



## **STORMWATER POLLUTION PREVENTION PROGRAM**

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

August 2023

Prepared for:  
City of Circle Pines  
200 Civic Heights Circle  
Circle Pines, MN 55014

From:  
WSB  
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## **Introduction**

In 1990, the U.S. EPA created the Municipal Separate Storm Sewer System (MS4) Program to address the concerns with stormwater pollution. In Minnesota, the program is administered by the MPCA.

This program requires approximately 300 cities, townships, counties, watershed districts, and large campuses such as universities, hospitals and prison complexes that operate their own private roads and stormwater drainage systems to comply with the MS4 program.

MS4 permittees are required to develop stormwater pollution prevention programs (SWPPP), educate the public about stormwater pollution, and engage citizens in solving local water pollution problems. The six categories of required action, known as minimum control measures, include:

1. Public education and outreach;
2. Public Participation and Involvement;
3. Illicit Discharge Detection and Elimination (illegal dumping into storm sewers and ditches);
4. Construction Site Stormwater Runoff Control;
5. Post Construction Stormwater Management; and
6. Pollution Prevention and Good Housekeeping [in municipal operations such as parks maintenance and public works].

The permit addresses concerns such as winter salt storage, construction site erosion and sediment control, and runoff from new development. Every five (5) years, the MPCA requires the permittees to renew their permit and make updates to their stormwater programs to remain in compliance.

This binder includes the information the City uses to remain in compliance with this permit.

## **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 and 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.

## For More Information

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## Enforcement Activities

Construction Site Erosion and  
Sediment Control  
Illicit Discharge Detection and  
Elimination

## Procedures

Verbal Warnings  
Written Warnings  
Notice of Violations  
Stop Work Orders  
Civil/Criminal Penalties

## Appendices

Appendix A – Non-Compliance  
Notice to Contractors  
Appendix B – Stop Work Order  
Appendix C – Notice of Illegal  
Discharge

# Enforcement Response Plan

## 1. INTRODUCTION AND BACKGROUND

This Stormwater Enforcement Response Plan (ERP) codifies enforcement procedures used by the City of Circle Pines (City) to enforce provisions of its National Pollutant Discharge Elimination System (NPDES) Statewide Stormwater Permit No. MS400000 (hereafter referred to as the MS4 Permit). Under the MS4 permit, the City is to control the release of pollutants to and discharges from the municipal separate storm sewer system (MS4) which is owned or operated by the City through rules and regulations controlling stormwater discharges. The MS4 Permit will do the following:

- Control the contribution of pollutants to the MS4 by stormwater and non-stormwater discharges associated with industrial activity and the quality of stormwater discharged from sites of industrial activity.
- Prohibit illicit discharges to the MS4.
- Control the discharge to the MS4 from spills, dumping, or disposal of materials other than stormwater.
- Require compliance with conditions in State statutes, rules, permits, contracts, and orders.
- Carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance and non-compliance with permit conditions including the prohibition on illicit discharges to the MS4.

The City's MS4 consists of a conveyance or system of conveyances owned by the City that is designed or used for collecting or conveying stormwater, which is not a combined sewer and which is not part of a publicly owned treatment works.

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## 1.1 Purpose

This ERP describes the measures available to the City to exercise its authority. The ERP identifies enforcement procedures designed to encourage a timely response by the discharger. Implementation of the ERP will ensure a consistent response throughout the City and avoid confusion, delays, and disputes over enforcement for stormwater pollution prevention.

An effective enforcement program depends on detailed and comprehensive documentation of all contacts with the alleged violator and of all evidence establishing the violation. Investigations and enforcement actions must be handled quickly. The City is required by the Permit to investigate reports of illicit discharges and initiate enforcement action to eliminate the source(s) of the discharge.

## 1.2 City of Circle Pines Permit History

The City's current MS4 permit was issued by the State of Minnesota's Pollution Control Agency (MPCA) and became effective on August 1, 2013. This permit replaces the previous National Pollutant Discharge Elimination System (NPDES) MS4 permit issued by the MPCA on June 1, 2006. The scope of the current permit includes all stormwater discharges associated with construction sites, industrial facilities, maintenance facilities, and other activities within the MS4's jurisdiction.

## 1.3 Types of Enforcement Actions

The City will use City Code, permits, and penalties to enforce illicit discharges to the City's MS4 system. The City anticipates two general types of stormwater violations: construction sites and illicit discharges or connections to the City's MS4. Potential violators include construction contractors, businesses, industries, private citizens, and other governmental agencies which are detailed below.

### *1.3.1 Construction Sites*

The City's construction contractors are required to obtain all required permits pertaining to land disturbance activities from various agencies. Permits could include County, DNR, City, or State permits.

The City is responsible for inspection oversight responsibility and must ensure that a trained employee inspects construction activity at sites until final stabilization is achieved. The MS4 permit requires the City to implement a system to monitor contracted construction activities and to enforce Permit provisions. The City is required to list and describe all violations and enforcement responses taken for construction activities in the Annual Report submitted to MPCA.

The City's authority to take enforcement action at construction sites is derived from its city code along with permit language.

### *1.3.2 Illicit Discharges and Connections*

The Permit also requires the City of Circle Pines to take measures to detect and eliminate illicit discharges and connections to the City's MS4. An illicit discharge is defined as any discharge to a MS4 that is not composed entirely of stormwater, with the exception of allowable non-stormwater discharges and separately permitted discharges. Illicit connections are defined as any man-made conveyance that connects an illicit discharge directly to the MS4. The City is required to implement a program to minimize, detect, investigate, and eliminate illicit discharges and connections, including unauthorized non-stormwater discharges and spills, into the MS4 system.

## 2. METHODS OF DISCOVERY OF NON-COMPLIANCE

Reports of a stormwater violation or non-compliance may come from one the following several sources:

- 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).
- Permit Compliance Activities – Non-compliances may be discovered through Permit-required inspections or monitoring, including construction site inspections, dry weather screening, and stormwater sampling.
- 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).
- Reports from the Public – Public complaints may come directly to City or through other local, state or federal government agencies.

### **3. CONSTRUCTION SITE EROSION AND SEDIMENT ENFORCEMENT AND POST-CONSTRUCTION STORMWATER MANAGEMENT**

This section imposes the obligation of an applicant to perform their duties in an honest, diligent, and cooperative manner.

The following section describes the City's authority and the mechanisms for enforcing Permit provisions on construction sites within the boundaries of the City's MS4 jurisdiction.

#### **3.1 Compliance Requirements**

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

- Applicants are to comply with the State's NPDES CGP, City, and County permits for regulated construction projects, including the obligation to file NPDES CGP application 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.

#### **3.2 Construction Enforcement**

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:

- Severity of the violation: the duration, quality, and quantity of pollutants, and effect on public safety and the environment
- The violator's knowledge (either negligent or intentional) of the regulations being violated



- A history of violations and /or enforcement actions individual or contractor
- The potential deterrent value of the enforcement action

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. The recommended sequence of enforcement actions are detailed below.

### *3.2.1 Verbal Warning*

This action is a verbal exchange between an inspector or the resident engineer and the alleged violator. The information exchanged will be documented by the inspector and logged in to the City of Circle Pines' building permit inspection database. Typically, no letter is written if the problem is corrected immediately and the inspector or resident engineer observes the corrective action and deems it appropriate.

### *3.2.2 Notice of Violation*

A Notice of Violation (NOV) may be issued if the non-compliance continues for 7 days after the verbal warning is issued, if the non-compliance cannot be corrected while the inspector is on site, or if the non-compliance is a significant violation. The NOV will document the reasons why the discharge is illegal and will provide a deadline for compliance. Based on the type and severity of the non-compliance, the period between the verbal and NOV may not wait the full 7 days. Compliance is required within 7 days to avoid additional enforcement actions; however, if the situation warrants, a shorter or longer deadlines may be permissible. A sample letter to violators is provided in Appendix A.

### *3.2.3 Stop Work Order*

If the verbal and NOV do not result in corrective action by the documented deadline, the City may stop work (full or partial shutdown) at the construction site. Upon successful corrective action in response to a stop work order and upon approval by the City, work may begin at the site. Example Stop Work Orders are provided in Appendix B.

### *3.2.3.1 Temporary Suspension of Work*

If immediate action is required due to an imminent threat of discharge or if the contractor does not respond to the warning letter within the required time frame, the City may temporarily suspend work on the project until the corrective action has been completed.

### *3.2.3.2 Require Corrective Action*

The City may require the permit holder to undertake corrective or remedial action to address any release, threatened release, or discharge of the hazardous substance, pollutant or contaminant, water, wastewater, or stormwater.

### *3.2.3.3 Revocation of Permit*

The City may revoke any permit issued to the permit holder if corrective action is not completed by the documented deadline.

### *3.2.3.4 Abatement*

The City may correct the deficiency or hire a contractor to correct the deficiency if corrective action is not completed by the documented deadline. The issuance of a permit constitutes a right-of-entry for the City or its contractor to enter the construction site for the purpose of correcting deficiencies in erosion control. If the City corrects the deficiency or hires a contractor to correct the deficiency, the City may require reimbursement to the City for all costs incurred in correcting stormwater pollution control deficiencies, pursuant to the City Code.

## 4. ILLICIT DISCHARGES AND CONNECTION ENFORCEMENT

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.

Similarly to the process in **Section 3.2**, 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.

### 4.1 Verbal Warning

When a routine inspection of the drainage system identifies an illegal connection/discharge to the City's MS4 system, the inspector documents the discharge on a IDDE Inspection Form or in their City electronic management system, which will be provided to the City Engineer within 48 hours, as well as notify other departments and agencies as appropriate.

If the source of the connection is evident, the observer/inspector will contact the connector/discharger directly by phone or in person to discuss elimination. The communication will include requesting any permits or other authorizations and providing a follow up date (within 15 days). If the discharge is permitted or authorized (documentation is required), no further action is required; if the discharge is not authorized, it will need to be addressed or ceased within 15 days.

### 4.2 Written Warning

If after 15 days of the verbal warning the illicit connection/discharge has not been corrected, the Public Works Director will issue a "Notice of Illegal Discharge and Demand for Corrective Action" letter to the property owner (example letter in Appendix C). The letter will request that the connection/discharge be ceased or removed within 30 days. A follow up inspection will be performed by a City staff member to ensure compliance. If the connection/discharge has not been corrected, the incident will be referred internally to the City Engineer for further review.

### 4.3 Removal of Connection/Discharge

The City may remove the illegal connection/discharge if it has not been corrected within a

suitable timeframe. If the City removes the illegal connection/discharge, the responsible party is subject to civil action for damages.

## 4.4 Civil Action

If the illegal connection/discharge is not corrected within 60 days of observation, the City Engineer may forward the matter to be considered for further legal action. Additional measures will be escalated as needed to achieve compliance.

### 4.4.1 *Minnesota Pollution Control Agency*

Authority to administer the state MS4 permit in Minnesota rests with the MPCA. The MPCA has several enforcement mechanisms for violations of NPDES rules, including fines.

### 4.4.2 *United States Environmental Protection Agency*

Although the USEPA delegated authority for the NPDES Program to the state of Minnesota, the USEPA reserves the authority to apply fines in addition to fines issued by the MPCA. Federal environmental regulations based on the Clean Water Act allow the USEPA to levy fines on dischargers of up to \$27,500 per day per violation.

## 5. EMERGENCY RESPONSE CONDITIONS

The City's MS4 Permit identifies "discharges from emergency situations where federal rules specify washing as the preferred method to assure public safety" as an authorized non-stormwater discharge. Discharges or flow from firefighting activities and other discharges authorized by the City and/or State Duty Officer that are necessary to protect public health and safety are not subject to enforcement action.

## 6. REPORTING REQUIREMENTS

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.

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).
6. Date(s) violation(s) resolved.



# Enforcement Response Plan

## APPENDIX A NON-COMPLIANCE NOTICE TO CONTRACTOR



**CITY OF CIRCLE PINES  
NON-COMPLIANCE NOTICE**

FROM: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

You are hereby notified            tests,    inspection indicates that the  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Does not conform to permit/city code requirements for discharges to the city's MS4 system.





# Enforcement Repsonse Plan

## APPENDIX B STOP WORK ORDER



# Stop Work Order



City of Circle Pines  
200 Civic Heights Circle  
Circle Pines, MN 55014

Ph: (763) 784-5898

Address: \_\_\_\_\_

Stop Work Notice Number: \_\_\_\_\_ Date: \_\_\_\_\_

Notice given to: \_\_\_\_\_

Notice posted at: \_\_\_\_\_

As authorized by the Circle Pines City Code: Section 1350: Stormwater Management and the City's Engineering Design Guidelines, you are hereby directed to stop all construction work for the following reasons:

Name: \_\_\_\_\_

Inspector

Signature: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell: \_\_\_\_\_

Email: \_\_\_\_\_

**Do not remove this notice until authorized by the City of Circle Pines**

## DO NOT PROCEED

**WITH THIS JOB UNTIL THE ABOVE HAS BEEN APPROVED FOR  
CORRECTION BY A MEMBER OF THE CITY STAFF**



# Enforcement Repsonse Plan

## APPENDIX C NOTICE OF ILLEGAL DISCHARGE AND DEMAND FOR CORRECTIVE ACTION



## NOTICE OF ILLEGAL DISCHARGE OR CONNECTION

Person or Business Name

Address

Circle Pines, MN

Dear Property Owner:

The City of Circle Pines is responsible for maintaining the storm sewer system. The Minnesota Pollution Control Agency (MPCA) Municipal Separate Storm Sewer System General Permit requires the City to control the amount of pollutants entering the drainage system. Part of this charge is the detection and elimination of illegal discharges or connections to the system that may contain pollutants or are otherwise not allowed. Left uncorrected, any pollutants entering the system will ultimately impact nearby streams, as storm drainage is not treated at any sort of treatment facility. Any discharge/connection without permission is illegal and requires immediate termination of the discharge.

An inspection of the drainage system has occurred in the vicinity of your property and an illegal connection/discharge was discovered entering into the City system. The discharge/connection was discovered on <insert date> at <insert business name and address>.

Indicators or Source include piping and staining.

Photographs of this discharge/connection are enclosed with this letter. In addition, I have enclosed an aerial photograph showing the location of this discharge/connection.

This discharge or connection must be ceased or removed within 30 days. A follow-up investigation will be conducted after that time to ensure compliance. If the situation is not corrected, the City will take corrective measures, including but not limited to referring this matter to the MPCA so that enforcement action can be taken, which may include the issuance of a fine. In the alternative, the City may remove the discharge/connection and bill you directly pursuant City Code: Chapter 1360 – Regulation of Discharge into Storm Sewer System. If the illegal discharge/connection cannot be removed within 30 days, you do not understand this notice, or you disagree that an illegal discharge/connection exists at your property, please contact me with further details or explanation by calling [REDACTED].

Sincerely,

Chandra Peterson  
Assistant City Administrator for Public Services  
City of Circle Pines  
200 Civic Heights Circle  
Circle Pines, MN 55014

Enclosure (photographs)

Cc:

# City of Circle Pines 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

Name	Title	Department	Phone	Email
Patrick Antonen	City Administrator	Administration	763-231-2605	PAntonen@ci.circle-pines.mn.us
Chandra Peterson	Asst. City Administrator for Public Services	Administration	763-231-2611	CPeterson@ci.circle-pines.mn.us

## Schedule

Month	Topic	Month	Topic
<i>January</i>	Salt Use	<i>July</i>	Smart Irrigation
<i>February</i>	Pet Waste	<i>August</i>	Invasive Species
<i>March</i>	Illicit Discharge	<i>September</i>	Pet Waste
<i>April</i>	Adopt a Drain	<i>October</i>	Leaves
<i>May</i>	Landscaping	<i>November</i>	Salt Use
<i>June</i>	Fertilizers	<i>December</i>	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 a [list of certified contractors](#).

- **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 [Anoka County Household-Hazardous-Waste-Facility](#) at 763-324-3400.
- 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 for keeping 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 \(state.mn.us\)](https://www.state.mn.us/pest/)



## 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 the 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:

- 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 a [list of certified contractors](#).
- **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

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## Procedures

Identifying Priority Topics  
Distribution of Educational  
Materials  
Implementation of Educational  
Program  
Documentation

## Minimum Control Measure 1 Public Education and Outreach

### 1.1 BASIS FOR THE STANDARD OPERATING PROCEDURES (SOPS)

The MS4 General Permit requires the City of Circle Pines (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.

This manual not only assists the City of Circle Pines in meeting the MS4 Permit regulations, but encourages them to use targeted best management practices (BMPs) to prevent the discharge of pollutants to stormwater. This Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Circle Pines' ponds, creeks, and lakes.

### 1.2 OBJECTIVES OF THE SOP

This manual is intended to provide guidance on Public Education & Outreach:

- Provide guidance to the City regarding the permit requirements for public education and outreach.
- Provide guidance to the City for implementing a public education program.
- Provide tools for tracking and documenting efforts towards achieving the goals for public education and outreach.



# Standard Operating Procedure

## 1.3 IDENTIFYING PRIORITY TOPICS

The City of Circle Pines has identified potential priority topics for public education, outreach, and participation, primarily based on land use and overall population demographic. 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
- Promoting adoption of residential best management practices (BMPs)
- Yard waste

The City of Circle Pines is recommended to evaluate their high priority education topics at least once during each five-year permit term, and update as needed.

## 1.4 DISTRIBUTION OF EDUCATIONAL MATERIALS

The City of Circle Pines has identified a variety of opportunities to distribute educational materials to their residents and business owners. 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.

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 an annual newsletter and twice-yearly utility bill inserts. The City is recommended to evaluate the distribution methods used annually during the permit term, and update as needed.

## 1.5 IMPLEMENTATION OF EDUCATIONAL PROGRAM

The City of Circle Pines has an educational program implementation method in place, consisting of:

- a. Identification of a target audience
  - Residents
  - Businesses
  - Low-income residents
  - People of color
  - Non-native English-speaking residents
- b. Designation of the responsible person(s) in charge of overall plan implementation
  - Assistant City Administrator for Public Services
- 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. An annual evaluation to measure the extent to which measurable goals for each target audience are attained.

## 1.6 DOCUMENTATION

The City of Circle Pines has a procedure to document the public education and outreach program. The City is recommended to evaluate and assess 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.
- f. All information required under the City's education and outreach plan.
- 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.

### Process

- a. After an educational document or event is disturbed or held, record brief information of the document disturbed within the City's SWPPP tracking Excel table to help expedite the annual reporting process as well as the evaluation of the program's effectiveness. Table 1 contains simple attributes that can be used in the database.
- b. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.



# Standard Operating Procedure

Table 1. Example of Public Education & Outreach Tracking Table

<b>Description of Activity:</b>	<b>Type of Material:</b> brochure, newsletter, utility bill insert, newspaper ad, radio ad, television ad, cable access channel, stormwater-related event, school presentation/project, website, other	<b>Circulation/Audience:</b> residents, business owners, developers, industrial, students, other	<b>Date of Activity:</b>
<i>Ex: Spring grass clippings sweep up reminder and memo</i>	<i>City newsletter insert</i>	<i>Residents – 65,000 Business owners – 3,000</i>	<i>4/2/2022</i>

The City of Circle Pines 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.



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## Procedures

Implementation of Public  
Participation/Involvement  
Program  
Documentation

## Minimum Control Measure 2 Public Participation and Involvement

### 2.1 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 Circle Pines to develop written procedures for the purpose of developing and implementing a public education program that informs 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 of Circle Pines in meeting the MS4 Permit regulations but encourages them to use targeted best management practices (BMPs) to prevent the discharge of pollutants to stormwater. This Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Circle Pines ponds, creeks, and lakes.

### 2.2 OBJECTIVES OF THE SOP

This manual is intended to provide guidance on Public Participation & Involvement:

- Provide guidance to the City regarding the permit requirements for public participation and involvement.
- Provide tools for tracking and documenting efforts towards achieving the goals for public participation and involvement.

## 2.3 IMPLEMENTATION OF PUBLIC PARTICIPATION/INVOLVEMENT PROGRAM

The City of Circle Pines has a public participation/involvement program implementation method in place, consisting of:

- Designation of the responsible person(s) in charge of overall plan implementation
- Specific activities and schedules to reach measurable goals for each target audience
- A description of any coordination with and/or use of other stormwater education and outreach programs being conducted by other entities, as applicable

### Process

- a. The City of Circle Pines 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 that meeting.
- b. The City will provide public access to the SWPPP, annual reports, and other documentation intended to support the SWPPP through:
  - A hard copy upon request
  - Available at a public event
- c. The City will consider oral and written input submitted by the public to the City, regarding the SWPPP.
- d. The City shall provide the following public involvement activities:
  - Cleanup event

## 2.4 DOCUMENTATION

The City of Circle Pines has a procedure to document the public participation and involvement program. The City is recommended to assess the effectiveness of the program annually, during the permit term. 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 as a result of written input received.
- c. Dates, 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.

### Process

- a. After a public involvement event is held, record brief information of the document disturbed within the City's SWPPP tracking Excel table to help expedite the annual reporting process as well as the evaluation of the program's effectiveness. Table 2 contains simple attributes that can be used in the database.
- b. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.



# Standard Operating Procedure

Table 2. Example of Public Participation & Involvement Tracking Table

Description of Activity:	Date of Activity:	Description of Any Input Received:
<i>Ex: Annual public meeting, combined with City Council meeting</i>	4/2/2022	None

The City of Circle Pines 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

### For More Information

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### Possible Pollutants

Organics  
Chemicals  
Fuel

### Procedures

Locating Priority Areas  
Review of Available Information  
Mapping Verification Process  
Detection Process  
Citizen Call-In Program  
Tracking of Illicit Discharges  
Opportunistic Illicit Discharge  
Observation  
Training

### Appendices

Appendix A – Definitions  
Appendix B – IDDE Guidance  
Appendix C – IDDE Fact Sheet  
Appendix D – Spill Response Plan

### 3.1 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 Circle Pines 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 Circle Pines in meeting the MS4 Permit regulations but encourages them to use targeted best management practices (BMPs) to prevent the discharge of non-stormwater related discharges. This Standard Operating Procedures Manual will help promote behavior to improve the water quality of the City of Circle Pines' ponds, creeks, and lakes.

### 3.2 OBJECTIVES OF THE SOP

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

- Provide guidance to municipalities regarding commonly found illicit discharges.
- Provide guidance to municipalities for prioritizing areas where illicit discharges are commonly found.
- Provide 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.
  - 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 detecting, tracking, and eliminating illicit discharges.

## 3.3 LOCATING PRIORITY AREAS

A map has been provided within the SWPPP that identifies potential priority areas for detecting illicit discharges based on land use. The methodology for further establishing priority areas is detailed in Section 3.3.1 “Review of Available Information”. The City of Circle Pines is recommended to complete the prioritization at least once during each five-year permit term. The City of Circle Pines will use the Assistant City Administrator for Public Services as the responsible person(s) for investigating, locating, and eliminating an illicit discharge.

### 3.3.1 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, restaurant discharge including grease, cleaning solution, grass clippings, fertilizer, pesticides, salt, spills and dumping (Appendix A).

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

- Ordinance

#### Preparation

The following is a list of resources that should 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. The City will target these industrial based land uses and inspect the outfalls within these areas at least annually. As appropriate, commercial areas including bars, restaurants, grocery stores, shopping malls, automobile shops, carpet cleaners, ready-mix and bituminous plants, and sand and gravel pits may be targeted for illicit discharges.

*b. Locations of Previous Illicit Discharges*

Areas with historical illicit discharge reports or previous citizen complaints may be considered as high priority. The City of Circle Pines currently does not have areas of known illicit discharges.

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:

- a. Land uses associated with business/industrial activities.
- b. Areas where illicit discharges have been identified in the past.
- c. Areas with storage of significant materials that could result in an illicit discharge.

*c. High Density of Known Outfalls per Stream Mile*

Areas with a high density of outfalls are considered high priority. These outfalls within the City of Circle Pines are within the industrial base land use of the City and will be inspected annually.

*d. Age of Infrastructure/Development*

Older areas of the community could be considered a high priority if regular IDDE action is needing to take place in these locations. Currently the City does not consider these a high priority.

*e. Location of Public Sanitary Sewer/Age of Sewer/Date of Separation*

Older areas that were put on public sewer or separated long ago should be considered high priority. No areas in the City exist where sewer was combined where illicit discharges may be present.

*f. Location of Areas on Septic Systems*

Older areas on septic systems should be considered high priority.

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 MS4
- All receiving waters

*g. Water Quality Information*

Areas with poor water quality should be considered high priority.

*h. Areas that Drain to Public Beaches*

These areas should be designated as high priority for public health and economic reasons.



## Documentation

The City of Circle Pines shall maintain a written or mapped inventory of priority areas the City identifies as having a higher likelihood for illicit discharges.

Collect dry weather inspection information whenever possible. Dry weather discharge information can either be collected on the paper forms for manual entry into a separate database later or can be directly entered into a database on a laptop or the data logger on-site.

## 3.4 DETECTION PROCESS

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 or in response to MCM 6 inspections. 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 will be recorded using the appropriate form and documented using the City's designated SWPPP tracking system within the network electronically at the end of the day.

Most public works crews conduct their regular duties in and around the storm drain system. A Program Manager may elect to have crews conduct IDDE inspections on a formal basis (bringing an inspection form and equipment) while performing other municipal 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 without an inspection form available, 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. Both the IDDE Guidance (Appendix B) and IDDE Fact Sheet (Appendix C) can be used to assist in the detection process.

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 to the municipality. A single technique may be used, or several techniques may need to be combined to identify the source of the discharge. The three types of discharges are as follows:

- a. 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, or eliminate before they occur, transitory discharges is through 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 (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 less likely to be discovered and are more difficult to trace and remove because they generally occur on private property and require probable cause and/or a search warrant for further investigation. 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: 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 a potential source location was identified during the initial observation. Investigative techniques are as follows:

- a. 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.
- b. 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 sandbag), 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.

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

## 3.5 CITIZEN CALL-IN PROGRAM

### Activities and Definition

A citizen call-in program is an effective way to identify illicit discharges. To maximize the effectiveness of citizen call-ins, dispatch personnel should be instructed on the use of the IDDE inspection form to collect as much information as possible at the time of the report. If the report is a result of a spill or emergency the caller should be directed to call 911. Spill response procedures can be found in Appendix D. Dispatch personnel should also be instructed as to where to direct the information gathered from the tracking sheet so that appropriate action is taken.

### Preparation

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

### Process

- a. The City of Circle Pines will utilize IDDE inspection form to collect the appropriate information from the caller under the “Citizen Compliant” section of the form. This information should get transferred to the Program Manager for non-hazardous spills and investigated.
- b. The Fire Chief should be contacted for hazardous spills or emergency situations.
  - a. Promptly investigate reported incidents.
  - b. If an illicit discharge of unknown source is confirmed, follow the procedure of tracing illicit discharges.
  - c. If an illicit discharge known source is confirmed:
    1. For Non-Emergency Situations inform the violator that the illicit discharge needs to discontinue. This may require fixing a cross-connection, incorporating Best Management Practices, repairing a faulty piece of equipment, etc.
    2. For Spills and Emergency Situations: Follow the City’s Spill Response Plan (Appendix D).

## 3.6 OPPORTUNISTIC ILLICIT DISCHARGE OBSERVATION

### Activities and Definition

The opportunity to locate and document illicit discharges can occur during normal work activities by any of the City staff or inspectors. By offering the proper training to appropriate city employees and inspectors, they will be ready to actively locate illicit discharges and respond in the proper manner to issue penalties and make sure appropriate cleanup occurs.

### Preparation

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

### Process

- a. Call the appropriate authority (i.e., department head, stormwater specialist, or a supervisor).
- 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 personnel will complete the following:
  1. Complete the IDDE inspection form and save for records.
  2. Obtain sample for visual observation and complete and outfall inspection form, if applicable.
  3. Follow the procedure of IDDE – Detection Process.
- 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.
  2. For Spills and Emergency Situations: follow the City's Spill Response Plan (Appendix D).

### Documentation

- a. File all completed forms in the City's SWPPP program network system.
- b. Document any further action taken.

## 3.7 TRACKING ILLICIT DISCHARGES

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. Enforcement actions taken for illicit discharges

### Process

- a. Circle Pines will use a system to track illicit discharges that is attached to the City's overall SWPPP program. Table 3 contains simple attributes that can be used in the database.
- b. The City of Circle Pines shall maintain written procedures for investigating, locating, and eliminating the source of illicit discharges. The procedures shall include:
  - A timeframe in which the City will investigate a reported illicit discharge
    - Reports of illicit discharges are investigated as soon as possible, but within one business day.
  - Use of visual inspections to detect and track the source of an illicit discharge
  - Tools to investigate and locate an illicit discharge.
- c. Tools to investigate and locate an illicit discharge shall include:
  - Mobile cameras
  - Collecting and analyzing water samples
  - Smoke testing
  - Dye testing
- d. Each illicit discharge will be linked to a GIS shapefile within the City's mapping system. Linking to GIS data allows mapping of illicit discharge locations, citizen complaint locations, and many other IDDE issues will assist greatly in the overall program.
- e. The City's tracking system will allow the City to evaluate the overall IDDE program and expedite the annual report to the MPCA.
- f. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.



# Standard Operating Procedure

## Documentation

The City of Circle Pines shall document the following relating to MCM 3:

- a. Date(s) and location(s) of IDDE inspections conducted.
- b. Reports of alleged illicit discharges received, including date(s) of the report(s), and any follow-up action(s) the City takes.
- 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).
- f. Action(s) the City takes, including date(s), to address discovered illicit discharges.

## Standard Operating Procedure

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

## 3.8 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. Staff will be trained through in-person presentations and training documents.

Training of field staff will as well 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:*  
Including 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 control requirements and associated BMPs.
- c. *Field Staff (Police, Fire Department, Public Works, Parks Staff):*  
Identification, investigation, termination, cleanup, and reporting of illicit discharges.
- d. *Office Staff:*  
Illicit discharge reporting.
- e. *Field and Other Staff:*  
Implementation of the construction and post-construction stormwater management program, including permitting, plan review, inspections, and enforcement.

### Documentation

The City of Circle Pines shall document training relating to the permit including the following:

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



## 3.9 ENFORCEMENT RESPONSE PROCEDURE

### Activities and Definition

To the extent allowable under state or local law, the City of Circle Pines 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 Circle Pines 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. Criminal action
- d. Civil penalty

### Documentation

The City of Circle Pines 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.

## 3.10 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.

Sargent, D. and W. Casonguay. 1998. An Optical Brightener Handbook. Prepared for: The Eight Towns and the Bay Committee. Ipswich, MA. Available at:  
<http://www.naturecompass.org/8tb/sampling/index.html>.

Waye, D. 2003. A New Tool for Tracing Human Sewage in Waterbodies: Optical Brightener Monitoring. Northern Virginia Regional Commission. Annandale, VA. Available online  
[http://www.novaregion.org/pdf/OBM\\_Abstract2.pdf](http://www.novaregion.org/pdf/OBM_Abstract2.pdf).

**Authorized Enforcement Agency:** the City of Circle Pines.

**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-stormwater 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.

**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-stormwater 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).

**Inlet:** The location at which the water enters the holding area (i.e. stormwater detention pond).

**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) Stormwater Discharge Permit:** 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 prop, or general area-wide basis.



**Non-Stormwater Discharge:** Any discharge to the storm drain system that is not composed entirely of stormwater.

**Outfall:** The point source where a municipal separate storm sewer system discharges to a receiving water, or the stormwater discharge permanently leaves the permittee's MS4. It does not include diffuse runoff or conveyances that connect segments of the same stream or water systems (e.g., when a conveyance temporarily leaves an MS4 at a road crossing).

**Outlet:** The location at which the water leaves the holding area (i.e. stormwater detention pond).

**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.

**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 stormwater 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.

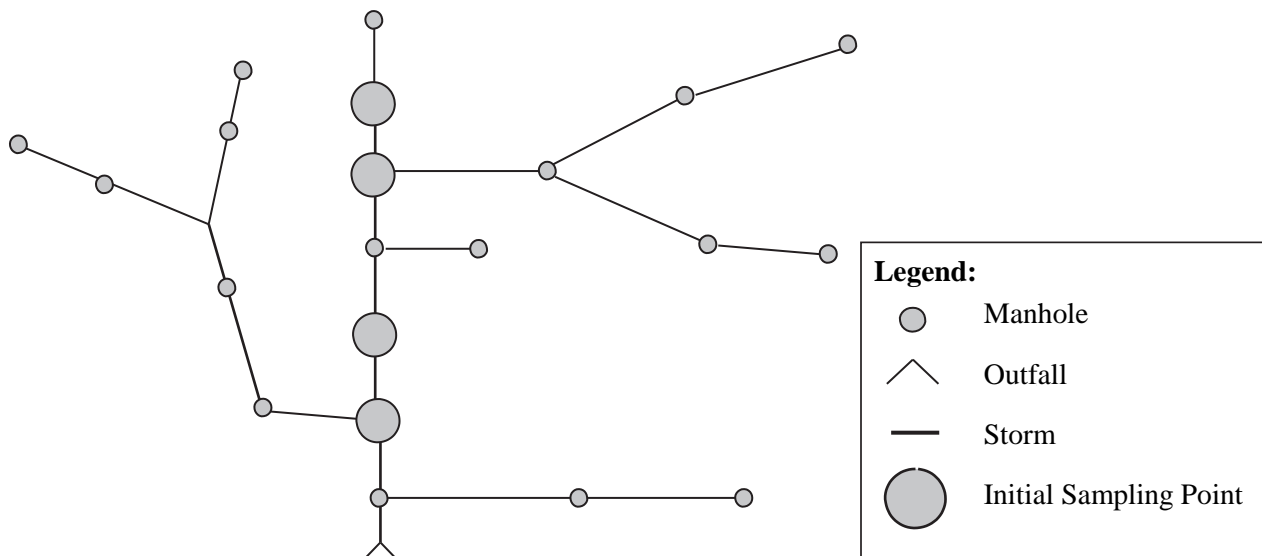
**Stormwater Pollution Prevention Plan:** A document which describes the best management practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater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

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



It is necessary to understand the various tracing techniques and limitations 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:

- a. **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.



- b. **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.

Parameter	Threshold	Source
Ammonia	>0.1 mg/L	Brown et al (2004)
E. coli	>235 CFU/100 ml (grab sample)	EPA (1986)
Total coliform	>10,000 CFU/100 ml (grab sample)	California state standard (Dorfman and Rosselot, 2011)
Fluoride	>0.25 mg/L	Brown et al (2004)
Detergents	>0.25 mg/L	Brown et al (2004)
Potassium	>6 ppm	Guidance extrapolated from Lilly and Sturm (2010)

Table 1. Threshold Levels for Screening Parameters Used in Illicit Discharge Surveys

This table was taken from the 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. Environmental Protection Agency 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.

- c. **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 the 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).
- d. **Optical brightener monitoring traps:** Optical brightener monitoring (OBM) traps can be used to trace intermittent or transitory discharges that result from wash water 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 wash water 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.

- e. 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 occurs 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.

- f. 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. The following 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.
  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.
- g. 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 residents can call to relay any particular health concerns (e.g., chronic respiratory problems)



Federal regulations define an illicit discharge as “...any discharge to an MS4 that is not composed entirely of stormwater...” with some exceptions. These exceptions include discharges from NPDES-permitted industrial sources and discharges from fire-fighting activities. Illicit discharges are considered “illicit” because MS4s are not designed to accept, process, or discharge such non-stormwater wastes.

Illicit Discharges enter the system through either direct connections (e.g., wastewater piping connected to storm drains) or indirect connections (e.g., cracked sanitary systems, spills collected by storm drains, or paint or used oil dumped into a storm drain). The result is untreated discharges that contribute to high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health (USEPA, <http://water.epa.gov/polwaste/npdes/stormwater/upload/fact2-5.pdf>).

Some sources of illicit discharge include:

- Sanitary wastewater
- Sediment from construction site runoff
- Car wash wastewater
- Landscape waste
- Paints, solvents
- Used oil, grease
- Cleaning products
- Spills from accidents
- Illegal connections to the storm sewer system



Laundry, washwater



Petroleum, oil, solvents



Chemical release, sediment



Sediment from construction



Illegal dumping



Washwater, chemical



Concrete, mortar rinse water





# Standard Operating Procedure

## Spill Response Plan – Appendix D

### EMERGENCY CONTACT INFORMATION

<i>Onsite Emergency Contact(s)</i>	Rich Lavell – Public Works Superintendent (763) 231-2606
	Chandra Peterson – Asst. City Administrator (763) 231-2611
<i>Emergency Response Contact(s)</i>	Fire/Paramedics/Police: 911 Fire Non-Emergency Line: (651) 792-7900 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, insure 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.



## For More Information

Chandra Peterson  
200 Civic Heights Circle  
Circle Pines, MN 55014  
(763) 231-2611  
cpeterson@ci.circle-pines.mn.us

## Possible Pollutants

Sediment  
Erosion  
General Housekeeping

## Procedures

Plan Review  
Training  
Inspections  
City Projects Erosion and Sediment  
Control BMPs  
Private Projects  
Private Projects Long-Term  
Operation and Maintenance

## Appendices

Appendix A – Construction Site  
Guidance  
Appendix B – Detail Plates  
Appendix C – Erosion and Sediment  
Control Reminder Handout  
Appendix D – Individual Lot  
Erosion and Sediment Control

## Minimum Control Measure 4 Construction Erosion and Sediment Control

### 4.1 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 Circle Pines to develop written procedures for the purpose of eliminating pollutants associated with construction activity due to new development and redevelopment on projects with land disturbance that meets the following:

- All projects either creating or disturbing 1 acre or greater of new impervious will require the submittal of a Stormwater Management Plan.
- All projects disturbing less than 1 acre and down to 10,000 square feet or will result in more than 200 cubic yards of cut or fill are only required to develop an erosion control plan.

This manual assists the City of Circle Pines in meeting the MS4 Permit regulations, by incorporating guidance on the following:

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

## 4.2 OBJECTIVES OF THE SOP

This manual is intended to provide the following guidance on Construction Site Erosion and Sediment Control Stormwater Management:

- 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.

## 4.3 DEVELOPMENT PLAN REVIEW

### Activities and Definition

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

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

- Ordinances
- Permits
- Operational plans

### 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.
- b. The City of Circle Pines 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 Code, City's Engineering Design Standards for Stormwater Management, and the MPCA Construction General Permit.
- d. Reviews of submitted plans, will utilize a check list to insure accuracy.

### Process

The City's regulatory mechanism(s) 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. The regulatory mechanism(s) shall require the owners and operators of construction activity to keep site plans up to date regarding 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.



# Standard Operating Procedure

- f. Temporary sediment basins.
- g. Termination conditions.

The following additional processes shall be done:

- a. Building lots will be required to submit a Stormwater Pollution Prevention Plan (SWPPP).
- b. The City engineering and staff will review plans and for sites equal to or greater than one acre.
- c. The City of Circle Pines shall use of a written checklist, consistent with the requirements of the regulatory mechanism(s), to document the adequacy of each site plan required
- d. A check list will be used to ensure accuracy and thoroughness of submitted plans.
- e. The City will be responsible for enforcement of their stormwater rules.

## Follow-up

When plans are submitted by the applicant, the design staff will ensure that all comments are addressed before work can take place on site. The applicant shall address comments offered by the City prior to permit issuance. The City of Circle Pines has 60 days to make a final decision on a development or redevelopment review.

## Documentation

- a. Document each plan review completed within the City's SWPPP tracking Excel table to help expedite the annual reporting process.
  - 1. Project name.
  - 2. Location.
  - 3. Total acreage to be disturbed.
  - 4. Owner and operator of the proposed construction activity.
  - 5. Proof of notification to obtain coverage under the CSW Permit or proof of coverage under the CSW Permit.
  - 6. Any stormwater related comments and supporting completed checklist used by the City to determine project approval or denial.
- b. Keep copies of plans, BMP quantities, and proposed BMPs that will be available to the inspector.
- c. Keep a log of all maintenance agreements that are filed with the City.



## 4.4 TRAINING

### Activities and Definition

Training of City of Circle Pines staff will be important so that they are aware of the importance of good erosion and sediment control practices as well as techniques regarding the proper installation of post-construction stormwater BMPs. This includes knowledge in 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 the 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 following training components shall be documented:

- General subject matter covered.
- Name(s) and departments of individuals in attendance.
- Date of each event.

## 4.5 INSPECTIONS

### Activities and Definition

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

### Preparation

- a. Annually, identify priority sites for inspection based on topography, soil characteristics, type of receiving water, stage of construction, compliance history, or weather conditions.
- b. Ensure the name(s) of individual(s) or position title(s) responsible for conducting site inspections is the Consultant.
- c. Ensure staff has proper training pertaining to erosion and sediment control techniques.
- d. Refer to the construction site guidance document (Appendix A) and the City's BMP standard detail plates (Appendix B) to review proper installation techniques are being used.

### Process

- a. Identify sites that require an erosion and sediment control inspection.
- b. Prior to construction, the following erosion and control BMPs must be installed:
  1. A single rock construction entrance must be used for the entire entrance/exit of the site to eliminate tracking into streets
  2. Perimeter control:
    - i. Silt fence must be trenched
    - ii. Silt fence needed for 2:1 slopes or steeper inclines and behind sidewalk
    - iii. Filter logs may be used for curbside perimeter control and when slope is not an issue.
    - iv. Sodded buffer strip
  3. Inlet Protection
  4. Protection for rear lot catch basins
- e. Perform inspection using the City's construction ESC inspection form.
- f. 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.
- g. Document construction activities and follow up with site owner/City about findings from inspection.

1. If feasible, prior to leaving the site talk to the responsible person to ensure corrections can be made in a timely fashion.
  2. Send the Erosion Control Notice(s) to the permit applicant responsible.
- h. Perform a follow up inspection of site if deficiencies are found during initial inspection. Ensure that correction items have been completed.
- i. 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 Warning
  2. Notice of Violations
  3. Stop-Work Orders
  4. Revocation of permit and abatement

## Documentation

- a. The City of Circle Pines shall maintain written procedures for identifying high-priority and low-priority sites for inspection. At a minimum, the written procedures shall include:
1. Detailed explanation describing how sites will be categorized as either high-priority or low-priority.
  2. A frequency at which the City will conduct inspections for high-priority sites.
  3. A frequency at which the City will conduct inspections for low-priority sites.
  4. The name(s) of individual(s) or position title(s) responsible for conducting site inspections.
- b. 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):
1. Whether stabilization of exposed soils (including stockpiles) was done.
  2. Whether stabilization of ditch and swale bottoms was done.
  3. Whether storm drains have inlet protection.
  4. Whether energy dissipation at pipe outlets was done.
  5. Vehicle tracking BMPs.
  6. Whether the preservation of a 50-foot natural buffer or redundant sediment controls where stormwater flows to a surface water within 50 feet of disturbed soils was done.
  7. Owner/operator of construction activity self-inspection records.
  8. 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).
  9. BMPs maintained and functional.

- c. 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:
  1. Keep logs of number of inspections.
  2. Keep records of inspection reports and reports sent.
  3. Keep records of escalation of penalties.
    - i. Name of the person responsible for violating the terms and conditions of the City's regulatory mechanism(s)
    - ii. Date(s) and location(s) of the observed violation(s)
    - iii. Description of the violation(s)
    - iv. Corrective action(s) (including completion schedule) that the City issued
    - v. Referrals to other regulatory organizations (if any)
    - vi. Date(s) violation(s) resolved
- d. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.

## Noncompliance

The City of Circle Pines 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).

## 4.7 CITY PROJECTS EROSION AND SEDIMENT CONTROL BMPS

### Activities and Definition

City projects that involve excavation or filling, or a combination of excavation and filling, in excess of 50 cubic yards of material will use proper erosion and sediment control BMPS.

### Preparation

- a. Provide BMPS for City projects including: inlet protection, perimeter control, temporary and permanent stabilization methods.
- b. Ensure staff has University of Minnesota's erosion and sediment control certification and/or have been trained by a certified staff person on proper erosion and sediment control techniques.
- c. Refer to the construction site guidance document (Appendix A) and the City's BMP standard detail plates (Appendix B) to review proper installation techniques are being used.

### Process

- a. All qualified construction and land disturbing activities within the City should follow the City Code as well as the City's Engineering Design Standards for Stormwater Management.
- b. All construction projects that have the potential to impact the MS4 system or any natural resource will have BMPS available prior to construction activity.
- c. All perimeter control BMPS are required to be fixed, substituted, or enhanced if they are no longer working or sediment fills one-half (1/2) of the height of the BMP. This must be done by the end of the next business day or as soon as site conditions permit.
- d. Temporary or permanent sediment basins are required to be drawn down and have sediment removed when the depth of the captured sediment reaches one-half (1/2) the storage volume of the basin.
- e. Tracked sediment from the construction site entrance/exit is required to be removed from all paved surfaces both on and off site. This must be done as soon as possible or within 24 hours of being found.
- f. Install down gradient perimeter control where needed on the site.
- g. Provide inlet protection for adjacent inlets and outlets, to prevent sediment and debris from discharging into the storm sewer.

- h. Stabilize all exposed soil areas and stockpiles as soon as possible or upon completion of work. If work is not complete, temporary stabilization methods will be used if the work will not continue for more than 14 days, or 7 days depending on the discharge proximity to special/impaired waters.
- i. If any sediment reaches the MS4 system (including surface waters, drainage ditches, and conveyance systems, etc.), the sediment is required to be removed within seven (7) days after it is found.

### Documentation

- a. Keep a log showing that BMPs were inspected and properly maintained during the active construction period until the period where 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 in accordance with the NPDES Construction General Permit.
- c. Document maintenance performed on:
  - 1. Perimeter Control
  - 2. Inlet Protection
  - 3. Erosion Control BMPs
  - 4. Stabilization Performed
  - 5. Sediment Control BMPs
- d. 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.
- e. If applicable, document the final location of where the material was disposed and any paperwork received from the disposal location.
- f. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.

## 4.8 PRIVATE PROJECTS

### Activities and Definition

- a. Private projects that require a permit, as per the requirements set forth in the City Code 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 inspecting building permit activities. Engineering staff will be responsible for inspecting sites that require a state NPDES permit.
- b. The City of Circle Pines requires the submittal of a Stormwater Management Plan for all projects that require a grading, drainage, and erosion control permit.
- c. The City has staff that actively inspects construction sites throughout the City's jurisdiction.

### Process

- a. Any private project that will require a City permit will be given both the erosion and sediment control reminder handout (Appendix C) and the individual lot erosion and sediment control handout (Appendix D), depending on their applicability, to assist the City in proper BMP choice and use.
- b. All qualified construction and land disturbing activities within the City should follow the City Code and the City's Engineering Design Standards for Stormwater Management.
- c. 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 will use the City's ESC inspection form.

### Documentation

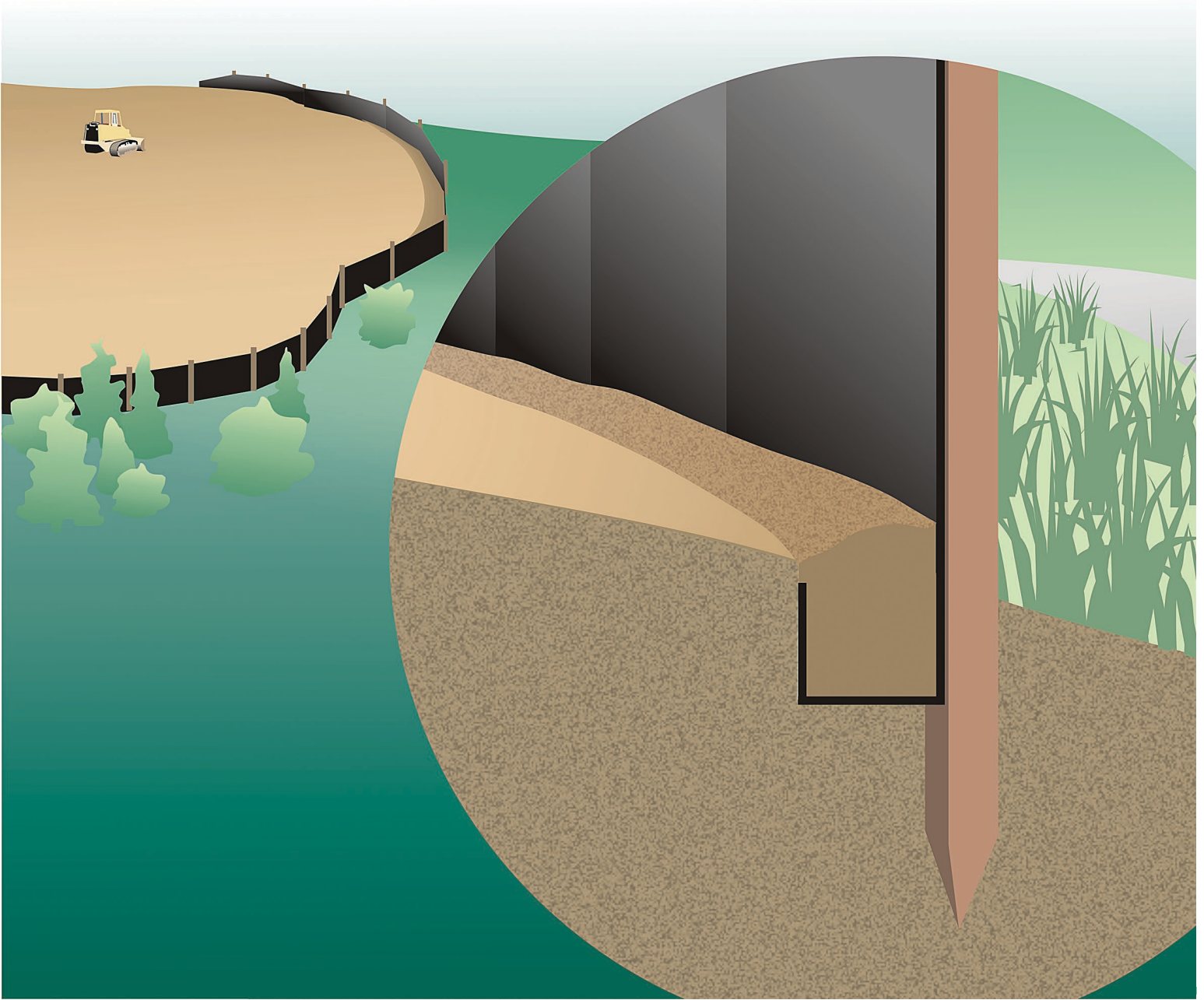
- a. Keep track of private project locations and obtain contact information for owners and operators on file at the City.
- b. Keep records of long-term maintenance agreements on file at the City.
- c. Keep records of inspection reports and reports sent.
- d. Keep records of any enforcement action(s) taken.



## Standard Operating Procedure

The City of Circle Pines 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.





# Stormwater Construction Inspection Guide - Appendix A

**m1** MINNESOTA POLLUTION  
CONTROL AGENCY

October 2018

## ***Acknowledgments***

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## ***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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# 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](https://rsp.pca.state.mn.us/TEMPO_RSP/Orchestrate.do?initiate=true).

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#### 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.

---

### 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).

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.

## 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](http://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.

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### **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).

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).

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.

---

### **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.

---

### **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.



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.

### 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.

---

### 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 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](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://metro council.org/Wastewater-Water/Planning/Water-Resources-Management/Water-Quality-Management-Key-Roles.aspx>

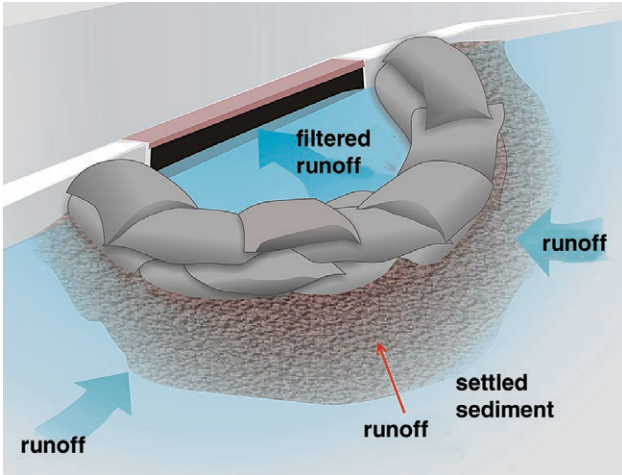
Both manuals provide details on the standards and specifications for installing and maintaining these and other stormwater BMPs.

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

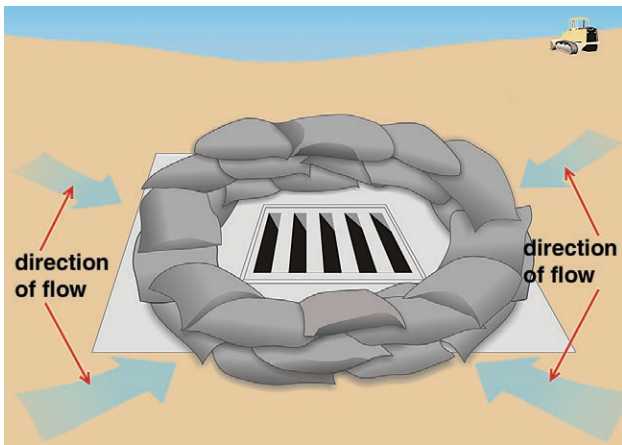
The BMPs in this list were selected because they are commonly found on construction sites disturbing less than five acres of soil.



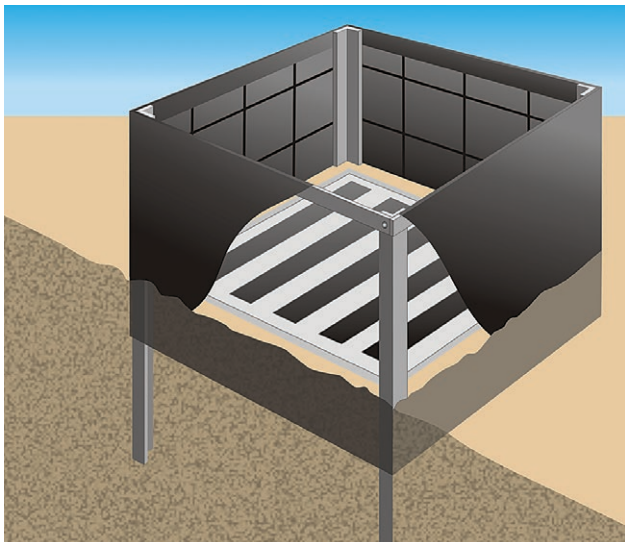




**Figure 1. Sand or gravel bags can be used to filter stormwater runoff before entering a catch basin. Commercial products are also available that fit in front of or inside the catch basin.**



**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 Permittee(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***

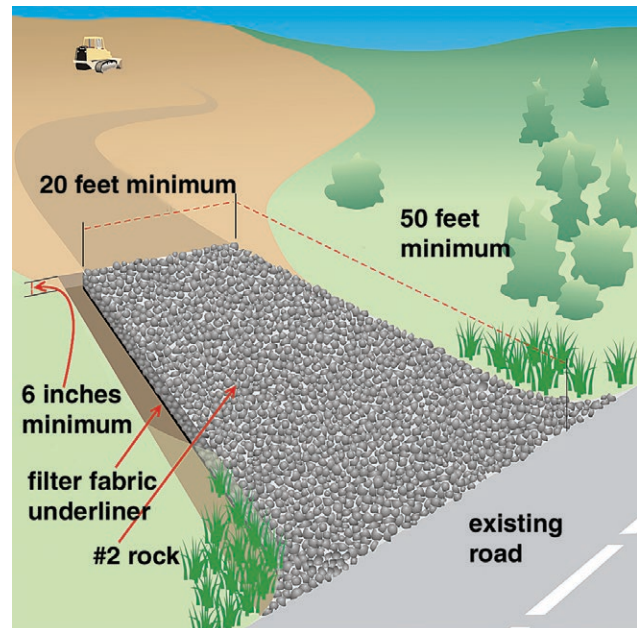
A rock construction exit can reduce the amount of sediment transported onto paved roads by vehicles. The construction exit does this by knocking mud off the vehicle tires before the vehicle enters a public road.

### **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).

### **Inspection tips:**

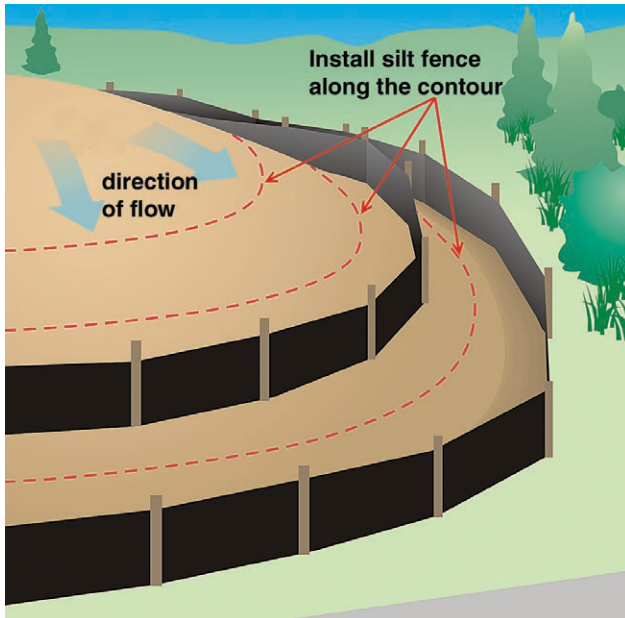
- ✓ Is there evidence of sediment tracking from the site? (Street sweeping may be necessary if sediment tracking is evident).
- ✓ Is there evidence that vehicles are leaving the site from other locations, and not using the designated construction exits?
- ✓ Does the aggregate need to be replaced or replenished?
- ✓ 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?



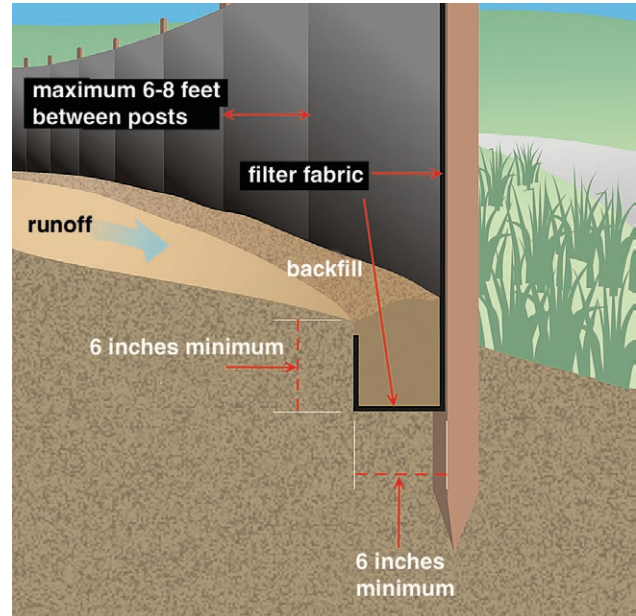
**Figure 4. Stabilized construction exit.**

## ***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**

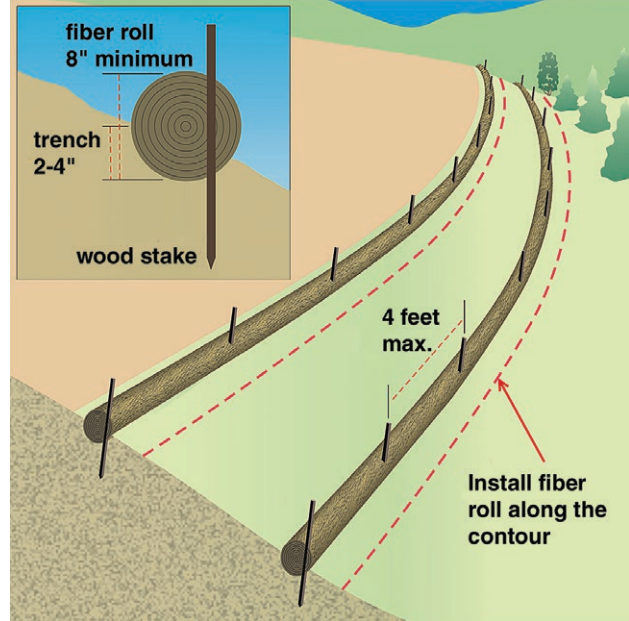
- Soil should be compacted after trenching.
- The stakes used to hold the silt fence must be on the down-slope side.

**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.



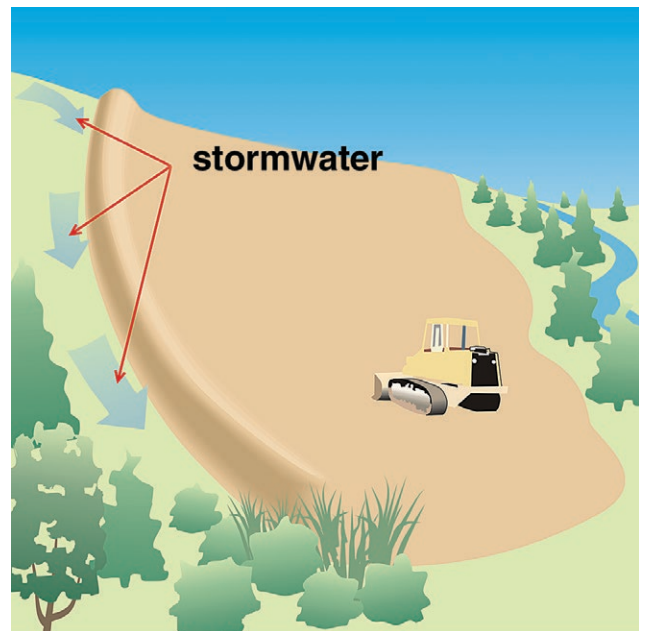
**Figure 8. Fiber roll installation and detail.**

***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:**

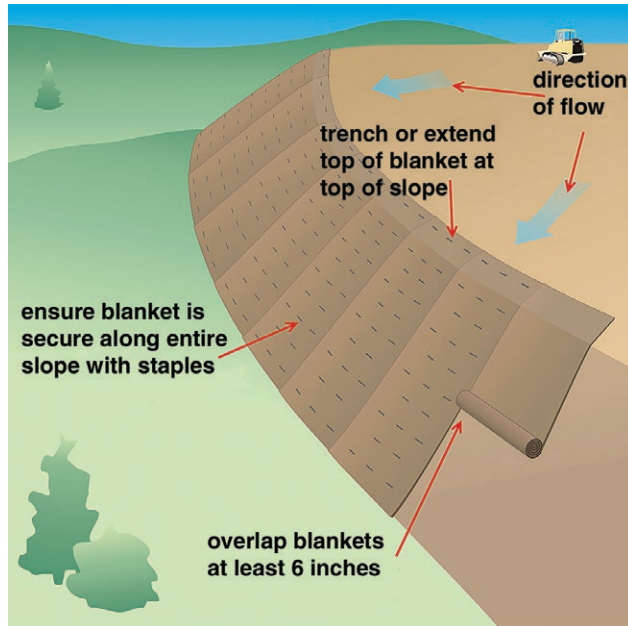
- ✓ Check to make sure the diversion discharges to a stable outlet or channel.
- ✓ Check to see if diversion ditches and berms have been seeded.
- ✓ Is the diversion eroding? (channel grades should be relatively flat).
- ✓ Check dams may be necessary if high velocity flows are present.



**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 temporarily or permanently ceased. Temporary stock piles without significant silt, clay or organic components and the constructed based components of the roads, paving 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 impervious 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.

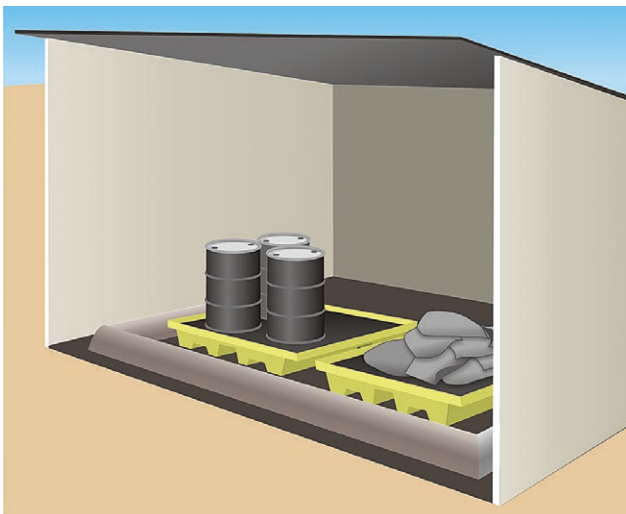
Permittees must first consider volume reduction practices on-site (e.g., infiltration or other) when designing the permanent stormwater treatment system. If the permit prohibits infiltration, permittees may consider a wet sedimentation basin, filtration basin or regional pond.

- *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 liner. A compacted clay liner that does not allow washout liquids to enter ground water is considered an 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](http://www.pca.state.mn.us/publications/wq-strm2-10.pdf)

### **MPCA Minnesota Stormwater Manual**

[www.pca.state.mn.us/water/stormwater/stormwater-manual.html](http://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](http://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](http://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://metro council.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](http://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](http://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

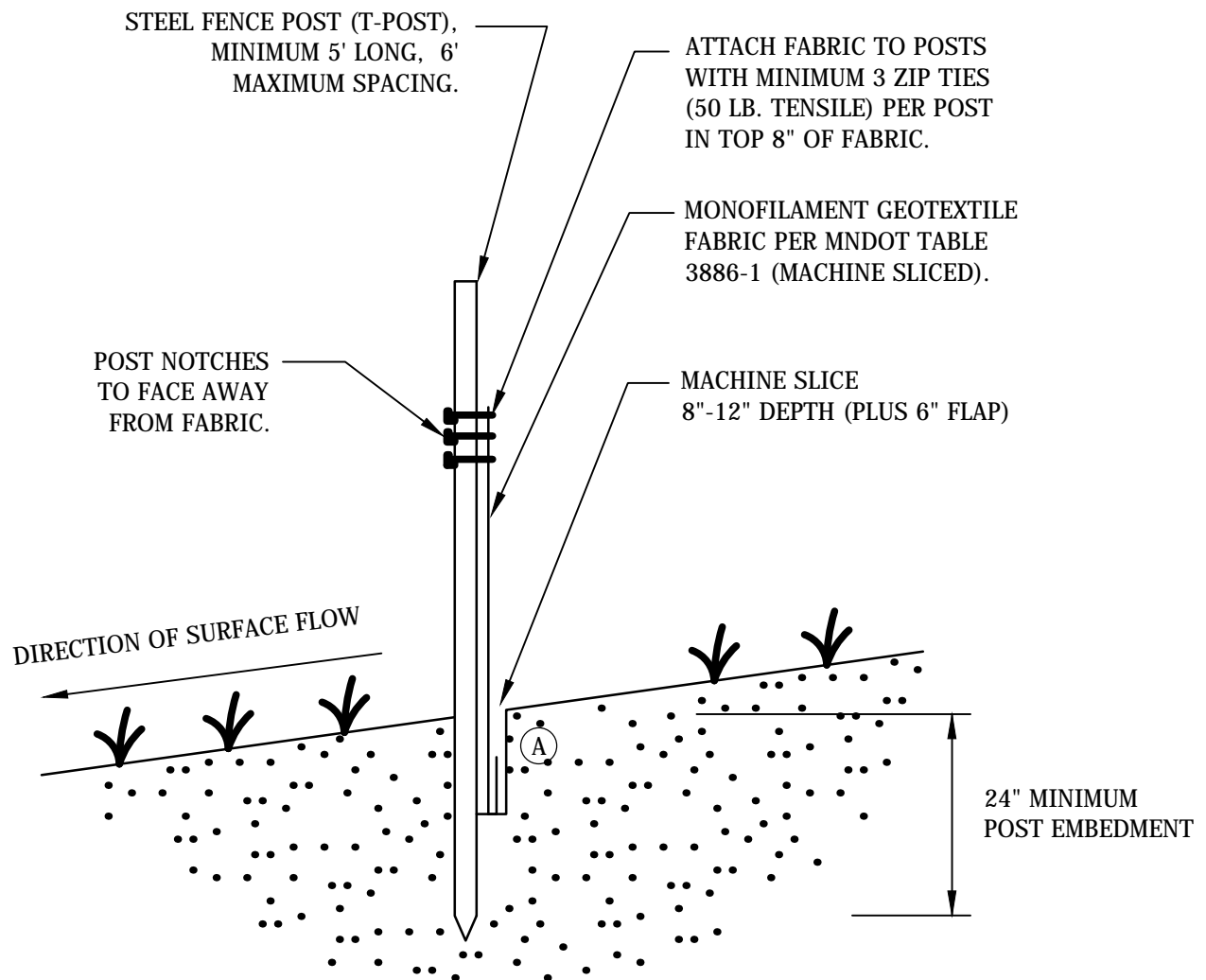
Observations:

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:





**NOTE:**  
THE MACHINE SLICED METHOD (THIS DETAIL) IS THE STANDARD SILT FENCE INSTALLATION METHOD. HEAVY-DUTY (ERO-1B) OR STANDARD (ERO-1C) SILT FENCE INSTALLATION METHODS SHOULD ONLY BE USED WHEN APPROVED OR DIRECTED BY THE CITY.

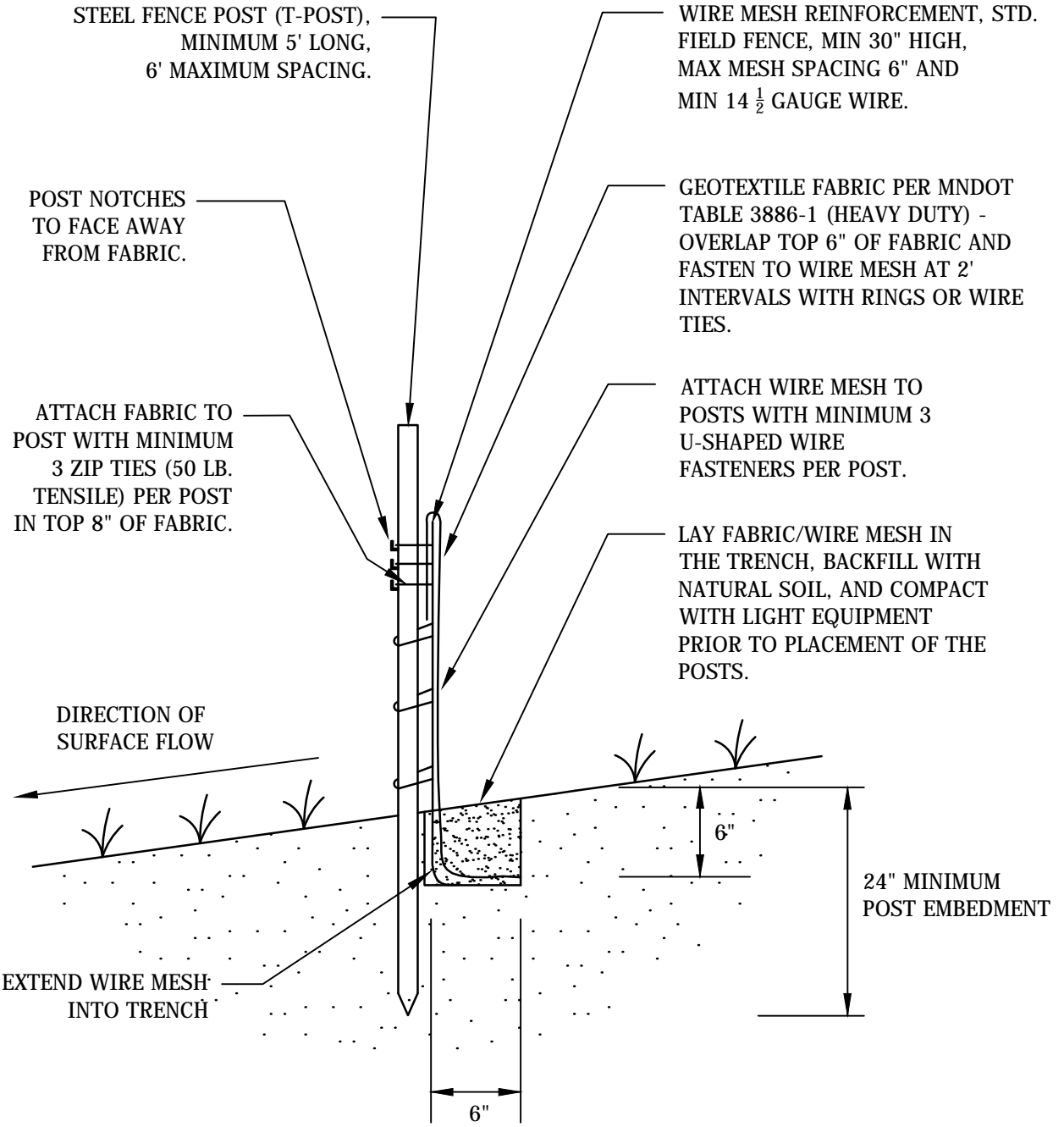
**(A) COMPACTION:**  
AFTER "SLICING" IN THE FABRIC AND *BEFORE* INSTALLATION OF STEEL POSTS, DRIVE INSTALLATION EQUIPMENT OVER THE "SLICE" WHILE FABRIC IS LAYING ON THE GROUND. *THEN* INSTALL STEEL POSTS AND PULL UP FABRIC TO ATTACH AT A UNIFORM HEIGHT.



SILT FENCE  
MACHINE SLICED  
Appendix B

LAST REVISION:  
Sep. 2015

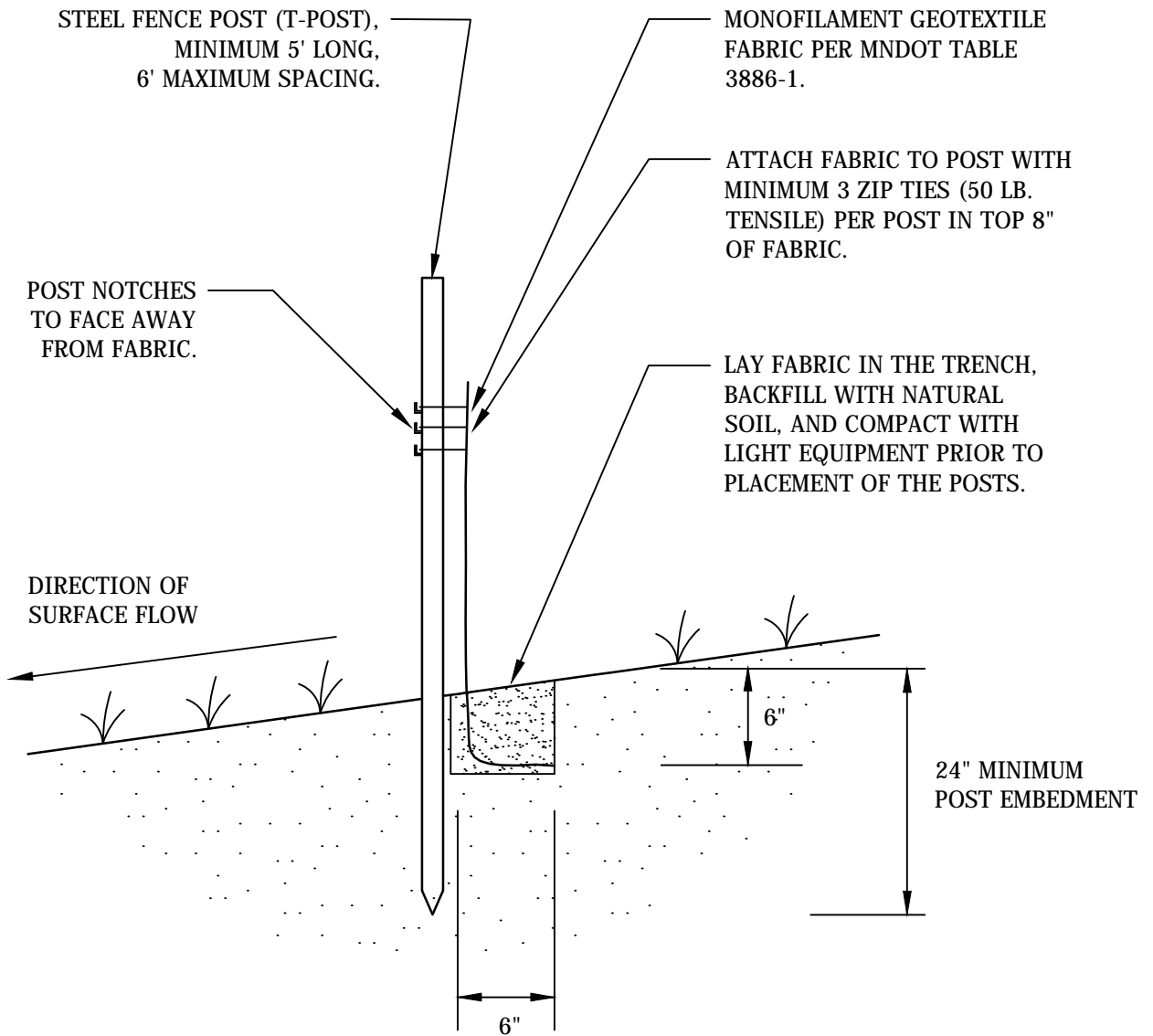
PLATE NO.  
ERO-1A



**SILT FENCE  
HEAVY DUTY**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-1B**



**SILT FENCE  
STANDARD**

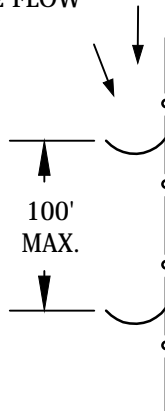
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-1C**

# PLAN VIEW

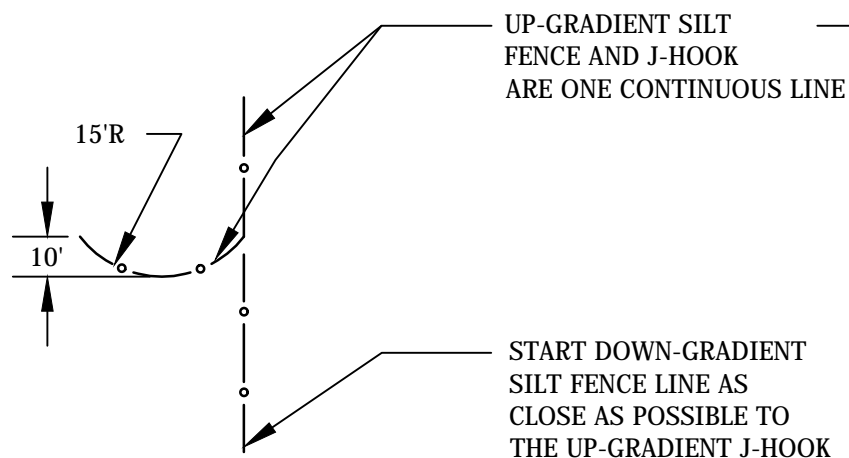
## I. SPACING REQUIREMENTS

DIRECTION OF SURFACE FLOW

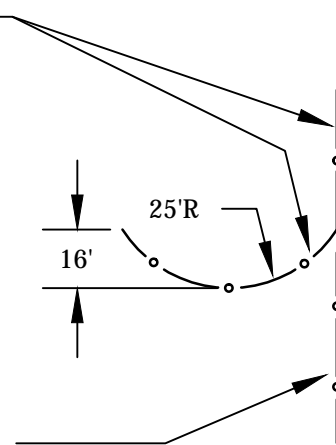


NOTE: SPACING DISTANCES WILL VARY, BUT ARE NOT TO EXCEED 100 FEET.

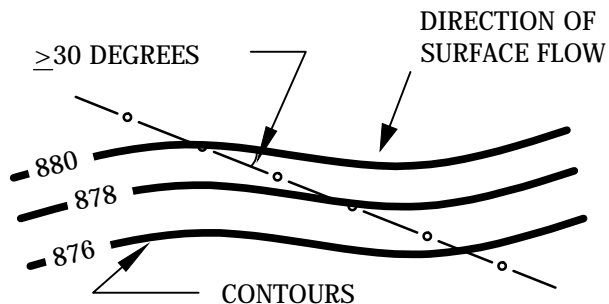
## II. SIZING REQUIREMENTS: J15, J25



J15 - FOR CATCHMENT AREA < 0.25 ACRES



J25 - FOR CATCHMENT AREA ≥ 0.25 ACRES



NOTE: J-HOOKS SHALL BE USED WHEN THE SILT FENCE IS INSTALLED AT AN ANGLE OF 30 DEGREES OR GREATER FROM PARALLEL TO THE CONTOURS.



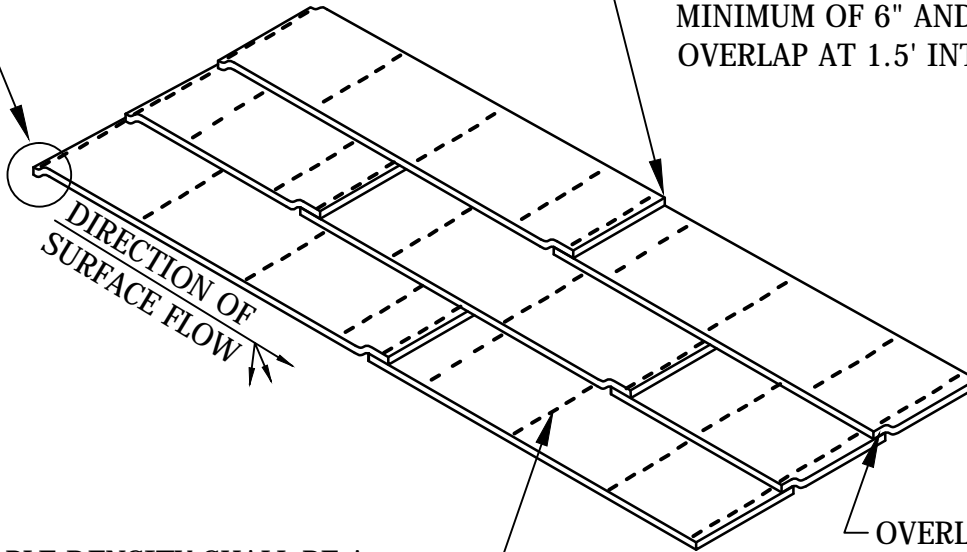
### SILT FENCE J-HOOK

LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-1D

ANCHOR TRENCH  
(SEE DETAIL AND NOTES BELOW)

OVERLAP END JOINTS  
MINIMUM OF 6" AND STAPLE  
OVERLAP AT 1.5' INTERVALS.

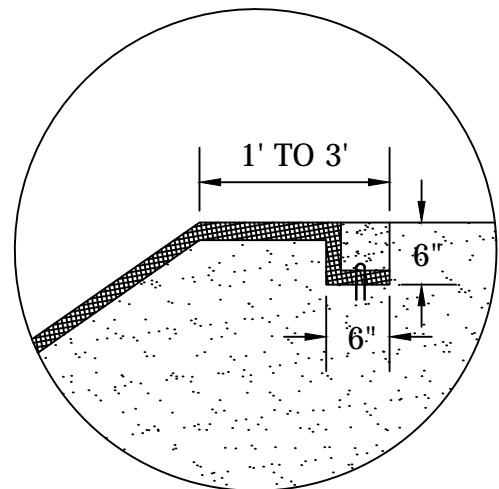


STAPLE DENSITY SHALL BE A  
MINIMUM OF 3 U-SHAPED 8",  
11 GAUGE METAL STAPLES PER  
SQUARE YARD (THIS MAY VARY AS  
DIRECTED BY THE CITY).

OVERLAP  
LONGITUDINAL JOINTS  
MINIMUM OF 6"

**ANCHOR TRENCH**

1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. BLANKET LENGTH SHALL NOT EXCEED 100'  
WITHOUT AN ANCHOR TRENCH

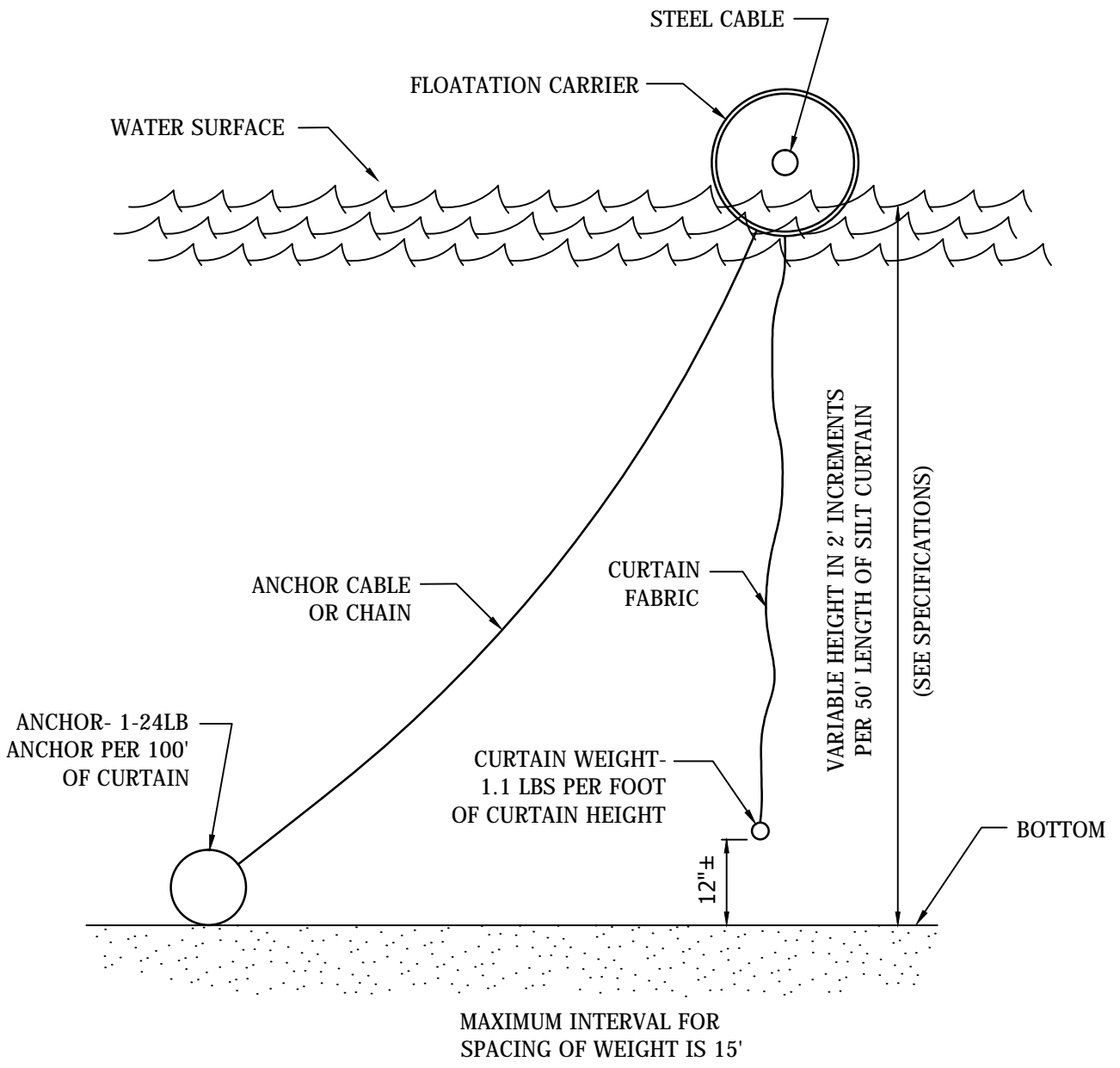


**EROSION CONTROL BLANKET  
INSTALLATION**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-2**





MAXIMUM INTERVAL FOR SPACING OF WEIGHT IS 15'

- NOTES:**
- DOUBLE SILT CURTAINS SHOULD BE SPACED 10' APART.
  - CURTAIN LENGTH TO MATCH BOTTOM PROFILE AS CLOSELY AS POSSIBLE.



## FLOATING SILT CURTAIN

LAST REVISION:  
Sep. 2015

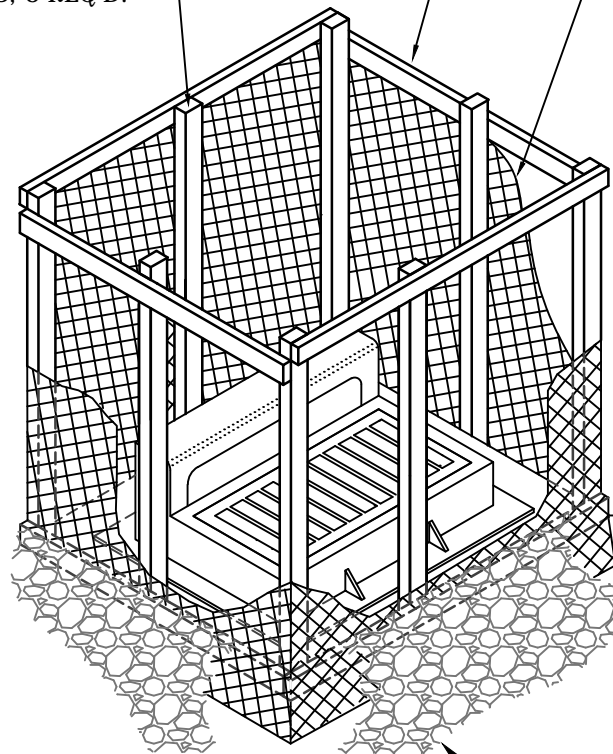
PLATE NO.  
**ERO-3**

WOODEN LATH SHALL BE NAILED SECURELY TO THE POST MEMBER TO SECURE FILTER FABRIC.

2" X 4" HORIZONTAL MEMBERS CONTINUOUS AROUND TOP AND BOTTOM. FASTENED TO EACH POST USING 2-20D COMMON NAILS

2" X 4" X 2.5' LONG WOOD POSTS, 8 REQ'D.

MONOFILAMENT GEOTEXTILE FABRIC AS PER MNDOT TABLE 3886-1 (MACHINE SLICED). ADDITIONAL 8-10" OF FABRIC FLAP AT BOTTOM OF BOX



8-10" FABRIC FLAP EXTENDING BEYOND BOTTOM 2"x4" - BURY UNDER ROCK TO PREVENT UNDERWASHING

1 1/2" WASHED ROCK  
1' DEEP X 1' WIDE

**NOTES:**

CONTRACTOR SHALL CONSTRUCT SILT BOX TO FIT AROUND THE INLET STRUCTURE WITH 6" MINIMUM CLEARANCE TO EDGES OF STRUCTURE. SILT BOX TO BE PLACED ON AN EVEN SURFACE 6" BELOW STRUCTURE OPENING. TOP OF SILT BOX TO EXTEND 18" MINIMUM ABOVE EXISTING GRADE.

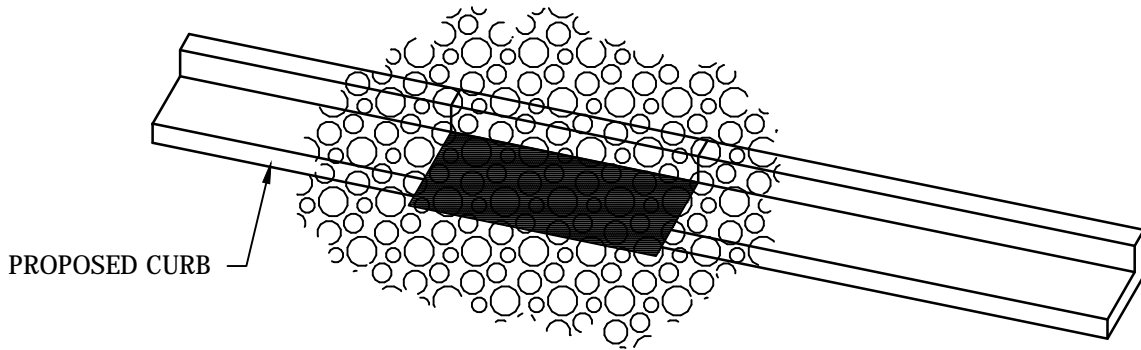


**INLET PROTECTION  
SILT BOX FOR CATCH BASIN  
BEFORE ROAD CONSTRUCTION**

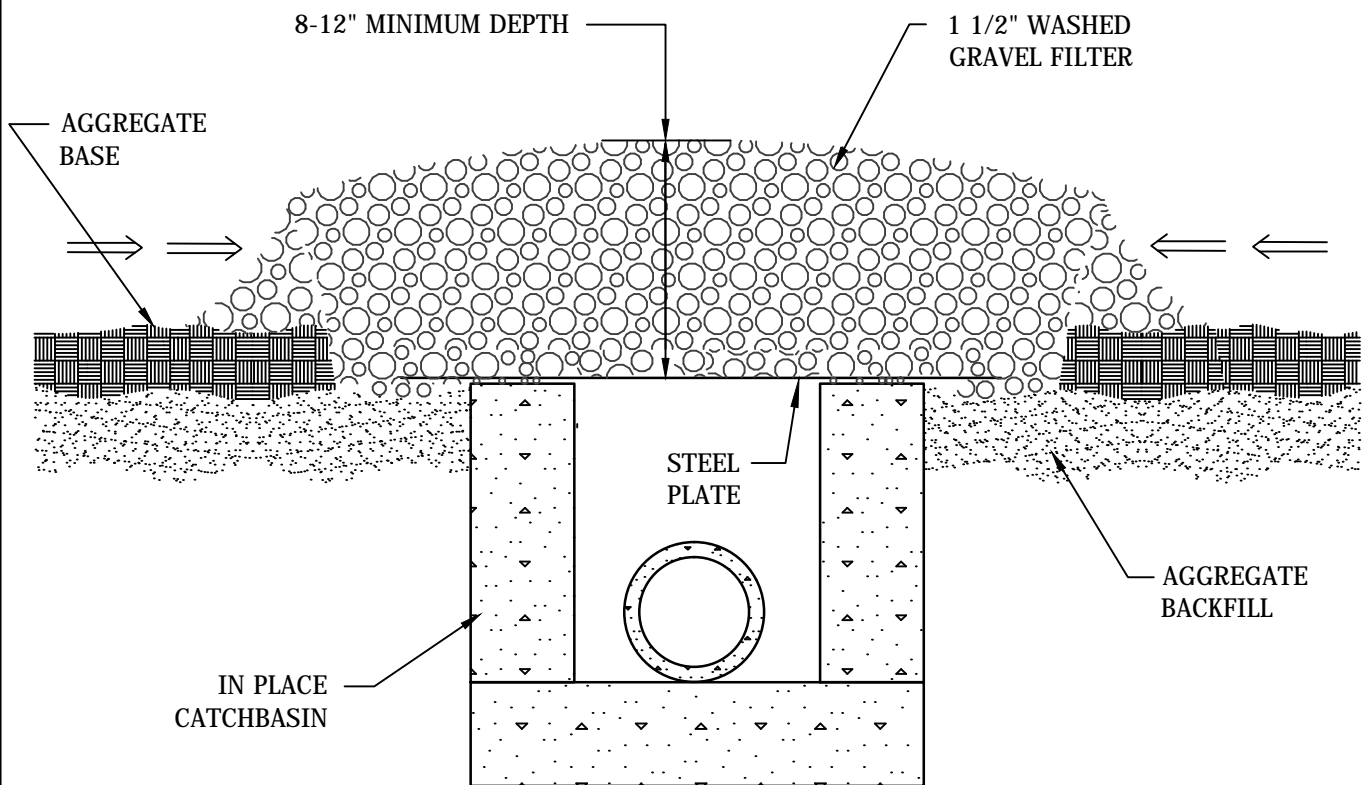
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-4A**

PLAN



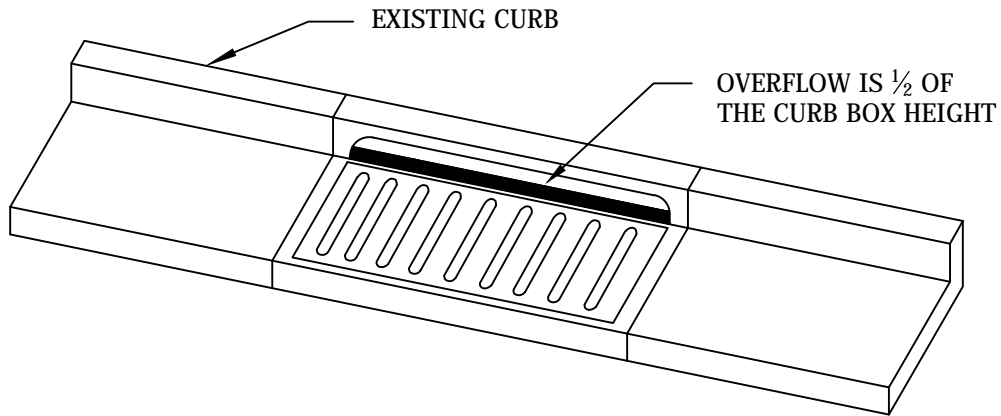
← ← = DIRECTION OF SURFACE FLOW



**INLET PROTECTION  
ROCK FILTER FOR CATCH BASIN  
DURING ROAD CONSTRUCTION**

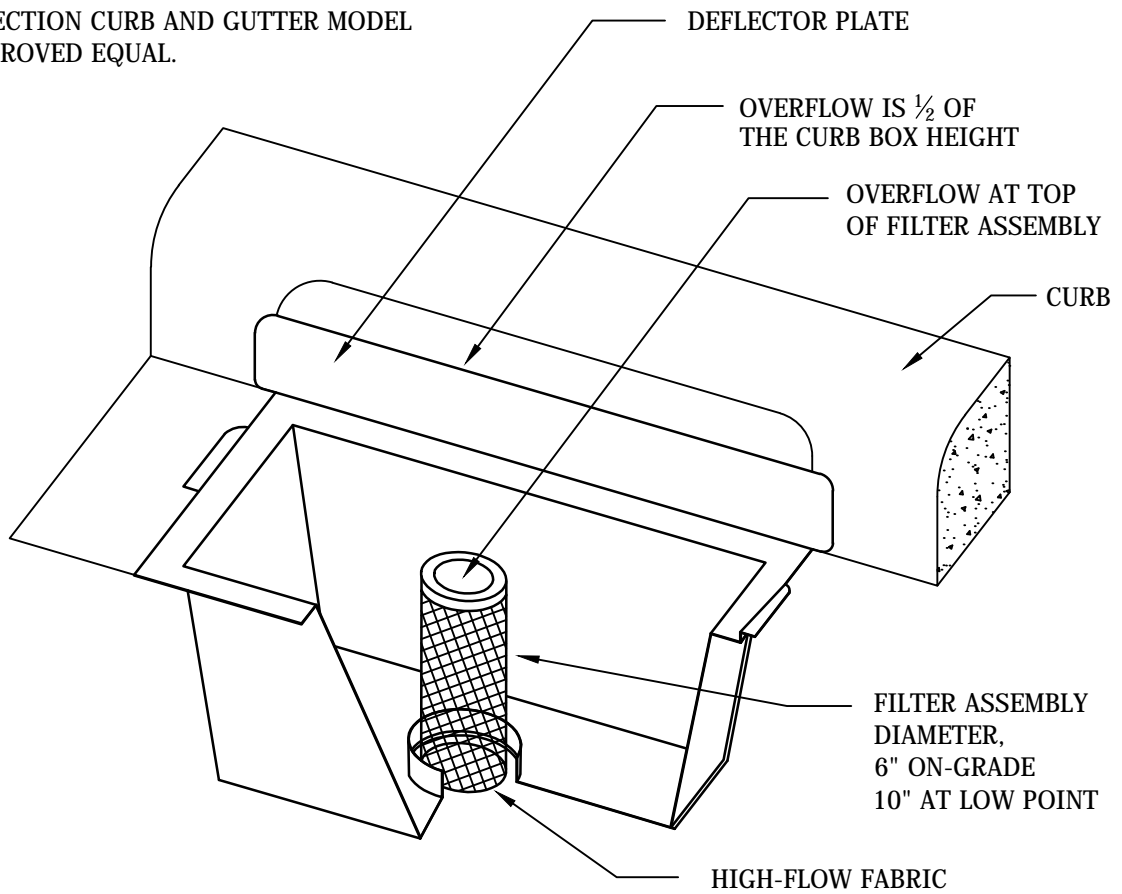
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-4B**



PLAN

WIMCO ROAD DRAIN CG-23\* HIGH FLOW  
INLET PROTECTION CURB AND GUTTER MODEL  
OR CITY APPROVED EQUAL.



\* FOR THE NEW R-3290-VB STANDARD CASTING,  
INSTALL WIMCO ROAD DRAIN  
CG-3290 OR CITY APPROVED EQUAL.



INLET PROTECTION  
CATCH BASIN INSERT  
AFTER PAVING

LAST REVISION:  
Sep. 2015

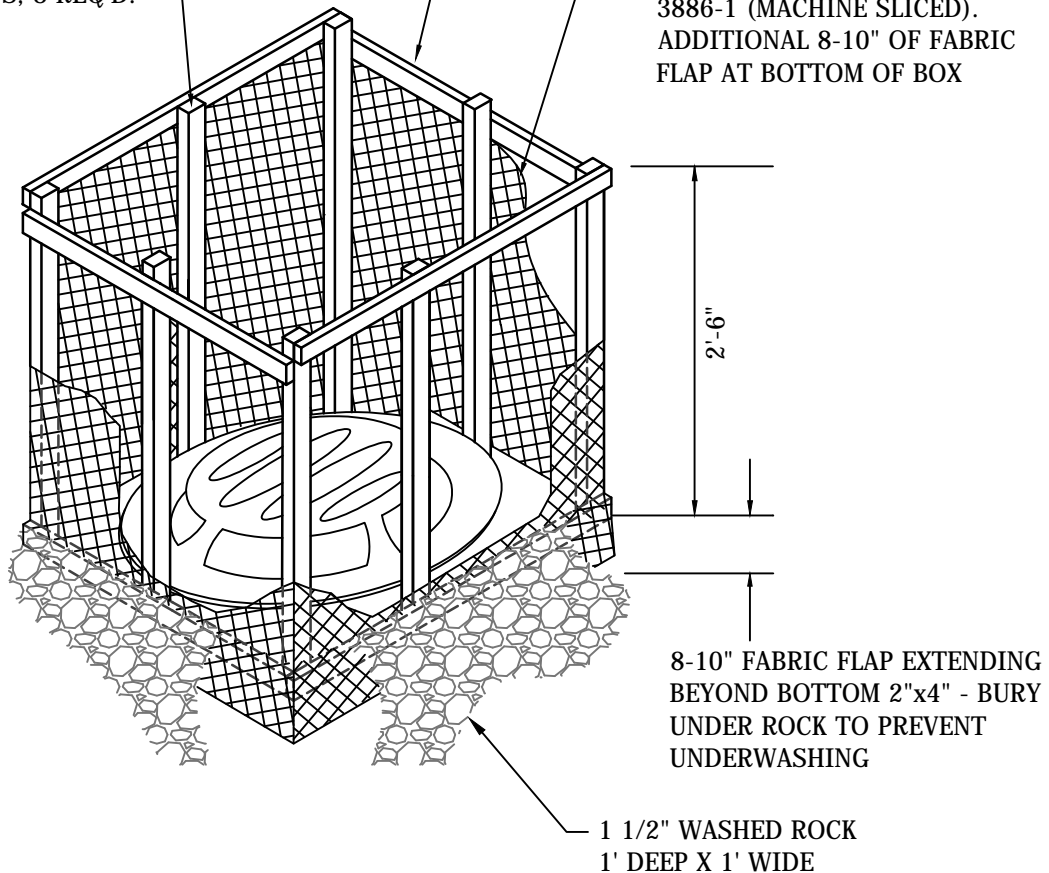
PLATE NO.  
ERO-4C

WOODEN LATH SHALL BE NAILED SECURELY TO THE POST MEMBER TO SECURE FILTER FABRIC.

2" X 4" HORIZONTAL MEMBERS CONTINUOUS AROUND TOP AND BOTTOM. FASTENED TO EACH POST USING 2-20D COMMON NAILS

2" X 4" X 2.5' LONG WOOD POSTS, 8 REQ'D.

MONOFILAMENT GEOTEXTILE FABRIC AS PER MNDOT TABLE 3886-1 (MACHINE SLICED). ADDITIONAL 8-10" OF FABRIC FLAP AT BOTTOM OF BOX



**NOTES:**

CONTRACTOR SHALL CONSTRUCT SILT BOX TO FIT AROUND THE INLET STRUCTURE WITH 6" MINIMUM CLEARANCE TO EDGES OF STRUCTURE. SILT BOX TO BE PLACED ON AN EVEN SURFACE 6" BELOW STRUCTURE OPENING. TOP OF SILT BOX TO EXTEND 18" MINIMUM ABOVE EXISTING GRADE.

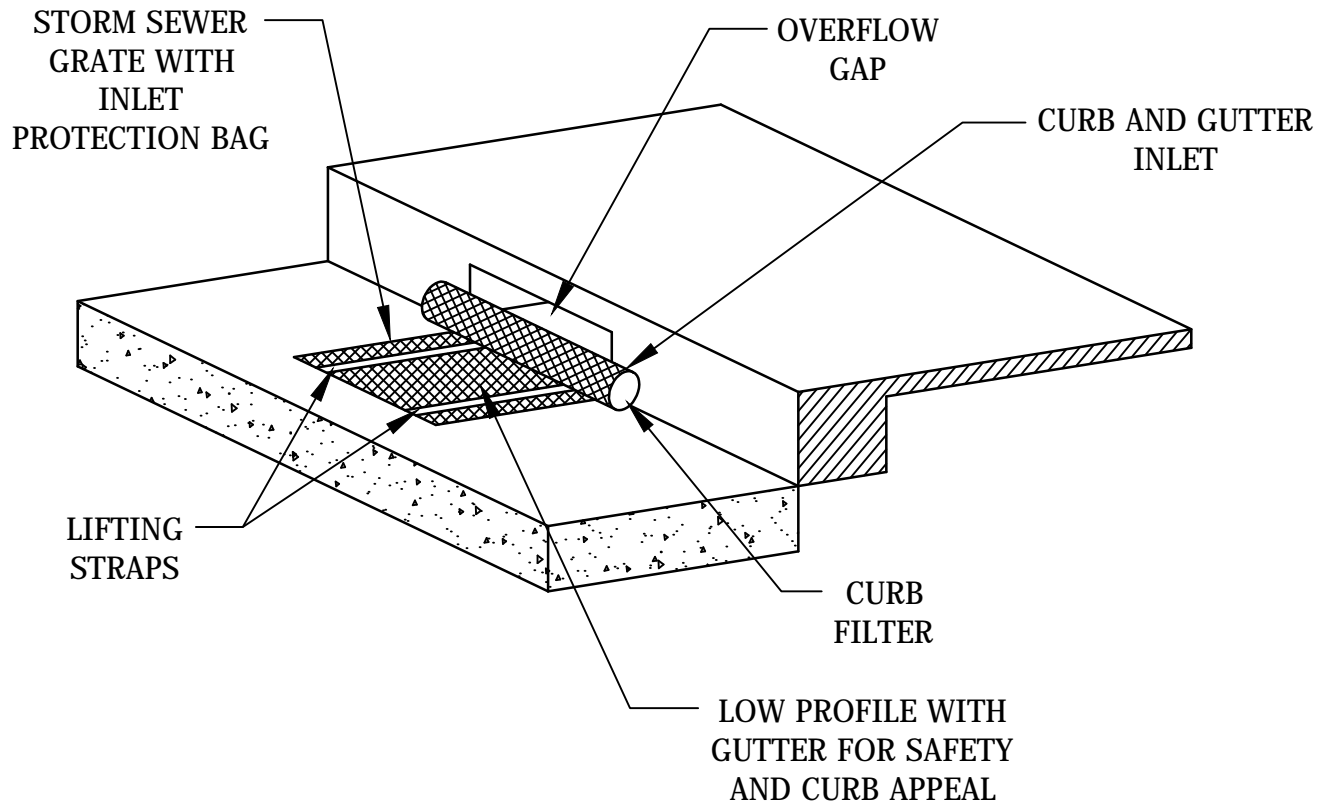


**INLET PROTECTION  
SILT BOX FOR  
BEEHIVE CASTING**

LAST REVISION:  
Sep. 2015

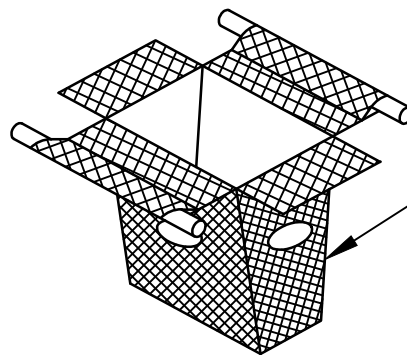
PLATE NO.  
**ERO-4D**

## SEDIMENT CONTROL LOG AND INLET PROTECTION BAG



### INLET PROTECTION BAG DETAIL

BAG TO BE HELD IN PLACE BY EXISTING GRATE



FRONT, BACK AND BOTTOM TO BE MADE FROM SINGLE PIECE OF FABRIC



INLET PROTECTION

LAST REVISION:  
Sep. 2015

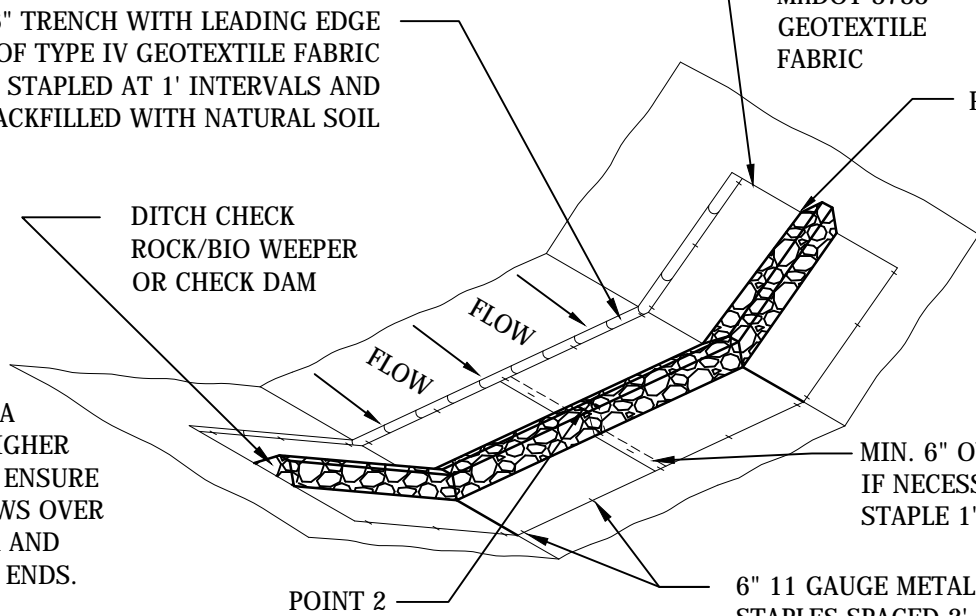
PLATE NO.  
ERO-4E

6" X 6" TRENCH WITH LEADING EDGE OF TYPE IV GEOTEXTILE FABRIC STAPLED AT 1' INTERVALS AND BACKFILLED WITH NATURAL SOIL

MnDOT 3733 GEOTEXTILE FABRIC

POINT 1

DITCH CHECK  
ROCK/BIO WEEPER  
OR CHECK DAM



**NOTE:**

POINT 1 MUST BE A MINIMUM OF 6" HIGHER THAN POINT 2 TO ENSURE THAT WATER FLOWS OVER THE DITCH CHECK AND NOT AROUND THE ENDS.

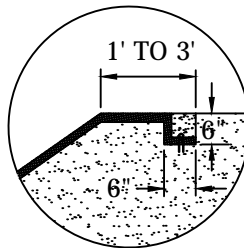
MIN. 6" OVERLAP IF NECESSARY, STAPLE 1' O.C.

6" 11 GAUGE METAL STAPLES SPACED 2' O.C.

	HEIGHT (INCHES)	WIDTH (INCHES)	MATERIAL
SMALL CHECK	24	12 - 18	MnDOT 3601 CLASS II RIP RAP
LARGE CHECK	36	24 - 30	MnDOT 3601 CLASS III RIP RAP
ROCK WEEPER	18	6 - 12	MnDOT 3882 TYPE 9 MULCH (1 1/2" WASHED ROCK)

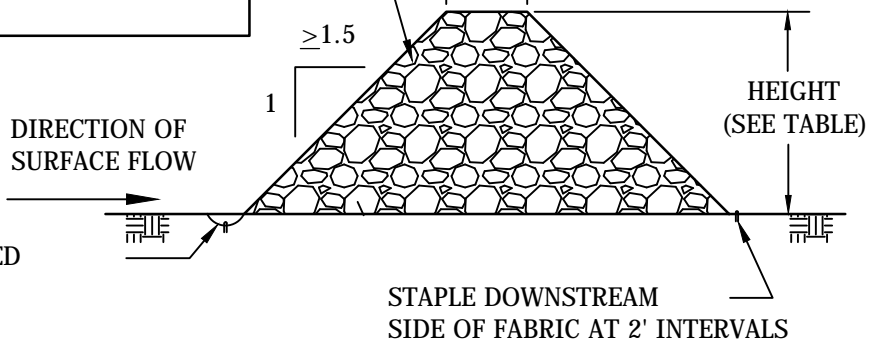
**ANCHOR TRENCH**

1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT



MATERIALS (SEE TABLE)

WIDTH (SEE TABLE)



TYPE IV GEOTEXTILE FABRIC ANCHORED IN 6" X 6" TRENCH WITH 6", 11 GAUGE METAL STAPLES AT 1' INTERVALS



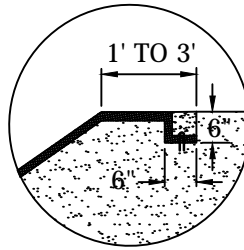
**ROCK DITCH CHECK / WEEPER  
SIZING & MATERIALS**

LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-5A

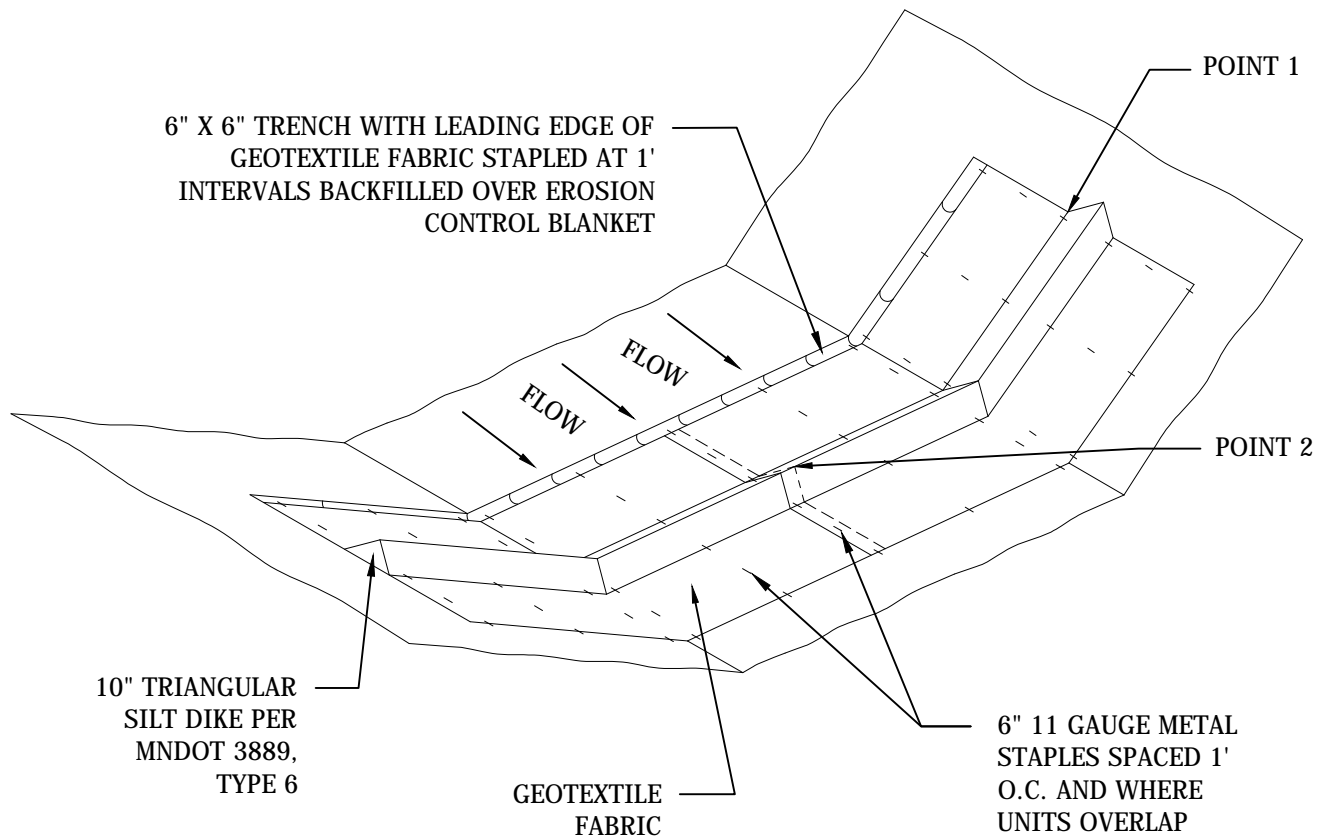
**ANCHOR TRENCH**

1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT



**NOTE:**  
STAPLE DENSITY SHALL CONFORM TO MANUFACTURERS SPECIFICATIONS.

**NOTE:**  
POINT 1 MUST BE A MINIMUM OF 6" HIGHER THAN POINT 2 TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

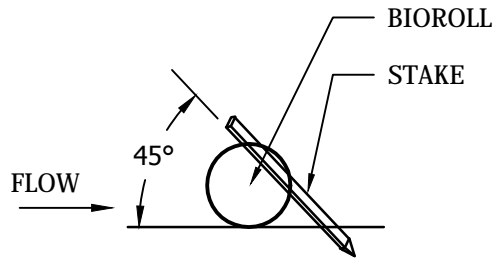
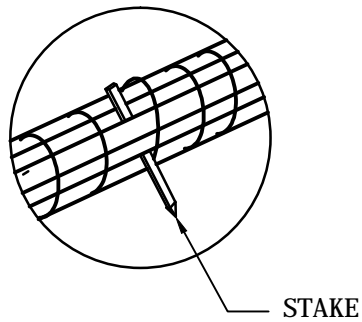


**DITCH CHECK  
TRIANGULAR SILT DIKE**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-5D**

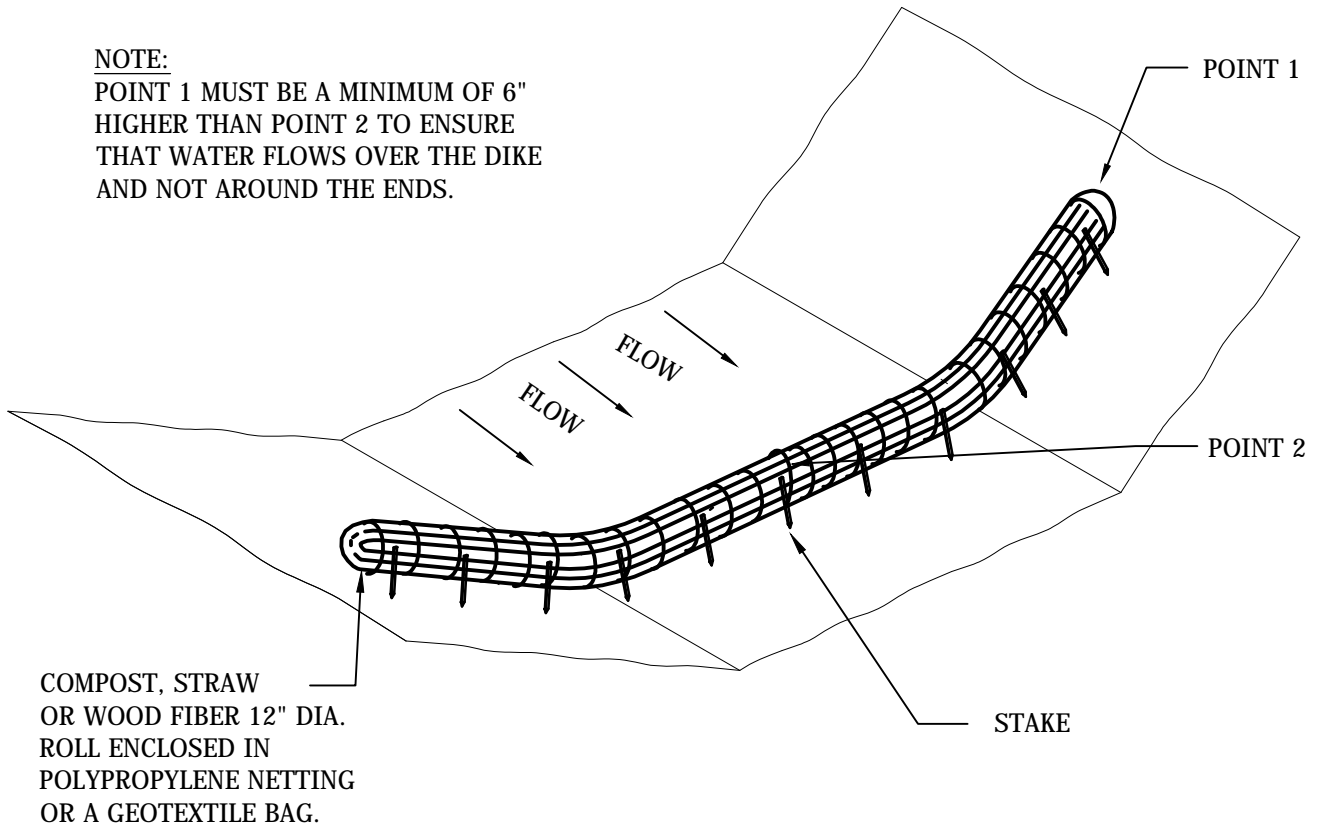




2" x 2" x 16" LONG WOODEN STAKES AT 1'-0" SPACING MINIMUM. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE COMPOST LOG AT AN ANGLE OF 45° WITH THE TOP OF THE STAKE POINTING UPSTREAM.

NOTE:

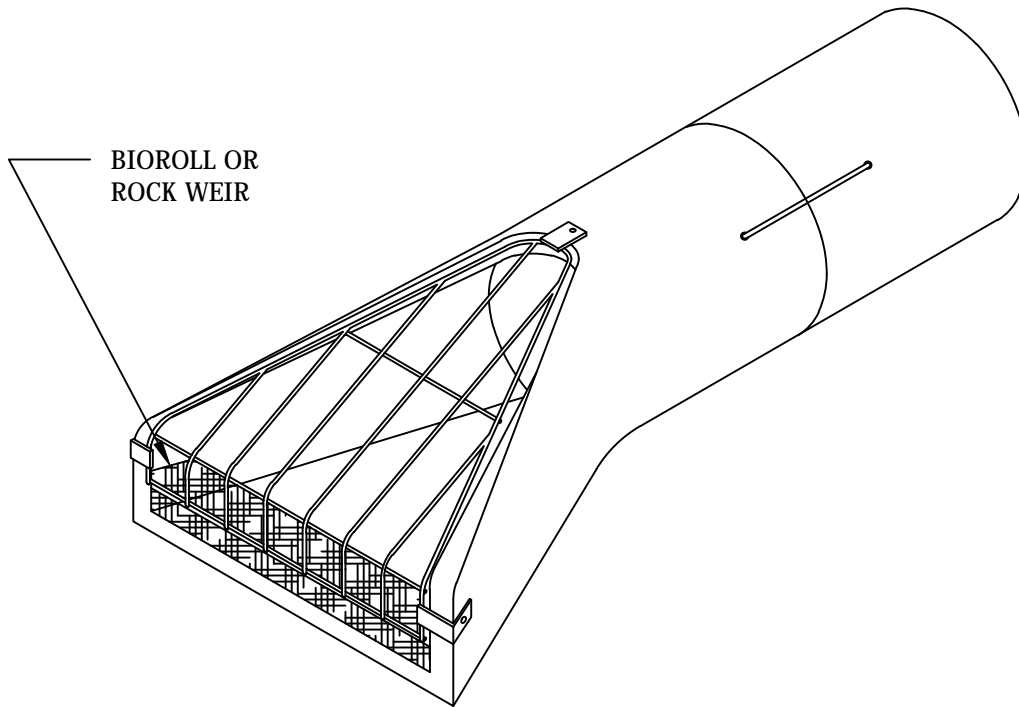
POINT 1 MUST BE A MINIMUM OF 6" HIGHER THAN POINT 2 TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.



BIOLOG DITCH CHECK

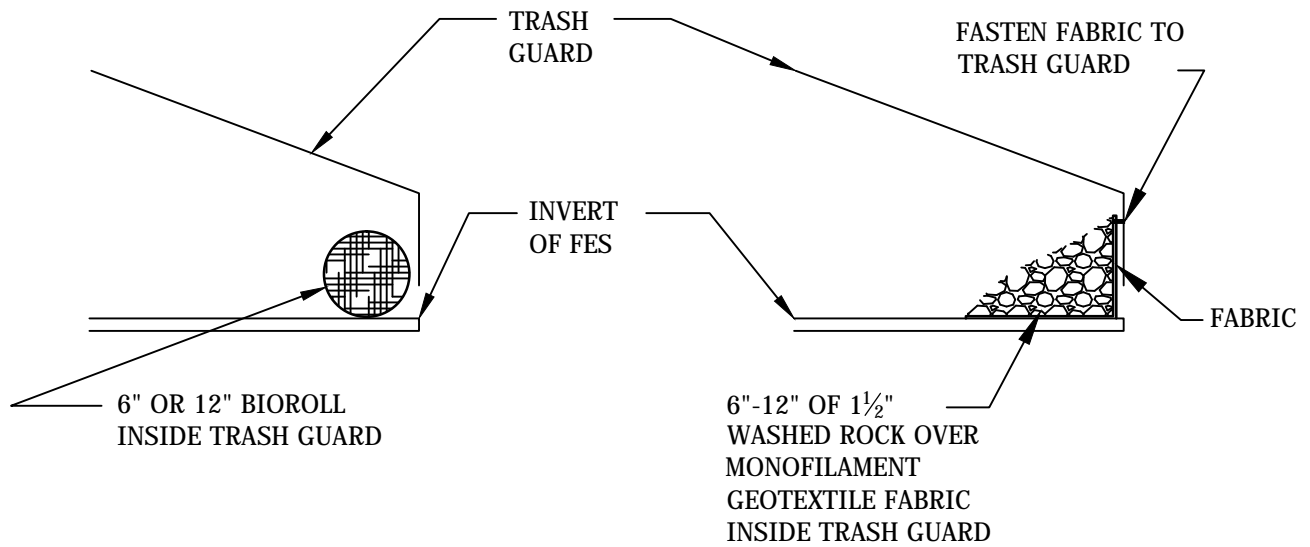
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-5E



BIOROLL WEIR

ROCK WEIR



6" OR 12" BIOROLL  
INSIDE TRASH GUARD

6"-12" OF 1½"  
WASHED ROCK OVER  
MONOFILAMENT  
GEOTEXTILE FABRIC  
INSIDE TRASH GUARD



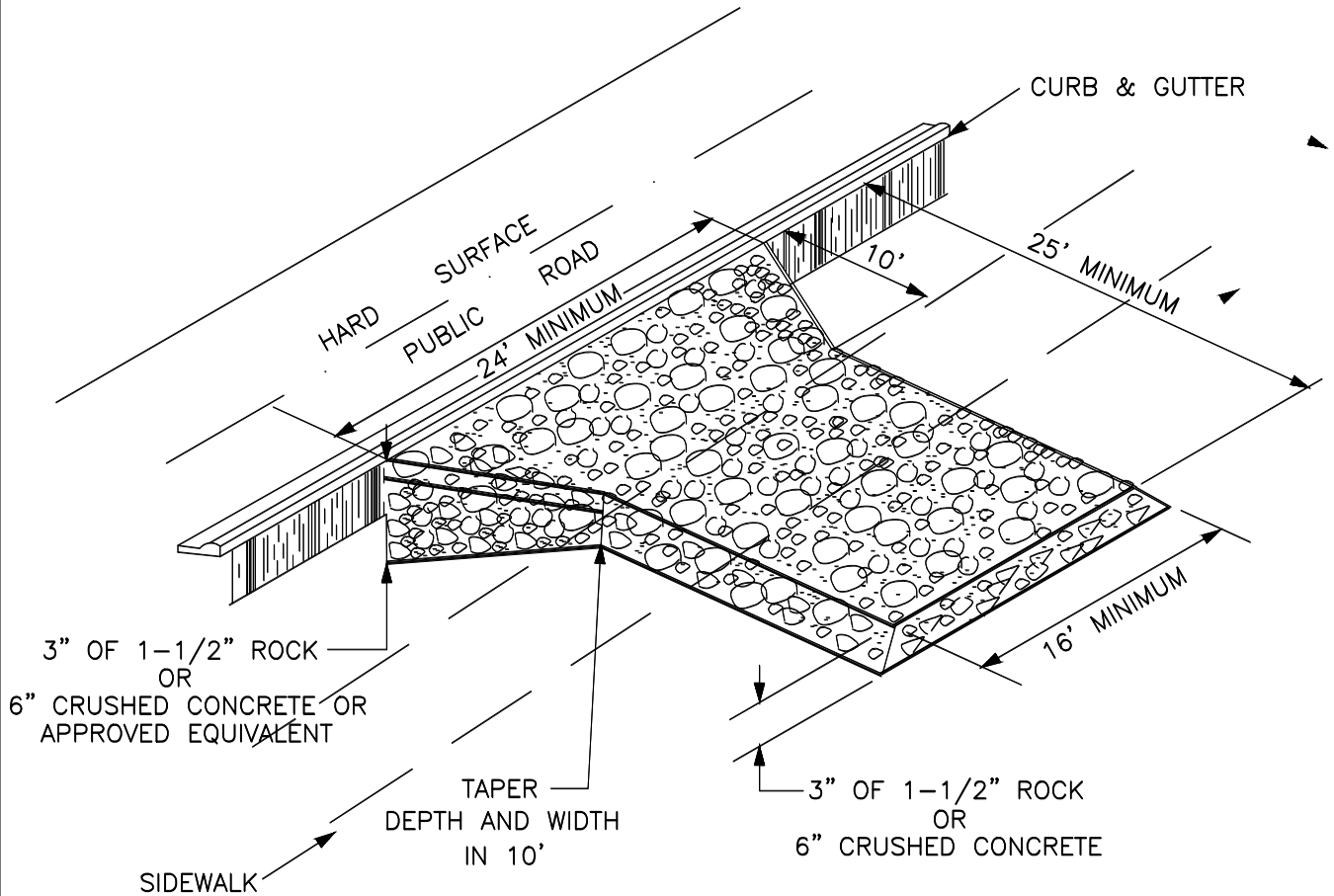
PIPE CHECK  
BIOROLL WEIR  
ROCK WEIR

LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-6

SPECIAL NOTE:

SPECIAL ATTENTION SHALL BE PAID WHEN INSTALLING DRIVEWAYS TO NOT UNDERMINE OR DAMAGE EXISTING SIDEWALKS.



**RESIDENTIAL CONSTRUCTION ENTRANCE  
ROCK  
WOOD / MULCH**

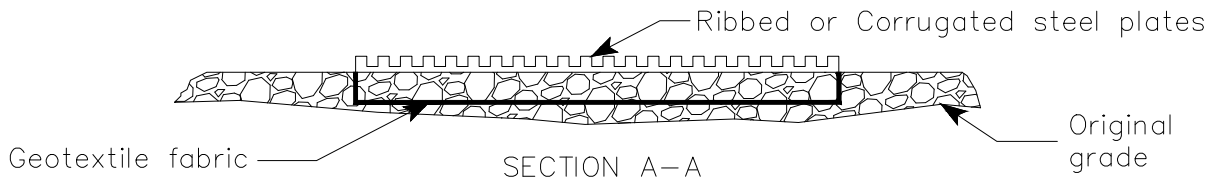
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-7A**

Gravel pad(s) MnDOT Class  
CA-15 or CA-25 Riprap  
Bedding

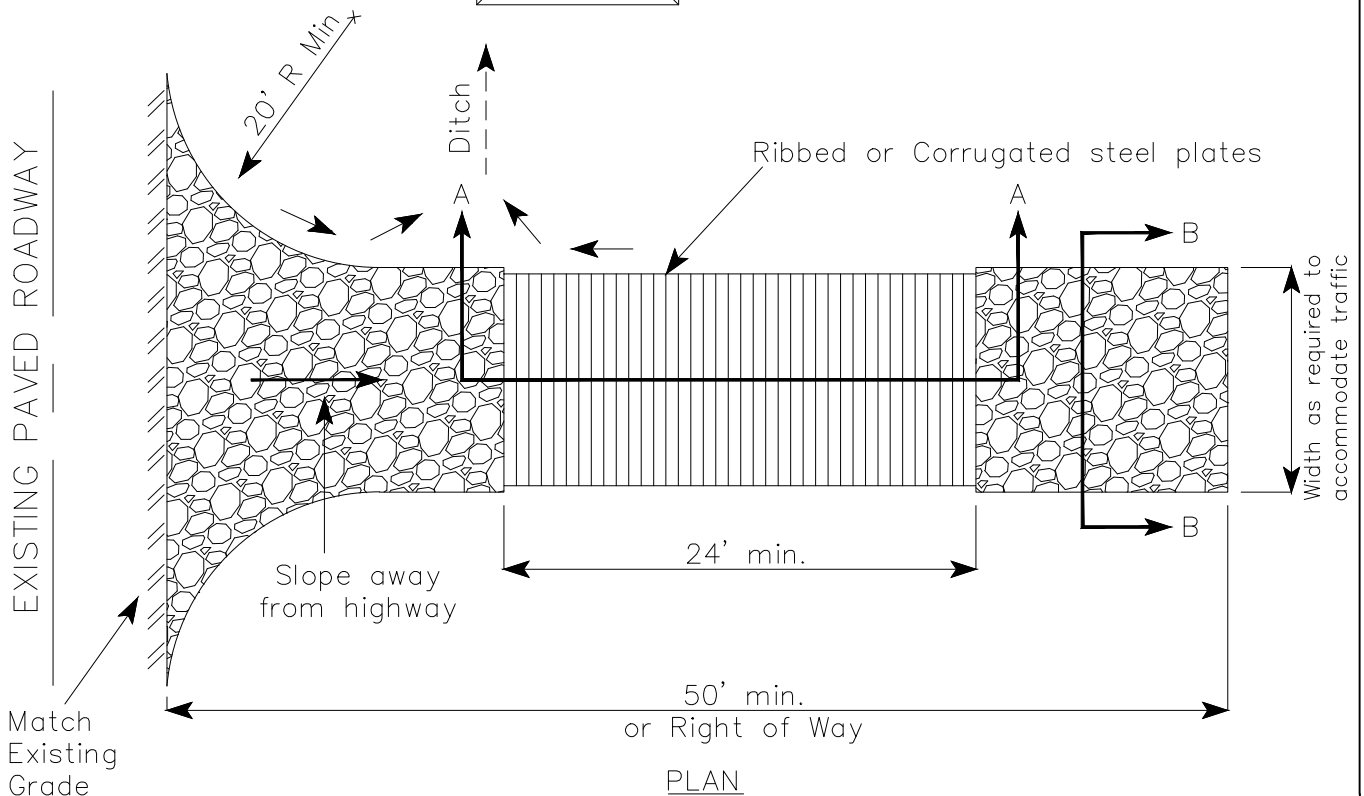
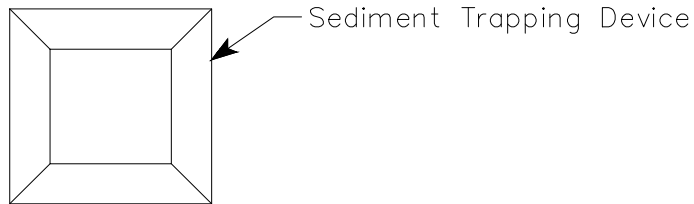


SECTION B-B  
(not to scale)



SECTION A-A  
(not to scale)

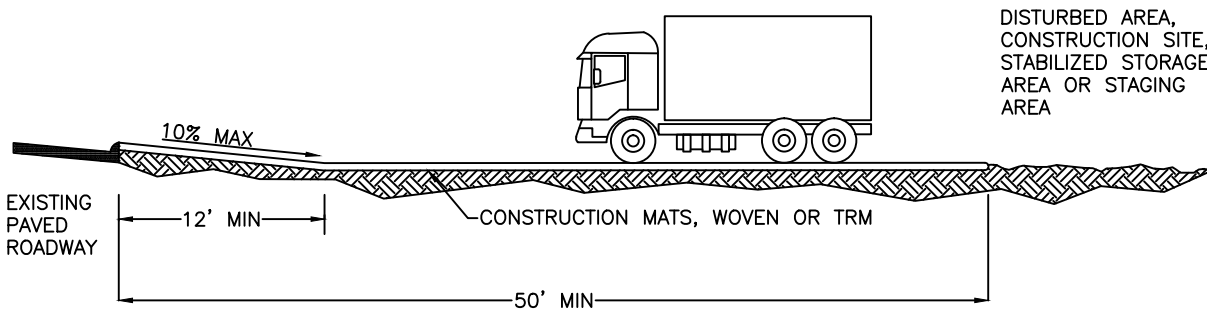
NOTES:  
Channelize runoff to  
sediment trapping device



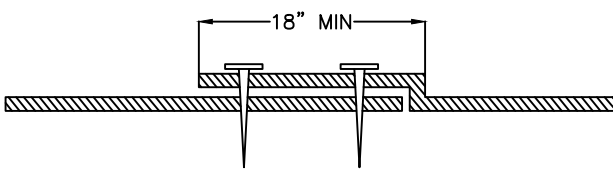
**COMMERCIAL CONSTRUCTION ENTRANCE  
ROCK**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-7B**

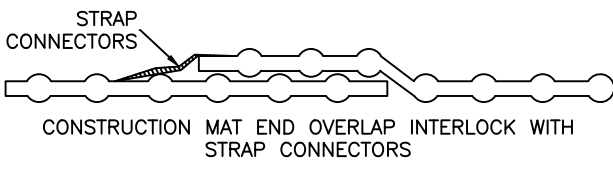
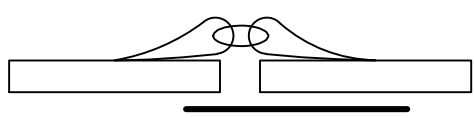


**END OVERLAP**

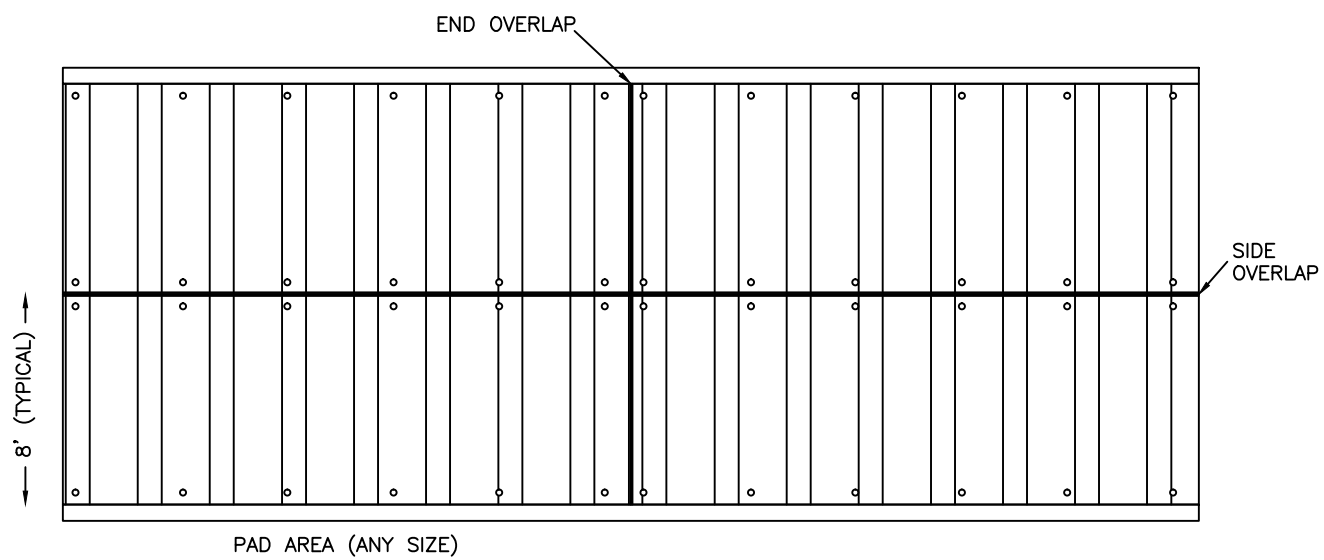


TRM END OVERLAP WITH SPIKES OR STAKES

**SIDE OVERLAP**



CONSTRUCTION MAT END OVERLAP INTERLOCK WITH STRAP CONNECTORS

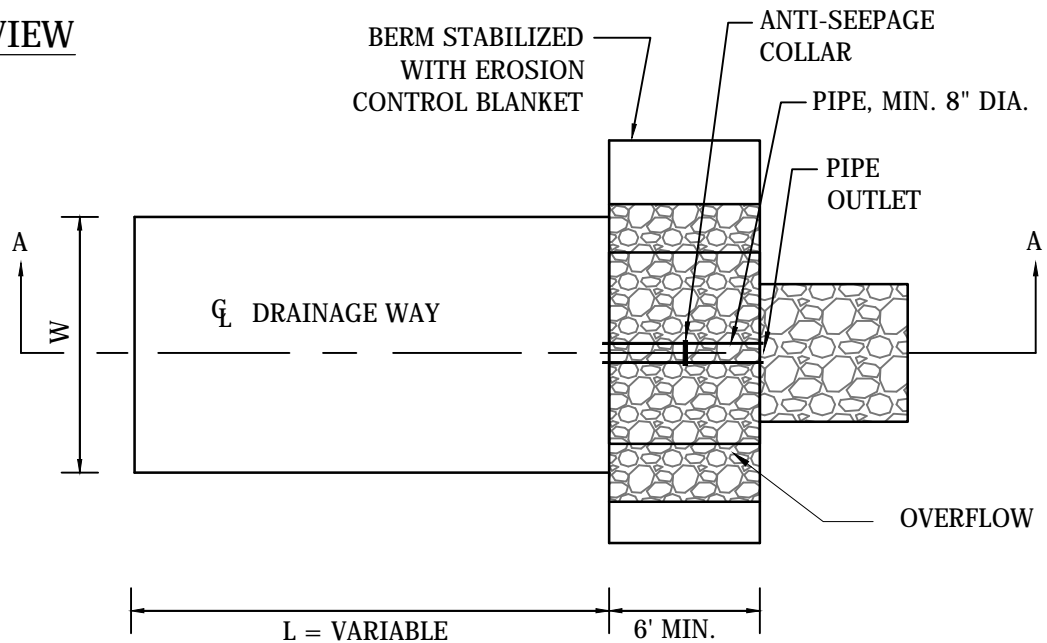


**COMMERCIAL CONSTRUCTION ENTRANCE  
MUD MAT**

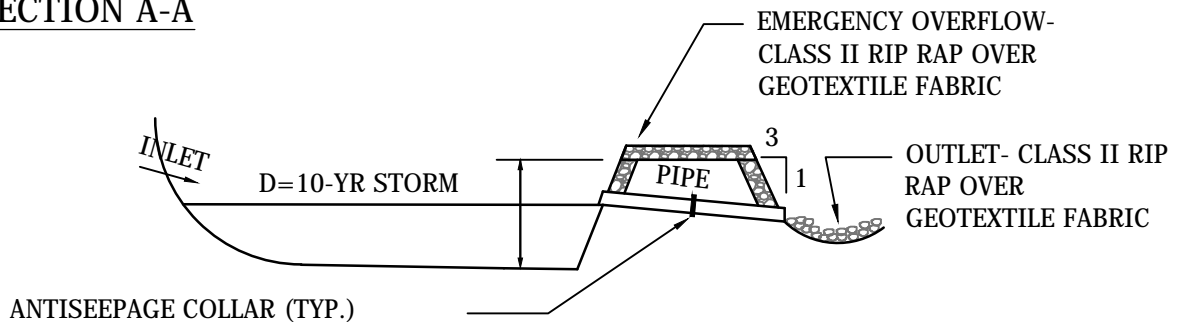
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-7C**

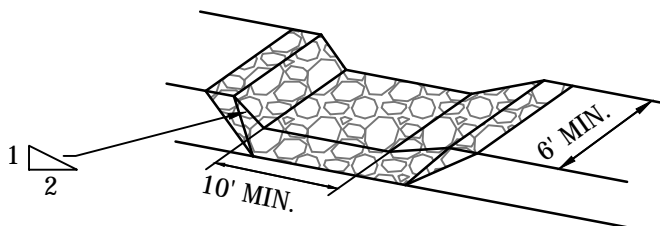
### I. PLAN VIEW



### II. SECTION A-A



### III. BASIN EMERGENCY OVERFLOW



**NOTES:**

BASIN USED FOR 10 ACRES DRAINAGE AREA OR MORE. DESIGN RUNOFF VOLUME IS FROM A 2-YR, 24-HR STORM PER ACRE DRAINED TO THE BASIN. BASIN VOLUME MUST BE A MIN. OF 1800 CUBIC FEET/ACRE. SEE PLANS/SPECIFICATIONS FOR BASIN DIMENSIONS AND PIPE SIZE AND SLOPE.



## TEMPORARY SEDIMENTATION BASIN PIPE OUTLET

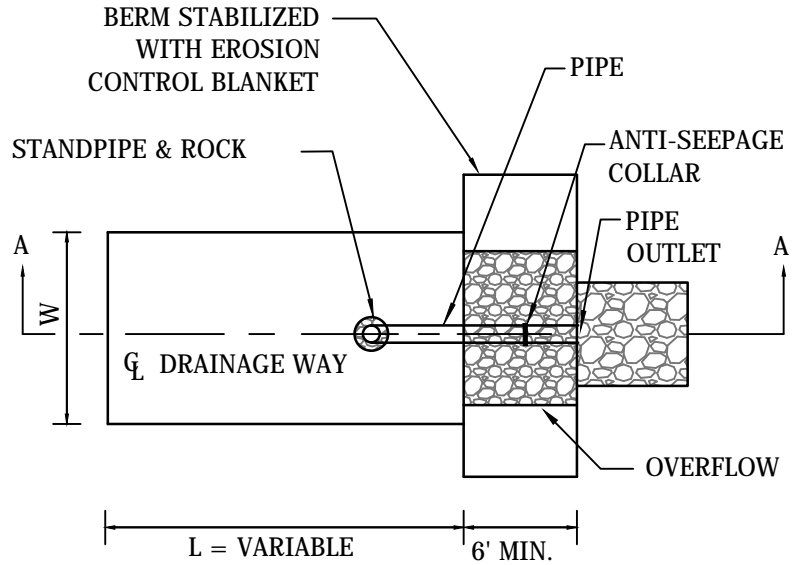
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-8A

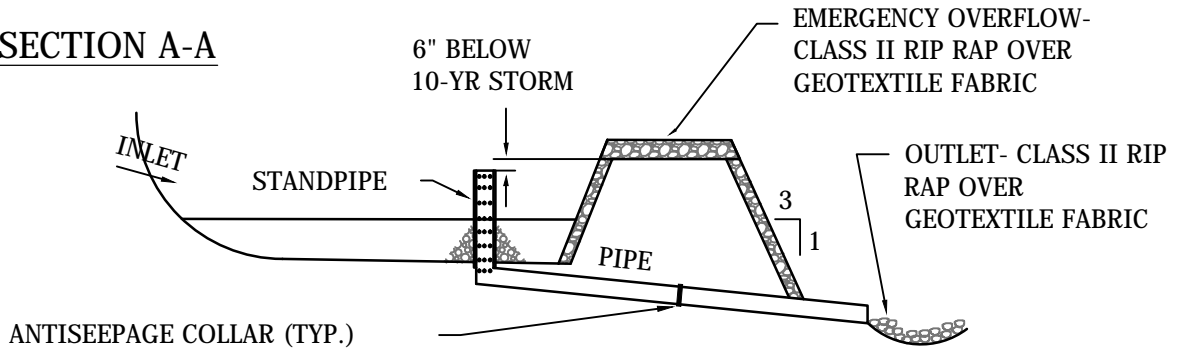
# I. PLAN VIEW

**NOTES:**

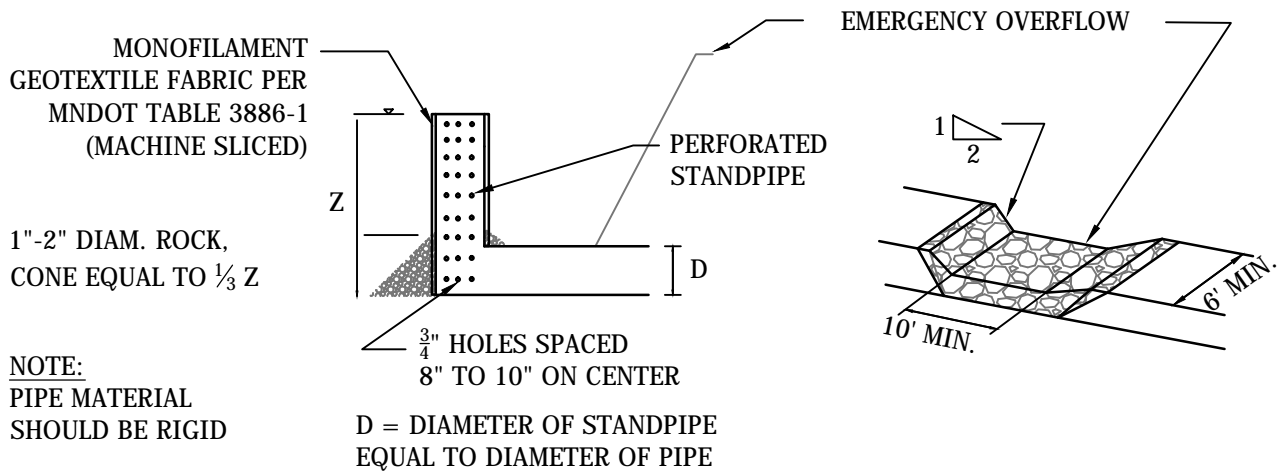
BASIN USED FOR 10 ACRES DRAINAGE AREA OR MORE. DESIGN RUNOFF VOLUME IS FROM A 2-YR, 24-HR STORM PER ACRE DRAINED TO THE BASIN. BASIN VOLUME MUST BE A MIN. OF 1800 CUBIC FEET/ACRE. SEE PLANS/SPECIFICATIONS FOR BASIN DIMENSIONS AND PIPE SIZE AND SLOPE.



# II. SECTION A-A



# III. BASIN STANDPIPE AND EMERGENCY OVERFLOW

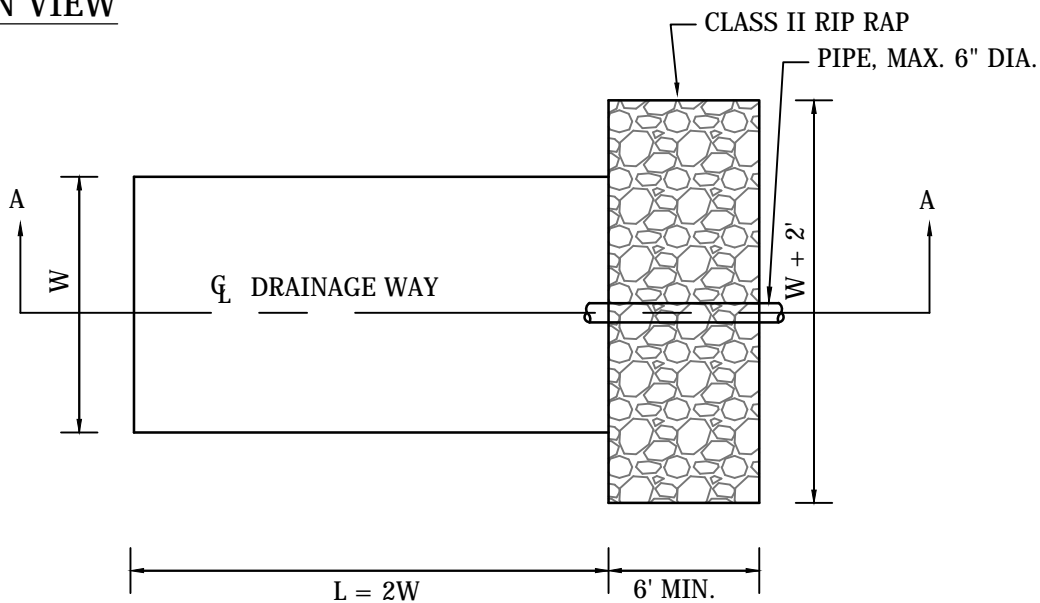


## TEMPORARY SEDIMENTATION BASIN STANDPIPE OUTLET

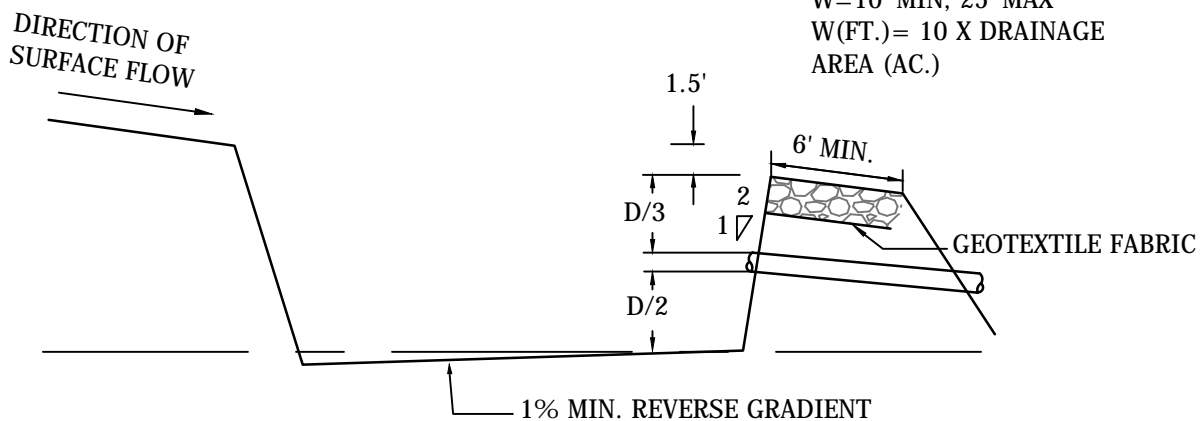
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-8B

**I. PLAN VIEW**



**II. SECTION A-A**



**NOTE:**  
D=3' MIN, 5' MAX  
W=10' MIN, 25' MAX  
W(FT.)= 10 X DRAINAGE  
AREA (AC.)



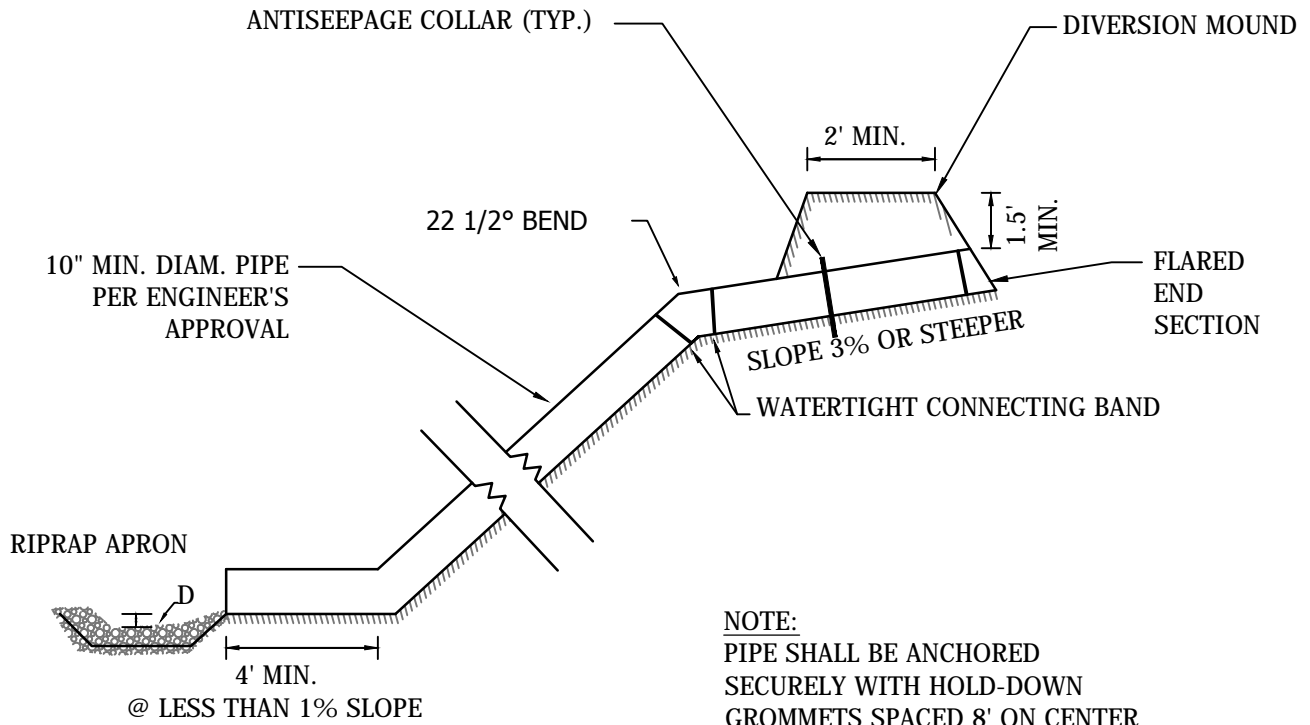
**TEMPORARY SEDIMENT TRAP**

LAST REVISION:  
Sep. 2015

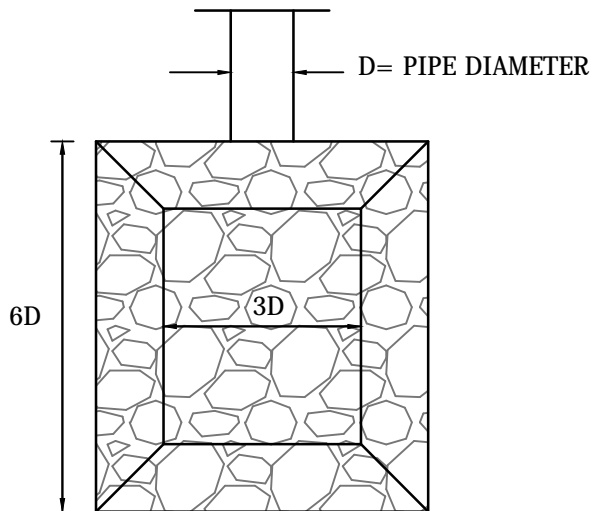
PLATE NO.  
**ERO-9**



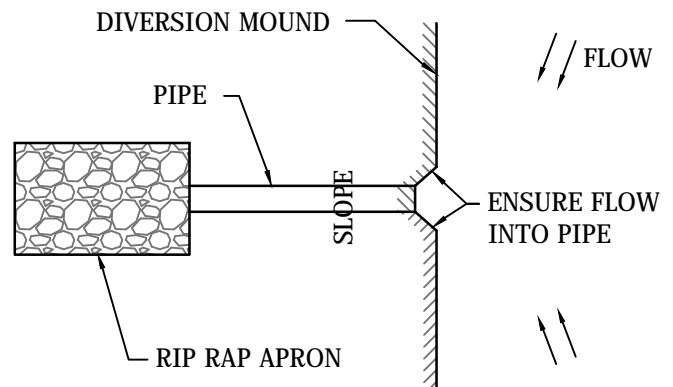
## PROFILE VIEW



## RIPRAP APRON PLAN



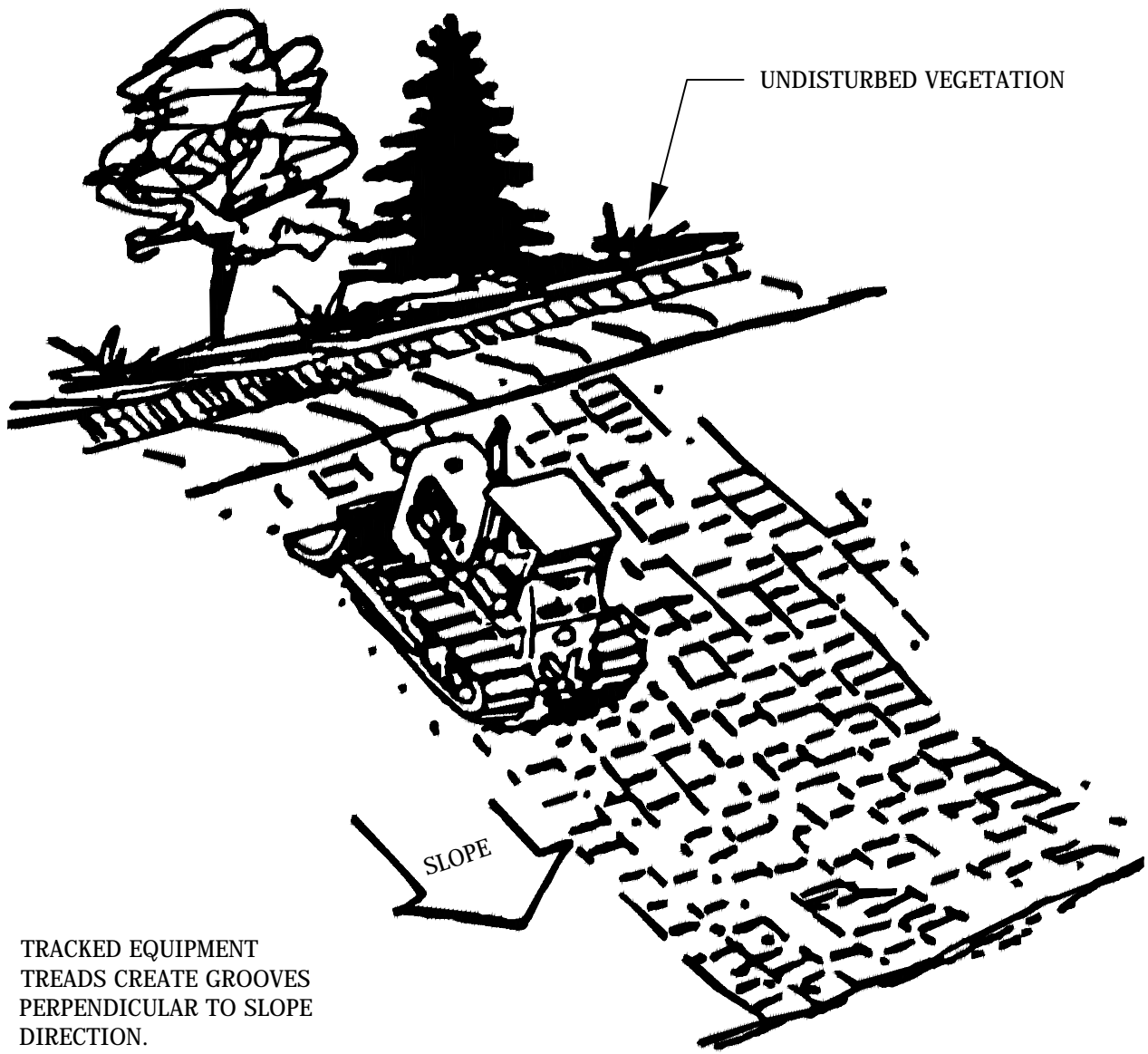
## PLAN VIEW



## DIVERSION MOUND AND TEMPORARY PIPE DOWNDRAIN

LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-10



TRACKED EQUIPMENT  
TRENDS CREATE GROOVES  
PERPENDICULAR TO SLOPE  
DIRECTION.

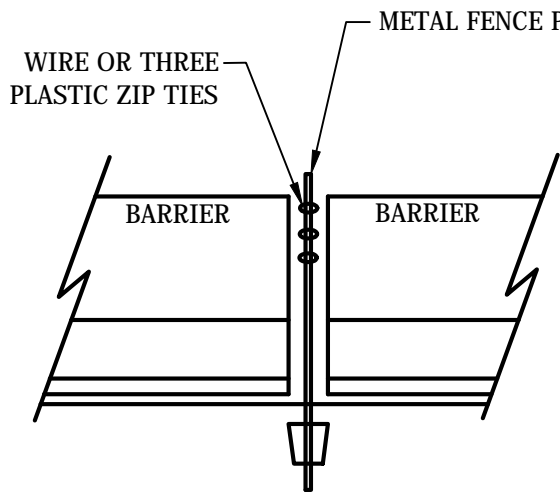
NOTE:  
ALL SLOPES WITH A GRADE EQUAL TO OR STEEPER THAN 3:1  
REQUIRE SLOPE TRACKING. SLOPES WITH A GRADE MORE GRADUAL  
THAN 3:1 REQUIRE SLOPE TRACKING IF THE STABILIZATION METHOD  
IS EROSION CONTROL BLANKET OR HYDROMULCH.



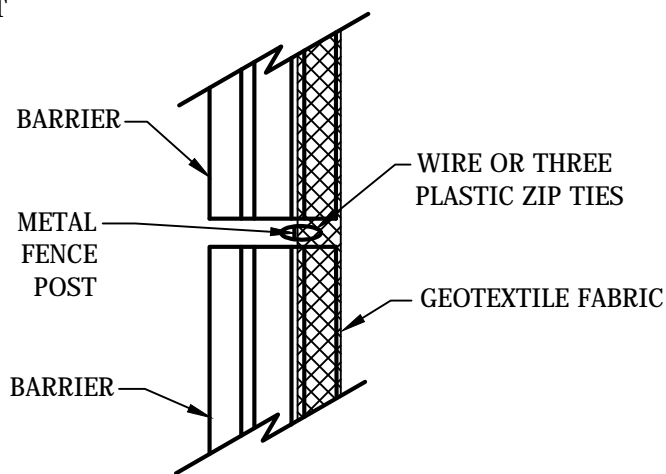
## SLOPE TRACKING

LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-11

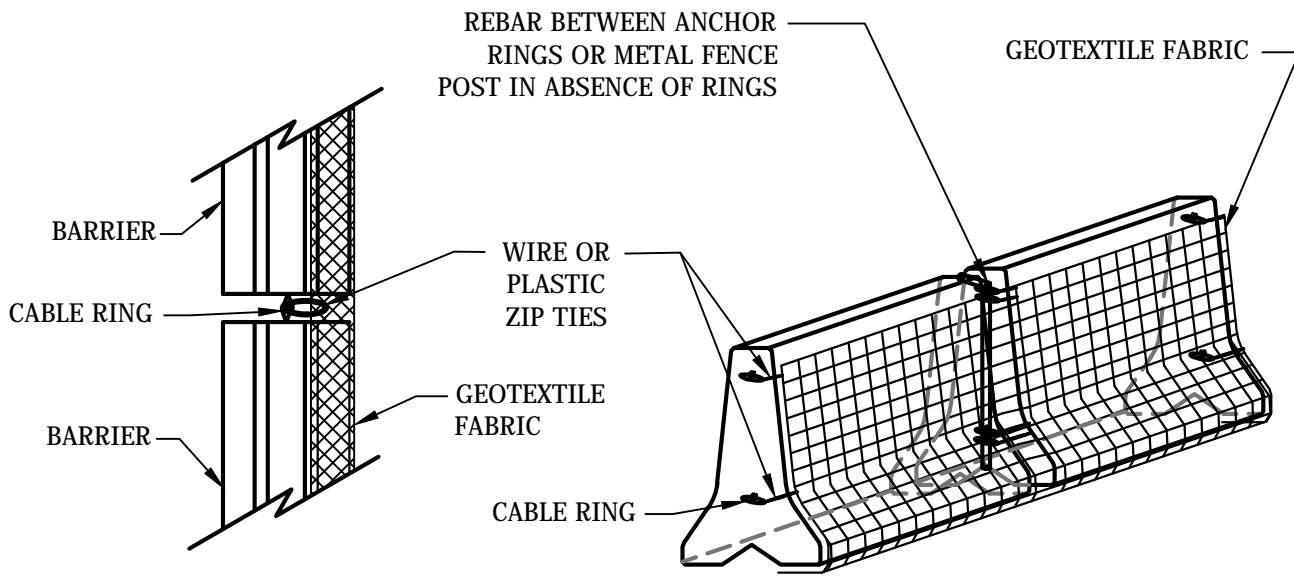


SIDE VIEW



TOP VIEW

**BARRIER WITHOUT CABLE RINGS**



TOP VIEW

3D VIEW

**BARRIER WITH CABLE RINGS  
SILT FENCE, SUPER DUTY**

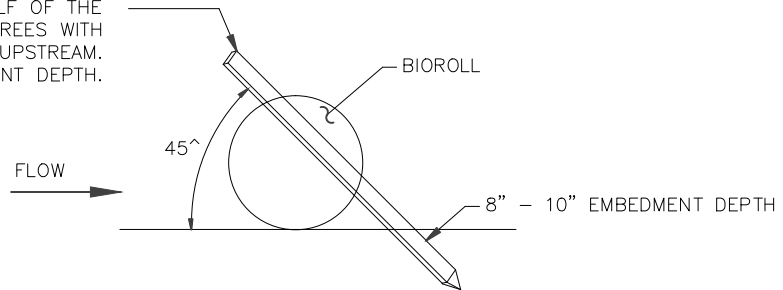


**SUPER DUTY PERIMETER CONTROL  
SILT FENCE / CONCRETE BARRIER  
SYSTEM**

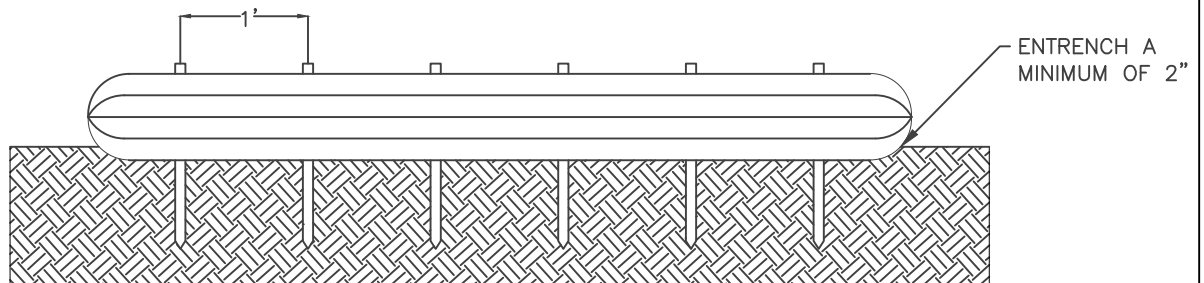
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-12A

1" X 2" X 18" LONG WOODEN STAKES AT 1' 0" SPACING MAXIMUM. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE BIOROLL AT AN ANGLE OF 45 DEGREES WITH THE TOP OF THE STAKE POINTING UPSTREAM. PROVIDE 8" TO 10" OF EMBEDMENT DEPTH.



BIOROLL STAKING DETAIL



NOTE:  
WHEN MORE THAN 1  
BIOROLL/COMPOST LOG IS  
NEEDED, OVERLAP ENDS A  
MINIMUM OF 6" AND STAKE

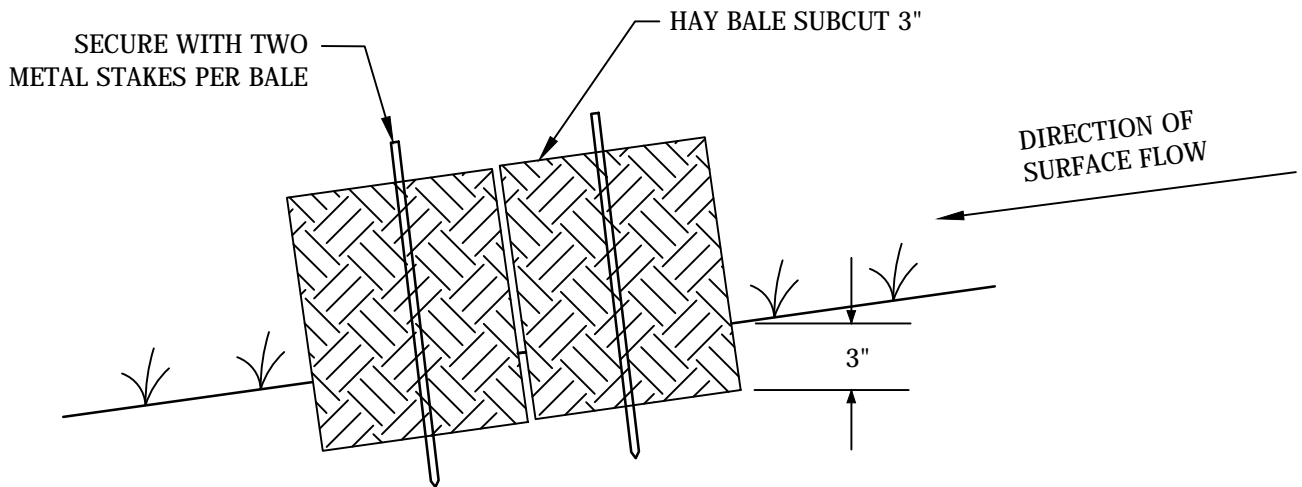


PERIMETER / SEDIMENT CONTROL  
BIO ROLL  
STRAW OR WOOD

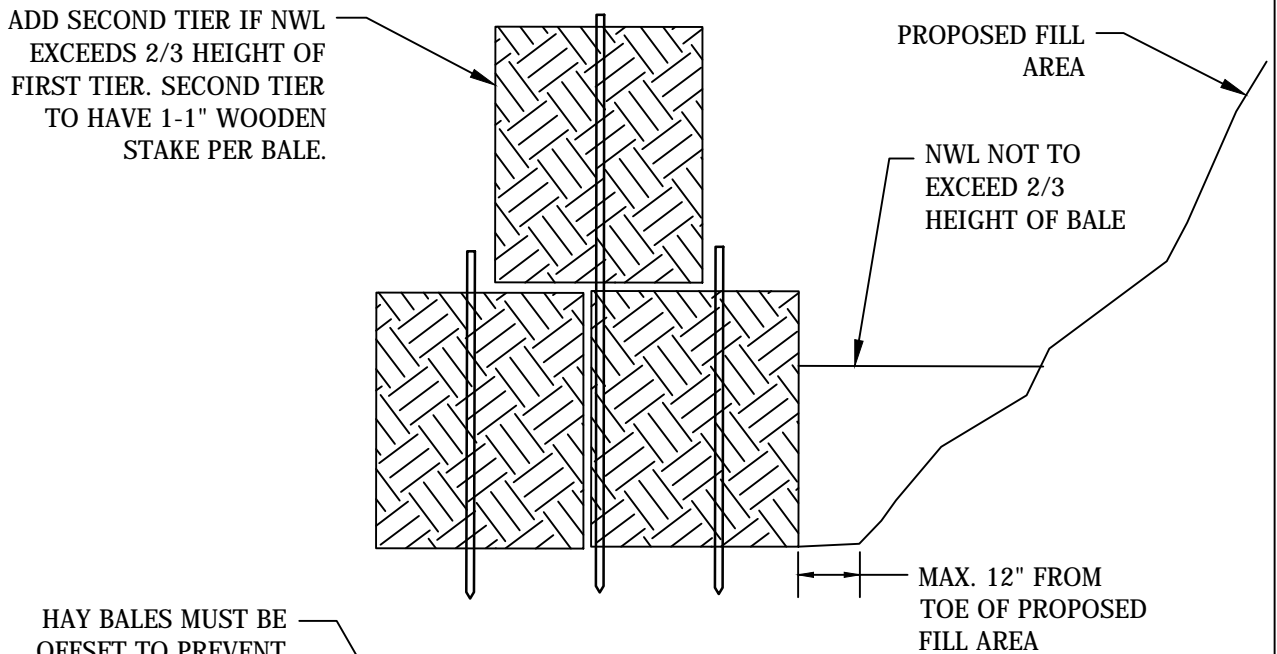
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-12B

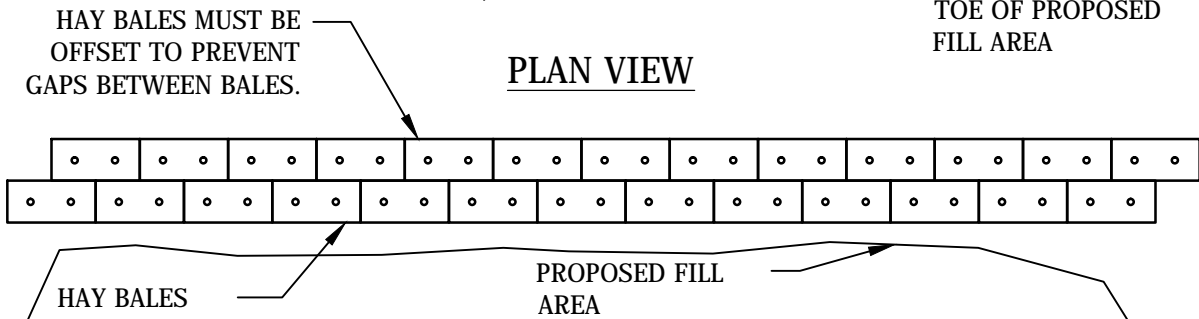
**PROFILE VIEW-UPLAND PERIMETER CONTROL**



**PROFILE VIEW-PERIMETER CONTROL IN SHALLOW STANDING WATER**



**PLAN VIEW**

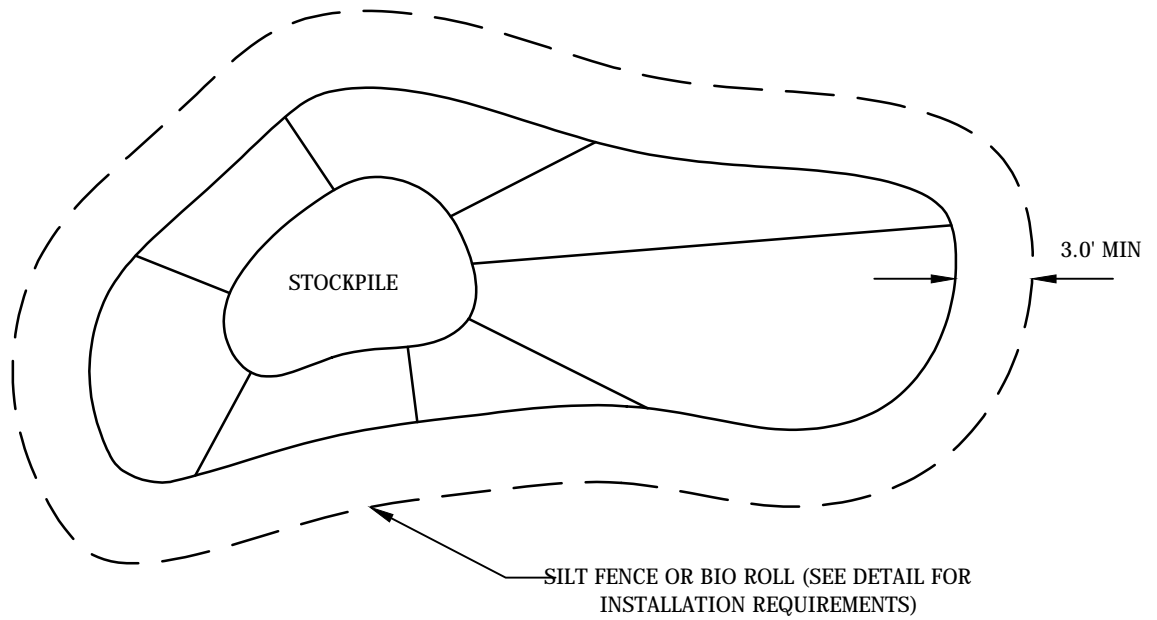


**PERIMETER / SEDIMENT CONTROL  
HAY BALES**

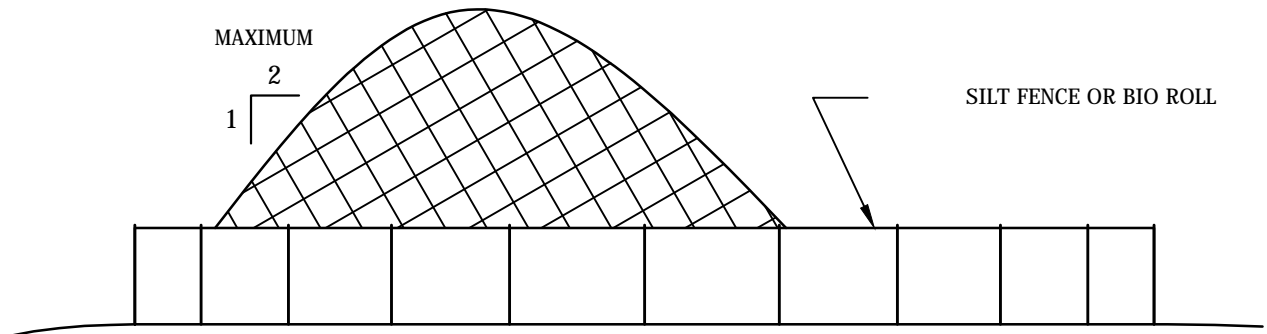
LAST REVISION:  
Sep. 2015

PLATE NO.  
ERO-12C

PLAN VIEW



SECTION VIEW

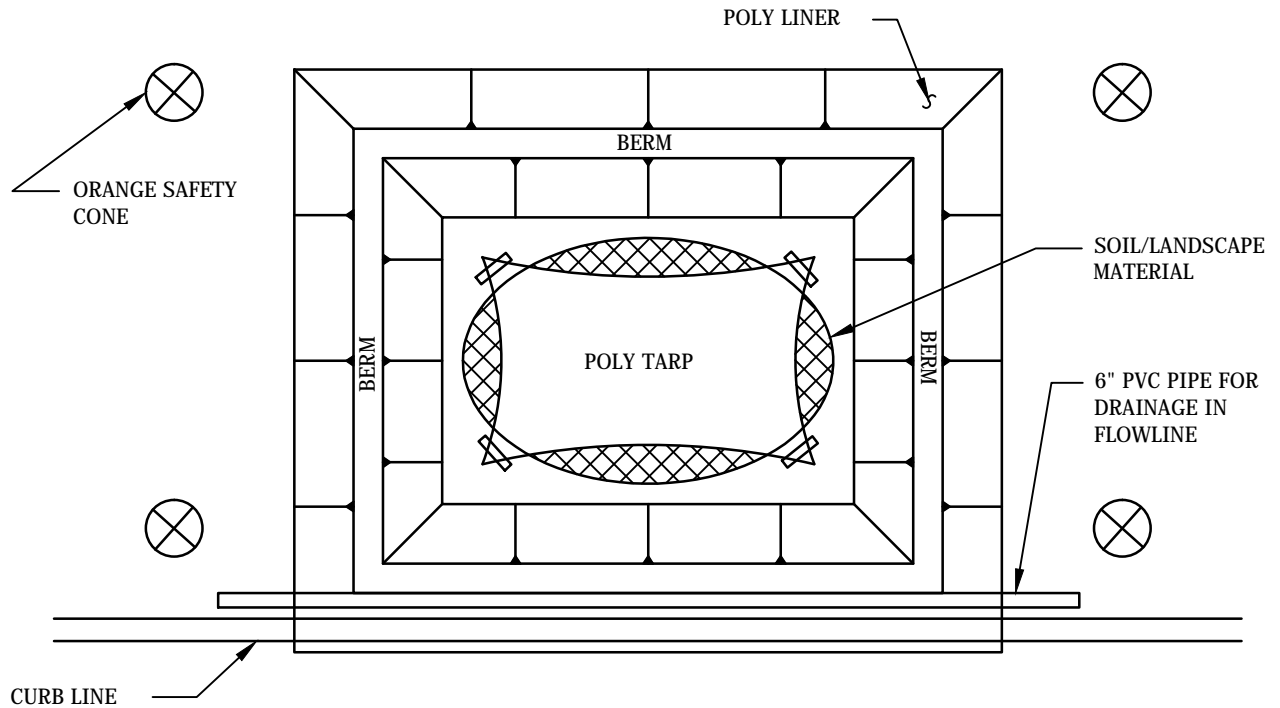


**STOCKPILE PROTECTION  
(STANDARD)**

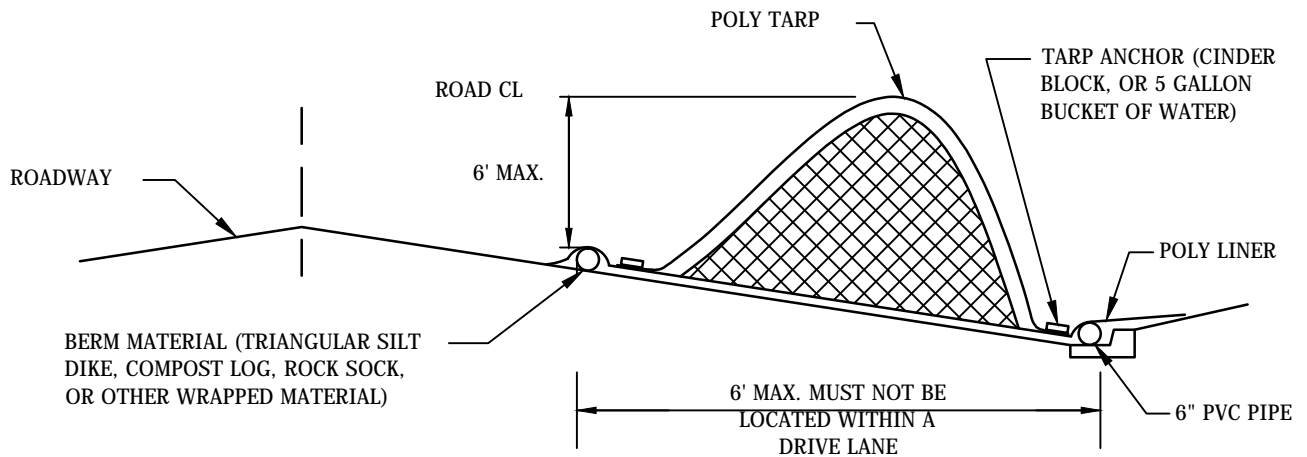
LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-13A**

PLAN VIEW



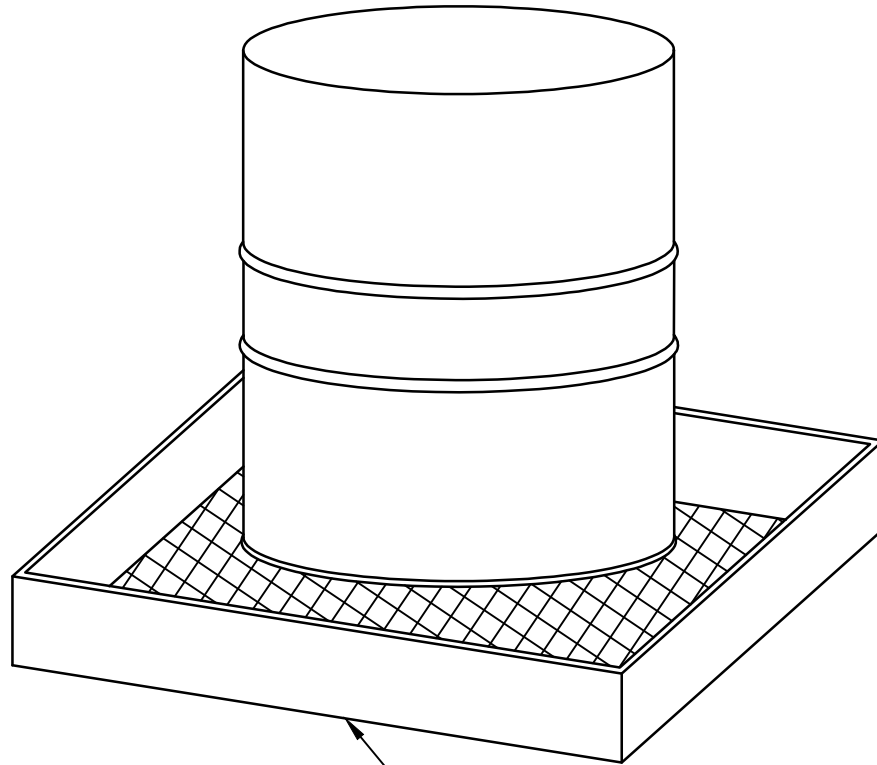
SECTION VIEW



**STOCKPILE PROTECTION  
(IN ROADWAY)**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-13B**



SECONDARY CONTAINMENT AROUND THE  
ENTIRE HAZARDOUS MATERIAL SOURCE



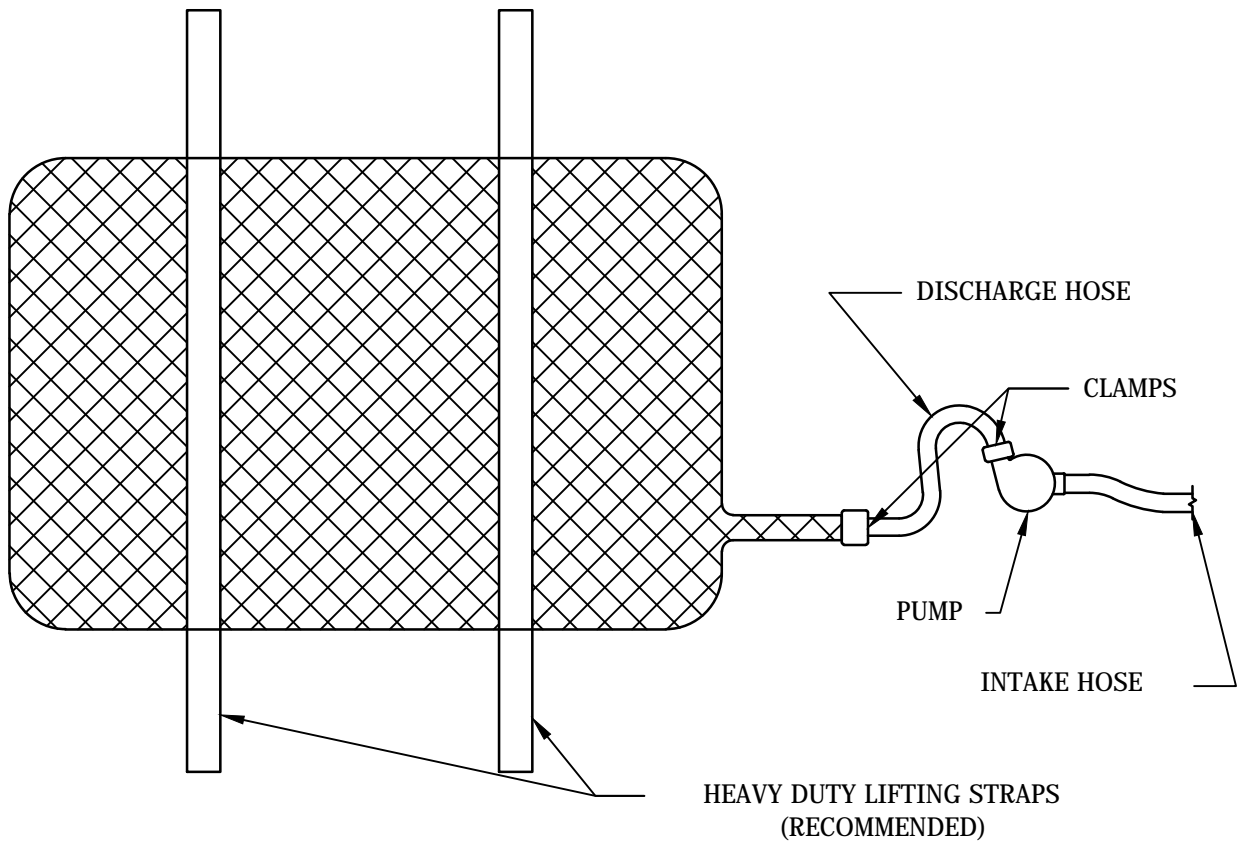
## SECONDARY CONTATINMENT

LAST REVISION:  
Sep. 2015

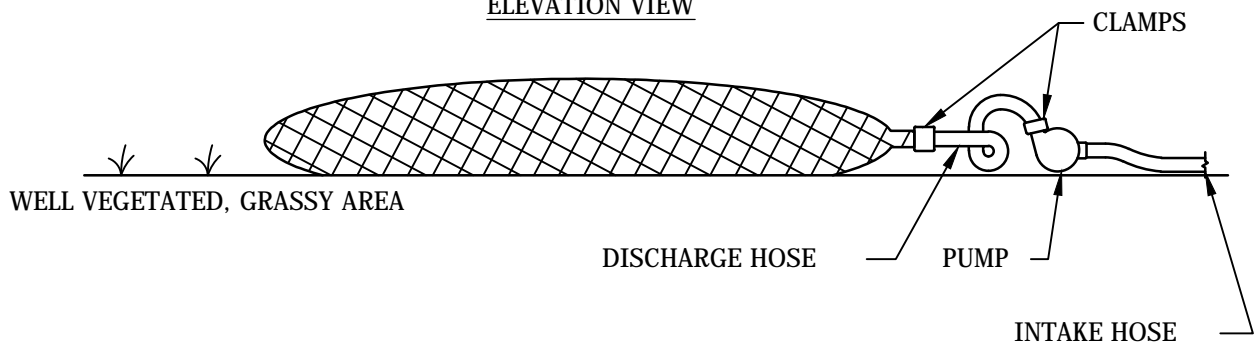
PLATE NO.  
**ERO-14**



PLAN VIEW



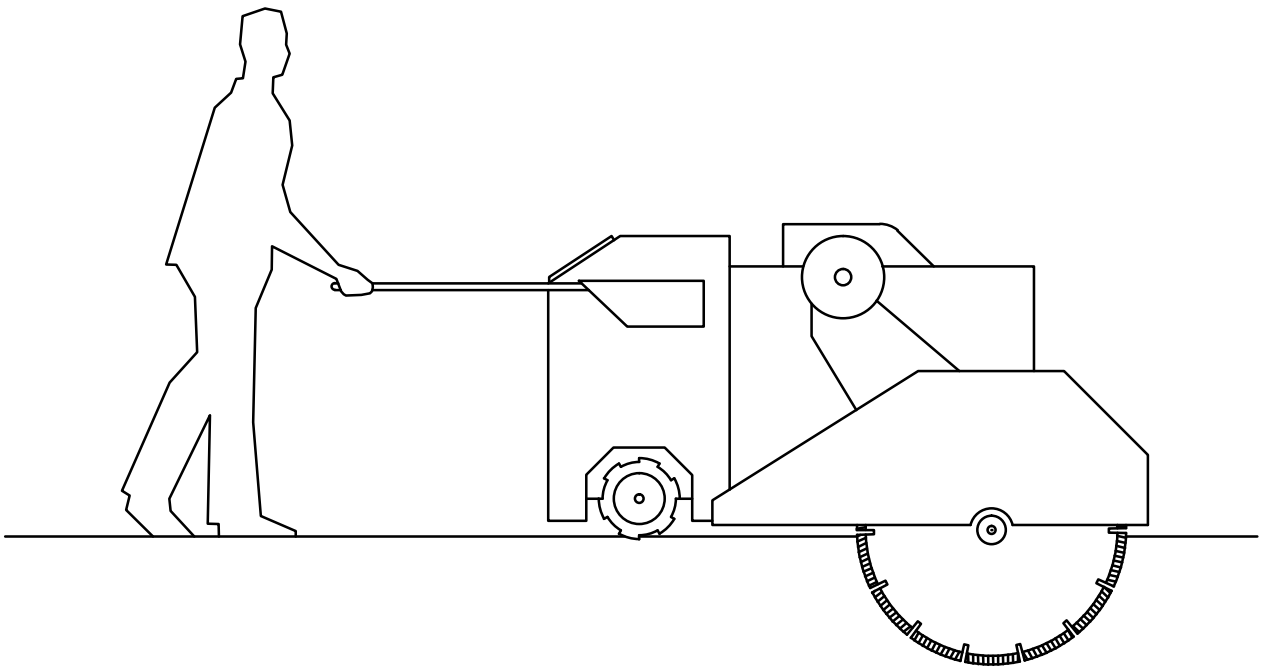
ELEVATION VIEW



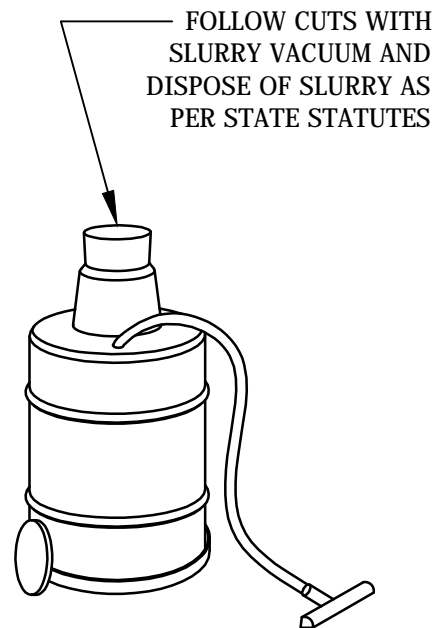
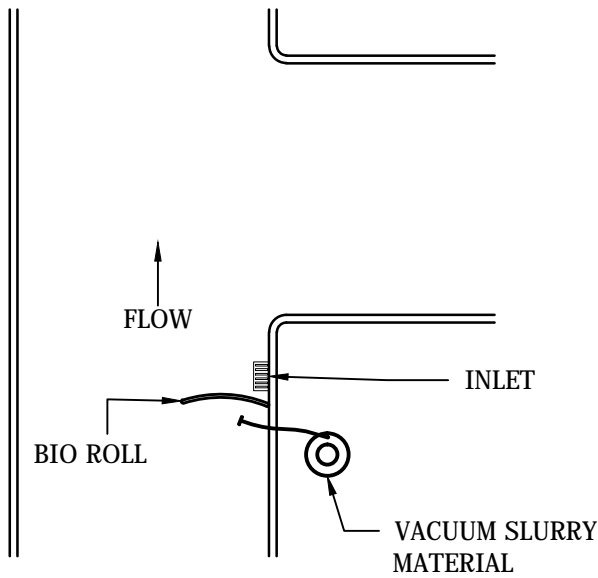
**DEWATERING BAG**

LAST REVISION:  
Sep. 2015

PLATE NO.  
**ERO-15**



PLAN VIEW



USE AS LITTLE COOLING WATER AS POSSIBLE

TURN OFF WATER WHEN NOT CUTTING

DO NOT CLEAN THE CUTTING AREA BY HOSTING IT DOWN



## CONCRETE SAW CUTTING

LAST REVISION:  
Sep. 2015

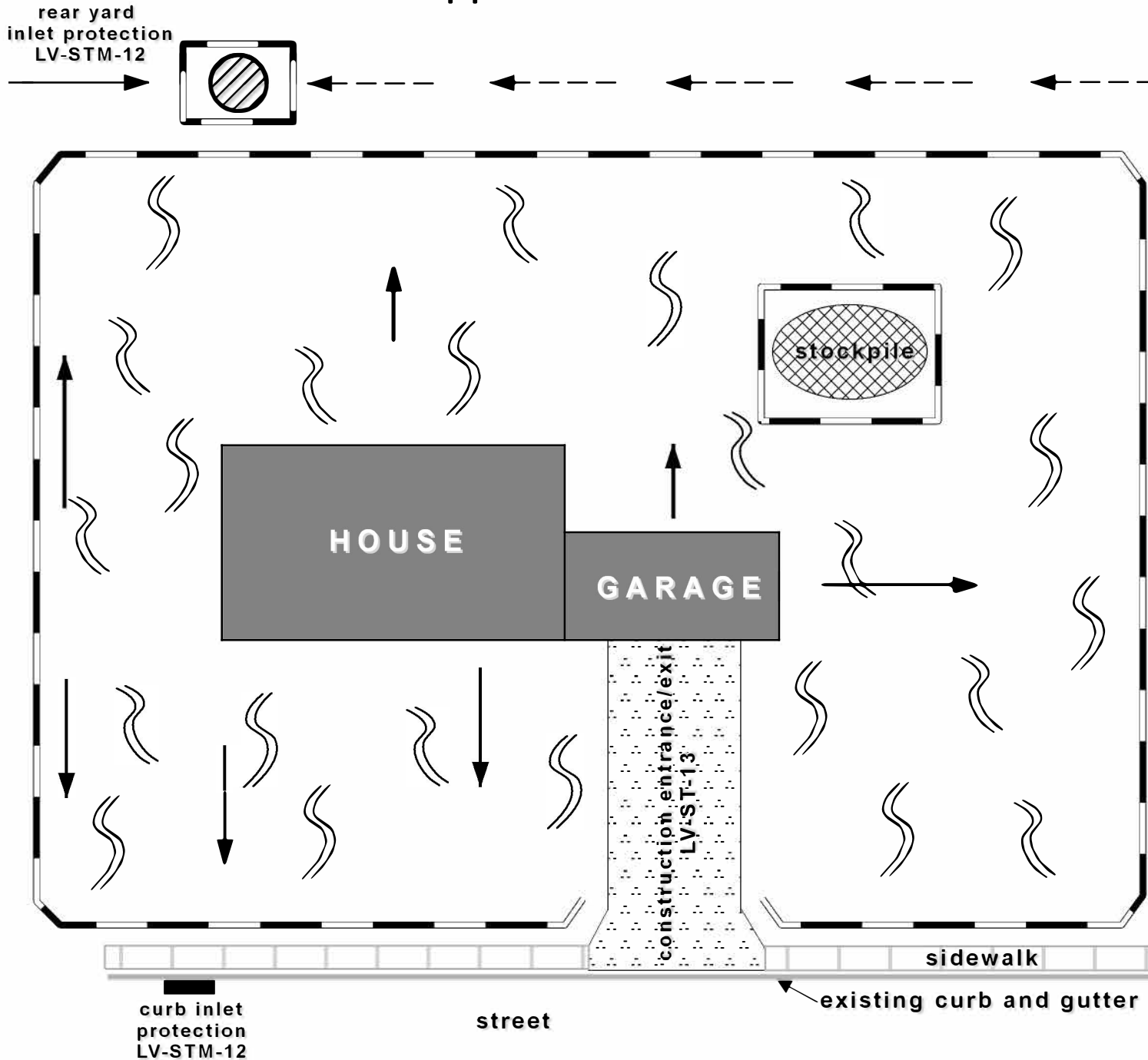
PLATE NO.  
ERO-16

## EROSION AND SEDIMENT CONTROL REMINDER HANDOUT

- Erosion and sediment control measures for single-family residential construction must be in place before any clearing and grading is performed.
- Erosion and sediment control measures must be installed to City of Circle Pines standards. These requirements are in the engineering guidelines attached to your permit package. Additional site-specific erosion control measures may be necessary for your project. Winter site stabilization controls for erosion and sedimentation are in effect from October 1<sup>st</sup> to April 30<sup>th</sup>.
- Erosion and sediment control measures are monitored by City environmental resources staff during the construction process. These inspections are covered by a flat fee. Hourly fees for erosion and sediment control inspections only will be assessed if more than 0.25 hours of inspection time is required. This billing system offers customers predictability with regard to assessed fees, and also rewards customers who properly manage erosion and sediment control measures on their construction sites.
- If erosion and sediment control measures are in need of repair, a correction notice will be issued. If corrections are not made and/or if sediment is leaving your project, a Stop Work order may also be issued.
- Stop Work orders and code enforcement inspections will be billed at the hourly rate.
- Foundation inspection approval will not be granted until erosion and sediment control measures are in place.
- Minor corrections to erosion and sediment control measures that are in place must be completed in the timeframes outlined in NPDES permit requirements. If corrections are not completed within that timeframe, a Stop Work order will be posted and code enforcement fees will be charged.
- Sites must be vegetated either temporarily or permanently with appropriate sediment controls prior to being transferred to the homeowner. Failure to complete this task will result in the City executing the security and completing the necessary activities to provide stabilization of the site.
- Homeowner's must receive the MPCA "Homeowner" fact sheet that describes the importance of maintaining erosion and sediment control until final stabilization is achieved.
- Please contact your building inspector if you have any erosion and sediment control questions.

# Individual Lot Erosion and Sediment Control

## Appendix D



### Erosion Control Legend

- ← - - direction of drainage
- ← finished grade
- - - silt fence
- ⊗ stockpile
- ~ temporary/permanent cover

- ### Notes
1. It is the responsibility of the builder to comply with State laws and local ordinances regarding construction site erosion and sediment control.
  2. This plan is only a sample plan and is not intended to be all inclusive or address every situation, additional or modified practices may be required.
  3. Erosion and sediment control measures must be functional and maintained throughout construction.
  4. Maintain positive drainage away from the structure(s).
  5. Streets must be cleared of all debris at the end of each day.
  6. Temporary/permanent cover is required on all exposed soils throughout the building process.
  7. Stockpiles must not be placed near waterbodies or on streets or sidewalks.

## Minimum Control Measure 5 Post-Construction Stormwater Management

### 5.1 PLAN REVIEW

#### Activities and Definition

Plans that are submitted to the City of Circle Pines for approval will have a review process to guarantee that post-construction stormwater standards are being met.

The City shall 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:

- Ordinances

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

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

- Require owners of construction activity to submit site plans with post-construction stormwater management BMPs designed with accepted engineering practices to the City of Circle Pines for review and confirmation that regulatory mechanism(s) requirements have been met, prior to start of construction activity.
- 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.
- For construction activity (excluding linear projects), the water quality volume must be calculated as one (1) inch times the sum of the new and the fully reconstructed impervious surface.
- 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. Where the entire water quality volume cannot be treated within the existing right-of-way, a reasonable attempt to obtain additional right-of-way, easement, or other permission to treat the stormwater during the project planning process must be made.
- 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, other volume reduction practices, a wet sedimentation basin, or filtration basin may be considered:

1. Volume reduction practices must be considered first.
  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. If the entire water quality volume is not addressed on the site of the original construction activity and the remaining water quality volume must be addressed through off-site treatment.
- f. 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 of Circle Pines 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 perform or approve 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.

10. That receive stormwater runoff from these types of entities regulated under NPDES for industrial stormwater: automobile salvage yards; scrap recycling and waste recycling facilities; hazardous waste treatment, storage, or disposal facilities; or air transportation facilities that conduct deicing activities.
- g. 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. If the entire water quality volume is not addressed on the site of the original construction activity, then the remaining water quality volume must be addressed through off-site treatment.
- 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. 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 this permit cannot be used to meet this requirement.
- j. Off-site treatment projects must be completed no later than 24 months after the start of the original construction activity. If the City determines that more time is needed to complete the treatment project, the City of Circle Pines must provide the reason(s) and schedule(s) for completing the project in the annual report.
- k. If the City receive payment from the owner of a construction activity for off-site treatment and the City must apply any such payment received to a public stormwater project.
- l. Include the establishment of legal mechanism(s) between the City and owners of structural stormwater BMPs not owned or operated by the City. The legal mechanism(s) must include provisions that, at a minimum:
  1. Allow the City of Circle Pines 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.

### Preparation

- a. Review City Ordinances, the MPCA Construction General Permit, and the MS4 post-construction standards.
- b. Reviews of submitted plans, will utilize a check list to ensure accuracy.

### Process

- a. Building lots will be required to submit a Stormwater Pollution Prevention Plan (SWPPP).
- b. The City of Circle Pines' engineering and staff will review plans for sites equal to or greater than one acre.
- c. A check list will be used to ensure accuracy and thoroughness of submitted plans.
- d. The City of Circle Pines will be responsible for enforcement of their stormwater rules:
  1. *Erosion and Sediment Control*. Unless otherwise exempted by these Standards, Applicants are required to follow the Erosion and Sediment Control requirements of this Section and are encouraged to incorporate the Stormwater Management requirements of this Section, for all proposed land disturbing activities within the City that meet any or all the following:
    - i. Disturbs a total land surface area of 6,000 square feet or more; or
    - ii. Involves excavation or filling, or a combination of excavation and filling, in excess of 100 cubic yards of material; or
    - iii. Involves the laying, repairing, replacing, or enlarging of an underground utility, pipe or other facility, or the disturbance of road ditch, grass swale or other open channel for a distance of 300 feet or more; or
    - iv. Is a land disturbing activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property, or may violate any other erosion and sediment control standard set forth in this ordinance.
    - v. Any land disturbance activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.
  2. *Stormwater Management*. Unless otherwise exempted in these Standards, Applicants are required to develop a Stormwater Management Plan that meets the requirements of this Section, for all proposed land disturbing activities that meet any or all of the following:



## Standard Operating Procedure

- i. Any land disturbing activity that may ultimately result in the addition of 1.0 acre or greater of impervious surfaces, including smaller individual sites that are part of a common plan of development that may be constructed at different times; or
  - ii. Any land disturbance activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.
3. *Exemptions.* The provisions of this Section do not apply to:
- i. Any part of a subdivision if a preliminary plat for the subdivision that has been approved by the City Council on or before the effective date hereof.
  - ii. Installation of fence, sign, telephone, and electric poles and other kinds of posts or poles.
  - iii. Excavations or land moving activities involving less than fifty cubic yards of soil.
  - iv. Emergency work to protect life, limb, or property.

### Training

The City of Circle Pines 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 course every three (3) calendar years following the initial training.

### Follow-up

When plans are submitted by the applicant, the design staff will ensure that all comments are addressed before work can take place on site. The applicant shall address comments offered by the City prior to permit issuance. The City of Circle Pines has 60 days to make a final decision on a development or redevelopment review.

### Documentation

- a. Document each plan review completed within the City's SWPPP tracking Excel table to help expedite the annual reporting process.
- b. Keep copies of plans, BMP quantities, and proposed BMPs that will be available to the inspector.
- c. Keep a log of all maintenance agreements that are filed with the City.

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 compared to the total water quality volume required to be treated.
- c. Documentation associated with off-site treatment projects the City authorizes, including

rationale to support the location of permanent stormwater treatment projects.

- d. Payments received and used.
- e. All legal mechanisms drafted, including date(s) of the agreement(s) and name(s) of all responsible parties involved.
- f. Keep logs of all maintenance agreements that are filed with the City, along with their BMP locations.

Documentation as related to training components:

- a. Document general subject matter covered.
- b. Names and departments of individuals in attendance.
- c. The date of each event.

## 5.2 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 agreements and maintenance plans that are recorded on the deed of the property. After the maintenance agreement is executed, the City is required to ensure the conditions for post-construction stormwater management continue to be met.

### Preparation

Develop a reporting mechanism (i.e. worksheet, questionnaire, etc.) for owners of post-construction stormwater BMPs.

### Process

- a. The City of Circle Pines 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.

## Enforcement Response Procedure

The City of Circle Pines shall maintain written ERPs to compel compliance with the regulatory mechanism(s) required in Section 20. The City shall specify the Assistant City Administrator for Public Services as the position title of responsible person(s) for conducting enforcement along with the timeframe. The following enforcement tools include:

- a. Verbal warnings
- b. Notice of violations
- c. Civil penalties

## Documentation

- a. Keep logs of all maintenance agreements that get filed with the City of Circle Pines along with their BMP locations.
- b. Annually update the City mapping system to include all public and private storm sewer and post-construction stormwater BMPs installed within the City.
- c. Obtain as-built plans for all public and private post-construction stormwater BMPs that are installed within the City.
- d. Obtain a long-term maintenance agreement for private structural stormwater BMPs.
- e. Obtain a site plan review procedure to ensure the post-construction stormwater management is in accordance with the regulatory mechanism.
- f. Update the GIS system to include all public and private storm sewer and post-construction stormwater BMPs installed within the City.

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. Referrals to other regulatory organizations.
- e. The date(s) violation(s) are resolved.



## Standard Operating Procedure

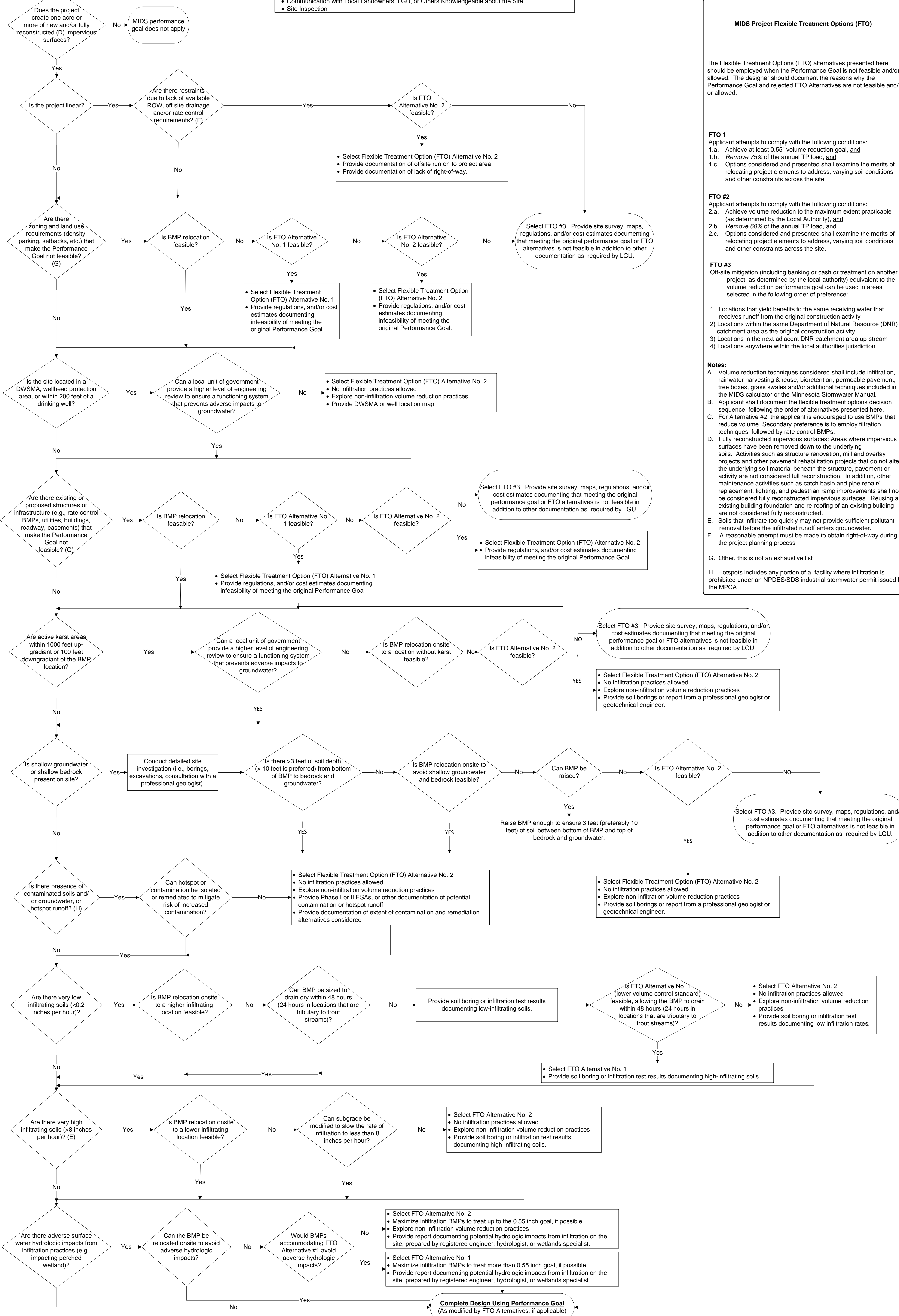
Keep copies of returned reporting mechanisms and inspection reports on file for at least three (3) years, should the City of Circle Pines be required to perform maintenance for non-compliance.

The City of Circle Pines 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.

MIDS DESIGN SEQUENCE FLOW CHART  
Appendix A

- Conduct Site Review:**
- Aerial Photos and Topographic Maps
  - County Soil Surveys and other Soil Information as Available
  - County Geologic Atlas
  - Local Groundwater Levels
  - DWSMA and Wellhead Protection Maps
  - FEMA and Local Floodplain Maps
  - Soil Borings and Site Survey
  - MPCA Listing of Potentially Contaminated Sites
  - Phase 1 and 2 Environmental Site Assessments
  - TMDLs and Local Water Quality Standards
  - Wetland Delineations, MNRAM Assessments, and Wetland Classifications
  - Proposed Conditions, Conceptual/Preliminary Site Design
  - Local zoning and land use requirements/ordinances, including stormwater rate control requirements
  - Communication with Local Landowners, LGU, or Others Knowledgeable about the Site
  - Site Inspection

**Define Performance Goal**  
New and redevelopment projects: Retain on site a volume of 1.1" from impervious surfaces  
Linear projects: Retain on site the larger of 1.1" from all new, or .55" from all new and fully reconstructed (D) impervious surfaces.



**MIDS Project Flexible Treatment Options (FTO)**

The Flexible Treatment Options (FTO) alternatives presented here should be employed when the Performance Goal is not feasible and/or allowed. The designer should document the reasons why the Performance Goal and rejected FTO Alternatives are not feasible and/or allowed.




**FTO #1**  
Applicant attempts to comply with the following conditions:  
1.a. Achieve at least 0.55" volume reduction goal, and  
1.b. Remove 75% of the annual TP load, and  
1.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site

**FTO #2**  
Applicant attempts to comply with the following conditions:  
2.a. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and  
2.b. Remove 60% of the annual TP load, and  
2.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.


**FTO #3**  
Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas 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 Department of Natural Resource (DNR) catchment area as the original construction activity  
3) Locations in the next adjacent DNR catchment area up-stream  
4) Locations anywhere within the local authorities jurisdiction

**Notes:**  
A. Volume reduction techniques considered shall include infiltration, rainwater harvesting & reuse, bioretention, permeable pavement, tree boxes, grass swales and/or additional techniques included in the MIDS calculator or the Minnesota Stormwater Manual.  
B. Applicant shall document the flexible treatment options decision sequence, following the order of alternatives presented here.  
C. For Alternative #2, the applicant is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.  
D. Fully reconstructed impervious surfaces: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed.  
E. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.  
F. A reasonable attempt must be made to obtain right-of-way during the project planning process  
G. Other, this is not an exhaustive list  
H. Hotspots includes any portion of a facility where infiltration is prohibited under an NPDES/SDS industrial stormwater permit issued by the MPCA

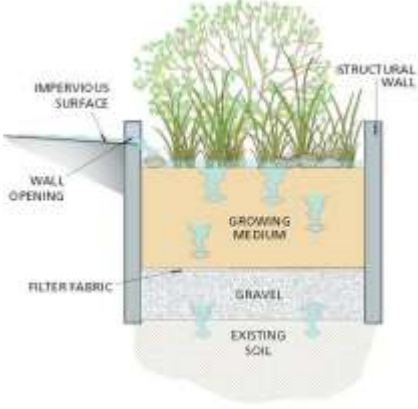

## APPENDIX B BMP MATRIX

BMP Type <sup>1</sup>	Benefits	Negatives	Implementation Considerations	Examples
Better Site Design	<ul style="list-style-type: none"> <li>Minimizes need for structural BMPs</li> <li>Preserves natural areas</li> <li>Provides buffers for waterbodies</li> <li>Reduces the amount of regulatory compliance</li> </ul>	<ul style="list-style-type: none"> <li>May conflict with local ordinances</li> </ul>	<ul style="list-style-type: none"> <li>Is there local buy in (developers, officials, etc.)?</li> </ul>	
Infiltration/Rain Garden	<ul style="list-style-type: none"> <li>Manages stormwater</li> <li>filters pollutants</li> <li>Wildlife habitat</li> <li>Little maintenance</li> <li>Adds beauty</li> </ul>	<ul style="list-style-type: none"> <li>Plants can take 2-3 years to establish</li> <li>More maintenance required in first few years</li> </ul>	<ul style="list-style-type: none"> <li>Construct downslope of runoff to be captured</li> <li>Plant in spring or fall</li> <li>Locate at least 10 feet from building foundations</li> </ul>	
Filtration/Riparian Buffer	<ul style="list-style-type: none"> <li>Increases infiltration and groundwater recharge</li> <li>Improves water quality</li> <li>Controls erosion &amp; sedimentation</li> <li>Provides wildlife</li> </ul>	<ul style="list-style-type: none"> <li>Not as effective on steep slopes</li> <li>More difficult to implement than some other practices</li> </ul>	<ul style="list-style-type: none"> <li>Plant in spring or fall</li> <li>Locate at least 10 feet from building foundations</li> </ul>	

## APPENDIX B BMP MATRIX



	habitat			
Permeable Pavement	<ul style="list-style-type: none"> <li>• Reduces runoff quantity, TSS, and TP loads, as well as temperature of runoff water</li> <li>• Well suited to high density urban areas that may not have space for other BMPs</li> </ul>	<ul style="list-style-type: none"> <li>• Require regular vacuuming to maintain infiltration capabilities</li> <li>• Suitable for low volume roads, ped only areas, parking stalls, etc.</li> <li>• Winter sanding may clog the surface material</li> </ul>	<ul style="list-style-type: none"> <li>• Should be located at least 10 feet from structures and 100 feet from water supply wells</li> <li>• Surface slopes should be at least 1% to provide an alternate means of drainage should the surface pavement become clogged</li> </ul>	

## APPENDIX B BMP MATRIX


<p>Infiltration Planters</p>	<ul style="list-style-type: none"> <li>Increases infiltration and evapotranspiration of stormwater</li> <li>Filters pollutants</li> <li>Requires little maintenance</li> <li>Provides wildlife habitat</li> <li>Large canopy of native trees maximized benefits</li> </ul>	<ul style="list-style-type: none"> <li>Takes many years before trees grow to provide maximum benefit</li> <li>Regular maintenance is required where invasive plant species exist</li> <li>Must guard against deer browsing and vole damage</li> </ul>	<ul style="list-style-type: none"> <li>Plant in spring or fall</li> <li>Watering may be necessary after planting during dry weather (25 gallons/week)</li> </ul>	 <p>The diagram illustrates a cross-section of an infiltration planter. At the top, there is an IMPERVIOUS SURFACE with a WALL OPENING on the left. Inside the planter, there is a GROWING MEDIUM with plants. Below the growing medium is a FILTER FABRIC, followed by a layer of GRAVEL. At the bottom, the planter sits on EXISTING SOIL. A STRUCTURAL WALL is shown on the right side of the planter.</p>
<p>Stormwater Reuse</p>	<ul style="list-style-type: none"> <li>Protects water supplies by reducing use during peak summer months</li> <li>Results in cost savings by reducing municipal water bill</li> <li>Mimics the natural hydrology of the area by infiltrating rainwater</li> </ul>	<ul style="list-style-type: none"> <li>May act as a mosquito breeding site</li> <li>Human exposure to pathogens</li> <li>Cross contamination of potable water supply</li> <li>No well-defined operation and maintenance plan</li> </ul>	<ul style="list-style-type: none"> <li>Some roof types are not conducive since they have the potential to introduce contaminants into the system</li> <li>Systems needs to remain watertight and be located on level ground</li> </ul>	 <p>The photograph shows a black rainwater harvesting barrel with a downspout attached. It is located outdoors, next to a wooden fence and a window. The barrel is sitting on a small concrete base.</p>




## APPENDIX B BMP MATRIX

<p>Green Roofs</p>	<ul style="list-style-type: none"> <li>• Double the lifespan of traditional roof</li> <li>• Reduce the urban heat island effect</li> <li>• Can reduce flow rate by up to three hours and reduce flow of stormwater by up to 65%2</li> <li>• Reduces energy costs by insulating the structure; less swing in diurnal temperatures</li> </ul>	<ul style="list-style-type: none"> <li>• Installation costs double that of a traditional roof</li> <li>• Significant maintenance obligations to ensure establishment</li> </ul>	<ul style="list-style-type: none"> <li>• Roofs must be able to structurally support vegetation and growing medium</li> <li>• Quality Installation and leak prevention a must</li> <li>• Historic buildings may require special authorization</li> </ul>	 <p>Source: U.S. Government Services Agency</p>
<p>Iron Enhanced Sand Filters</p>	<ul style="list-style-type: none"> <li>• High pollutant removal rates</li> <li>• Use as a retrofit for existing ponds or other BMPs</li> <li>• Can be used at sites with restrictions where infiltration may not be appropriate or feasible</li> </ul>	<ul style="list-style-type: none"> <li>• Disposal of iron-sand bed will be required when the iron is consumed</li> <li>• Long inundation periods and dead vegetation can cause low oxygen conditions and iron loss</li> <li>• Head required for drawdown</li> </ul>	<ul style="list-style-type: none"> <li>• Adjacent slopes must be less than 20% and greater than 1%</li> <li>• Depth to bedrock and water table must be more than 3 feet or an impermeable liner must be used</li> </ul>	

## APPENDIX B BMP MATRIX

<p>Stormwater Ponds</p>	<ul style="list-style-type: none"> <li>• Provides flood control by reducing the rate that stormwater enters receiving waters</li> <li>• Removal of pollutants such as phosphorous, total suspended solids, and metals through settling of stormwater</li> <li>• May reduce channel erosion by reducing peak stormwater flows to receiving waters</li> </ul>	<ul style="list-style-type: none"> <li>• Space requirements could be high since the pond footprint should be 1-3% of the drainage area</li> <li>• Have the potential for nuisance insects or odor</li> <li>• May pose safety concerns</li> </ul>	<ul style="list-style-type: none"> <li>• Need to maintain dead storage or permanent pool</li> <li>• Pretreatment highly recommended to reduce sedimentation and reduce maintenance requirements</li> <li>• Soil groups A and B may require a liner to maintain dead storage</li> <li>• Adjacent slopes should be less than 25% but greater than 0.5%</li> <li>• May not be appropriate if receiving waters are cold water fisheries</li> </ul>	
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## APPENDIX B BMP MATRIX

<p>Hydrodynamic Separators</p>	<ul style="list-style-type: none"> <li>• Units are underground, reducing space requirements</li> <li>• Can be used as pretreatment devices</li> <li>• Can be used in cold climates if installed below the frost line</li> </ul>	<ul style="list-style-type: none"> <li>• May not meet local standards when used alone</li> <li>• Not very effective for removing nutrients and bacteria</li> </ul>	<ul style="list-style-type: none"> <li>• May require a bypass if high flows are common or expected</li> <li>• Consider pollutant of concern; solids and floatables are removed much more effectively than dissolved pollutants</li> </ul>	
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<sup>1</sup>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.

<sup>2</sup>Source: U.S. General Services Administration <http://www.gsa.gov/portal/content/166443>



# **Engineering Design Standards for Stormwater Management**

**City of Circle Pines**

**November 2014**

**Appendix C**

**Prepared by WSB & Associates**



# Engineering Design Standards

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## APPENDICES

- Appendix A MIDS Flowchart
- Appendix B BMP Matrix

# Engineering Design Standards

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## 1. DESIGN OVERVIEW

The City of Circle Pines' Stormwater Pollution Prevention Plan (SWPPP) identifies the goals and policies that define the City's stormwater management program, which are implemented via the City Stormwater Management Ordinance of the Zoning Code (Chapter 13 – Section 1350) and these Engineering Design Standards. Circle Pines' stormwater requirements were written to meet the City's goals to preserve, protect, and manage its water resources as well as to meet federal, state, and watershed stormwater regulations and to meet the following objectives:

- Minimize increases in stormwater runoff rates from any development in order to reduce flooding, siltation and erosion and in order to maintain the integrity of stream channels,
- Minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality,
- Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime to the maximum extent practicable,
- Ensure that these management controls are properly maintained and pose no threat to public safety, and
- Implement stormwater management controls to help meet current and future total maximum daily load (TMDL) goals, to address the need to improve water quality, and to meet objectives in the Local Surface Water Management Plan.

## 2. DEFINITIONS

For the purpose of this Design Manual, the following definitions describe the meaning of the terms used in this Design Manual:

*Applicant* means a property owner or agent of a property owner who has filed an application for a Stormwater Management Permit.

*Applicability* means any land disturbing activity requiring a City of Circle Pines Stormwater Management Plan as defined in City Code Section 1350: Stormwater Management.

*Channel* means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

*Impervious Area* means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, gravel, driveways, swimming pools, etc.).

## Engineering Design Standards

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*Land Disturbance Activity* means any activity that changes the volume or peak discharge rate of stormwater runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity that bares soil or rock or involves the diversion or piping of any natural or fabricated watercourse.

*Maintenance Agreement* means document recorded against the property which provides for long-term maintenance of stormwater treatment practices.

*Nonpoint Source Pollution* means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

*Off-Site Facility* means a stormwater management measure located outside the subject property boundary described in the permit application for land development activity.

*Redevelopment* means for projects with 1 acre or greater of impervious and reconstructing greater than 15 percent of the existing impervious surfaces the requirements of MIDS will apply to both the reconstructed and new impervious surface. For projects reconstructing less than 15 percent of the existing impervious only the new impervious will be subject to conformance with the MIDS requirements. (*MPCA, Tech Support Document for Post-Construction Stormwater Management*).

*Responsible Party* means the entity which will be responsible for ownership and maintenance of Stormwater Treatment Practices.

*Stop Work Order* means an order which requires that all construction activity on a site be stopped.

*Stormwater Management* means the use of structural or non-structural practices that are design to reduce stormwater runoff pollutant loads, discharge volumes, and/or peak discharge rates.

*Stormwater Management Plan* means a set of drawings or other documents submitted by a person as a prerequisite to obtaining a stormwater management approval, which contains all of the required information and specifications pertaining to Stormwater Management.

# Engineering Design Standards

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*Stormwater Reviews* means any site that either increases impervious surface by greater than 1 acre or redevelops 1 acre or greater of impervious. The review will be completed to evaluate compliance with the MPCA's Minimal Impact Design Standards (MIDS). For sites either creating or redeveloping less than 1 acre of impervious the City will work with the applicant to determine if water quality practices can be incorporated into the site. Sites less than 1 acre will also not be allowed their drainage to negatively impact downstream properties (or water bodies).

*Stormwater Runoff* means flow on the surface of the ground, resulting from precipitation.

*Stormwater Treatment Practices (STPs)* means measures, either structural or nonstructural, that are determined to be the most effective and practical means of preventing or reducing point source or nonpoint-source pollution inputs to stormwater runoff and waterbodies.

*Water Quality Volume (WQ<sub>v</sub>)* means that runoff storage volume needed to treat the specified phosphorus loading as determined in the Circle Pines Engineering Design Guidelines.

*Watercourse* means a permanent or intermittent stream or other body of water, either natural or fabricated, which gathers or carries surface water.

*Watershed* means the total drainage area contributing runoff to a single point.

### **3. PROCEDURE FOR REVIEWING STORMWATER MANAGEMENT PLANS**

All projects either creating or disturbing 1 acre or greater of new impervious will require the submittal of a Stormwater Management Plan. In lieu of preparation of a Stormwater Management Plan projects disturbing less than 1 acre and down to 10,000 square feet or will result in more than 200 cubic yards of cut or fill are only required to develop an erosion control plan addressing the requirements of Section 6 of these guidelines.

The general review process, from the submittal of the concept and final plans to the issuance of the Stormwater Management Plan approval, is summarized in the following six steps:

- 1) Determine what stormwater management provisions apply (stormwater management, erosion control, buffers, floodplain management).
- 2) What permits, or approvals, are required for the project site, and what waivers and/or exemptions are applicable (COE, DNR, MPCA, Watershed, WCA, etc.)
- 3) Determine if the project falls with the Rice Creek Watershed District.



# Engineering Design Standards

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- 4) Are the selected practices appropriate for this site?
- 5) Are the practices designed to meet the minimum performance criteria?
- 6) Does the Plan meet other resource protection requirements as specified in the City of Circle Pines Code and Comprehensive Plan?
- 7) Are provisions for long-term maintenance adequate, including access and methods for maintenance defined?

## 4. SUBMITTAL REQUIREMENTS

### **Requirements for Stormwater Management Plan Approval**

#### **Stormwater Management Plan Required**

No stormwater management permit will be approved unless it includes a Stormwater Management Plan detailing how runoff and associated water quality impacts resulting from the development will be controlled or managed (note the exceptions in Section 3.). This plan must indicate whether stormwater will be managed on-site or off-site and, if on-site, the general location and type of practices.

The Stormwater Management Plan must be signed by a licensed professional engineer in the State of Minnesota, who will verify that the design of all stormwater management practices meet the submittal requirements outlined in the Submittal Checklist found in the City's SWPPP program binder. No building permit, grading permit, sediment control permit, or subdivision approval shall be issued until a satisfactory final Stormwater Management Plan, or a waiver thereof, shall have undergone a review and been approved by the City after determining that the plan waiver is consistent with the requirements of this manual.

#### **Stormwater Management Conceptual Plan Requirements (Optional)**

A stormwater management concept plan submittal is optional, but highly encouraged. A concept plan identifies basic site information, locations of proposed development features, and preliminary locations and sizing of STPs. The concept submittal has a greater chance of identifying major obstacles and can facilitate alternative stormwater management arrangements in a timely fashion and at the onset of project planning. If a concept plan is submitted for review, it should include sufficient information (e.g., maps, basic hydrologic and water quality calculations etc.) to evaluate the environmental characteristics of the project site. This information should show the potential impacts of all proposed development of the site, both present and future, on the water resources, and show the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The intent of this conceptual planning process is to determine the type of stormwater management of stormwater runoff from future development, and to identify major issues prior to completing final plans.

# Engineering Design Standards

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The concept plan is less time consuming and more efficient to evaluate proposed development plans with this step of the review process.

The final plan provides more detailed design information for the proposed STPs, and includes much more detail in terms of hydrologic conditions and site features.

For redevelopment an applicant should include within a concept plan measures for controlling existing stormwater runoff discharges and water quality from the site in accordance with the standards of this Manual. After review of the concept plan and modifications are made to that plan as deemed necessary by the City, a final Stormwater Management Plan may be submitted for approval.

## **Stormwater Management Plan Requirements (Required)**

Record drawings are required for all projects that impact wetlands and/or the floodplain, require water quality ponding, have significant grade changes, and/or have other unusual circumstances. Record drawings must be certified by a professional land surveyor or civil engineer. (Record drawings should not include temporary erosion control measures.)

### 1. Plan Details

- north arrow, street names, and lot and block numbers for property or subdivision
- location of benchmark, based on the City/County benchmark system
- key with all line types, symbols, shading, and cross-hatching denoted
- illustration key showing symbols for all information pertaining to lot and building design, including grades, easements, lot and block, setbacks, etc...
- plan scale (shown graphically on a bar scale) of: 1 inch = 20 feet, 1 inch = 30 feet, 1 inch = 40 feet, or 1 inch = 50 feet. Plans in other scales will not be reviewed.
- total area of subject property, with subtotals of disturbed **and** undisturbed areas (tabulation permitted)
- subject property's boundary lines, lot lines and right of way lines
- all existing and proposed drainage and utility easements
- all man-made features, including existing and proposed buildings, structures, and paved areas
- all existing storm sewer facilities within 150 feet of the subject parcel
- all proposed storm sewer facilities (include grades and size of structures)
- all existing and proposed natural features including, but not limited to, significant trees and tree lines, wetlands, ponds, lakes, streams, drainage channels, floodplain, etc...
- show setbacks and buffers for wetlands, ponds, lakes, streams, and floodplains

# Engineering Design Standards

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- all adjacent plats, parcels, rights-of-way, section lines, extended a minimum of 100 feet (50 feet for single family home construction) beyond the subject parcel in all directions

## 2. Topography

- topography details in a minimum of two-foot contour intervals with existing contours as **dashed lines** and proposed contours as dark, **solid lines**, labeled at each edge of the plan and at other appropriate locations
- standard lot benching detail, where appropriate (maximum slopes: 3:1)
- direction arrows indicating swales and lot drainage patterns (show percent grades along drainage swales on plan)

## 3. Elevation Information

- proposed top of curb elevations at lot corners and driveway or entrances
- finished spot elevations at all high and low points
- proposed elevations at garage and lowest floor for proposed buildings
- proposed finished ground elevations around home for final grading

## 4. Temporary Erosion Control Best Management Practices (BMPs)

Show location of all structural erosion control measures (with standard detail plates and maintenance information for each), including, but not limited to:

- temporary rock entrance/exit for all vehicle access points (show on plan and provide detail)
- perimeter silt fence; silt fence and/or bale checks should also be placed along swales or slopes greater than 50 feet in length (flare ends of silt fence up slope)
- storm sewer inlet filters (indicate type and show graphically on plan at each location)
- temporary sediment basins
- erosion control mats, fiber blankets, netting, temporary seed, or temporary mulch. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
- soil stockpile areas (indicate temporary stabilization measures)
- Street Sweeping Required**

Plans must include a note indicating that all adjacent streets will be swept daily, or as directed by the City, to remove all accumulated materials. Failure to perform any street

# Engineering Design Standards

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sweeping within six hours of notice by the City will result in the work being performed by the City and all associated costs billed.. The City also requires removal of accumulated materials on streets during winter.

## 5. Final Stabilization

New resident construction requires vegetated stabilization from the front curb line to the back of the structure for the entire width of the lot. Show seeding and/or turf establishment locations and specifications, including:

- type of seeding (permanent, temporary, dormant)
- seed type and application rate
- fertilizer type and application rate
- mulch type, application rate, and method of anchoring
- specifications for installation and maintenance of erosion control mats, blankets, or netting
- note requiring seeding/restoration to be completed within 48 hours of final grading
- location of all areas to be vegetated

## 6. Tree Preservation

Show the following standards when a Tree Preservation Permit is required (see Tree Preservation ordinance for more requirements and information).

- Identify, tally, and locate all significant trees on site (tally and show graphically on plan).
- Identify, tally, and locate all significant tree removals on site (tally and show graphically on plan).
- Use tally information and calculations from ordinance to determine if mitigation is required.
- If mitigation is required, provide separate landscape plan identifying requirements.
- Show location of all tree preservation fencing required by ordinance specifications (heavy-duty silt fence can also be used for tree protection).

## **5. LIST OF ACCEPTABLE PRACTICES**

In the development of the STP appropriate for the development or redevelopment, infiltration (water quality volume) is foremost in importance to apply in the design. Filtration is warranted when site conditions do not allow for an effective infiltration facility. For flooding or rate control, detention systems are typically the preferred practice. Low Impact Design (LID) practices are encouraged when they can be functionally incorporated into the design. Alternative practices may be approved at the discretion of the City Engineer. For when infiltration is not

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feasible the STPs proposed shall meet the performance identified in the MIDS Flexible Treatment Options (FTO).

## **Volume Control Systems:**

- Infiltration trench
- Infiltration basin
- Raingarden
- Underground storage
- Reuse
- Green Roofs
- Trees/Tree Planters

## **Filtration Systems:**

- Surface sand filter
- Underground sand filter
- Perimeter sand filter
- Organic filter
- Bioretention system
- Raingarden with underdain
- Pervious pavement with underdrain
- Underground storage with underdrain
- Tree trench

## **Detention Systems:**

- Wet pond
- Stormwater re-use systems
- Multiple pond systems
- Extended detention basin
- Micro-pool extended detention basin
- Dry detention ponds
- Underground storage
- Other, as approved by the City of Circle Pines

## **Wetlands:**

- Shallow wetland
- Pond/wetland systems

## Open Channel Systems:

- Dry swale
- Wet swale
- Grass swale
- Natural channel, or stream

## 6. CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

### 6.1 Erosion Control

1. The Permittee must plan for and implement appropriate construction phasing vegetative buffer strips, horizontal slope grading, and other construction practices to minimize erosion. All areas not to be disturbed shall be marked (e.g. with flags, stakes, signs, silt fence etc.) on the project site before any work begins.
2. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
3. Additional BMPs together with enhanced runoff controls are required for discharges to special waters and impaired waters. The BMPs identified for each special or impaired water are required for those areas of the project draining to a discharge point on the project that is within one mile of a special or impaired water and flows to that water.
4. The permittee must stabilize the normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connecting to a surface water or property edge.
5. Pipe outlet must have temporary or permanent energy dissipation before connecting to surface water.
6. When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.
7. All areas disturbed during construction must be restored as detailed in these requirements. The type of permanent restoration shall be clearly shown on the plans including but not limited to sod, seed, impervious cover and structures. A minimum of 6 inches of topsoil must be installed prior to permanent restoration.

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Areas in which the top soil has been placed and finish graded or areas that have been disturbed and other grading or site building construction operations are not actively underway must be temporary or permanently restored as set forth in the following requirements.

- 1) Areas with slopes that are less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.
- 2) Areas with slopes that are greater or equal to 3:1 must be seeded and erosion control blanket placed within 14 days of the area not being actively worked.
- 3) All seeded area must be either mulched and disc anchored, hydro-mulched, or covered by erosion control blanket to reduce erosion and protect the seed. Temporary or permanent mulch must be disc anchored and applied at a uniform rate of 2 tons per acre and have 90% coverage.
- 4) If the disturbed area will be re-disturbed within a six month period, temporary vegetative cover shall be required consisting of an approved seed mixture and application rate.
- 5) If the disturbed area will not be re-disturbed within a six month period, permanent vegetative cover shall be required consisting of an approved seed mixture and application rate.
- 6) All areas that will not have maintenance done such as mowing as part of the final design shall be permanently restored using an approved seed mixture and application rate.
- 7) Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.
8. All erosion control measures must be maintained for the duration of the project until final stabilization has been achieved in accordance with Section 1.7. If construction operations or natural events damage or interfere with any erosion control measures, they shall be restored to serve their intended function.
9. Additional erosion control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements

### **6.2 Sediment Control Practices**

1. 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 achieved.
2. If down gradient treatment system is overloaded additional up gradient sediment control practices must be installed to eliminate overloading. The SWPPP must be amended to identify the additional practices.
3. All storm drain inlets must be protected by approved BMPs during construction

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- until all potential sources for discharge have been stabilized. These devices must be maintained until final stabilization is achieved. Inlet protection may be removed if a specific safety concern (street flooding/freezing) has been identified.
4. Temporary stockpiles must have silt fence or other effective sediment controls on the down gradient side of the stockpile and shall not be placed at least twenty five (10) feet from any road, wetland, protected water, drainage channel, or storm water inlets. Stockpile left for more than fourteen (14) days must be stabilized with mulch, vegetation, tarps or other approved means.
  5. Vehicle tracking of sediment from project shall be minimized by approved BMPs. These shall be installed and maintained at the City approved entrances. Individual lots shall each be required to install and maintained entrances throughout the construction building until a paved driveway is install.
  6. Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.
  7. Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.
  8. Silt fence or other approved sediment control devices shall be required along the entire curb line, except for approved opening where construction entrance will be installed or drainage flows away from curb. This device must be maintained until final stabilization is achieved. Ditch checks shall be required in ditch bottoms. Spacing for the check must be as followed: [***Height in feet*** (of the sediment device used)] ***X 100 / Slope Gradient***
  9. Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.
  10. Flows from diversion channels or pipes (temporary or permanent) must be routed to sedimentation basins or appropriate energy dissipaters to prevent the transport of sediment to outflow or lateral conveyors and to prevent erosion and sediment buildup when runoff flows into the conveyors.
  11. A concrete washout shall be installed on projects that require the use of concrete. All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A sign must be installed adjacent to each washout facility to inform operators to utilize the proper facilities.
  12. All sediment control measures shall be used and maintained for the duration of the project until final. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.
  13. Additional sediment control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements.
  14. Restrict clearing and grading within 20 feet of an existing wetland boundary to provide for a protective buffer strip of natural vegetation.

### 6.3 Temporary Sediment Basins

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1. A temporary sediment basin (or permanent) shall be provided when 10 or more acres of disturbed soil drain to a common location prior to the runoff leaving the site or entering surface waters. The Permittee is also encouraged, but not required to install temporary sediment basins in areas with steep slope or highly erodible soils even if the area is less than ten (10) acres and it drains to one common area. The basins shall be designed and constructed according to the following requirements.
  - 1) The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2-year, 24-hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1,800 cubic feet of storage below the outlet pipe from each acre drained to the basin.
  - 2) Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin shall be provided where attainable until final stabilization of the site.
  - 3) Temporary basin outlets will be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.
  - 4) Temporary (or permanent) basins must be constructed and made operational concurrent with the start of soil disturbance that is up gradient of the area and contributes runoff to the pond.
  - 5) Where the temporary sediment basin is not attainable due to site limitations, equivalent sediment controls such as smaller sediment basins, and/or sediment traps, silt fences, vegetative buffer strips or any appropriate combination of measures are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. In determining whether installing a sediment basin is attainable, the Permittee must consider public safety and may consider factors such as site soils, slope, and available area on site. This determination must be documented in the SWPPP.
  - 6) The Permittee shall maintain the sedimentation basins and will remain functional until an acceptable vegetative cover is restored to the site, resulting in a pre-development level rate of erosion. The city will not issue building permits for lots containing sediment basins until they have been removed or relocated based on the projects restoration progress.

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- 7) Basins designed to be used for permanent stormwater management shall be brought back to their original design contours prior to acceptance by the City.

### **6.4 Dewatering and Basin Draining**

1. If water cannot be discharged into a sedimentation basin before entering a surface water it must be treated with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners. The Permittee must make sure discharge points are appropriately protected from erosion and scour. The discharge must be dispersed over riprap, sand bags, plastic sheeting or other acceptable energy dissipation measures. Adequate sediment control measures are required for discharging water that contains suspended soils.
2. All water from dewatering or basin draining must discharge in a manner that does not cause nuisance conditions, erosion in receiving channels, on down slope properties, or inundation in wetlands causing significant adverse impact to wetlands.

### **6.5 Inspections and Maintenance**

1. The Permittee shall be responsible for inspecting and maintenance of the BMPs
2. The Permittee must routinely inspect the construction project once every seven (7) days during active construction and within 24-hours of a rainfall event of 0.5 inches or greater in 24-hours.
3. All inspections and maintenance conducted during construction must be recorded in writing and must be retained with the SWPPP. Records of each inspection and maintenance activity shall include:
  - 1) Date and time of inspection.
  - 2) Name of person(s) conducting the inspections.
  - 3) Findings of inspections, including recommendations for corrective actions.
  - 4) Corrective actions taken (including dates, times, and the party completing the maintenance activities).
  - 5) Date and amount of all rainfall events 0.5 inches or greater in 24-hours.
  - 6) Documentation of changes made to SWPPP.
4. Parts of the construction site that have achieved final stabilization, but work continues on other parts of the site, inspections of the stabilized areas can be reduced to once a month. If work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs or prior to resuming construction, which ever happens first.
5. All erosion and sediment BMPs shall be inspected to ensure integrity and effectiveness. All nonfunctional BMPs shall be repaired, replaced or

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- supplemented with a functional BMP. The Permittee shall investigate and comply with the following inspection and maintenance requirements.
6. 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 shall be made within 24-hours of discovery, or as soon as field conditions allow access.
  7. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72-hours of discovery, or as soon as field conditions allow access.
  8. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The Permittee shall remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The Permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization shall take place within 7 calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work.
  9. Construction site vehicle exit locations shall be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment shall be removed from all off-site paved surfaces, within 24 hours of discovery, or if applicable, within a shorter time.
  10. The Permittee is responsible for the operation and maintenance of temporary and permanent water quality management BMPs, as well as all erosion prevention and sediment control BMPs, for the duration of the construction work at the site. The Permittee is responsible until another Permittee has assumed control over all areas of the site that have not been finally stabilized or the site has undergone final stabilization, and a NOT has been submitted to the MPCA.
  11. If sediment escapes the construction site, off-site accumulations of sediment shall be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in streets could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).
  12. All infiltration areas shall be inspected to ensure that no sediment from ongoing construction activities is reaching the infiltration area and these areas are protected from compaction due to construction equipment driving across the infiltration area.

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### **6.6 Pollution Management Measures/Construction Site Waste Control**

1. The Permittee must implement the following pollution prevention management measures on the site.
  - 1) 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.
  - 2) Hazardous Materials such as oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas shall be provided to prevent vandalism. Storage and disposal of hazardous waste shall be in compliance with MPCA regulations.
  - 3) External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff shall be contained and waste properly disposed of. No engine degreasing is allowed on site.
  - 4) The City of Circle Pines prohibits discharges of any material other than stormwater, and discharges from dewatering or basin draining activities. Prohibited discharges include but are not limited to vehicle and equipment washing, maintenance spills, wash water, and discharges of oil and other hazardous substances.
  - 5) The Permittee must comply with all other pollution prevention/good housekeeping requirements of the MPCA NPDES Construction General Permit.

### **6.7 Final Stabilization**

1. The Permittee must ensure final stabilization of the project. Final stabilization can be achieved in one of the following ways.
2. All soil disturbing activities at the site have been completed and all soils will be stabilized by a uniform perennial vegetative cover with a density of at least 70 percent over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;
  - 1) All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion; and
  - 2) All temporary synthetic, and structural erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization; and
  - 3) The Permittee must clean out all sediment from conveyances and from temporary sedimentation basins that are to be used as permanent water quality

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management basins. Sediment must be stabilized to prevent it from washing back into the basin, conveyances or drainage ways discharging off-site or to surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

3. For residential construction only, final stabilization has been achieved when:
  - 1) Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner.
  - 2) The Permittee must distribute the MPCA “homeowner factsheet” to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

## **6.8 Training**

1. The SWPPP must provide a chain of command showing who prepared the SWPPP, who is responsible for the management of the construction site and inspections.
2. The training shall consist of a course developed by a local, state or federal agency, professional organization, water management organization, or soil and water conservation district and must contain information that is related to erosion prevention, sediment control, or permanent stormwater management and must relate to the work that you are responsible for managing.

## **7. GUIDANCE ON STORMWATER TREATMENT PRACTICES (STPS)**

Designers are expected to follow the Minimal Impact Design Standards (MIDS) flowchart detailed in the Minnesota Stormwater Manual (Appendix A). Deviations from recommended guidance in the Minnesota Stormwater Manual will require detailed written explanation. Approval of any deviation from the Minnesota Stormwater Manual guidance will be at the discretion of the City.

## **8. BASIC SIZING CRITERIA**

Proposed Stormwater Management Plans must incorporate Volume Control, Water Quality Control, and Rate Control as the basis for stormwater management in the proposed development plan. The City of Circle Pines, as a permitted MS4, requires for new development projects to have a no net increase from pre-project conditions of total volume, TSS, and TP; in addition, for

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redevelopment projects within the city, it is required to have a net reduction from pre-project conditions of total volume, TSS and TP.

## **8.1 Volume Control Requirements**

Volume control measures are required on projects to meet the water quality criteria of the Rice Creek Watershed District's Surface Water Management Plan and to meet the requirements of the City of Circle Pines' MS4 Permit obligations. Volume control shall be required for proposed new impervious areas greater than 1 acre or redevelopment of impervious greater than 1 acre. If an applicant can demonstrate that the volume control standard has been met, then the water quality sizing criteria shall be considered satisfied.

## **8.2 Volume Control Calculations**

Depending on applicability, a proposed development shall capture and retain on site 1.1 inches of runoff from the impervious surfaces in post-construction conditions. For redevelopment projects, the performance goal is to capture and retain on site 1.1 inches of runoff from the new and/or fully redeveloped impervious surfaces over 1 acre. For projects less than 1 acre the City encourages applicants to incorporate volume control or the water quality provisions to the extent feasible. For linear projects, the performance goal is to capture and retain onsite the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
- 1.1 inches of runoff from the net increase in impervious surfaces

For projects where it is not feasible to meet the volume reductions requirements it will be required to meeting the water quality requirements of these engineering guidelines.

Infiltration is infeasible when:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under and NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
- Where vehicle fueling and maintenance occur.
- 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 the bedrock.
- Where high levels of contaminant in soil or groundwater will be mobilized by the infiltrating stormwater

## **8.3 Water Quality Control**

For New Development, the water quality control standard shall be considered satisfied if the volume control standard has been satisfied. In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the proposed STP will need to satisfy the water quality standards using the MIDS flexible treatment options as outlined below in addition to the MIDS Design Sequence Flowchart (Appendix A).

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MIDS Flexible Treatment Options:

Option 1:

- Applicant attempts to comply with the following conditions:
  - Achieve at least 0.55 inch volume reduction goal, and
  - Remove 75 percent of the annual total phosphorus load, and
  - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site

Option 2:

- Applicant attempts to comply with the following conditions:
  - Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
  - Remove 60 percent of the annual total phosphorus load, and
  - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

Option 3:

- Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:
  - Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
  - Locations within the same Department of Natural Resources (DNR) catchment area as the original construction activity.
  - Locations in the next adjacent DNR catchment area up-stream.
  - Locations anywhere within the local authority's jurisdiction.

## 8.4 Rate Control

1. At a minimum, detention basins should maintain existing flow rates for the 2, 10, and 100-year 24-hour rainfalls in accordance to the Atlas14 data as shown in the table below:

Event	Rainfall/Snowmelt Depth (inches)
2-year, 24 hour	2.81
10-year, 24 hour	4.20
100-year, 24 hour	7.22
100-year, 10 day snowmelt	9.94

2. Detention basins shall be designed with capacity for the critical 100-year event, which is defined as the 100-year event that produces the highest water level

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- among a 2-hour, 6-hour, 12-hour, or 24 hour rainfall events or the 10-day, 9.94-inch snowmelt runoff event.
3. The maximum duration for rainfall critical event analysis shall be 24-hours except in cases where basins are landlocked, where back to back 24-hour events and the 10-day 9.94-inch snowmelt runoff event shall also be used. In all cases a hydrograph method of analysis should be used. For the 24-hour rainfall event, or back to back 24-hour rainfall events, an SCS Type II distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.
  4. All drainage system analyses and designs shall be based on proposed full development land use patterns.
  5. Development adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):
    - 1) Three feet above the HWL determined by modeling back to back 100-year, 24-hour events,
    - 2) Three feet above the highest known water level, or
    - 3) Five feet above the HWL determined by modeling a single 100-year, 24-hour event.
  6. When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey.
  7. For basins with a suitable outlet, freeboard will be 2-feet above the HWL determined by modeling the 100-year critical event. Emergency overflows a minimum of 1.5 feet below lowest ground elevation adjacent to a structure should also be provided.
  8. Adjacent to channels, creeks, and ravines freeboard will also be 2-feet to the 100-year critical event elevation.
  9. A Type II 24-hour rainfall distribution with average antecedent moisture conditions should be utilized for runoff calculations.
  10. The recommended minimum outlet diameter is 6 inches due to plugging susceptibility and may supersede the rate control requirement for the 2-year event.
  11. City standard detail plates should be utilized for pond outlet structures.
  12. Outlet structures should be designed in three phases with primary outlet structure and secondary overflow structure routed to the storm sewer and a defined emergency overflow as the tertiary outlet structure.

### 8.5 Freeboard

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Elevation separations of buildings with respect to ponds, lakes, streams, and stormwater features shall be designed as follows:

1. At least two feet of vertical separation is required from the low opening elevation above the 100-year high water elevation and DNR Ordinary High Water level (if applicable) for the area providing the structure is flood proofed in accordance with Chapter 13 of the City Code. If the structure is not flood proofed in accordance with the requirements of the RCWD then the freeboard requirements will be set by the low floor elevation. In areas where this separation is not or cannot be provided, additional analysis is required showing that the 100-year back-to-back storm event does not affect adjacent homes.
2. Drainage easements and outlots for ponds, lakes, wetlands, streams, etc., shall encompass an area to the calculated two foot above the 100-year HWL.

## **8.6 Floodplain Management**

The City prohibits filling activities within the 100-Year floodplain that will cause an increase in the stage of the 100-year or regional flood or cause an increase in the flood damages in the reach affected unless compensatory storage is provided and/or channel improvement is provided that will not result in the flood stage. Filling within the floodway is prohibited unless the filling meets FEMA, DNR, and Watershed Commission requirements, and City Code Chapter 13. Applications proposing to alter the floodplain shall submit the following:

- 1) Cut/fill diagrams along with calculations demonstrating that the filling or alteration of the floodplain is not resulting in a reduction in the flood stage/storage.

## **8.7 Buffers**

Buffers are required adjacent to wetlands and encouraged adjacent to streams and lakes for projects requiring a stormwater management permit as defined in City Code Section 1350: Stormwater Management.

1. The following standards shall guide the creation or restoration of buffers to achieve the goals and policies of the RCWD's Surface Water Management Plan. The Administrator may modify or waive standards depending on each project Site and goals for the wetland.
2. The buffers zones are as follows:
  - a. Stream (measured from top of bank) – 25 feet
  - b. Lakes (measured from delineated OHWL)
    - i. Natural environment lake - 100 feet
    - ii. Recreational development lake – 50 feet
    - iii. General development lake – 25 feet

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- c. Wetlands: Buffers based on a MnRAM classification or similar classification system will be as follows (measured from the delineated wetland edge):
  - i. Preserve – 75 feet average and minimum of 50 feet
  - ii. Manage 1 – 50 feet average and minimum of 30 feet
  - iii. Manage 2 or 3 – 25 feet average and a minimum of 15 feet
- d. The use of a meandering buffer strip to maintain a natural appearance is encouraged in areas of flat topography.
- e. An access corridor, not to exceed 20 feet in width or 20 percent of the buffer edge, whichever is less, is permitted.
- f. Accessory structures intended to provide access to Wetlands such as stairways and docks are permitted in the access corridor.
- g. The buffer may be placed in a conservation easement.
- h. Monuments identifying the conservation easement, designed in accordance with City standards, should be placed every 100 feet to delineate the buffer edge and at intersections with property lines.
- i. Buffer strip vegetation should be appropriate to the goals for the water body. Where acceptable natural vegetation exists in buffer strip areas, the retention of such vegetation in an undisturbed state is preferred. The Minnesota PCA’s manual “Plants for Stormwater Design: Species Selection for the Upper Midwest” provides guidance on buffer plant selection.
- j. Allowable land used and vegetative criteria for buffers are specified in the BCWMC’s Requirement for Development and Redevelopment.
- k. The BCWMC will allow exemptions for public recreational facilities parallel to the shoreline (e.g. trails) up to 20 feet in width, with that width being added to the required.

### 8.8 Shoreland Management

The City of Circle Pines has an established adopted shoreland management Code Section 11.65: Shoreland Management. The City code has established setbacks for placement of structures and impervious and also requirements for shoreland alterations. The City also encourages the following for work occurring within the shoreland zone:

1. Encourage the use of natural vegetation or bioengineering techniques for the stabilization of shorelines.
2. Use materials such as granite or fieldstone for shoreline stabilization project where hard armoring is necessary.
3. Encourage the use of techniques that will minimize runoff and improve water quality associated with new development and redevelopment. When possible use existing natural drainage ways, wetlands, and vegetated soil surfaces to convey, store, filter, and retain stormwater runoff before discharge to public waters. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference

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shall be given to designs using surface drainage, vegetated filter strips, bioretention areas, rainwater gardens, enhanced swales, off-line retention areas, and natural depressions for infiltration rather than buried pipes and human-made materials and facilities (*MnDNR Alternative Shoreland Standards, 2005*).

### **8.9 Long Term Inspection and Maintenance of Stormwater Facilities**

- 1) No private stormwater facilities may be approved unless a maintenance plan is provided that defines how access will be provided, who will conduct the maintenance, the type of maintenance and the maintenance intervals. At a minimum, all private stormwater facilities shall be inspected annually and maintained in proper condition consistent with the performance goals for which they were originally designed and as executed in the stormwater facilities maintenance agreement.
- 2) Access to all stormwater facilities must be inspected annual and maintained as necessary. The applicant shall obtain all necessary easement or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the City of Circle Pines.
- 3) All settled materials including settled solids, shall be removed from ponds, sumps, grit chambers, and other devices, and disposed of properly.

## **9. STORMWATER TREATMENT PRACTICE DESIGN STANDARDS**

### **9.1 Storm Sewers**

1. Manhole spacing shall not exceed 400 feet.
2. Where more than one pipe enters a structure, a catch basin/manhole shall be used.
3. Storm sewer pipe should match top of pipe on top of pipe unless grade constraints prevent this. In that case, hydraulic calculations will be necessary to verify that excessive surcharging will not occur.
4. Stormwater pipes shall be designed utilizing the Rational Method. Channel design shall be hydrograph method only. All methods are subject to the City Engineer's approval.
5. Lateral systems shall be designed for the 10-year rainfall using the Rational Method. State Aid roadway storm sewer shall be designed per the State Aid requirements.
6. The minimum full flow velocity within the storm sewer should be 3 feet per second (fps). The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to 6fps.
7. Trunk storm sewer should be designed at a minimum to carry 100-year pond discharge in addition to the 10-year design flow for directly tributary areas. The

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following table shall be used for the calculation of peak rates using the Rational Method:

Cover Type	10-Year Runoff Coefficient
Single-family Residential	0.4
Multi-family Residential	0.5
Commercial	0.7
Industrial	0.7
Parks, Open Space	0.2
Ponds, Wetlands	1.0

8. For storms greater than the 10-year event, and in the case of plugged inlets, transient street ponding will occur. For safety reasons, the maximum depth in streets should not exceed 1.5 feet at the deepest point.
9. To promote efficient hydraulics within manholes, manhole benching shall be provided to 1/2 diameter of the largest pipe entering or leaving the manhole.
10. Vaned grate (3067V) catch basin castings shall be used on all streets.
11. The maximum design flow at a catch basin for the 10-year storm event shall be three (3) cubic feet per second (cfs), unless high capacity grates are provided. Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.
12. All structures located in the street are to be a minimum of four feet deep (rim to invert) and a minimum of three feet deep elsewhere. Two-by-three catch basins are to be four (4) feet deep.

## 9.2 Outlet and Inlet Pipes

1. Inlet pipes of stormwater ponds shall be extended to the pond normal water level whenever possible.
2. Outfalls with velocities greater than 4 fps into channels, where the angle of the outfall to the channel flow direction is greater than 30 degrees, requires energy dissipation or stilling basins.
3. Outfalls with velocities of less than 4 fps, that project flows downstream into a channel in a direction 30 degrees or less from the channel flow direction, generally do not require energy dissipaters or stilling basins, but will require riprap protection.
4. In the case of discharge to channels, riprap shall be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. Riprap shall be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate through the riprap and reduce its stability. Riprap shall be placed to a thickness at least 2.5 times the

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mean rock diameter to ensure that it will not be undermined or rendered ineffective by displacement. If riprap is used as protection for overland drainage routes, grouting may be recommended.

5. Discharge velocity into a pond at the outlet elevation shall be 6 fps or less. Riprap protection is required at all inlet pipes into ponds from the NWL to the pond bottom.
6. Where outlet velocities to ponds exceed 6 fps, the design should be based on the unique site conditions present. Submergence of the outlet or installation of a stilling basin approved by the City is required when excessive outlet velocities are experienced.
7. Submerged outlet pipes from ponds are not allowed.

## 9.3 Channels and Overland Drainage

1. Overland drainage routes where velocities exceed 4 fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.
2. Open channels and swales are recommended where flows and small grade differences prohibit the economical construction of an underground conduit. Open channels and swales can provide infiltration and filtration benefits not provided by pip.
3. The minimum grade in all unpaved areas shall be 2%.
4. Maximum length for drainage swales shall be 400 feet.
5. Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable.
6. Riprap shall be provided at all points of juncture, particularly between two open channels and where storm sewer pipes discharge into a channel.
7. Open channels should be designed to handle the expected velocity from a 10-year design storm without erosion. Riprap may need to be provided.
8. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels shall be designed to allow easy access for equipment.

## 9.4 Ponds

1. Maximum allowable pond slopes above the outlet elevation are 4:1.
2. All constructed ponds and wetland mitigation areas shall have an aquatic or safety bench around their entire perimeter. The aquatic bench is defined as follows:
  - a. Cross-slope no steeper than 10:1.
  - b. Minimum width 10 feet.
  - c. Located from pond outlet elevation to one foot pond outlet elevation.

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3. All constructed ponds shall be provided a maintenance access from an adjacent roadway. The maintenance access shall be provided in the form of an easement no narrower than 20 feet. The maintenance access shall have a longitudinal slope no steeper than 6:1 and minimal cross slope. Maintenance access routes, due to their extra width, also serve well as emergency overflow (EOF) routes.
4. All constructed ponds and wetland mitigation areas shall have a maintenance access bench around sufficient perimeter to provide access to all inlets and outlets. The maintenance bench shall be located within a designated outlot or within a permanent easement. The maintenance bench shall extend from the outlet elevation to one foot above the outlet elevation and its cross slope shall be no steeper than 10:1. The maintenance bench shall connect to the maintenance access.
5. Maximum pond wet volume depth is 8 feet.
6. Mean depth for wet ponds shall be a minimum of 4 feet. If the pond is smaller than 3 acre-feet in volume, mean depths of 3 to 4 feet may be used. Mean depth is defined as the area at outlet elevation divided by the wet volume.
7. All ponds shall be graded to one foot below design bottom elevation. This “hold down” allows sediment storage until site restoration is complete.
8. The top berm elevation of ponds shall be a minimum of one foot above the 100-year pond HWL.
9. Grading shall not block or raise emergency overflows from adjoining properties unless some provision has been made for the runoff that may be blocked behind such an embankment.
10. All ponds shall have a protected EOF that is a minimum of 2 feet below the lowest building opening.

### **9.5 Infiltration/Filtration Practices**

1. Sizing of filtration/infiltration practices, or STPs, shall be in conformance with the volume control requirements of this manual and the *Minnesota Stormwater Manual*.
2. When designing an infiltration practice for volume control and water quality management, on-site testing and detailed analysis are strongly encouraged in order to determine the infiltration rates of the proposed infiltration facility. Documented site-specific infiltration or hydraulic conductivity measurements (double-ring infiltrometer) completed by a licensed soil scientist or engineer is required. In the absence of a detailed analysis, the saturated infiltration rates listed in the Infiltration Rates for Infiltration STPs table found on the *Minnesota Stormwater Manual* shall be used. A piezometer shall be installed in order to ascertain the level of the local groundwater table and demonstrate at least three

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feet of separation between the bottom of the proposed facility and the groundwater. The soil boring is required to go to a depth of at least five feet below the proposed bottom of the STP. The soils shall be classified using the Unified Soil Classification system. The least permeable soil horizon will dictate the infiltration rate. Infiltration practices shall be designed to infiltrate the required runoff volume within 48 hours.

3. Pretreatment, in the form of ponds, forebays, filter strips, or other approved methods, shall be provided for all infiltration areas. Pretreatment upstream of volume management practices is a key element in the long-term viability of infiltration areas. The level of pretreatment varies largely depending on the STP and drainage area RCWD, City staff, and *Minnesota Stormwater Manual* recommendations shall be utilized for determining the appropriate level of pretreatment on a case-by-case basis.
4. The infiltration practice shall not be used within fifty feet of a municipal, community or private well, unless specifically allowed by an approved wellhead protection plan.
5. The infiltration practice shall not be used for runoff from fueling and vehicle maintenance areas and industrial areas with exposed materials posing contamination risk, unless the infiltration practice is designed to allow for spill containment.
6. The infiltration practice shall not be used in Hydrologic Soil Group (HSG) C& D soils without soil corrections.
7. Vegetation of infiltration/filtration practices shall be as shown in the City of Circle Pines Standard Details. A plan for management for vegetation shall be included in the Stormwater Pollution Prevention Plan.
8. If soils are unsuitable for infiltration, then filtration may be used with drain tile, provided in accordance with the City of Circle Pines Standard Details.
9. Subgrade soils for infiltration/filtration practices shall be as presented in the City of Circle Pines Standard Details. Assume a 40% void ratio for clean washed rock and 20% for construction sand for the purposes of volume calculations.
10. Rock storage beds shall be constructed using crushed angular granite that has been thoroughly washed to remove all fine particles that could result in clogging of the system.
11. For infiltration benches adjacent to ponds, benches shall have slopes no steeper than 5:1 over the proposed infiltration zone. A slope of 10:1 is preferred. The Minnesota Stormwater Manual cites concerns with locating infiltration features immediately adjacent to ponds. To address this, benches shall be located to maintain hydraulic separation from the saturated zone of the pond in order to minimize the loss of infiltration potential over time.

## **9.6 Emergency Overflow Paths**

1. Emergency Overflows (EOFs) shall be sized with a minimum bottom width of five feet and 4:1 side slopes.
2. The maximum flow depth in EOFs shall be less than equal to one foot as calculated for a 100-year back-to-back storm event.

## **10. DESIGN EXAMPLES**

The design process for each of the acceptable Stormwater Treatment Practices is detailed in the *Minnesota Stormwater Manual*, [http://stormwater.pca.state.mn.us/index.php/Main\\_Page](http://stormwater.pca.state.mn.us/index.php/Main_Page).

## **11. STORMWATER TREATMENT PRACTICE DETAIL DRAWINGS**

Please refer to the City of Circle Pines' Standard Details.

## **12. CONSTRUCTION SPECIFICATIONS**

Construction specifications and details are found in the *Minnesota Stormwater Manual* for each of the acceptable STPs, unless otherwise restricted by this manual.

## **13. CHECKLISTS**

Refer to the Forms section of the City's SWPPP program.

- Checklists for Construction Inspection and Operation & Maintenance
- Construction Inspection and Operation & Maintenance Checklists for each of the approved Stormwater Treatment Practices are available in the *Minnesota Stormwater Manual*.



## For More Information

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## Possible Pollutants

Sediment  
Erosion  
General Housekeeping  
Hazardous Materials

## Procedures

Operations  
Pollution Prevention  
Parks  
Sanitary Sewer - Overflows  
Streets  
Storm Drainage System  
Vehicles  
Water

## Appendices

Appendix A – MPCA Sediment  
Removal Guidance  
Appendix B – Outfall Flow Chart  
Appendix C – Spill Response Plan  
Appendix D – Outfall Inspection  
Fact Sheet  
Appendix E – Facility Inventory  
Form

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

### 6.1 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 Circle Pines 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.

### 6.2 OBJECTIVES OF THE SOP

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

- Provide BMPs used for municipal activities.
- Provide methods for employing spill prevention response.
- Provide BMPs to prevent or reduce the stormwater impacts documented on the Facility Inventory Form.
- 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 tools for documenting inspections of ponds, outfalls, and municipal facilities.

## 6.3 TRAINING

The City of Circle Pines will provide training and information on an annual basis to employees involved in the inspection and maintenance of The City of Circle Pines' 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 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).
- Tools and resources to assist in winter maintenance (e.g., deicing application rate guidelines, calibration charts, Smart Salting Assessment Tool).

## 6.4 OPERATIONS

### Work Schedule

Inspection and maintenance are performed in conjunction with and can be impacted by other maintenance operations. Inspection and maintenance will typically be conducted during a regular eight (8) hour workday. Extended workdays and shift changes may be necessary for spring runoff events and emergency conditions to provide maximum efficiency. For safety reasons, no operator will work more than a twelve (12) hour shift in any twenty-four (24) hour period.

### Complaints

Complaints concerning the storm drainage system will be taken during normal working hours and after normal working hours by those designated as emergency contacts. Problems requiring immediate attention will be handled on a priority basis as determined by the Public Works Director. The City will document all complaints and upgrade this procedure as necessary while considering the constraints of available resources.

### Documentation

The City of Circle Pines will document the inspection, maintenance, complaint, and emergency responses actions as defined by this document and ensure the Assistant City Administrator for Public Services is responsible for the implementation of this MCM. The City will document the inspection, maintenance, complaint, and emergency responses actions as defined by this document. The inspection and maintenance activities associated with the storm sewer system and stockpile/storage material handling areas will be completed using the forms provided in this document.

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

- a. Equipment storage and maintenance
- b. Park(s)
- c. Public parking lot(s)
- d. Public works yard(s)
- e. Vehicle storage and maintenance (e.g., fueling and washing) yard(s)
- f. Materials storage yard(s)

## 6.5 POLLUTION PREVENTION

### 6.4.1 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 on 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

Document training of employees.

## 6.4.2 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 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 maps and logs to track swept parking areas and approximate quantities.
- b. Document training of employees.

## 6.4.3 Stockpile and Storage Material Handling Areas

### Activities and Definition

The City of Circle Pines completed their facility inventory March 2015. During the inventory the City evaluated public works facilities, police stations, parks, open space, and their water treatment facility. It was determined that only two facilities have areas with pollutants concerns that will need to be inspected on a quarterly basis. During the inspections the City will evaluate fueling procedures, stockpiles, hazardous wastes storage, landscape areas, and vehicle/equipment washing.

### Preparation

- a. Conduct regular employee training to reinforce proper housekeeping.
- b. Install proper BMPs as indicated on the facility BMP map.
- c. Perform regular maintenance of BMPs installed.

### Process

- a. Quarterly inspect all areas as shown the BMP facility map and as per the facility inspection form.
- b. Perform maintenance as directed on the facility inspection form.

### Clean-up/Follow-up

- a. Install/replace failing BMPs.
- b. Purchase new BMPs to ensure adequate quantities are available for maintenance.
- c. Equipment not to be cleaned out unless appropriate inlet project device is put in place.
- d. Fueling areas are to be inspected for leaks and all spill kits re-stocked.

### Documentation

- a. Keep inspection and maintenance logs.
- b. Logs to be updated quarterly.

## 6.5.1 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. All City of Circle Pines staff who handle chemicals have the appropriate Applicator's Certification.
- 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 and never on impervious surfaces. 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.

## 6.5.2 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 Department's daily activities.

### Preparation

Review process with all Parks employees.

### Process

- a. Ensure appropriate inlet protection is installed within adjacent storm sewer structures that may receive discharge from equipment washing areas.
- b. Wipe off dirt, dust and fluids with disposable towel or air compressor.
- c. If detergents are used wash equipment in approved wash station.

### Clean-up/Follow-up

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

### Documentation

N/A



## 6.5.3 Mowing and Trimming

### Activities and Definition

Regular mowing and trimming activities have 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. Put on eye and hearing protection, as required.
- b. Mow and trim the lawn.
- c. Sweep or blow clippings to grass areas, then clear with deck of mower.

### Clean-up/Follow-up

- a. Mowers are cleaned daily. Refer to equipment cleaning procedures.
- b. Dry spoils are dry swept and disposed of properly
- c. Wash equipment in approved wash station.

### Documentation

Document and observed deficiencies for correction or repair.

## 6.5.4 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 a 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

Document and observed deficiencies for correction or repair.

## Activities and Definition

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

## Preparation

- a. Enforce ordinance that requires pet owners to clean up pet wastes and use leashes in public areas. If public off-leash areas are designated, verify they are clearly defined.
- 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 while mowing and watering.
- c. Provide ordinance enforcement as needed. Look for opportunities for increased education.

## Clean up/Follow-up

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

## Documentation

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

## 6.5.6 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 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 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

N/A

## 6.5.7 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 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

N/A

## 6.5.8 Transporting Equipment

### Activities and Definition

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

### Preparation

- a. Determine equipment needed for transport and method (trailer, truck bed) needed to transport equipment, if required.
- 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, if required.
- d. Wash equipment if needed, according to the written procedure for cleaning equipment.

### Documentation

Pre-trip and post-trip inspection report, if required.

## 6.7 SANITARY SEWER – OVERFLOWS

### Activities and Definition

Sanitary sewer system even with high-performing operation and maintenance programs will experience overflows and backups from time to time. A proper response plan will help mitigate the effects of a backup and it will be necessary to contact the Minnesota State Duty Officer.

### Preparation

- a. Train staff to make them aware of the need to report the spill and spill response/clean-up procedures (Appendix C).
- b. Have all equipment ready to assist with spill clean-up or containment (e.g., confined space entry equipment, safety gear, jet flushing unit/vacuum truck, pumps, disinfectants, televising equipment, etc.)
- c. Have sewer maps available.

### Process

- a. Report sanitary sewer spill to Minnesota State Duty Officer at (651)-422-0798 or 1-800-422-0798.
- b. Typical information requested by the Minnesota State Duty Officer includes:
  1. Name of caller
  2. Date, time, and location of incident
  3. Telephone number for call-backs at the scene or facility
  4. Whether local officials have been notified
  5. Materials and quantity involved in the incident
  6. Incident location
  7. Responsible party
  8. Any surface waters or sewers impacted
  9. Present situation of the spill (on-going or contained)
- c. Inform the public if they are at risk (e.g., spill nears swimming beached, public drinking water intakes, and recreational areas. Notification mechanisms may include:
  1. Hand delivery of door hangers
  2. Temporary posting at impacted areas
  3. Notifications in newspaper, radio announcements, messages on local access cable channel, messages on website, and social media.

## 6.7.1 Overlays and Patching

### Activities and Definition

Pollutants collect on surfaces in between storm events because 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. Cracks should be properly sealed. Alligator cracks and potholes should be removed and patched. Rutting should be milled.
- c. Surface should be clean and dry.
- d. Uniform tack coat applied and cured prior to placement of overlay.
- e. 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 pavement has cooled, sweep gutters to remove loose aggregate.

### Documentation

NA



## 6.7.2 Crack Seal

### Activities and Definition

Pollutants collect on surfaces in between storm events because 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. Remove weeds from the road.
- b. Air-blast the cracks to remove sediments from the crack to allow for proper adhesion.
- c. Ensure that surface is clean and dry.
- d. Sweep within 24 hours

### Process

- a. Proper temperature of 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

Record location and date on the maintenance database and map.

## 6.7.4 Shouldering and Mowing

### Activities and Definition

Pollutants collect on surfaces in between storm events because 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

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

Clean any loose material off asphalt or gutter.

### Documentation

Record location and date on the maintenance database and map.

## 6.7.5 Secondary Road Maintenance

### Activities and Definition

Plans that are submitted to the City of Circle Pines 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) on monthly maintenance.
- b. Wash equipment if needed, according to the written procedure for cleaning equipment.
- c. Clean up any debris on traveled roads and dispose of it in the landfill.

### Documentation

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

## 6.7.6 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 washout concrete trucks or equipment into storm drains, 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.

### Documentation

N/A

## 6.7.7 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 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. Wash out in properly designated areas only.

### Documentation

N/A

## 6.7.8 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 another 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 number 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 from 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

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

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

- Date(s) and description of findings, including whether an illicit discharge is detected, for all inspections conducted.
- Any adjustments to inspection frequency.
- Date(s) and a description of maintenance conducted because of inspection findings, including whether an illicit discharge is detected.
- Schedule(s) for maintenance of structural stormwater BMPs and outfalls when necessary because maintenance cannot be completed within one year of discovery.
- Stormwater management training events, including general subject matter covered, names and departments of individuals in attendance, and date of each event.

## 6.7.9 Street Sweeping

### Activities and Definition

Pollutants collect on surfaces in between storm events because 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 based on areas with highest priority.
- 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

Highlight the City of Circle Pines Street map to show progress being made as the City sweeps its streets in the spring and fall.



## 6.7.10 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 from blowing.
- c. Make sure the City of Circle Pines knows and understands the SWPPP requirements for the site the City will be working at.
- d. Determine the location 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

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.

## 6.9 STORM DRAINAGE SYSTEM

### 6.8.1 Catch Basins

#### Activities and Definition

Catch basin cleaning needs to be completed on a regular basis to ensure the functionality of the storm sewer system.

#### Preparation

- a. Clean sediment and trash off grate.
- b. Do visual inspection on outside of grate.
- c. Make sure nothing needs to be replaced.
- d. Do 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. Keep any notes or comments of any problems.
- c. Document the landfill location of where material is disposed.

## 6.8.2 Outfall Inspections/Maintenance

### Activities and Definition

Prior to the expiration date of the City's MS4 permit, the City shall conduct at least one inspection of all outfalls (excluding underground outfalls) to determine structural integrity, proper function, and maintenance needs.

### Preparation

- a. Collect dry weather inspection information whenever possible.
- b. Mark the outfall with its identifier for future location and easy reference using pre-manufactured signs.
- c. Ensure that all the appropriate forms are available during the time of the inspection.

### Process

- a. For each outfall inspection, complete the inspection form provided in the City's SWPPP program binder.
- b. If applicable, take appropriate pictures and attach them with the inspection form.
- c. The Outfall Inspection Fact Sheet (Appendix B) can be used to assist in the inspection process.

### Clean-up/Follow-up

Follow the procedure of Routine Pond Maintenance for any required maintenance.

Inspect all outfalls (excluding underground outfalls) each permit term to determine structural integrity, proper function, and maintenance needs.

### Documentation

- a. Keep logs of number of outfalls inspected each year.
- b. Document any maintenance performed.
- c. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.

## 6.8.3 Structural Stormwater Best Management Practice Inspections/Maintenance

### Activities and Definition

Structural Stormwater Best Management Practices (SSBMPs) will be inspected annually to determine structural integrity, proper function, and maintenance needs. SSBMPs include BMPs put in place that are designed to remove pollutants (i.e., environmental manholes, raingardens, filtration features, etc.).

### Preparation

- a. Clean sediment and trash off grate.
- b. Do visual inspection on outside of grate.
- c. Make sure nothing needs to be replaced.
- d. Do 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).
- c. 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) to determine structural integrity, proper function, and maintenance needs.
- d. The City must determine if repair, replacement, or maintenance measures are necessary to ensure the structural integrity and proper function of structural stormwater BMPs and outfalls.
- e. The City must complete 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.
- f. 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 logs of number of catch basins cleaned.
- b. Record the amount of waste collected.
- c. Keep any notes or comments of any problems.
- d. Document the landfill location of where material is disposed.

## 6.8.4 Pond Inspections

### Activities and Definitions

Prior to the expiration date of the City's MS4 permit, the City shall conduct at least one inspection of all City owned stormwater ponds to determine structural integrity, proper function, and maintenance needs. The City of Circle Pines shall also inspect any privately owned ponds that are under the City's maintenance requirements as deemed appropriate a signed maintenance agreement.

### Preparation

- a. Collect dry weather inspection information whenever possible.
- b. Ensure that all the appropriate forms are available during the time of the inspection.

### Process

- a. For each pond inspection, complete the inspection form provided in the City's SWPPP program binder.
- b. If applicable, take appropriate pictures and attach them with the inspection form.

### Clean-up/Follow-up

Follow the procedure of Routine Pond Maintenance for any required maintenance.

Inspect all ponds and outfalls (excluding underground outfalls) each permit term to determine structural integrity, proper function, and maintenance needs.

### Documentation

- a. Keep logs of number of outfalls inspected each year.
- b. Document any maintenance performed.
- c. Save all documents within the City's network designated SWPPP folder using the same folder structure as provided with the electronic SWPPP provided.

## 6.8.5 Routine Pond Maintenance

### Activities and Definition

Stormwater ponds remove pollutants transported by rain events through settling and biological uptake. To function properly, stormwater ponds need to have volume to hold water and wetland plants along the pond edges and shallow areas. Performing maintenance to stormwater ponds is critical for the long-term operation of the MS4 system. Routine maintenance is considered a maintenance project that will remove less than 100 cubic yards of material.

### Preparation

- a. Schedule the pond maintenance work for a time when dry weather is expected.
- b. 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 number of debris that might leave basin during cleaning process.
- b. Perform routine maintenance, which may include:
  1. Removal of trash and other accumulated debris from trash grate.
  2. Removal of vegetation around and/or in front of the outlet structure.
  3. Repair of side slopes to mitigate erosion issues.
  4. Replacement of riprap in front of the outlet to prevent future scour and erosion.
- c. Continue cleaning structures and surrounding area as necessary by sweeping and shoveling.
- d. Put all material removed from the pond into a dump truck.
- e. Some structures might require use of a vacuum truck. If so, use the same procedures described for cleaning catch basins.

### Clean-up/Follow-up

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



- 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 other observations about the maintenance that will help the city operate and maintain that site in the future.



## 6.8.6 Pond Assessment Process

### Activities and Definition

The following pond assessment procedures and schedule shall be followed to determine the Total Suspended Solids (TSS) and Total Phosphorous (TP) treatment effectiveness of City owned and operated ponds that are constructed for the collection and treatment of stormwater.

### Assessment Procedure

At the initiation of a pond assessment, the City of Circle Pines shall evaluate the City-owned and operated stormwater treatment ponds in year 1 to determine the highest priority pond(s) for assessing TSS and TP effectiveness. This will be completed at the initiation of each assessment rather than prioritizing all the ponds upfront because priorities and unknown factors may change from year-to-year.

In order to create a pond assessment schedule for the City-owned and operated stormwater treatment ponds to determine the highest priority pond(s) for assessing TSS and TP effectiveness, in year 1 the City should prioritize ponds to assess based on the following criteria:

- Age of pond.
- Contributing drainage area characteristics (size, land use, upland treatment, etc.).
- Known concerns based on inspections.
- Type and location of receiving water.
- Sensitivity of receiving water.
- Complaints received from the public.

The ponds that have been identified as having the highest priority shall be added to a schedule to be more thoroughly assessed in year 1. The remaining ponds will be reassessed in year 2 using the same criteria. Like year 1, the ponds that have been identified as having the highest priority shall be added to a schedule to be more thoroughly assessed in year 2.

### Additional Survey of Pond

From the initial assessment of each pond completed in year 1, the City will perform a more thorough analysis of the ponds that are found to be half full of sediment, as well as the ponds that are continually showing signs of needing maintenance, in the following years. The following steps shall be taken to assess the City Pond(s) for TSS and TP treatment effectiveness:

- a. Gathering of background information. This may include the following:
  - Original design information, if available (record drawings, design calculations, etc.).
  - Determination of contributing drainage area.
  - As-built survey information, if completed and available.
  - Other significant information available that pertains to the pond.

- b. Site investigation and/or survey of existing pond conditions. This may include the following:
  - Determination of sediment levels in the pond.
  - Identification of outlet details (elevations, type, and condition of structure(s), etc.).
  - Identification of inlet details (number, type, elevations, etc.).
  - Other significant pond characteristics and details.
- c. Desktop evaluation of existing TSS and TP treatment effectiveness by completing water quality calculations using the survey data obtained, P8, Pondnet, or other suitable modeling methods.

## Clean-up/Follow-up

- a. Once the assessment of each pond is complete, a pond maintenance and dredging schedule can be implemented.
- b. The City of Circle Pines will either complete the dredging in-house or contract it out depending on the availability of City staff.
- c. The dredged materials must be tested, and a disposal plan will be developed, based on the test results.
- d. Sediment removal guidance for the testing and removal of sediment can be found in Appendix A.
- e. Inspect all ponds and outfalls (excluding underground outfalls) each permit term to determine structural integrity, proper function, and maintenance needs.

## Documentation

- a. Create a record of the schedule determined for basin/pond cleaning.
- b. Keep logs of each detention basins/pond cleaned including date, individuals involved in cleaning, and a description of the type of debris removed.
- c. Record the amount of waste collected and the results of the sediment testing (if applicable).
- d. 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.

## 6.8.7 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. Removing sediment and debris on a regular basis will help the system in getting the most TP and TSS removal.

### Preparation

- a. The MPCA requires the City of Circle Pines to sample sediment prior to dredging to determine concentrations of 17 cPAHS, non-carcinogenic PAHs, arsenic, and copper.
  1. If the annual volume of sediment to be removed is less than 100 cubic yards, then no chemical testing or sediment characterization is required; however, the City is responsible for the due diligence in the reuse and/or disposal of this material.
  2. When more than 100 cubic yards of sediment need to be removed, the City will need to complete further analysis of the pond sediment. The sediment will need to be tested and disposed of in accordance with the guidance found in the MPCA's Sediment Removal Guidance (Appendix A).
  3. Testing of the ponds can be done so that areas of the pond can be segregated (e.g., if areas of the pond such as the inlets are identified to have the highest concentrations the areas around the inlet could be disposed of differently as compared to the remainder of the pond, if the areas can be segregated sufficiently).
- b. If chemical testing or sediment characterization is required, the sediment samples shall be sent to an analytical laboratory for review.
- c. Once the results from the analytical laboratory have been received, a maintenance and disposal plan will be developed based on the test results. The City shall use sediment removal guidance from the MPCA in Appendix A.
- d. Discuss maintenance needs with the Public Works Director to discuss the next course of action prior to scheduling any maintenance activities.
- e. Schedule the Pond cleaning work for a time when dry weather is expected. Factors that may delay these activities may include temperatures below thirty-two (32) degrees Fahrenheit, wind, rain, snow, and frozen storm drainage systems. Inspection and maintenance will typically be conducted during a regular eight (8) hour workday. Extended workdays and shift changes may be necessary for spring runoff events and emergency conditions to provide maximum efficiency. For safety reasons, no operator will work more than a twelve (12) hour shift in any twenty-four (24) hour period.
- f. Unexpected ponding water can create a dangerous condition for vehicles, motorcyclists, bicyclists, pedestrians, and property. It is not practical to sign all areas for potentially dangerous conditions. During such events, warning signs indicating a hazard may be placed in the vicinity and other areas

as deemed necessary by the Public Works Director. These signs will remain in place until the situation has subsided.

- g. Remove any sediment and trash from grates, placing it in a truck for disposal.
- h. 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 number 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 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. Inspect all ponds and outfalls (excluding underground outfalls) each permit term 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.

## 6.8.8 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 as appropriate.
- 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.

### Documentation

- a. Keep log of actions performed including date and individuals involved.
- b. Keep any notes or comments of any problems.

## 6.10 VEHICLES

### 6.9.1 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 storm drains 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.

## 6.9.2 Vehicle and Equipment Storage

### Activities and Definition

When hazardous material encounters 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

N/A

## 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

N/A



## 6.11 WATER

### 6.10.1 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. This process is a responsibility of the contractor. Contractor shall use such projects as a chlorine diffuser.

#### 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

Complete paperwork.

## 6.10.2 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

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

### Process

- a. Slow the discharge.
- b. Inspect flow path of discharge water.
- c. As much as possible, flows should be directed to the municipal sanitary sewer system for treatment.
- d. Protect water inlet areas.
- e. Follow planned repair procedures.
- f. Haul off spoils of excavation.
- g. Consider 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

Complete paperwork.

## 6.10.3 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

Complete paperwork.

## 6.10.4 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

Complete paperwork.

## 6.10.5 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

NA

## 6.10.6 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 a 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.

## 6.10.7 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 appropriate facility.

### Documentation

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

The City of Circle Pines 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 because of the annual assessment.

# Managing Stormwater Sediment Best Management Practices Guidance Appendix A





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# Stormwater sediment best management practices

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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](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](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 waters 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 (EPA's) 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 be homogenized (mixed well) in a pre-cleaned container (large 4 L Pyrex mixing cups work well; larger volumes can use pre-cleaned 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 generate 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”.

# References

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USEPA. 2002. Guidance for quality assurance project plans. U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC. EPA/240/R-02/009. (<http://1.usa.gov/1OnE4LN>)

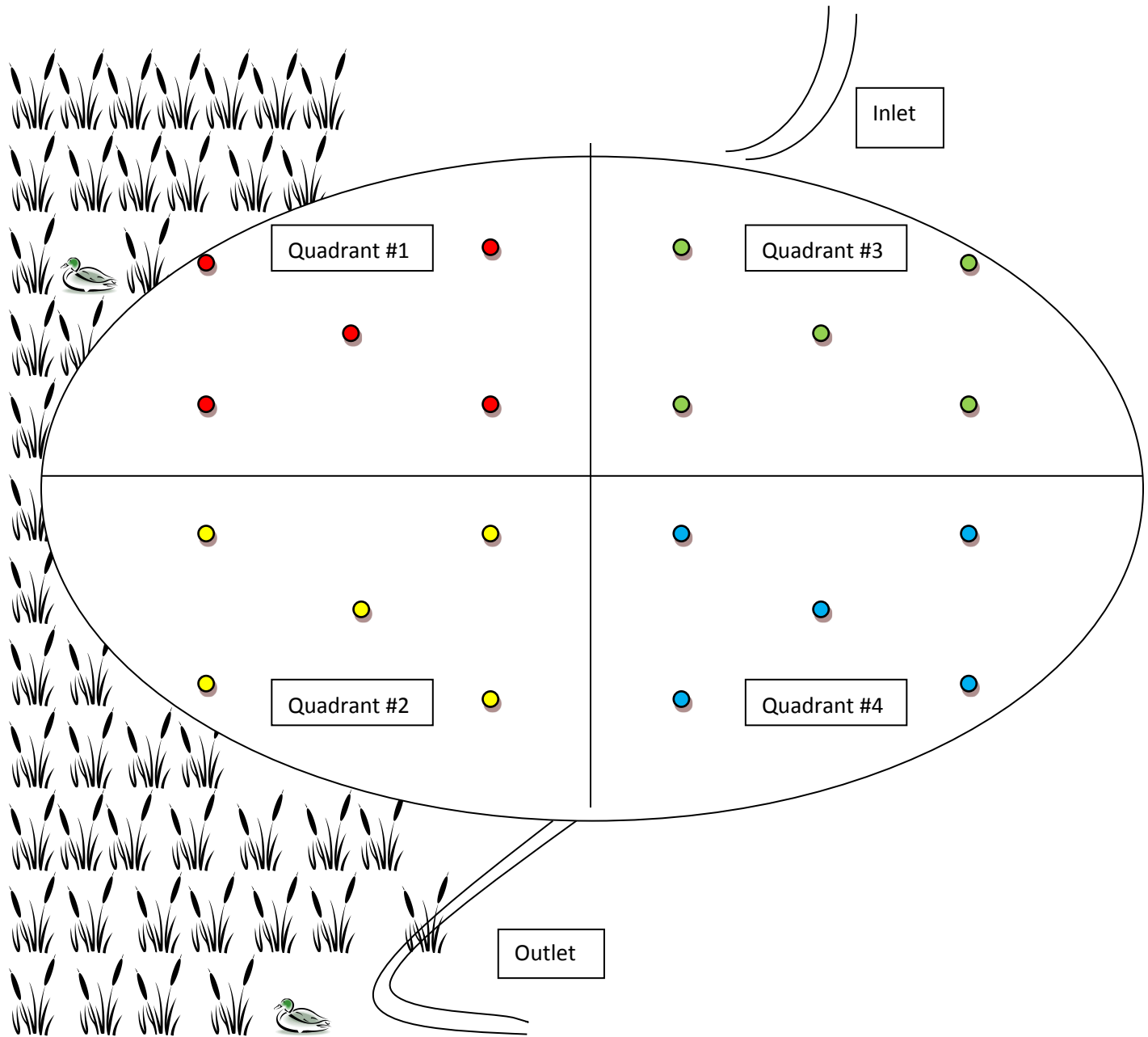


Figure A-1. Sediment sampling scheme for a stormwater pond greater than four acres in size.

**Table A-1. List of PAHs to be analyzed in stormwater pond sediments**

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***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
<b>Benzo[a]pyrene**</b>	<b>1.0</b>	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
<b>Total BaP Equivalents =</b>			<b>19.730</b>

\* 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**

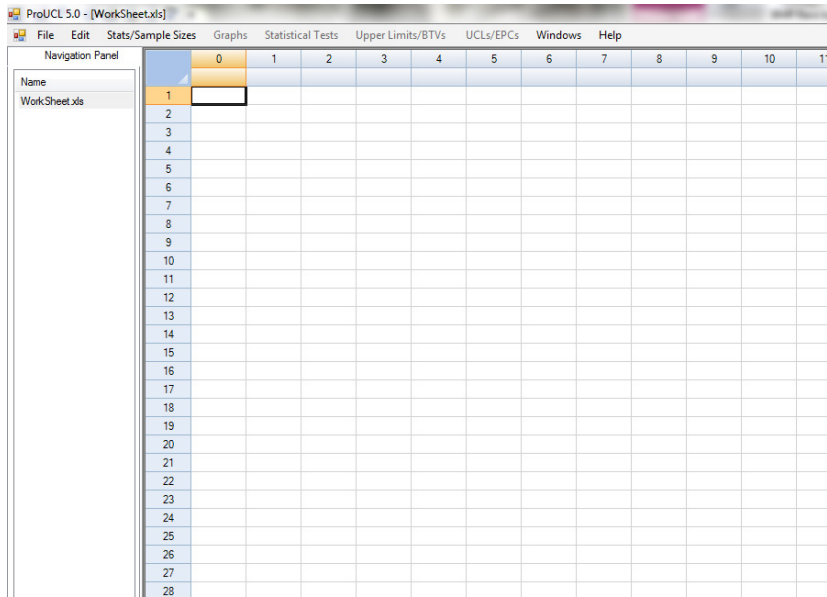
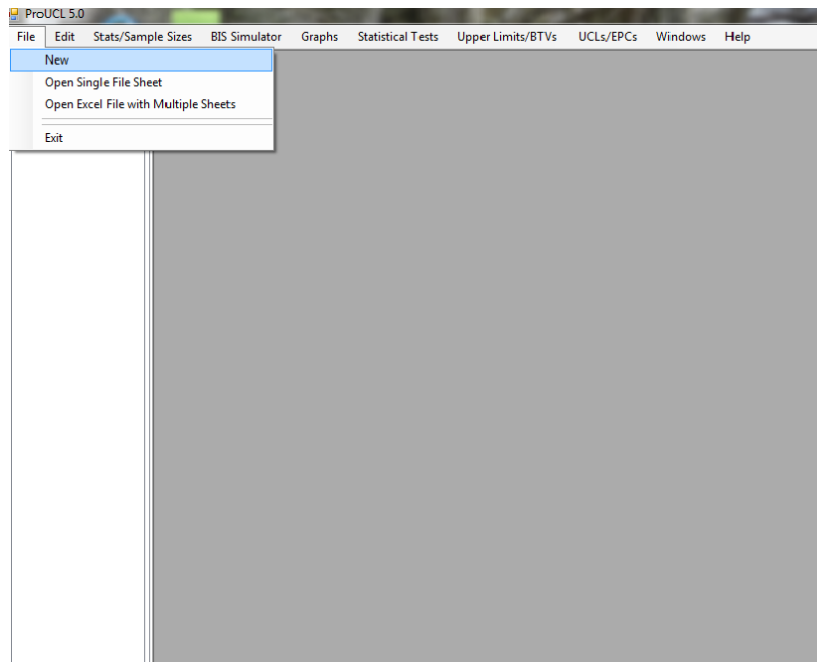
- Determine the percentage of cPAH nondetects by dividing the number of nondetects in each sample by the total number of cPAHs sampled and then multiplying by 100. For example, if 17 cPAHs were analyzed and results indicated 10 nondetects, you would perform the following calculation to determine the 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**

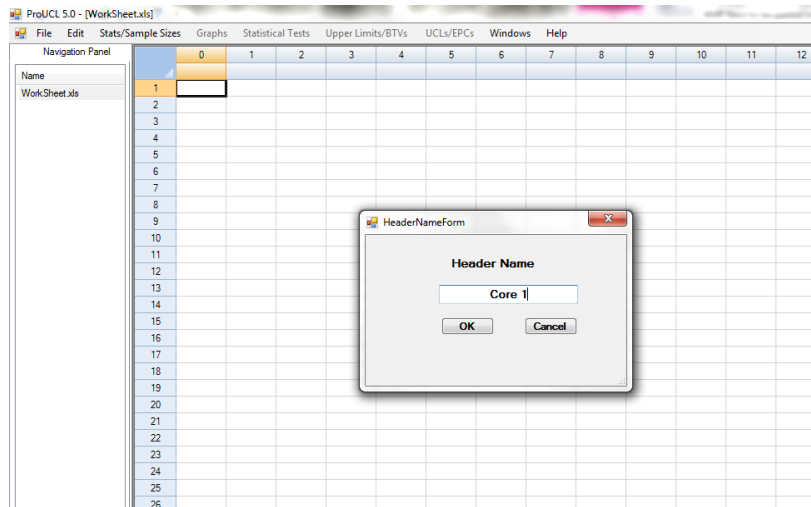
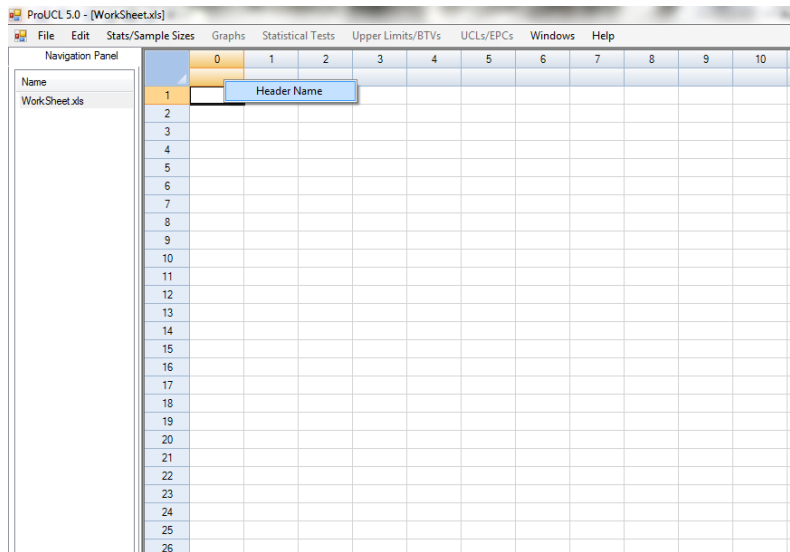
- Use the “Summary of Stormwater Pond Sediment Testing Results” spreadsheet to calculate the BaP equivalent concentration for each of the cPAHs analyzed. The spreadsheet is available on MPCA’s website MS4 stormwater web page at: <http://www.pca.state.mn.us/sbiza7c>. Click on the “Permit” tab and scroll 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 multiplies 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”.

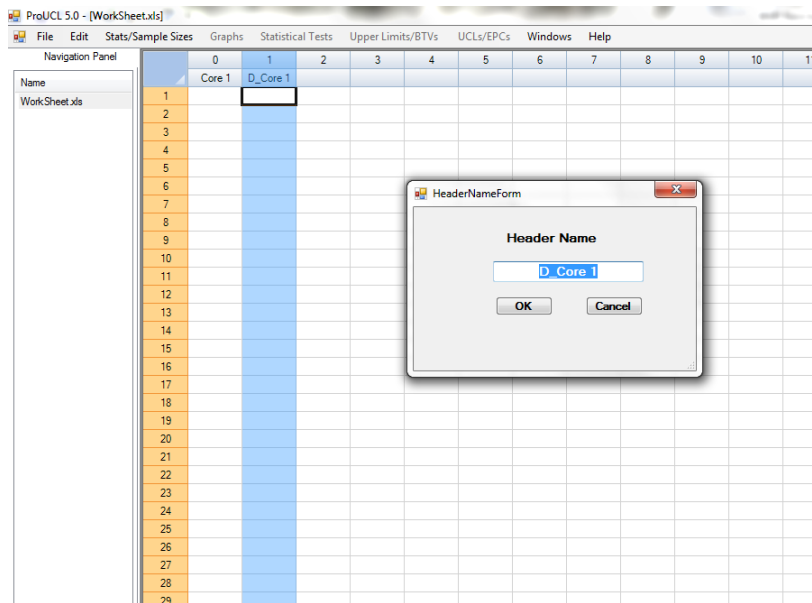
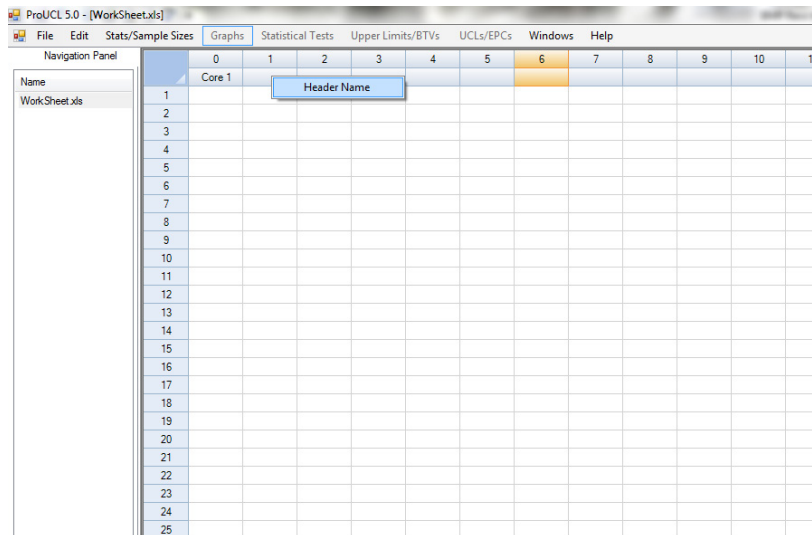




3. Name the first column to identify your core location or sample (ex. "Core 1" or "Sample 1") by clicking on the header and choosing "Header Name". The "HeaderNameForm" window will open. Enter the title of that column and click "OK".



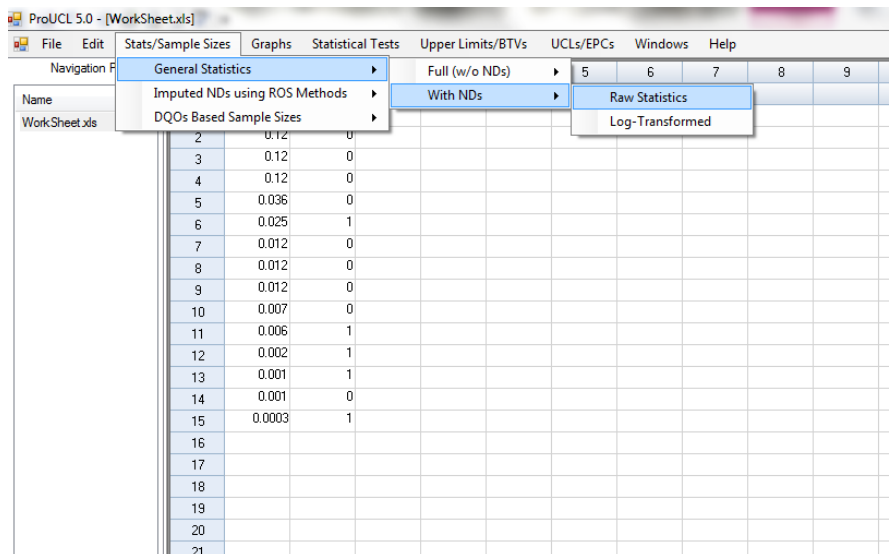
4. Name the second column with a “D\_” in front of the name you gave your first column (ex. “D\_Core 1” or “D\_Sample 1”) by clicking on the header and choosing “Header Name”. The “HeaderNameForm” window will open. Enter the title of that column and click “OK”.

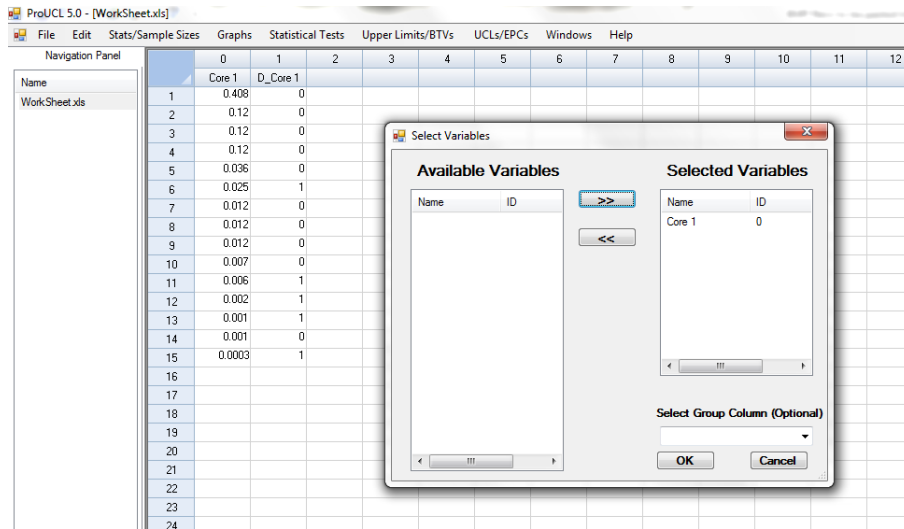
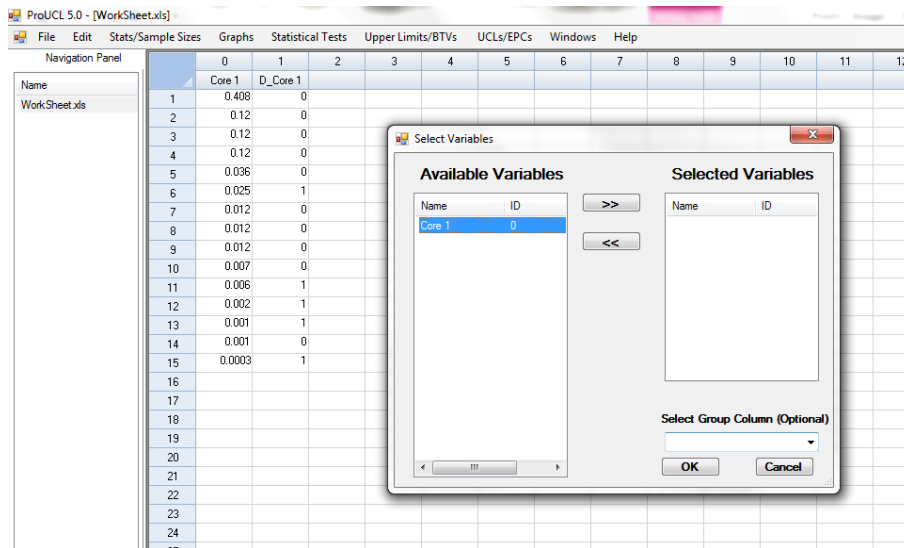


5. Enter the cPAH data from the “Summary of Stormwater Pond Sediment Testing Results” spreadsheet, “BaP Equiv. Conc.” Column for your specific core or sample (F, H, I) into the first column (ex. “Core 1” column). In the second column, enter a “0” if that sample (concentration) is a nondetect (based on 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.

	0	1	2	3	4	5	6
Name	Core 1	D_Core 1					
1	0.408	0					
2	0.12	0					
3	0.12	0					
4	0.12	0					
5	0.036	0					
6	0.025	1					
7	0.012	0					
8	0.012	0					
9	0.012	0					
10	0.007	0					
11	0.006	1					
12	0.002	1					
13	0.001	1					
14	0.001	0					
15	0.0003	1					
16							
17							
18							
19							
20							
21							

- 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).
- 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.





- 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).

ProUCL 5.0 - [WND\_Raw\_Stats.xls]

File Edit BIS Simulator Graphs Statistical Tests Upper Limits/BTVs UCLs/EPCs Windows Help

Name: [ ]

1 **General Statistics on Uncensored Data**

2 Date/Time of Computation 3/25/2016 1:00:40 PM

3 **User Selected Options**

4 From File WorkSheet.xls

5 Full Precision OFF

6

7 From File: WorkSheet.xls

8

9 **General Statistics for Censored Datasets (with NDs) using Kaplan Meier Method**

10

Variable	NumObs	# Missing	Num Ds	NumNDs	% NDs	Min ND	Max ND	KM Mean	KM Var	KM SD	KM CV
Core 1	15	0	5	10	66.67%	0.001	0.408	0.00423	2.036E-5	0.00721	1.706

14 **General Statistics for Raw Dataset using Detected Data Only**

15

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Median	Var	SD	MAD/0.675	Skewness	CV
Core 1	5	0	3.0000E-4	0.025	0.00686	0.002	1.0770E-4	0.0104	0.00252	2.002	1.513

19 **Percentiles using all Detects (Ds) and Non-Detects (NDs)**

20

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Core 1	15	0	0.001	0.0018	0.004	0.012	0.078	0.12	0.12	0.206	0.368

- 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.
- 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.
  - 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.
    - 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 multiplies 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).

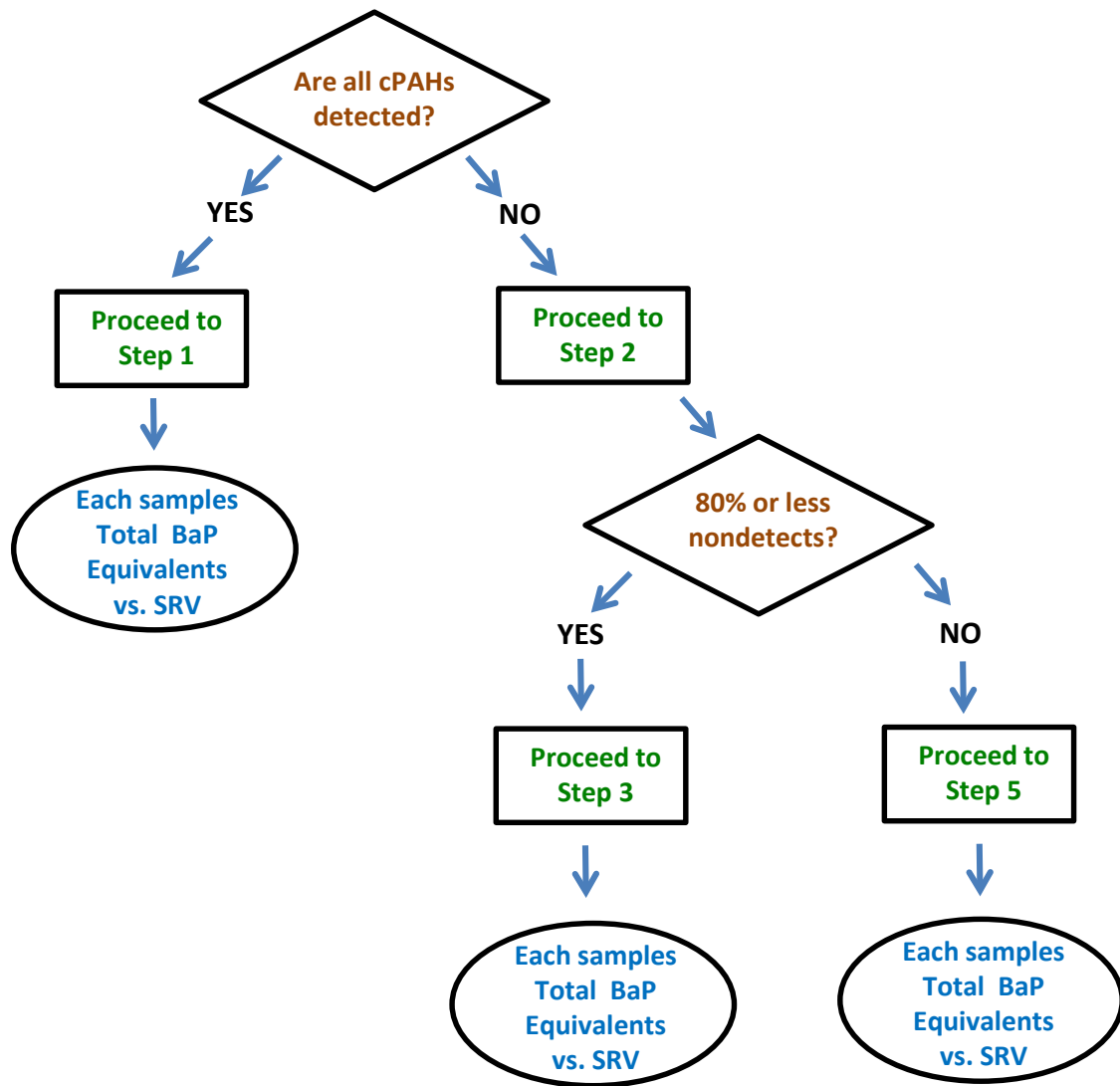


Figure B-1. Calculating B[a]P Equivalents Flowchart



**Table B-3. cPAH****Reporting Limits**

<b>Carcinogenic PAH (cPAH)</b>	<b>Potency Equivalent Factor (PEF)</b>	<b>Appropriate Maximum Reporting Limit *</b> <b>mg/kg</b>
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 (California Environmental Protection Agency). 1993. Benzo[*a*]pyrene as a toxic air contaminant. Part B. Health effects of benzo[*a*]pyrene. Air Toxicology and Epidemiology Section, Office of Environmental Health Hazard Assessment, Berkeley, CA.

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/cnr/technical-support-document-cancer-potency-factors-2009>).

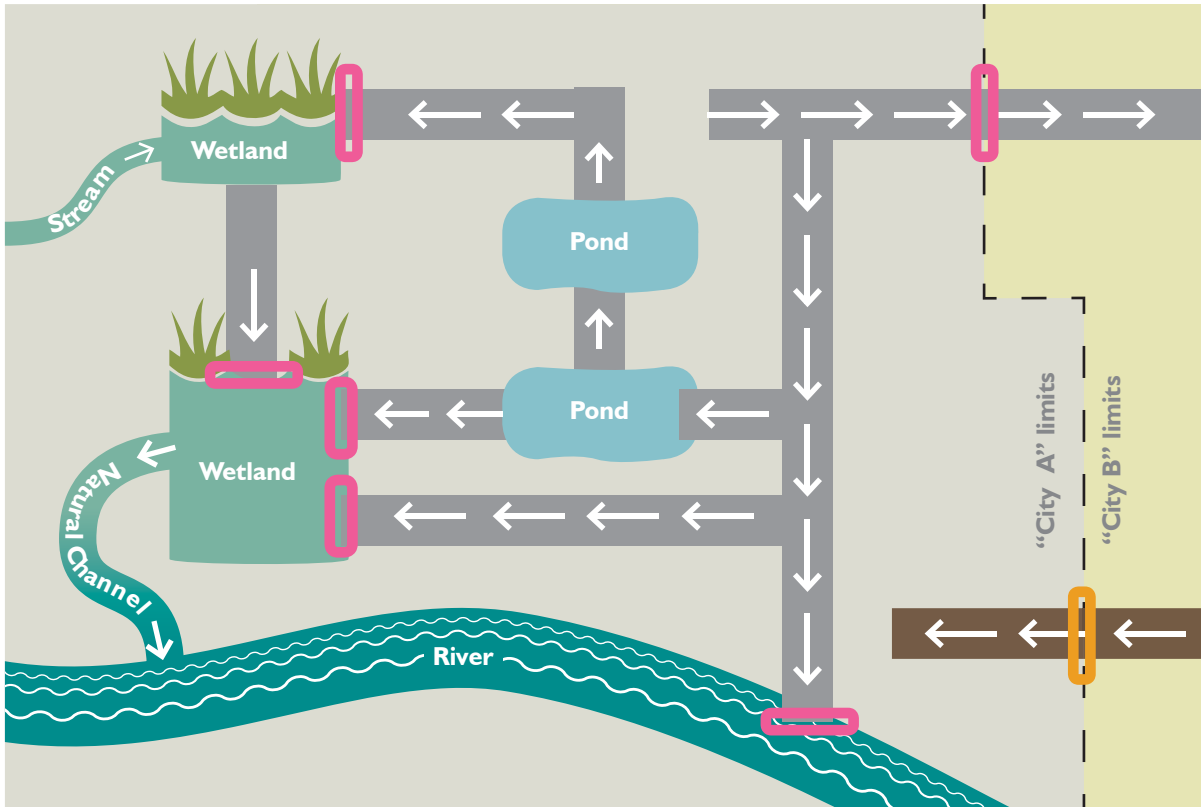
Helsel, D.R. 2010. Summing nondetects: Incorporating low-level contaminants in risk assessment. *Integr. Environ. Assess. Manage.* 6:361-366. (article is freely available at: <http://onlinelibrary.wiley.com/doi/10.1002/ieam.31/full>).

Helsel, D.R. 2012. *Statistics for Censored Environmental Data Using Minitab® and R*. Second Edition. John Wiley & Sons, Inc.: Hoboken, NJ. (<http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002278.html>).





MDH (Minnesota Department of Health). 2001. Polycyclic aromatic hydrocarbons: Methods for estimating health risks from carcinogenic PAHs. Minnesota Department of Health, St. Paul, MN. (<http://www.health.state.mn.us/divs/eh/risk/guidance/pahmemo.html>).

MDH (Minnesota Department of Health). 2014. Guidance for Evaluating the Cancer Potency of Polycyclic Aromatic Hydrocarbon (PAH) Mixtures in Environmental Samples. Minnesota Department of Health, St. Paul, MN. (<http://www.health.state.mn.us/divs/eh/risk/guidance/pahguidance.pdf>).

# What is an Outfall?



## Key

-  - City A's Outfall
-  - City B's Outfall
-  - City A's Stormwater Conveyance
-  - City B's Stormwater Conveyance

## Notes

- Wetland to wetland = **outfall**
- Pond to wetland = **outfall**
- Pond to pond = no outfall
- Conveyance to pond = no outfall
- Conveyance to river = **outfall**
- Natural channel to river = no outfall
- Stream to wetland = no outfall
- City A into City B = **outfall (owned by City A)**
- City B into City A = **outfall (owned by City B)**

## Definitions

**Conveyance/MS4:** Includes roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains.

**Outfall:** The point source where a conveyance/MS4 discharges to a receiving water, or the stormwater discharge permanently leaves the permittee's MS4.

**Receiving Water:** Means any lake, river, stream, or wetland that receives stormwater discharges from an MS4.

**Outlet:** The location at which the water leaves the basin.

**Inlet:** The location at which the water enters the basin.



# Standard Operating Procedure

## Spill Response Plan – Appendix C

### EMERGENCY CONTACT INFORMATION

<i>Onsite Emergency Contact(s)</i>	Rich Lavell – Public Works Superintendent (763) 231-2606
	Chandra Peterson – Asst. City Administrator (763) 231-2611
<i>Emergency Response Contact(s)</i>	Fire/Paramedics/Police: 911 Fire Non-Emergency Line: (651) 792-7900 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, insure 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.





City of  
**CIRCLE PINES**  
**APPENDIX D**  
**OUTFALL INSPECTION**  
**FACT SHEET**

Federal regulations define an outfall as “the point source where a municipal separate storm sewer system discharges to a receiving water, or the stormwater discharge permanently leaves the permittee’s MS4. It does not include diffuse runoff or conveyances that connect segments of the same stream or water systems...”

**Outfall BMP Inspection Condition:**



★★★★★  
Clear/Functioning



★★★★☆  
Needs  
Maintenance/Cleaning



★★★☆☆  
Needs Repair



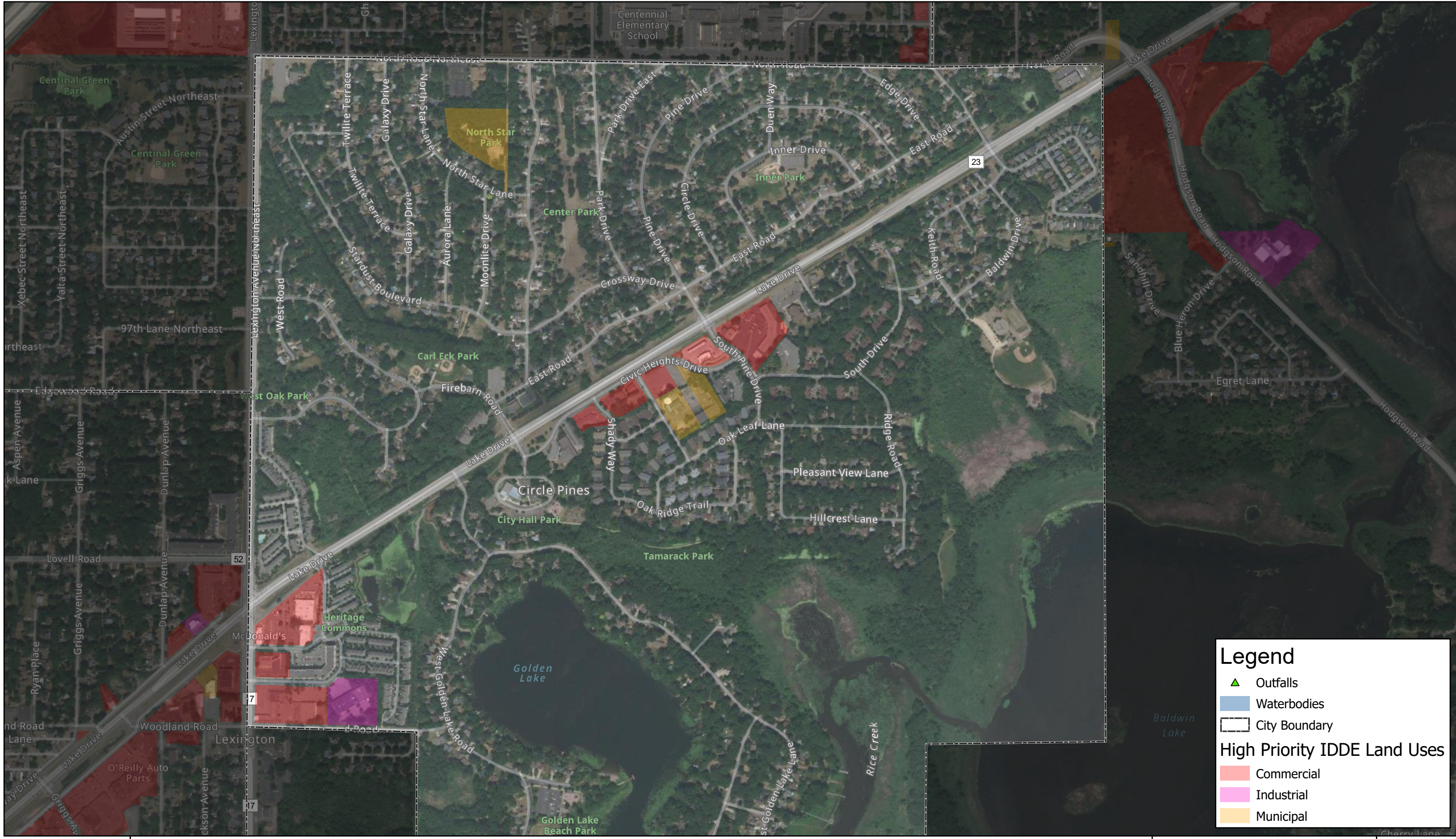
★★☆☆☆  
Needs Replacement



★★☆☆☆  
Immediate Action  
Needed







**Legend**

- ▲ Outfalls
- Waterbodies
- City Boundary

**High Priority IDDE Land Uses**

- Commercial
- Industrial
- Municipal

### High Priority Illicit Discharge Detection and Elimination - North

City of Circle Pines, MN



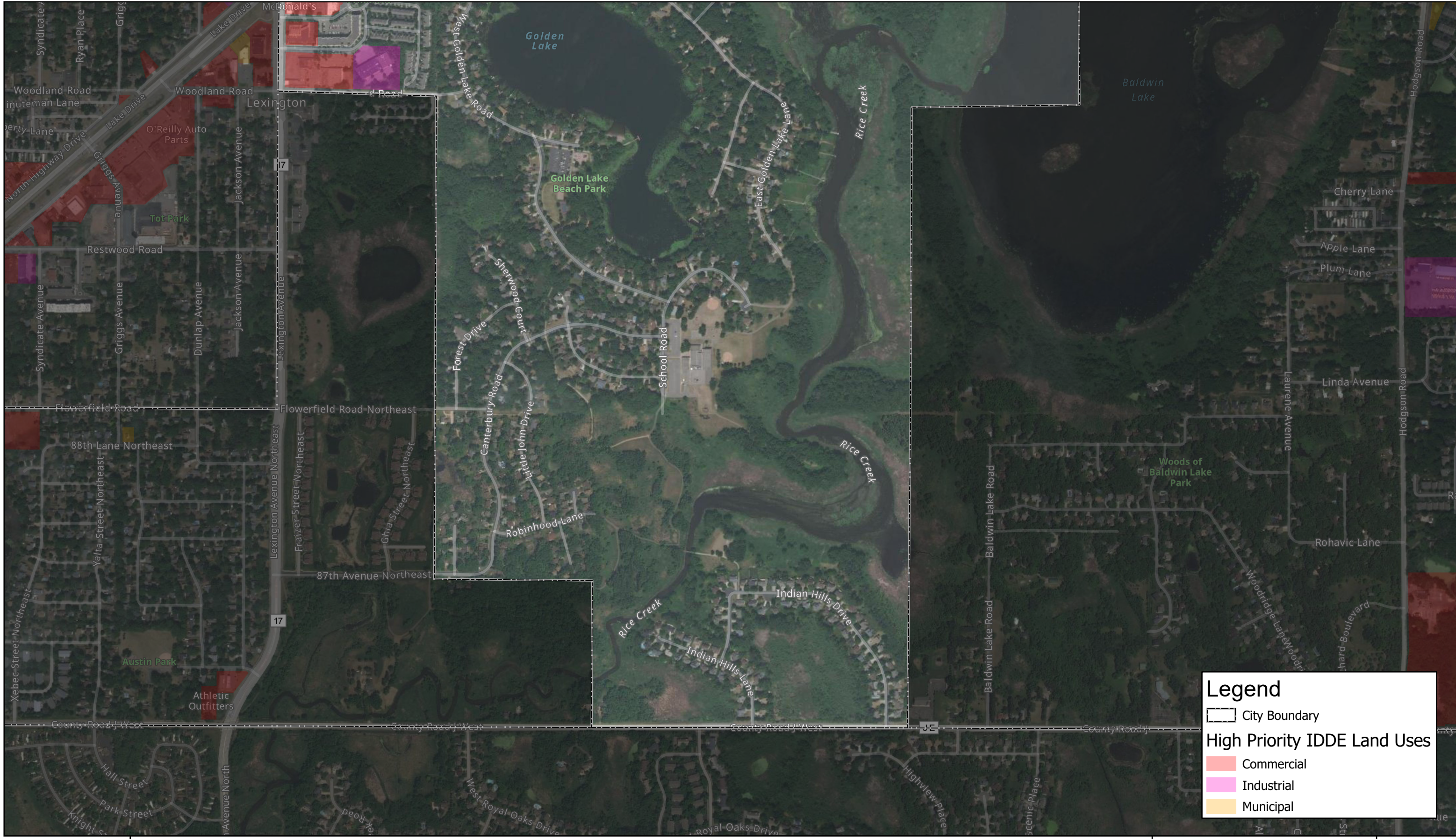
N

0 700 Feet

1 inch = 700 feet





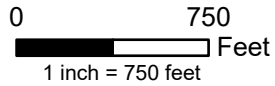


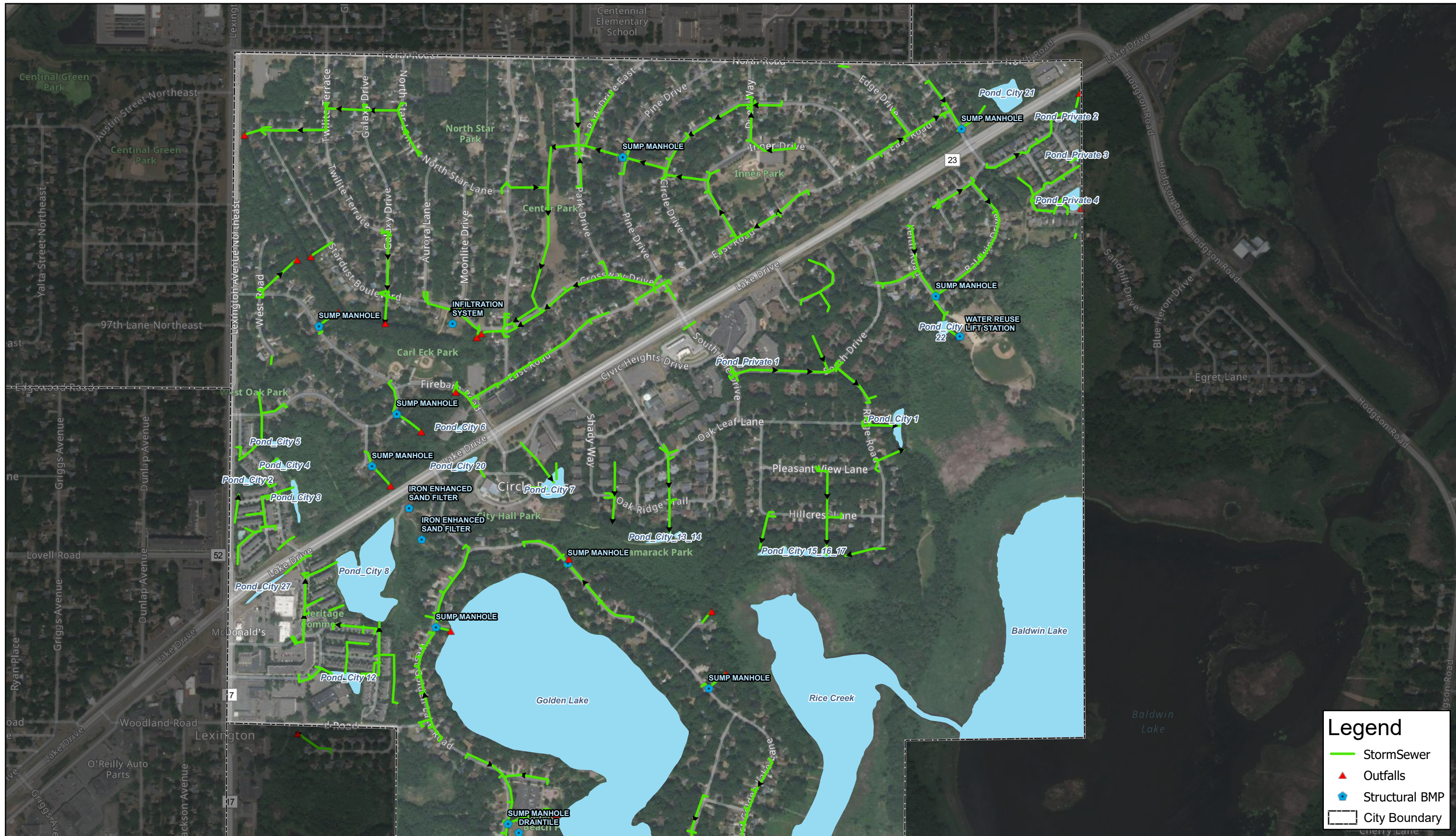
**Legend**

-  City Boundary
- High Priority IDDE Land Uses**
-  Commercial
-  Industrial
-  Municipal

### High Priority Illicit Discharge Detection and Elimination - South

City of Circle Pines, MN



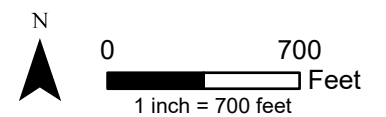


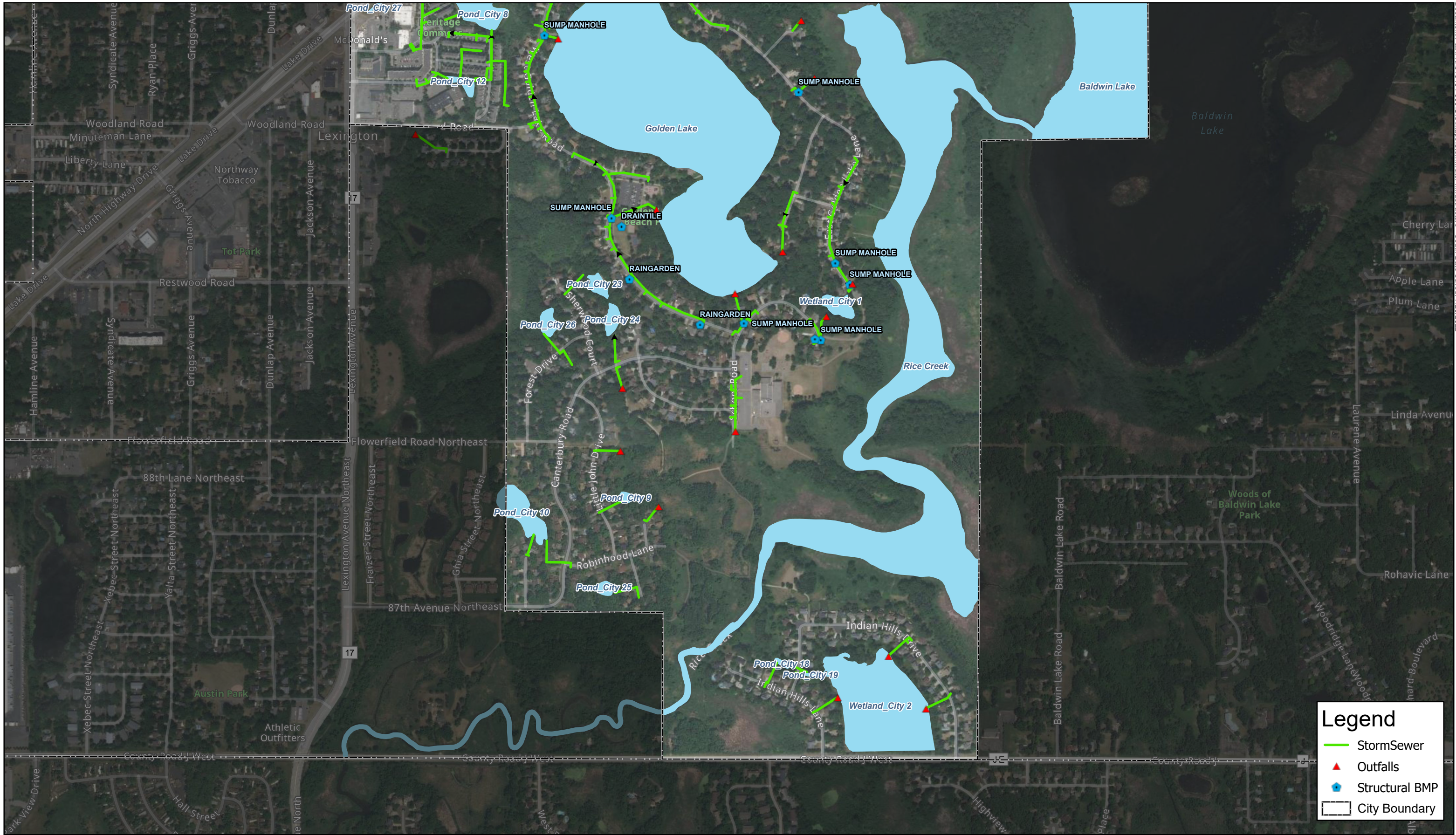
**Legend**

- StormSewer
- ▲ Outfalls
- Structural BMP
- City Boundary

### Stormwater Infrastructure - North

City of Circle Pines, MN



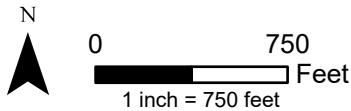


**Legend**

- StormSewer
- ▲ Outfalls
- Structural BMP
- City Boundary



**Stormwater Infrastructure - South**  
City of Circle Pines, MN



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## **CHAPTER 3: LICENSES AND PERMITS**

### **Section 320 – Animals**

#### **320.01. DOGS AND OTHER ANIMALS.**

##### **A. Definitions.**

*Proper disposal* means burial where lawfully permitted, flushing in the toilet, bagging for disposal in the owner or keeper's waste receptacle, and bagging for disposal in a waste receptacle in a public park or park area.

*Immediately* means at once, without delay.

*Soil/defile* means to make unclean from excrement.

*Waste* means solid matter expelled from the bowels of the pet, excrement.

##### **E. Unlawful acts.**

1. The City of Circle Pines finds that the manner of keeping of dogs, cats and other animals may be in conflict with the public health, safety, and welfare, including stormwater contamination and may constitute a public nuisance or otherwise be detrimental to the general welfare. It is unlawful for any animal to defecate on public property or the private property of another, without the owner or person in control of the animal immediately removing the excrement and disposing of it in a sanitary manner. The owner or person in control of the animal must have a bag or other receptacle for the collection and proper disposal of the animal's excrement in their possession. The owner or keeper of any animal shall also be responsible for the periodic removal and proper disposal of feces deposited on property owned or exclusively occupied by such owner or keeper such as to prevent the creation of a public nuisance.

**Chapter 13. ZONING**  
**SECTION 1365 – Rules of Post-Construction Stormwater Management (NEW)**

**1365.01 Submittal of Site Plans.**

Site plans must be submitted for review and confirmation that ordinance requirements have been met, prior to start of construction activity. *[MS4 General Permit Item 20.4]* Site plans must consist of: *[MS4 General Permit Item 20.20]*

- a) All 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.

**1365.02 Post-Construction Stormwater Management BMP Criteria.**

- a) Designed with accepted engineering practices. *[MS4 General Permit Item 20.4]*
- b) 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. *[MS4 General Permit Item 20.5]*
- c) For construction activity (excluding linear projects), water quality volume (calculated as an instantaneous volume) must be calculated as one (1) inch times the sum of the new and the fully reconstructed impervious surface. *[MS4 General Permit Item 20.6]*
- d) For linear projects, water quality volume (calculated as an instantaneous 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. Where the entire water quality volume cannot be treated within the existing right-of-way, a reasonable attempt to obtain additional right-of-way, easement, or other permission to treat the stormwater during the project planning process must be made. Volume reduction practices must be considered first. Volume reduction practices are not required if the practices cannot be provided cost effectively. If additional right-of-way, easements, or other permission cannot be obtained, the owner/operator of construction activity must maximize the treatment of the water quality volume prior to discharge from the City of Circle Pines' MS4. *[MS4 General Permit Item 20.7]*
- e) For non-linear projects, where the water quality volume cannot cost effectively be treated on the site of the original construction activity, the remaining water quality volume must be addressed through off-site treatment and meet the following requirements (must be 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 of Circle Pines' jurisdiction.
- f) 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.

**1365.03 Long-term Maintenance.**

- a) The applicant must enter into a long-term maintenance agreement with the City of Circle Pines that documents all responsibilities for long-term operation and maintenance of stormwater treatment practices that are not owned or operated by the City of Circle Pines. At a minimum, the long-term maintenance agreement must include provisions that:
  - b) Allow the City of Circle Pines to conduct inspections of structural stormwater BMPs not owned or operated by the City of Circle Pines, perform necessary maintenance, and assess costs for those structural

stormwater BMPs when the City of Circle Pines determines the owner of that structural stormwater BMP has not ensured proper function;

- c) Are designed to preserve the City of Circle Pines' right to ensure maintenance responsibility, for structural stormwater BMPs not owned or operated by the City of Circle Pines, when those responsibilities are legally transferred to another party; and
- d) 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.
- e) The City of Circle Pines must maintain a written or mapped inventory of structural stormwater BMPs not owned or operated by the City that meet all of the following criteria: *[MS4 General Permit Item 20.16]*
  - 1) The structural stormwater BMP includes an executed legal mechanism(s) between the City and owners responsible for the long-term maintenance, as required in MS4 General Permit Item 20.15; and
  - 2) The structural stormwater BMP was implemented on or after August 1, 2013

**1365.04 Permanent Stormwater Management System Design Criteria.** Infiltration Systems are prohibited in the following areas (See "higher level of engineering review" in the Minnesota Stormwater Manual for more information): *[MS4 General Permit Item 20.9]*

- a) Areas that receive runoff from vehicle fueling and maintenance areas regardless of the amount of new and fully reconstructed impervious surface;
- b) Areas where infiltrating stormwater may mobilize high levels of contaminants in soil or groundwater. To make this determination, the owners and/or operators of construction activity must complete the Agency'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;
- c) Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13, if the system will be located:
  - 1) In an Emergency Response Area (ERA) within a DWSMA classified as having high or very high vulnerability as defined by the Minnesota Department of Health; or
  - 2) In an ERA within a DWSMA classified as moderate vulnerability unless a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater has been approved by the City of Circle Pines; or
  - 3) Outside of an ERA within a DWSMA classified as having high or very high vulnerability unless a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater has been approved by the City of Circle Pines.

**Chapter 11. VEHICLES, TRAFFIC, STREETS AND SIDEWALKS**

**SECTION 1141 – SALT STORAGE AT COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL FACILITIES**

**1141.01 Definitions.** The following words, terms, and phrases, when used in this section, shall have the meanings ascribed to them in this subsection, except where the context clearly indicates a different meaning:

*Subd. 1 Anti-icing.* Anti-icing means the application of a deicer prior to the onset of a snow event.

*Subd. 2 Deicer or Deicing Material.* Deicer or deicing material means a substance used to melt snow and ice or used for its anti-icing effects (where the quantity of deicing material is more than five tons in solid form or 1,000 gallons in liquid form).

**1141.02 General Provisions.**

- (a) 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.
- (b) 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. 1 Facility siting.*

- (a) The facility must be in close proximity to the area in which the deicing materials are to be used, if practical.
- (b) 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.
- (c) A facility must be located on impermeable surfaces.
- (d) The property's slope must be away from the facility's salt, deicer, and sand storage area.
- (e) 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. 2 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. 3 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.

**Chapter 13. ZONING**  
**SECTION 1365 – Rules of Post-Construction Stormwater Management (NEW)**

**1365.01 Submittal of Site Plans.**

Site plans must be submitted for review and confirmation that ordinance requirements have been met, prior to start of construction activity. *[MS4 General Permit Item 20.4]* Site plans must consist of: *[MS4 General Permit Item 20.20]*

- a) All 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.

**1365.02 Post-Construction Stormwater Management BMP Criteria.**

- a) Designed with accepted engineering practices. *[MS4 General Permit Item 20.4]*
- b) 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. *[MS4 General Permit Item 20.5]*
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**Chapter 11. VEHICLES, TRAFFIC, STREETS AND SIDEWALKS**

**SECTION 1141 – SALT STORAGE AT COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL FACILITIES**

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