of erosion in vegetated areas.
- ✓ Concentrated flows should not be allowed across newly seeded slopes.
- ✓ If late in the year, a slope may need to be mulched rather than seeded.

Permanent stormwater treatment system

For projects that replace pervious surfaces with one or more acres of cumulative impervious surface, a permanent stormwater management system that treats one inch runoff from the new impervioius surface is required. See Section 15 of the permit for additional information.

For projects where the full volume reduction requirement cannot be met on-site, (e.g. the site has infiltration prohibitions), permittees must document the reasons in the SWPPP.

For linear projects where permittees cannot treat the entire water quality volume within the existing right-of-way, permittees must make a reasonable attempt to obtain right-of-way, easement or other permission for stormwater treatment during the project planning process. Documentation attempts must be in the SWPPP.

Permittees must first consider volume reduction practices on-site (e.g., infiltration or other) when designing the permanent stormwater treatment system. If the permit prohibits infiltration, permittees may consider a wet sedimentation basin, filtration basin or regional pond.

- *Infiltration/filtration.* Treatment can include infiltration basins and trenches, rainwater gardens, sand filters, bioretention areas, and enhanced swales. The water quality volume treated should be 1 inch of new impervious surface. (Section 16 & Section 17).
- *Wet sedimentation basin.* Permanent storage volume (dead storage) of 1800 cubic feet of storage per acre that drains to the basin must be provided. The water

quality volume (live storage) must be discharged at no more than 5.66 cubic feet per second (CFS) per acre of surface area of the pond. The water quality volume treated should be one inch times of new impervious surface. (Section 18).

- *Regional Ponds.* Written authorization to discharge to a regional pond must be included in the SWPPP, and the pond must meet the permit's design requirements. (Section 19)
- *Combination of the above practices.* SWPPP must document the volume that each practices addresses.
- *Alternative method.* An alternative method must be approved in advance by the MPCA. Check the SWPPP to see if approval and additional documentation is provided.

Solid waste/hazardous materials management

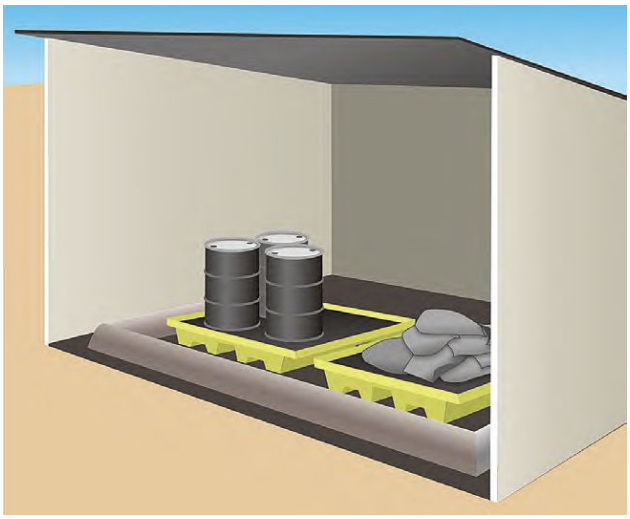

Figure 11. Example of hazardous materials storage (doors removed for illustrative purposes only). Access to hazardous materials must be restricted.

Section 12 of the permit requires construction sites to implement pollution prevention measures. At a minimum, sites are required to:

- Properly dispose of solid waste.
- Hazardous materials must be properly stored, including secondary containment, with restricted access to prevent vandalism. Oil, gasoline and paint are hazardous materials often used at construction sites.
- Limit external washing of vehicles and contain runoff. Engine degreasing is prohibited.

Permit requirements:

- Solid Waste: Collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with MPCA disposal requirements. (Item 12.9).
- Hazardous Materials: Oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Access to storage areas must be restricted to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations. (Item 12.4).
- Spills must be reported to the Minnesota Duty Officer 1-800-422-0798.

- Concrete washout onsite: All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable line. A compacted clay liner that does not allow washout liquids to enter ground water is considered and impermeable liner. The liquid and solid wastes must not contact the ground, and there must not be runoff from the concrete washout operations or areas. Liquid and solid wastes must be disposed of properly and in compliance with MPCA regulations. A sign must be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities. (Item 12.9).

Inspection tips:

- ✓ Does the construction site have dumpsters or other containers for debris and solid waste?
- ✓ Is there evidence of solid waste or debris in the storm drain system?
- ✓ Are oil, gasoline and paint properly stored?
- ✓ Does the construction operator allow vehicles to be washed on-site?
- ✓ Are solid waste and hazardous materials stored away from receiving waters and catch basins?
- ✓ Is there evidence of hazardous materials being disposed of in the solid waste bins?
- ✓ Is there evidence that the solid waste or hazardous materials containers have leaked?
- ✓ Are vehicles or equipment fueled on-site? Is this area bermed or away from receiving waters and storm drains?
- ✓ Are all hazardous materials containers properly labeled?
- ✓ Are concrete washouts properly installed away from receiving waters and storm drains?
- ✓ Is there a sign adjacent to each washout facility to inform concrete equipment operators to utilize the proper facility.

Chapter 4

Referring enforcement cases to the MPCA

Specific referral procedures are detailed in contracts between the MPCA and non-MPCA inspectors. In most instances, referrals will follow this general practice. Cases may be referred directly to the MPCA from approved agencies. At this point the MPCA determines if enforcement actions are warranted and if proper documentation has been filed. If the MPCA determines that no action is required, because of the lack of documentation or insufficient information or evidence, the case will be referred back with a letter of explanation. If MPCA staff determine that action is required the case will be pursued. Cases that meet MPCA requirements will be brought through the MPCA enforcement process in conjunction with the referring approved agency. Most times a parallel request will be made by the referring approved agency to engage with local enforcement measures. These measures may include: having the plan-approving agency (zoning and planning departments) refrain from issuing or, in some cases, revoking any building or grading permits until outstanding violations are remedied.

The following are three common violations at small construction sites and the potential level of enforcement response by the MPCA and approved partners. Further information and details on MPCA enforcement response or guidance on inspection reports and field letter of warning use can be obtained from the MPCA Enforcement Response Plan (ERP).

For failure to obtain an NPDES stormwater permit

Citation: 7001.1035, 7001.1040 and 7001.1030.

Suggested enforcement action: Administrative Penalty Order (APO).

Evidence needed: photos of the construction activity, DELTA permit search, a completed inspection report, pollutant discharge documentation (when occurring), size of site, cite the "failure to obtain a permit" violation,

Required action: Immediately cease construction work. Create corrective actions that will prevent harm or correct/minimize releases. Apply for permit ASAP and prior to continued site activity. Follow up with appropriate enforcement action.

For discharging sediment into waters of the state

Citation: Minnesota Statute 115.061 or Minn. R. 7001.0210.

Suggested enforcement action: APO/Stipulation Agreement.

Evidence needed: Delineation of sediment plume, photos, and inspection report which describes the impacts with good factual records.

Required action: Create corrective actions to stop discharge and prevent harm or correct/minimize releases, report discharges to appropriate agencies. Proceed with appropriate enforcement action; most cases involving discharges typically involve penalties depending on the seriousness, length of time and response to the discharge.

For violations of the NPDES/SDS stormwater permit requirements

Citation: NPDES/SDS Permit MN R100001

Suggested enforcement action: Letter of Warning, APO or Stipulation Agreement.

Evidence needed: Review erosion and sediment control plans, photos, and inspection reports that describes any impacts with good factual records of failure of the permit conditions.

Required action: Clearly and concisely document any violations, including the location of the violation and the part of the permit that the construction operator is violating. Create corrective actions that will result in compliance with the permit and, if appropriate, establish a time frame for compliance. Write clearly and concisely. Proceed with enforcement as appropriate. Cases involving environmental harm or potential for harm may involve penalties depending on the seriousness, length of time and response to the corrective actions. Case by case evaluation is necessary to make these determinations. If a reinspection is necessary, set a time or date for this (either scheduled with the construction operator or an unannounced inspection).

Enforcement options available

There are a suite of enforcement options available to local government or state agencies ranging from field requests to formal notices and various penalty actions, including local citations, administrative penalty orders, stipulation agreements, stop work orders and permit revocations.

Chapter 5

Additional resources

This *Stormwater Inspection Guide* is available online, as are the additional resources on stormwater BMPs listed below:

MPCA Stormwater Inspection Guide
www.pca.state.mn.us/publications/wq-strm2-10.pdf

MPCA Minnesota Stormwater Manual
www.pca.state.mn.us/water/stormwater/stormwater-manual.html. The first half of the manual is dedicated to the general Minnesota context for stormwater management. The second half includes diagrams and formulas, it is intended for professional, but useful for homeowners.

MPCA Stormwater Program
www.pca.state.mn.us/water/stormwater/index.html. Click on the construction stormwater program to get copies of the construction permit, application, fact sheets, information on special waters and staff contacts.

MPCA Stormwater BMP Manual
www.pca.state.mn.us/water/pubs/sw-bmpmanual.html. An electronic copy of the MPCA's *Protecting Water Quality in Urban Areas: Best Management Practices for Dealing with Stormwater Runoff from Urban, Suburban and Developing Areas of Minnesota* (2000). Includes information on all types of stormwater control practices.

Metropolitan Council's Urban Small Sites BMP Manual
https://metrocouncil.org/Wastewater-Water/Planning/Water-Resources-Management/Water-Quality-Management-Key-Roles.aspx
An electronic copy of the *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates* (2001). This BMP manual provides information on construction and permanent stormwater BMPs.

Minnesota Erosion Control Association
www.mnerosion.org. An organization that is advancing effective stormwater management and erosion and sediment control techniques and practices.

International Erosion Control Association
www.ieca.org Association for erosion and sediment control professionals.

Chapter 6

Definitions

The following selected definitions are reprinted from the MPCA's construction permit. For additional definitions, see the construction permit.

"Best management practices (BMPs)"
Erosion and sediment control and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing degradation of surface water, including avoidance of impacts, construction-phasing, minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies. Individual BMPs found in the construction permit are described in the current version of *Minnesota Stormwater Manual*. BMPs must be adapted to the site and can be adopted from other sources. However, they must be similar in purpose and at least as effective and stringent as the MPCA's BMPs. (Other sources include manufacturers specifications, *Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, U.S. Environmental Protection Agency 1992, and Erosion Control Design Manual, Minnesota Department of Transportation, et al, 1993).

"Common plan of development or sale"
A contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

"Construction activity"
Construction activity as defined in 40 C.F.R. part 122.26(b)(14)(x) and small construction activity as defined in 40 C.F.R. part 122.26(b)(15). This includes a disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff, leading to soil erosion and movement of sediment into surface waters or drainage systems. Examples of construction activity may include clearing, grading, filling and excavating. Construction activity includes the disturbance of less than one-acre of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more.

"Erosion prevention"
Measures employed to prevent erosion including but not limited to: soil stabilization practices, limited grading, mulch, temporary or permanent cover, and construction phasing.

"Final stabilization" requires all of Parts 1-5 or Part 6:

1. All soil disturbing activities at the site have been completed and all soils must be stabilized by a uniform perennial vegetative cover with a density of 70% over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions.

2. The permanent stormwater treatment system meets all requirements in Section 15. This includes but is not limited to, a final clean out of temporary or permanent sedimentation basins that are to be used as permanent water quality management basins and final construction or maintenance of infiltration basins. All sediment must be removed from conveyance systems and ditches must be stabilized with permanent cover.

3. Prior to submission of the NOT, all temporary synthetic and structural erosion prevention and sediment control BMPs (such as silt fence) must be removed on the portions of the site for which the Permittee is responsible. Best Management Practices designed to decompose on site (such as some compost logs) may be left in place.

4. For residential construction only, individual lots are considered finally stabilized if the structure(s) are finished and temporary erosion protection and downgradient perimeter control has been completed and the residence has been sold to the homeowner. Additionally, the Permittee must distribute the MPCA's "Homeowner Fact Sheet" to the homeowner to inform the homeowner of the need for, and benefits of, permanent cover.

5. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land) Final Stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use.

6. A Permittee may terminate permit coverage prior to completion of all construction activity if all of the following conditions are met in addition to Part 2 and 3 and where applicable, Part 4 or Part 5.

    a. Construction activity has ceased for at least 90 days.

    b. At least 90% (by area) of all originally proposed construction activity has been completed and permanent cover established on those areas.

    c. On areas where construction activity is not complete, permanent cover has been established.

"Operator"
The person (usually the general contractor), designated by the owner, who has day-to-day operational control and/or the ability to modify project plans and specifications related to the SWPPP. The person must be knowledgeable in those areas of the permit for which the operator is responsible. (Section 1 – Section 3, Section 5, Section 8 – Section 13).

"Owner"
The person or party possessing the title of the land on which the construction activities will occur; or if the construction activity is for a lease, easement, or mineral rights license holder, the party or individual identified as the lease, easement or mineral rights license holder; or the contracting government agency responsible for the construction activity.

"Permittee"
A person(s), firm, or governmental agency or other institution that signs the application and is responsible for compliance with the terms and conditions of the permit.

"Sediment control"
Methods employed to prevent sediment from leaving the site. Sediment control practices include silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, and temporary or permanent sedimentation basins.

"Stormwater"
Defined under Minn. R. 7077.0105, subp. 41(b), and includes precipitation runoff, stormwater runoff, snow melt runoff, and any other surface runoff and drainage.

"Stormwater Pollution Prevention Plan"
A plan for stormwater discharge that includes erosion prevention measures, sediment controls and permanent stormwater Management System that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site nonpoint pollution.

"Surface water or waters"
All streams, lakes, ponds, marshes, wetlands, reservoirs, springs, rivers, drainage systems, waterways, watercourses, and irrigation systems whether natural or artificial, public or private.

"Temporary erosion protection"
Methods employed to prevent erosion. Examples of temporary cover include; straw, wood fiber blanket, wood chips, and erosion netting.

"Waters of the state"
Defined in Minn. Stat. § 115.01, subd. 22 as all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Attachment A - Photo log

Acme construction (permit number)

Inspected by: (Inspector's name, office, phone number)

Construction site name and inspector's last name, office, and phone number are centered in the header and must appear on all pages.

Photo 1: Well-maintained and labeled concrete truck washout

Generally each page will have two landscape or one portrait picture(s). To size each picture, right-click on the picture and select Format Picture for sizing. For landscape view, set height to 3.5" and width is set by MS Word (make sure Lock Aspect Ratio is checked ON.) For portrait view, set width to 3.5" and height is set by MS Word.

Photo 2: Hay bales and silt fence that are in need of

Inspection date: January 5, 2004

Page 1 of 3

Inspection date and sequential page numbering in the footer must appear on all pages.

Attachment B - Violation citations

NPDES/SDS General Stormwater Permit for Construction activity violation citations

Citation	Permit section or rule
No permit	Minn. R. 70090.2010 subp. 1, 2, 3 (permit required, permit application deadline, and compliance requirements for unpermitted construction, respectively)
Change of coverage	Item 3.7
Erosion control practices during construction	
a) All exposed soil must be stabilized no later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased	Item 8.4
b) Normal wetted perimeter of drainage system - 200' within 24 hours of connecting	Item 8.6
c) Energy dissipation (temp. or perm.) within 24 hours	Item 8.9
Sediment control practices during construction	
a) Lacking sediment control practices Overloaded systems eliminated, no unbroken slopes 75' @ 3:1>	Item 9.3
b) Temporary sediment basin required	Item 9.13
c) Inlet BMPs not functional	Item 9.7
d) Perimeter controls/soil disturbance	Item 9.2
Inspections and maintenance	
a) Maintenance of erosion and sediment temporary/permanent cover	Item 11.4
b) Temporary sediment basin 1/2-volume	Item 11.8
c) Recovery of sediment in waters (name water body)	Item 11.5
– Duty to notify, avoid and recover water pollution	Minn. Stat. § 115.061
– Nuisance conditions prohibited (define discharge)	Minn. R. 7050.0210, subp. 2
d) Vehicle tracking	Item 11.6
Inspections and records retention	Section 11
a) SWPPP development required	Section 5
SWPPP requirements:	Item 5.2
– BMPs/locations procedures	Item 5.5
– Site map/flow arrows	Item 5.9
– Phased areas	Item 5.18
– Surface waters/wetlands 1 mile	Item 5.10
– Methods for final stabilization	Item 5.17
b) Inspections (specifically note failed maintenance)	Section 11
c) Training requirement documentation	Item 21.2

Permanent stormwater treatment	
>One acre impervious, permanent treatment required	Section 15
a) Wet sedimentation basin	Section 18
• Regional ponds	Section 19
• Infiltration/filtration (hydro analysis)	Section 16/Section17
• Alternative methods, 90-day review, monitoring	
b) Pretreatment required	Item 16.6/Item 17.5
c) Dewatering	Section 10
d) Turbid discharges off site or waters of the state	Minn. R. 7050. 0210, subp. 2
e) Wetland impacts: authorization and mitigation	
Management pollution prevention	
a) Solid waste disposed of properly	Item 12.5
b) Hazardous materials in secondary containment and restricted access	Item 12.4
c) Defined areas for construction vehicles external washing	Item 12.8
d) Defined concrete washout on site and with a sign	Item 12.9

Attachment B - Violation citations

(continued)

Letter of warning (LOW)

A notice to a regulated party (RP) that documents violations discovered during an inspection, complaint follow-up or review of submittals. The LOW typically includes a reference of the statute, rule, permit condition or checklist that are violated. The LOW typically requires the regulated party to complete specific corrective actions to return the facility to compliance. The LOW usually gives a regulated party between 7-30 days to complete required corrective actions.

Request for information (RFI)

A notice to an RP requiring information. Occasionally additional information is required to determine the status of compliance or for an RP to respond to violations discovered. This information can be used to determine if elevated enforcement (including penalties) is appropriate.

Corrective actions (LOW or RFI)

Requirements to correct field conditions and to come into compliance with the permit, statute or rules and must be responded to in the period noted on this field report. This response (including any lack of response) is considered by the MPCA and future enforcement for the violations discovered.

Attachment C - Temporary, permanent sediment basin checklist

Site name/Location _____ Date of inspection_____

Permanent – temporary (circle) sedimentation basins: (location/ID)_____

Required basin installed (> 10 acres/ single point (T) or >1 acre new impervious (P)?	Yes	No
Does basin have energy dissipation for outlet?	Yes	No
Stabilized emergency overflow outlet?	Yes	No
Was basin constructed /operational concurrent with construction?	Yes	No
Are slopes stabilized with perm cover or temp erosion protection?	Yes	No
Is basin connected to surface waters? Yes Name/description waters: _____		
Was discharge- connection stabilized within 24 hours of connecting?	Yes	No
Dewatering: Onsite to a temp. settling basin? Yes No If offsite, is water turbid?	Yes	No
If no settling basin, was appropriate BMPs for turbidity and scour applied?	Yes	No
Is discharge from site creating a nuisance conditions or WQ violations?	Yes	No

Observations:

Permanent – temporary (circle) sedimentation basins: (location/ID)_____

Required basin installed (> 10 acres/ single point (T) or >1 acre new impervious (P)?	Yes	No
Does basin have energy dissipation for outlet?	Yes	No
Stabilized emergency overflow outlet?	Yes	No
Was basin constructed /operational concurrent with construction?	Yes	No
Are slopes stabilized with perm cover or temp erosion protection?	Yes	No
Is basin connected to surface waters? Yes Name/description waters: _____		
Was discharge- connection stabilized within 24 hours of connecting?	Yes	No
Dewatering: Onsite to a temp. settling basin? Yes No If offsite, is water turbid?	Yes	No
If no settling basin, was appropriate BMPs for turbidity and scour applied?	Yes	No
Is discharge from site creating a nuisance conditions or WQ violations?	Yes	No

Observations:

Permanent – temporary (circle) sedimentation basins: (location/ID)_____

Required basin installed (> 10 acres/ single point (T) or >1 acre new impervious (P)?	Yes	No
Does basin have energy dissipation for outlet?	Yes	No
Stabilized emergency overflow outlet?	Yes	No
Was basin constructed /operational concurrent with construction?	Yes	No
Are slopes stabilized with perm cover or temp erosion protection within 200' of surface water?	Yes	No
Is basin connected to surface waters? Yes Name/description waters: _____		
Was discharge- connection stabilized within 24 hours of connecting?	Yes	No
Dewatering: Onsite to a temp. settling basin? Yes No If offsite, is water turbid?	Yes	No
If no settling basin, was appropriate BMPs for turbidity and scour applied?	Yes	No
Is discharge from site creating a nuisance conditions or WQ violations?	Yes	No

Observations:

Minimum Control Measure 5
Post-Construction Stormwater Management

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APPENDICES

1. INTRODUCTION

1.1. Basis for the Standard Operating Procedures (SOPs)

The Minnesota Pollution Control Agency reissues their National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The MS4 GP requires the City of Stillwater to develop written procedures for the purpose of eliminating pollutants associated with construction activity, including new development and redevelopment projects with land disturbance of greater than or equal to one acre, and projects that are less than one acre that are part of a common plan of development or sale.

This manual assists City of Stillwater in meeting the Stormwater Phase II regulations, by incorporating guidance on the following:

- Plan Review
- Training
- Inspections
- Long-term Operation and Maintenance

The Guidelines and Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Stillwater's lakes, ponds, and creeks.

1.2. Objectives of the SOPs

This manual is intended to provide guidance on Post-Construction Stormwater Management:

- Provide guidance regarding plan review procedures.
- Provide guidance to municipalities for prioritizing where construction site inspections may need to occur on a more frequent basis.
- Provide guidance to municipal staff on what to look for during construction inspections.
- Provide guidance to City staff regarding the construction of post-construction stormwater BMPs to help ensure their longevity.
- Provide guidance to municipal staff regarding the construction of post- construction stormwater BMPs to help ensure their longevity.
- Provide guidance on how to enforce non-compliant construction sites.
- Provide guidance to municipal staff on proper procedures for BMP operation and maintenance.

2. PLAN REVIEW

Activities and Definition

Plans that are submitted to the City of Stillwater for approval will have a review process to guarantee that post-construction stormwater standards are being met. The City shall require owners of construction activity to submit site plans with postconstruction stormwater management BMPs designed with accepted engineering practices to the City for review and confirmation that regulatory mechanism(s) requirements have been met, prior to start of construction activity.

The approach to meet the performance standard for Volume, Total Suspended Solids (TSS), and Total Phosphorus (TP) required by the Permit is to retain a runoff volume equal to one-inch times the area of the proposed increase of impervious surfaces on-site.

Maintain the following post-construction stormwater management regulatory mechanisms that prohibits non-stormwater discharges into the City's MS4, requires the use of green infrastructure, and prohibits infiltration in certain situations, and restricts it in others.:

- Contract language
- Ordinance
- Standards
- Written policies

The following requirements are incorporated into the City's regulatory mechanism:

a. Require owners of construction activity to submit site plans with post-construction stormwater management BMPs designed with accepted engineering practices to the City for review and confirmation that regulatory mechanism(s) requirements have been met, prior to start of construction activity.
b. Require owners of construction activity to treat the water quality volume on any project where the sum of the new impervious surface and the fully reconstructed impervious surface equals one or more acres.
c. For construction activity (excluding linear projects), stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from impervious surfaces.
d. For linear projects, the water quality volume must be calculated as the larger of one (1) inch times the new impervious surface or one-half (0.5) inch times the sum of the new and the fully reconstructed impervious surface.
e. For linear projects, the stormwater runoff volumes will be controlled, and the post-construction runoff volume shall be retained on site for:
    1. 0.55 inches of runoff from the new and/or fully reconstructed impervious surfaces.

2. 1.1 inches of runoff from the net increase in impervious area.

f. Volume reduction practices (e.g., infiltration or other) to retain the water quality volume on-site must be considered first when designing the permanent stormwater treatment system. This permit does not consider wet sedimentation basins and filtration systems to be volume reduction practices. If this permit prohibits infiltration as described in item 20.9, other volume reduction practices, a wet sedimentation basin, or filtration basin may be considered.
   1. Volume reduction practices must be considered first, as described in item 20.8.
   2. Volume reduction practices are not required if the practices cannot be provided cost effectively.
   3. If additional right-of-way, easements, or other permission cannot be obtained, owners of construction activity must maximize the treatment of the water quality volume prior to discharge from the MS4.
   4. The General Permit does not consider wet sedimentation basins and filtration systems to be volume reduction practices. If the General Permit prohibits infiltration as described in item 20.9, other volume reduction practices, a wet sedimentation basin, or filtration basin may be considered.
   5. For non-linear projects, where the water quality volume cannot cost effectively be treated on the site of the original construction activity, the City must identify, or may require owners of the construction activity to identify, locations where off-site treatment projects can be completed.
   6. If the entire water quality volume is not addressed on the site of the original construction activity, the remaining water quality volume must be addressed through off-site treatment and, at a minimum, ensure the requirements of items 20.11 through 20.14 are met.

g. Infiltration systems must be prohibited when the system would be constructed in areas:
   1. That receive discharges from vehicle fueling and maintenance areas, regardless of the amount of new and fully reconstructed impervious surface.
   2. Where high levels of contaminants in soil or groundwater may be mobilized by the infiltrating stormwater. To make this determination, the owners and/or operators of construction activity must complete the MPCA's site screening assessment checklist, which is available in the Minnesota Stormwater Manual, or conduct their own assessment. The assessment must be retained with the site plans.
   3. Where soil infiltration rates are more than 8.3 inches per hour unless soils are amended to slow the infiltration rate below 8.3 inches per hour.
   4. With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
   5. Of predominately Hydrologic Soil Group D (clay) soils.
   6. In an Emergency Response Area (ERA) within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, Subp. 13, classified as high or very high vulnerability as defined by the Minnesota Department of Health.

7. In an ERA within a DWSMA classified as moderate vulnerability unless the City performs or approves a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater.
8. Outside of an ERA within a DWSMA classified as high or very high vulnerability unless the City performs or approves a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater.
9. Within 1,000 feet up-gradient or 100 feet down gradient of active karst features.

h. Ensure off-site treatment project areas are selected in the following order of preference.
   1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
   2. Locations within the same DNR catchment area as the original construction activity.
   3. Locations in the next adjacent DNR catchment area up-stream.
   4. Locations anywhere within the City's jurisdiction.

i. If the City receives payment from the owner of a construction activity for off-site treatment, the City must apply any such payment received to a public stormwater project, and all projects must comply with the requirements in items 20.11 through 20.13.

j. Off-site treatment projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP. Routine maintenance of structural stormwater BMPs already required by the General Permit cannot be used to meet this requirement.

k. Off-site treatment projects must be completed no later than 24 months after the start of the original construction activity. If the City determines more time is needed to complete the treatment project, the City must provide the reason(s) and schedule(s) for completing the project in the annual report.

l. Include the establishment of legal mechanism(s) between the City and owners of structural stormwater BMPs not owned or operated by the City, which have been constructed to meet the requirements in Section 20. The legal mechanism(s) must include provisions that, at a minimum:
   1. Allow the City to conduct inspections of structural stormwater BMPs not owned or operated by the City, perform necessary maintenance, and assess costs for those structural stormwater BMPs when the City determine the owner of that structural stormwater BMP has not ensured proper function.
   2. Are designed to preserve the City's right to ensure maintenance responsibility for structural stormwater BMPs not owned or operated by the City, when those responsibilities are legally transferred to another party.
   3. Are designed to protect/preserve structural stormwater BMPs. If structural stormwater BMPs change, causing decreased effectiveness, new, repaired, or improved structural stormwater BMPs must be implemented to provide equivalent treatment to the original BMP.

Process

a. Review City ordinances (Subdivisions and Zoning), the City of Stillwater Comprehensive Plan, the Surface Water Management Plan, the MPCA Construction General Permit, and the MS4 post-construction stormwater standards.
b. Reviews of submitted plans, will utilize a checklist to ensure accuracy (Appendix A).

Training

The City of Stillwater shall ensure that individuals receive training commensurate with their responsibilities as they relate to the Post-Construction Stormwater Management program. The City shall ensure that previously trained individuals attend a refresher training every three (3) calendar years following the initial training.

3. LONG-TERM OPERATION AND MAINTENANCE

Activities and Definition

All BMPs installed for the purpose of meeting the post-construction stormwater management standard are required to develop maintenance plans that are recorded on the deed of the property. This is required for the Brown's Creek Watershed District (BCWD) and Carnelian Marine Watershed Districts (CMSCWD). Any bioengineering projects must include a long-term maintenance plan required by the BCWD and CMSCWD that will ensure that small erosion spots are corrected, and native plant materials are successful.

Preparation

a. Establish a partnership with the watersheds for maintenance of post-construction stormwater BMPs on private facilities.
b. Develop a questionnaire for owners of post-construction stormwater BMPs.

Process

a. The City may conduct inspections of post-construction stormwater BMPs once during each MS4 permit cycle to determine if the system(s) are functioning as designed and permitted.
b. Once during each MS4 permit cycle request applicants to fill out and return the questionnaire.
c. If any applicants do not return their questionnaire to the City, the City may inspect the post-construction stormwater BMP on behalf of the applicant and bill the property owner for administrative costs incurred.
d. Notify all owners of post-construction stormwater BMPs with deficiencies and require repair within 4 months.

e. If any owners of post-construction stormwater BMPs with deficiencies are not repaired within 4 months of notification, the City may complete the repairs and bill the property owner for such repairs.
f. Decertify all owners of post-construction stormwater BMPs that do not return the questionnaire.
g. Defer all applicants that do not return their questionnaire to the watersheds for enforcement.

Documentation

a. Keep logs of all maintenance agreements that get filed with the watershed districts along with their BMP locations.
b. Obtain as-built plans for all public and private post-construction stormwater BMPs that are installed within the City.
c. Update the GIS system to include all public and private storm sewer and post-construction stormwater BMPs installed within the City.

Enforcement Response Procedure

The City of Stillwater shall maintain written ERPs to compel compliance with the regulatory mechanism(s) required in Section 20. The City shall specify the Natural Resource Technician as the position title of responsible person(s) for conducting enforcement along with the timeframe. The following enforcement tools include:
a. Verbal warning
b. Notice of violation
c. Administrative order
d. Stop Work Order - Temporary Suspension of Work
e. Require Corrective Action.

Documentation

Documentation as related to training:
a. Document general subject matter covered
b. Document the names and departments of individuals in attendance
c. The date of each event
d. Keep logs of all maintenance agreements that are filed with the City, along with their BMP locations.

Documentation as related to the City's site review process:
a. Supporting documentation used to determine compliance, including any calculations for the permanent stormwater treatment system.
b. The water quality volume that will be treated through volume reduction practices (e.g., infiltration or other) compared to the total water quality volume required to be treated.

c. Documentation associated with off-site treatment projects authorized by the City, including rationale to support the location of permanent stormwater treatment projects in accordance with items 20.10 and 20.11.
d. All legal mechanisms drafted in accordance with permit item 20.15, including date(s) of the agreement(s) and name(s) of all responsible parties involved.
e. Keep logs of all maintenance agreements that get filed with the watershed districts along with their BMP locations.
f. Obtain as-built plans for all public and private post-construction stormwater BMPs that are installed within the City.
g. Update the GIS system to include all public and private storm sewer and post- construction stormwater BMPs installed within the City.
h. Obtain a long-term maintenance agreement for private structural stormwater BMPs.
i. Obtain a site plan and review procedure to ensure the post-construction stormwater management is in accordance with the regulatory mechanism.
j. Keep copies of returned questionnaires and inspection reports on file for at least three years, should the City be required to perform maintenance for non-compliance.

Documentation as related to the enforcement conducted pursuant to the City's ERPs:
a. The name of the person responsible for violating the terms and conditions of the City's regulatory mechanism(s)
b. The date(s) and location(s) of the observed violation(s)
c. A description of the violation(s) Corrective action(s) issued
d. Corrective action(s) issued
e. Referrals to other regulatory organizations
f. The date(s) violation(s) are resolved

The City of Stillwater shall conduct an annual assessment of the Post-Construction Stormwater Management program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., inventory, trainings, site plan reviews, inspections, enforcement, etc.)) in Section 20 of the MS4 General Permit and determine how the program might be improved. The City shall perform the annual assessment prior to completion of each annual report and document any modifications made to the program because of the annual assessment.

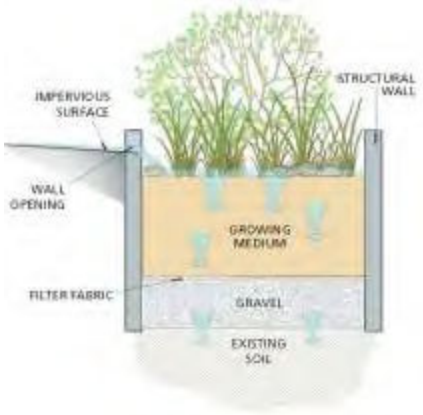
APPENDIX A
BMP MATRIX

BMP Type[1]	Benefits	Negatives	Implementation Considerations	Examples
Better Site Design	• Minimizes need for structural BMPs • Preserves natural areas • Provides buffers for waterbodies • Reduces the amount of regulatory compliance	• May conflict with local ordinances	• Is there local buy in (developers, officials, etc.)?	
Infiltration/Rain Garden	• Manages stormwater • filters pollutants • Wildlife habitat • Little maintenance • Adds beauty	• Plants can take 2-3 years to establish • More maintenance required in first few years	• Construct downslope of runoff to be captured • Plant in spring or fall • Locate at least 10 feet from building foundations	
Filtration/Riparian Buffer	• Increases infiltration and groundwater recharge • Improves water quality • Controls erosion & sedimentation • Provides wildlife habitat	• Not as effective on steep slopes • More difficult to implement than some other practices	• Plant in spring or fall • Locate at least 10 feet from building foundations	

APPENDIX A
BMP MATRIX

Permeable Pavement	• Reduces runoff quantity, TSS, and TP loads, as well as temperature of runoff water • Well suited to high density urban areas that may not have space for other BMPs	• Require regular vacuuming to maintain infiltration capabilities • Suitable for low volume roads, ped only areas, parking stalls, etc. • Winter sanding may clog the surface material	• Should be located at least 10 feet from structures and 100 feet from water supply wells • Surface slopes should be at least 1% to provide an alternate means of drainage should the surface pavement become clogged	

APPENDIX A
BMP MATRIX

Infiltration Planters	• Increases infiltration and evapotranspiration of stormwater • Filters pollutants • Requires little maintenance • Provides wildlife habitat • Large canopy of native trees maximized benefits	• Takes many years before trees grow to provide maximum benefit • Regular maintenance is required where invasive plant species exist • Must guard against deer browsing and vole damage	• Plant in spring or fall • Watering may be necessary after planting during dry weather (25 gallons/week)	
Stormwater Reuse	• Protects water supplies by reducing use during peak summer months • Results in cost savings by reducing municipal water bill • Mimics the natural hydrology of the area by infiltrating rainwater	• May act as a mosquito breeding site • Human exposure to pathogens • Cross contamination of potable water supply • No well-defined operation and maintenance plan	• Some roof types are not conducive since they have the potential to introduce contaminants into the system • Systems needs to remain watertight and be located on level ground	

APPENDIX A
BMP MATRIX

Green Roofs	• Double the lifespan of traditional roof • Reduce the urban heat island effect • Can reduce flow rate by up to three hours and reduce flow of stormwater by up to 65% • Reduces energy costs by insulating the structure; less swing in diurnal temperatures	• Installation costs double that of a traditional roof • Significant maintenance obligations to ensure establishment	• Roofs must be able to structurally support vegetation and growing medium • Quality Installation and leak prevention a must • Historic buildings may require special authorization	 Source: U.S. Government Services Agency
Iron Enhanced Sand Filters	• High pollutant removal rates • Use as a retrofit for existing ponds or other BMPs • Can be used at sites with restrictions where infiltration may not be appropriate or feasible	• Disposal of iron-sand bed will be required when the iron is consumed • Long inundation periods and dead vegetation can cause low oxygen conditions and iron loss • Head required for drawdown	• Adjacent slopes must be less than 20% and greater than 1% • Depth to bedrock and water table must be more than 3 feet or an impermeable liner must be used	

APPENDIX A
BMP MATRIX

Stormwater Ponds	• Provides flood control by reducing the rate that stormwater enters receiving waters • Removal of pollutants such as phosphorous, total suspended solids, and metals through settling of stormwater • May reduce channel erosion by reducing peak stormwater flows to receiving waters	• Space requirements could be high since the pond footprint should be 1-3% of the drainage area • Have the potential for nuisance insects or odor • May pose safety concerns	• Need to maintain dead storage or permanent pool • Pretreatment highly recommended to reduce sedimentation and reduce maintenance requirements • Soil groups A and B may require a liner to maintain dead storage • Adjacent slopes should be less than 25% but greater than 0.5% • May not be appropriate if receiving waters are coldwater fisheries	

APPENDIX A
BMP MATRIX

Hydrodynamic Separators	• Units are underground, reducing space requirements • Can be used as pretreatment devices • Can be used in cold climates if installed below the frost line	• May not meet local standards when used alone • Not very effective for removing nutrients and bacteria	• May require a bypass if high flows are common or expected • Consider pollutant of concern; solids and floatables are removed much more effectively than dissolved pollutants	

[1] The list of the BMPs provided are an example of potential BMPs that could be implemented throughout the City. The sites should be evaluated using the Minnesota Stormwater Manual's criteria for selecting BMPs. If infiltration is not determined feasible the applicant shall demonstrate credits using the Minimal Impact Design Standards (MIDS)s Flexible Treatment Options.

[2] Source: U.S. General Services Administration http://www.gsa.gov/portal/content/166443

APPENDIX B

CITY OF STILLWATER
COUNTY OF WASHINGTON
STATE OF MINNESOTA

STORMWATER FACILITIES MAINTENANCE AGREEMENT WITH ACCESS RIGHTS AND COVENANTS

(_____Insert Project Reference Numbers___)

This AGREEMENT, made and entered into this ___ day of _____, 20___, for the maintenance and repair of certain Stormwater Management Facilities is entered into between _____ (hereinafter referred to as "OWNER") and the City of Stillwater (hereinafter referred to as "CITY") for the benefit of the CITY, the OWNER, the successors in interest to the CITY or the OWNER, and the public generally.

WITNESSETH

WHEREAS, the undersigned is the owner of that certain real property lying and being in the _____ Land Lot/District, _____ identified as [Tax Map/Parcel Identification Number] _____ and being more particularly described by deed as recorded in the land records of the City of Stillwater, Minnesota, Deed Book _____ Page ____, hereinafter called the "Property".

WHEREAS, the undersigned is proceeding to build on and develop the property; and has submitted the Site Plan/Subdivision Plan known as _____, (Name of Plan/Development) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for detention of stormwater within the confines of the property; and

WHEREAS, the City and the undersigned, its successors and assigns, including any homeowners' association, (hereinafter the "Landowner") agree that the health, safety, and welfare of the residents of the City of Stillwater, Minnesota, requires that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the City requires that on-site stormwater management facilities as shown on the Plan (the "Facilities") be constructed and adequately maintained by the Landowner.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

(1) When a new drainage control facility is installed, the party having the facility installed shall obtain a copy of the as-built plans from the City of Stillwater's Engineering Department. Responsible parties shall make records of the installation and of all maintenance and repair, and shall retain the records for at least ten years. These records shall be made available to

the City of Stillwater's City Engineer during Inspection of the facility and at other reasonable times upon request of the City Engineer.

(2) The following operational maintenance activities shall be performed on all permitted systems on a regular basis or as needed:

a) Removal of trash and debris,
b) Inspection of inlets and outlets,
c) Removal of sediments when the storage volume or conveyance capacity of the stormwater management system is below design levels
d) Ensure systems designed for infiltration are drawing down within 48 hours, and
e) Stabilization and restoration of eroded areas.

(3) Specific operational maintenance activities are required, depending on the type of permitted system, in addition to the practices listed in subsection (2), above.

a) Retention, swale and underdrain systems shall include provisions for:
    1. Mowing and removal of grass clippings, and
    2. Aeration, tilling, or replacement of topsoil as needed to restore the percolation capability of the system. If tilling or replacement of the topsoil is utilized, vegetation must be established on the disturbed surfaces.
b) Exfiltration systems shall include provisions for removal of sediment and debris from pretreatment or sediment collection systems.
c) Wet detention systems shall include provisions for operational maintenance of the littoral zone. Replanting shall be required if the percentage of vegetative cover falls below the permitted level. It is recommended that native vegetation be maintained in the littoral zone as part of the system's operation and maintenance plan. Undesirable species such as cattail and exotic plants should be controlled if they become a nuisance.
d) Dry detention systems shall include provisions for mowing and removal of grass clippings.

(4) If the system is not functioning as designed and permitted, operational maintenance must be performed immediately to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design and performance standards of this chapter, the permittee must either replace the system or construct an alternative design.

(5) In the event the Landowner fails to maintain the Facilities in good working condition acceptable to the City, the City will no longer provide credits towards a reduction in the landowners' stormwater utility fee. The City may enter upon the Property and take such steps as are necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner. This provision shall not be construed to allow the City to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the City is under no obligation to routinely maintain, or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City. The Landowner grants to the City, its authorized agents and employees, a non-exclusive, perpetual easement over, across, under and through the Property for such purposes.

IN WITNESS THEREOF, the parties hereto acting through their duly authorized agents have caused this Agreement to be signed, sealed and delivered:

(Insert Company/Corporation/Partnership Name) [SEAL]

_____
By: (Type Name and Title)

The foregoing Agreement was acknowledged before me
this ____ day of _____, 20___, by

_____
Unofficial Witness

_____
NOTARY PUBLIC

My Commission Expires: _____

CITY OF STILLWATER, MINNESOTA

ATTACHMENT 1: CITY OF STILLWATER
ENGINEERING STANDARDS FOR STORM WATER
TREATMENT FACILITIES

The following are the maintenance requirements required for the proper operation of water quality treatment structures provided by the *Minnesota Stormwater Manual* (MPCA):

Pond Maintenance Requirements

1. Annual inspection, maintenance reporting and certification by a professional engineer (Provided by Owner). Information must be submitted to the City annually.

2. Excavate pond to original design capacity when one half (1/2) of the wet volume of the pond is lost due to sediment deposition.

3. Remove floatable debris in and around the pond area including, but not limited to oils, gases, debris and other pollutants.

4. Maintain landscape adjacent to the facility per original design, including but not limited to maintenance of the buffer strip and other plant materials as per original plan design.

5. Maintenance of all erosion control measures including but not limited to rip rap storm sewer outlets, catch basin inlets, etc.

Water Quality Manhole Maintenance Requirements

1. Annual inspection, maintenance reporting and certification by a professional engineer (Provided by Owner). Information must be submitted to the City annually.

2. Maintenance should be performed once the sediment or oil depth exceeds the established requirements recommended by the manufacturer.

3. Maintenance should occur immediately after a spill takes place. Appropriate regulatory agencies should also be notified in the event of a spill.

4. Disposal of materials shall be in accordance with local, state and federal requirements as applicable.

Rain Garden Maintenance Requirements

1. Inlet and Overflow Spillway – Remove any sediment build-up or blockage and correct any erosion.

2. Vegetation
    a. Maintain at least 80% surface area coverage of plants approved per plan.
    b. Removal of invasive plants and undesirable woody vegetation.
    c. Removal of dried, dead and diseased vegetation.
    d. Re-mulch void or disturbed/exposed areas.

3. Annual inspection and maintenance efforts must be documented and submitted to the City.

Filtration Basin Maintenance Requirements

1. Sweep sediment from parking lot 4 times per year

2. Ongoing and as needed:
    a. Prune and weed to maintain appearance
    b. Remove trash and debris
    c. Maintain at least 80% surface area coverage of plants approved per plan.
    d. Removal of invasive plants and undesirable woody vegetation.
    e. Removal of dried, dead and diseased vegetation.
    f. Re-mulch void or disturbed/exposed areas.

3. Semi-annually:
    a. Remove sediment from inflow points (off-line systems)
    b. Inspect aggregate filter system and clean as needed
    c. Shrubs should be inspected to evaluate health. Remove dead and diseased vegetation.

4. Annually:
    a. Inspect and remove any sediment and debris build-up in pre-treatment areas
    b. Inspect inflow points and bio retention surface for buildup of road sand associated with spring melt period. Remove and replant as necessary.

5. 2 to 3 years:
    a. Test pH of planting soils. If pH is below 5.2, add limestone. If pH is 7.0 to 8.0, add iron sulfate plus sulfur.

6. Annual inspection and maintenance efforts must be documented and submitted to the City.

Minimum Control Measure 6
Pollution Prevention and Good Housekeeping
Practices for Municipal Facilities

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APPENDICES

MINIMUM CONTROL MEASURE 6

1. INTRODUCTION

1.1. Basis for the Standard Operating Procedures (SOPs)

The Minnesota Pollution Control Agency issues a National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The MS4 GP requires the City of Stillwater to alter their own actions as well as work with other governmental agencies to help ensure a reduction in the amount and type of pollution that:

- Collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways.
- Results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems.

This manual not only assists the City of Stillwater in meeting the Stormwater Phase II regulations but encourages them to use targeted best management practices (BMPs) to prevent the discharge of non-stormwater related discharges. The Guidelines and Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Stillwater's lakes, ponds, streams, and rivers.

1.2. Objectives of the SOPs

This manual is intended to provide guidance on Good Housekeeping Practices for Municipal Operations as follows:

- Provide BMPs used for municipal activities.
- Provide BMPs to prevent or reduce the stormwater impacts from the facilities documented on the Faculty Inventory.
- Provide BMPs to protect Source Water Protection Areas, such as Drinking Water Supply Management Areas and source water protection areas for surface intakes.
- Stormwater pond assessment procedures and schedule to evaluate the effectiveness of total suspended solids (TSS) and total phosphorus (TP) removal of municipally owned/operated ponds.
- Provide methods for employing spill prevention and response.
- Provide tools for documenting inspections of municipal facilities.

1.3. Training

The City of Stillwater will provide training and information on an annual basis to employees involved in the inspection and maintenance of The City of Stillwater's storm drainage system, illicit discharge detection, construction site maintenance, and general municipal good housekeeping. At a minimum, training and information will cover:

- Inspection/maintenance procedures
- Reasons for inspection/maintenance
- Erosion and sediment control inspection/maintenance practices
- Good housekeeping practices associated with municipal activities
- Daily, intermediate, and long-term preventative inspection/maintenance
- Major/minor repairs
- Vegetation inspection
- Stormwater basins versus wetlands
- Spills or illegal dumping into the storm sewer system
- Public stormwater basins versus private stormwater basins
- Stormwater basins with vegetation requiring additional inspection/maintenance

The City's training program shall include:

- The importance of protecting water quality.
- The requirements of the permit are relevant to the responsibilities of the individuals.
- A schedule that establishes initial training for individuals, including new and/or seasonal employees, and recurring training intervals to address changes in procedures, practices, techniques, or requirements.

The City's winter maintenance training program shall include:

- The importance of protecting water quality.
- BMPs to minimize the use of deicers (e.g., proper calibration of equipment and benefits of pretreatment, pre-wetting, and anti-icing); and
- Tools and resources to assist in winter maintenance (e.g., deicing application rate guidelines, calibration charts, Smart Salting Assessment Tool)

1.4. Documentation

Maintain a written or mapped inventory of the City's owned/operated facilities that contribute pollutants to stormwater discharges:

a. Composting
b. Equipment storage and maintenance
c. Public parking lots
d. Public works yard(s)
e. Salt storage
f. Materials storage yard(s)

2. POLLUTION PREVENTION

2.1. Dumpsters/Garbage Storage

Activities and Definition

Potential for pollutants can occur if proper garbage management is not in place. An appropriate number of dumpsters should be located throughout the facility to provide enough storage for daily activities. In addition, facility dumpsters are to be marked for proper materials disposal.

Preparation

a. Train employees in proper trash disposal.
b. Locate dumpsters and trash cans in convenient, easily observable areas.
c. Provide properly labeled recycling bins to reduce the amount of garbage disposed.
d. Where applicable install berms, curbing, or vegetation strips around storage areas to control water entering/leaving storage areas.
e. Whenever possible store garbage containers beneath a covered structure or inside to prevent contact with stormwater.

Process

a. Inspect garbage bins for leaks regularly and have repairs made immediately by responsible party.
b. Request/use dumpsters and trash cans with lids and without drain holes.
c. Locate dumpsters on a flat, hard surface that does not slope or drain directly into the storm drain system.

Clean-up/Follow-up

a. Keep areas around dumpsters clean of all garbage.
b. Have garbage bins emptied regularly to keep from overfilling.
c. Wash out bins or dumpsters as needed to keep odors from becoming a problem.

Documentation

a. Document training of employees.

2.2. Parking Lot Maintenance

Activities and Definition

Parking lots can potentially generate increased pollutant loads to the stormwater system from run-off. A well-maintained parking surface can help to reduce some of those pollutant concerns.

Preparation

a. Conduct regular employee training to reinforce proper housekeeping.

b. Restrict parking in areas to be swept prior to and during sweeping using regulations as necessary.
c. Perform regular maintenance and services in accordance with the recommended vehicle maintenance schedule on sweepers to increase and maintain efficiency.

Process

a. Sweep parking areas, as needed, or as directed by the City's responsible official.
b. Hand sweep sections of gutter if soil and debris accumulate.
c. Pick-up litter as required to keep parking areas clean and orderly.

Clean-up/Follow-up

a. Dispose of sweepings properly (appropriate facility).
b. Street sweepers are to be cleaned out in a manner as instructed by the manufacturer and in a location that swept materials cannot be introduced into a storm drain.
c. Swept materials will not be stored in locations where stormwater could transport fines into the storm drain system.

Documentation

a. Keep accurate logs to track swept parking areas and approximate quantities.
b. Document training of employees.

2.3. Parks – Chemical Application Pesticides, Herbicides, Fertilizers

Activities and Definition

A pivotal part of the beautification of the City is a great parks system. The health and beauty of lawns and natural areas take the application of some chemicals and fertilizers.

Preparation

a. Make sure the City's state Chemical Handling Certification is complete and up-to-date before handling any chemicals.
b. Calibrate fertilizer and pesticide application equipment to avoid excessive application.
c. Use pesticides only if there is an actual pest problem and periodically test soils for determining proper fertilizer use.
d. Time and apply the application of fertilizers, herbicides or pesticides to coincide with the manufacturer's recommendations for best results ("Read the Label").
e. Know the weather conditions. Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).

Process

a. Always follow the manufacturer's recommendations for mixing, application and disposal ("Read the Label").
b. Do not mix or prepare pesticides for application near storm drains. Preferably mix pesticides inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
c. Employ techniques to minimize off-target application (e.g. spray drift, over broadcasting.) of pesticides and fertilizers.

Clean-up/Follow-up

a. Sweep pavements or sidewalks where fertilizers or other solid chemicals have fallen, back onto grassy areas before applying irrigation water.
b. Triple rinse containers and use rinse water as product. Dispose of unused pesticide as hazardous waste.
c. Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and their containers ("Read the Label").

Documentation

a. Keep copies of MSD sheets for all pesticides, fertilizers and other hazardous products used.
b. Record fertilizing and pesticide application activities, including date, individual who did the application, amount of product used and approximate area covered.

2.4. Parks – Cleaning Equipment

Activities and Definition

There are many benefits to taking proper care of the City's equipment. Prolonging the life of the equipment by taking the time to maintain critical parts is an essential part of the Parks departments daily activities.

Preparation

a. Review process with all Parks employees.

Process

a. Wipe off dirt, dust and fluids with a disposable towel.
b. Wash equipment in approved wash station.

Clean-up/Follow-up

a. Dispose of towels in proper trash receptacle.
b. Sweep the floor and dispose of debris.

Documentation

a. NA

2.5. Parks – Mowing and Trimming

Activities and Definition

Regular mowing and trimming activities have the potential to deposit materials onto hard surfaces. Care should be taken to ensure mowing or trimming refuse is disposed of properly.

Preparation

a. Process overview with employees.
b. Check the oil and fuel levels of the mowers and other equipment. Fill in proper areas if needed.

Process

a. Install temporary catch basin protection on potentially affected basins.
b. Put on eye and hearing protection.
c. Mow and trim the lawn.
d. Sweep or blow clippings to grass areas.
e. Remove inlet protection if used.

Clean-up/Follow-up

a. Mowers are to be scraped and brushed at designated location.
    1. Dry spoils are dry swept and disposed of properly.
b. Wash equipment in approved wash station.

Documentation

a. Document and observe deficiencies for correction or repair.

2.6. Parks – Open Space Management

Activities and Definition

Open space provides great value to the park system that go beyond ball fields. This includes stormwater retention and potential flood relief.

Preparation

a. Provide regular observation and maintenance of parks, golf courses, and other public open spaces.
b. Identify public open spaces that are used for stormwater detention and verify that detention areas are included on the storm drain system mapping, inspection schedules, and maintenance schedules.

Process

a. Ensure that any storm drain or drainage system components on the property are properly maintained.
b. Avoid placing bark mulch (or other floatable landscaping materials) in stormwater detention areas or other areas where stormwater runoff can carry the mulch into the storm drainage system.
c. Follow all SOPs related to irrigation, mowing, landscaping, and pet waste management.

Clean-up/Follow-up

a. Keep all outdoor work areas neat and tidy. Clean by sweeping instead of washing whenever possible. If areas must be washed, ensure that wash water will enter a landscaped area rather than the storm drain. Do not use soap for outdoor washing.
b. Pick up trash on a regular basis.

Documentation

a. Document and observed deficiencies for correction or repair.

2.7. Parks – Pet Waste

Activities and Definition

Pet waste has the potential to be a contributor to downstream degradation if not maintained and properly disposed of.

Preparation

a. Adopt and enforce ordinances that require pet owners to clean up pet wastes and use leashes in public areas. If public off-leash areas are designated, make sure they are

clearly defined. Avoid designating public off-leash areas near streams and water bodies.

b. Whenever practical and cost effective, install dispensers for pet waste bags and provide disposal containers at locations such as trail heads or parks where pet waste has been a problem. Provide signs with instructions for proper cleanup and disposal.

Process

a. Check parks and trails for pet waste as needed.
b. Check public open space for pet waste prior to mowing and watering.
c. Provide ordinance enforcement as needed.

Clean up / follow-up

a. Remove all pet waste; provide temporary storage in a covered waste container and dispose of it properly. The preferred method of disposal is at a solid waste disposal facility.

Documentation

a. Document problem areas for possible increased enforcement and/or public education signs.

2.8. Parks – Planting Vegetation (Starters)

Activities and Definition

Vegetation is a key component of establishing healthy ecosystems that hold water and nutrients on site.

Preparation

a. Call the appropriate numbers for the location of utilities.
b. Decide where any spoils will be taken.

Process

a. Dig holes; place spoils near the hole where they may easily be placed back around the roots. Avoid placing spoils into the gutter system.
b. Bring each plant near the edge of the hole dug for it.
c. Check the depth of the hole and adjust the depth if necessary. The depth of the hole for a tree should be as deep as the root ball, so that the top of the root ball is level with the top of the hole.
d. Carefully remove pot or burlap.

e. Place the plant in the hole.
f. Backfill the hole with existing spoils, compost, and a litter fertilizer if desired. Do not use excessive amendments.
g. Water the plant.
h. Stake the plant if necessary to stabilize it.

Clean-up/Follow-up

a. Remove any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed.
b. Sweep dirt from surrounding pavement(s) into the planter area.
c. Transport spoils to their designated fill or disposal area.

Documentation

a. N/A

2.9. Parks – Planting Vegetation (Seeds)

Activities and Definition

Vegetation is a key component of establishing healthy ecosystems that hold water and nutrients on site

Preparation

a. Call the appropriate numbers for the location of utilities.
b. Decide where any spoils will be taken.
c. Decide on the application rate, method, water source, and ensure adequate materials are on hand.
d. Grade and prepare soil to receive the seed. Place any extra soil in a convenient location to collect.

Process

a. Place the seed and any cover using the pre-determined application method (and rate).
b. Lightly moisten the seed.

Clean-up/Follow-up

a. Remove any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed.
b. Sweep dirt from surrounding pavement(s) into the planter area.

c. Transport spoils to their designated fill or disposal area.

Documentation

a. N/A

2.10. Parks – Transporting Equipment

Activities and Definition

Equipment Transportation is a pivotal part of the daily activities that occurs on a daily basis.

Preparation

a. Determine equipment needed for transport and method (trailer, truck bed) needed to transport equipment.
b. Conduct pre-trip inspection of equipment.

Process

a. Load and secure equipment on trailer or truck.
b. Load and secure fuel containers for equipment usage.

Clean-up/Follow-up

a. Off load equipment.
b. Store equipment and trailer in proper location.
c. Conduct post-trip inspection of equipment.
d. Wash equipment if needed, according to the written procedure for Cleaning Equipment.

Documentation

a. Pre-trip and post-trip inspection report.

2.11. Streets/Storm Drain – Catch Basin Cleaning

Activities and Definition

Catch Basin Cleaning needs to be completed on a regular basis to insure the functionality of the stormsewer system.

Preparation

a. Clean sediment and trash off of grate.
b. Do visual inspection on outside of grate.
c. Make sure nothing needs to be replaced.
d. Do an inside visual inspection to see what needs to be cleaned.

Process

a. Clean using a high-powered vacuum truck to start sucking out standing water and sediment.
b. Use a high-pressure washer to clean any remaining material out of catch basin, while capturing the slurry with the vacuum.
c. After catch basin is clean, send the rodder of the vacuum truck downstream to clean pipe and pull back sediment that might have gotten downstream of pipe.
d. Move truck downstream of pipe to next catch basin.

Clean-up/Follow-up

a. When vacuum truck is full of sediment, take it to the designated location to dump all the sediment out of truck into a drying bed.
b. When it evaporates, clean it up with a backhoe/skid loader, put it into dump truck and take to permanent disposal site (landfill).

Documentation

a. Keep logs of number of catch basins cleaned.
b. Record the amount of waste collected.
c. Keep any notes or comments of any problems.

2.12. Streets/Storm Drain – Curb Painting

Activities and Definition

Storm drains are gateways that allow pollutants in stormwater to flow untreated from local streets to lakes, rivers and streams. Residual oil, grease, solids, antifreeze, cigarette butts, yard waste, plastic and other wastes found on roads, parking lots and driveways pollute downstream waters by increasing phosphorus levels, reducing oxygen levels and ultimately impairing aquatic habitat for fish and other organisms as well as drinking water sources.

Preparation

a. Calculate the amount of paint required for the job.
b. Use water-based paints if possible.

c. Determine whether the wastes will be hazardous or not and the required proper disposal of said wastes. Prepare surfaces to be painted without generating wastewater by sandblasting and/or scraping.
d. Thoroughly sweep up all sand, blastings, and/or paint scrapings.
e. If paint stripping is needed, use a citrus-based paint remover whenever possible since it is less toxic than chemical strippers.
f. If wastewater will be generated, use curb, dyke, etc. around the activity to collect the filter and collect the debris.

Process

a. Paint curb.
b. Prevent over-spraying of paints and / or excessive sandblasting.
c. Use drip pans and drop clothes in areas of mixing paints and painting.
d. Store latex paint rollers and brushes in airtight bags to be reused later with the same color.
e. Have available absorbent material and other BMP's ready for an accidental paint spill.

Clean-up/Follow-up

a. Paint out brushes and rollers as much as possible. Squeeze excess paint from brushes and rollers back into the containers prior to cleaning them.
b. Pour excess paint from trays and buckets back into the paint can containers and wipe with cloth or paper towels. Dispose of the towels according to the recommendations on the paint being used.
c. Rinse water-based paint brushes in the sink after pre-cleaning. Never pour excess paint or wastewater from cleanup of paint in the storm drain.
d. Cleanup oil-based paints with paint thinner. Never clean oil-based brushes in a sink or over a storm drain. Filter solvents for reuse if possible and / or store in approved drum for recycling.
e. Dispose of waste collected by placing it in a garbage container. Left-over paint and solvents should be stored for later use (do not place these liquids in the garbage).

Documentation

a. Write-up / report of any discharges into storm drain system.

2.13. Streets/Storm Drain – Detention Pond Cleaning

Activities and Definition

Storm drains are gateways that allow pollutants in stormwater to flow untreated from local streets to lakes, rivers and streams. Residual oil, grease, solids, antifreeze, cigarette butts, yard waste, plastic and other wastes found on roads, parking lots and driveways

pollute downstream waters by increasing phosphorus levels, reducing oxygen levels and ultimately impairing aquatic habitat for fish and other organisms as well as drinking water sources.

Preparation

a. Schedule the Pond cleaning work for a time when dry weather is expected.
b. Remove any sediment and trash from grates, placing it in a truck for disposal.
c. Do a visual inspection to make sure any grates, structures, manholes, and pipes are in good working order. Remove manhole covers and grates as necessary for inspecting.

Process

a. Provide outlet protection where feasible to minimize the amount of debris that might leave basin during cleaning process.
b. Start cleaning basin by using backhoe to remove debris and sediment off the bottom.
c. Continue cleaning structures and pond bottom as necessary by sweeping and shoveling.
d. Put all material removed from the pond into a dump truck.
e. Some structures might require the use of a vacuum truck. If so use the same procedures described for cleaning catch basins.

Clean-up/Follow-up

a. After cleaning basins, clean off the concrete pads using dry methods (sweeping and shoveling).
b. Make sure they are swept up and clean.
c. Take the material that was removed to the landfill for final disposal.
d. After performing maintenance, clean off the concrete pads using dry methods (sweeping and shoveling).
e. Properly dispose of the material that was removed.
f. Site restoration work, if applicable, shall be conducted as soon as weather conditions permit and may include:
    - Additional clean-up or maintenance of inlet and outlet structures.
    - Additional site stabilization work including sediment and erosion control.
    - Establishing plant, seed, sod, mulch or vegetation to prevent erosion (above waterline).
    - Professional engineer to sign-off on project completion.
g. Inspect all ponds and outfalls (excluding underground outfalls) each permit term in order to determine structural integrity, proper function, and maintenance needs.

Documentation

a. Keep logs of each detention basins/pond cleaned including date, individuals involved in cleaning, and a description of the type of debris removed.
b. Record the amount of waste collected.
c. Keep any notes or comments of any problems.

Document pond sediment excavation and removal activities including the following:
a. A unique ID number and geographic coordinate of each stormwater pond from which sediment is removed.
b. The volume (e.g., cubic yards) of sediment removed from each stormwater pond.
c. Results from any testing of sediment from each removal activity.
d. Location(s) of final disposal of sediment from each stormwater pond.

2.14. Streets/Storm Drain – Creek Management

Activities and Definition

Storm drains, streets, and creeks are gateways that allow pollutants in stormwater to flow untreated from local streets to lakes, rivers and streams. Residual oil, grease, solids, antifreeze, cigarette butts, yard waste, plastic and other wastes found on roads, parking lots and driveways pollute downstream waters by increasing phosphorus levels, reducing oxygen levels and ultimately impairing aquatic habitat for fish and other organisms as well as drinking water sources.

Preparation

a. Monitor streams on a regular basis (Annually).
b. Check culverts and crossings after every storm.
c. Maintain access to stream channels wherever possible.
d. Identify areas requiring maintenance.
e. Determine what manpower or equipment will be required.
f. Identify access and easements to area requiring maintenance.
g. Determine method of maintenance that will be least damaging to the channel.
h. Obtain stream alteration permit.

Process

a. Remove unwanted material (debris, branches, soil) from the creek channel and place it in a truck to be hauled away.

Clean up / follow-up

a. Stabilize all disturbed soils.

b. Remove all tracking from paved surfaces near maintenance site, if applicable.
c. Haul all debris or sediment removed from area to approved dumping site.

Documentation

a. Keep log of actions performed including date and individuals involved.
b. Record the amount of materials removed or imported.
c. Keep any notes or comments of any problems.
d. Use "before" and "after" photographs to document activities as applicable.

2.15. Streets/Storm Drain – Ditch Management

Activities and Definition

Storm drains are gateways that allow pollutants in stormwater to flow untreated from local streets to lakes, rivers and streams. Residual oil, grease, solids, antifreeze, cigarette butts, yard waste, plastic and other wastes found on roads, parking lots and driveways pollute downstream waters by increasing phosphorus levels, reducing oxygen levels and ultimately impairing aquatic habitat for fish and other organisms as well as drinking water sources.

Preparation

a. Monitor ditches on a regular basis (Annually)
b. Maintain access to ditch channels wherever possible.
c. Contact affected property owners and utility owners.

Process

a. Identify areas requiring maintenance.
b. Determine what manpower or equipment will be required.
c. Identify access and easements to area requiring maintenance.
d. Determine method of maintenance that will be least damaging to the channel and adjacent properties or utilities.

Clean-up/Follow-up

a. Stabilize all disturbed soils.
b. Remove all tracking from paved surfaces near maintenance site, if applicable.
c. Haul all debris or sediment removed from area to approved dumping site.
d. Prior to the expiration date of the General Permit, the City must conduct at least one inspection of all ponds and outfalls (excluding underground outfalls) in order to determine structural integrity, proper function, and maintenance needs.

e. The City must determine if repair, replacement, or maintenance measures are necessary in order to ensure the structural integrity and proper function of structural stormwater BMPs and outfalls.
f. The City must complete the necessary maintenance as soon as possible. If the City determines necessary maintenance cannot be completed within one year of discovery, the City must document a schedule(s) for completing the maintenance.
g. Inspect and ensure maintenance structural stormwater BMPs annually (excluding stormwater ponds, which are under a separate schedule below) each calendar year to determine structural integrity, proper function, and maintenance needs unless the City determines either of the following conditions apply:
    1. Complaints received or patterns of maintenance indicate a greater frequency is necessary; or
    2. Maintenance or sediment removal is not required after completion of the first two calendar year inspections; in which case the City may reduce the frequency of inspections to once every two (2) calendar years.

Documentation

a. Keep log of actions performed including date and individuals involved.
b. Record the amount of materials removed or imported.
c. Keep any notes or comments of any problems.
d. Use "before" and "after" photographs to document activities as applicable.

2.16. Streets/Storm Drain – Chip Seal

Activities and Definition

Pollutants collect on surfaces in between storm events as a result of atmospheric deposition, vehicle emissions, winter road maintenance, construction site debris, trash, road wear and tear. Chip sealing is a part of the maintenance of these surfaces that helps to prolong the life of the roadway.

Preparation

a. Clean and dry areas where materials are to be applied.
b. Apply temporary covers to manholes and catch basins to prevent oil and materials from getting inside of them.

Process

a. Apply emulsion at recommended rate.
b. Spread chips closely behind emulsion distributor, slowly such that the chips do not roll when they hit the surface.
c. Roll chips. Rollers follow closely behind the chip spreader. Roll the entire surface twice.

d. Maximum speed 5 mph.

Clean-up/Follow-up

a. All loose aggregate is removed from the roadway by sweeping it up (see SOP for Street Sweeping).
b. Excessive asphalt applications and spills are removed with shovels and scraping tools.
c. Remove the temporary covers from manholes and catch basins. If it appears that any chip seal materials have gotten into the inlet boxes, remove the material according to the SOP for inlet boxes.
d. Dispose of the waste material that has been swept and scraped up by taking it to the landfill.

Documentation

a. Record location and date on the maintenance database and map.

2.17. Streets/Storm Drain – Slurry Seal

Activities and Definition

Plans that are submitted to the City of Stillwater for approval will have a review process to guarantee that erosion and sediment control standards are being met.

Preparation

a. Remove weeds from the roads. Sweep areas where materials are to be applied, and allow drying, if necessary. Verify that existing pavement has been inspected for detrimental effects of poor drainage.
b. Cover/protect catch basins and manholes.

Process

a. Apply materials in a smooth and uniform manner. Slurry material should not run onto adjacent pavement surface, curb and gutter or waterway.

Clean-up/Follow-up

a. If loose aggregate is remaining in street or curb, sweep it up.
b. Ensure that excess emulsion materials are removed from the site and stored for later use in an area or container that is not exposed to the weather.
c. Remove covers/protection from catch basins and manholes, and valves.

Documentation

a. Record location and date on the maintenance database and map.

2.18. Streets/Storm Drain – Overlays and Patching

Activities and Definition

Pollutants collect on surfaces in between storm events as a result of atmospheric deposition, vehicle emissions, winter road maintenance, construction site debris, trash, road wear and tear. Overlays and patching are a part of the maintenance of these surfaces that help prolong the life of the roadway.

Preparation

a. Measure and mark locations of manholes and valves on the curb.
b. Apply temporary covers to manholes and catch basins to prevent oil and materials from getting inside of them.
c. Cracks should be properly sealed. Alligator cracks and potholes should be removed and patched. Rutting should be milled.
d. Surface should be clean and dry.
e. Uniform tack coat applied and cured prior to placement of overlay.
f. If milling is required, install inlet protection as needed.

Process

a. Check hot asphalt mix for proper temperature, percentage asphalt, gradation, air voids, and any other agency requirements.
b. Raise manhole lids and valves to elevation of new asphalt surface with riser rings.
c. Surface texture should be uniform, no tearing or scuffing.
d. Rolling should be done to achieve proper in-place air void specification.

Clean up / follow-up

a. Covering should be removed as soon as the threat of imported materials entering the system is reduced and prior to a storm event.
b. After the pavement has cooled, sweep gutters to remove loose aggregate.

Documentation

a. Record location and date on the maintenance database and map.

2.19. Streets/Storm Drain – Crack Seal

Activities and Definition

Pollutants collect on surfaces in between storm events as a result of atmospheric deposition, vehicle emissions, winter road maintenance, construction site debris, trash, road wear and tear. Crack sealing is a part of the maintenance of these surfaces that help prolong the life of the roadway.

Preparation

a. Apply temporary covers to manholes and catch basins to prevent oil and materials from getting inside of them.
b. Remove weeds from the road.
c. Air-blast the cracks to remove sediments from the crack to allow for proper adhesion.
d. Ensure that the surface is clean and dry.

Process

a. The proper temperature of the material should be maintained.
b. Sufficient material is applied to form the specified configuration.

Clean-up/Follow-up

a. Excessive sealant application or spills are removed.
b. Sweep all loose debris from the pavement and dispose of it in the local landfill.

Documentation

a. Record location and date on the maintenance database and map.

2.20. Streets/Storm Drain – Shouldering and Mowing

Activities and Definition

Pollutants collect on surfaces in between storm events as a result of atmospheric deposition, vehicle emissions, winter road maintenance, construction site debris, trash, road wear and tear, and litter from adjacent lawn maintenance (grass clippings). The shoulders of the road should be properly maintained to ensure infiltration and other techniques for stormwater run-off are working with the most efficiency.

Preparation

a. Set up temporary traffic control devices.

Process

a. Place import material as needed and perform grading to achieve proper drainage.
b. Mulch clippings to help reduce the amount of supplemental fertilizer required.

Clean up / follow-up

a. Clean any loose material off asphalt or gutter.

Documentation

a. Record location and date on the maintenance database and map.

2.21. Streets/Storm Drain – Secondary Road Maintenance

Activities and Definition

Plans that are submitted to the City of Stillwater for approval will have a review process to guarantee that erosion and sediment control standards are being met.

Preparation

a. Determine length amount and type of road base or gravel that will be needed.
b. Determine proper equipment to be used and or any safety hazards.
c. Design proper drainage: slopes, berms, etc.

Process

a. Have truck drivers follow a designated route for hauling in the soil (See SOP for transporting soil and gravel).
b. If soils are too dry to achieve compaction, loosen surface material and moisture condition.
c. Smooth or grade soil with the desired crown or cross-slope.
d. Compact soil.

Clean up/Follow-up

a. Replace filter fabric with washed rock (if necessary) for monthly maintenance.
b. Clean up equipment according to the SOP for Cleaning Equipment.
c. Clean up any debris on traveled roads and dispose of it in the landfill.

Documentation

a. Fill out daily activity report in logbook or journal. Include date, time, personnel, and location.

2.22. Streets/Storm Drain – Concrete Work

Activities and Definition

The use of concrete is a common practice for BMP maintenance, proper management of those materials is critical for pollution prevention.

Preparation

a. Train employees and contractors in proper concrete waste management.
b. Store dry and wet materials under cover, away from drainage areas.
c. Remove any damaged concrete that may need to be replaced.
d. Prepare and compact sub-base.
e. Set forms and place any reinforcing steel that may be required.
f. Determine how much new concrete will be needed.
g. Locate or construct approved concrete washout facility.

Process

a. Install inlet protection as needed.
b. Avoid mixing excess amounts of fresh concrete on-site.
c. Moisten sub-base just prior to placing new concrete. This helps keep the soil from wicking moisture out of the concrete into the ground.
d. Place new concrete in forms.
e. Consolidate new concrete.
f. Screed off surface.
g. Let concrete obtain its initial set.
h. Apply appropriate surface finish.
i. Remove forms when concrete will not slump.

Clean-up/Follow-up

a. Perform washout of concrete trucks and equipment in designated areas only.
b. Do not wash out concrete trucks or equipment into stormdrains, open ditches, streets or streams.
c. Cement and concrete dust from grinding activities is swept up and removed from the site.
d. Remove dirt or debris from street and gutter.

2.23. Streets/Storm Drain – Garbage Storage

Activities and Definition

Illegal dumping of non-hazardous household waste and improper dumping of yard waste in streets, storm drains, wetlands, lakes, and other water bodies pollutes surface waters.

Non-hazardous household waste includes items such as tires, furniture, common household appliances and other bulk items. Yard waste includes any organic debris such as grass clippings, leaves, and tree branches.

Preparation

a. Locate dumpsters and trash cans with lids in convenient, easily observable areas.
b. Provide properly labeled recycling bins to reduce the amount of garbage disposed.
c. Provide training to employees to prevent improper disposal of general trash.

Process

a. Inspect garbage bins for leaks regularly, and have repairs made immediately by the responsible party.
b. Locate dumpsters on a flat, impervious surface that does not slope or drain directly into the storm drain system.
c. Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
d. Keep lids closed when not actively filling dumpster.

Clean-up/Follow-up

a. Keep areas around dumpsters clean of all garbage.
b. Have garbage bins emptied as often as needed to keep from overfilling.
c. Wash out bins or dumpsters as needed to keep odors from becoming a problem.
d. Wash out in properly designated areas only.

Documentation

a. N/A

2.24. Streets/Storm Drain – Snow Removal and De-icing

Activities and Definition

The concentration of chloride is increasing in our surface and ground water largely due to stormwater runoff from road salt storage piles, areas of excessive application, or simply from years of repeated application since chloride does not degrade in soil and water. Chloride in road salt and road salt additives (e.g. ferrocyanide for anti-caking) can create toxic conditions for fish, insects and vegetation.

Preparation

a. Store de-icing material under a covered impervious storage area indoors or in an area where water coming off the de-icing materials is collected and delivered to the sanitary sewer or reused as salt brine in order to implement practices to reduce exposure when transferring material from salt storage areas (e.g., sweeping, diversions, and/or containment).
b. Slope loading area away from storm drain inlets.
c. Design drainage from loading area to collect runoff before entering stormwater system.
d. Washout vehicles (if necessary) in approved washout area before preparing them for snow removal.
e. Calibrate spreaders to minimize amount of de-icing material used and still be effective.
f. Provide vehicles with spill cleanup kits in case of hydraulic line rupture or other spill.
g. Train employees in spill cleanup procedures and proper handling and storage of de-icing materials.

Process

a. Load material into trucks carefully to minimize spillage.
b. Periodically dry sweep loading area to reduce the amount of de-icing materials exposed to runoff.
c. Distribute the minimum amount of de-icing material to be effective on the roads.
d. Do not allow spreaders to idle while distributing de-icing materials.
e. Park trucks loaded with de-icing materials inside when possible.

Clean-up/Follow-up

a. Sweep up all spilled de-icing material around loading area.
b. Clean out trucks after snow removal duty in approved washout area.
c. Provide maintenance for vehicles in covered areas.
d. If sand is used in de-icing operations, sweep up residual sand form streets when weather permits.
e. The City shall implement a written snow and ice management policy for individuals that perform winter maintenance activities for the City. The policy shall establish practices and procedures for snow and ice control operations (e.g., plowing or other snow removal practices, sand use, and application of deicing compounds).

Documentation

a. Fill out daily activity report in logbook or journal. Include date, time, personnel, and location.

   Document the following information associated with the City's operations and maintenance program:

a. Date(s) and description of findings, including whether or not an illicit discharge is detected, for all inspections conducted in accordance with items 21.9 and 21.10.
b. Any adjustments to inspection frequency as authorized in item 21.9.
c. Date(s) and a description of maintenance conducted as a result of inspection findings, including whether or not an illicit discharge is detected.
d. Schedule(s) for maintenance of structural stormwater BMPs and outfalls when necessary, maintenance cannot be completed within one year of discovery.
e. Stormwater management training events, including general subject matter covered, names and departments of individuals in attendance, and date of each event.

2.25. Streets/Storm Drain – Street Sweeping

Activities and Definition

Pollutants collect on surfaces in between storm events as a result of atmospheric deposition, vehicle emissions, winter road maintenance, construction site debris, trash, road wear and tear, and litter from adjacent lawn maintenance (grass clippings). Sweeping of materials such as sand, salt, leaves and debris from city streets, parking lots and sidewalks prevents them from being washed into storm sewers and surface waters. Timing, frequency and critical area targeting greatly influence the effectiveness of sweeping.

Preparation

a. Prioritize cleaning routes to use at the highest frequency in areas with the highest pollutant loading.
b. Restrict street parking prior to and during sweeping using regulations as necessary.
c. Increase sweeping frequency just before the rainy season, unless sweeping occurs continuously throughout the year.
d. Perform preventative maintenance and services on sweepers to increase and maintain their efficiency.

Process

a. Streets are to be swept as needed or specified by the City; Street maps are used to ensure all streets are swept at a specific interval.
b. Drive street sweeper safely and pick up debris.
c. When full take the sweeper to an approved street sweeper cleaning station.

Clean-up/Follow-up

a. Street sweepers are to be cleaned out in an approved street sweeper cleaning station.
b. Street sweeping cleaning stations shall separate the solids from the liquids.

c. Once solids have dried out, haul them to the local landfill.
d. Decant water is to be collected and routed to an approved wastewater collection system area only.
e. Haul all dumped material to the landfill.

Documentation

a. Keep accurate logs to track streets swept and streets still requiring sweeping.
b. Log the quantities of debris collected and hauled off.

2.26. Streets/Storm Drain – Transporting Soil and Gravel

Activities and Definition

Transportation of materials should be handled with pre-planning and contingency planning.

Preparation

a. Dry out wet materials before transporting.
b. Spray down dusty materials to keep them from blowing.
c. Make sure the City of Stillwater knows and understand the SWPPP requirements for the site the City will be working at.
d. Determine the location so that the truck and other equipment will be cleaned afterwards.

Process

a. Use a stabilized construction entrance to access or leave the site where materials are being transported to/from.
b. Cover truck bed with a secured tarp before transporting.
c. Follow the SWPPP requirements for the specific site to /from which the materials are being hauled.
d. Make sure not to overfill materials when loading trucks.

Clean-up/Follow-up

a. Use sweeper to clean up any materials tracked out on the roads from site.
b. Washout truck and other equipment when needed in properly designated area.

Documentation

a. Keep records of any material that is tracked out of site and what was done to clean it up and how long it took to clean up and what the weather conditions were at the time.

2.27. Vehicles – Fueling

Activities and Definition

Fueling of equipment and vehicles should always occur in designated areas when possible. Spill prevention and planning should occur before any fueling takes place.

Preparation

a. Train employees on proper fueling methods and spill cleanup techniques.
b. Install a canopy or roof over aboveground storage tanks and fuel transfer areas.
c. Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on mobile fueling vehicles and shall be disposed of properly after use.

Process

a. Shut off the engine.
b. Ensure that the fuel is the proper type of fuel for the vehicle.
c. Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut off to prevent overfill.
d. Fuel vehicle carefully to minimize drips to the ground.
e. Fuel tanks shall not be topped off.
f. Mobile fueling shall be minimized. Whenever practical vehicles and equipment shall be transported to the designated fueling area in the Facilities area.
g. When fueling small equipment from portable containers, fuel in an area away from stormdrains and water bodies.

Clean-up/Follow-up

a. Immediately clean up spills using dry absorbent (e.g. kitty litter, sawdust, etc.) sweep up absorbent material and properly dispose of contaminated clean up materials.
b. Large spills shall be contained as best as possible and the Duty officer and Hazmat team should be notified as soon as possible.

Documentation

a. Comply with underground storage tank records and monitoring requirements.
b. Document training of employees.

2.28. Vehicles – Vehicle and Equipment Storage

Activities and Definition

When hazardous material comes into contact with rain or snow, the pollutants are washed into the storm sewer system and, ultimately, to surface water bodies and/or ground water. Hazardous materials have negative impacts on fish habitat, ground water drinking water sources, and recreational uses.

Preparation

a. Inspect parking areas for stains/leaks on a regular basis.
b. Provide drip pans or absorbents for leaking vehicles.

Process

a. Whenever possible, store vehicles inside where floor drains have been connected to sanitary sewer systems.
b. When inside storage is not available, Vehicles and equipment will be parked in the approved designated areas.
c. Maintain vehicles to prevent leaks as much as possible.
d. Address any known leaks or drips as soon as possible. When a leak is detected a drip pan will be placed under the leaking vehicle.
e. The shop will provide a labeled location to empty and store drip pans.
f. Clean up all spills using dry methods.
g. Never store leaking vehicles over a storm drain.

Clean-up/Follow-up

a. Any leaks that are spilled on the asphalt will be cleaned up with dry absorbent; the dry absorbent will be swept up and disposed of in the garbage.
b. The paved surfaces around the building will be swept every two weeks, weather permitting.

Documentation

a. N/A

2.29. Vehicles – Washing

Activities and Definition

MS4 vehicle washing involves the removal of dust and dirt from the exterior of trucks, boats and other vehicles, as well as the cleaning of cargo areas and engines and other mechanical parts. Washing of vehicles and equipment generates oil, grease, sediment and metals in the wash water as well as degreasing solvents, cleaning solutions and detergents used in the cleaning operations.

Preparation

a. Provide wash areas for small vehicles inside the maintenance building that has a drain system which is attached to the sanitary sewer system.
b. Provide wash areas for large vehicles on an approved outside wash pad that has a drain system which is attached to the sanitary sewer system.
c. No vehicle washing will be done where the drain system is connected to the storm sewer system.

Process

a. Minimize water and soap use when washing vehicles inside the shop building.
b. Soap should not be used when washing vehicles outside the shop building.
c. Use hoses with automatic shut off nozzles to minimize water usage.
d. When washing outside the building, it is the operator's responsibility to make sure all wash water is contained on the wash pad and does not have access to the storm drain.
e. Never wash vehicles over a storm drain.

Clean-up/Follow-up

a. Sweep wash areas after every washing to collect what solids can be collected to prevent them from washing down the drain system.
b. Clean solids from the settling pits on an as needed basis.

Documentation

a. N/A

2.30. Water – Planned Waterline Excavation Repair/Replacement

Activities and Definition

Waterline Excavation and repair of an MS4 system can potentially involve activities that could affect the health of the MS4 system. Planning is critical.

Preparation

a. Determine where discharge flow will go.
b. Place inlet protection at nearest downstream storm drain inlets.
c. Clean gutters leading to inlets.
d. Isolate waterline to be worked on.
e. Neutralize any chlorine residual before discharging water.

Process

a. Make efforts to keep water from pipeline from entering the excavation.
b. Direct any discharge to pre-determined area.
c. Backfill and compact excavation.
d. Haul of excavated material or stockpile nearby.

Clean-up/Follow-up

a. Clear gutter /waterway where water flowed.
b. Clean up all areas around excavation.
c. Clean up travel path of trucked material.

Documentation

a. Complete paperwork.

2.31. Water – Unplanned Waterline Excavation Repair/Replacement

Activities and Definition

Waterline Excavation and repair of an MS4 system can potentially involve activities that could affect the health of the MS4 system. Unplanned excavations can be additionally tricky and pre-planning is critical.

Preparation

a. Make sure service trucks have wattles, gravel bags, or other materials for inlet protection.

Process

a. Slow the discharge.
b. Inspect the flow path of discharge water.
c. Protect water inlet areas.
d. Follow planned repair procedures.
e. Haul off spoils of excavation.
f. Consider the use of silt filter bags on pumps.

Clean-up/Follow-up

a. Repair eroded areas as needed.
b. Follow planned repair procedures.
c. Clean up the travel path of trucked excavated material.

Documentation

a. Complete paperwork.

2.32. Water – Transporting Dry Excavated Materials and Spoils

Activities and Definition

Transportation of materials should be handled with pre-planning and contingency planning.

Preparation

a. Utilize truck with proper containment of materials.
b. Determine disposal site of excavated materials.

Process

a. Load
b. Check truck after loading for possible spillage.
c. Transport in manner to eliminate spillage and tracking.
d. Utilize one route for transporting.

Clean-up/Follow-up

a. Clean loading area.
b. Clean transporting route.
c. Wash off truck and other equipment in a designated equipment cleaning area.

Documentation

a. Complete paperwork.

2.33. Water – Transporting Wet Excavated Materials & Spoils

Activities and Definition

Transportation of materials should be handled with pre-planning and contingency planning.

Preparation

a. Utilize truck with containment for material.
b. Determine disposal site of excavated material.

Process

a. Load and Transport in manner to minimize spillage & tracking of material.
b. Check truck for spillage.
c. Utilize one route of transport.

Clean-up/Follow-up

a. Clean route of transport to provide cleaning of any spilled material.
b. Washout equipment truck and other equipment in designated wash area.

Documentation

a. Complete paperwork.

2.34. Water – Waterline Flushing for Routine Maintenance

Activities and Definition

Flushing is a process that rapidly removes water from the City's water piping system. Flushing uses water force to scour out materials that accumulate in the city's pipes. Water pipes are usually flushed by opening fire hydrants, where the discharged water flows off the streets the same as rainwater.

Preparation

a. Determine flow path of discharge to inlet of waterway.
b. Determine chlorine residual.
c. Neutralize chlorine residual.

Process

a. Clean flow path.
b. Protect inlet structures.
c. Use diffuser to dissipate pressure to reduce erosion possibilities.

Clean-up/Follow-up

a. Clean flow path.
b. Remove inlet protection.

Documentation

a. Residual tests of discharge water.

b. Complete paperwork.

2.35. Water – Waterline Flushing after Construction/System Disinfection with Discharge to Storm Drain.

Activities and Definition

Flushing is a process that rapidly removes water from the City's water piping system. Flushing uses water force to scour out materials that accumulate in the City's pipes. Water pipes are usually flushed by opening fire hydrants, where the discharged water flows off the streets the same as rainwater.

Preparation

a. Determine chlorine content of discharge water and select de-chlorination equipment to be used.
b. Determine flow path of discharge.

Process

a. Protect inlets in flow path.
b. Install de-chlorination equipment.
c. Sweep and clean flow path.
d. Use diffuser to reduce velocities.

Clean-up/Follow-up

a. Pick up inlet protection.
b. Clean flow paths.
c. Remove equipment from flush point.

Documentation

a. Residual tests of discharge water.
b. Complete paperwork.

2.36. Water – Chemical Handling/Transporting and Spill Release

Activities and Definition

Hotspot facilities are facilities that produce higher levels of stormwater pollutants and/or present a higher potential risk for spills, leaks or illicit discharges. Hazardous material storage and handling is of particular concern in these areas.

Preparation

a. Understand MSDS sheets for handling of product.
b. Determine proper place of handling.
c. Have necessary containment and spill kits at handling place.

Process

a. Begin transfer process.
b. Discontinue operations if a spill level occurs.
c. Disconnect and store handling equipment.

Clean-up/Follow-up

a. Clean up spills with proper material.
b. Dispose of contaminated material at an appropriate facility.

Documentation

a. Report spills to duty officer.
b. Complete paperwork.

The City of Stillwater shall conduct an annual assessment of the operations and maintenance program to evaluate program compliance, the status of achieving the measurable requirements (activities that must be documented or tracked as applicable to the MCM (e.g., inventory, trainings, inspections, maintenance activities, etc.)) in Section 21, and determine how the program might be improved. The City must perform the annual assessment prior to completion of each annual report and document any modifications made to the program as a result of the annual assessment.

Appendix A: Inventory Form

City of Stillwater Facility Inventory					
ID	**Name**	**Address**	**POC Present?**	**X Coord**	**Y Coord**
1	Stillwater Town Hall	8380 Kimbro Ave	N	45.070312	-92.893964
2	Ball Field	8380 Kimbro Ave	N	45.070833	-92.895507

Appendix B

City of Stillwater
Pond & Structural Stormwater BMP Inspection Form

Pond ID:	**Completed By:**
Address/Nearby Landmark:	**Signature:**
Date:	**Late Rain Date:** **Amount:** (inches)
Facility Type: ☐ Pond ☐ Structural Stormwater BMP: _____	

Illicit Discharge Evaluation				
Activities	**Yes√**	**No √**	**NA √**	**Comments**
Odor to discharge?				
Color to discharge?				
Floatables in discharge (ex: trash)?				
Stains/Deposits in or on structure?				
Additional Comments:				

Functional Evaluation **(0 – acceptable, 1 – item needs maintenance, 2 – immediate repair)**	
Overall Stabilization Condition	RATE: 0 / 1 / 2
Overall Structural Condition	RATE: 0 / 1 / 2
Flow Description (at time of inspection)	☐ NONE ☐ TRICKLE ☐MODERATE ☐SUBSTANTIAL
Approximate Depth of Flow	DEPTH:_____(inches)
Visible Sediment Delta Forming?	☐ YES ☐NO
Amount of Sediment Build-up	RATE: 0 / 1 / 2
Additional Comments:	

Erosion				
Activities	**Yes√**	**No √**	**NA √**	**Comments**
Is vegetation on side slopes failing?				
Any signs of erosion?				
Additional Comments:				

Inflow/Outflow Structures				
Activities	**Yes√**	**No √**	**NA √**	**Comments**
Any signs of erosion?				
Any signs of structure settling?				
Any signs of physical damage?				
Any signs of accumulated sediment in the inlet/outlet?				
Any signs of accumulated debris, trash, etc.				
If *YES* to any of the above, schedule for maintenance.				
Any debris present?				
If *YES*, remove debris or schedule for maintenance.				
Additional Comments:				

Appendix C: Pond Inventory Form

MS4 Pond, Wetland, and Lake Inventory Form

Municipal Separate Storm Sewer System (MS4) Program

Doc Type: Plans/Specifications/Maps

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Stillwater	3/23/2022	Pond 1	Constructed Pond		45.0554	-92.8634
City of Stillwater	3/23/2022	Pond 2	Constructed Pond		45.123323	-92.89315
City of Stillwater	3/23/2022	Unnamed Wetland	Wetland		45.11817	-92.959734
City of Stillwater	3/23/2022	Pond 3	Constructed Pond		45.119016	-92.958256
City of Stillwater	3/23/2022	Pond 4	Constructed Pond		45.117809	-92.958993
City of Stillwater	3/23/2022	Pond 5	Constructed Pond		45.03677	-92.93572

Appendix D
Managing Stormwater Sediment
Best Management Practices Guidance

Minnesota Pollution Control Agency

May 2017

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Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 |

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This report is available in alternative formats upon request, and online at www.pca.state.mn.us.

Document number: wq-strm4-16

Contents

Stormwater sediment best management practices

This document provides guidance for stormwater collection and conveyance systems, which have been designed, constructed, operated, and maintained for the purpose of providing treatment of stormwater.

Revisions since June of 2015

- Land use category definitions have been revised.
- Minor changes have been made to the "Stormwater Sediment Spreadsheet" to make the spreadsheet easier to use when calculating benzo[a]pyrene (B[a]P) equivalents and comparing contaminant concentrations in stormwater sediment to soil reference values.
- Sediment sampling is required regardless of the volume of sediment to be excavated.
- Minor changes have been made to the section "Determination of excavated soil as regulated solid waste".
- General information about hydraulic dredging has been added.

Stormwater collection and conveyance systems help protect infrastructure from flooding and they collect and concentrate pollutants to prevent them from reaching lakes, rivers, streams, wetlands, and other waters of the state where they could have a negative effect on water quality, aquatic animals, or human health. Managing contamination and pollutants in stormwater collection and conveyance systems should be expected and sampling is required prior to disposal, or beneficial use (e.g. fill, topsoil, or compost) to determine proper management.

This guidance document will help you think through important steps associated with sediment removal projects. These may include:

- Who is responsible for managing stormwater sediment?
- Land use within a drainage area.
- Sampling sediment and what laboratory analysis is required.
- How to calculate BaP equivalents for carcinogenic polycyclic aromatic hydrocarbons (cPAHs).
- Management requirements for contaminated sediment where contaminated stormwater sediments are accepted for disposal.

This document is intended to help those responsible for operation and maintenance of stormwater systems determine when sediment removal is needed, and what steps to consider during the course of managing a sediment removal project. This is guidance. It is not a comprehensive list of everything you may need to do when managing a sediment removal project.

Other considerations may also include:

- Proximity to high value resources or sensitive ecological features
- Landscape variations, and soil types
- Management of native or invasive species
- A wide range of other variables that may be encountered from one municipality to the next, or one project to the next

This guidance was developed with special assistance from the cities of Burnsville, Circle Pines, Maplewood, Roseville, St. Paul, White Bear Lake, and Woodbury, Minnesota.

Background

Action was taken during the 2009 Minnesota Legislative session, which included funding to conduct research on stormwater pond sediment contamination and to help Minnesota cities clean-out

contaminated stormwater ponds. (House File Number 1231 Passed by the Minnesota Legislature on May 18, 2009, and approved by Governor Tim Pawlenty on May 22, 2009.)

Research concluded that polycyclic aromatic hydrocarbons (PAHs) are often responsible for the greatest contamination problems in stormwater pond sediment (Crane et al. 2010). Research conducted on stormwater pond sediments in the Minneapolis-St. Paul, Minnesota metropolitan area showed that PAHs are the primary contaminants of concern affecting disposal decisions (Polta et al. 2006; Crane et al. 2010). PAHs persist in the environment and pose a risk to animals, plants, and people at elevated concentrations. These contaminants are formed by the incomplete combustion of organic materials, such as wood, oil, and coal, as well as occurring naturally in crude oil and coal (Crane et al. 2010).

Coal tar-based sealants are a major source of PAHs in urban sediments where these products are used in the surrounding watershed (Mahler et al. 2012). The Minnesota Pollution Control Agency's (MPCA) research (Crane 2014) determined that coal tar-based sealants were the most important source of PAHs (67.1%), followed by vehicle emissions (cars and trucks) (29.5%) and pine wood combustion (3.4%).

The Legislation also provided funding for municipalities who pass ordinances banning or restricting the use of coal tar-based sealants. Twenty-nine municipalities passed such ordinances before legislation in the spring of 2013 banned coal tar-based sealants state wide effective January 1, 2014 (Minn. Stat. § 116.202).

The 2009 Legislation also directed the MPCA to develop stormwater best management practices (BMPs) to avoid or mitigate impacts of PAH contamination from coal tar-based sealants. The MPCA provides guidance for the operation and maintenance of constructed stormwater collection systems. BMPs can be found in the Minnesota Stormwater Manual at this location http://stormwater.pca.state.mn.us/index.php/Main_Page.

Stormwater collection and conveyance systems are commonly referred to as stormwater ponds, stormwater control devices, wet detention basins, or National Urban Runoff Program (NURP) ponds.

This document provides guidance for sediment removal projects from stormwater ponds that have been designed, constructed, operated and maintained for the purpose of providing treatment of stormwater.

Sediment removal from lakes, rivers, streams, and wetlands may be subject to additional requirements such as a permit from the Minnesota Department of Natural Resources (DNR) to allow work below the ordinary high water level. Permit determinations are guided by DNR hydrologists based on geographical location. A list of DNR hydrologists by area is available on the DNR website at http://files.dnr.state.mn.us/waters/area_hydros.pdf.

Sediment may also be generated in other stormwater collection devices such as rain gardens, infiltration swales, sumps, traps, pipes, and/or other conveyance structures. This guidance may be adapted for other situations to determine representative contaminant concentrations. The analytical component outlined in Appendix A may be applied to other sediment sampling situations, but the MPCA does not have specific sampling guidance at this time for those situations and it is not necessary to follow this guidance for other types of sediment removal projects. The sampling guidance provided in Appendix A is strictly for sampling sediment from stormwater ponds that have been designed, constructed, operated, and maintained for the purpose of providing treatment of stormwater.

Sediment disposal costs

The high cost to manage contaminated stormwater sediment has brought operation and maintenance of stormwater ponds into the public spotlight. Disposal costs for stormwater sediment removal projects with contamination exceeding the industrial soil reference values is regulated as a solid waste and the cost for disposal can be as much as three times more expensive than uncontaminated sediment depending on the type and level of contamination. The high cost to manage contaminated sediment

emphasizes the importance of source control to reduce the loading of contamination into stormwater ponds.

Sediment removal process

Inventory and maintenance needs.

Evaluating and testing sediment.

Engineering, contracting, and work plans.

Excavating sediment.

Site restoration.

Records and documentation to keep on file.

1. Inventory and maintenance needs

Assessing need and planning sediment removal projects includes a number of steps that range from estimating lost capacity to notifying neighbors about plans to maintain the stormwater collection system. For municipalities who are managing dozens, or sometimes hundreds of stormwater ponds, starting with an inventory and a maintenance prioritization process is recommended.

Some municipalities find it helpful to develop a flowchart or other prioritization scheme to triage and track priority sediment removal projects. Topics of importance may include:

- Have priorities been identified by city inspections – sediment level, lost capacity, other needs?
- Accessibility. Does the city already have access via parkland, easement, or outlot? Are there access points for machinery and trucks?
- What are the sediment analysis results? Can the city afford to remove and manage the sediment?
- Is the downstream lake or sub-watershed a priority?
- What is the expected cost/benefit from the project?
- Can a stormwater pond be expanded, or redesigned to provide greater benefit?
- Is surveying needed to assess lost capacity and depth of excavation?
- How will you measure or estimate the volume of sediment to be removed?
- Have sediment deltas and inlet/outlet structures been identified/located?
- Are communications with other stakeholders important/public relations?
- Are visual inspections, notes, checklists, or photos to track maintenance projects needed?

The first phase of work identifies need and determines if a sediment removal project is even necessary. This may include a preliminary survey to gage sediment depth and provide a rough estimate of the number of cubic yards of sediment to be removed. This assessment and planning will help guide work plan development and contracting if a sediment removal project is deemed necessary.

2. Evaluating and testing sediment

Sediment samples are collected and compared to MPCA's Remediation Division soil reference values (SRVs) to determine where excavated sediment may be beneficially used or disposed. This affects work plan development, including contract specifications for bidding projects and is an important part of the management process.

- Guidance for *collecting samples and testing sediment* is summarized in Appendix A.
- Guidance for *comparing contaminant analytical data (concentrations) to SRVs and* calculating *B[a]P equivalents* is summarized in Appendix B.

There are two sets of SRVs based on the following remediation soil land use categories:

Residential land includes lawn surrounding single family housing and newly developed single family residences, multi-family housing, condominiums, playgrounds, sports fields, beaches, produce gardens, long-term care facilities, correctional housing, hospitals, campgrounds, child care centers, churches, schools, wildlife areas, local/state/national forests, and public or private erodible trails.

Industrial land includes lawns, yards, and landscaping that surround hotels, office buildings, retail stores, shopping centers, and restaurants and industrial property, public utility facilities, rail and freight facilities, storage facilities, warehouses, office buildings, and manufacturing facilities.

The analytical results and calculation of B[a]P equivalents are compared to the MPCA's Remediation Divisions SRV values to determine management or treatment options.

Management options include:

Use of excavated sediment as unregulated fill. Contaminant concentrations from the list of analytes, including cPAHs expressed as B[a]P equivalents and any other site-specific contaminants, are all below the Residential SRVs. The excavated sediment is unregulated fill and does not require any special management. Excavated sediment may be reused in accordance with the MPCA's BMPs for the Off-Site Use of Unregulated Fill available at: http://www.pca.state.mn.us/index.php/view-document.html?gid=13503.

Determination of excavated soil as regulated solid waste. One or more of the required list of analytes, including cPAHs expressed as B[a]P equivalents and any other site-specific contaminants, exceed the Residential SRVs but do not exceed the Industrial SRVs. The excavated sediment requires special management and cannot be used as unregulated fill.

Excavated sediment that is not considered unregulated fill is most commonly guided to a solid waste landfill. Depending on the types and concentrations of contaminants, sediment may need to be disposed of at a Municipal Solid Waste (MSW) landfill that has an industrial solid waste management plan; that do accept contaminated soils. This means contaminated sediment must go to a MSW landfill that has a liner and a leachate collection system.

MSW landfills in Minnesota that can accept contaminated sediment are listed at this webpage:

http://www.pca.state.mn.us/veiz806 or, the list can be accessed directly at this link: http://www.pca.state.mn.us/index.php/view-document.html?gid=12806.

Some additional landfills that are permitted to accept industrial waste, and which may also accept contaminated stormwater sediments, include:

1. Voyageur Industrial Landfill in Cannon Falls, Minnesota
2. Vonco II Landfill in Becker, Minnesota
3. Vonco V Landfill in Duluth, Minnesota
4. Shamrock Environmental Landfill in Cloquet, Minnesota
5. Dem-Con Landfill in Shakopee, Minnesota
6. Veolia E S Rolling Hills Landfill in Buffalo, Minnesota
7. SKB Rosemount Industrial Waste Facility in Rosemount, Minnesota

Guidance for analytical data comparing contaminants to SRVs and calculating B[a]P equivalents are summarized in Appendix B. At this time, testing sediment for metals other than copper and arsenic is not required. However, contractors who remove and/or transport sediment, or facilities that beneficially re-use or dispose of sediment may require test results for heavy metal concentrations. This may be an important variable as sediment removal projects are planned and samples are collected and compared. It is recommended that you consult with contractors and contact disposal

or re-use facilities to ensure they will be able to accept your waste and to determine what additional sampling requirements (if any) may be required by the facility.

3. Engineering, contracting, and work plans

Work plan development includes a wide range of logistics including, but not limited to:

- Notification of residents and neighbors.
- How to access the site and what machinery will be needed to remove sediment.
- Define how sediment will be removed, measured, and paid for.
- Testing or analysis requirements for the destination disposal or treatment facility.
- Plans for erosion control.
- Tree removal, environmental impact, depth to ground water, and risks associated with the displacement of wildlife or invasive species.
- Lack of design and/or construction documentation (no "as-built" records).
- Estimating water draw-down needs and the amount of time and oversight needed to drain the stormwater collection system.
- What permits (if any) may be required by your local watershed district, county, or the DNR. The MPCA does not require a permit or notification for routine maintenance of stormwater ponds. Cities are advised to keep records and documentation of their sediment removal projects as outlined in this guidance and as required by the Municipal Separate Storm Sewer Systems (MS4) Permit. A permit from the MPCA is required if projects will disturb one or more acres upland. Projects disturbing one or more acres upland are required to have a Construction Stormwater Permit.
- Defining appropriate BMPs for dewatering (e.g., rock riprap, sand bags, plastic sheeting, or other accepted energy dissipation measures), such that the discharge does not adversely affect the receiving water or downstream landowners.
- Ensuring that water from pumping or draw-down activities is discharged in a manner that does not cause nuisance conditions, erosion in receiving channels, or erosion on down-slope properties. This also includes inundation of wetlands causing significant and/or adverse impact. The general rule of thumb is "keep it clear".
- How sediment will be transported and a process to track the volume of sediment removed.
- Defining logistics, administrative, and engineering requirements, surveys, dewatering processes, site access and easements, rock entrance and off-site tracking needs, coordination with adjacent cities, and/or watershed districts and the Minnesota Department of Transportation.

4. Excavating sediment

Sediment excavation projects can take place during the winter or summer.

Benefits to sediment removal projects in the winter include:

- Winter excavations greatly reduce the risk that rain may cause flooding and erosion of dewatered ponds, or turbid runoff conditions.
- Access with trucks and heavy machinery is easier in the winter when soil surrounding stormwater ponds freezes solid.
- Adjacent residents and neighbors have windows closed and this means less noise, less dust, less odor, and fewer disturbances overall.
- Water can be pumped down so remaining water can freeze solid. Pumping should be discontinued before the bottom of the pond is disturbed and sediment is stirred up making the water turbid. Remaining water should be allowed to freeze solid trapping any suspended sediment in ice. The ice can then be skimmed off with a bulldozer so it can be piled within the pond. This keeps turbid water in the basin after snow and ice melt during spring thaw.

Winter excavation projects also have a few drawbacks. They include:

- Shorter working days
- Problems associated with working in freezing conditions and sub-zero weather
- The use of lights after dark to extend the work day

Sediment removal can begin once snow and ice have been skimmed off and piled within the pond. Once sediment is removed, final grading should achieve a natural (gradual) slope for all banks. Ice and snow that has been stockpiled in the pond should be evenly distributed throughout the basin once sediment has been removed. This will allow water and remaining sediment to be retained in the pond. Temporary stabilization of slopes and banks should ensure control of erosion and prevent site run-off during spring snowmelt and the first rain events of the season. Cleanup and removal of temporary infrastructure should be done working your way out of the site. Once equipment and temporary infrastructure (such as transport roads and rock entrances) is removed, it will be cost prohibitive and essentially impossible to make additional corrections.

Summer excavations include the risk of unexpected rainfall events that can complicate a conventional sediment removal project and sometimes delay the project for days and increase the risk to receiving waters down-stream. Small projects (less than one acre) may be completed in one day or less and risks associated with unexpected rainfall events can be minimized or avoided altogether. Small projects do not require a permit, but safeguards and best management practices are still required to ensure negative down-stream impacts to receiving waters are prevented. Large projects that will disturb one or more acres upland are required to have a Construction Stormwater Permit to ensure BMPs are implemented as the scale of the project and potential risks to receiving waters increase.

One method of sediment removal that can be used during the summer months is called hydraulic dredging. This process utilizes a watercraft or floating dredging device with a large centrifugal pump to remove sediment. Saturated mud and sand (often referred to as muck) is removed from the stormwater pond and discharged into a large filter bag (or series of bags) upland. This process may allow sediment to be pumped hundreds and sometimes thousands of feet away from the pond depending on site conditions. Water that drains from the filter bag is channeled to a secondary treatment system with a flocculent that provides additional filtration before the water is returned to the stormwater pond. Benefits to hydraulic dredging include:

- Allows work to be performed during warm weather conditions.
- May be better suited for sites that are difficult to access with large trucks or large machinery.
- In many cases, it will result in less disturbance for neighbors as the dredging operation is generally more quiet than operating various types of heavy machinery.
- Impacts to reptiles (turtles) and amphibians (frogs) may be less as they are not hibernating in the sediment and are able to move away from the slow moving dredge.
- Filter bags and treatment of the water that drains from them reduce fugitive dust and provide a secure way to store sediment while the sediment dries out.
- No need to bypass flows in the watershed, which can be difficult if the watershed draining to the pond is large.
- Hydraulic dredging can take place even when there are significant groundwater inputs to the pond.
- Scheduling and costs are typically more predictable and are not likely to vary as they might with conventional excavation methods.
- Hydraulic dredging has a longer working season. Sediment removals via hydraulic dredging can be performed roughly eight months of the year depending on site conditions and seasonal variations from year to year.
- Hydraulic dredging projects are not impacted by rainfall and can continue operations during rainfall if desired.

Hydraulic dredging projects also have a few drawbacks. They include:

- Segregating specific areas of the pond by contaminate levels may be difficult or impossible.
- The necessary area needed for dewatering and storage may not be available depending on the specific site.
- In drought, years there may be too little water in the pond to effectively float and propel the dredge.
- Projects are typically more expensive than conventional excavation methods.
- Sediment pumped to filter bags must be handled a second time when the bags are opened and sediment is loaded into trucks for transportation off site.
- Grinding or mulching dense vegetation can be a messy and difficult process when large amounts of woody debris (logs, stumps) are encountered. Dense vegetation can slow down the dredging process and it may also increase time and cost.

Regardless of method, survey work is usually conducted to better estimate the amount of sediment to be removed and to identify the depths of excavation in order to restore desired capacity. If the removal volume is not defined by surveying then establishing a standard volume per truck and calculating the volume based on truck loads leaving the site can be used to track the volume in cubic yards.

Excavating or removing sediment from stormwater collection systems requires care to prevent turbid water and pollutants from impacting down-stream waters such as wetlands, streams, rivers, or lakes. This is just as true for winter sediment removal projects as it is for projects conducted during the summer months.

5. Site restoration and erosion control

Site restoration work should be conducted as soon as weather conditions permit and may include:

- Additional cleanup or maintenance of inlet and outlet structures.
- Additional site stabilization work including sediment and erosion control.
- Establishing plants, seed, sod, mulch, or vegetation to prevent erosion (above water line).

- Professional engineer sign-off on project completion.

Erosion control (temporary and permanent) are typically incorporated into plans and specifications for stormwater sediment removal projects. Permanent erosion-control features may include provisions for:

- Vegetative buffer strips around the pond.
- Design of grassed waterways and overflow channels.
- Armoring of spillways and banks, or other features needed to prevent erosion for the life cycle of the stormwater collection and conveyance system.

Temporary erosion control features may include provisions such as mulch, tackifiers, or erosion control blankets to prevent erosion until seeding takes root and vegetation becomes established. Erosion of banks, side slopes, safety benches, spillways, outfalls, channels, and adjacent upland areas disturbed by machinery are all priority areas during site restoration. These areas should be stabilized as quickly as possible to prevent erosion.

Areas susceptible to erosion should be inspected frequently following a sediment removal project. If erosion occurs, the eroded areas should be restored as quickly as possible. If erosion persists, action must be taken immediately to protect downstream receiving wasters with permanent erosion control. Permanent features may include:

- Bioengineering strategies
- Turf reinforcement mats
- Vegetated-concrete-block-armoring
- Properly sized riprap and filter materials

Vegetated buffer strips (25 feet or more) are recommended to surround the stormwater pond (whenever possible) to prevent erosion from the pond's immediate tributary. Establishing vegetation not only helps maintain the integrity of the pond, it also helps with the ponds overall appearance. Establishing vegetation is important, but care should be taken to prevent trees, shrubs, or brush from growing within 15 feet of the toe of the embankment, or 25 feet from the inlet and outlet structures. Roots can damage pipes and other infrastructure, but trees and shrubs can also clog inlets and outlets and prevent the stormwater pond from functioning properly.

6. Records and documentation to keep on file

It is important to keep good records about the operation and maintenance of stormwater collection systems. Good records will not only assist with an accurate inventory and triage of stormwater ponds, but they can also provide the basis for sound planning in the future. Important records and documentation for sediment removal projects may include:

- Inspection dates and frequency of inspections **(Required by MS4 Permit)**
- Description of maintenance and dates performed **(Required by MS4 Permit)**
- The unique ID# of the pond **(Required by MS4 Permit)**
- Employee training records **(Required by MS4 Permit)**
- Volume of sediment removed in cubic yards **(Required by MS4 Permit)**
- Evaluation, testing, and/or laboratory results **(Required by MS4 Permit)**
- Place of disposition/disposal **(Required by MS4 Permit)**
- "As Built" prints or plans if they exist
- The name and geographical location of the pond with reference to nearest cross roads
- Contractor information, shipping papers/manifests/contractual agreements
- Any other observations about the sediment removal, or work performed, that will help the city operate and maintain that site in the future

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Appendix A: Sediment sampling and analytical technical guidance

This technical guidance should be shared with staff or environmental consultants responsible for sampling sediments and interpreting the analytical results for the owner or responsible party. It is the responsibility of the owner or responsible party to either train their staff or select consultants who can perform these tasks.

Sediment sampling

The U.S. Environmental Protection Agency's (EPAs) report on "Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual" (EPA 2001) provides guidance on sediment monitoring plans, collection of whole sediments, field sample processing, transport and storage of sediments, sediment manipulations, and quality assurance/quality control (QA/QC) issues. This report should be used as a resource by owners or responsible parties, and their consultants, for sampling and processing stormwater pond sediments. In particular, this user-friendly document provides pictures of sediment sampling equipment, flowcharts for making decisions, checklists, and boxes of important bulleted items.

Sediment characterization

Stormwater pond sediments are very complex, and chemical results can vary greatly within a few yards of each sample. This feature makes it more difficult to provide generic guidance for a broad suite of stormwater ponds. Stormwater ponds also vary in size and shape, and some ponds have multiple inlets and outlets. Finally, the type of land uses in the drainage areas of the ponds can influence contaminant concentrations in the pond sediments.

Based on the MPCA's 2009 stormwater pond study (Crane 2014), coal tar-based sealant sources comprised 67.1% of total PAHs in surface sediments of ponds located primarily in residential, commercial, and industrial land use areas. Higher concentrations of PAHs will occur in stormwater pond sediments in watersheds where coal tar-based sealants are used on driveways and parking lots than in watersheds where either asphalt-based sealants (which have much lower concentrations of PAHs), no sealant, or other material such as concrete, permeable pavers, or gravel are used for driveways and parking lots. Even though a statewide ban on coal tar-based sealants went into effect January 1, 2014 in Minnesota, abraded coal tar-based sealant particles from existing driveways and parking lots will continue to wash off into stormwater collection and conveyance systems for years to come. As these parking lots and driveways are sealed with asphalt-based sealants in the future, and with the elimination of new applications of coal tar-based sealants, concentrations of PAHs in sediment deposits are expected to decrease over time.

The MPCA requires owners or responsible parties to sample sediments prior to disposal to determine concentrations of 17 cPAHs, 10 noncarcinogenic PAHs, and the metals arsenic and copper. A list of the specific cPAHs and noncarcinogenic PAHs can be found in MPCA's "Summary of Stormwater Pond Sediment Testing Results" spreadsheet available on MPCA's website MS4 stormwater web page at: http://www.pca.state.mn.us/sbiza7c. Click on the "Permit" tab and scroll down to the bottom under the "Additional Items" heading. It is the responsibility of the owner or responsible party to evaluate the drainage area of each stormwater collection system to determine whether spills, improper disposal, or the potential for a release from commercial or industrial operations indicate that sampling for other contaminants is needed. For example, if sediment is being removed from a pond in an industrial park and there has been a release of contaminants known to accumulate in sediments (example, nickel from a metal plating facility), the owner or responsible party should include those contaminants on the list for sampling.

Analysis of sediment samples for particle size and total organic carbon (TOC) is optional, but this information may be useful for some beneficial reuse scenarios of the excavated sediment.

The analytical laboratory will provide guidance on the mass of sediment needed for each analysis. Field sampling should be conducted early in the process to provide timely assessments of management options. Sediment sampling for required analytical parameters must be conducted regardless of the volume of sediment to be excavated from the pond.

General guidance for characterizing sediment is as follows:

- **Sampling depth:** Sampling should be to the planned depth of excavation or greater. The MPCA has provided previous guidance to collect sediment samples in two foot intervals (e.g., 0 – 2 ft, 2 - 4 ft), but it is the responsibility of the owner or responsible party to collect sediment samples that will cover the depth to be dredged. If field sample collection is simpler over two-foot depth intervals, then by all means continue to do this. The important issue is to submit a sediment sample to the analytical laboratory that is representative of the entire depth interval to be excavated. Since collecting sediment from two or more long (2 ft) cores may entail a large mass of sediment, it may be easier to slice the core from top to bottom and only analyze half of the slice; this slice can be combined with a deeper layer slice to provide one composite sample for the analytical laboratory to analyze. It is not acceptable to randomly scoop out bits of sediment from different portions of the sediment core to composite together since doing so may miss out on the historical record of sediments (and contaminants) deposited in different depth intervals.
- **Sampling equipment:** Core samplers are more appropriate to use to obtain cohesive sediment samples at a depth than grab samplers. Grab samplers can be used to collect surface samples if the sediment samples are too floccy (loose) with vegetative detritus (e.g., parts of cattail stalks/leaves) or are too sandy to be retained in a core sampler.
- **Sampling location data:** Geopositional (GPS) coordinates need to be collected at the location of each sample site.
- **Sample number and design:** The number of samples to be collected depends on the surface area of the pond and/or the area of planned dredging. [Note: this is a change in policy from previous MPCA guidance (Stollenwerk et al. 2011) that recommended the number of samples per the estimated volume of dredge material.]
    - The goal is to collect sediment samples that are representative of the material that will be removed to maintain the functionality of the stormwater pond.
    - Multiple samples need to be collected, particularly since some compounds may not be detected in all areas of the pond.
- **Dredging area - one acre or less:** For planned sediment removal within stormwater ponds or portions thereof with a surface area less than or equal to one acre, at least two locations (sites) need to be sampled for chemical analysis. Sample sites may be selected randomly or in a transect from the main inlet to the outlet of the pond. When sediment removal is targeted only for a certain location(s) within a pond (e.g., a sediment delta near an inlet), sample sites should be selected in the same manner except that the candidate areas for site selection should be defined by boundaries of the targeted area rather than the entire pond.
- **Dredging area - one to four acres:** For planned sediment removal within stormwater ponds or portions thereof having a surface area between one and four acres, one sampling site should be located in each acre and portion of an acre of the pond. In some cases, multiple samples may need to be collected at the same site and composited together to provide an adequate mass of sediment for the analytical work. Sample sites may either be selected randomly or in a transect from the main inlet to the outlet of the pond. When sediment removal is targeted only for a certain location(s) within a pond (e.g., a sediment delta near an inlet), sample sites should be

selected in the same manner except that the candidate areas for site selection should be defined by boundaries of the targeted area rather than the entire pond.

- **Dredging area – greater than four acres:** For planned sediment removal within stormwater ponds or portions thereof that are larger than four acres, divide the area into four sections (quadrants) as shown in Figure A-1. Select at least five sites (i.e., subsamples) within each quadrant using either the dice pattern shown in Figure A-1 or using a random sampling strategy. Sediment from each subsample needs to homogenized (mixed well) in a precleaned container (large 4 L Pyrex mixing cups work well; larger volumes can use precleaned buckets). For a given quadrant, an equal aliquot of sediment from each associated subsample is then composited together to form the sediment sample for that quadrant that is submitted to the analytical laboratory. When sediment removal is targeted only for a certain location(s) within a pond (e.g., a sediment delta near an inlet), sample sites should be selected in the same manner except that the candidate areas for site selection should be defined by boundaries of the targeted area rather than the entire pond.
- **Dredging area – greater than four acres, irregularly shaped:** For natural ponds larger than four acres that have an irregular shape, such as bays off the main pond, each bay should be sampled if it is targeted for dredging. Depending on the size of the bay, use the aforementioned guidance for developing a sampling plan.
- **Field replicate samples:** To provide a measure of field precision, collect one field replicate sample for every 10 samples or less collected for analysis (i.e., 10% of samples should be collected in replicate). The goal of a replicate is to be as similar in space and time as one of your "primary" samples. Select the sample(s) to be replicated. One can generate a field replicate with surplus sediment from the cores/samples already collected for that sample, provided sufficient sediment remains. To create a replicate, repeat exactly the same procedures that were used to generated the selected sample, as near in time as possible to the primary sample (i.e., sample/subsample the same cores, masses, locations, and/or necessary processing steps). Adherence to the same procedures and timeline will enhance your analytical precision and results.
- **Sample collection, handling and processing (prior to submittal to laboratory) practices:**
  - Remove any rocks, pebbles, trash, large invertebrates (like beetles), or large pieces of detritus from each subsample and composite sample.
  - Overlying water needs to be decanted from the subsamples.
  - Composite sediment samples in the field prior to splitting into the sample jars.
  - Sediment samples from stormwater ponds can vary in their consistency. Some samples may be loose ("soupy") if they contain much cattail or wetland plant detritus. In these cases, collect/subsample extra sediment to ensure the laboratory will have enough mass of sediment to conduct their analyses.
  - **Sample homogenization and splitting:** Sediment samples should be homogenized (mixed well) before splitting the sample into pre-cleaned jars for the PAH and metals analyses.
  - **Sample labeling and laboratory bottles:** The laboratory will provide pre-cleaned sample jars and labels for clients, including separate containers for PAHs, metals, and in some cases percent moisture analysis. Use a permanent marker to fill out the sample label. It is often helpful to pre-label your bottles (before adding sample) both to avoid confusion and the difficulty of attaching labels to wet surfaces. It is also helpful to wrap clear packing tape around the label to secure it on the jar because labels may easily come loose while on ice in coolers during transport.
  - **Sample percent moisture analysis:** Laboratories measure the percent moisture in the samples to convert the results to dry weight measurements. This may be billed as a separate

procedure. In some cases, the laboratory will provide a separate sampling container for percent moisture analysis.

- **Sample transport, storage, and tracking:** Store the sediment samples on ice in a cooler during field sampling. Sample tracking forms or chain-of-custody forms must be used during field sampling to record observations about the sediment samples and to provide field sampling information (e.g., sample station, date, time, sampling equipment, analyses to be done). Most analytical laboratories will provide their clients with chain-of-custody forms.

Submit samples to analytical laboratories

At the end of each field sampling day, either transfer the samples directly to the analytical laboratory, which is preferred, or store them in an interim refrigerator or freezer (depending on the specifications of the laboratory) prior to submittal. Some laboratories may provide a courier pick-up service. When out-of-town laboratories are used, ship the samples on ice in sturdy coolers using an overnight courier; also use packing peanuts and consider wrapping each jar in bubble wrap.

The analytical laboratories will provide guidance on the holding times for samples based on the analytical parameter. Sediment samples can usually be frozen to extend the holding time, but care must be taken to only fill the sample jars two-thirds full to allow room for expansion while the sediment freezes.

To increase the success of the analytical work, follow these steps prior to submitting the sediment samples:

- **Remove excess water:** Even with decanting overlying water during field sampling, the sample jars may contain a layer of water over the sediment. This water needs to be removed prior to analysis. Either the field sampler (if the samples are stored overnight at an interim facility) or the analytical laboratory needs to remove this overlying water. Laboratory staff will not automatically do this step, and the client needs to specify if they want this accomplished. Use of a pre-cleaned, wide-bore pipette to remove overlying water is better than decanting the sample since it will not disturb the sediment as much in the jar. If the laboratory receives sediment samples that have a high water content, then there may not be enough mass of sediment available to do their analyses.
- **Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis:** To assess analyte recovery and precision, request/confirm that the laboratory will spike and analyze one Matrix Spike and one Matrix Spike Duplicate per 20 samples or less, as is usual standard practice. For the MS/MSD spike and recovery assessment, it is desirable to use "average" samples – e.g., samples that are not too clean or sandy but also not too dirty or full of organic matter. Provide guidance to the laboratory on which samples may meet this criterion, if possible. Otherwise, instruct the laboratory to use their best judgment or to randomly select sample(s) from those submitted to include in this assessment. *Note: if your budget allows, it is best to conduct an MS/MSD spike assessment for each pond being sampled, even if this means assessing more than the typical one-per-20 samples.*
- **Sample tracking/chain of custody:** Provide a copy of the sample tracking or chain of custody form to the analytical laboratory when the samples are submitted or shipped to them.

Considerations in Selecting an Analytical Laboratory:

Cooperative Purchasing Venture (CPV) program: Municipalities can access laboratory services through the Minnesota Department of Administration Cooperative Purchasing Venture (CPV) program. There is no charge to sign-up, and the CPV program is open to all municipalities. The CPV program allows municipalities to obtain laboratory services through state-negotiated contract prices. Municipalities who are not currently CPV members, but would like to become one, may sign-up for this program at the Minnesota Department of Administration's website at: http://www.mmd.admin.state.mn.us/cpv2.htm. The Minnesota Department of Administration's website contains a comprehensive list of state-negotiated contracts. The following contract is specific to sampling and laboratory analysis:

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Laboratories that will perform sample cleanup procedures: It is often necessary to reduce matrix interferences for sediment analysis. Typically, a sample cleanup or dilution step will be performed by the laboratory for this purpose. MPCA's position is that sample cleanup is the far better option for municipalities. Laboratories that do offer cleanup typically charge a small fee (a small fraction of the cost of PAH analysis). But in comparison with dilution, sample cleanup will result in better precision, lower reporting limits, and a concomitantly reduced risk of misclassifying sediments as Tier 2 or 3 dredge material. The extra cost for sample cleanup is miniscule in comparison to the potential, unnecessary cost of misclassification and unnecessary disposal at a landfill approved for contaminated sediments. MPCA recommends that responsible parties request that their laboratory provide this service, if not currently offered. Upon request, MPCA will provide references to laboratories that will perform cleanup.

Analytical methods

The primary analytical methods are provided below:

The extended list of PAHs (Table A-1), including 17 cPAHs and noncarcinogenic PAHs, must be analyzed based on the most recent final version of EPA SW-846 Method 8270 by gas chromatography/mass spectrometry (GC/MS) with selective ion monitoring (SIM) as an option.

- Analysis of stormwater pond sediment extracts will often result in compound or matrix interference that can affect analytical accuracy and precision. MPCA recommends sample extract cleanup instead of dilution (see above "Considerations in Selecting an Analytical Laboratory").
  - An example of a cleanup procedure to isolate the hydrocarbon fraction is to pass the sample extract through an alumina and/or silica gel.
  - Refer to the most recent final versions of EPA SW-846 Method 8270 and Method 3600 for guidance on appropriate cleanup techniques.
  - When sample extracts are subjected to cleanup procedures, the associated batch quality control samples, i.e., method blank, laboratory control sample (LCS), MS/MSD, etc., must also be subjected to the same cleanup procedures.
- The analytical laboratory must be asked to report PAHs that are in-between the method detection limit and the reporting limit and to qualify results as estimated.
- Metals should be analyzed by either inductively coupled plasma-optical emission spectrometry (ICP) or inductively coupled plasma—mass spectrometry (ICP—MS) using the most recent final version of EPA SW-846 Method 6010 or 6020.
- Sediment results must be reported on a dry weight basis.

- Information on TOC and particle size distribution within sediment samples can provide context to understand and anticipate PAH occurrences, because organic content and particle size/type affect the partitioning behavior of many contaminants. Although not required, these parameters may thus be of interest to practitioners when interpreting their data and planning future investigations. TOC can be analyzed using the most recent final version of EPA SW-846 Method 9060. Particle size can be analyzed multiple ways to determine percent sand, silt, and clay. If only the inorganic particle size fraction is of interest, then the sediment samples will need to be pretreated to remove organic matter. If organic matter is included in the analysis, then the "apparent" (i.e., organic plus inorganic) particle size distribution will be determined.

QA/QC data quality indicators

The field sampling procedures and analytical methods include several QA/QC measures to ensure useable data are collected and measured. In particular, data quality indicators (DQIs) are qualitative and quantitative descriptors used in interpreting the degree of acceptability or utility of data. The principal DQIs are precision, bias, representativeness, comparability, and completeness. Establishing acceptance criteria for the DQIs sets quantitative goals for the quality of data generated in the analytical measurement process. See https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5 for information on establishing DQIs.

For cPAHs and noncarcinogenic PAHs by EPA Method 8270, the DQIs set by the MPCA are:

- Blanks: analyte concentrations are less than the method detection limit or reporting limit, whichever is being used for quantitation; method blanks should be prepared with each analytical batch of 20 samples or less.
- Surrogate Recovery: approximately 30-150%, the recovery of the surrogate compounds are used to measure data quality in terms of accuracy (extraction efficiency).
- Laboratory Control Sample (LCS) and Matrix Spike (MS) Recovery: approximately, 30-150%; the percent recoveries of target analytes are calculated to measure data quality in terms of accuracy.
- MS/Matrix Spike Duplicate (MSD) Precision: relative percent difference (RPD) <30%; this is used to evaluate the data in terms of precision.

For metals (arsenic and copper):

- Blanks: analyte concentrations are less than the reporting limit; method blanks should be prepared with each analytical batch of 20 samples or less.
- Precision (% RPD): <20%.
- Accuracy: LCS- 80-120%.
- MS/MSD: 75 – 125%, unless laboratory calculated limits are tighter.

Electronic data requirements

- Electronic copies of the data should be obtained from the analytical laboratory in spreadsheet format (e.g., Microsoft Excel). Laboratories will normally report sample concentrations down to the reporting limit. Request that the laboratory also report sample concentrations down to the method detection limit to ensure B[a]P equivalents can be calculated appropriately (Appendix B). Note that concentrations quantified between the method detection limit and the reporting limit should be flagged as "estimated".

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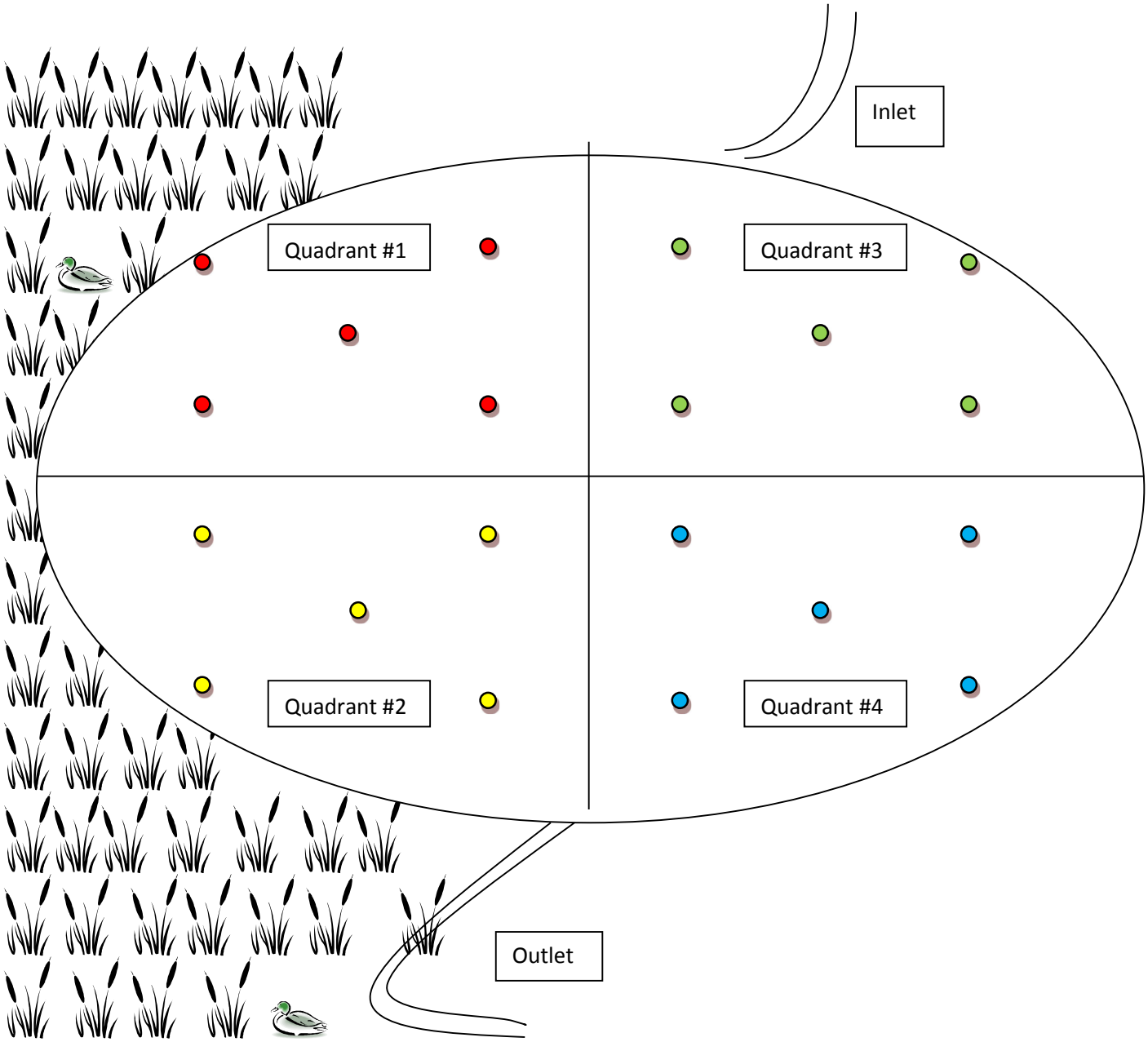


Figure A-1. Sediment sampling scheme for a stormwater pond greater than four acres in size.

Table A-1. List of PAHs to be analyzed in stormwater pond sediments

Noncarcinogenic PAHs
Acenaphthene
Acenaphthylene
Anthracene
Benzo[g,h,i]perylene
Fluoranthene
Fluorene
2-Methylnaphthalene
Naphthalene
Phenanthrene
Pyrene
Carcinogenic PAHs
Benzo[a]anthracene
Benzo[b]fluoranthene
Benzo[j]fluoranthene
Benzo[k]fluoranthene
Benzo[a]pyrene
Chrysene
Dibenz[a,h]acridine
Dibenz[a,h]anthracene
7H-Dibenzo[c,g]carbazole
Dibenzo[a,e]pyrene
Dibenzo[a,h]pyrene
Dibenzo[a,i]pyrene
Dibenzo[a,l]pyrene
7,12-Dimethylbenz[a]anthracene
Indeno[1,2,3-cd]pyrene
3-Methylcholanthrene
5-Methylchrysene

Note: A combination of benzo[b]fluoranthene, benzo[j]fluoranthene, and/or benzo[k]fluoranthene frequently coelute together when sediments are analyzed

Appendix B: Soil reference values and benzo[a]pyrene equivalents

Appendix B provides guidance for comparing contaminant concentrations from stormwater pond sediment to the MPCA's Remediation Division Soil Reference Values (SRVs) and instructions for calculating benzo[a]pyrene (B[a]P) equivalents for carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

Comparing sediment contaminant concentrations to SRVs

Soil Reference Values (SRVs):

SRVs are risk-based values derived to assess potential human health exposures from soil at a Remediation cleanup site using a reasonable maximum exposure (RME) scenario. RME scenarios are intended to protect an entire population without being overly conservative by using reasonable upper bound estimates for the most sensitive exposure parameters and central tendency estimates for less sensitive exposure parameters.

They are intended to evaluate both potential non-cancer and cancer risks associated with a contaminant present in soil. Two separate SRVs are calculated for each contaminant, one for non-cancer risk and one for cancer risk. The final SRV reported as the Residential or Industrial SRV is the lower of the two. In other words, it is the smallest concentration of the contaminant that could potentially pose either a non-cancer or cancer risk. For example, for contaminant "X", if the non-cancer SRV is 10 mg/kg and the cancer SRV is 5 mg/kg, then the final SRV is reported as 5 mg/kg.

Since stormwater sediment removed from the stormwater pond is being evaluated for use on dry land as soil, SRVs are an appropriate conservative risk based values to evaluate potential human health risks.

"Summary of Stormwater Pond Sediment Testing Results" Spreadsheet:

MPCA's stormwater program "Summary of Stormwater Pond Sediment Testing Results" spreadsheet allows users to compare stormwater pond sediment data to SRVs. The spreadsheet is available on MPCA's website MS4 stormwater web page at: http://www.pca.state.mn.us/sbiza7c. Click on the "Permit" tab and scroll down to the bottom under the "Additional Items" heading.

The spreadsheet will open to the "BaP equiv. calculation" tab used to compare the data to the SRVs. There are three sections where data can be entered:

- Metals
- Noncarcinogenic PAHs
- Carcinogenic PAHs/ BaP Equivalents

Metals and noncarcinogenic PAHs

For metals and noncarcinogenic PAHs, follow the instructions listed below. For carcinogenic PAHs (cPAHs), follow the instructions listed under the "Calculating B[a]P Equivalents" section.

1. Enter the chemicals reporting limit into the "Reporting Limit", Column (B).
2. Enter the core location (sample) data (concentrations) under the "Sample Locations and Depths" columns under each "Core Location #" (E&F, G&H, I&J) for the site. Add additional core location columns if you have more than 3 core locations (samples).
3. Compare the chemical data (concentrations) under the "Sample Locations and Depths", "Core Location #" columns (E&F, G&H, I&J) to the "Residential SRV Values" and "Industrial SRV Values" columns (C, D).

Calculating B[a]P equivalents

Minnesota Department of Health Guidance

The Minnesota Department of Health (MDH) issued new guidance regarding the calculation of B[a]P equivalents (http://www.health.state.mn.us/divs/eh/risk/guidance/pahguidance.pdf). Several new cPAHs were added to the required list to be analyzed that currently do not have analytical methods for soil. At this time, it is not feasible to adopt MDH's guidance for use with the Remediation Division's soil reference values (SRVs). MPCA will continue to use the potency equivalency factor (PEF) method previously recommended by MDH to evaluate human health risks from cPAHs until new analytical methods for soil are developed for the new cPAHs on the revised list.

MDH's previous recommendation was based on evaluating the 25 cPAHs that the California Environmental Protection Agency (Cal EPA) identified as being probable or possible human carcinogens (Cal EPA 1993, 2009; MDH 2001). Since toxicity data does not exist for all individual cPAHs, they are evaluated according to how potent they are in relation to a reference contaminant, B[a]P. Assuming B[a]P has a toxicity of one, other cPAHs are assigned a PEF to indicate how toxic they are in comparison to B[a]P. Table B-1 lists B[a]P PEFs for 17 cPAHs to be measured in stormwater pond sediments. This section only pertains to cPAHs, which are evaluated by using B[a]P equivalents. Noncarcinogenic PAHs are evaluated individually and are not included in the total B[a]P equivalent concentration.

Table B-1. B[a]P Potency Equivalency Factors (PEFs)

cPAH	PEF	cPAH	PEF
Benz[a]anthracene*	0.1	Dibenzo[a,e]pyrene	1
Benzo[b]fluoranthene	0.1	Dibenzo[a,h]pyrene	10
Benzo[j]fluoranthene	0.1	Dibenzo[a,i]pyrene	10
Benzo[k]fluoranthene	0.1	Dibenzo[a,l]pyrene	10
Benzo[a]pyrene	***1.0***	7,12-Dimethylbenzanthracene	34
Chrysene	0.01	Indeno[1,2,3-c,d]pyrene	0.1
Dibenz[a,h]acridine	0.1	3-Methylcholanthrene	3
Dibenz[a,h]anthracene	0.56	5-Methylchrysene	1
7H-Dibenzo[c,g]carbazole	1		

* A common synonym for this compound is Benzo[a]anthracene

** Benzo[a]pyrene is the reference contaminant

Site sediment concentrations of individual cPAHs are multiplied by the corresponding PEF value in Table B-1 to obtain an individual B[a]P equivalent concentration. These individual B[a]P equivalent concentrations are summed for all cPAHs to arrive at a total B[a]P equivalent concentration that is compared to the B[a]P SRV. For example, Table B-2 shows how the B[a]P equivalents were calculated for a hypothetical stormwater pond where all 17 cPAHs were detected in the sediment sample. The "Site Concentration" for each cPAH is entered into Column C. Each cPAH concentration is multiplied by the corresponding "Potency Equivalency Factor (PEF)" in Column B to arrive at the individual "BaP Equivalent" concentration in Column D. B[a]P equivalent concentrations are then summed to obtain the "Total BaP Equivalents" at the bottom of Column D.

Table B-2. Example – Calculating Total B[a]P Equivalents for Detected cPAH Data

A cPAH Contaminant	B Potency Equivalent Factor (PEF)	C Site Concentration mg/kg	D BaP Equivalent mg/kg
Benz[a]anthracene	0.1	2.190	0.219
Benzo[b]fluoranthene*	0.1	3.750	0.375
Benzo[j]fluoranthene*	0.1	0.000	0.000
Benzo[k]fluoranthene	0.1	1.320	0.132
Benzo[a]pyrene	1	2.270	2.270
Chrysene	0.01	2.790	0.028
Dibenz[a,h]acridine	0.1	0.219	0.022
Dibenz[a,h]anthracene	0.56	0.270	0.152
7H-Dibenzo[c,g]carbazole	1	0.160	0.160
Dibenzo[a,e]pyrene	1	0.828	0.828
Dibenzo[a,h]pyrene	10	0.419	4.190
Dibenzo[a,i]pyrene	10	0.391	3.910
Dibenzo[a,l]pyrene	10	0.150	1.500
7,12-Dimethylbenzanthracene	34	0.150	5.137
Indeno[1,2,3,-c,d]pyrene	0.1	1.350	0.135
3-Methylcholanthrene	3	0.170	0.512
5-Methylchrysene	1	0.160	0.160
		Total BaP Equivalents =	**19.730**

* In this example benzo[b]fluoranthene and benzo[j]fluoranthene coeluted. In other words, the combined concentration of both cPAHs was reported by the laboratory as 3.75 mg/kg benzo[b and j]fluoranthene. Since both contaminants have the same PEF value, 3.75 was entered for the sediment concentration of benzo[b]fluoranthene while the concentration of benzo[j]fluoranthene was entered as zero.

Carcinogenic PAHs (cPAHs):

For cPAHs, follow the instructions below. Please refer to Figure B-1 for a flowchart depicting the following process.

Step 1

- **If all of the cPAHs have been detected, follow the instructions below in Step 1. If not, proceed to Step 2**. Use the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet to calculate the B[a]P equivalent concentration for each of the cPAHs analyzed. The spreadsheet is available on MPCA's website MS4 stormwater webpage at: http://www.pca.state.mn.us/sbiza7c. Click on the "Permit" tab and scroll down to the bottom under the "Additional Items" heading.
    1. The spreadsheet will open to the "BaP equiv. calculation" tab
    2. Under the "Carcinogenic PAHs/B[a]P Equivalents" section, enter the cPAHs reporting limit to the "Reporting Limit" Column (B).
    3. Enter the core location (sample) cPAH data (concentrations) under the "Sample Locations and Depths" column, "Core Location #", "Site Conc." columns (E, G, I). Add additional core location columns if you have more than three core locations (samples).
    4. The spreadsheet automatically calculates the B[a]P equivalent concentration in the "BaP Equiv." columns (F, H, J).

5. Compare each samples "Total B[a]P equivalents" concentrations column (row 39, columns F, H, J) for each core location (sample) to the Residential and Industrial SRVs listed for B[a]P (columns C, D).

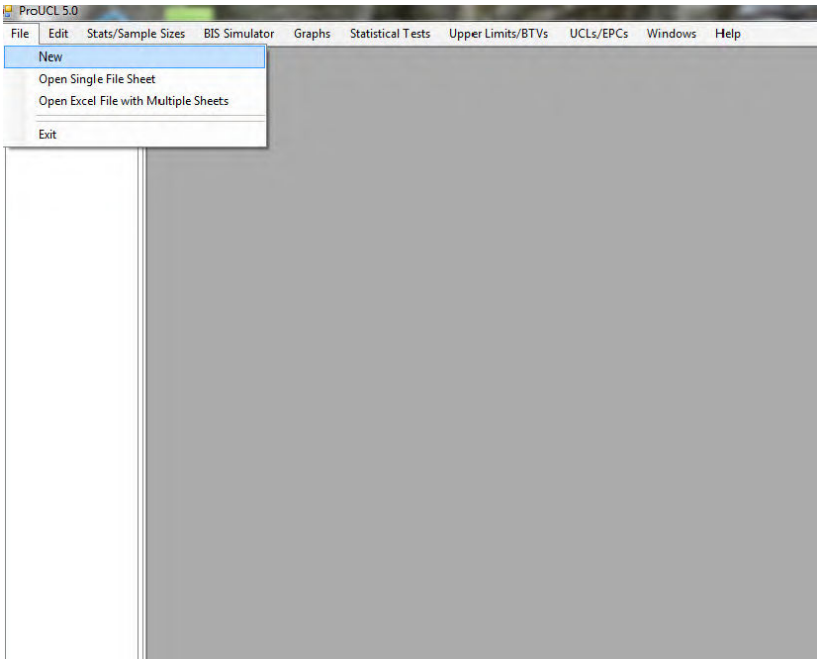
Step 2

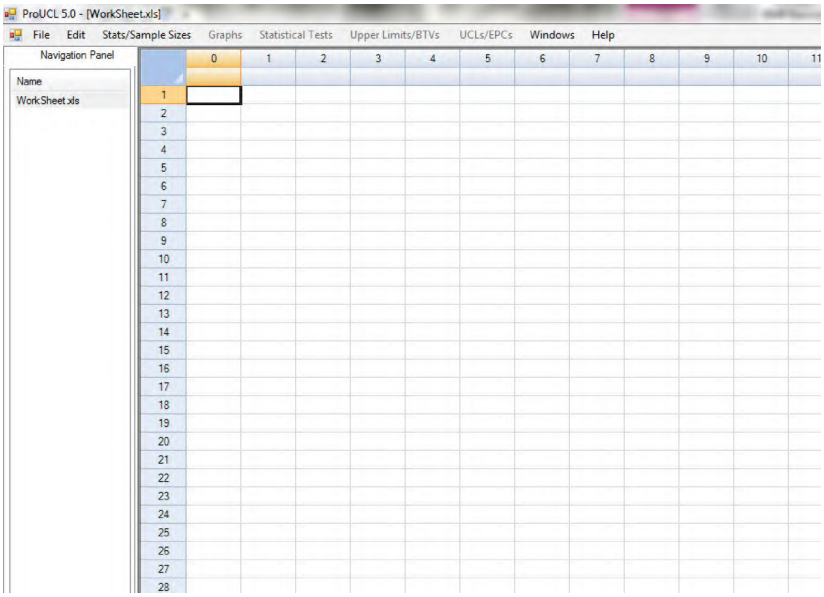
- Determine the percentage of cPAH nondetects by dividing the number of nondetects in each sample by the total number of cPAHs sampled and then multiplying by 100. For example, if 17 cPAHs were analyzed and results indicated 10 nondetects, you would perform the following calculation to determine the percentage of nondetects: 10/17*100 = 59% nondetects.
    1. **If you have 80% or less nondetects, proceed to Step 3**.
    2. **If you have greater than 80% nondetects, proceed to Step 4**.

Step 3 - 80% or Less Nondetects

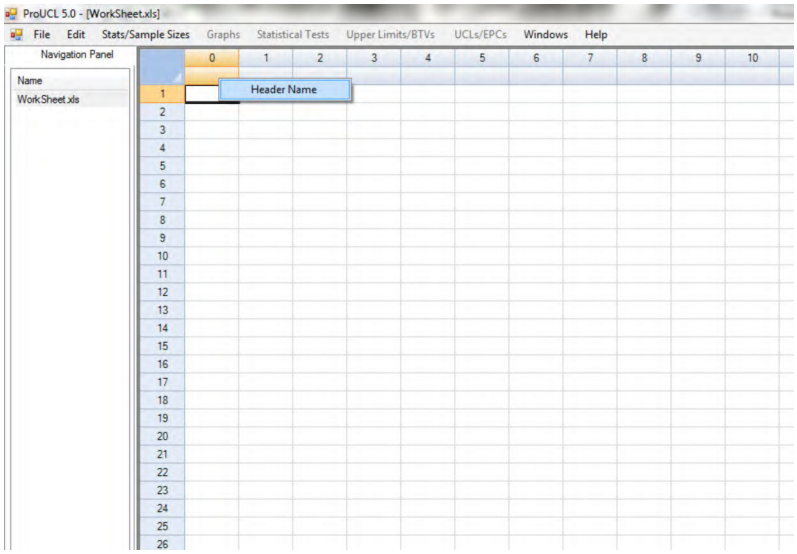
- Use the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet to calculate the BaP equivalent concentration for each of the cPAHs analyzed. The spreadsheet is available on MPCA's website MS4 stormwater web page at: http://www.pca.state.mn.us/sbiza7c. Click on the "Permit" tab and scroll down to the bottom under the "Additional Items" heading.
    1. The spreadsheet will open to the "BaP equiv. calculation" tab.
    2. Under the "Carcinogenic PAH/B[a]P Equivalents Section, enter the site data (concentration) for any detected cPAHs in the "Site Conc." columns (E, G, I), for each core location (sample). If the data you received from the lab is under the laboratory reporting limit but greater than the method detection limit (J flagged or estimated values), enter the estimated value into the spreadsheet treating it like it is a detected concentration. Enter the reporting limit or the method detection limit for all nondetect cPAHs.

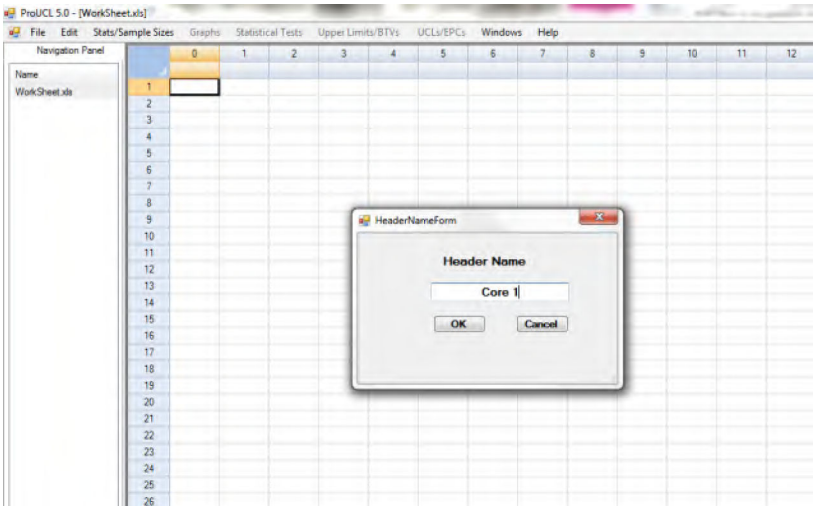
       Note: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and can provide an estimate of the detected concentration. It does not provide information about compounds reported as not detected. There is a possibility of false negatives for compounds that are not detected.
    3. B[a]P equivalent concentrations will automatically calculate and be displayed in the "BaP Equiv. Conc." columns (F, H, J). The spreadsheet automatically multiples the "Potency Equiv. Factor (PEF)" Column (C) by the "Site Conc." (E, G, I).
    4. The "BaP Equiv. Conc." values (F, H, J) are the values that need to be used to calculate the B[a]P equivalent concentration using Kaplan Meier statistics.
- Use EPA's ProUCL software to calculate the Kaplan Meier mean (KM Mean in ProUCL) B[a]P equivalent concentration.
    1. EPA's ProUCL software is available to download for free at: https://www.epa.gov/land-research/proucl-software.
    2. In ProUCL, open up a new worksheet by choosing "File", then "New".



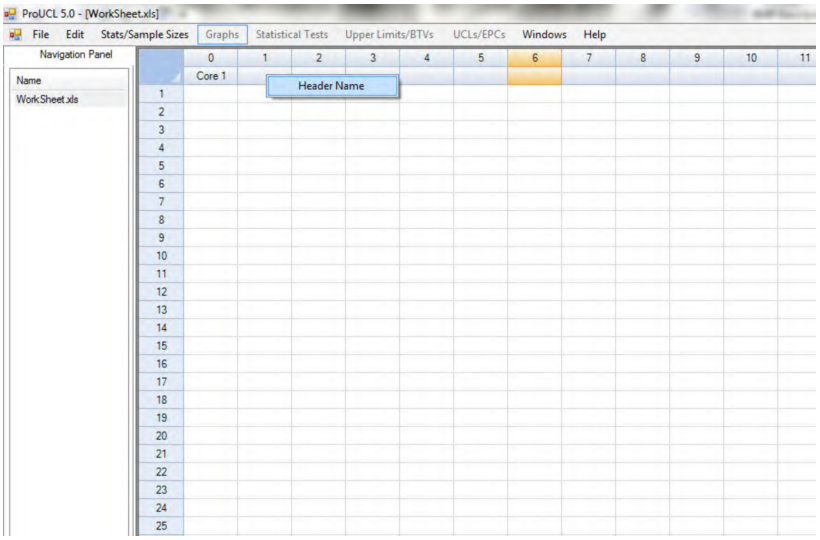


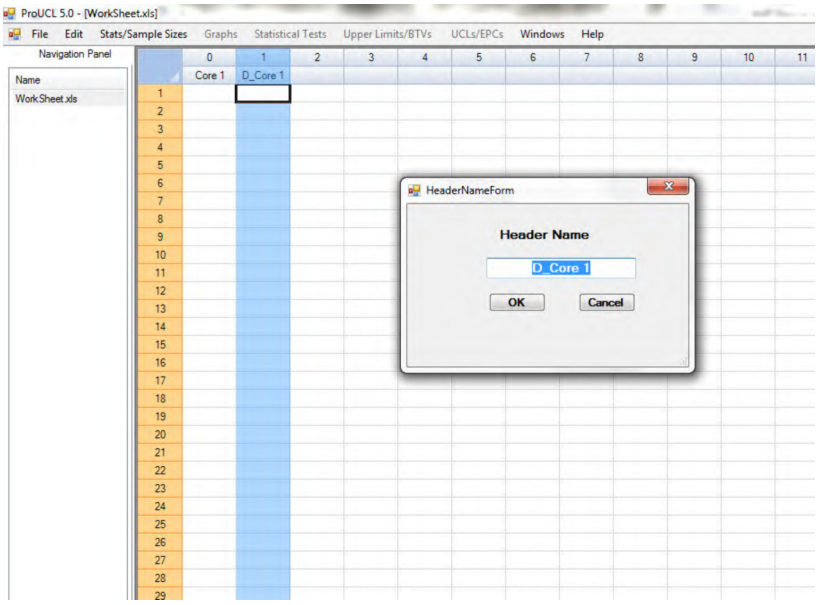
3. Name the first column to identify your core location or sample (ex. “Core 1” or “Sample 1”) by clicking on the header and choosing “Header Name”. The “HeaderNameForm” window will open. Enter the title of that column and click “OK”.



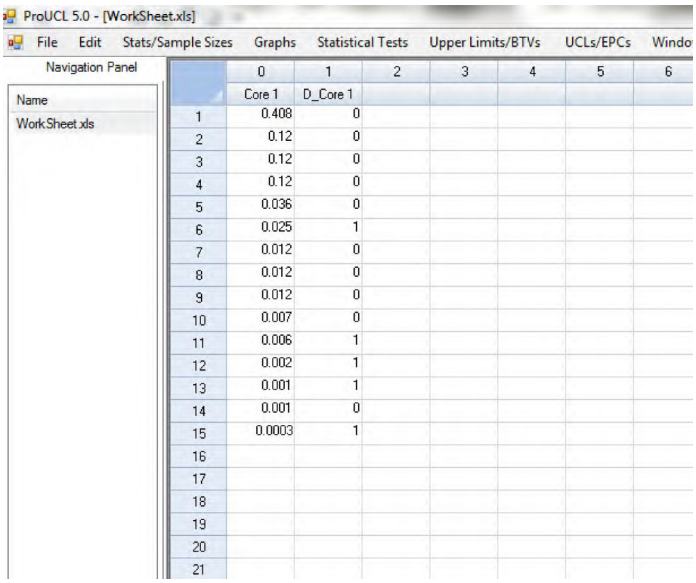


4. Name the second column with a “D_” in front of the name you gave your first column (ex. “D_Core 1” or “D_Sample 1”) by clicking on the header and choosing “Header Name”. The “HeaderNameForm” window will open. Enter the title of that column and click “OK”.



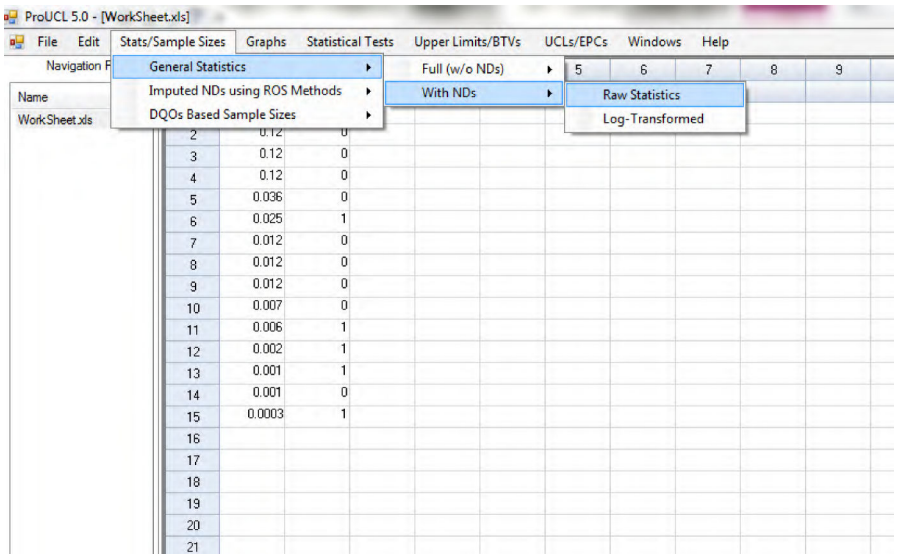


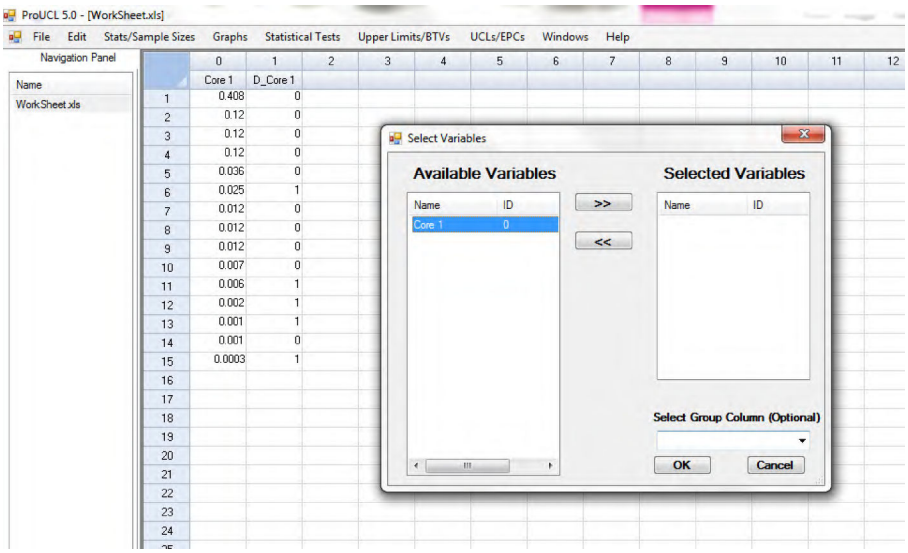
5. Enter the cPAH data from the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet, "BaP Equiv. Conc." Column for your specific core or sample (F, H, I) into the first column (ex. "Core 1" column). In the second column, enter a "0" if that sample (concentration) is a nondetect (based on a reporting limit or detection limit rather than an actual sample concentration) and a "1" if it is a detected concentration. There is no need to conduct any additional sorting of the data ProUCL automatically does this. It is also not necessary to correct for Effron's bias since this is automatically accomplished by ProUCL.

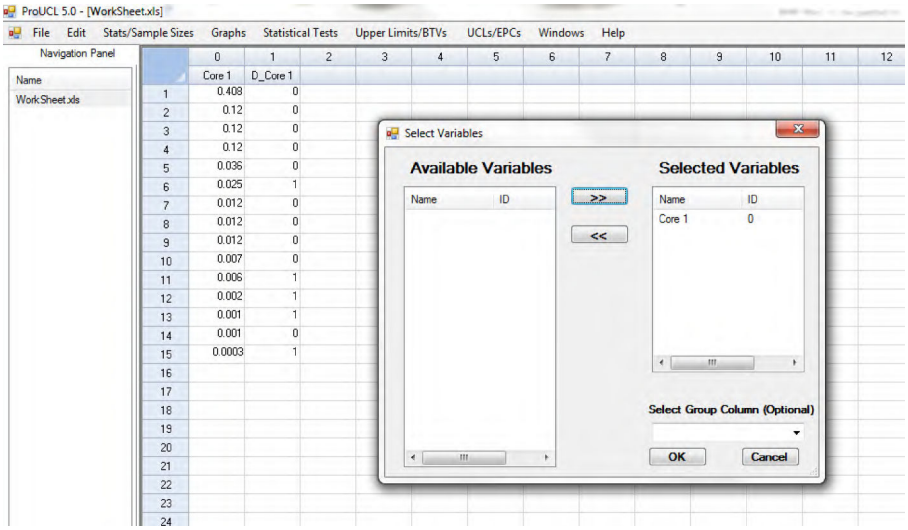


6. Repeat this procedure for each additional core (sample) listed in the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet using additional columns across the spreadsheet (ex. Core 2 or sample 2 would be entered into columns 2 and 3 in the ProUCL spreadsheet).

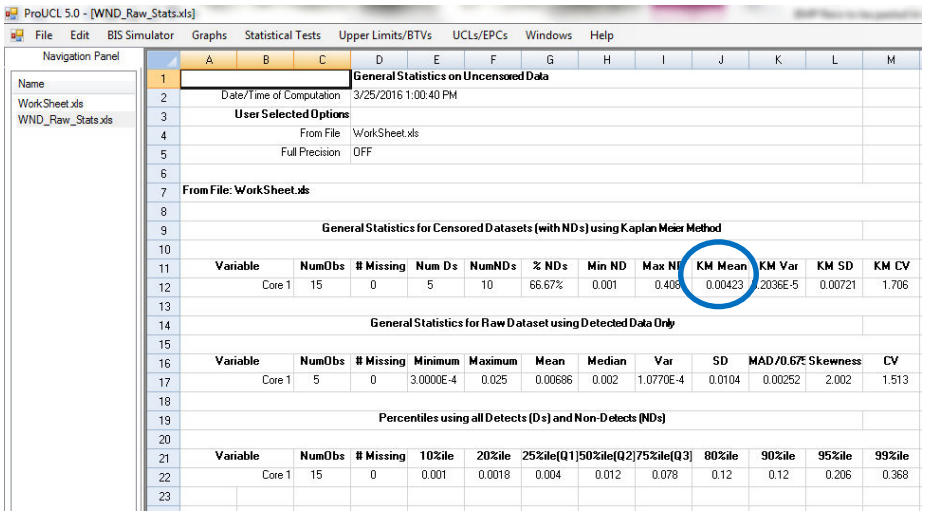
7. Under "Stats/Sample Sizes", chose "General Statistics", "With NDs", "Raw Statistics". The "Select Variables" window will open. Click the ">>" button to choose the data you want to use to calculate the "General Statistics". You can choose all of your cores (samples) at the same time. Click "OK" to run the calculation.







8. ProUCL will calculate “General Statistics” including the Kaplan Meier mean, which is the value you will use to compare to the SRVs (see “KM Mean” in the blue circle below).



9. Multiply the "KM Mean" from ProUCL (value in blue circle above) by the number of cPAHs that were analyzed for and included in this calculation. Enter this value into the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet, "Total B[a]P equivalent – Kaplan Meier" (row 40) under the appropriate core number (sample). For example: If 15 cPAHs were analyzed for, the calculation would be 15 * 0.00423 = 0.0635 mg/kg.
10. Compare each samples "Total B[a]P equivalents – Kaplan Meier" concentration column (row 40) to the Residential and Industrial SRVs listed for B[a]P (columns C, D) for each core location (sample).

    NOTE: If the laboratory reports the 3 fluoranthenes (benzo[b]fluoranthene, benzo[j]fluoranthene and benzo[k]fluoranthene) as total fluoranthenes count this as 1 cPAH. If the laboratory reports two of the fluoranthenes (benzo[b]fluoranthene and benzo[j]fluoranthene) as benzo[b,j]fluoranthene, count this as 1 cPAH.

Step 4 – Greater than 80% Nondetects

- When a dataset has greater than 80% nondetects, Kaplan Meier is no better than stating the B[a]P equivalent concentration is somewhere between the B[a]P equivalent concentration calculated when replacing the nondetects with the full reporting limit and when replacing the nondetects with zeros. Use the "Summary of Stormwater Pond Sediment Testing Results" spreadsheet to calculate the potency equivalent factor (PEF) for each of the cPAHs analyzed. The spreadsheet is available on MPCA's website MS4 stormwater web page at: http://www.pca.state.mn.us/sbiza7c. Click on the "Permit" tab and scroll down to the bottom under the "Additional Items" heading.
    1. Determine if appropriate reporting limits have been used by comparing the reporting limits used for your samples (found in the laboratory report) to those listed in the Table B-3 below.
        a. If the reporting limit used by the laboratory for a cPAH is equal to or less than the reporting limit in the table, appropriate reporting limits were used for that cPAH. All cPAHs need to be checked. If all cPAHs have been analyzed using appropriate reporting limits, skip to number 2 below to calculate total B[a]P equivalents.

b. If any of the cPAHs did not use an appropriate reporting limit, you cannot calculate B[a]P equivalents using the instructions in number 2 below. In this case, you will need to either re-analyze your samples for the cPAHs that did not have appropriate reporting limits or obtain new samples. The laboratory will be able to help you decide which one makes sense in your case.

   i. If the laboratory is able to re-run the sample and obtain a lower reporting limit, equal to or less than that in Table 1, it might be beneficial to run your sample again for that cPAH.

   ii. If the laboratory had to dilute your sample resulting in an increase in the reporting limit for a cPAH, you will probably need to obtain new samples.

2. To calculate B[a]P equivalents follow the steps below.

   a. In the "Summary of Stormwater Pond Sediment Testing Results", under the "Site Conc." column, enter the site data (concentration) for any detected cPAHs in the "Site Conc." columns (E, G, I), for each core location (sample). If the data you received from the lab is under the laboratory reporting limit but greater than the method detection limit (J flagged or estimated value), enter the estimated value into the spreadsheet treating it like it as a detected concentration. Enter ½ the reporting limit for all nondetect cPAHs.

   b. The B[a]P equivalent concentration will automatically calculate in the "BaP Equiv. Conc." column. The spreadsheet automatically multiples the "Potency Equiv. Factor (PEF)" column (C) by the "Site Conc." column (E, G, I) and enters it into the "BaP Equiv. Conc." Column (F, H, J).

   c. After all of the site concentrations ("Site Conc.") have been entered, the total B[a]P equivalent concentration is displayed under the "Total BaP Equivalents", row 39, under the "BaP Equiv. Conc." columns (F, H, J) for each core location (sample). The spreadsheet automatically sums all of the individual cPAH "BaP Equiv. Conc." values and enters it into the "Total BaP Equivalents" cell under each core location (sample).

   d. Compare each samples "Total B[a]P equivalents" concentration column (row 39) to the Residential and Industrial SRVs listed for B[a]P (columns C, D) for each core location (sample).

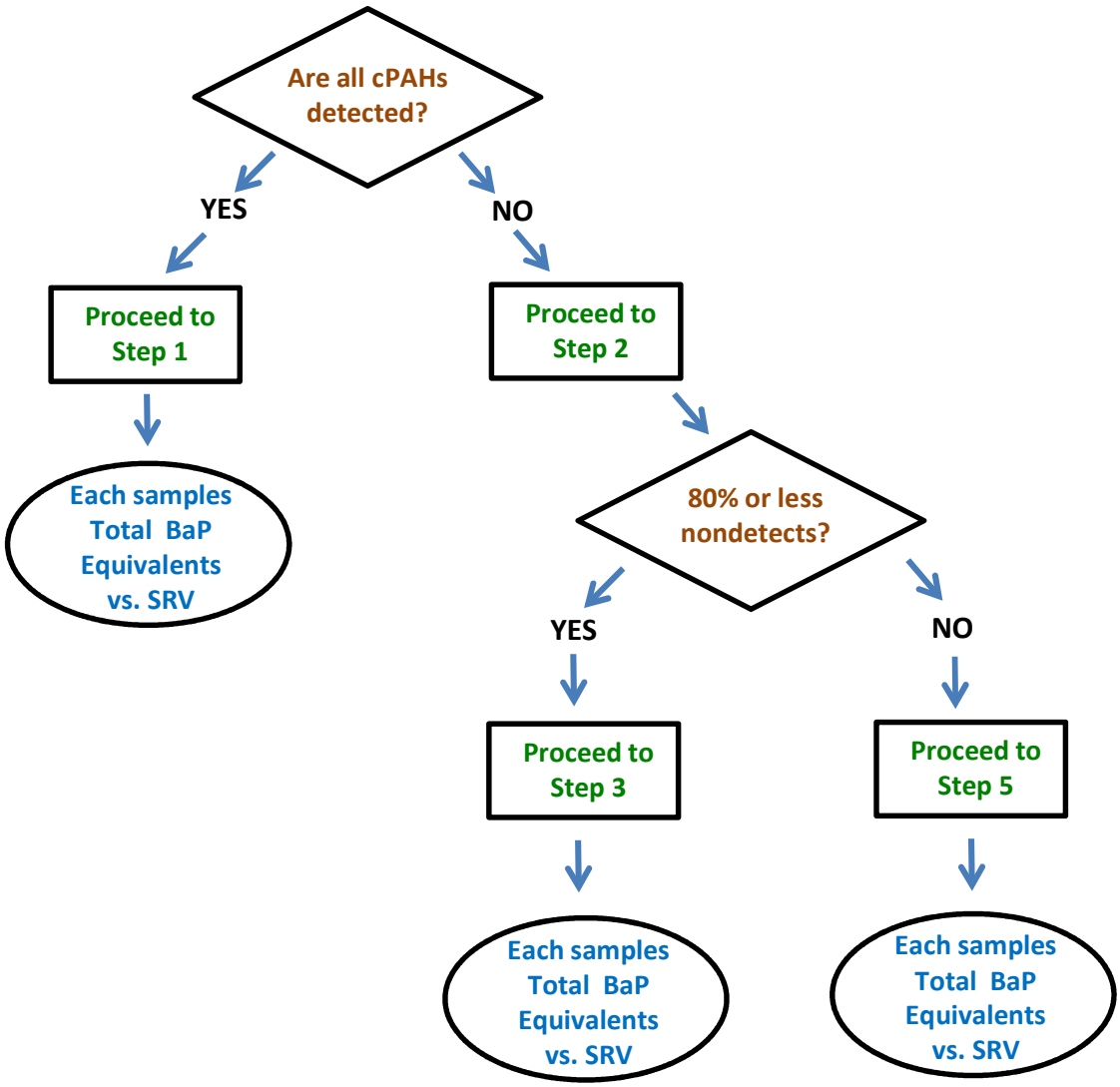


Figure B-1. Calculating B[a]P Equivalents Flowchart

Table B-3. cPAH

Reporting Limits

Carcinogenic PAH (cPAH)	Potency Equivalent Factor (PEF)	Appropriate Maximum Reporting Limit * mg/kg
Benz[a]anthracene	0.1	0.01
Benzo[b]fluoranthene	0.1	0.03
Benzo[j]fluoranthene	0.1	0.03
Benzo[k]fluoranthene	0.1	0.03
Benzo[a]pyrene	1	0.01
Chrysene	0.01	0.01
Dibenz[a,h]acridine	0.1	0.01
Dibenz[a,h]anthracene	0.56	0.01
7H-Dibenzo[c,g]carbazole	1	0.01
Dibenzo[a,e]pyrene	1	0.01
Dibenzo[a,h]pyrene	10	0.01
Dibenzo[a,i]pyrene	10	0.01
Dibenzo[a,l]pyrene	10	0.01
7,12-Dimethylbenzanthracene	34	0.01
Indeno[1,2,3,-c,d]pyrene	0.1	0.01
3-Methylcholanthrene	3	0.01
5-Methylchrysene	1	0.01

*** Laboratory reporting limits listed will need to be corrected for dry weight.**

References

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Cal/EPA. 2009. Technical support document for cancer potency factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life stage exposures. Appendix B. Chemical-specific summaries of the information used to derive unit risk and cancer potency values. Office of Environmental Health Hazard Assessment, Oakland, CA. (http://oehha.ca.gov/air/crnr/technical-support-document-cancer-potency-factors-2009).

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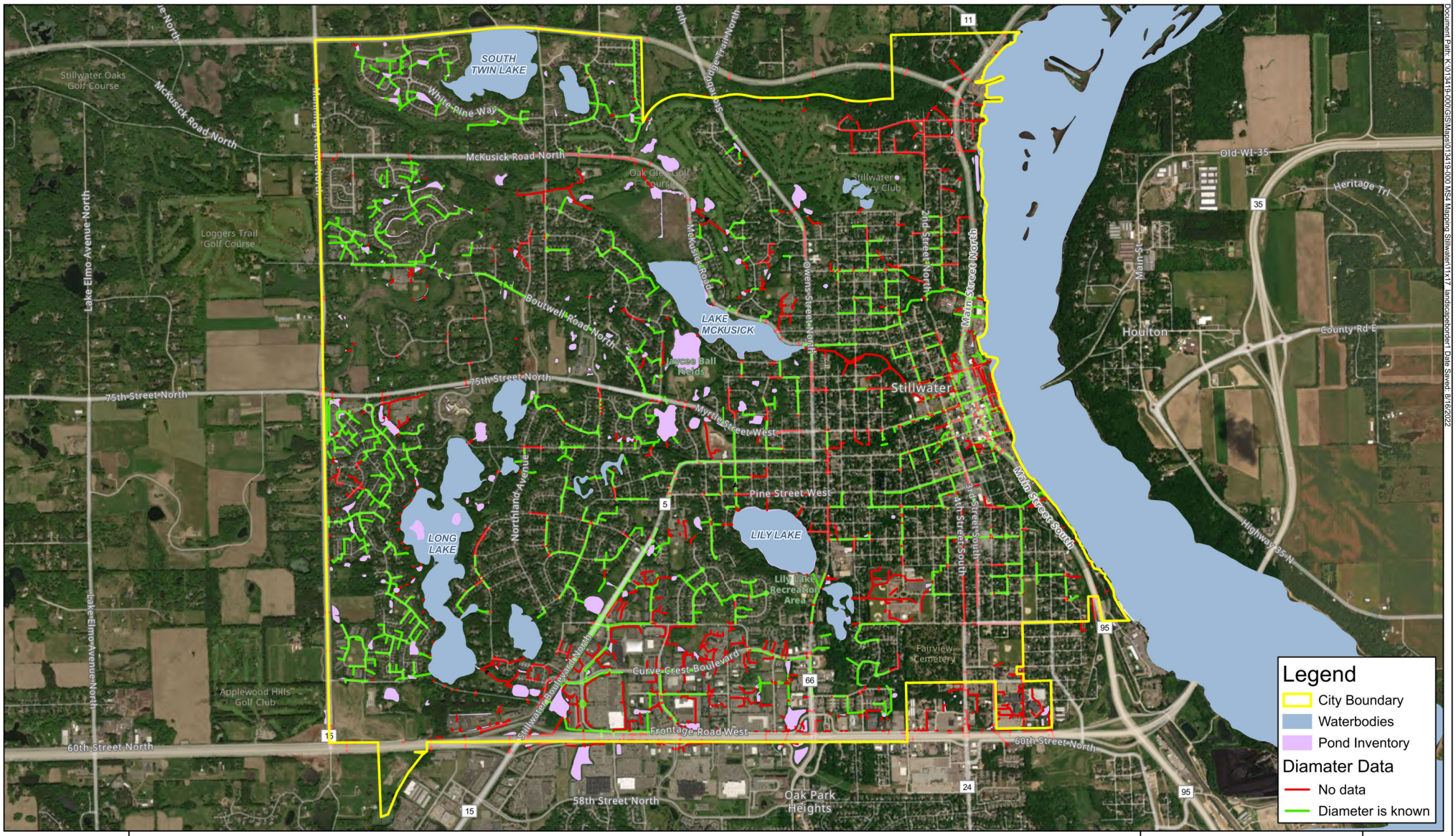
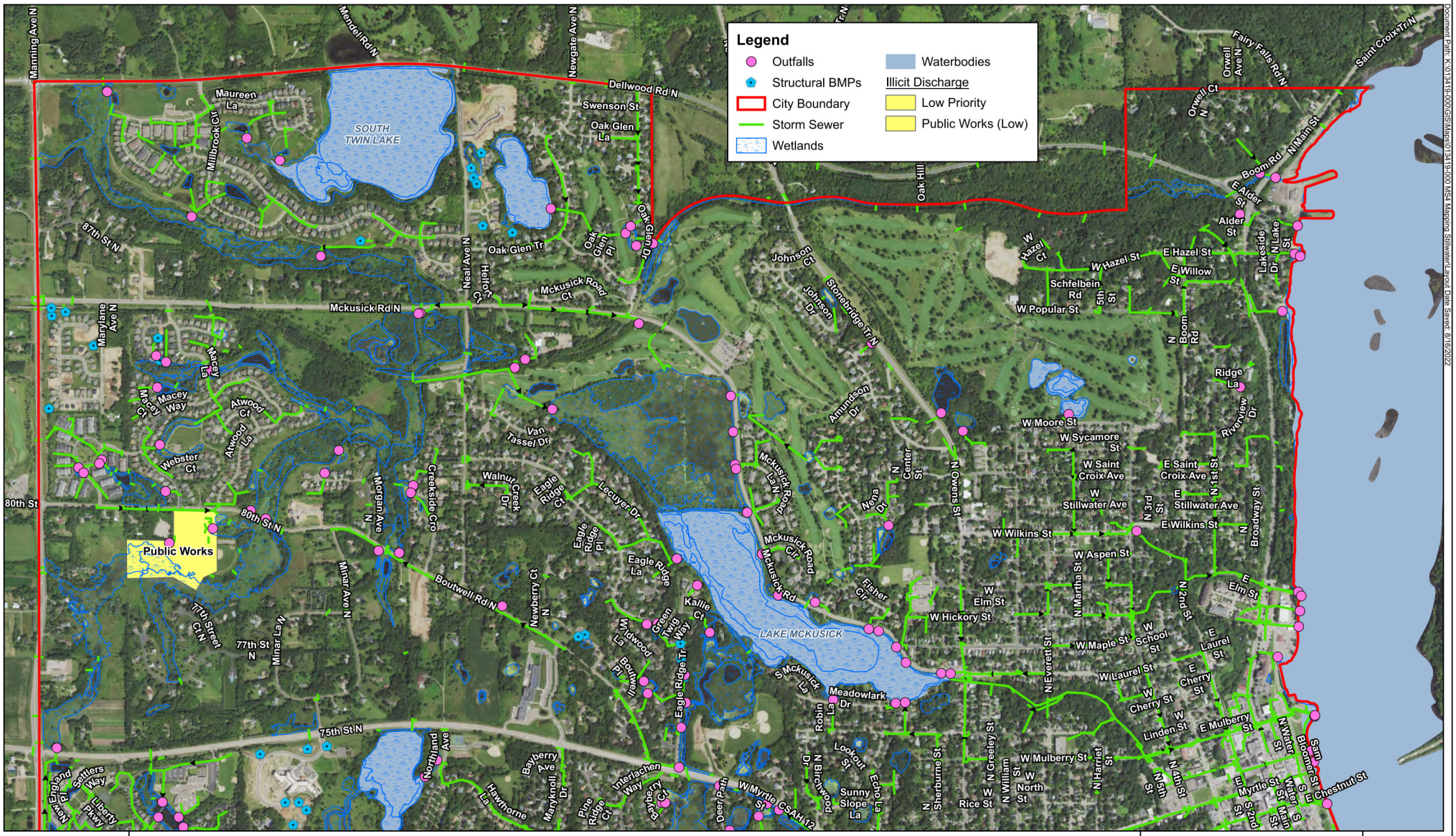


Stormsewer Pipe Size Inventory

City of Stillwater, MN
WSB Project No. 013419-000

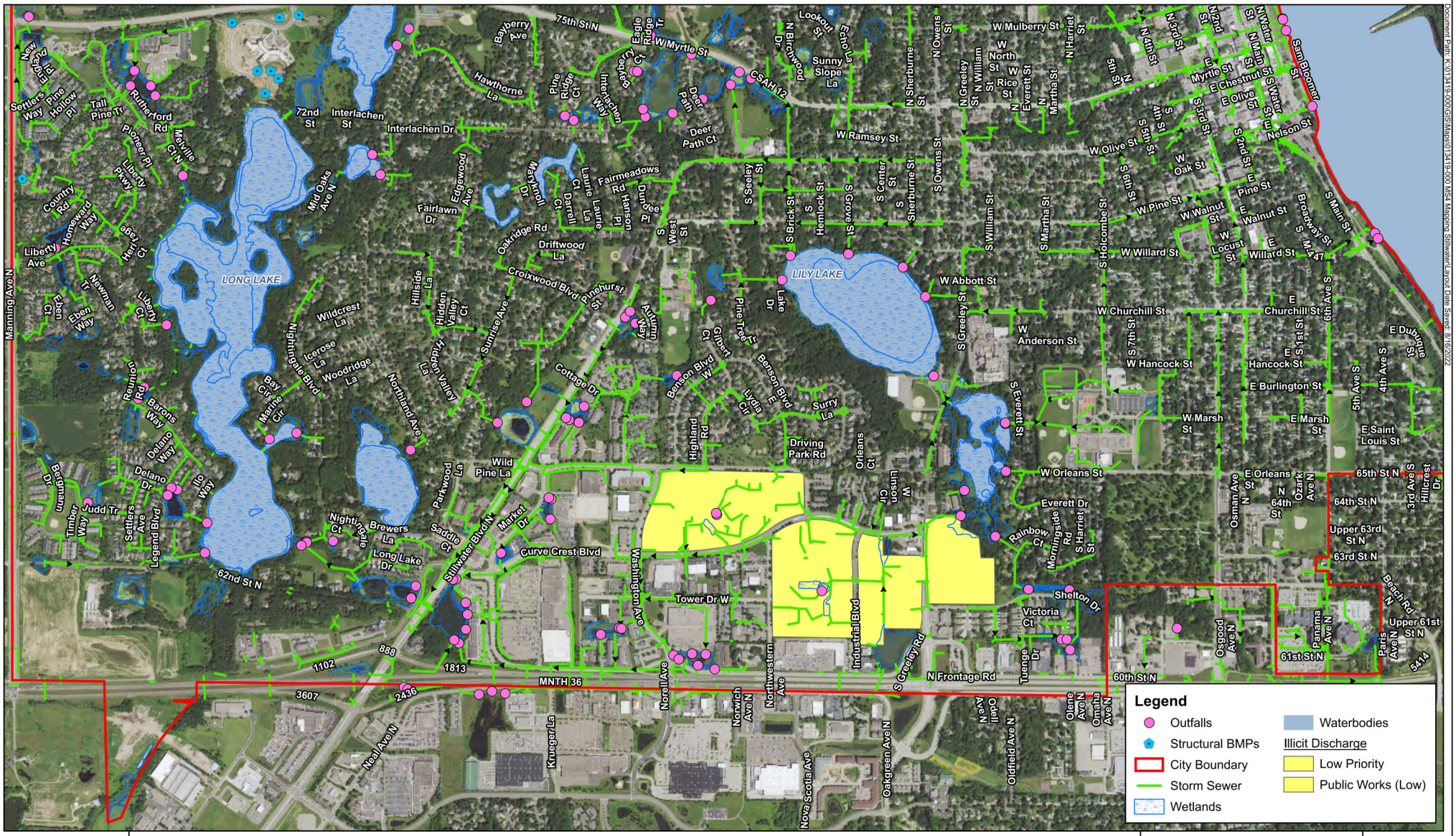
N
0 2,000 Feet
1 inch = 2,000 feet



Stormwater & Illicit Discharge Map - North

MS4 Permit Mapping
City of Stillwater

N
0 0.2 Miles



Stormwater & Illicit Discharge Map - South

MS4 Permit Mapping
City of Stillwater

Stillwater
THE BIRTHPLACE OF MINNESOTA

wsb

Sec. 27-4. Dogs and other animals.

Subd. 1. *Definitions*. The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this subdivision, except where the context clearly indicates a different meaning:

Animal means a dog, cat or other animal.

Animal shelter means any premises designated by the city council for the purpose of impounding or caring for animals held under the authority of this chapter.

At large means off the owner's premises and not under the control of the owner or a member of such owner's immediate family either by leash, cord or chain, or similar physical restraint.

Kennel means any place where four or more dogs over six months of age are kept, owned, boarded, bred or offered for sale.

Owner means a person who harbors, feeds, boards, possesses, keeps or has custody of an animal.

Pet shop means any owner engaged in the business of breeding, buying, selling or boarding animals of any species.

Subd. 2. *License required*. It is unlawful for a person to own, harbor or keep a dog over the age of six months within the city unless the person has obtained a license for the dog. An owner has 30 days after becoming a city resident to obtain a license. The license application shall include:

(1) The name and address of the owner.

(2) The name and address of the person making application, if other than the owner.

(3) The breed, sex and age of the dog for which a license is sought.

(4) A certificate of vaccination for rabies from a qualified veterinarian.

Subd. 3. *License term*. Except for dangerous dog licenses, which are issued for a one-year term, all other dog licenses may be issued either for a 3-year term or a lifetime license that is valid for the lifetime of the dog (including a potentially dangerous dog, but not including a dangerous dog). For a lifetime license, the owner shall provide proof of a current rabies vaccination certificate to the City Clerk every three years.

Subd. 4. *License fee*. No license will be issued for a dog unless the owner pays the license fee, as established in the City's fee schedule. Reductions in fees may be made based on whether the dog is sterilized or electronically tagged with a microchip.

Subd. 5. *Tag description and duplicate fee*. Upon completion of a license application, submission of a certification of vaccination valid for the license term, and payment of the license fee, the city clerk shall issue a metallic tag, stamped with a number and expiration year of the license, if applicable. Duplicate tags are available for an additional fee. Owners shall comply with the following requirements:

(1) *Tag to be worn*. Tags must be valid and securely fastened to the dog's chain or collar or harness, at all times.

(2) *Nontransferable*. Licenses and tags are not transferable from one dog to another or from one owner to another.

(3) *Dangerous dog tags*. Dangerous dogs shall wear tags that comply with section 27-5.

Subd. 6. *Limitation on number of dogs*. A person must not keep more than a total of three dogs that are older than four months on any residential premises within the city.

Subd. 7. *Running at Large.*

(1) Except within the designated area at the city's off-leash dog park, no dog shall be allowed to run at large. An animal is running at large if the animal:

(a) Is not effectively contained within a fenced area; or

(b) Is on any unfenced area or lot abutting a street, alley, public park, public place or upon any other private land without being effectively restrained by chain or leash that is no longer than 6 feet, or an electronic pet containment device that prevents it from moving beyond such unfenced area or lot; or

(c) Is on any street, public park, school grounds or public place without being effectively restrained by chain or leash.

(2) The license holder, owner or keeper of any animal will be responsible for the effective restraint of the animal and must not permit the animal to run at large.

Subd. 8. *Impounding*. Any officer or any person duly authorized by the city may capture and seize any animal found running at large within the city contrary to the provisions of this section.

Subd. 9. *Redemption*. Any animal seized and impounded may be redeemed by any person producing a license or proving ownership by a statement in writing within five days after such seizure and impounding and by paying the impound fee, plus any additional boarding costs, redemption fees, license fees or special call-back services costs incurred by the city by the impoundment and, upon presentation of payment, the city will release the animal to the owner. If the animal is unlicensed, a license must be obtained before it may be released. If the owner of the seized or impounded animal under the provisions of this section does not reclaim possession of the animal in compliance with the foregoing provisions within five days after the seizure or impounding, the owner will forfeit all right of property in the animal.

Subd. 10. *Disposition of unclaimed animals*. At the expiration of five days from the time the animal is impounded as provided for in this section, if the animal is not reclaimed according to the provisions in this section, it will be the duty of the City to dispose of the animal in a humane manner and according to law.

Subd. 11. *Nuisances committed by animals; owner responsibility.*

(1) *Habitual barking or crying*. It shall be unlawful for any owner to keep an animal in the city that habitually barks or cries. Habitual barking shall be defined as barking or crying for repeated intervals of at least three minutes with less than one minute of interruption. Barking or crying must be audible off of the owner's premises.

(2) *Damage to property*. It shall be unlawful for any owner's animal to damage any lawn, garden, or other property of another, whether or not the owner has knowledge of the damage.

(3) *Diseased animals*. No person shall keep or allow to be kept on such person’s premises, or on premises occupied by them, nor permit to be at large in the city, any animal which is diseased so as to be a danger to the health and safety of the city, even though the animal is properly licensed under this section.

Subd. 12. *Cleaning up of litter.*

(1) The owner of any animal or any person having the custody or control of any animal will be responsible for cleaning up any feces of the animal and disposing of the feces in a sanitary manner.

(2) A person who owns, keeps or harbors an animal must not allow or cause the animal to be on property, other than the owner's own property, without having tools or equipment in such person’s immediate possession that are suitable for the removal of animal fecal material.

(3) All fecal materials deposited by the animal must be promptly and effectively removed from the ground or surface and deposited in a sanitary manner.

(4) The provisions of this section will not apply to the ownership or use of civilian service dogs or police enforcement dogs.

Subd. 13. *Care of and cruelty to animals*. No owner shall fail to provide any animal with sufficient food and water, proper shelter and veterinary care when needed. No person shall beat, cruelly treat, torment or otherwise abuse any animal or cause or permit any dogfight, cockfight, bullfight or other combat between animals or between animals and humans. No owner of an animal shall abandon such animal.

Subd. 14. *Interfering with enforcement*. A person must not interfere with any city official, animal control officer or police officer while engaged in performing work under the provisions of this section.

Subd. 15. *License requirements to nonresidents*. The subdivisions of this section requiring a license shall not apply to nonresidents of the city, provided that dogs of such owners shall not be kept in the city longer than 30 days without a license.

(Ord. No. 1142, § 2, 4-7-20)

Sec. 38-9. - Salt Storage at Commercial, Industrial, and Institutional Facilities.

Subd. 1. *Definitions*. The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this subdivision, except where the context clearly indicates a different meaning:

*Anti-icing***:** means the application of a liquid deicer prior to the onset of a snow event.

*Deicer***:** means any substance used to melt snow and ice or used for its anti-icing effects.

Subd. 2. Indoor operations for the storage of deicing materials must be provided whenever possible in order to prevent such material from being affected by rain, snow, or melt water.

Subd. 3. All salt, sand, and other deicing materials stored outdoors must be covered at all times. When not using a permanent roof, a waterproof impermeable, flexible cover must be placed over all storage piles. The cover must prevent runoff and leachate from being generated by the outdoor storage piles. The cover must be secured to prevent removal by wind or other storm events. Piles must be formed in a conical shape and covered as necessary to prevent leaching.

Subd. 4. Facility Siting.

(1) The facility must be in close proximity to the area in which the deicing materials are to be used, if practical.

(2) Each facility must be located outside of floodplains and 200 feet from lakes, rivers, streams, ditches, storm drains, manholes, catch basins, wetlands, and any other areas likely to absorb runoff. A facility must not be located in close proximity to surface water features, water supplies, wells or drywells.

(3) A facility must be located on impermeable surfaces.

(4) The property's slope must be away from the facility's salt, deicer, and sand storage area.

(5) Salt vulnerable natural areas should be avoided as storage facilities to the extent possible. Where they cannot be avoided, specific measures should be instituted to protect vulnerable areas. Salt vulnerable areas include, but are not limited to:

(a) Areas with salt sensitive vegetation.

(b) Areas serving as a source of drinking water (surface water and groundwater).

(c) Areas with bodies of water with low dilution, low volume, or salt sensitive species.

(d) Areas associated with groundwater recharge zones or shallow water table, with medium to high permeable soils.

Subd. 5. Snow Piles. Snow piles must be located downslope from salt and deicer storage areas to prevent the snow melt from flowing through storage areas and carrying material to the nearest drainage system or waterway.

Subd. 6. Transfer of materials. Practices must be implemented in order to reduce exposure (e.g., sweeping, diversions, and/or containment) when transferring salt or other deicing material.