



# **CITY** *of* **HARRISVILLE**

363 West Independence • Harrisville, Utah 84404 • (801) 782-9648 • (801) 782-1449, Fax

## **STORM WATER MANAGEMENT PLAN**

**November 2010**

# **STORM WATER MANAGEMENT PLAN**

for

**HARRISVILLE CITY CORPORATION**

Original Date: July 2002  
Previous Update: November 2004  
Update: November 2010

Updated by:

**HARRISVILLE CITY  
PUBLIC WORKS DEPARTMENT  
with assistance from  
JUB ENGINEERS  
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## **GENERAL INFORMATION**

### **0.1 INTRODUCTION**

The Clean Water Act requires that all communities within certain metropolitan areas adopt a Storm Water Management Plan by March 8, 2003. Harrisville City, in the Wasatch Front Metropolitan area falls under this requirement. This book is intended to address the requirements for Harrisville City.

This version of the Storm Water Management Plan was updated by the Harrisville City Public Works Department with the assistance of JUB Engineers in 2010. This Storm Water Management Plan was updated to the current MS4 permit.

As a minimum, these requirements consist of community information, naming responsible persons, obtaining appropriate signatures, mapping, addressing the six Minimum Control Measures (MCM's), establishing Best Management Practices (BMP's), measurable goals and addressing the fiscal requirements of the plan. All of these items are discussed below.

### **0.2 COMMUNITY INFORMATION**

Harrisville City is located at the base of the Wasatch Front, on the North section of Weber County. The population of the community from the Wasatch Front Regional Council on July 1 of 2007 was 5,107. The majority of the land use in the community is residential with some Commercial and Industrial.

The city was incorporated in the 1960's. It is estimated that the community is approximately 59% built out.

### **0.3 RESPONSIBLE PERSONS**

The Harrisville City Mayor is the ranking elected official:

Richard S. Hendrix  
363 W. Independence Blvd.  
Harrisville, Utah 84404  
Phone: (801) 782-4100

The responsible person for the Storm Water System is the current Public Works Director:

Gene Bingham, Public Works Director  
363 W. Independence Blvd  
Harrisville, UT 84404  
Public Works Facility: (801) 782-4100  
Cell: (801) 940-6715

The person responsible for Storm Water Inspections and Enforcement is the current Storm Water Inspector:

Jake Meibos,  
363 W. Independence Blvd.  
Harrisville, Utah 84404  
Public works Facility: (801) 782-4100  
Cell: (801) 940-6717

The person responsible for citations of enforcement violations:

Harrisville City Police Department/Code Enforcement  
363 West Independence Blvd.  
Harrisville, Utah 84404  
(801) 782-4100

#### **0.4 STORM WATER MAPPING**

Included with this Plan in section MCM 3, Illicit Discharge Detection and Elimination, is a map showing the storm drain system of the City. All discharges from the City are indicated. Master Plan storm water infrastructure is also shown on the map.

#### **0.5 FISCAL ABILITY**

Financial ability is a critical role throughout this plan. In June 2003 the City incorporated a Storm Water Utility in order to finance the majority of these items. The funding for the applicable BMP's and O&M expenses are as follows:

The following table summarizes the budget that has been established by Harrisville City for storm water management, as per the Storm Water Management Plan, based upon the current fiscal year.

<b>Item</b>	<b>Amount</b>
Employee Wages (enforcement)	\$10,220
Employee Benefits	\$5,387
Engineering/BMP O&M	\$20,000
Billing Charges	\$7,000
Curb and Driveway Approach Replacement	\$10,000
Employee Storm Water Training	\$2,000
DEQ Fees	\$500
Street Cleaning and Equipment	\$19,893
<b>TOTAL</b>	<b>\$75,000</b>

# PUBLIC EDUCATION AND OUTREACH

## Minimum Control Measure 1

### 1.1 INTRODUCTION

Harrisville City has committed to Joint Permit with Weber County to meet the requirements of Public Education and Outreach. All official documents (e.g., interlocal agreements, resolutions, etc.), as per the current UPDES MS4 General Permit requirements on Co-Permitting and other applicable **ELECTED RANKING OFFICIAL** signatures shall be included in the **ANNUAL REPORT**.

Specific responsibilities required in the **SWMP** shall be presented in their appropriate sections. Because storm water runoff is generated from dispersed land surfaces e.g., pavements, yards, driveways, and roofs – efforts to control storm water pollution must consider individual, household, commercial, public behaviors and activities that can generate pollution from these surfaces. These common individual behaviors have the potential to generate storm water pollution:

- Littering
- Disposing of trash and recyclables
- Disposing of pet waste
- Applying of lawn chemicals
- Washing cars
- Changing motor oil on impervious driveways
- Household behaviors like disposing leftover paint and household chemicals, improper hazardous waste disposal, etc..

It takes individual behavior change and proper practices to control such pollution. Therefore it is important to make the public sufficiently aware and concerned about the significance of their behavior for storm water pollution through information and education that can change improper behaviors.

Phase II MS4's are required to educate their community on the pollution potential of common activities, and increase awareness of the direct links between land activities, rainfall run off, storm drains, and their local water resources. Commercial and residential behaviors are challenging in as much as some habits are identical while others may vary. Therefore an effort should be made to effectively target identical habits where possible and furthermore address the individual practices relating to the specific use. Most importantly the requirement is to give the public clear guidance on steps and specific actions that they can take to reduce their storm water pollution potential. Operators of small MS4s are encouraged to utilize partnerships with other governmental entities to fulfill this minimum control measure's requirements. It is generally more cost-effective to use an existing program, than to have numerous operators developing their own local programs. As a condition of the joint permit, Weber County will have the major responsibility for this Minimum Control Measure.

## 1.2 MEASURABLE GOALS

The following table summarizes the BMPs, Measurable Goals, and Implementation Schedule of the City's for each BMP.

<b>MCM 1 - PUBLIC EDUCATION AND OUTREACH</b>			
Name	BMP	Measurable Goal	Implementation Schedule
HWMC HWMR	Hazardous Waste Management Commercial/Residential	Listing of dump sites on City web site and distribute information on proper handling and disposal for both Commercial and Residential. <i>Goal Completed</i>	<i>Weber County Transfer Station Goal Completed</i>
PEP	Public Education / Participation	Joint Permit for Public Education with Weber County. Promote education as a prerequisite for participation and involvement.	<i>On going</i>
SDSS	Storm Drain System Signage.	Label and maintain all catch basins. Education can be accomplished by sign advertising. Participation can be accomplished by involvement of labeling. <i>Goal Completed</i>	<i>Goal Completed/On Going</i>
CESW	Classroom Education on Storm Water	Support a developed plan for getting Storm Water Education into schools in coordination with Weber County.	2011
PSMCB	Promoting the Storm Water Message on Commercial Business.	Develop a plan for Storm Water Education to all Commercial Businesses within Harrisville City. Provide at a minimum- City web site information and additional web site addresses.	2011

SWEM *DH (MCM 3)	Storm Water Educational Material	Develop a plan in conjunction with Weber County (to further enhance education) on distributing information to all local residents and commercial businesses- pamphlets and brochures indicating potential hazards that are applicable to their individual uses that can generate storm water pollution. Information distribution may be accomplished through mailing, volunteer groups, the web site and *staff distribution.	2011
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### 1.3 BEST MANAGEMENT PRACTICES (BMP)

The following pages consist of the fact sheets for the above mentioned goals and BMP's. Each page represents a separate BMP with details given. The intent of this section is to provide a variety of practices that could be related to Public Education and Outreach. The format is similar to other communities on the Wasatch Front, originally obtained from Salt Lake County's Storm Water Management Plan.



**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

**APPLICATION:**

Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and Solvents; petroleum products such as oils, fuels, and grease; herbicides and pesticides; Acids for cleaning masonry; and concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with Federal, State, and local regulations, including:

- Sandblasting grit mixed with lead, cadmium, or chromium-based paints; asbestos; and PCB's.

**INSTALLATION/APPLICATION CRITERIA:**

The following steps will help reduce storm water pollution from hazardous wastes:

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.

**LIMITATIONS:**

Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

**MAINTENANCE:**

- Inspect hazardous waste receptacles and area regularly.
- Arrange for regular hazardous waste collection.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High Impact
- Medium Impact
- Low or Unknown Impact



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**DESCRIPTION:**

Many products found in homes contain chemicals potentially harmful to both people and the environment. Chemical products such as oven cleaners, paint removers, bug killers, solvents, and drain cleaners are just a few common hazardous products in the home. Over the last 20 years, concern about the disposal of such products has been growing.

In 1976, the Resource Conservation and Recovery Act (RCRA) was passed, regulating the procedures governing the generation, storage, transport, treatment, and disposal of hazardous materials. Although this legislation has mitigated some of the problems associated with commercial hazardous material disposal, more needs to be done to reduce and properly dispose of home hazardous wastes.

Hazardous products include the following:

- Cleaning products: oven cleaner, floor wax, furniture polish, drain cleaner, and spot remover
- Car care and maintenance: motor oil, battery acid, gasoline, car wax, engine cleaner, antifreeze, degreaser, radiator flush, and rust preventative
- Home improvement products: paints, preservatives, strippers, brush cleaners, and solvents
- Other products labeled toxic, flammable, or corrosive, or containing lye, phenols, petroleum distillates, or trichlorobenzene

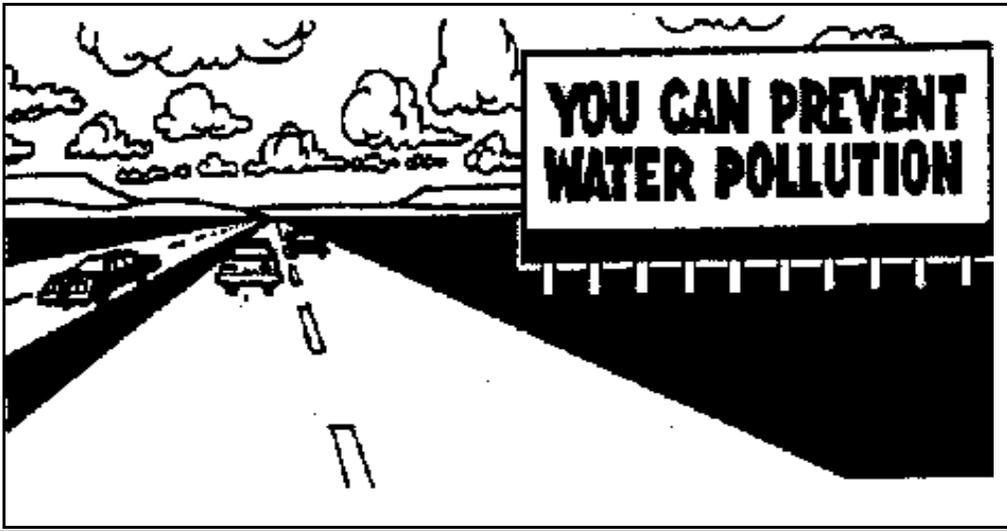
**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High Impact
- Medium Impact
- Low or Unknown Impact



**DESCRIPTION:**

Public education/participation, like an ordinance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMPs. This information sheet highlights the importance of integrating elements of public education and participation into a municipality’s overall plan for storm water quality management.

A public education and participation plan provides the municipality with a strategy for educating its employees, the public, and businesses about the importance of protecting storm water from improperly used, stored, and disposed of pollutants. Municipal employees must be trained, especially those that work in departments not directly related to storm water but whose actions affect storm water. Residents must become aware that a variety of hazardous products are used in the home and that their improper use and disposal can pollute storm water. Increased public awareness also facilitates public scrutiny of industrial and municipal activities and will likely increase public reporting of incidents.

**APPROACH:**

- Pattern a new program after the many established programs around the country.
- Implement public education/participation as a coordinated campaign in which each message is related to the last.
- Present a clear and consistent message and image to the public regarding how they contribute to storm water pollution and what they can do to reduce it.
- Utilize multi-media to reach the full range of audiences.
- Translate messages into the foreign languages of the community to reach the full spectrum of the populace and to avoid misinterpretation of messages.
- Create an awareness and identification with the local watershed.
- Use everyday language in all public pieces. Use outside reviewers to highlight and reduce the use of technical terminology, acronyms, and jargon.
- Make sure all statements have a sound, up-to-date technical basis. Do not contribute to the spread of misinformation.
- Break complicated subjects into smaller more simple concepts. Present these concepts to the public in a metered and organized way to avoid “overloading” and confusing the audience.

**LIMITATIONS:**

None.

**PROGRAM ELEMENTS**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High Impact
- Medium Impact
- Low or Unknown Impact



**PROGRAM ELEMENTS**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges

**DESCRIPTION:**

Stenciling of the storm drain system (inlets, catch basins, channels, and creeks) with prohibitive language/graphic icons discourages the illegal dumping of unwanted materials.

**APPROACH:**

- Create a volunteer work force to stencil storm drain inlets.
- An important aspect of a stenciling program is the distribution of informational flyers that educate the neighborhood (business and residential) about storm water pollution, the storm drain system, and the watershed. The flyers should also provide information on alternatives such as recycling, household hazardous waste disposal, and safer products.
- Because a stenciling program primarily involves volunteer services, liability release forms and volunteer identification notices should also be administered.
- Readability of stencils is critical to their effectiveness. Wherever possible stencils should be painted on a smooth surface such as cement, as opposed to asphalt.
- Use municipal staff to erect signs near drainage channels and creeks.
- An effectively implemented stenciling program encourages change in personal behavior and helps minimize non-point source pollutants from entering the storm drain system. An additional benefit is that waste and catch basin maintenance is minimized through the reduction of disposed materials into storm drain inlets. Finally a well-implemented stenciling program encourages the use of household hazardous waste collection and used oil recycling programs.

**LIMITATIONS:**

- Private property access limits stenciling to publicly-owned areas.
- Program is highly dependent on volunteer response.
- Storm drain inlets that are physically blocked will be missed or require follow-up.
- High traffic/commercial/industrial zones are the responsibility of city staff.
- Ongoing maintenance is needed to maintain readable signs.



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**TARGETED POLLUTANTS**

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- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High     Medium     Low



**DESCRIPTION:**

Classroom education is an integral part of any storm water pollution outreach program. Providing storm water education through schools exposes the message not only to students but to their parents as well. Topics can include water conservation, proper lawn and garden care, and proper disposal of hazardous household wastes.

**APPROACH:**

- Building a strong relationship with the school district is the most important step in getting storm water education into the schools.
- When developing an outreach message for children, choose the age ranges to target.
- Many addition classroom materials are available for use free of cost. Educational materials are available for downloading from the internet at [www.csu.org/water/watereducation/watereducation.html](http://www.csu.org/water/watereducation/watereducation.html).
- Make students aware of the potential impacts of hazardous household materials on water quality and inform residents of ways to properly store, handle, and dispose of the chemicals.
- Water usage in the home can easily be reduced by 15 to 20 percent – without major discomfort – by implementing a program to conserve water in the home.
- Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property.

**LIMITATIONS:**

- One of the limitations of classroom education is being able to incorporate storm water issues into the school curricula. With so many subjects to teach, environmental issues might be viewed as less important.

**MAINTENANCE:**

- Programs and educational materials can be re-used, but they must be presented on a continual basis.

**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**BMP: Promoting the Storm Water Message – Commercial Businesses**

**PSMCB**



Signs can be posted to educate both employees and the public about the impacts of business activities on water quality

**DESCRIPTION:**

A successful outreach campaign must tailor its message to a targeted audience. The target audience may be industry or business groups whose activities influence the health of watersheds. Many commercial activities contribute to storm water pollution (such as vehicle washing, landscape fertilization, and improper hazardous waste disposal). Therefore, it is important to address commercial activities specifically in an outreach strategy and recognize that in most cases incentives must be provided to encourage businesses to change their behavior.

**APPROACH:**

- Materials can be designed and produced to provide education and outreach including posters, magnets, calendars, fliers, brochures, and BMP fact sheets and handbooks.
- Target businesses include restaurants, auto maintenance, parking lots, gas stations, car washes, and home mechanics, to name a few.
- Incentive programs can be put in place for compliance. Participants can be rewarded with technical assistance, promotional items, and public recognition (cfpub.epa.gov/npdes/stormwater/menuofbmps)

**LIMITATIONS:**

- There are many different types of commercial activities, and outreach programs might not be applicable to some of them. Before developing and implementing an outreach program, municipalities should prioritize business types that they think might impair water quality or that might be most receptive to outreach.
- Because the measures that the municipality proposes for businesses are voluntary, owners, operators, and employees must be convinced that changing their behavior is valuable and worth their efforts.

**PROGRAM ELEMENTS**

- : New Development
- : Commercial Activities
- : Industrial Activities
- : Municipal Facilities
- : Illegal Discharges



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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High  Medium  Low



Some examples of stormwater educational materials

**DESCRIPTION:**

Educational Materials to present information to the public on storm water issues and water quality awareness is an integral part of any storm water education program. Providing storm water education by sending out information with bills, newsletters, or presented at city activities, in city offices, schools, and fair booths, exposes the message to a wide variety of people, if not city-wide. Topics can include water conservation, proper lawn and garden care, and proper disposal of hazardous household wastes. Many educational materials can be used for city personnel, contractors as well as homeowners or businesses.

**APPROACH:**

- Building a strong relationship with citizens is the most important step in getting storm water education city-wide.
- Educational materials can be tailored to all different age groups and technical background.
- Make people aware of the potential impacts of hazardous household materials on water quality and inform residents of ways to properly store, handle, and dispose of the chemicals.
- Water usage in the home can easily be reduced by 15 to 20 percent-without major discomfort-by implementing a program to conserve water in the home.
- Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property.

**LIMITATIONS:**

- Not everyone will actually read or incorporate the information into their lives.
- Budgets need to have sufficient funds to obtain educational materials and their distribution.

**MAINTENANCE:**

- Programs and educational materials can be reused, but they must be presented on a continual basis.

**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

## **PUBLIC INVOLVEMENT AND PARTICIPATION**

### **Minimum Control Measure 2**

#### **2.1 INTRODUCTION**

Harrisville City has committed to Joint Permit with Weber County to meet the requirements of Public Involvement and Participation. All official documents (ie. inter local agreements, resolutions, etc.), as per the current UPDES MS4 General Permit requirements on Co-Permitting shall be included in the **ANNUAL REPORT**. Specific responsibilities in the **SWMP** shall be presented in their appropriate sections. Operators of small MS4's are encouraged to utilize partnerships with other governmental entities to fulfill this Minimum Control Measure's requirements. It is generally more cost effective to use an existing program, than to have numerous operators developing their own local programs. As a condition of the Joint Permit, Weber County will have the major responsibility for this Minimum Control Measure.

#### **2.2 POLLUTANTS OF CONCERN**

**MCM's #1 and #2** may be related in as much as overlapping practices of education through participation. Further reduction in storm water pollution can be accomplished with appropriate Best Management Practices that follow these as well as other procedures. Consider what happens to detergents from car washing, leaves and lawn clippings left in the gutter, or litter that is carelessly deposited alongside of the road. These are the kinds of pollutants that flow into the storm drain system. Below is a brief description of some of the more typical storm water pollutants and potential impacts these pollutants may have on waterways.

##### Sediment

Sediment can be harmful to aquatic life (plants, fish, and other animals that live in lakes and streams). Light needed by plants in water is blocked by sediments. Sediments can carry chemicals that are toxic and that cause the oxygen in water to be used up. Sediments clog fish gills and fill in the places they hide. Sediment generally is the result of soil erosion from lawns, hillsides, and gardening/landscaping activities.

##### Floatables

Floatables are pieces of litter in the water. They may be contaminated with toxic chemicals and bacteria. Floatables are also an eyesore in our waterways. Commonly observed floatables include cigarettes, plastic containers, wrappers, and cans. Floatables such as these are generally the result of careless handling practices or littering.

##### Bacteria and Viruses

Bacteria are washed with animal excrement and leakage from sewers and septic tanks into waterways. These organisms can cause disease in both animals and humans. Biological contaminants come from litter, organic matter, and animal waste.

### Oxygen Demanding Substances

The chemical breakdown of organic materials (leaves, excrement, and street litter) washed into waterways decreases levels of dissolved oxygen in water. Aquatic life requires this oxygen to exist.

### Nutrients

Nutrients such as nitrogen and phosphorus result in excessive plant growth that clogs waterways, blocks sunlight, and reduces oxygen. Some sources of nutrients are fertilizer, excrement, and detergents.

### Oil and Grease

Petroleum products (gasoline, oil, and grease) may be toxic to aquatic life, even in small amounts. Oil and grease in storm drains can generally be traced to automotive leaks and spills or improper disposal of used oil and automotive products into storm drains.

### Pesticides, Herbicides and Fertilizers

Excess amounts of pesticides, herbicides, and fertilizers applied to yards, lawns and greenways are washed into streams during rainfall events. These chemicals can cause increased algae growth and toxicity to organisms.

### Metals

Metals such as lead, zinc, mercury, copper, and cadmium in water, can be toxic to humans, aquatic life and other animals that drink the water. Metals come from vehicle exhaust, weathered paint, metal plating, tires and motor oil.

### Toxic Substances

Gasoline, household products, and paint thinner are examples of toxic substances. These substances can deplete oxygen in waterways and cause toxic effects in living organisms.

## **2.3 GENERAL PRACTICES**

As citizens, there are many things that we can do to protect the water in our environment. These general practices can be executed by simpler changes to routine habits. With every resident practicing good housekeeping and material management, great effects can be seen in local water quality. Here are just a few:

### Household and Home Maintenance

√ Buy household products such as cleaners and furniture polish labeled “non-toxic”. Use small quantities and purchase only the amount you need.

√ Follow manufacturer’s recommendations for use and storage of all toxic products including cleaners, solvents, and paints.

√ Properly dispose of household hazardous wastes (any toxic substances) at solid waste facilities.

√ Rinse paint brushes in the sink. Filter and reuse paint thinner or brush cleaners. Dispose of used materials at a hazardous materials collection event.

√ Recycle reusable materials. Throw litter into trash cans and keep cans tightly covered to prevent foraging by neighborhood animals.

### Lawn and Garden

√ Minimize the use of pesticides, herbicides and fertilizers; apply carefully and sweep up excess.

√ Use a broom rather than a hose to clean up sidewalks and driveways. Do not hose down gutter.

√ Deposit leaves and clippings in a garbage can or a compost pile.

√ Divert rain spouts and garden hoses from paved surfaces onto grass or garden areas to allow filtration through the soil. Water only your lawn and garden.

√ Control sediment migration and erosion, don't let it reach the gutter, sweep up and re-use it.

√ Do not over-water -- Don't be a "gutter flooder."

√ Pick-up, bag, and dispose of pet waste in a garbage can.

### Automotive

√ Recycle used motor oil and antifreeze at automotive centers.

√ Have your car inspected and maintained regularly to reduce leakage of oil, antifreeze and other fluids.

√ Reduce automotive emissions through regular auto maintenance, ride sharing, and by using public transportation.

√ Conserve water when using your car and use biodegradable soap.

Non-point source pollution comes from many sources and its control is everyone's responsibility. Pollution prevention and good housekeeping practices are essential to reducing non-point source pollution. From the individual gardener to the public official, everyone has a stake in protecting our resources. The best place to get started is your own backyard and garage.

## 2.4 MEASURABLE GOALS

The following table summarizes the BMPs, Measurable Goals, and Implementation Schedule of the City's for each BMP.

<b>MCM 2 - PUBLIC INVOLVEMENT AND PARTICIPATION</b>			
<b>Name</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>
PEP	Public Education / Participation	Joint permit with Weber County for Public Involvement/Participation.	<i>Goal Completed/ongoing.</i>
	Annual standards and plan review from staff and public.	Annual review of SWMP and storm water construction standards with staff and public.	Annually in February
	Community clean up; Involve local groups	Semi-annual city wide cleanup; volunteer groups to do storm drain system signs	Beginning Spring of 2010
AS	Adopt a Stream and Storm Drain program	Encourage individuals or groups to keep storm drains free of debris and to monitor what is entering local water ways through storm drains. Involve citizens and groups to clean up, monitor and protect the local water ways.	Beginning Spring of 2011

## 2.5 BEST MANAGEMENT PRACTICES (BMP)

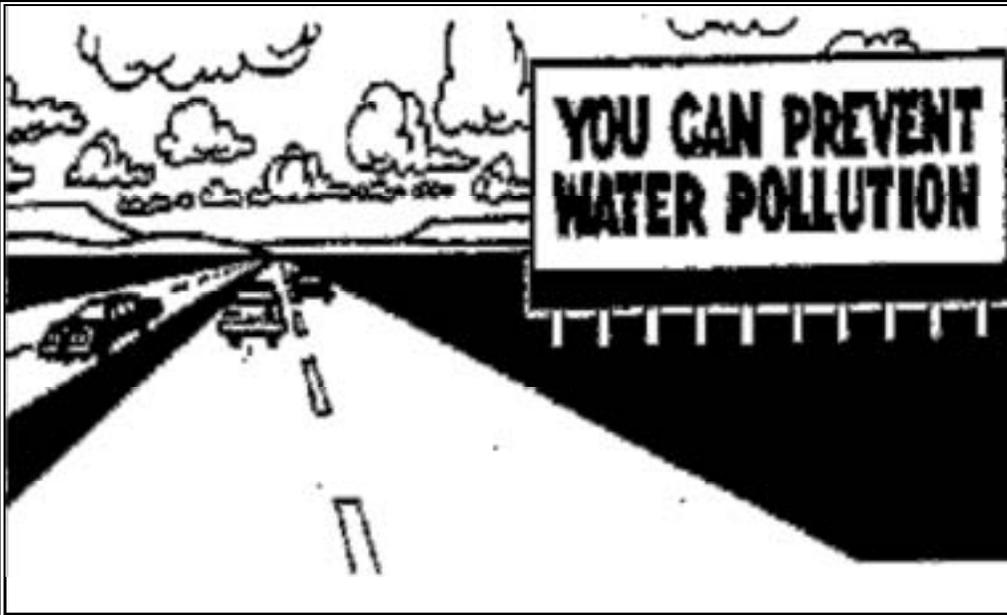
The following pages consist of the fact sheets for the above mentioned goals and BMP's. Each page represents a separate BMP with details given. The intent of this section is to provide a variety of practices that could be related to Public Education and Outreach. The format is similar to other communities on the Wasatch Front, originally obtained from Salt Lake County's Storm Water Management Plan.

## 2.6 REFERENCES

Orange County Environmental Management Agency. "The ocean begins at your front door! Nonpoint Source Pollution and what you can do to help!"

New Jersey Department of Environmental Protection and Energy. "Nonpoint Source Pollution."

Salt Lake County Engineering Division. September 1999. "Guidance Document for Storm Water Management."



**DESCRIPTION:**

Public education/participation, like an ordinance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMPs. This information sheet highlights the importance of integrating elements of public education and participation into a municipality’s overall plan for storm water quality management.

A public education and participation plan provides the municipality with a strategy for educating its employees, the public and businesses about protecting storm water from improperly used, stored, and disposed of pollutants. Municipal employees must be trained, especially those that work in departments not directly related to storm water but whose actions affect storm water. Residents must become aware that a variety of hazardous products are used in the home and their improper use and disposal can pollute storm water. Increased public awareness also facilitates public scrutiny of industrial and municipal activities and will likely increase public reporting of incidents.

**APPROACH:**

- Pattern a program after many established programs around the country.
- Implement public education/participation as a coordinated campaign in which each message is related to the last.
- Present a clear and consistent message and image to the public regarding how they contribute to storm water pollution and what they can do to reduce it.
- Utilize multi-media to reach the full range of audiences.
- Translate messages into the foreign languages of the community to reach the full spectrum of your populace and to avoid misinterpretation of messages.
- Create an awareness and identification with the local watershed.
- Use everyday language in all public pieces. Use outside reviewers to highlight and reduce technical terminology, acronyms, and jargon.
- Make sure all statements have a sound, up-to-date technical basis. Do not contribute to the spread of misinformation.
- Break complicated subjects into smaller more simple concepts. Present these concepts to the public in a metered and organized way to avoid “overloading” and confusing the audience.

**LIMITATIONS:** None.

**PROGRAM ELEMENTS**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



*363 W. Independence Blvd.  
Harrisville, UT 84404  
(801) 782-9648*

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High  Medium  Low



**DESCRIPTION:**

Adopt-A-Stream programs are an excellent public outreach tool for municipalities to involve citizens of all ages and abilities. They are volunteer programs in which participants "adopt" a stream, creek, or river to study, clean up, monitor, protect, and restore. Through these activities, the adopting group or organization becomes the primary caretaker of that stretch of stream in the watershed.

**APPROACH:**

- Municipalities can begin an Adopt-A-Stream program by obtaining a watershed map and marking potential stream sites on it. The map can then be used to keep track of which stretches are adopted and by whom.
- Identify different types of activities that can be done to improve streams within the city.
- Prepare "how to" packets for each stream improvement activity that can be distributed to interested organizations. For example, a packet for conducting a stream cleanup might include trash bags and gloves, a map designating appropriate trash pickup sites along the stream and private land areas for which special permission might be required, and a list of contact information for trash collectors and recyclers.
- Require documentation to be completed by the participants, such as registration forms and cleanup reports.
- The media should be used whenever possible to spread the word about the Adopt-A-Stream program and the activities it sponsors. Advertisements can be placed in newspapers, public service announcements (PSAs) can be broadcast on TV and radio, and an internet site can be developed with program information.
- Many Adopt-A-Stream programs partner with schools to develop interdisciplinary classroom curricula and activities. Through the program, teachers and students adopt a waterway and perform chemical, physical, and biological testing to determine water quality and perform habitat restoration.

**LIMITATIONS:**

- Commitment. Many people sign up for activities but quickly find they do not have time for follow-up activities.
- Other limitation may include funding availability, weather, equipment maintenance, and liability associated with the dangers of slippery rocks or steep slopes.

**MAINTENANCE:**

- To maintain water quality, cleanup efforts must be recurring.

**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

## ILLICIT DISCHARGE DETECTION AND ELIMINATION

### Minimum Control Measure 3

#### 3.1 INTRODUCTION

Federal regulations define an “illicit discharge” “as any discharge to a municipal separate storm sewer system that is not composed entirely of storm water” (except discharges resulting from firefighting activities and a few other categories). Common sources of non-storm water, dry weather discharges in urban areas include apartments and homes, car washes, restaurants, airports, landfills and gas stations to name but a few. These so called “generating sites” discharge sanitary waste water, septic system effluent, vehicle wash water, wash down from grease traps, motor oil, antifreeze, gasoline and fuel spills, among other substances. These illicit discharges can enter the storm drain system in various ways, (e.g., waste water piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration in to the storm drain system, spills, or “midnight dumping”). Illicit discharges can be further divided in to those discharging continuously and those discharging intermittently. Dry weather discharges can contribute significant pollutants to receiving waters.

The detection and elimination of illicit discharges is important to protect and restore urban waterways. One way for example, as part of the Public IDDE for any program, is to report illicit discharges by calling Harrisville City @ (801) 782-4100 or 911.

Harrisville City has committed to joint permit with Weber County to meet the requirements of Illicit Discharge Detection and Elimination. As a condition of the joint permit, Weber County has a minor responsibility for this Minimum Control Measure.

#### 3.2 MEASURABLE GOALS

The following table summarizes the BMPs, Measurable Goals, and Implementation Schedule of the Citys for each BMP.

<b>MMC 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION</b>			
<b>Name</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>
Permit	Joint Permit with Weber County	Joint Permit with Weber County for discharge and detection.	<i>Goal Completed</i>
MAP	Maintain a map of the City Storm Drain System in GIS.	Continue GIS maintenance	<i>Goal Completed</i>
SW-MP	Obtain a Storm Water Master Plan to pin point locations for future detention and sediment basins.	Obtain a master plan	<i>Goal Completed</i>

DWS	Dry weather screening. (SOP added)	20% per year as per SOP	<i>Immediate in 2010</i>
PSMCB	Promoting the storm water message on commercial business.	See MCM1 PSCMB, HWMC	
IDDEO	Establish an illicit discharge detection and elimination ordinance.	Maintain and enforce ordinance.	<i>Goal Completed Ongoing</i>
IDDE-SOP's	Establish SOP's for detecting and eliminating illicit discharges.	Maintain and enforce SOP's	2010
IDDE-PEP	Establish an education program for commercial businesses.	See MCM 1 SWEM	2010
ET	Train employees on the IDDE program as per section 4.2.3.11 of the Small MS4 General UPDES Permit.	Train annually	2010
DH	Develop an IDDE awareness notice of violation program.  Distribute door hangers by staff when a potential IDDE is discovered.	Maintain program	2011

### **3.3 BEST MANAGEMENT PRACTICES (BMP)**

The following pages consist of the fact sheets for the above mentioned goals and BMP's. Each page represents a separate BMP with details given. The intent of this section is to provide a variety of practices that could be related to Public Education and Outreach. The format is similar to other communities on the Wasatch Front, originally obtained from Salt Lake County's Storm Water Management Plan.

### **3.4 STORM WATER MAPPING**

The attached map shows the storm water system for the City.



**EXISTING BASIN TABLE**

NO.	NAME	DEPTH	WIDTH	LENGTH	AREA	STATUS
1	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
2	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
3	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
4	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
5	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
6	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
7	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
8	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
9	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
10	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
11	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
12	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
13	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
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15	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
16	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
17	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
18	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
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23	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
24	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
25	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
26	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
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33	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
34	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
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88	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
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98	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
99	STREET SEWER	4.0'	4.0'	100'	400	EXISTING
100	STREET SEWER	4.0'	4.0'	100'	400	EXISTING



- LEGEND**
- CITY LIMITS
  - LAND ZONE
  - EXISTING STORM SEWER
  - EXISTING STORM SEWER (PROPOSED)
  - PROPOSED STORM SEWER
  - EXISTING WATER
  - EXISTING WATER MAIN
  - OPEN CHANNEL DRAINAGE
  - EXISTING RETENTION BASIN

**JA CONSULTING ENGINEERS**  
 114 East 10th Street  
 Tulsa, Oklahoma 74103-1213  
 Phone: (918) 581-1111  
 Fax: (918) 581-1112

**MARSHVILLE CITY CORPORATION**  
 STORM WATER MAINTENANCE PLAN UPDATE AND  
**CAPITAL FACILITIES PLAN**





**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**DESCRIPTION:**

Inspection of drainage-ways during dry weather at least ten days after a storm. Report and documentation of active flowing drainage-ways. General assessment of water quality. Actively flowing drainage-ways are then followed upstream to identify the source.

**APPROACH:**

- Organize a group of people to inspect drainage-ways during dry weather at least ten days after a storm.
- Provide a map of the land layout and the storm drainage system in order to efficiently locate checkpoints and mark areas where water is flowing.
- In areas where water is flowing, a general assessment of the water quality can be made with respect to discoloration, pollutants, and odor.
- Document and report the status of all checkpoints to the authorized municipality.
- The municipality then makes efforts to follow up and identify the source of the water. Sources should then be marked on a system map.
- Illicit discharges should be disconnected and removed from the system.

**LIMITATIONS:**

- Permission may be required to access private properties.
- Inaccurate map data may result in confusion.
- Water coming from springs, land drains, and surfacing ground water can be difficult to trace.

**MAINTENANCE:**

- Identified non-storm water sources should be monitored on a regular basis to ensure no contamination enters the storm water system.

## **IDDE- DWS-SOP - Outfall Inspections/dry weather screening**

1. Preparation:
  - a. Know the past and present weather conditions. Conduct inspections during dry weather periods.
  - b. Gather all necessary equipment including: tape measure, clear container, EPA form "outfall reconnaissance inventory/sample collection field sheet", flashlight, and camera (optional).
  - c. Obtain maps showing outfall locations and identifiers.
  - d. Obtain outfall description and observations from previous inspections, so the outfall can be accurately identified and observations compared.
  
2. Process:
  - a. Perform an inspection of each identified outfalls at least once per year. Inspect 20 percent of the receiving waters each year for unknown outfalls. Whenever possible, use the same personnel for consistency in observations.
  - b. Identify each outfall with a consistent and unique identifier. Use maps and previous inspection reports to confirm the outfall identity and location. (See Harrisville City storm water map)
  - c. If dry weather flow is present at the outfall, then document and evaluate the discharge by completing the following steps:
    - i. Collect field samples for visual observations in a clean, clear container and in a manner that avoids stirring up sediment that might distort the observation.
    - ii. Characterize and record observations on basic sensory and physical indicators (e.g., outfall condition, flow, odor, color, oil sheen) on the Outfall Inspection Form.
    - iii. Compare observations to previous inspections.
    - iv. If the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (e.g., groundwater, intermittent stream, etc.)
  - d. If an illicit discharge (such as raw sewage, petroleum products, paint, etc.) is encountered or suspected, follow the procedure of SOP IDDE - Tracing Illicit Discharges.
  
3. Cleanup - as necessary
  
4. Documentation
  - a. File completed outfall inspection forms.
  - b. Update maps if new outfalls are observed and inspected.

## **IDDE SOP - Call-in Inspections/ Response Procedure**

1. Preparation:
  - a. Have a system in place to receive phone calls and collect information regarding suspected illicit discharges.
    - **Call the Harrisville City office @ 801-782-9648**
    - **Weber/Morgan Heath Department @ 801-399-7169**
    - **Weber County spill response @ 801-536-4123**
    - **A Plus Environments LLC @ 801-392-6545**
    - **HMHTTC Response Inc. @ 801-627-2240 or 800-927-9303**
    - **Lincoln Environmental Services @ 800-257-5370**
    - **North View Fire Department @ 801-782-8159**
    - **Department of Water Quality @ 800-458-0145**
2. Process:
  - a. Use the Incident Tracking Sheet to collect the appropriate information from the caller. Then, transfer the Incident Tracking Sheet to the proper authority (ie. department head, storm water specialist, construction inspector, code enforcement officer, or other assigned personnel). See the file for the tracking sheet.
  - b. Promptly investigate reported incidents.
  - c. If an illicit discharge of unknown source is confirmed, follow the procedure of SOP IDDE - Tracing Illicit Discharges.
  - d. If an illicit discharge of known source is confirmed, follow the procedure of SOP IDDE - Removing Illicit Discharges.
3. Clean up:
  - a. Clean catch basin, clean storm drain, or initiate spill response, as applicable. Follow relevant SOPs.
4. Documentation:
  - a. File all completed forms (ie. incident tracking, catch basins cleaning, storm drain cleaning).
  - b. Document any further action taken.
  - c. Review incidents reported by citizens on an annual basis to look for patterns of illicit discharges and to evaluate the call-in inspection program.

## **IDDE SOP - Tracing Illicit Discharges**

1. Preparation:
  - a. Review / consider information collected when illicit discharge was initially identified and document using Incident Tracking Form or Outfall Inspection Form.
  - b. Obtain storm drain mapping for the area of the reported illicit discharge.
  - c. Gather all necessary equipment including: tape measure, clear container, clipboard with necessary forms, flashlight, and camera (optional).
  
2. Process:
  - a. Survey the general area / surrounding properties to identify potential sources of the illicit discharge as a first step.
  - b. Trace illicit discharges using visual inspections of upstream points as a second step. Use available mapping to identify tributary pipes, catch basins, etc.
  - c. If the source of the illicit discharge cannot be determined by a survey of the area or observation of the storm drain system, then consider the following additional steps:
    - i. Use weirs, sandbags, dams, or optical brightener monitoring traps to collect or pool intermittent discharges during dry weather.
    - ii. Smoke test or televise the storm drain system to trace high priority, difficult to detect illicit discharges.
    - iii. Dye test individual discharge points within suspected buildings.
    - iv. Consider collecting bacterial samples of flowing discharges to confirm/refute illicit discharge.
  - d. If the source is located, follow SOP IDDE - Removing Illicit Discharges.
  - e. If the source cannot be found, add the location to a future inspection program.
  
3. Clean up:
  - a. Clean catch basin, clean storm drain, or initiate spill response, as applicable. Follow relevant SOPs.
  
4. Documentation:
  - a. Document tracing results for future reference.

## **IDDE SOP - Opportunistic Illicit Discharge Observation**

1. Preparation:
  - a. Be alert for potential illicit discharges to the municipal storm water system while going about normal work activities.
2. Process:
  - a. Call the appropriate authority (ie. department head, storm water specialist, construction inspector, code enforcement officer or a supervisor) if you see evidence of an illicit discharge.
  - b. Assess the general area of the illicit discharge to see if you can identify its source.
  - c. Whenever possible, take photographs of the suspected illicit discharge.
  - d. Responding storm water department personnel or code enforcement officer will complete the following:
    - i. Use the IDDE Incident Tracking Sheet to document observations.
    - ii. Obtain sample for visual observation and complete an Outfall Inspection Form, if applicable.
    - iii. Follow the procedure of SOP IDDE - Tracing Illicit Discharges.
3. Clean-up
  - a. Clean catch basin, clean storm drain, or initiate spill response, as needed. Follow relevant SOPs.
4. Documentation:
  - a. File all completed forms (ie. Incident Tracking Form, Outfall Inspection Form, Catch Basin Cleaning Form, and Storm Drain Cleaning Log).
  - b. Document any further action taken. As in any enforcement, follow up inspections and changes.

## **IDDE SOP- Removing Illicit Discharges**

1. Preparation:
  - a. Obtain available property ownership information for the source of the illicit discharge.
2. Process:
  - a. Determine who is financially responsible and follow associated procedures as given below.
    - i. For Private Property Owner:
      1. Contact owner.
      2. Issue Notice of Violation for violations of the municipal ordinance.
      3. Determine schedule for removal.
    - ii. For Municipal Facility:
      1. Notify appropriate municipal authority or department head.
      2. Schedule removal.
      3. Remove illicit connection.
  - b. Suspend access to storm drain if threats of serious physical harm to humans or the environment are possible.
  - c. Direct responsible party to initiate repairs/corrections/cleanup. Coordinate with enforcement official for escalating penalties in accordance with the municipal ordinance.
  - d. Repair/correct cause of discharge if municipality is responsible. Schedule the work through the appropriate municipal authority or department head.
  - e. Seek technical assistance from the Weber-Morgan Health Department or Utah Department of Water Quality, if needed.
3. Clean up:
  - a. Confirm illicit discharge is removed or eliminated by follow-up inspection.
4. Documentation:
  - a. Maintain records of notice of violation and penalties.
  - b. Document repairs, corrections, and any other actions required.

## **IDDE-ET-SOP- Annual Employee Training about the IDDE Program**

1. Train all employees as per current IDDE SOP's on their normal job responsibilities of proper MS4 pollution control procedures and IDDE obligations including:
  - a. How to identify spills.
  - b. Investigation of spills.
  - c. Termination of spills.
  - d. Clean up of spills.
  - e. Reporting of illicit discharges including spills.
  - f. Improper disposal and illicit connections.

## **IDDE-SOP- Evaluation and Immediate Containment of Illicit Discharges**

1. Determine the kind of illicit discharge. Check for illicit discharge indicators (e.g. odor, color, turbidity, and floatables).
2. Locate source of illicit discharge and eliminate.
3. Have a list of emergency spill materials and locations.
4. Place applicable emergency spill material at the site of the illicit discharge (e.g. flotation booms, oil rags, water based oil absorbent materials, etc).
5. Seek technical assistance from the Weber-Morgan Health Department, Utah Department of Water Quality, and North View Fire Department if needed.

## **SPILL REPORT FORM**

Date of Spill \_\_\_\_\_ Time \_\_\_\_\_ Duration \_\_\_\_\_

Chemical name or identity of any substance involved in the release: \_\_\_\_\_

\_\_\_\_\_

Is it a hazardous substance or EHS? \_\_\_\_\_

Estimate of Quantity Spilled \_\_\_\_\_

Who Responded? \_\_\_\_\_

Cleaning Method Used \_\_\_\_\_

\_\_\_\_\_

Any Discharge to Storm Drain? \_\_\_\_\_

\_\_\_\_\_

Any known or anticipated acute or chronic health risks for exposed individuals associated with the emergency spill: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Were proper precautions taken, including evacuation, if necessary? \_\_\_\_\_

\_\_\_\_\_

Was Spill Reported to the State?    Yes    No

## OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

### Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigator:		Form completed by:	
Temperature (°F):	Reflow (in.):	Last 24 hours:	Last 48 hours:
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Contact:		Photo #:	
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial	<input type="checkbox"/> Open Space		
<input type="checkbox"/> Ultra-Urban Residential	<input type="checkbox"/> Institutional		
<input type="checkbox"/> Suburban Residential	Other: _____		
<input type="checkbox"/> Commercial	Known Industries: _____		
Notes (e.g., origin of outfall, if known):			

### Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter/Dimensions: _____ _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully  With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Barium <input type="checkbox"/> rip-rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoidal <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Top Width: _____ Bottom Width: _____	
<input type="checkbox"/> In-Stream	(applicable when collecting samples)			
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<i>If No, skip to Section 5</i>		
Flow Description (if present)	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial			

### Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS					
PARAMETER	RESULT	UNIT	EQUIPMENT		
<input type="checkbox"/> Flow #1	Volume		Liter	Bottle	
	Time to fill		Sec		
<input type="checkbox"/> Flow #2	Flow depth		In	Tape measure	
	Flow width	____' ____"	ft, in	Tape measure	
	Measured length	____' ____"	ft, in	Tape measure	
	Time of travel		s	Stop watch	
Temperature		°F	Thermometer		
pH		pH Units	Test strip/Probe		
Ammonia		mg/L	Test strip		

## Illicit Discharge Hotline Incident Tracking Sheet

<b>Incident ID:</b>				
<b>Responder Information</b>				
Call taken by:		Call date:		
Call time:		Precipitation (inches) in past 24-48 hrs:		
<b>Reporter Information</b>				
Incident time:		Incident date:		
Caller contact information (optional):				
<b>Incident Location</b> (complete one or more below)				
Latitude and longitude:				
Stream address or outfall #:				
Closest street address:				
Nearby landmark:				
<b>Primary Location Description</b>		<b>Secondary Location Description:</b>		
<input type="checkbox"/> Stream corridor (In or adjacent to stream)	<input type="checkbox"/> Outfall	<input type="checkbox"/> In-stream flow	<input type="checkbox"/> Along banks	
<input type="checkbox"/> Upland area (Land not adjacent to stream)	<input type="checkbox"/> Near storm drain	<input type="checkbox"/> Near other water source (storm water pond, wetland, etc.):		
Narrative description of location:				
<b>Upland Problem Indicator Description</b>				
<input type="checkbox"/> Dumping	<input type="checkbox"/> Oil/solvents/chemicals	<input type="checkbox"/> Sewage		
<input type="checkbox"/> Wash water, suds, etc.	<input type="checkbox"/> Other: _____			
<b>Stream Corridor Problem Indicator Description</b>				
<b>Odor</b>	<input type="checkbox"/> None	<input type="checkbox"/> Sewage	<input type="checkbox"/> Rancid/Sour	<input type="checkbox"/> Petroleum (gas)
	<input type="checkbox"/> Sulfide (rotten eggs); natural gas	<input type="checkbox"/> Other: Describe in "Narrative" section		
<b>Appearance</b>	<input type="checkbox"/> "Normal"	<input type="checkbox"/> Oil sheen	<input type="checkbox"/> Cloudy	<input type="checkbox"/> Suds
	<input type="checkbox"/> Other: Describe in "Narrative" section			
<b>Floatables</b>	<input type="checkbox"/> None:	<input type="checkbox"/> Sewage (toilet paper, etc)	<input type="checkbox"/> Algae	<input type="checkbox"/> Dead fish
	<input type="checkbox"/> Other: Describe in "Narrative" section			
Narrative description of problem indicators:				
Suspected Violator (name, personal or vehicle description, license plate #, etc.):				

**Investigation Notes**

Initial investigation date:	Investigators:
<input type="checkbox"/> No investigation made	Reason:
<input type="checkbox"/> Referred to different department/agency:	Department/Agency:
<input type="checkbox"/> Investigated: No action necessary	
<input type="checkbox"/> Investigated: Requires action	Description of actions:
Hours between call and investigation:	Hours to close incident:
Date case closed:	

Notes:

### Outfall Recontaminance Inventory Field Sheet

**Section 4: Physical Indicators for Floating Outfalls Only**

Are Any Physical Indicators Present in the River?  Yes  No *(If No, Skip to Section 5)*

INDICATOR	CHECKED Present	DESCRIPTION	SEVERITY INDEX (1-3)
Color	<input type="checkbox"/>	<input type="checkbox"/> Brown <input type="checkbox"/> Turbid/low <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> White <input type="checkbox"/> Other:	<input type="checkbox"/> 1 - Yellow <input type="checkbox"/> 2 - Turbidity from a distance <input type="checkbox"/> 3 - Turbidity from a distance
Odor	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other:	<input type="checkbox"/> 1 - Turbidity in sample bottle <input type="checkbox"/> 2 - Clearly visible in sample bottle <input type="checkbox"/> 3 - Clearly visible in sample flow
Turbidity	<input type="checkbox"/>	<i>See severity</i> <input type="checkbox"/> Storage (Toler Paper, etc.) <input type="checkbox"/> Spills <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Other:	<input type="checkbox"/> 1 - Slight cloudiness <input type="checkbox"/> 2 - Clearly visible in distance <input type="checkbox"/> 3 - Clearly visible in distance
Flotation (Does Not Include Trash)	<input type="checkbox"/>		<input type="checkbox"/> 1 - Triclighty edges not obvious <input type="checkbox"/> 2 - Brown, turbidness of edges (e.g., possible sand or oil sheen) <input type="checkbox"/> 3 - Brown, edges clear (e.g., obvious oil sheen, scale, or floating material)

**Section 5: Physical Indicators for Both Floating and Non-Floating Outfalls**

Are Physical Indicators that are not related to flow present?  Yes  No *(If No, Skip to Section 5)*

INDICATOR	CHECKED (Present)	DESCRIPTION	SEVERITY INDEX
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Spilling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Overrun	
Debris/Sediment	<input type="checkbox"/>	<input type="checkbox"/> Only <input type="checkbox"/> Few Lines <input type="checkbox"/> Piles <input type="checkbox"/> Other:	
Absent or Sparse Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Brownish <input type="checkbox"/> Salty <input type="checkbox"/> Other:	
Free pool quality	<input type="checkbox"/>	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Hydrocarbons <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Sludge <input type="checkbox"/> Brownish Algae <input type="checkbox"/> Other:	
Rip-rap/bed grade	<input type="checkbox"/>	<input type="checkbox"/> Shown <input type="checkbox"/> Gauge <input type="checkbox"/> Other:	

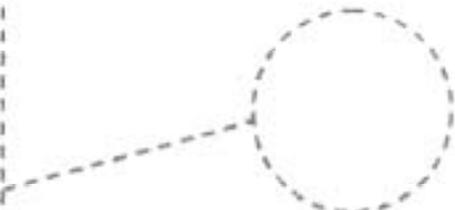
**Section 6: Overall Outfall Characterization**

Unlikely  Potential (presence of two or more indicators)  Suspicious (one or more indicators with a severity of 3)  Obvious

**Section 7: Data Collection**

1. Sample for the lab?	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. If yes, collected from:	<input type="checkbox"/> River <input type="checkbox"/> Pool <input type="checkbox"/> Yes <input type="checkbox"/> No <i>If Yes, type</i> <input type="checkbox"/> Other
3. Inconfluent flow trap set?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Section 8: Any Non-IBID Discharge Concerns (e.g., trash or needed infrastructure repairs)?



## Stormwater Pollution Found in Your Area!

**This is not a citation.**

This is your form to let the city know if you found the following pollutants in the storm sewer system in your area. This storm sewer system leads directly to

- Motor oil
  - Oil filters
  - Antifreeze/transmission fluid
  - Paint
  - Solvent/degreaser
  - Cooking grease
  - Detergent
  - Home improvement waste (concrete, mortar)
  - Pet waste
  - Yard waste (leaves, grass, mulch)
  - Excessive dirt and gravel
  - Trash
  - Construction debris
  - Pesticides and fertilizers
  - Other
- 
- 

**For more information or to report an illegal discharge of pollutants, please call:**  
harrsville city public works  
601-782-4100 ext 1021



[www.epa.gov/cip/polstmswrcr](http://www.epa.gov/cip/polstmswrcr)

EPA 833-F-03-002  
April 2003



Stormwater runoff is precipitation from rain or snowmelt that flows over the ground. As it flows, it can pick up debris, chemicals, dirt, and other pollutants and deposit them into a storm sewer system or waterbody.

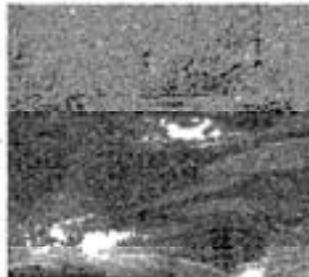
Anything that enters a storm sewer system is discharged *untreated* into the waterbodies we use for swimming, fishing, and providing drinking water.

**Remember:**

**Only Rain Down the Drain**

To keep the stormwater leaving your home or workplace clean, follow these simple guidelines:

- ◆ Use pesticides and fertilizers sparingly.
- ◆ Repair auto leaks.
- ◆ Dispose of household hazardous waste, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- ◆ Clean up after your pet.
- ◆ Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- ◆ Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- ◆ Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- ◆ Sweep up and properly dispose of construction debris like concrete and mortar.



# CONSTRUCTION SITE RUNOFF CONTROL

## Minimum Control Measure 4

### 4.1 INTRODUCTION

All Permittees shall develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction sites with a land disturbance of greater than one acre, including projects that are less than one acre that are part of a larger **COMMON PLAN OF DEVELOPMENT** or sale. Public and private projects, including projects proposed by the departments and agencies, (including utility companies and special service districts) shall comply with these requirements. If any project (requiring a State permit or not) is less than one acre and not a part of a larger common plan of development but has the potential for storm water pollutant generation, all applicable requirements shall apply. When a CPD site is legitimately stabilized and terminated by filing a Notice of Termination (NOT) with DWQ that is verified by a local MS4 or DWQ, the construction storm water permit is terminated (whether the site is substantially completed or not). Upon resumption of any further construction, the site will retain its status as a CPD and will require issuance of a storm water permit, no matter what size of land is disturbed, unless **both** of the following two requirements are met: 1- Less than 1 acre of the CPD is remaining. 2- There has been no ongoing construction on the site for at least two years. Harrisville City has committed to Joint Permit with Weber County to meet the requirements of Construction Site Runoff Control. The City will take the major role of responsibility for this Measure as a condition of the joint permit with Weber County

### 4.2 POLLUTANTS OF CONCERN

Sediment in storm water is the primary pollutant of concern for construction activities. Other pollutants including heavy metals, nutrients, and additional toxics (construction materials and chemicals) are often found in runoff waters from construction sites. The following sections address storm water runoff from the pollutants of concern associated with construction site activities along with impacts to receiving waters caused by these pollutants.

#### Sediment

Soil erosion is the process by which soil particles are removed from the land surface by wind, water, or gravity. Water erosion is the primary mechanism for the transport of sediment into storm water systems and receiving waters. Vegetation protects soil from erosion by intercepting and absorbing rainfall, and by binding soil together with root structures. When trees and brush are removed, soil is exposed and is easily transported off site, resulting in increased sediment migration. Natural depressions and hills which temporarily pond water are often removed by grading activities; rainfall then runs off the area, taking with it soil particles. Run off from areas which have been cleared and grubbed are associated with generally higher volumes of flow conveyed at an increased velocity capable of carrying sediment particles.

Excessive sediment in water can cause increased turbidity and reduced light penetration, resulting in impaired vision for aquatic life, clogging of fish gills, and a reduction in aesthetic values. In addition, other substances such as nutrients, heavy metals, and hydrocarbons tend to attach to sediment and in turn are transported with the sediment.

### Nutrients

Nutrients, nitrogen and phosphorus, from fertilizers, pesticides, construction chemicals, and solid waste are often generated at construction sites. Excessive discharge into waterways may result in algae growth which can cause odor problems and reduce the dissolved oxygen available to fish and other aquatic life.

### Oils and Greases

Oil and grease contain a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. The main sources of oil and grease during construction activities are leakage from engines, spills at fueling stations, overfilled tanks, and waste oil disposal.

### Other Toxic Chemicals

Construction of buildings and roads may require toxic or hazardous materials such as pesticides, herbicides, petroleum products, and building materials such as asphalt, sealants and concrete which may pollute storm water running off the construction site. These types of pollutants often contain small amounts of metals and other materials which may be harmful to humans, plants, and fish in streams.

### Miscellaneous Wastes

Miscellaneous wastes include wash water from concrete mixers, paints and painting equipment cleaning activities, solid wastes resulting from trees and shrubs removed during land clearing, wood and paper materials derived from packaging of building products, food containers such as paper, aluminum, and metal cans, and sanitary wastes. The discharge of these can lead to unsightly and polluted waterways.

## **4.3 MEASURABLE GOALS**

The following table summarizes the BMPs. Note: BMP's should be used in a manner that ultimately does not allow pollutants (eg. dirt and mud) to reach a paved surface or storm drain system inlet if there are other means of control. The goal is to implement procedures as close to the source as possible. It is not the intent of Harrisville City's SWMP to endorse BMP's to be used downstream when upstream BMP measures can be utilized to prevent pollutants from reaching the final critical inlet destination point of a storm drain system where extreme measures have to be used. The following table summarizes the BMP's, Measurable Goals, and Implementation Schedule of the City for each BMP.

<b>MCM 4 - CONSTRUCTION SITE RUNOFF CONTROL</b>			
<b>Name</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>
	See BR, CESA, CR,CWM, DC, ECB, EVWA, GM, HWM,* IP, PTHD, SB, SCE, SCU, SF, FR, ST , VEF, and WD BMP fact sheets & SOP'S.( *IP – Above surface BMP's should only be used as a final MCM option for paved surfaces and will not be allowed on a dedicated Public ROW from November 1, to April 1 ).	Adopt an Ordinance for enforcement	<i>Goal Completed</i>
<i>CCIT</i>	Contractor Certification & Inspector Training	Coordinate with Weber County for Contractor Training classes. Obtain inspector registration.	Continue maintaining RSI certification through state requirements.
<i>ECP</i>	Erosion Control Plan	All Contractors will submit a SWPPP for City projects	Ongoing
<i>SPR</i>	Site Plan Review	Review site plans to ensure they include adequate BMP's to protect water quality. As seen below. Include Sop's for Construction Site Run Off Control, (CSSWRC), Notice of Termination, (NOTN), and MS4 Inspection and Enforcement (MS4IE)	Ongoing
<i>PCSPR</i>	(Post Construction Site Plan Review)	Define Construction Ownership & Maintenance for each site.	Ongoing

#### **4.4 BEST MANAGEMENT PRACTICES (BMP)**

The following pages consist of the fact sheets for the above mentioned goals and BMP's. The intent of this section is to reduce pollutants in any storm water runoff to the MS4 from construction sites. Each page represents a separate BMP with details given that can be considered as procedures to fulfill the minimum requirements for all applicable parties.

## 4.5 REFERENCES

Berman, L., C. Hartline, N. Ryan, and J. Thorne. 1991. "Urban Runoff: Water Quality Solutions." American Public Works Association, Special Report #61.

City of Boise, Public Works Department. January 1997. "Boise Storm Water Best Management Practices (BMP) Guidebook."

Denver Regional Council of Governments. February 1998. "Keeping Soil On Site - Construction Best Management Practices."

Salt Lake County Engineering Division. September 1999. "Guidance Document for Stormwater Management."

State of California. March 1993. "California Storm Water Best Management Practice Handbooks."

State of Minnesota. October 1989. "Protecting Water Quality in Urban Areas - Best Management Practices for Minnesota."

U.S. Environmental Protection Agency. September 1992. "Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices," EPA-832-R-92-005.

**BMP: Building Repair and Construction**

**BRC**



**OBJECTIVES**

- Cover
- Contain
- Educate
- Reduce/Minimize
- Commercial Activities
- Recycle

**DESCRIPTION:**

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to storm water from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.



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**APPROACH:**

**Pollution Prevention**

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

**Suggested Protocols**

*Repair & Remodeling*

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vac truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
  - Medium Impact
  - Low or Unknown Impact

- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.
- Painting**
- Enclose painting operations consistent with local air quality regulations and OSHA.
  - Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
  - Develop paint handling procedures for proper use, storage, and disposal of paints.
  - Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
  - Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
  - Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
  - Transfer and load paint and hot thermoplastic away from storm drain inlets.
  - Do not transfer or load paint near storm drain inlets.
  - Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
  - Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
  - Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
  - Cover or enclose painting operations properly to avoid drift.
  - Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
  - Capture all cleanup-water and dispose of properly.
  - Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
  - Store leftover paints if they are to be kept for the next job properly, or dispose properly.
  - Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

**Training**

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

**Spill Response and Prevention**

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

**Limitations**

- This BMP is for minor construction only. The State's General Construction Activity Storm water Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

**OBJECTIVES**

- Cover
- Contain
- Educate
- Reduce/Minimize
- Commercial Activities
- Recycle



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**BMP: Building Repair and Construction – Continued**

**REQUIREMENTS:**

***Costs***

- These BMPs are generally low to modest in cost.

**MAINTENANCE:**

- N/A

**SUPPLEMENTAL INFORMATION:**

***Further Detail of the BMP***

*Soil/Erosion Control*

- If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.
- If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective “in-line” treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a “turn-down” elbow or similar device to trap floatables.

# BMP: Contaminated or Erodible Surface Areas

CESA



### DESCRIPTION:

Prevent or reduce the discharge of pollutants to storm water from contaminated or erodible surface areas by leaving as much vegetation on-site as possible, minimizing soil exposure time, stabilizing exposed soils, and preventing storm water runoff and runoff.

### APPLICATION:

This BMP addresses soils which are not so contaminated as to exceed criteria but the soil is eroding and carrying pollutants off in the storm water.

### INSTALLATION/APPLICATION CRITERIA:

Contaminated or erodible surface areas can be controlled by: Preservation of natural vegetation, re-vegetation, chemical stabilization, removal of contaminated soils or geosynthetics.

### LIMITATIONS:

Disadvantages of preserving natural vegetation or re-vegetating include:

- Requires substantial planning to preserve and maintain the existing vegetation.
- May not be cost-effective with high land costs.
- Lack of rainfall and/or poor soils may limit the success of re-vegetated areas.
- Disadvantages of chemical stabilization include:
  - Creation of impervious surfaces.
  - May cause harmful effects on water quality.
  - Is usually more expensive than vegetative cover.

### MAINTENANCE:

- Maintenance should be minimal, except possibly if irrigation of vegetation is necessary.

### OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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### TARGETED POLLUTANTS

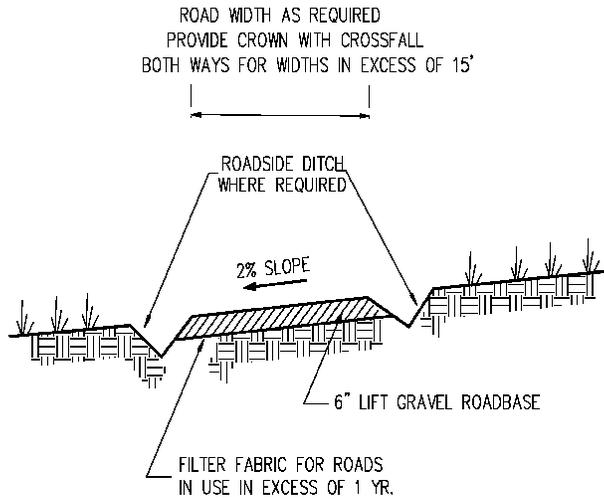
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

### IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**DESCRIPTION:**

Temporary stabilization of on-site roadway by placement of gravel roadbase.

**APPLICATION:**

- On-site roadways used daily by construction traffic (may not apply to gravelly type soils)
- Parking or staging areas susceptible to erosion due to traffic use

**INSTALLATION/APPLICATION CRITERIA:**

- Grade temporary access road with 2% cross fall, for two-way width provide crown.
- Provide roadside ditch and outlet controls where required.
- Place 6 inches of 2-inch to 4-inch crushed rock on driving area

**LIMITATIONS:**

- May require removal of gravel roadbase at completion of activities if final cover is not impervious
- May require controls for surface storm water runoff

**MAINTENANCE:**

- Inspect after major rainfall events and at least monthly.
- Place additional gravel as needed and repair any damaged areas.
- Maintain any roadside drainage controls.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

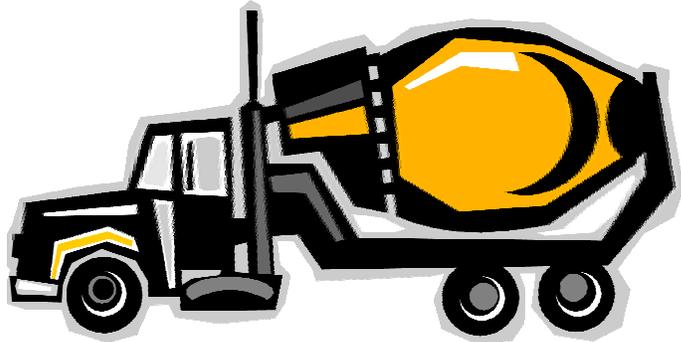
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

**APPLICATIONS:**

This technique is applicable to all types of sites.

**INSTALLATION/APPLICATION CRITERIA:**

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

**LIMITATIONS:**

- Off-site washout of concrete wastes may not always be possible.

**MAINTENANCE:**

- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.



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**TARGETED POLLUTANTS**

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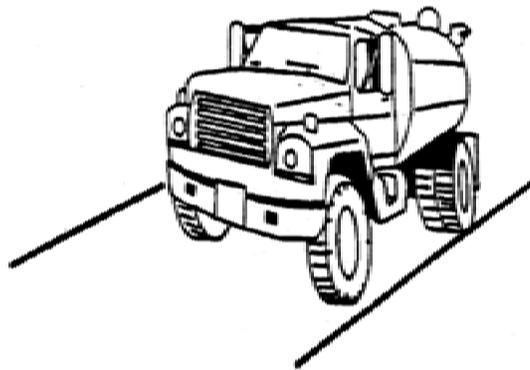
**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

## **SOP-STREETS/STORM DRAIN – Concrete Work**

1. Preparation:
  - a. Store dry and wet materials under cover, away from drainage areas
  - b. Remove any damaged concrete that may need to be replaced.
  - c. Prepare and compact sub-base.
  - d. Set forms and place any reinforcing steel that may be required.
  - e. Determine how much new concrete will be needed.
  - f. Locate or construct approved concrete washout facility.
  - g. Protect downstream gutter drains (concrete cutting and grinding).
  
2. Process:
  - a. Avoid mixing excess amounts of fresh concrete on-site.
  - b. Moisten sub base just prior to placing new concrete. This helps keep the soil from wicking moisture out of the concrete into the ground.
  - c. Place new concrete in forms.
  - d. Consolidate new concrete
  - e. Screed off surface
  - f. Let concrete obtain its initial set
  - g. Apply appropriate surface finish
  - h. Remove forms when concrete will not slump
  - i. Barricade and or block off fresh concrete until cure.
  
3. Clean-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 and cutting activities is swept up and removed from the site.



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

**DESCRIPTION:**

Dust control BMPs reduce surface activities and air movement that causes dust to be generated from disturbed soil surfaces. Construction sites can generate large areas of soil disturbance and open space for wind to pick up dust particles. Airborne particles pose a dual threat to the environment and human health. First, dust can be carried offsite, thereby increasing soil loss from the construction area and increasing the likelihood of sedimentation and water pollution. Second, blowing dust particles can contribute to respiratory health problems and create an inhospitable working environment.

**APPLICATIONS:**

Dust control measures are applicable to any construction site where there is the potential for air and water pollution from dust traveling across the landscape or through the air. Dust control measures are especially important in arid or semiarid regions, where soil can become extremely dry and vulnerable to transport by high winds. Implement dust control measures on all construction sites where there will be major soil disturbances or heavy equipment construction activity such as clearing, excavation, demolition, or excessive vehicle traffic. Earthmoving activities are the major source of dust from construction sites, but traffic and general disturbances can also be major contributors. The dust control measures that are implemented at a site will depend on the topography and land cover of the site and its soil characteristics and expected rainfall.

**SITING AND DESIGN CONSIDERATIONS:**

When designing a dust control plan for a site, the amount of soil exposed will dictate the quantity of dust generation and transport. Therefore, construction sequencing and disturbing only small areas at a time can greatly reduce problematic dust from a site. If land must be disturbed, consider using temporary stabilization measures before disturbance. A number of methods can be used to control dust from a site; not all will be applicable to a site. The owner, operator, and contractors responsible for dust control at a site will have to determine which practices accommodate their needs according to specific site and weather conditions. The following is a brief list of some control measures and design criteria.



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

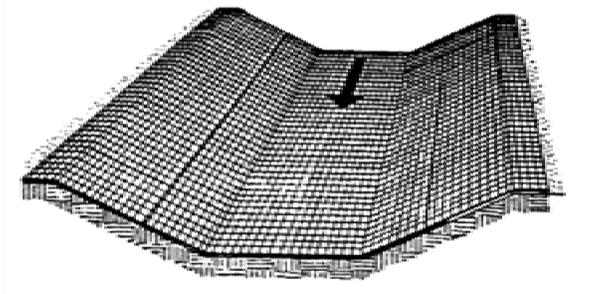
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

### **BMP: Dust Controls - Continued**

- *Sprinkling/Irrigation.* Sprinkling the ground surface with water until it is moist is an effective dust control method for haul roads and other traffic routes (Smolen et al., 1988). This practice can be applied to almost any site.
- *Vegetative Cover.* In areas not expected to handle vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetative cover provides coverage to surface soils and slows wind velocity at the ground surface, thus reducing the potential for dust to become airborne.
- *Mulch.* Mulching can be a quick and effective means of dust control for a recently disturbed area (Smolen et al., 1988).
- *Wind Breaks.* Wind breaks are barriers (either natural or constructed) that reduce wind velocity through a site and, therefore, reduce the possibility of suspended particles. Wind breaks can be trees or shrubs left in place during site clearing or constructed barriers such as a wind fence, snow fence, tarp curtain, hay bale, crate wall, or sediment wall (USEPA, 1992).
- *Tillage.* Deep tillage in large open areas brings soil clods to the surface where they rest on top of dust, preventing it from becoming airborne.
- *Stone.* Stone can be an effective dust deterrent for construction roads and entrances or as a mulch in areas where vegetation cannot be established.
- *Spray-on Chemical Soil Treatments (palliatives).* Examples of chemical adhesives include anionic asphalt emulsion, latex emulsion, resin-water emulsions, and calcium chloride. Chemical palliatives should be used only on mineral soils. When considering chemical application to suppress dust, determine whether the chemical is biodegradable or water-soluble and what effect its application could have on the surrounding environment, including waterbodies and wildlife.



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
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**DESCRIPTION:**

Erosion control blankets are used in place of mulch on areas of high velocity runoff and/or steep grade, to aid in controlling erosion on critical areas by protecting young vegetation.

**APPLICATIONS:**

- Where vegetation is likely to grow too slowly to provide adequate cover.
- In areas subject to high winds where mulch would not be effective.

**INSTALLATION/APPLICATION CRITERIA:**

- Install erosion control blankets parallel to the direction of the slope.
- In ditches, apply in direction of the flow.
- Place erosion control blankets loosely on soil - do not stretch.
- Ends of blankets should be buried no less than six inches deep.
- Staple the edges of the blanket at least every three feet.

**LIMITATIONS:**

- Not recommended in areas which are still under construction.

**MAINTENANCE:**

- Check for erosion and undermining periodically, particularly after rainstorms.
- Repair dislocations or failures immediately.
- If washouts occur, reinstall after repairing slope damage.
- Monitor until permanently stabilized.



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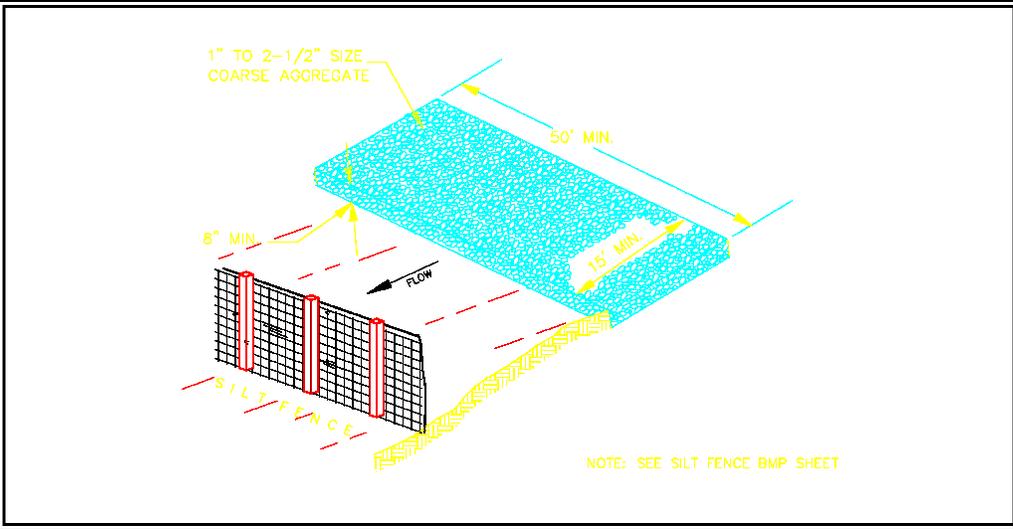
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- Oil & Grease
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- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High     Medium     Low



**DESCRIPTION:**

A stabilized pad of crushed stone for general washing of equipment and construction vehicles.

**APPLICATION:**

- At any site where regular washing of vehicles and equipment will occur.
- May also be used as a filling point for water trucks limiting erosion caused by overflow or spillage of water.

**INSTALLATION/APPLICATION CRITERIA:**

- Clear and grub area and grade to provide maximum slope of 1%
- Compact subgrade and place filter fabric if desired (recommended for wash areas to remain in use for more than 3 months).
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8-inches.
- Install silt fence downgradient (see silt fence BMP information sheet).

**LIMITATIONS:**

- Cannot be utilized for washing equipment or vehicles that may cause contamination of runoff such as fertilizer equipment or concrete equipment.
- Solely used to control sediment in wash water.

**MAINTENANCE:**

- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent area for sediment deposit and install additional controls as necessary.
- Repair area and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate activities.
- Maintain silt fence as outlined in specific silt fence BMP information sheet.

**OBJECTIVES**

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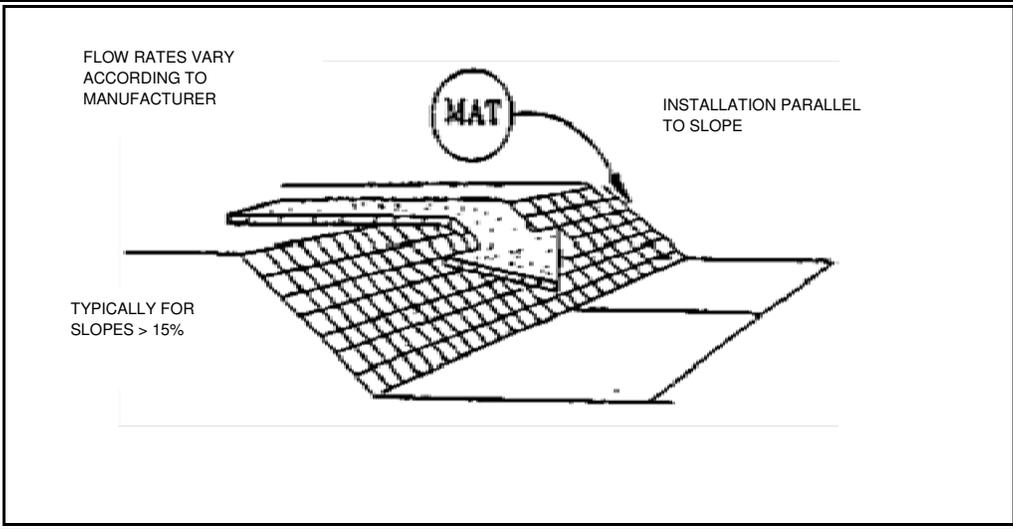
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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
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**OBJECTIVES**

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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High     Medium     Low

**DESCRIPTION:**

Mattings made of natural or synthetic material which are used to temporarily or permanently stabilize soil.

**APPLICATION:**

- Typically suited for post-construction site stabilization, but may be used for temporary stabilization of highly erosive soils.
- Channels and streams.
- Steep slopes.

**INSTALLATION/APPLICATION CRITERIA:**

- Mattings may be applied to disturbed soils and where existing vegetation has been removed.
- The following organic matting materials provide temporary protection until permanent vegetation is established, or when seasonal circumstances dictate the need for temporary stabilization until weather or construction delays are resolved: Jute mattings and straw mattings.
- The following synthetic mattings may be used for either temporary or post-construction stabilization, both with and without vegetation: excelsior matting, glass fiber matting, mulch matting.
- Staples are needed to anchor the matting.

**LIMITATIONS:**

- Mattings are more costly than other BMP practices, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- May delay seed germination, due to reduction in soil temperature.
- Installation requires experienced contractor to ensure soil stabilization and erosion protection.

**MAINTENANCE:**

- Inspect monthly and after significant rainfall.
- Re-anchor loosened matting and replace missing matting and staples as required.



**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

**APPLICATION:**

Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and Solvents; petroleum products such as oils, fuels, and grease; herbicides and pesticides; acids for cleaning masonry; and concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with Federal, State, and local regulations, including:

- Sandblasting grit mixed with lead, cadmium, or chromium-based paints; asbestos; and PCB's.

**INSTALLATION/APPLICATION CRITERIA:**

The following steps will help reduce storm water pollution from hazardous wastes:

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.

**LIMITATIONS:**

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

**MAINTENANCE:**

- Inspect hazardous waste receptacles and area regularly.
- Arrange for regular hazardous waste collection.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
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**TARGETED POLLUTANTS**

- Sediment
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- Toxic Materials
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- Floatable Materials
- Other Waste

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High Impact
- Medium Impact
- Low or Unknown Impact

**DESCRIPTION:**

Storm drain inlet protection measures prevent soil and debris from entering storm drain drop inlets. These measures are usually temporary and are implemented before a site is disturbed.

There are several types of inlet protection:

*Excavation around the perimeter of the drop inlet:* Excavating a small area around an inlet creates a settling pool that removes sediments as water is released slowly into the inlet through small holes protected by gravel and filter fabric.

*Fabric barriers around inlet entrances:* Erecting a barrier made of porous fabric around an inlet creates a shield against sediment while allowing water to flow into the drain. This barrier slows runoff while catching soil and other debris at the drain inlet.

*Block and gravel protection:* Standard concrete blocks and gravel can be used to form a barrier to sediments that permits water runoff to flow through select blocks laid sideways.

Sandbags can also be used to create temporary sediment barriers at inlets. For permanent inlet protection after the surrounding area has been stabilized, sod can be installed. This permanent measure is an aesthetically pleasing way to slow storm water near drop inlet entrances and to remove sediments and other pollutants from runoff.

**APPLICABILITY:**

- All temporary inlet protection should have a drainage area no greater than 1 acre per inlet.
- Temporary controls should be constructed before the surrounding landscape is disturbed.
- Excavated drop inlet protection and block and gravel inlet protection are applicable to areas of high flow, where drain overflow is expected.
- Fabric barriers are recommended for smaller, flatter drainage areas (slopes less than 5 percent leading to the drain).
- Temporary drop inlet control measures are often used in sequence or with other erosion control techniques.



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## **BMP: Inlet Protection - continued**

### **SITING AND DESIGN CONSIDERATIONS:**

- With the exception of sod drop inlet protection, install these controls before any soil disturbance in the drainage area. Excavate around drop inlets at least 1 foot deep (2 feet maximum), excavating a volume of at least 35 yd<sup>3</sup> per acre disturbed. Side slopes leading to the inlet should be no steeper than 2:1. Design the shape of the excavated area such that the dimensions fit the area from which stormwater is expected to drain. For example, the longest side of an excavated area should be along the side of the inlet expected to drain the largest area.
- Stake fabric inlet protection close to the inlet to prevent overflow onto unprotected soils. Stakes should be at least 3 feet long and spaced no more than 3 feet apart. Construct a frame for fabric support during overflow periods, and bury it at least 1 foot below the soil surface. It should rise to a height no greater than 1.5 feet above the ground. The top of the frame and fabric should be below the downslope ground elevation to keep runoff from bypassing the inlet.
- Block and gravel inlet barriers should be at least 1 foot high (2 feet maximum). Do not use mortar. Lay the bottom row of blocks at least 2 inches below the soil surface, flush against the drain for stability. Place one block in the bottom row on each side of the inlet on its side to allow drainage. Place 1/2-inch wire mesh over all block openings to prevent gravel from entering the inlet. Place gravel (3/4 to 1/2 inch in diameter) outside the block structure at a slope no greater than 2:1.
- Do not consider sod inlet protection until the entire surrounding drainage area is stabilized. Lay the sod so that it extends at least 4 feet from the inlet in each direction to form a continuous mat around the inlet. Lay the sod strips perpendicular to the direction of flows. Stagger them so that the strip ends are not aligned. The slope of the sodded area should not be steeper than 4:1 approaching the drop inlet.

### **LIMITATIONS:**

- To increase the effectiveness of these practices, use them with other measures, such as small impoundments or sediment traps (USEPA, 1992). In general, storm water inlet protection measures are practical for areas receiving relatively clean runoff that is not heavily laden with sediment. They are designed to handle drainage from areas less than 1 acre (CASQA, 2003).
- To prevent clogging, storm drain control structures must be maintained frequently. If sediment and other debris clog the water intake, drop inlet control measures can actually cause erosion in unprotected areas.

### **MAINTENANCE CONSIDERATIONS:**

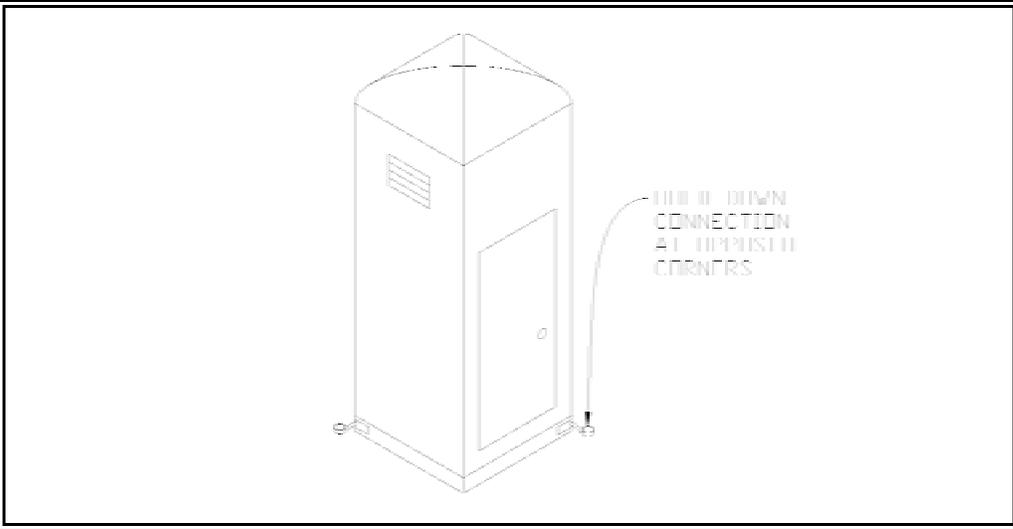
- Check all temporary control measures after each storm event.
- To maintain the capacity of the settling pools, remove accumulated sediment from the area around the drop inlet (excavated area, area around fabric barrier or block structure) when the capacity is reduced by half. Remove additional debris from the shallow pools periodically.
- The weep holes in excavated areas around inlets can become clogged, preventing water from draining out of the pools. If that happens, it might be difficult and costly to unclog the intake.

### **EFFECTIVENESS:**

- Excavated drop inlet protection can be used to improve the effectiveness and reliability of other sediment traps and barriers, such as fabric or block and gravel inlet protection. The effectiveness of inlet protection alone is low for erosion and sediment control, long-term pollutant removal, and habitat and stream protection.

### **COST CONSIDERATIONS:**

- The cost of implementing storm drain inlet protection measures varies depending on the control measure used. Initial installation costs range from \$50 to \$150 per inlet depending on the materials used, with an average cost of \$100 (USEPA, 1993).
- Maintenance costs can be high (up to 100 percent of the initial construction cost annually) because of the frequent inspection and repair needs. The Southeastern Wisconsin Regional Planning Commission has estimated the cost of installing inlet protection devices at \$106 to \$154 per inlet (SEWRPC, 1991).



**DESCRIPTION:**

Temporary on-site sanitary facilities for construction personnel.

**APPLICATION:**

- All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

**INSTALLATION/APPLICATION CRITERIA:**

- Locate portable toilets in convenient locations throughout the site.
- Secure portable toilet to the ground with rebar at opposite corners.

**LIMITATIONS:**

- No limitations.

**MAINTENANCE:**

- Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- Regular waste collection should be arranged with licensed service.
- All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
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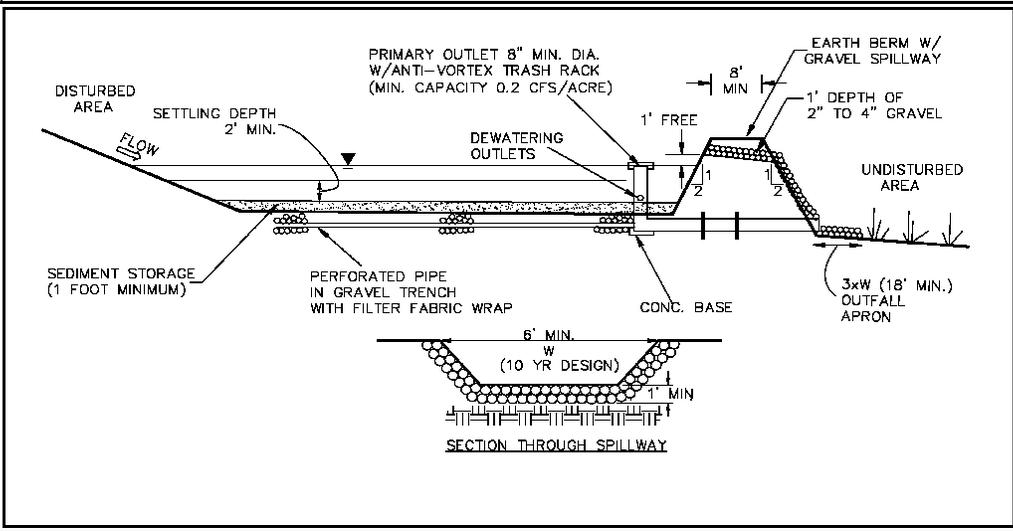
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**OBJECTIVES**

- Housekeeping Practices
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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**DESCRIPTION:**

A pond created by excavation or construction of an embankment, and designed to retain or detain runoff sufficiently to allow excessive sediment to settle.

**APPLICATION:**

- At the outlet of all disturbed watersheds 10 acres or larger.
- At the outlet of smaller disturbed watersheds, as necessary.
- Where post construction detention basins will be located.

**INSTALLATION/APPLICATION CRITERIA:**

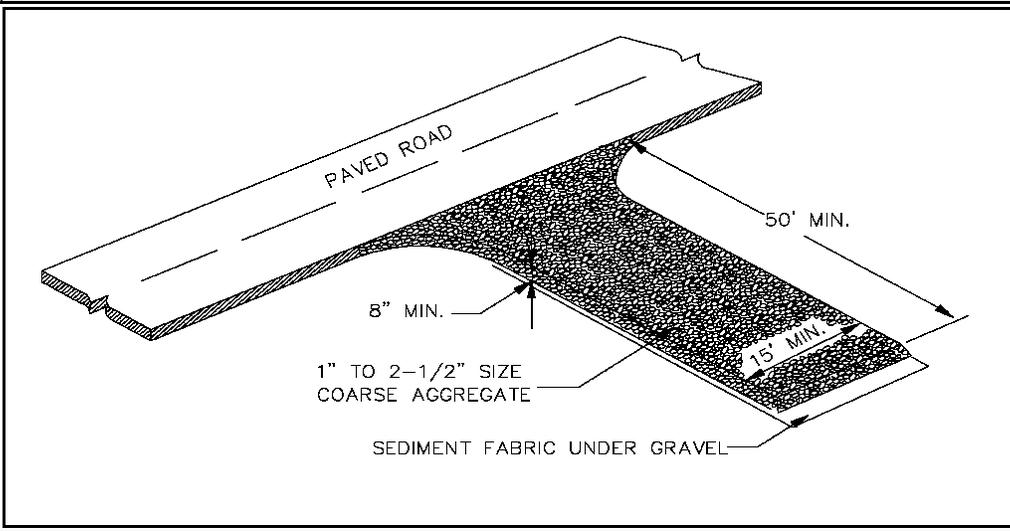
- Design basin for site specific location, maintain effective flow length 2 times width.
- Excavate basin or construct compacted berm containment, ensure no downgradient hazard if failure should occur. (Provide minimum of 67 cy. per acre of drainage area).
- Construct dewatering and outfall structure and emergency spillway with apron.

**LIMITATIONS:**

- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.
- May require safety fencing to prevent public access.
- Height restrictions for embankment regulated by Utah Division of Dam Safety.

**MAINTENANCE:**

- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



**DESCRIPTION:**

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface.

**APPLICATIONS:**

- At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

**INSTALLATION/APPLICATION CRITERIA:**

- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months).
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.

**LIMITATIONS:**

- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.

**MAINTENANCE:**

- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
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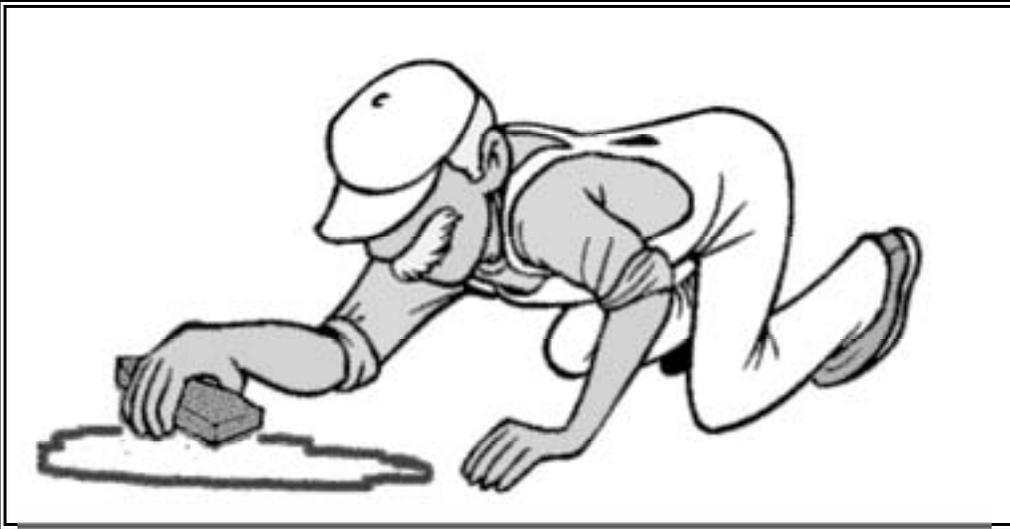
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- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**DESCRIPTION:**

Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

**APPLICATION:**

- All sites

**GENERAL:**

- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

**METHODS:**

- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact local Fire Department and State Division of Environmental Response and Remediation (Phone #536-4100) for any spill of reportable quantity.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

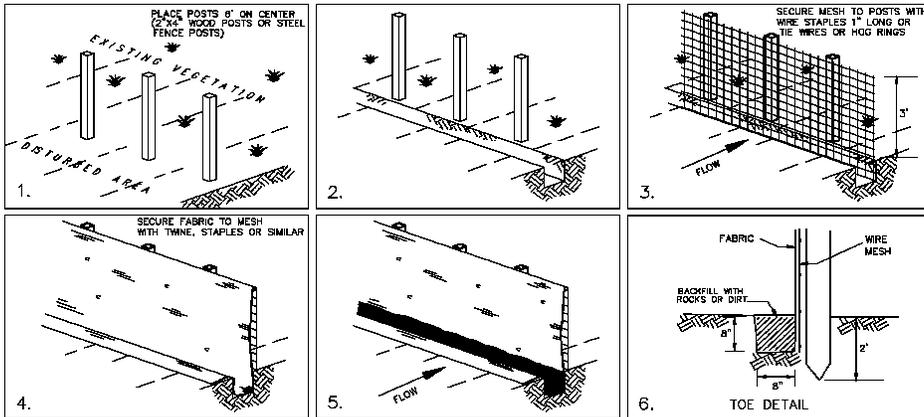
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**DESCRIPTION:**

A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.

**APPLICATION:**

- Perimeter control: place barrier at downgradient limits of disturbance
- Sediment barrier: place barrier at toe of slope or soil stockpile
- Protection of existing waterways: place barrier at top of stream bank
- Inlet protection: place fence surrounding catchbasins

**INSTALLATION/APPLICATION CRITERIA:**

- Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately upgradient of posts.
- Secure wire mesh (14 gage min. With 6 inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- Backfill trench over filter fabric to anchor.

**LIMITATIONS:**

- Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- Recommended maximum upgradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)
- Recommended maximum flow rate of 0.5 cfs
- Ponding should not be allowed behind fence

**MAINTENANCE:**

- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Reanchor fence as necessary to prevent shortcutting.
- Remove accumulated sediment when it reaches 1/2 the height of the fence.

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

<ul style="list-style-type: none"> <li>■ High Impact</li> <li><input checked="" type="checkbox"/> Medium Impact</li> <li><input type="checkbox"/> Low or Unknown Impact</li> </ul>
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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

<ul style="list-style-type: none"> <li>■ High</li> <li><input checked="" type="checkbox"/> Medium</li> <li><input type="checkbox"/> Low</li> </ul>
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**DESCRIPTION:**

Fiber rolls (also called fiber logs or straw wattles) are tube-shaped erosion-control devices filled with straw, flax, rice, coconut fiber material, or composted material. Each roll is wrapped with UV-degradable polypropylene netting for longevity or with 100 percent biodegradable materials like burlap, jute, or coir. Fiber rolls complement permanent best management practices used for source control and revegetation. When installed in combination with straw mulch, erosion control blankets, hydraulic mulches, or bounded fiber matrices for slope stabilization, these devices reduce the effects of long or steep slopes (Earth Saver Erosion Control Products, 2005). Fiber rolls also help to slow, filter, and spread overland flows. This helps to prevent erosion and minimizes rill and gully development. Fiber rolls also help reduce sediment loads to receiving waters by filtering runoff and capturing sediments.

**APPLICABILITY:**

Fiber rolls can be used in areas of low shear stress. Avoid using them in channels that are actively incising or in reaches with large debris loads or potential for significant ice buildup (Maryland Department of the Environment, 2000). Fiber rolls have been used to control erosion in a variety of areas--along highways and at construction sites, golf courses, ski areas, vineyards, and reclaimed mines. According to the California Stormwater Quality Association (CASQA, 2003), fiber rolls can be suitable in the following settings:

- Along the toe, top, face, and at-grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow
- At the end of a downward slope where it transitions to a steeper slope
- Along the perimeter of a project
- As check dams in unlined ditches
- Downslope of exposed soil areas
- Around temporary stockpiles



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## BMP: Fiber Rolls - continued

### **SITING AND DESIGN CONSIDERATIONS:**

Fiber rolls should be prefabricated rolls or rolled tubes of [geotextiles](#) fabric. When rolling the tubes, make sure each tube is at least 8 inches in diameter. Bind the rolls at each end and every 4 feet along the length of the roll with jute-type twine (California Stormwater Quality Association, 2003).

#### *Slope ground projects*

- On slopes, install fiber rolls along the contour with a slight downward angle at the end of each row to prevent ponding at the midsection (California Straw Works, 2005). Turn the ends of each fiber roll upslope to prevent runoff from flowing around the roll. Install fiber rolls in shallow trenches dug 3 to 5 inches deep for soft, loamy soils and 2 to 3 inches deep for hard, rocky soils. Determine the vertical spacing for slope installations on the basis of the slope gradient and soil type. According to California Straw Works (2005), a good rule of thumb is:
  - 1:1 slopes = 10 feet apart
  - 2:1 slopes = 20 feet apart
  - 3:1 slopes = 30 feet apart
  - 4:1 slopes = 40 feet apart
- For soft, loamy soils, place the rows closer together. For hard, rocky soils, place the rows farther apart. Stake fiber rolls securely into the ground and orient them perpendicular to the slope. Biodegradable wood stakes or willow cuttings are recommended. Drive the stakes through the middle of the fiber roll and deep enough into the ground to anchor the roll in place. About 3 to 5 inches of the stake should stick out above the roll, and the stakes should be spaced 3 to 4 feet apart. A 24-inch stake is recommended for use on soft, loamy soils. An 18-inch stake is recommended for use on hard, rocky soils.

#### *Projects without slopes*

- Fiber rolls can also be used at projects with minimal slopes. Typically, the rolls are installed along sidewalks, on the bare lot side, to keep sediment from washing onto sidewalks and streets and into gutters and storm drains. For installations along sidewalks and behind street curbs, it might not be necessary to stake the fiber rolls, but trenches must still be dug. Fiber rolls placed around storm drains and inlets must be staked into the ground. These rolls should direct the flow of runoff toward a designated drainage area. Place them 1 to 1½ feet back from the storm drain or inlet.

### **Limitations**

- The installation and overall performance of fiber rolls have several limitations, including the following:
- Fiber rolls are not effective unless trenched.
- Fiber rolls can be difficult to move once saturated.
- To be effective, fiber rolls at the toe of slopes greater than 5:1 must be at least 20 inches in diameter. An equivalent installation, such as stacked smaller-diameter fiber rolls, can be used to achieve a similar level of protection.
- If not properly staked and entrenched, fiber rolls can be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.

### **Maintenance Considerations**

- The maintenance requirements of fiber rolls are minimal, but short-term inspection is recommended to ensure that the rolls remain firmly anchored in place and are not crushed or damaged by equipment traffic (Murphy and Dreher, 1996). Monitor fiber rolls daily during prolonged rain events. Repair or replace split, torn, unraveled, or slumping fiber rolls. Fiber rolls are typically left in place on slopes. If they are removed, collect and dispose of the accumulated sediment. Fill and compact holes, trenches, depressions, or any other ground disturbance to blend with the surrounding landscape.

### **Effectiveness**

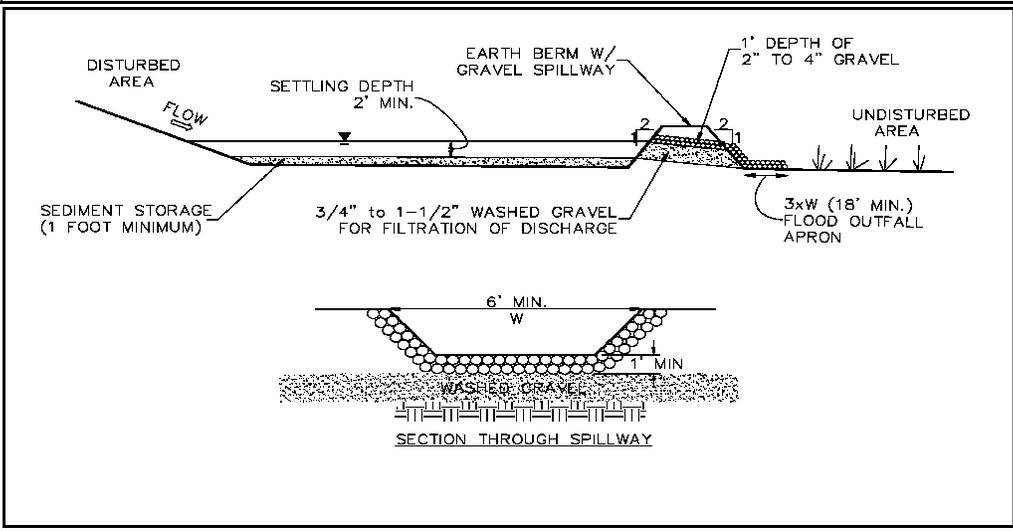
- Unlike other BMPs that could cause water to back up and flow around the edges, fiber rolls allow water to flow through while capturing runoff sediments. Fiber rolls placed along the shorelines of lakes and ponds provide immediate protection by dissipating the erosive force of small waves. As an alternative to silt fences, fiber rolls have some distinct advantages, including the following (Earth Saver, 2005):
- They install more easily, particularly in shallow soils and rocky material.
- They are more adaptable to slope applications and contour installations than other erosion and sediment control practices.
- They are readily molded to fit the bank line.

## **BMP: Fiber Rolls - continued**

- They blend in with the landscape and are less obtrusive than other erosion and sediment controls such as silt fence.
- They do not obstruct hydraulic mulch and seed applications.
- They can be removed or left in place after vegetation is established.
- Fiber rolls can provide slope protection for 3 to 5 years (California Straw Works, 2005). They slowly decompose into mulch, and the netting breaks down into small pieces. The San Diego State University Soil Erosion Research Laboratory reported that the use of fiber roll products reduced offsite sediment delivery by 58 percent (International Erosion Control Association, 2005).
- The Flint Creek watershed, which covers approximately 28 square miles of Lake and Cook counties in northeastern Illinois, was listed in the Illinois Water Quality Report (1994-1995) as being impaired due to nonpoint source pollution from land development, channelization, and urban runoff. Along with other bioengineering techniques, fiber rolls were installed along the shorelines of the creek to reduce the effects of wave action. Native plants were installed in the fiber rolls. As a result, the growth of vegetative cover increased and helped to stabilize the slopes along the banks of the creek. Ultimately, the water quality of Flint Creek was improved (USEPA, 2002).

### **Cost Considerations**

- Material costs for fiber rolls range from \$20 to \$30 per 25-foot roll (CASQA, 2003). Labor hours should also be allocated for installation, monitoring, and maintenance. Because fiber rolls are usually left along slopes and are biodegradable, labor costs for removing them are avoided. However, sediment removal and disposal are still necessary in areas where sediment accumulates to at least one-half the distance between the top of the fiber roll and the ground surface.



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**DESCRIPTION:**

A sediment trap is a small excavated or bermed area where runoff from small drainage areas is detained and sediment can settle.

**APPLICATION:**

- Temporary control for runoff from disturbed areas of less than 3 acres.
- Temporary control for discharge from diversion dike, surface benching, or other temporary drainage measures.

**INSTALLATION/APPLICATION CRITERIA:**

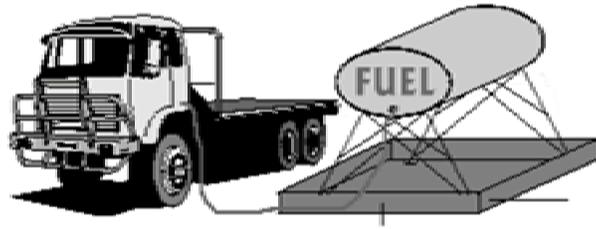
- Design basin for site specific location.
- Excavate basin or construct compacted berm containment.
- Construct outfall spillway with apron.
- Provide downstream silt fence if necessary.

**LIMITATIONS:**

- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.

**MAINTENANCE:**

- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

**DESCRIPTION:**

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

**INSTALLATION/APPLICATION:**

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills. Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks. (40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

**LIMITATIONS:**

- Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

**MAINTENANCE:**

- Keep ample supplies of spill cleanup materials on-site.
- Inspect fueling areas and storage tanks on a regular schedule.



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**TARGETED POLLUTANTS**

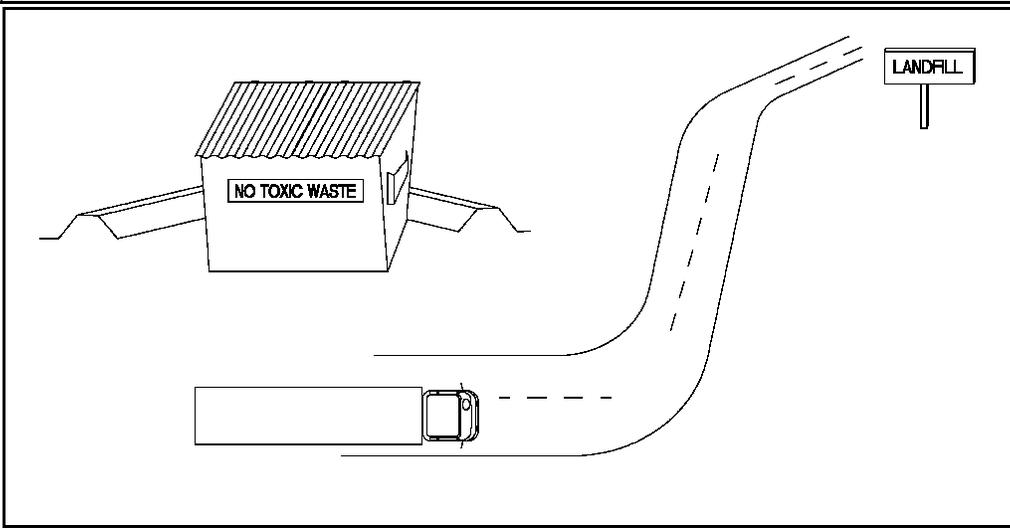
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**DESCRIPTION:**

Controlled storage and disposal of solid waste generated by construction activities.

**APPLICATION:**

- All construction sites.

**INSTALLATION:**

- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

**LIMITATIONS:**

- On-site personnel are responsible for correct disposal of waste.

**MAINTENANCE:**

- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> High Impact</li> <li><input checked="" type="checkbox"/> Medium Impact</li> <li><input type="checkbox"/> Low or Unknown Impact</li> </ul>
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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> High</li> <li><input checked="" type="checkbox"/> Medium</li> <li><input type="checkbox"/> Low</li> </ul>
--



**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices

**DESCRIPTION:**

One of the most important factors determining whether or not erosion and sediment controls will be properly installed and maintained on a construction site is the knowledge and experience of the contractor. Many communities require certification for key on-site employees who are responsible for implementing the ESC plan. Several states have contractor certification programs. The State of Delaware requires that at least one person on any construction project be formally certified. The Delaware program requires certification for any foreman or superintendent who is in charge of onsite clearing and land-disturbing activities for sediment and runoff control associated with a construction project.



**APPROACH:**

- Training and certification will help to ensure that the plans are properly implemented and that best management practices are properly installed and maintained.
- Inspector training programs are appropriate for municipalities with limited funding and resources for ESC program implementation.
- Contractor certification can be accomplished through municipally sponsored training courses, or more informally, municipalities can hold mandatory pre-construction or pre-wintering meetings and conduct regular and final inspection visits to transfer information to contractors (Brown and Caraco, 1997).
- To implement an inspector training program, the governing agency would need to establish a certification course with periodic recertification, review reports submitted by private inspectors, conduct spot checks for accuracy, and institute fines or other penalties for noncompliance.
- Curb systems should be maintained through curb repair (patching and replacement).
- To minimize the amount of spilled material tracked outside of the area by personnel, grade within the curbing to direct the spilled materials to a down-slope side of the curbing, thus keeping the spilled materials away from personnel and equipment. Grading will also facilitate clean-up.

**LIMITATIONS:**

- Contractor certification and inspector training programs require a substantial amount of effort on the part of the municipality or regulatory agency.
- They need to develop curricula for training courses, dedicate staff to teach courses, and maintain a report review and site inspection staff to ensure that both contractors and inspectors are fulfilling their obligations and complying with the ESC program.

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

<ul style="list-style-type: none"> <li>■ High Impact</li> <li><input checked="" type="checkbox"/> Medium Impact</li> <li><input type="checkbox"/> Low or Unknown Impact</li> </ul>
--

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High     Medium     Low



**Diversion dikes can be used to contain storm water onsite**

**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> High Impact</li> <li><input checked="" type="checkbox"/> Medium Impact</li> <li><input type="checkbox"/> Low or Unknown Impact</li> </ul>
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**DESCRIPTION:**

Erosion and sediment control are generally two of the biggest problems on construction sites. Erosion control measures must be taken during a construction project. An Erosion Control Plan will be submitted and approved before work can begin on the project. An Erosion Control Plan describes what erosion control BMPs will be implemented, when and where, during the project. Erosion and sediment control measures should be installed before other construction activities begin.

**APPROACH:**

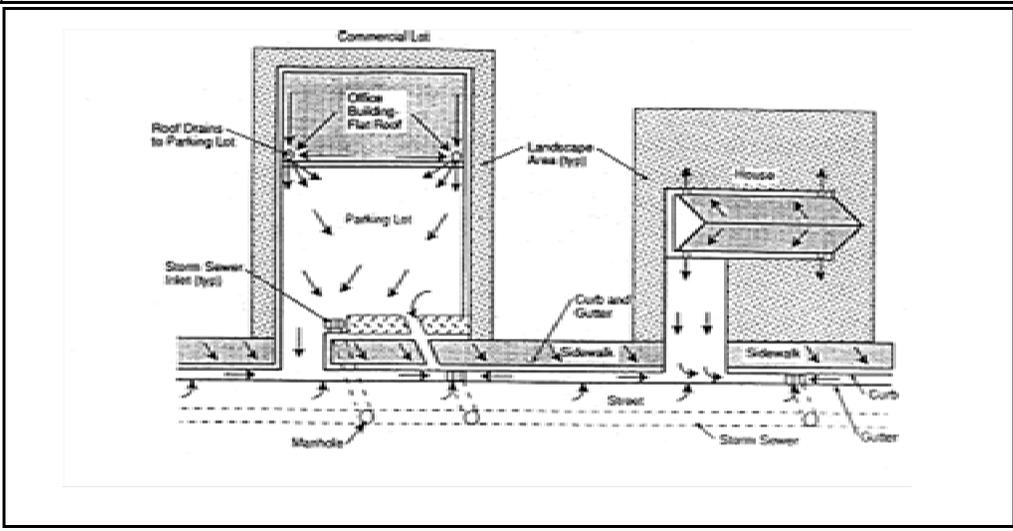
- Create a list of possible erosion control BMPs that could be implemented in any given project.
- Require submittal of erosion & sediment control plans for projects that are on 1 acre and larger sites.
- Develop a review checklist for plan review personnel.
- Provide the review checklist to contractors/developers so they know what is expected.
- Provide inspectors with a copy of the approved plans.
- Check to make sure erosion control measures are properly installed before beginning other construction activities.

**LIMITATIONS:**

- Must be enforced to be effective.
- Sometimes site conditions are different than planned on and the plans have to be modified.
- The erosion control measures have to be maintained.
- The BMPs have to be installed early on in the project.
- The BMPs have to be removed after the threat of erosion is no longer present.

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training



**OBJECTIVES**

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects



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**TARGETED POLLUTANTS**

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- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High     Medium     Low

**DESCRIPTION:**

Site plan review will be conducted of all commercial sites and subdivisions by the City Engineer and other city staff for consideration of storm water issues.

**APPLICATIONS:**

- All site plans, including those less than 1 acre, will be reviewed. The costs of such reviews will be paid for by the developer through the City.

**INSTALLATION/APPLICATION CRITERIA:**

- Detention basin calculations will be submitted for the 10 year storm with orifice plate size given.
- Storm water calculations will be in accordance with county standards.
- The outlet piping must be shown to an approved discharge location.
- Flood zone issues must be addressed.
- Overflow locations must be addressed.
- All site plans and subdivisions greater than 1 acre must have an Erosion Control Plan.
- The spillway location and elevation must be shown.
- The detention basin volume must be indicated on the plan.
- Efforts must be made to minimize directly connected impervious areas

**LIMITATIONS:**

- The downstream receiving pipe or ditch must be capable of the design flows, otherwise percolation rates must be considered.
- Consideration for oil separation must be given.
- Infiltration of water near building foundations and parking lots is a concern.
- Will likely result in increased maintenance for private detention basins.

**MAINTENANCE:**

- Inspections will be required during construction.
- After construction is complete, the improvements, including the orifice plate must be inspected.
- Periodic inspections are required in insure proper maintenance.
- Remove sediment buildup and replace damaged grass cover.

# BMP: Post Construction Site Plan Review

PCSPR



### APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices

### DESCRIPTION:

Establishment and implementation of a schedule for long term operation and maintenance procedures for the existing storm drain system. The primary focus of this BMP is on structural BMPs installed by contractors, and developments that are left to be maintained by the MS4 or by residents and businesses.

### APPROACH:

- Review existing policy on who is responsible to maintain privately installed BMPs.
- Create or modify Development Agreements as necessary.
- Review existing maintenance schedule and/or efforts.
- Review the requirements necessary to maintain the existing storm drain system.
- Conduct periodic inspections of existing facilities. To determine if they are being maintained.
- Create a schedule for long term operation and maintenance of the storm drain system.
- Implement the maintenance schedule.
- Follow up.
- Possibly offer incentives for properly maintained BMPs or charge fees to maintain privately held facilities.

### LIMITATIONS:

- Cost
- Access and ownership issues
- Availability of trained staff
- Difficulties in getting Home Owners Associations to do long term maintenance.



### TARGETED POLLUTANTS

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

### IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Staffing
- Training
- Administrative

- High
- Medium
- Low

## **SOP-CSSWRC – CONSTRUCTION SITE STORM WATER RUN OFF**

Specific processes and sanctions minimize occurrences of and obtain compliance from violators.

1. Inspect site using UPDES Storm Water Inspection Evaluation form.
2. Use ordinance #11.26.040 for escalating enforcement procedures and actions when applicable.

## **SOP-NOTN-NOTICE OF TERMINATION NOTIFICATION**

- Residential/subdivision development
  - Commercial developments
  - Residential lots/building permits
1. All residential and commercial development improvement drawings and site plans will have the NOT description as per the NOI labeled on the SWPP.
  2. All residential and commercial building permittees will be notified on the Construction Site Requirements checklist.

### **NOTICE OF TERMINATION (NOT)**

A completed Notice of Termination (NOT) form is required to terminate your permit at the end of construction. Please complete the NOT form, including the project's assigned permit number, and return it to the Division of Water Quality. If you apply online, you will receive a partially filled out NOT at the time of application on which you will need to fill in the termination date and provide a signature for submission. Please contact the storm water coordinator at (801) 536-4300 for any questions or a copy of the NOT form.

## **SOP-MS4 SWPP INSPECTION AND ENFORCEMENT**

### **Construction Site Inspection and Enforcement of Construction Storm Water Pollution Control Measures**

1. Construction site storm water inspections and enforcement of pollution control measures shall be done by the City Storm Water Inspector as referenced on page one of the General Information section of the SWMP.
2. Penalties from violations resulting in citations and fines shall be enforced by the Police Department/Code Enforcement Officer as referenced on page one of the General Information section of the SWMP.

## Storm Water Pollution Prevention Plan Elements

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

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

Contact Information: \_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Start Date: \_\_\_\_\_ End Date: \_\_\_\_\_

Description	✓	Location in SWPP & Notes
Identify all potential sources of pollution that might affect the Quality of storm water discharges from the site.		
Identify all operators at the site, and the areas over which each Operator has control.		
<b>Project &amp; Activity Description</b>		
Describe the nature/function of the construction project.		
Describe the intended sequences of major construction activities.		
Indicate the total site area (in acres) that is expected to be disturbed (including off-site borrow & fill areas).		
Include a general location map identifying site location and any waters of the U.S. within one mile of the site.		
Indicate the location of any storm water discharges associated with industrial activity other than at the site (e.g. dedicated asphalt or concrete plants).		
<b>Site Map</b>		
Include a legible site map, complete to scale, of the entire site. Indicate the following items on the map:		
Direction of storm water flow/drainage patterns, and approximate slopes after major grading activities;		

Description	✓	Location in SWPP & Notes
Locations of off-site material, waste, borrow or equipment storage areas used solely for the project.		
Locations of major structural and non-structural erosion and sedimentation controls.		
Name and location of all waters of the U.S. including wetlands.		
Locations where storm water discharges to surface water or to a municipal storm sewer system.		
Areas where final stabilization has occurred and no further construction will be done.		
<b>Controls to Reduce Pollutants</b>		
For each major activity identified in the project description, describe all control measures, the timing during the construction when measures will be installed, and the operator responsible for accomplishing the installation.		
Describe all interim and permanent stabilization practices, including installation schedule. Preserve vegetation where possible, and avoid the use of impervious surfaces.		
Maintain a record of the dates when major grading activity occurs, when construction activity has been temporarily or permanently ceased on a portion of the site, and when stabilization measures are initiated.		
Describe any structural practices used to divert flows from exposed soils, retain/detain flows, or otherwise limit runoff/pollutants from exposed areas.		
Describe any post-construction storm water management controls to be installed at the site, and identify any applicable federal/state/local/tribal requirements for design or installation.		
Describe all measures/waste disposal practices to prevent discharge of solid material, including building materials, to waters of the U.S.		
Describe measures to minimize off-site tracking of sediments to paved surfaces and the generation of dust.		
Describe any waste or construction materials to be stored onsite, and list all measure to limit exposure, including storage, spill prevention and response practices.		
Describe controls to minimize pollutants from sources other than construction (e.g. dedicated asphalt or concrete plants).		
<b>Non-Storm Water Discharge Management</b>		
Identify & list pollution prevention measures for any allowable non-storm water discharges.		

Description	✓	Location in SWPP & Notes
<b>Documentation of Permit Eligibility Related to Endangered Species</b>		
Document your project's eligibility for permit coverage with regard to endangered species. Applicants must follow the procedures in Appendix C to assess the potential effects of the project's storm water on endangered species and critical habitat.		
<b>Documentation of Permit Eligibility Related to Total Maximum Daily Loads</b>		
Document your project's eligibility for permit coverage with regard to discharging to water bodies with an approved TMDL. State TMDL information can be found through EPA's website, <a href="http://www.epa.gov/npdes/stormwater/cgp">www.epa.gov/npdes/stormwater/cgp</a> . Also check Part 9 of the permit for any applicable state/tribal requirements.		
<b>Copy of Permit Requirements</b>		
Include a copy of the permit with the SWPP.		
<b>Applicable State, Tribal or Local Programs &amp; Requirements</b>		
Describe your project's compliance with any applicable state, local or tribal requirements for soil and erosion control and storm water management.		
<b>Inspections</b>		
Describe routine inspection schedules and procedures to ensure control measures are operating effectively.		
Indicate if the inspection frequency is to be at least once every seven days, or at least once every 14 days and within 24 hours of the end of a storm event of 0.5 inches or greater.		
Indicate who the qualified personnel will be to perform inspections and describe the person's qualifications.		
Describe the format for the inspection reports documenting each inspection, including documentation of incidents of non-compliance or certifying full compliance, and indicating who will be authorized to sign the report.		
<b>Signature, Plan Review, &amp; Making Plans Available</b>		
Post a sign or other notice near the main entrance of the construction site. The sign must contain a copy of the NOI, name and phone number of contact person for scheduling SWPP viewing time, and the location of the SWPP.		
The operator must sign and certify the SWPP.		

Description	✓	Location in SWPP & Notes
<b>Maintenance of Controls</b>		
Describe all procedures and activities to be used to accomplish the following:		
Maintain all identified controls in effective operating condition.		
Maintain controls as soon as possible if site inspections identify controls are not working effectively.		
If control measures need to be modified, modifications must occur before next storm event whenever practicable.		
Remove sediment from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.		
<b>Inspections</b>		
If the site is eligible for reduced inspection frequency, indicate why it is eligible and the dates of the waiver period.		
Keep a section of the SWPP dedicated to inspection reports.		
Maintain inspection records for at least three years past the date permit coverage expires or is terminated.		
<b>Maintain an Updated Plan</b>		
Establish a protocol for modifying the SWPP whenever there is a change in design, construction, operation, or maintenance at the site, or if during inspections or investigations it is determined that the SWPP is ineffective in minimizing pollutants in the discharges from the site.		
<b>Signature, Plan Review, &amp; Making Plans Available</b>		
Retain the SWPP on site and make it available to EPA, state, tribal or local agency officials approving sediment and erosion plans.		
<b>Management Practices</b>		
Describe the protocol for ensuring that the following permit requirements will be met.		
All controls must be properly selected, installed, and maintained in accordance with the manufacturer specification and good engineering practices.		
Off-site accumulations of sediment must be removed as necessary.		
Litter, debris and chemicals must be prevented from being exposed to storm water.		
Portions of the site must be stabilized within 14 days where construction activity is temporarily or permanently ceased.		
A combination of sediment and erosion control measures must be used to		

<b>Description</b>	✓	<b>Location in SWPP &amp; Notes</b>
achieve maximum pollutant removal. When considering use of sediment basins, document any factors considered when determining whether to use sediment basins as a control measure.		
Velocity dissipation devices must be used at discharge locations and along outfall channels to provide non-erosive flow.		

# **POST CONSTRUCTION STORM WATER MANAGEMENT**

## **Minimum Control Measure 5**

### **5.1 INTRODUCTION**

The objective of this control measure is for the hydrology associated with new development to mirror the pre-development hydrology of the previously undeveloped site or to improve the hydrology of a redeveloped site and reduce the discharge of storm water. Harrisville City, through the Storm Drain Capital Facilities Master Plan, has implemented some of these controls in various areas of the City taking into consideration runoff from future development with several regional detention basins.

Although water quality considerations of this minimum control measure do not replace or substitute for water quantity or flood management requirements implemented locally for new developments, reducing storm water discharges for any purpose should always be considered for the numerous advantages associated with it. The selection of long term BMP's for this section was based upon sound engineering practices and past successful applications, e.g. detention basin sediment filtration.

Harrisville City has committed to Joint Permit with Weber County to meet the requirements of Post Construction Storm Water Management. The City will take the major role for responsibility for this measure as a condition of the joint permit with Weber County

This section is similar to MCM 6 - Pollution Prevention/Good Housekeeping, except that it applies more to redevelopment and long term operation and maintenance. MCM 6 applies more to preventing pollution in areas other than construction.

### **5.2 POLLUTANTS OF CONCERN**

Because of the many different types of residential, commercial and construction activities, there can be a wide variety of pollutants that make it into storm water runoff. Even different facilities of the same industry may need different approaches to reducing pollutant discharges to storm water. Therefore, it is imperative that the owner/operator of each facility understand the potential pollutants and impacts from their individual processes. This chapter will discuss the most typical pollutants found in industrial storm water runoff in which BMP's were selected to address the pollutant removal of concern.

Solids, nutrients, metals, oxygen demanding substances, bacteria and viruses, and oil and grease are the pollutants most frequently associated with storm water runoff. These pollutants are discussed in the following subsection.

#### Solids

Solids (often referred to as total or suspended solids) can cause many receiving water problems. First, it can cause direct toxicity to aquatic organisms, through such mechanisms as fouling of gills, suffocation, etc. Second, high solids concentrations can reduce water clarity. Third, solids act as a vehicle to transport other pollutants. Excessive solids are often the result of poor construction practices at the industrial site.

### Nutrients

Excessive nutrients such as nitrogen and phosphorus in the receiving water can cause problems by stimulating the growth of algae or rooted aquatic plants. Excessive plant growth can cause dissolved oxygen problems, reduce biologic diversity, worsen aesthetics, or impair use for water supply. Some industrial activities typically associated with nutrients include fertilizer/pesticide manufacturing and distribution, waste treatment, and food processing.

### Metals

Metals, especially “heavy” metals can be toxic at very low concentrations. Metals can also bio accumulate in fish and other species and be passed on to higher levels of the food chain, including humans. Certain metals including cadmium, copper, lead, silver, and zinc are the most common metals which contaminate waterways. Industrial activities which commonly deal with metals include mining, electroplating, cement, battery production, and metal recycling.

### Oxygen-Demanding Substances

Oxygen-demanding substances tend to deplete the dissolved oxygen levels in streams and lakes. The depleted oxygen supply can result in loss of aquatic life. Oxygen demanding substances are commonly found in food processing industries and chemical manufacturing plants.

### Bacteria and Viruses

Bacteria and viruses are the most common microorganisms found in surface water runoff. Bacteria and viruses often carry diseases which can be transferred to animal life and to humans. Food processing and medical wastes are often associated with microbiological contamination.

### Oil and grease

Oil and grease contain a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Industrial sources of oil and grease are generally associated with automobile related industries such as: repair shops, body and paint shops, retail distribution, and dismantlers/recyclers.

### Floatables

Trash and litter from industrial sites may contain amounts of pollutants which will effect storm water quality. Floatables in waterways and drainage systems pose both aesthetic and maintenance problems.

### Other Toxic Materials (Priority Pollutants)

Facilities may contribute other toxic materials to storm water in low concentrations. Pesticides, phenols and poly nuclear or polycyclic aromatic hydrocarbons (PAHs) are most frequently found in storm water discharges associated with industrial operations.

## **5.3 MEASURABLE GOALS**

The following table summarizes the BMPs, Measurable Goals, and Implementation Schedule of the City’s for each BMP.

<b>MCM 5 - POST CONSTRUCTION STORM WATER MANAGEMENT</b>			
Fact Sheet	BMP	Measurable Goal	Implementation Schedule
Basin	Detention Basin	Required for all development >1 acre. Refer to Ordinance #386 15.25.050 #2 for sites < 1 acre.	<i>Goal Completed</i>
Study	Storm Drain Study requirements	Require all storm drain studies to conform to Current City Ordinances	<i>Ongoing</i>
CW	Constructed Wetlands	To conform with the Storm Drain Master Plan Update	<i>Goal Completed</i>
EDB	Extended Detention Basins	To conform with the Storm Drain Master Plan Update	<i>Goal Completed</i>
OWS	Oil/Water Separators and Water Quality Inlets	Require in suspected developments such as commercial	<i>Ongoing</i>

<b>MCM 5 - POST CONSTRUCTION STORM WATER MANAGEMENT</b>			
SB	Sediment Basins	To conform with the Storm Drain Master Plan Update	<i>Goal Completed</i>
SPR	Site Plan Review and Inspection	Require erosion control plan for all sites greater than or equal to one acre that are part of a larger common plan of development or sale, or if there is a potential for the discharge of pollutants to the storm drain system regardless of size.	<i>Ongoing</i>
PCSPR	(Post Construction Site Plan Review)	See MCM 4. Include in the construction phase plan review. Sop for Inspection and Enforcement of Post Construction Storm Water Control Measures (IEPCSWCM)	<i>Ongoing</i>
I & M	Inspection & Maintenance	Routine inspection & maintenance. Inspect during and or after storm events or at a minimum once per year. Repair as needed.	<i>Ongoing</i>
S L O M	Overlay Map	Create a Sensitive Lands Overlay Map to protect the integrity of natural resources and sensitive areas.	<i>2011 Sensitive Lands</i>

<b>MCM 5 - POST CONSTRUCTION STORM WATER MANAGEMENT</b>			
ET	Employee Training	Provide adequate training for all staff involved in post-construction storm water management, planning and review, inspections and enforcement.	<i>2010</i>

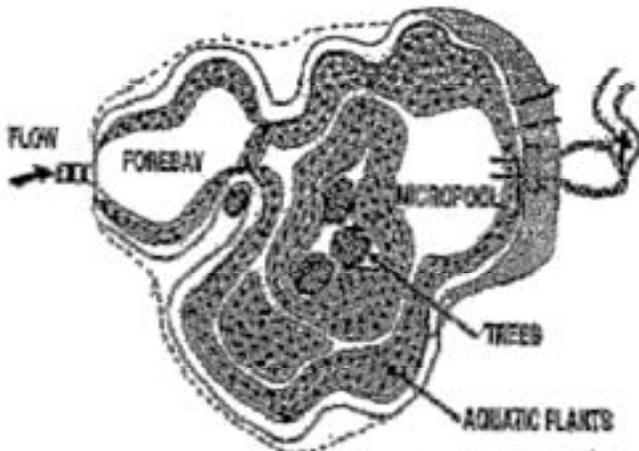
#### **5.4 BEST MANAGEMENT PRACTICES (BMP)**

The following pages consist of the fact sheets for the above mentioned goals and BMP's. Each page represents a separate BMP with details given. The intent of this section is to provide a variety of practices that could be related to Public Education and Outreach. The format is similar to other communities on the Wasatch Front, originally obtained from Salt Lake County's Storm Water Management Plan

#### **5.5 REFERENCES**

Salt Lake County Engineering Division. September 1999. "Guidance Document for Stormwater Management."

State of California. March 1993. "California Storm Water Best Management Practice Handbooks."



**DESCRIPTION:**

Constructed wetlands have a significant percentage of the facility covered by wetland vegetation.

**APPLICATION:**

- Need to achieve high level of particulate and some dissolved contaminant removal.
- Ideal for large, regional tributary areas.
- Multiple benefits of passive recreation and wildlife.

**INSTALLATION/APPLICATION CRITERIA:**

- Suitable soils for wetland vegetation are required.
- Surface area equal to at least 1% and preferably 2% of the tributary watershed.
- Include a forebay for extra storage and to trap incoming sediment.
- Involve qualified wetland ecologist to design and install wetland vegetation.
- Establishing wetland vegetation may be difficult.

**LIMITATIONS:**

- Concern for mosquitoes.
- Cannot be placed on steep unstable slopes.
- Need base flow to maintain water level.
- Not feasible in densely developed areas.
- Nutrient release may occur during winter.
- Overgrowth can lead to reduced hydraulic capacity.
- Regulatory agencies may limit water quality to constructed wetlands.

**MAINTENANCE:**

- Remove foreign debris and sediment build-up.
- Areas of bank erosion should be repaired.
- Remove nuisance species.
- Control mosquitoes.

**OBJECTIVES**

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects



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**TARGETED POLLUTANTS**

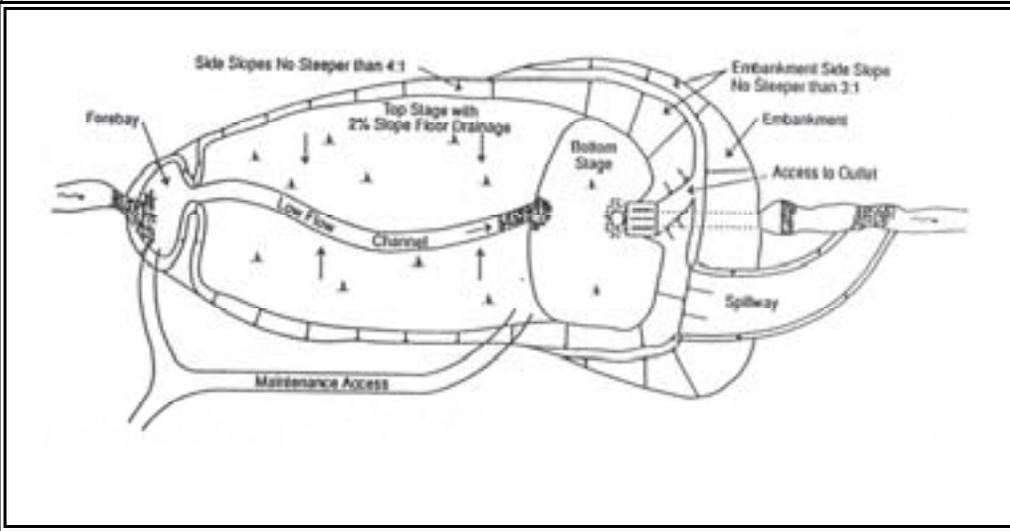
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**OBJECTIVES**

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects

**DESCRIPTIONS:**

Extended detention basins are dry between storms. During a storm the basin fills. A bottom outlet releases the storm water slowly to provide time for sediments to settle.

**APPLICATION:**

- Objective is to remove only particulate pollutants.
- Use where lack of water prevents the use of wet ponds, wetlands or biofilters.
- Use where wet ponds or wetlands would cause unacceptable mosquito conditions.

**INSTALLATION/APPLICATION CRITERIA:**

- Basin volume is sized to capture a particular fraction of the runoff.
- Drawdown time of 24 to 40 hours is required.
- A shallow basin with large surface area performs better than a deep basin with the same volume.
- Place energy dissipators at the entrance to minimize bottom erosion and resuspension.
- Vegetate side slopes and bottom to the maximum extent practical.
- If side erosion is particularly severe, consider paving or soil stabilization.
- If floatables are a problem, protect outlet with a trash rack or other device.
- Provide bypass or pass through capabilities for 100-year storm.

**LIMITATIONS:**

- May be less reliable than other treatment control BMPs. Inability to vegetate banks and bottom may result in erosion and resuspension.
- Limitation of the orifice diameter may preclude use in small watersheds.
- Requires differential elevation between inlet and outlet.

**MAINTENANCE:**

- Check outlet regularly for clogging.
- Check banks and bottom of basin for erosion and correct as necessary.
- Remove sediment when accumulation reaches 6-inches, or if resuspension is observed.



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**TARGETED POLLUTANTS**

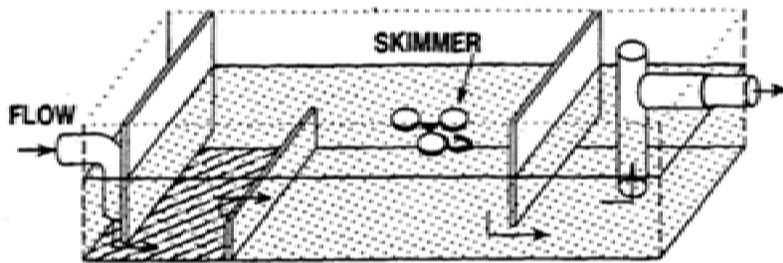
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High    Medium    Low



**DESCRIPTION:**

Oil/Water separators are designed to remove a specific group of contaminants: petroleum compounds and grease. However, separators will also remove floatable debris and settleable solids. Two general types of oil/water separators are used: conventional gravity separator and the coalescing plate interceptor (CPI).

**APPLICATION:**

- Applicable to situations where the concentration of oil and grease related compounds is abnormally high and source control cannot provide effective control. The general types of businesses where this situation is likely are truck, car, and equipment maintenance and washing businesses, as well as businesses that perform maintenance on their own equipment and vehicles.
- Public facilities where separators may be required include marine ports, airfields, fleet vehicle maintenance and washing, facilities, and mass transit park-and-ride lots.
- Conventional separators are capable of removing oil droplets with diameters equal to or greater than 150 microns.
- A CPI separator should be used if smaller droplets must be removed.

**INSTALLATION/APPLICATION CRITERIA:**

- Sizing relates to anticipated influent oil concentration, water temperature and velocity, and the effluent goal.
- To maintain a reasonable separator size, it should be designed to bypass flows in excess of first flush.

**LIMITATIONS:**

- The lack of data on oil characteristics in storm water leads to considerable uncertainty about performance.
- An air quality permit may be required.

**MAINTENANCE:**

Clean frequently of accumulated oil, grease, and floating debris.

**OBJECTIVES**

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects



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**TARGETED POLLUTANTS**

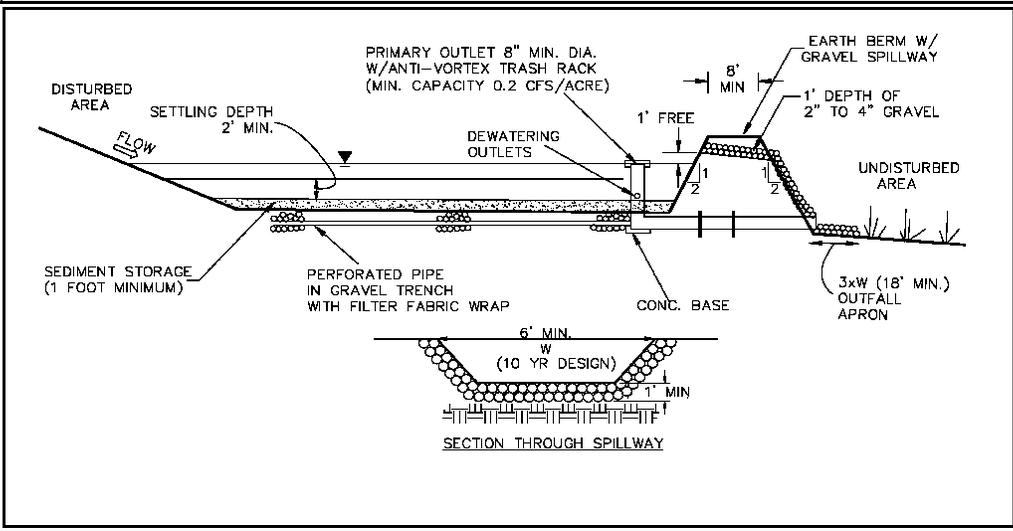
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low



**OBJECTIVES**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**DESCRIPTION:**

A pond created by excavation or construction of an embankment, and designed to retain or detain runoff sufficiently to allow excessive sediment to settle.

**APPLICATION:**

- At the outlet of all disturbed watersheds 10 acres or larger.
- At the outlet of smaller disturbed watersheds, as necessary.
- Where post construction detention basins will be located.

**INSTALLATION/APPLICATION CRITERIA:**

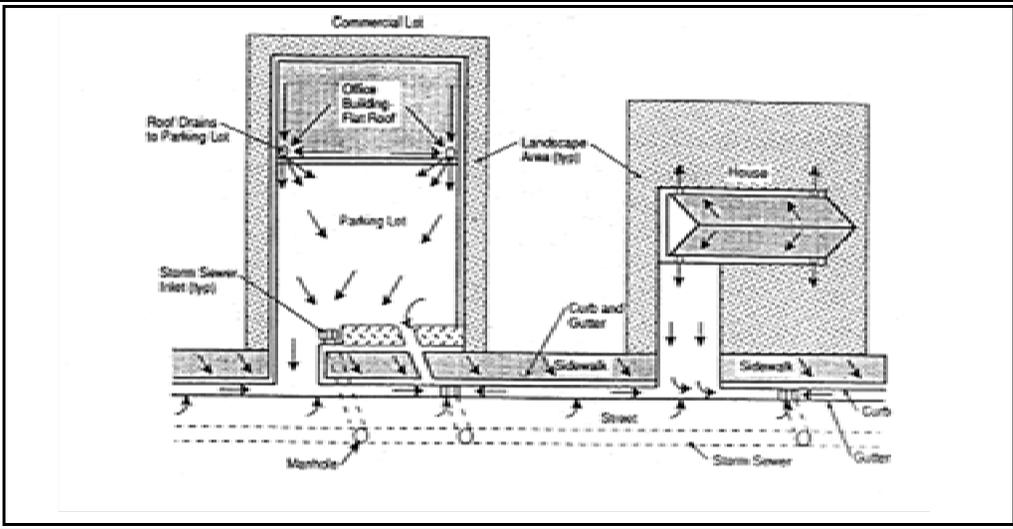
- Design basin for site specific location, maintain effective flow length 2 times width.
- Excavate basin or construct compacted berm containment, ensure no downgradient hazard if failure should occur. (Provide minimum of 67 cy. per acre of drainage area).
- Construct dewatering and outfall structure and emergency spillway with apron.

**LIMITATIONS:**

- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.
- May require safety fencing to prevent public access.
- Height restrictions for embankment regulated by Utah Division of Dam Safety.

**MAINTENANCE:**

- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



**Considerations**

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

**DESCRIPTION:**

Site plan review will be conducted of all commercial sites and subdivisions by the City Engineer and other city staff for consideration of storm water issues.

**APPLICATIONS:**

- All site plans, including those less than 1 acre, will be reviewed. The costs of such reviews will be paid for by the developer through the City.

**INSTALLATION/APPLICATION CRITERIA:**

- Detention basin calculations will be submitted for the 10 year storm with orifice plate size given.
- Storm water calculations will be in accordance with county standards.
- The outlet piping must be shown to an approved discharge location.
- Flood zone issues must be addressed.
- Overflow locations must be addressed.
- All Site plans and subdivisions greater than 1 acre must have an Erosion Control Plan.
- The spillway location and elevation must be shown.
- The detention basin volume must be indicated on the plan.
- Efforts must be made to minimize directly connected impervious areas

**LIMITATIONS:**

- The downstream receiving pipe or ditch must be capable of the design flows, otherwise percolation rates must be considered.
- Consideration for oil separation must be given.
- Infiltration of water near building foundations and parking lots is a concern.
- Will likely result in increased maintenance for private detention basins.

**MAINTENANCE:**

- Inspections will be required during construction.
- After construction is complete, the improvements, including the orifice plate must be inspected.
- Periodic inspections are required in insure proper maintenance.
- Remove sediment buildup and replace damaged grass cover.



**APPLICATIONS**

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices

**DESCRIPTION:**

Establishment and implementation of a schedule for long term operation and maintenance procedures for the existing storm drain system. The primary focus of this BMP is on structural BMPs installed by contractors, and developments that are left to be maintained by the MS4 or by residents and businesses.

**APPROACH:**

- Review existing policy on who is responsible to maintain privately installed BMPs.
- Create or modify Development Agreements as necessary.
- Review existing maintenance schedule and/or efforts.
- Review the requirements necessary to maintain the existing storm drain system.
- Conduct periodic inspections of existing facilities. To determine if they are being maintained.
- Create a schedule for long term operation and maintenance of the storm drain system.
- Implement the maintenance schedule.
- Follow up.
- Possibly offer incentives for properly maintained BMPs or charge fees to maintain privately held facilities.

**LIMITATIONS:**

- Cost
- Access and ownership issues
- Availability of trained staff
- Difficulties in getting Home Owners Associations to do long term maintenance.



**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

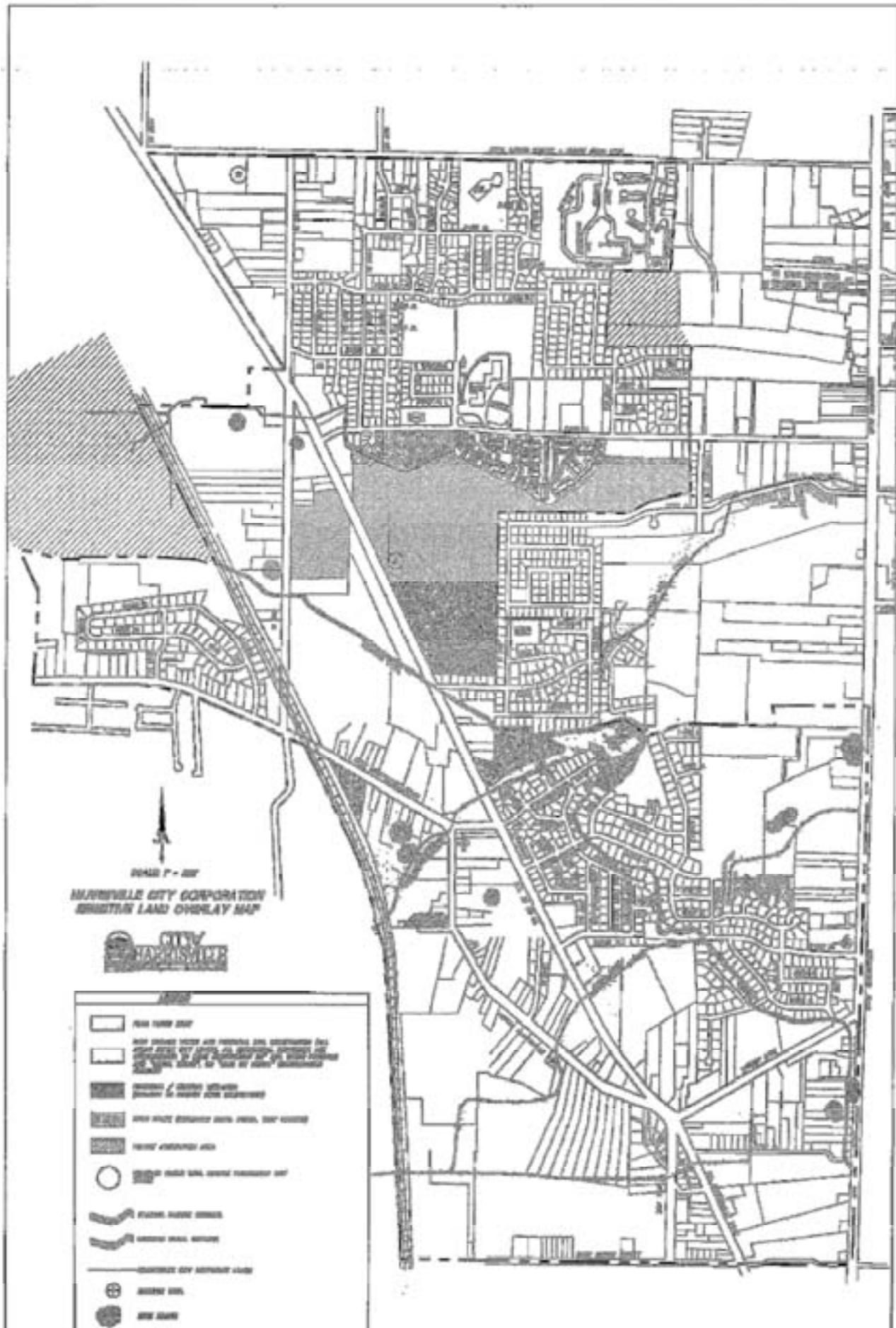
**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Staffing
- Training
- Administrative

- High
- Medium
- Low

## **IEPCSWCM-SOP-Inspection and Enforcement of Post-Construction Storm Water Control Measures**

1. Applicable Post-Construction SWPP inspection and review throughout the project.
2. Signed NOT.
3. Completion of steps 1 and 2 prior to conditional acceptance of the subdivision.





**Program Elements**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High  Medium  Low

**DESCRIPTION:**

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in storm water pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

**OBJECTIVES:**

Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

**APPROACH:**

- Integrate training regarding storm water quality management with existing training programs that may be required for other regulations.
- Employee training is a vital component of many of the individual source control BMPs included in this manual.

## **POLLUTION PREVENTION / GOOD HOUSE KEEPING**

### **Minimum Control Measure 6**

#### **6.1 INTRODUCTION**

The Pollution Prevention/Good Housekeeping for MCM 6 MS4 Operations is required to alter their own actions to help ensure a reduction in the amount and type of pollution that:

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

While this measure is meant primarily to improve or protect receiving water quality by altering municipal or facility operations, it also can result in a cost savings for the small MS4 operator, since proper and timely maintenance of storm water systems can help avoid repair costs from damage caused by age and neglect.

The City will take the major role for responsibility for this Measure as a condition of the joint permit with Weber County.

MCM 6 applies to preventing pollution in areas other than construction and establishing good techniques for Public Works and Sector P maintenance activities.

#### **6.2 POLLUTANTS OF CONCERN**

A variety of pollutants are associated with storm water pollution due to municipal activities including: sediment, nutrients, bacteria and viruses, oxygen demanding substances, oil and grease, metals, toxic pollutants, and floatables (Table 6-1). The impacts of these pollutants on water quality along with a discussion on municipal activities which can potentially contribute to their introduction into storm water runoff is presented in the following subsections.

##### Sediment

Sediment is a common component of storm water, and is considered to be one of the most damaging pollutants in Utah. Sediment fills in streams, lakes, rivers, wetlands, and road ditches, and can affect aquatic life by smothering fish larvae and eggs. Suspended soil particles can cause water to look cloudy or turbid. Excessive turbidity reduces light penetration in water, impairs sight of feeding fish, clogs fish gills, and increases drinking water treatment costs. Fine sediment also acts as a vehicle to transport other pollutants including nutrients, trace metals, and hydrocarbons to nearby surface waters.

Significant sediment-borne pollutants are associated with highway runoff; originating from pavement wear, vehicles, atmospheric deposition, and road maintenance. Other sources of sediment include erosion from new development and construction sites.

### Nutrients

Nutrients, especially nitrogen and phosphorus, can cause algal blooms and excessive aquatic plant growth in lakes. These conditions can impair many important uses of these waters, including recreation, fish habitat, and water supply.

Nitrogen and phosphorus associated with highway runoff come from atmospheric deposition and roadside fertilizer application. Phosphorus has also been associated with application of sand and salt on roads. Nutrients are a result of yard debris, garbage, as well as fertilizer and pesticide use.

### Metals

Trace metals are a water quality concern because the toxic effects they can have on aquatic life. Metals can also be a health hazard to humans through direct ingestion of contaminated water or through eating contaminated fish. The most common trace metals found in storm water runoff in urban areas are lead, zinc, and copper. These metals originate from galvanizing, chrome plating, and other metal sources associated with automobiles. Lead, cadmium, nickel and zinc in urban runoff have also been associated with different sources including body rust, brake lining wear, steel highway structures, and tire wear from automobiles.

### Oxygen-demanding substances

Oxygen-demanding substances tend to deplete the dissolved oxygen levels in streams and lakes. The depleted oxygen supply can result in the reduction of aquatic life. Oxygen demanding substances are found in yard waste (such as leaves and lawn clippings), animal wastes, street litter, and organic matter.

### Bacteria and Viruses

Bacteria and viruses are the most common microorganisms found in surface water runoff. Bacteria and viruses often carry diseases which can be transferred to animal life and to humans. The main sources of these contaminants are animal excrement and sanitary sewer overflows.

### Oil, Grease and Hydrocarbons

Oil, grease and hydrocarbons contain a wide array of compounds, some of which are toxic to aquatic organisms at low concentrations. The main sources of oil and grease are leakage from engines, restaurant grease traps, and waste oil disposal. Hydrocarbons typically come from spills, leaks, lubricants and asphalt surface leachate. Hydrocarbon levels are highest from parking lots, roads and service stations.

### Floatables

Floatables are pollutants that may be contaminated with heavy metals, pesticides, and bacteria. Typically resulting from street refuse or industrial yard waste, floatables also create an aesthetic "eye sore" in waterways or detention basins.

**Table 6-1.** Potential pollutants of concern associated with municipal activities.

Activity	Pollutant	Potential Source
Construction	Sediment	Poor erosion control practices on hillsides, undeveloped property, right-of-way for construction sites
Residential, Parks, and Golf Courses  Transportation and Commercial	Nutrients  Metals	Yard debris, garbage, fertilizer and pesticide use, rat poison, pyrotechnics  Paint, plastics, pottery pigments and glazes, automobile tires, common galvanized coatings, pesticide use, root killer application on sewer lines, old lead paint and glazes, wood preservatives, batteries
Residential	Oxygen Demanding Substances	Yard debris, animal wastes, organic chemical use
Parks and Residential	Bacteria and Viruses	Human and animal (pets and aquatic life) waste, sanitary sewer infiltration into storm drain system, decomposing yard waste
Commercial and Residential	Oil, Grease, and Hydrocarbons	Asphalt surface leaching, spills, leaks, construction activities

Residential and Parks	Floatables	Street refuse, industrial yard waste
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### 6.3 MEASURABLE GOALS

The following table summarizes the BMPs, Measurable Goals, and Implementation Schedule of the City for each BMP. It should be noted that as per MCM 6 4.2.6.1 that reads: "All facilities covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities (Sector P) do not need to develop an O&M program but must instead maintain the Storm Water Pollution Prevention Plan (SWPP) required by that permit", in which Harrisville City qualifies. In reviewing this section, the Harrisville City Sector P SWPP shall be included. In this MCM 6 section, additional information is included to meet additional General Permit requirements and for clarification purposes. The Fiscal Ability as referenced on page 2 of the General Information Section of this document projects the anticipated cost for the BMP as well as the source of funding. The City has a Storm Water Utility Fund (SWUF) which should cover the costs of this plan.

<b>MCM 6 - POLLUTION PREVENTION / GOOD HOUSE KEEPING</b>				
New Fact Sheet	Old Fact Sheet	BMP	Measurable Goal	Implementation Schedule
		Maintain Sector P Permit and SWPPP	Follow schedules as outlined in permit	<i>2010</i>
<i>Same</i>	ET	Employee Training	Provide a minimum of 2 days of training for storm water all other applicable staff	<i>Start in 2010</i>
		Storm Water Master Plan	Update the Master plan to include BMP's for improving existing facilities as needed	<i>Goal Completed</i>
<i>A-1, 2, 3, 6, 7, BGM, &amp; MU</i>	BGM	Building and Grounds Maintenance	Keep a log of usage city wide to ensure against waste. SOP's for Public Works MCM 6	<i>Ongoing</i>
<i>A-1, 2, 3, 6, 7, &amp; BRC</i>	BRC	Building Repair, and Construction	See training above	<i>Ongoing</i>
<i>Same</i>	CBC & SDSC	Catch Basin Cleaning Storm Drain System Cleaning	Clean catch basins annually	<i>Ongoing</i>

<b>MCM 6 - POLLUTION PREVENTION / GOOD HOUSE KEEPING</b>				
A-4	CO	Covering	Construct a storage facility for Salt Storage – SOP for Public Works MCM 6	<i>Goal Completed</i>
A-12	SWM	Solid Waste Management – Litter Control	Continue semiannual city cleanup program – SOP for Public Works MCM 6	<i>Ongoing</i>
A—4	MU	Material Use	See training above	<i>Ongoing</i>
Same	RBM	Roadway/Bridge Maintenance	Fill potholes annually –log tonnage of materials used. Refer to Public Works Standards for additional procedures on roadway maintenance	<i>Ongoing</i>
Same	SC/PL/O & M	Street Cleaning/Parking Lot Maintenance	Sweep streets semiannually-log miles and loads – SOP for Public Works MCM 6	<i>On going</i>
A-3	SCU/SP	Spill Clean-Up & Spill Prevention	Program managed by local fire department-refer to Sector P	<i>Goal Completed</i>
A-8	VEC	Vehicle and Equipment Cleaning	Maintain a log of washings. SOP for Public Works MCM 6	<i>Ongoing</i>
A-3	WHD	Waste Handling and Disposal	See MCM 1 for Weber County Transfer Station	<i>Goal Completed</i>
A-9	O & M	Standard Operating Procedures (SOP)	Create SOP's for Public Works BMP's as needed and as per MCM 6 of the General Permit	<i>Goal Completed</i>
A-5		Used Oil Recycling SOP Added	Save all used oil and dispose of through used oil contractor.	<i>Ongoing</i>
A-10(DB)		Detention Basins	Monitor detention basins for Maintenance MCM 5 and I & M	<i>Annually</i>
A-11		Storm Water Monitoring	Conduct Dry Weather Screening	<i>1/5 per year</i>
HWM		Reduce discharge of pollutants to Storm Water from Hazardous Waste.	Provide training of employees and subcontractors	<i>Ongoing</i>
Sector P		Develop a Sector P Industrial SWPP creek maintenance	Continue updating and implementing BMP's as needed	<i>On going</i>

## **6.4 BEST MANAGEMENT PRACTICES (BMP)**

The following pages consist of the fact sheets for the above mentioned goals and BMP's. Each page represents a separate BMP with details given. The intent of this section is to provide a variety of practices that could be related to Public Education and Outreach. The format is similar to other communities on the Wasatch Front, originally obtained from Salt Lake County's Storm Water Management Plan.

## **6.5 REFERENCES**

Berman, L., C. Hartline, N. Ryan, and J. Thorne. 1991. "Urban Runoff: Water Quality Solutions." American Public Works Association, Special Report #61.

City of Boise Public Works Department. January 1997. "Boise Storm Water Best Management Practices (BMP) Guidebook."

Debo, T.N. and A. J. Reese. 1995. Municipal Storm Water Management. Lewis Publishers. Boca Raton, FL.

Salt Lake County Engineering Division. September 1999. "Guidance Document for Stormwater Management."

State of California. March 1993. "California Storm Water Best Management Practice Handbooks."

State of Minnesota. October 1989. "Protecting Water Quality in Urban Areas - Best Management Practices for Minnesota."

U.S. Environmental Protection Agency. September 1992. "Storm Water Management for Industrial Activities - Developing Pollution Prevention Plans and Best Management Practices," EPA-832-R-92-006.



**DESCRIPTION:**

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in storm water pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

**OBJECTIVES:**

Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

**APPROACH:**

- Integrate training regarding storm water quality management with existing training programs that may be required for other regulations.
- Employee training is a vital component of many of the individual source control BMPs included in this manual.

**PROGRAM ELEMENTS**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High  Medium  Low



**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, and maintaining the storm water collection system.

**APPROACH:**

- Preserve existing native vegetation to reduce water, fertilizer, and pesticide needs.
- Carefully use pesticides and fertilizers in landscaping.
- Take care in over-watering landscape sites to reduce the risk of discharge of water contaminated with nutrients and pesticides.
- Integrate pest management where appropriate.
- Sweep paved surfaces.
- Clean the storm drainage system at appropriated intervals, includes marking storm drain inlets to minimize the dumping of inadvertent liquids.
- Properly dispose wash water, sweepings, and sediments.
- Take care of landscaped areas around the facility.
- Clean parking lots and areas other than industrial activity.
- Clean all catch basins in parking lots every 6 to 12 months or whenever the sump is full.
- Sweeping, either vacuum or mechanical, is the most appropriate BMP for cleaning parking lots and basins.

**LIMITATIONS:**

Alternative pest/weed controls may not be available, suitable or effective in every case.

**MAINTENANCE:**

The BMPs themselves relate to maintenance and do not require maintenance as they do not involve structures.

**Program Elements**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High     Medium     Low



**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from material use by using alternative products, minimizing hazardous material use on-site, and training employees and subcontractors.

**APPLICATION:**

The following materials are commonly used on construction sites:

- Pesticides and herbicides, fertilizers, detergents, plaster and other products, petroleum products such as fuel, oil, and grease.
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

**INSTALLATION/APPLICATION CRITERIA:**

- Use less hazardous, alternative materials as much as possible.
- Minimize use of hazardous materials on-site.
- Use only materials where and when needed to complete the construction activity.
- Follow manufacturer’s instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Personnel who use pesticides should be trained in their use.
- Do not over apply fertilizers, herbicides, and pesticides. Prepare only the amount needed.
- Unless on steep slopes, till fertilizers in to the soil rather than hydroseeding.
- Do not apply these chemicals just before it rains.

**LIMITATIONS:**

Alternative materials may not be available, suitable, or effective in every case.

**MAINTENANCE:**

Maintenance of this best management practice is minimal.

**Objectives**

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High  Medium  Low

## **SOP-PARKS – Chemical Application Pesticides, Herbicides, Fertilizers**

1. Preparation:
  - a. Make sure all applicable state Chemical Handling Certification is complete and up-to-date before handling any chemicals. ( To be done by 2011 )
  - 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 recommendation 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).
  
2. Process:
  - a. Always follow the manufacturer's recommendations for mixing, application and disposal. ("Read the Label").
  - b. Do not mix or prepare pesticides for application near storm drains, preferably mix inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
  - c. Employ techniques to minimize off-target application (e.g. spray drift, over broadcasting.) of pesticides and fertilizers.
  
3. Clean-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")
  
4. 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.

## **SOP-PARKS – Cleaning Equipment**

1. Preparation:
  - a. Review process with all Parks employees
  
2. Process:
  - a. Wipe off dirt, dust, and fluids with disposable towel
  - b. Wash equipment in approved wash station
  
3. Clean-up:
  - a. Dispose of towels in proper trash receptacle
  - b. Sweep floor and dispose of debris.

## **SOP-PARKS – Mowing and Trimming**

1. Preparation:
  - a. Process overview with all employees
  - b. Check the oil and fuel levels of the mowers and other equipment; fill if needed.
  
2. Process:
  - a. Install temporary catch basin protection installed on affected basins
  - b. Put on eye and hearing protection
  - c. Mow and trim the lawn
  - d. Sweep or blow clippings to grass areas
  - e. Remove inlet protection
  
3. Clean-up:
  - a. Mowers are to be scraped and brushed at shop – dry spoils are dry swept and disposed of
  - b. Wash equipment in approved wash station

## **SOP-PARKS – Open Space Management**

### 1. Preparation:

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

### 2. 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 storm water detention areas or other areas where storm water runoff can carry the mulch into the storm drainage system.
- c. Follow all SOPs related to irrigation, mowing, landscaping, and pet waste management.

### 3. Clean 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.

### 4. Documentation:

- a. Document any observed deficiencies for correction or repair.

## **SOP-PARKS – Pet Waste**

### 1. Preparation:

- a. Adopt and enforce ordinances that require pet owners to clean up pet wastes and use leashes in public areas. If public off-leash areas are designated, make sure they are clearly defined. Avoid designating public off-leash areas near streams and water bodies.
- b. Whenever practical and cost effective, install dispensers for pet waste bags and provide disposal containers at locations such as trail heads or parks where pet waste has been a problem. Provide signs with instructions for proper cleanup and disposal.

### 2. Process:

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

### 3. Clean up:

- a. 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.

### 4. Documentation:

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

## **SOP-PARKS – Planting Vegetation (Starters)**

### 1. Preparation:

- a. Call the Blue Stakes Center of Utah at least 2 working days before any digging will be done, to reveal the location of any underground utilities.
- b. Dial 811 or 1-800-662-4111
- c. Decide where any spoils will be taken.

### 2. Process:

- a. Dig holes; place spoils near the hole where they may easily be placed back around roots.
- b. Bring each plant near the edge of the hole dug for it.
- c. Check the depth of the hole, and adjust the depth if necessary. The depth of the hole for a tree should be as deep as the root ball, so that the top of the root ball is level with the top of the hole.
- d. Carefully remove pot or burlap.
- e. Place the plant in the hole.
- f. Backfill the hole with existing spoils, compost, and a litter fertilizer if desired. Do not use excessive amendments.
- g. Water the plant.
- h. Stake the plant, if necessary, to stabilize it.

### 3. Clean-up:

- a. Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is a 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.

## **SOP-PARKS – Planting Vegetation (Seeds)**

### 1. Preparation:

- a. Call the Blue Stakes Center of Utah at least 2 working days before any digging will be done, to reveal the location of any underground utilities.
- b. Dial 811 or 1-800-662-4111
- c. Decide on the application rate, method, water source, and ensure adequate materials are on hand.
- d. Grade and prepare the soil to receive the seed. Place any extra soil in a convenient location to collect.

### 2. Process:

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

### 3. Clean-up:

- a. Move 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, seed, and any cover material from surrounding pavement(s) into the planter area.
- c. Transport spoils to their designated fill or disposal area.

## **SOP-PARKS – Transporting Equipment**

1. Preparation:
  - a. Determine equipment needed for transport and method (trailer, truck bed) needed to transport equipment.
  - b. Conduct pre-trip inspection of equipment
  
2. Process:
  - a. Load and secure equipment on trailer or truck
  - b. Load and secure fuel containers for equipment usage
  
3. Clean-up:
  - a. Off load equipment
  - b. Store equipment and trailer in proper location on hard suffice.
  - c. Conduct post-trip inspection of equipment
  - d. Wash equipment, if needed, according to the SOP for Cleaning Equipment SOP
  
4. Documentation:
  - a. N/A

<p><b>BMP: Building Repair and Construction</b></p>	<p><b>BRC</b></p>
	<p><b>OBJECTIVES</b></p> <ul style="list-style-type: none"> <li>■ Cover</li> <li>■ Contain</li> <li>■ Educate</li> <li>■ Reduce/Minimize</li> <li>■ Commercial Activities</li> <li>■ Recycle</li> </ul>
<p><b>DESCRIPTION:</b>          Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to storm water from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.</p> <p><b>APPROACH:</b></p> <p><b>Pollution Prevention</b></p> <ul style="list-style-type: none"> <li>➤ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.</li> <li>➤ Buy recycled products to the maximum extent practical.</li> <li>➤ Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.</li> <li>➤ Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.</li> </ul> <p><b>Suggested Protocols</b>  <i>Repair &amp; Remodeling</i></p> <ul style="list-style-type: none"> <li>➤ Follow BMPs identified in Construction BMP Handbook.</li> <li>➤ Maintain good housekeeping practices while work is underway.</li> <li>➤ Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.</li> <li>➤ Cover materials of particular concern that must be left outside, particularly during the rainy season.</li> <li>➤ Do not dump waste liquids down the storm drain.</li> <li>➤ Dispose of wash water, sweepings, and sediments properly.</li> <li>➤ Store materials properly that are normally used in repair and remodeling such as paints and solvents.</li> <li>➤ Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vac truck, and clean the catch basin sump where you placed the plug.</li> <li>➤ Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.</li> <li>➤ Clean the storm drain system in the immediate vicinity of the</li> </ul>	 <p>363 W. Independence Blvd.          Harrisville, UT 84404          (801) 782-9648</p> <p><b>TARGETED POLLUTANTS</b></p> <ul style="list-style-type: none"> <li>■ Sediment</li> <li><input type="checkbox"/> Nutrients</li> <li>■ Heavy Metals</li> <li>■ Toxic Materials</li> <li><input type="checkbox"/> Oxygen Demanding Subst.</li> <li>■ Oil &amp; Grease</li> <li>■ Floatable Materials</li> <li><input type="checkbox"/> Bacteria &amp; Viruses</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>■ High Impact</li> <li><input checked="" type="checkbox"/> Medium Impact</li> <li><input type="checkbox"/> Low or Unknown Impact</li> </ul> </div>

construction activity after it is completed.

### **Painting**

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

### **Training**

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

### **Spill Response and Prevention**

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

### **Limitations**

- This BMP is for minor construction only. The State's General Construction Activity Storm Water Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

### **OBJECTIVES**

- Cover
- Contain
- Educate
- Reduce/Minimize
- Commercial Activities
- Recycle



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### **TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**BMP: Building Repair and Construction – Continued**

**REQUIREMENTS:**

***Costs***

- These BMPs are generally low to modest in cost.

**MAINTENANCE:**

- N/A

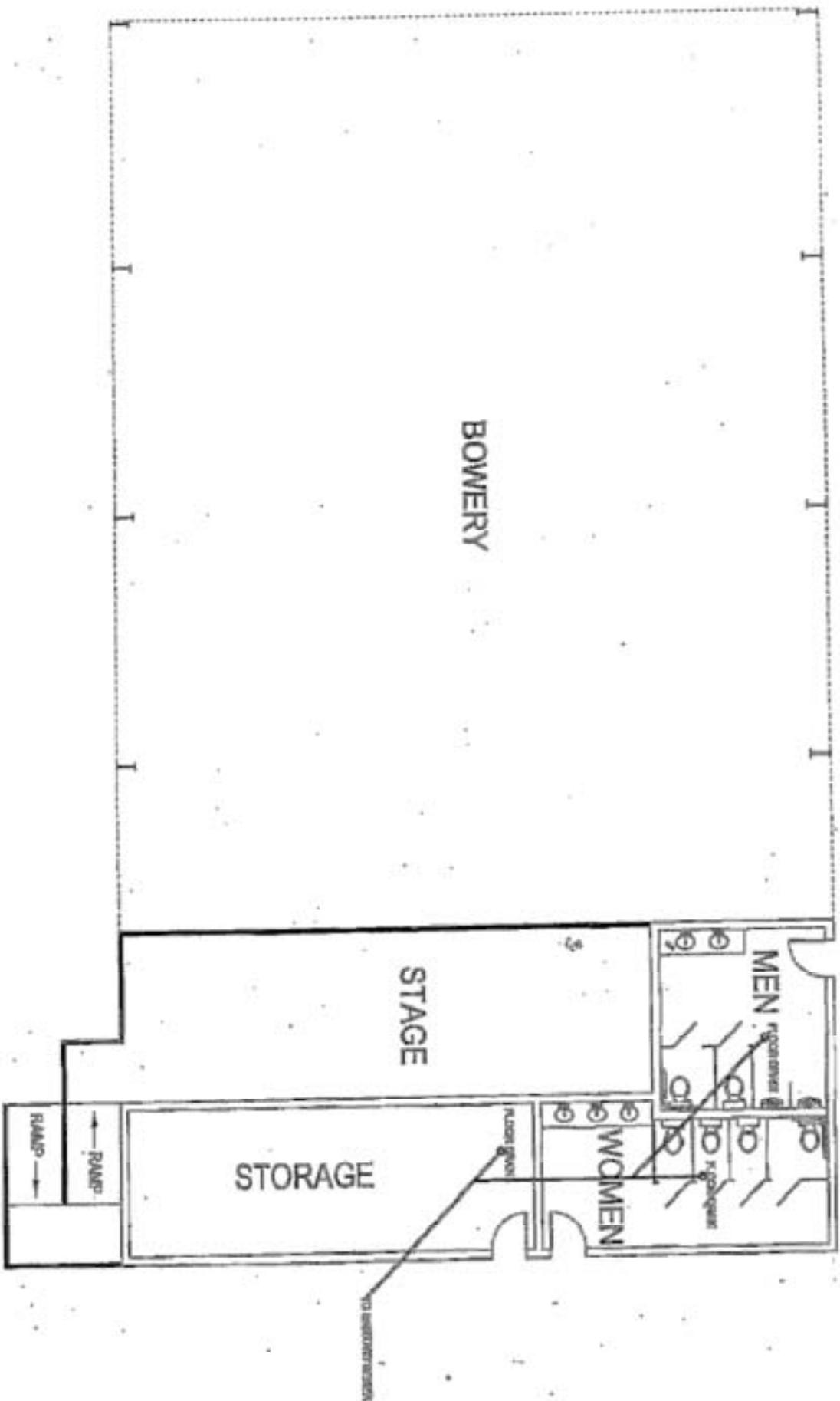
**SUPPLEMENTAL INFORMATION:**

***Further Detail of the BMP***

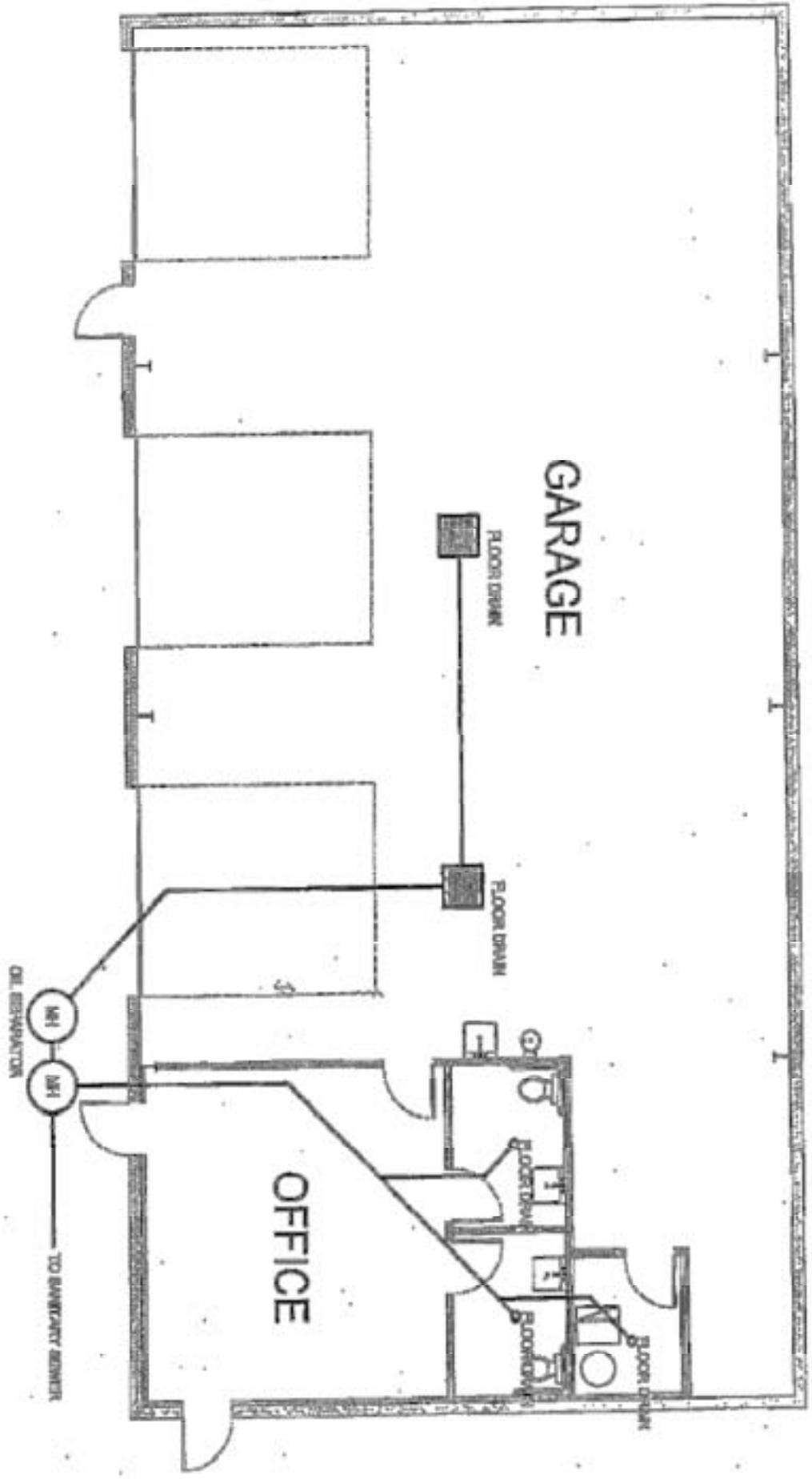
*Soil/Erosion Control*

- If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.
- If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective “in-line” treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a “turn-down” elbow or similar device to trap floatables.

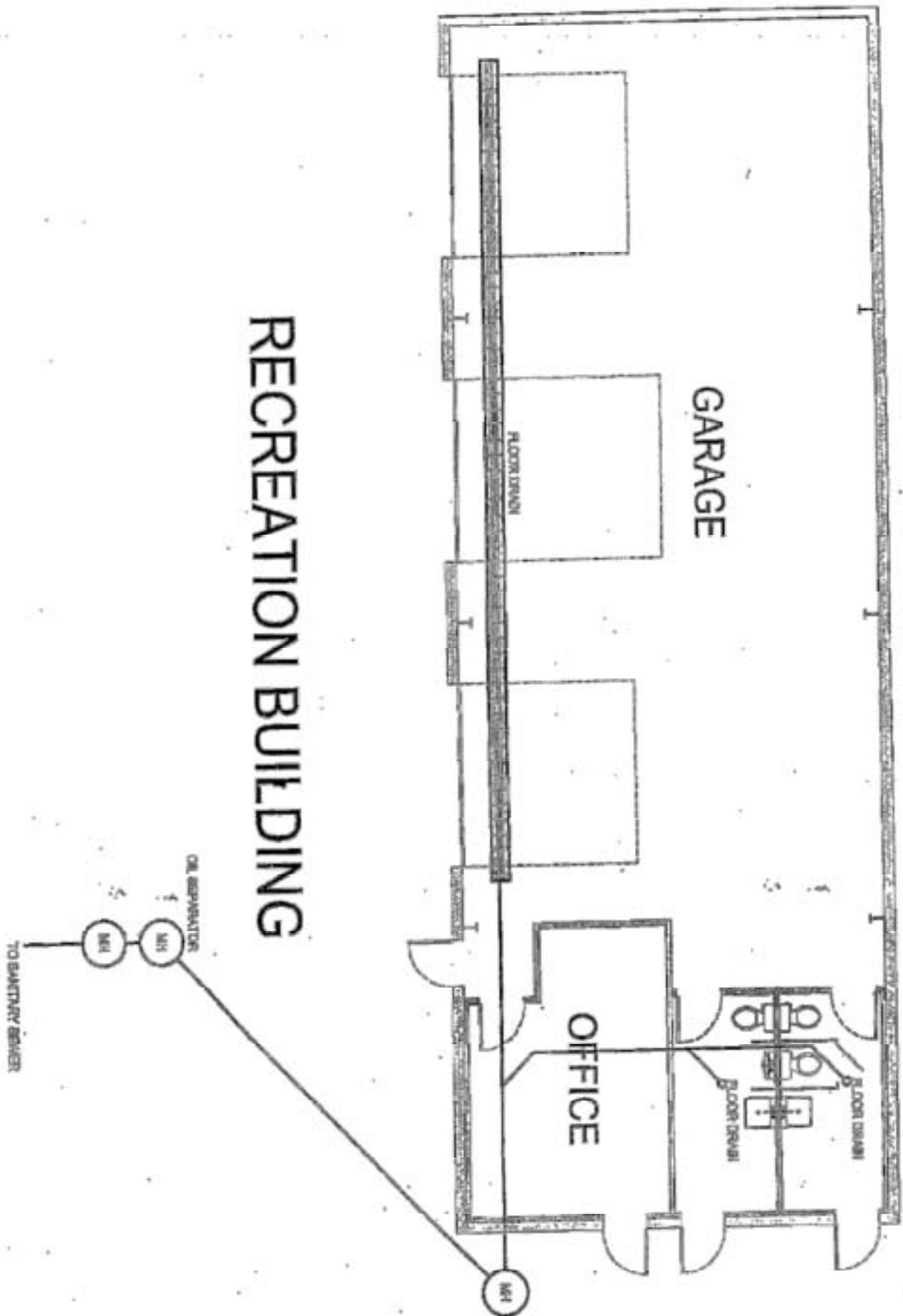
# HARRISVILLE PARK BOWERY



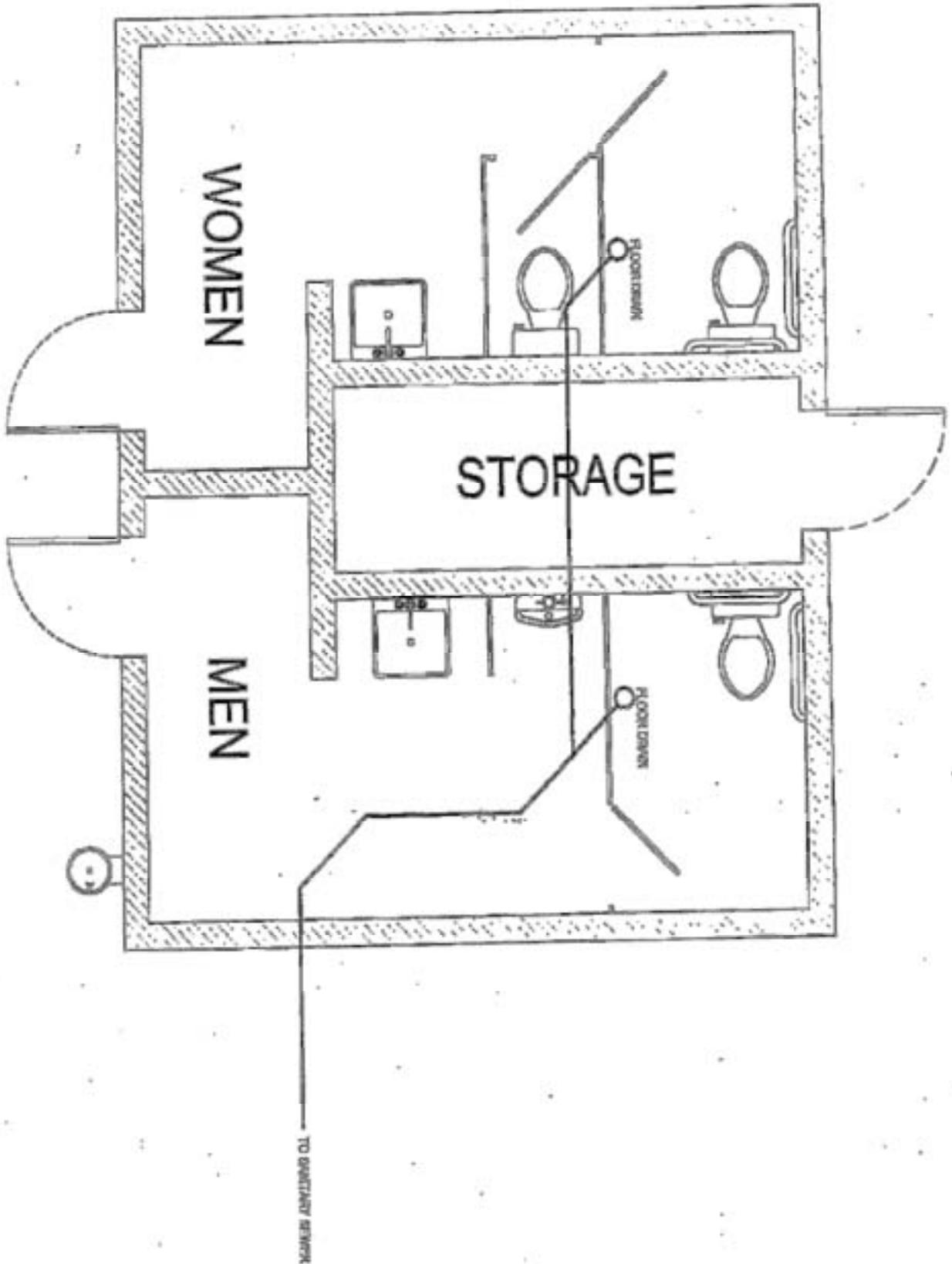
# PUBLIC WORKS BUILDING



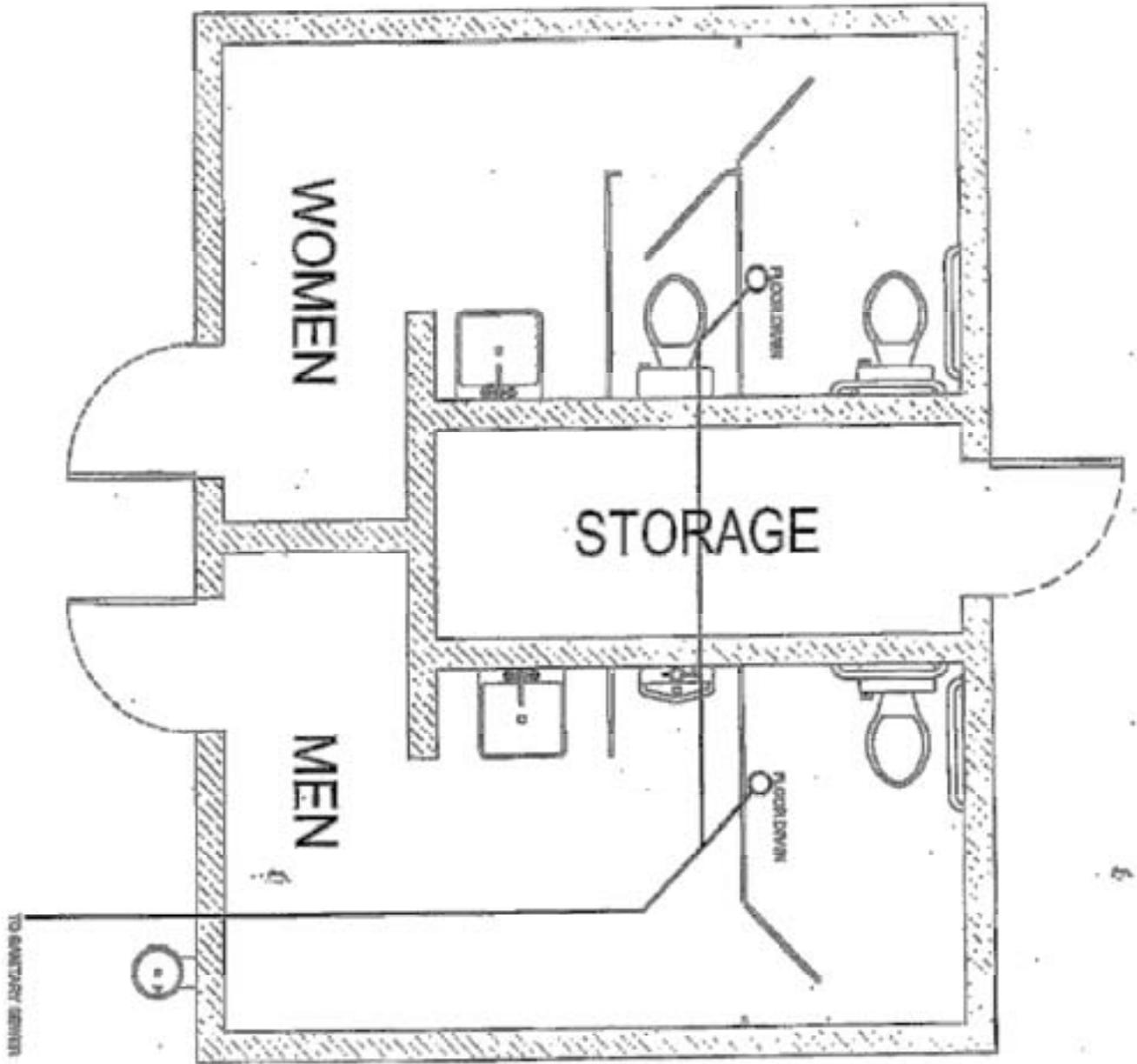
# RECREATION BUILDING

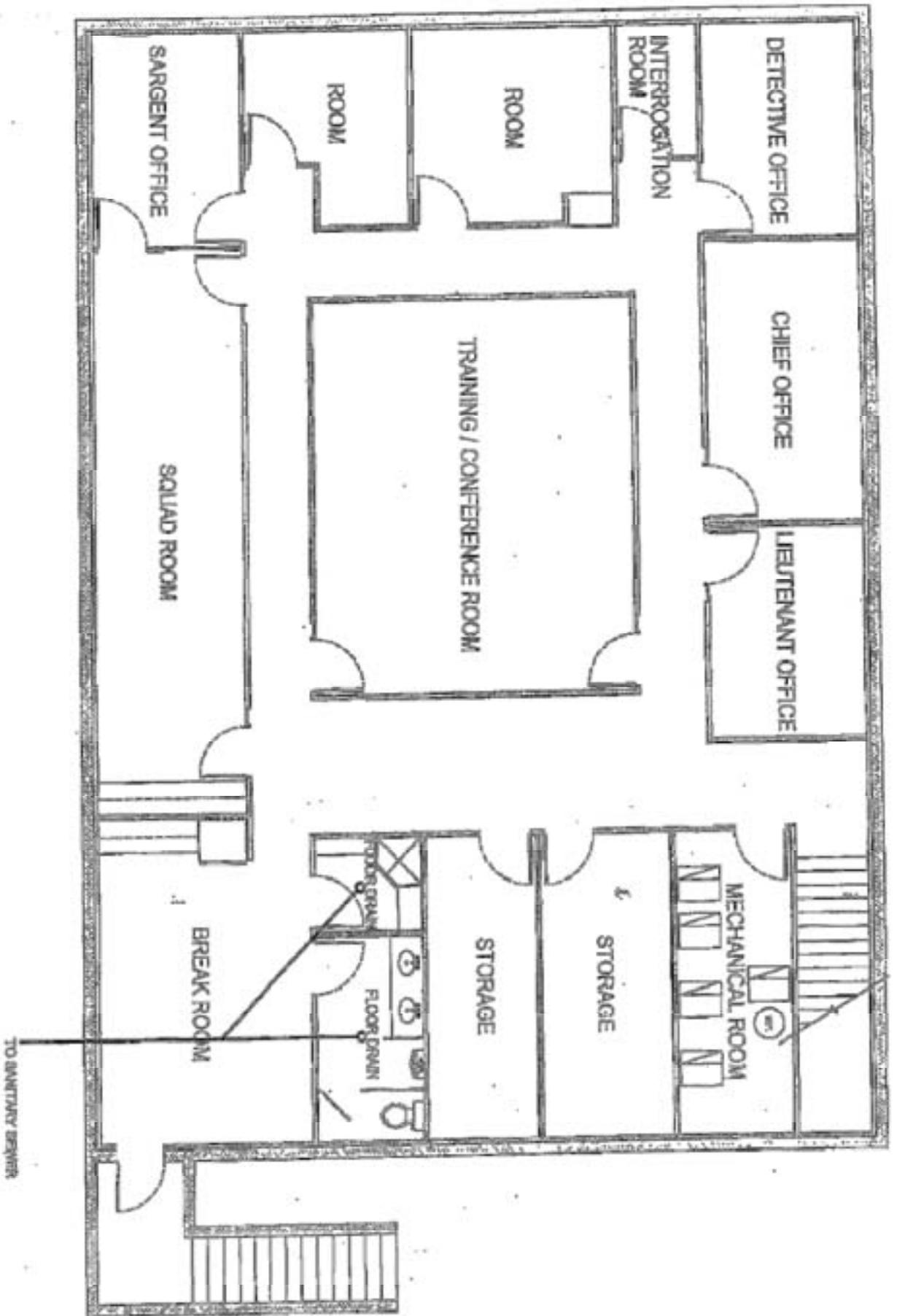


# INDEPENDENCE PARK RESTROOMS



# MILLENNIUM PARK RESTROOMS





# POLICE BUILDING

## BMP: Drainage System Maintenance

CBC-SDSC



### OBJECTIVES

- Cover
- Contain
- Educate
- Reduce/Minimize

### DESCRIPTION:

As a consequence of its function, the storm water conveyance system collects and transports urban runoff and storm water that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

### APPROACH:

#### **Pollution Prevention**

- Maintain catch basins, storm water inlets, and other storm water conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

#### **Suggested Protocols**

##### *Catch Basins/Inlet Structures*

Staff should regularly inspect facilities to ensure compliance with the following:

- Immediate repair of any deterioration threatening structural integrity.
- Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
- Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).
- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

##### *Storm Drain Conveyance System*

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.



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### TARGETED POLLUTANTS

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- |  |
|--|
| <ul style="list-style-type: none"><li>■ High Impact</li><li><input checked="" type="checkbox"/> Medium Impact</li><li><input type="checkbox"/> Low or Unknown Impact</li></ul> |
|--|

- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

*Open Channel*

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. The developer-applicant should also contact local governments (city, county, special districts), other state agencies, and Federal Corps of Engineers and USFWS.

*Illicit Connections and Discharges*

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?
  - Are there any odors associated with the drainage system?
  - Record locations of apparent illegal discharges/illicit connections.
  - Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
  - Eliminate the discharge once the origin of flow is established.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

*Illegal Dumping*

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.

**Training**

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - OSHA Confined Space Entry training (29 CFR 1910.146).
  - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

**Spill Response and Prevention**

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.

**CBC-SDSC Contin.**

**OBJECTIVES**

- Cover
- Contain
- Educate
- Reduce/Minimize



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- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**Other Considerations (Limitations and Regulations)**

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

**REQUIREMENTS:**

**Costs**

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

**Maintenance**

- Two-person teams may be required to clean catch basins with vector trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

**SUPPLEMENTAL INFORMATION:**

**Further Detail of the BMP**

*Storm Drain Flushing*

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging. Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in

suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of storm water pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

**CBC-SDSC Contin.**

## **SOP-SD-O&M – Storm Drain Operations and Maintenance**

1. Annually check and clean all City storm drain inlet boxes and pipes.
2. Personnel will pull grates and check the structures of the box and do a visual on the pipes.
  - a. Check for dirt, debris, and sediment.
3. Clean inlet boxes as needed, drain water into the sanitary sewer system. Let materials dry out and take to land fill. If storm drain pipes need cleaning, contract it out. Standard disposal procedures for both sewer and storm drain contractors are to take to the sewer plant. If any other disposal procedure is required, document what actions were taken.
4. Storm event operation and maintenance.
  - a. Check and clean inlet boxes throughout the City.
  - b. Remove any dirt or debris.
  - c. Dispose of applicable material properly and document.
5. Keep logs of location and number of storm drains and catch basins cleaned. Record the amount of waste collected. Make notes of any comments or concerns.

## **SOP-STORM DRAIN – Creek Management**

### 1. Preparation:

- a. Monitor streams on a regular basis. Bi-annually, before, during and after rain events.
- b. Check culverts and crossings after every storm.
- c. Maintain access to stream channels wherever possible.
- d. Identify areas requiring maintenance
- e. Determine what manpower or equipment will be required.
- f. Identify access and easements to area requiring maintenance.
- g. Determine method of maintenance that will be least damaging to the channel.
- h. Obtain Stream Alteration Permit. If needed.

### 2. Process:

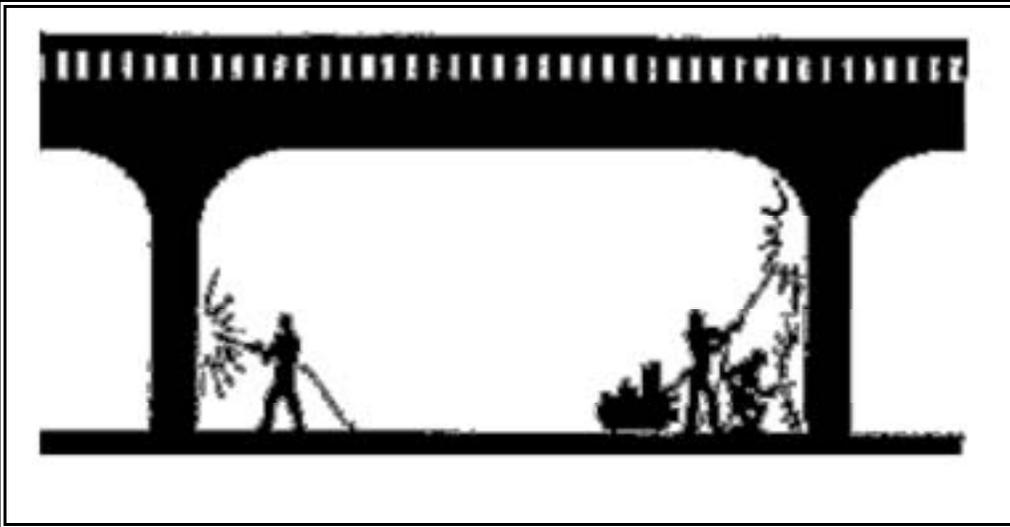
- a. Remove unwanted material (debris, branches, soil) from the creek channel and place it in a truck to be hauled to the Weber county land fill or the north Ogden compost.

### 3. Clean-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 the Weber county land fill or the North Ogden compost.

### 4. Documentation:

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



**DESCRIPTION:**

Address storm water pollution from roadway and bridge maintenance on a site-specific basis. The deposition and subsequent magnitude of pollutants found in road and bridge runoff is variable and affected by climate, surrounding land use, roadway or bridge design, traffic volume, and frequency and severity of accidental spills.

**APPROACH:**

Prevent or reduce the discharge of pollutants to storm water from roadway and bridge maintenance by:

- Paving as little as possible.
- Designing bridges to collect and convey storm water.
- Using measures to prevent runoff and runoff.
- Properly disposing of maintenance wastes.
- Training employees and subcontractors.

Some general measures for roadway maintenance should be implemented:

- Sweep and vacuum heavily traveled roadways to remove accumulated sediment and debris. (See the Street Sweeping BMP sheet).
- Ensure proper handling, application, and disposal of pesticides, fertilizers, and paints.
- Do not over-apply deicing salt and sand, and routinely calibrate spreaders.

The following steps will help reduce the storm water impacts of bridge maintenance:

- Site new bridges so that significant adverse impacts to wetlands, sensitive areas, critical habitat, and riparian vegetation are minimized.
- Design new bridges to avoid the use of scupper drains and route runoff to land for treatment control. Existing scupper drains should be cleaned of debris on a regular basis.
- Reduce the discharge of pollutants to surface waters during maintenance by using suspended traps, vacuums, or booms in the water to capture paint, rust, and removing agents.
- Train employees and subcontractors to reduce the discharge of wastes during bridge maintenance.

**LIMITATIONS:**

- The minimization of impervious areas may be limited by minimum required widths for roadways, shoulders, etc.
- The siting of new bridges is limited by available land, socioeconomic, fiscal, and political issues.

**Program Elements**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High    Medium    Low



**Program Elements**

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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  - Medium Impact
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**IMPLEMENTATION REQUIREMENTS**

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
  - Medium
  - Low

**DESCRIPTION:**

Reduce the discharges of pollutants to storm water from street surfaces by conducting street cleaning on a regular basis.

**APPROACH:**

- Prioritize cleaning to use the most sophisticated sweepers, at the highest frequency, and in areas with the highest pollutant loading.
- Restrict street parking prior to and during sweeping.
- Increase sweeping frequency just before the rainy season.
- Proper maintenance and operation of sweepers greatly increase their efficiency.
- Keep accurate operation logs to track programs.
- Reduce the number of parked vehicles using regulations.
- Sweepers effective at removing smaller particles (less than 10 microns) may generate dust that would lead to concerns over worker and public safety.
- Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). Many communities find it useful to have a compliment of both types in their fleet.

**LIMITATIONS:**

- Conventional sweepers are not able to remove oil and grease.
- Mechanical sweepers are not effective at removing finer sediments.
- Effectiveness may also be limited by street conditions, traffic congestion, presence of construction projects, climatic conditions, and condition of curbs.

**MAINTENANCE:**

- Replace worn parts as necessary.
- Install main and gutter brooms of the appropriate weight.

## **SOP-STREETS/STORM DRAIN – Street Sweeping**

1. Preparation:
  - a. Prioritize cleaning routes to use at the highest frequency in areas with the highest pollutant loading. Main roads, collector roads, and highly populated areas.
  - b. Restrict street parking prior to and during sweeping using regulations as necessary.
  - c. Increase sweeping frequency just before the rainy season. Sweep as many times as needed throughout the year. As soon as possible, weather permitting, in the spring.
  - d. Perform preventative maintenance and services on sweepers to increase and maintain their efficiency
  
2. Process:
  - a. Drive street sweeper safely and pick up debris
  - b. When full, take the sweeper to an approved street sweeper cleaning station.
  - c. Clean sweeper hopper out and inspect after each time it is dumped to maintain efficiency.
  
3. Clean-up:
  - a. Street sweepers are to be cleaned out in an approved manner such as NOT to introduce swept material into storm drains etc. street sweeper cleaning station
  - b. Street sweeping cleaning stations should 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.
  
4. Documentation:
  - a. Keep accurate logs to track streets swept and streets still requiring sweeping.
  - b. Log the amount of debris collected and hauled off.
  - c. Log dates and miles that are swept

## **SOP-BUILDINGS – Parking Lot Maintenance**

1. Preparation:
  - a. Conduct regular employee training to reinforce proper housekeeping.
    - i. Done annually in the “good housekeeping” training class.
  - 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.
  
2. Process:
  - a. Sweep parking areas, as needed, or as directed by the city’s responsible official.
    - i. Done bi-annually and as needed.
  - b. Hand sweep sections of gutter if soil and debris accumulate.
  - c. Pick-up litter as required to keep parking areas clean and orderly.
    - i. Done daily as needed.
  
3. Clean-up:
  - a. Dispose of sweepings properly (appropriate solid waste facility).
    - i. See the street sweeping SOP.
  - 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 storm water could transport fines into the storm drain system.
  
4. Documentation:
  - a. Keep accurate logs to track swept parking areas and approximate quantities.
    - i. See street sweeping log.
  - b. Document training of employees. See employee training file.

## BMP: Fluid Storage

A-1



### DESCRIPTION:

Accidental releases of materials from above ground liquid storage tanks and drums present the potential for contaminating storm waters with many different pollutants. Tanks may store many potential storm water runoff pollutants, such as gasoline, aviation gas, diesel fuel, kerosene, oils, greases, lubricants and other pollutants. Materials spilled, leaked, or lost from storage tanks may be carried away by rainfall runoff. These source controls apply to containers storing liquid materials.

### TARGETED POLLUTANTS

Nutrients  
Heavy Metals  
Toxic Materials  
Organics  
Oil & Grease

### APPROACH:

- Identify all areas of fluid storage and take inventory of each fluid. Label all fluid containers clearly.
- Large Containers:
  - Group all large containers with similar fluids together in a location away from drains. If storage in one overall location is not possible, store containers in one area in each department.
  - Provide secondary containment system for large containers such as double walled tanks, liners, vaults, containment pallets, etc.
  - Raise large containers off the ground and provide appropriate spill control measures.
- Small Containers:
  - Keep all small containers in one area with each department.
  - Provide secondary containment for small containers. If secondary containment is shared by several containers, provide containment for at least the volume of one full container.
- Place drip pans or absorbent materials under all taps and potential drip locations.
  - Provide an inventory of non-used drip pans that can be used under vehicles/equipment.
- Show locations of fluid storage on site map with a description of containment measures.
- Provide readily available absorbent materials.
- Post spill response plan near all hazardous materials storage areas.

### INSPECTION:

- Fluid containers should be inspected monthly, unless otherwise indicated in Appendix D, for signs of leaks or spills.
- Signs, labels, and spill response plan should be inspected monthly, unless otherwise indicated in Appendix D, to ensure they are easily read.

**MAINTENANCE:**

- Use dry cleanup methods to clean drips or spills. **Do not hose down spill area.**
- Replace containers as deemed necessary by inspection.
- Follow spill response checklist found in BMP "Spill Response" if a spill occurs.

**TRAINING:**

- No special training is required for this BMP.
- Other training as-per Appendix G.

**DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using the Vehicle Storage Intermediate Site Compliance Evaluation forms and filed appropriately.

**CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Store in covered location
- Use dry clean up methods first

**LIMITATIONS:**

- Training of employees must continually be updated.
- Keeping fluids far from a drain may be difficult.
- It may not be possible to store all fluid containers in one place.
- Stored fluids may need to be removed from containment during use.
- Storage areas need to be carefully planned to allow room for secondary containment.



**DESCRIPTION:**

Material storage areas exposed to rain and/or runoff can pollute storm water. Storm water can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in the release of materials. To prevent or reduce the discharge of pollutants to storm water from material delivery and storage, pollution prevention and source control measures must be implemented.

**TARGETED POLLUTANTS**

Sediment  
 Nutrients  
 Heavy Metals  
 Toxic Materials  
 Oxygen Demanding  
 Substances  
 Oil & Grease

**APPROACH:**

- Establish perimeter controls.
- Consolidate storage areas where possible.
- Minimize exit tracking.
- Provide proper site drainage.
- Cover materials as needed.

**INSPECTION:**

- Inspection of runoff area should be conducted monthly, unless otherwise noted in Appendix D, and after storms.
- Conduct visual inspections of turbidity in river during rain events, quarterly when conditions allow, to determine effectiveness of implemented measures.

**MAINTENANCE:**

- Remove accumulated sediment.
- Maintain perimeter controls.
- Refresh gravel filter as deemed necessary by inspections.

### **TRAINING:**

- No special training is required for this BMP.
- Other training as-per Appendix G.

### **DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using the Materials Storage Intermediate Site Compliance Evaluation sheet and filed appropriately.

### **CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Move used oil to vehicle storage shed
- Build canopy from vehicle maintenance shop to vehicle storage shed

### **LIMITATIONS:**

- Visual inspections need to be conducted during storm events to determine the effectiveness of the BMP.
- Tracking pad requires continual maintenance to ensure it is functioning properly.

Training of employees must continually be updated.



**DESCRIPTION:**

Spills and leaks are one of the largest contributors of storm water pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

**TARGETED POLLUTANTS**

Nutrients  
 Heavy Metals  
 Toxic Materials  
 Organics  
 Oil & Grease

**APPROACH:**

- Identify locations of potential spills or leaks on a site map.
- Identify all areas of fluid storage and take inventory of each fluid. Label all fluid containers clearly. Label all hazardous material according to its hazard (corrosive, poisonous, radioactive, flammable, explosive).
- Store and maintain appropriate spill cleanup materials in a location known to all near the storage area; and ensure that employees are familiar with the site's spill response plan and/or proper spill cleanup procedures.
- Place spill prevention and cleanup materials in a readily accessible area and mark clearly.
- Clean up spills and leaks immediately upon occurrence.
- Sweep and clean the storage area monthly if it is paved, **do not hose down the area to a storm drain.**
- Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.
- Provide secondary containment for existing containers.
- Place drip pans or absorbent materials under all taps and potential drip locations.

**PROCEDURE:**

- In the event of a leak or a spill use the following "Spill Response Plan":
  1. Stop source
  2. Contain Spill
  3. Call supervisor
  4. Identify substance
  5. Quantify spill
  6. Did spill leave the site?
  7. Call county health department (801-591-7168)
  8. Call State (801-536-4123)
  9. Clean up and dispose
  10. Document  
(Use Spill Response Report from SWPPP Appendix B)

**INSPECTION:**

- No Inspection Required

**MAINTENANCE:**

- See Approach and Procedure Sections

**TRAINING:**

- Spill Prevention and Response
  - Training as-per Appendix G.

**DOCUMENTATION:**

- Spills and leaks should be reported using the Spill Response Report found in Appendix B and filed appropriately.

**LIMITATIONS:**

- Training of employees must continually be updated.



**DESCRIPTION:**

Material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water. Improper storage of these materials can result in accidental spills and the release of materials. To prevent or reduce the discharge of pollutants to stormwater from material delivery and storage, pollution prevention and source control measures must be implemented.

**TARGETED POLLUTANTS**

Sediment  
Nutrients  
Toxic Materials

**APPROACH:**

- Locate salt storage in an appropriate location.
- Contain the salt storage area to prevent it from running off into storm drains.
- Grade salt storage area to drain in a controlled manner.
- Build covered area for salt storage.

**INSPECTION:**

- Salt Storage area should be inspected quarterly, unless otherwise noted in Appendix D, for structural integrity (no cracks, leaks, etc.) and containment functionality.

**MAINTENANCE:**

- Maintenance of cover structure and containment area should be performed as deemed necessary by inspections.

**TRAINING:**

- Provide annual training on:
  - Proper loading and unloading of salt.
- Other training as-per Appendix G.

**DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using the Material Storage Intermediate Site Compliance Evaluation sheet and filed appropriately.

### **CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Sweep in front of salt storage
- Post sign

### **LIMITATIONS:**

- Loading and unloading salt usually takes place in areas where it may be exposed.
- Containment will need to be regularly maintained.
- Salt, as delivered, contains moisture. With time moisture will drain from the salt even if it is covered. This internal drainage has high salt concentrations.

## **SOP-STREETS/STORM DRAIN – Snow Removal and De-icing**

1. Preparation:
  - a. Store de-icing material under a covered storage area.
  - b. Wash out vehicles (if necessary) in approved washout area before preparing them for snow removal.
  - c. Calibrate spreaders to minimize amount of de-icing material used and still be effective
  - d. Provide vehicles with spill cleanup kits in case of hydraulic line rupture or other spills
  - e. Train employees in spill cleanup procedures and proper handling and storage of de-icing materials
  
2. Process:
  - a. Load material into trucks carefully to minimize spillage
  - b. Periodically dry sweep loading area to reduce the amount of de-icing materials exposed to runoff
  - c. Distribute the minimum amount of de-icing material to be effective on roads
  - d. Do not allow spreaders to idle while distributing de-icing materials.
  - e. Park trucks loaded with de-icing material inside or under cover when possible.
  
3. Cleanup:
  - a. Sweep up all spilled de-icing material around loading area
  - b. Clean out trucks after snow removal duty in approved washout area (see vehicle washing SOP)
  - c. Provide maintenance for vehicles in covered area
  
4. Documentation:
  - a. Date and time of snow removal and de-icing
  - b. Location of snow removal and or de-icing
  - c. Loads or tonnage of de-icing material used per activity.

## BMP: Used Oil Recycling

A-5



### DESCRIPTION:

Used motor oil is a hazardous waste because it contains heavy metals picked up from the engine during use. Since it is toxic to humans, wildlife, and plants, it should be disposed of at a local recycling or disposal facility.

### TARGETED POLLUTANTS

Nutrients  
Heavy Metals  
Toxic Materials  
Organics  
Oil & Grease

### APPROACH:

- Cover oil recycle storage to prevent storm water run on. (Possibly doghouse style cover)
- Provide secondary containment for oil recycle storage.
- Store only used motor oil in container. If other fluids are mixed into the oil it becomes a hazardous waste and cannot be recycled.

### INSPECTION:

- Inspect storage area quarterly, unless otherwise noted in Appendix D, for leaks, cracks, or spills from any of the containment.
- Determine if other materials have been mixed if possible by checking for separation of fluids.

### MAINTENANCE:

- Fix any leaks or cracks in secondary containment as deemed necessary by inspection.
- Replace secondary or primary containment as deemed necessary by inspection.
- Use dry cleanup methods to clean up any spills or leaks. **Do not hose down spill area.**

### TRAINING:

- No Special Training is required for this BMP.
- Other training as per Appendix G.
- 

### DOCUMENTATION:

- All inspections performed should be documented at the time of inspection using the Fleet Department Intermediate Site Compliance Evaluation sheet and filed appropriately.

**CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Add secondary containment
- Store in vehicle storage shed

**LIMITATIONS:**

- It may not be possible to cover the area immediately.
- Mixing fluids may limit the possibility of recycling the oil.

## BMP: Vehicle and Equipment Fueling

A-6



### DESCRIPTION:

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to storm water runoff. Implementing the following management practices can help prevent fuel spills and leaks.

### TARGETED POLLUTANTS

Nutrients  
Heavy Metals  
Toxic Materials  
Organics  
Oil and Grease

### APPROACH:

- Permanent BMP's include providing on-site absorbent materials and spill response training to prevent gasoline and other pollutants from running off into the storm drain.
- Cover the fueling area where possible to prevent storm water from coming in contact with spilled pollutants.
- Place a spill response cabinet with appropriate spill response equipment next to fueling area. Contain spills and follow spill response plan.
- Post spill response plan near the fueling area with instructions on what to do in the case of a spill or leak.
- Use labeled signs to indicate spill response equipment.

### INSPECTION:

- Inspect fueling area quarterly, unless otherwise noted in Appendix D, for structural failure, cracks, leaks, spills and overfills.

### MAINTENANCE:

- Spot clean fueling area regularly using dry cleanup methods. **Do not hose down spill area.**
- Fix any cracks, leaks, spills, and overfills upon occurrence or as deemed necessary by inspection.
- Training should be administered to all employees semi-annually regarding spill response plans and procedures.

### TRAINING:

- Provide annual training on:
  - Proper fueling techniques (including not topping off tank) to avoid unnecessary spills.
- Other training as-per Appendix G.

**DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using Vehicle Wash Area, Fuel Station, and Parking Lot Intermediate Site Compliance Evaluation sheet and filed appropriately.

**CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Temporary
  - Construct temporary berm to contain spills and contaminated runoff
- Permanent
  - Provided absorbent material with posted container
  - Construct canopy to cover fueling area

**LIMITATIONS:**

- Covering the fueling area will take time and cannot be implemented immediately.
- Requires extensive regular cleanup and maintenance until covered.

## **SOP-VEHICLES – Fueling**

1. 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.  
(long term activity )
  - 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.
  
2. 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.
  
3. Clean 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 HazMat team should be notified ASAP.
  
4. Records:
  - a. Document training of employees.



**DESCRIPTION:**

Vehicles stored outdoors are exposed to rain and/or runoff and can pollute storm water. Storm water can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of vehicles can result in accidental spills and the release of materials. To prevent or reduce the discharge of pollutants to storm water, pollution prevention and source control measures must be implemented.

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Organics
- Oil & Grease

**APPROACH:**

- Whenever possible, first identify any covered areas where vehicles may be stored.
- Identify and repair leaks, connections, hoses, etc. that may release materials or fluids during storage.
- Prior to storing any vehicle outdoors for more than two weeks, wash the vehicle in designated wash areas.
- If any vehicle is to be stored outdoors for an extended period of time (i.e. being used for parts), drain all fluids from the vehicle to reduce the likelihood of leaks.
- Use drip pans under any equipment that is leaking.
- Do preventative maintenance on all vehicles and equipment.

**INSPECTION:**

- General yard inspections should be conducted monthly, unless otherwise noted in Appendix D, including inspections of stored vehicles and equipment to ensure that pollutants are being adequately contained.

**MAINTENANCE:**

- Prior to storing any vehicle, identify and repair any leaks, connections, hoses, etc. that may release materials or fluids during storage.
- Use absorbent materials and dry cleanup methods in the event of a spill or leak. **Do not hose down the contaminated area.**
- Drain all fluids from vehicles being stored and used for parts.

**TRAINING:**

- No special training is required for this BMP.
- Training as-per Appendix G.

### **DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using Intermediate Site Compliance Evaluation sheet for each department and filed appropriately.

### **CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Absorbent material with signs
- Store in covered vehicle storage area

### **LIMITATIONS:**

- It may not be possible to store all vehicles in a covered area.
- Training of employees must continually be updated.

## **SOP-VEHICLES – Vehicle and Equipment Storage**

### 1. Preparation:

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

### 2. Process:

- a. Whenever possible, store vehicles inside where floor drains have been connected to sanitary sewer system.
- 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 to collect the drip.
- e. The shop will provide a labeled location to empty and store drip pans.
- f. If any leaks are discovered, a drip pan will be used to collect the fluids and the vehicle will be scheduled for repairs.
- g. Clean up all spills using dry methods.
- h. Never store leaking vehicles over a storm drain.

### 3. Clean 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.



**DESCRIPTION:**

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to storm water runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to storm water during vehicle and equipment cleaning.

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Organics
- Oil & Grease

**APPROACH:**

- Only use designated wash areas for vehicle cleaning. The wash area should be marked with signs to show where washing should occur.
- Use dry cleanup methods before washing when possible.
- Where practical, cover wash area, and run drains to the sanitary sewer.

**INSPECTION:**

- Oil/water separators should be inspected quarterly for buildup of sediments, oils, greases, and other pollutants unless otherwise indicated in Appendix D.
- Wash area sump and drain pipe should be inspected quarterly to ensure they are draining properly unless otherwise indicated in Appendix D.

**MAINTENANCE:**

- When cleaning vehicles and equipment use dry cleanup methods in a contained area whenever possible before washing them to prevent excess material from entering the storm drain system.
- Oil/water separators should be maintained under any one or more of the following conditions:
  - When depth of sediment in separator reaches 1 foot in depth
  - When oil sheen appears
  - When floatable debris covers 50% of surface area
- Hazardous material including oil sheen should either be absorbed or pumped out of the separator and disposed of properly.
- Sump and drain pipe should be maintained according to inspection. Sump and drain pipe should be cleared of sediment and other deposits.

### **TRAINING:**

- Provide annual training on:
  - Pre cleaning using dry methods
  - Appropriate use of power washer to minimize over spray
- Other training as-per Appendix G

### **DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using the Vehicle Wash Area, Fuel Station, and Parking Lot Intermediate Site Compliance Evaluation form and filed appropriately.

### **CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Wash all vehicles indoors
- Construct large vehicle washing pad and pump to sewer

### **LIMITATIONS:**

- Long term plan to redesign and cover the wash rack area is expensive and will take some time to fully implement.
- Employing training must be continually updated.

## SOP-VEHICLES – Washing

### 1. Preparation:

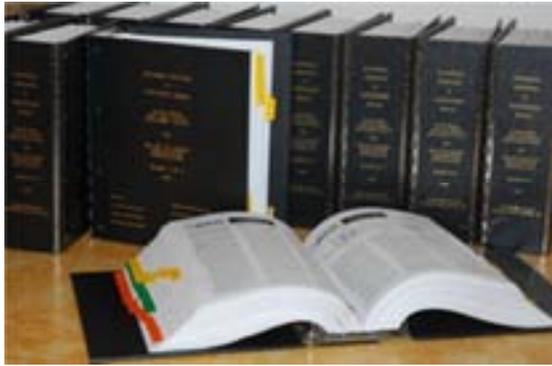
- a. Provide wash areas for small vehicles inside the maintenance building that has a drain system which is attached to the sanitary sewer system.
- b. Provide wash areas for large vehicles on an approved outside wash pad that has a drain system which is attached to the sanitary sewer system.
- c. Set up the pump in the drain box and the hoses from the pump to the sewer man hole for larger equipment.
- d. No vehicle washing will be done where the drain system is connected to the storm sewer system.

### 2. 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.  
Water Only.
- c. Use hoses with automatic shut off nozzles to minimize water usage.
- d. When washing outside the building, it is the operators' 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.

### 3. Clean 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.



**DESCRIPTION:**

Knowledge of operations and maintenance procedures plays an important role in preventing storm water pollution. Many incidents that have contributed large amounts of pollution were caused because of lack of knowledge of operations and maintenance procedures. Creating a readily available operations and maintenance manual will help prevent such incidents from occurring.

**TARGETED POLLUTANTS**

Nutrients  
 Heavy Metals  
 Toxic Materials  
 Organics  
 Oil & Grease  
 Floatables

**APPROACH:**

- Each department should have an Operations and Maintenance manual which contain the following:
  - A list of those responsible from each department and contact information
  - Detailed description of all activities the department performs and possible pollutants associated with each
  - Detailed description of best management practices used to protect against pollutants
  - List of procedures used to manage bmps

## **SOP-DPIR – Department Personnel Identification Responsibilities**

1. Fleet Maintenance, Buildings & Facilities – Dan Funk
2. Parks and Open Space – Bryan Fife
3. Roads, Parking Lots, Storm Water Collection and Conveyance, O&M, Inspections and Enforcement – Jake Meibos
4. Highways – The Utah Department of Transportation

## **SOP-VEM – Vehicle and Equipment Maintenance**

1. Where practical, perform all maintenance and repairs under cover and/or indoors.
2. Have all drains connect to the sewer via an oil/water separator.
3. Use drip pans and absorbents under or around leaky vehicles.
4. Dispose of fluids properly.

## **SOP-UOR – Used Oil Recycling**

1. Drain all used oil properly into oil pans or leak proof containers.
2. Clean up any additional oil residue with proper absorbent materials and rags.
3. Use only absorbent materials that can be disposed of through normal waste disposal practices.
4. Store used oil in approved used oil recycle container under a covered area.
5. Contract the services of a certified used oil recycle contractor for pick up and proper disposal.

<b>BMP: Detention Basin</b>	<b>DB</b>
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**DESCRIPTION:**

Detention ponds are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time to allow particles and associated pollutants to settle. They can also be used to provide flood control by including additional flood detention storage.

**TARGETED POLLUTANTS**

- Sediment
- Toxic Materials
- Organics
- Oil & Grease
- Floatables

**APPROACH:**

- Detention basins should be designed to retain water for a relatively short amount of time (i.e. 72 hours) to allow sediment and other pollutants to settle out, but prevent vector habitats from forming.
- Detention pond should be vegetated. Vegetation should be maintained regularly.
- Detention basins should be designed according to needed capacity to ensure proper containment of pollutants.

**INSPECTION:**

- Inspection of basin should be conducted quarterly, unless otherwise noted in Appendix D, and after storms to ensure drainage.
- Inspection of structural stability should be conducted quarterly, unless otherwise noted in Appendix D, to ensure water is being detained and treated as desired.
- Inspect emergency spillway annually unless otherwise noted in Appendix D.
- Inspect inlets or outlets quarterly and after storms unless otherwise noted in Appendix D.

**MAINTENANCE:**

- Maintain vegetation as deemed necessary by inspection.
- Remove materials that may block inlets or outlets as deemed necessary by inspection.
- Repair any damage to basin as deemed necessary by inspection.

**TRAINING:**

- No special training is required for this BMP.
- Other training as-per Appendix G.

**DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using the Detention Basin Intermediate Site Compliance Evaluation sheet and filed appropriately.

**CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Temporary
  - None
- Permanent
  - Build up berm along the south of the entrance to the detention basin to ensure runoff does not leave the public works site upstream of the detention basin.

**LIMITATIONS:**

- To remain effective, detention basins require regular maintenance.
- If water is not detained for an adequate amount of time, pollutants may not be effectively removed from storm water.
- Detention basins can create vector habitats.

## **SOP-STREETS/STORM DRAIN – Detention Pond Cleaning**

### 1. Preparation:

- a. Schedule the pond cleaning work for a time when dry weather is expected.
- b. Remove any sediment and trash from grates, placing it in a truck for disposal.
- c. Do a visual inspection to make sure any grates, structures, manholes, boxes, and pipes are in good working order. Remove manhole covers and grates as necessary for inspecting.
- d. Grate cleaning is done bi-weekly and before, during, and after rain events. See creek grate cleaning log for which grates to be cleaned.
- e. An overall inspection is done annually in the fall.

### 2. Process:

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

### 3. Clean-up:

- a. Take the material that was removed to the landfill for final disposal.
- b. Clean the equipment used.

### 4. Documentation:

- a. Keep a log 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.



**DESCRIPTION:**

Storm Water Monitoring is an important aspect in ensuring that BMP's are functioning effectively. Monitoring the stormwater on a regular basis will help to make sure that pollutants are being removed from the water before it enters the storm drain system. The following monitoring procedures must be followed to produce accurate results.

**TARGETED POLLUTANTS**

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Organics
- Oil & Grease
- Floatable Materials

**APPROACH:**

- Identify locations of storm water outfall from the facility.
- Identify (where possible) one individual to carry out collection and examination for the entire permit.
- A visual examination must be performed at least once quarterly during daylight hours unless there is insufficient water to produce a runoff event.
- Samples should be collected in a storm event that is greater than 0.1 inches in magnitude.
- Samples should be collected at least 72 hours from the previous measurable storm event.
- In the event that samples are unable to be collected due to adverse conditions (such as flooding, hurricane, tornadoes, electrical storms, etc.), the individual may document the reason for not performing the examination and file the documentation with visual examination records.
- When a site is inactive or unstaffed the individual is not required to conduct examinations as long as the site remains inactive or unstaffed.

**PROCEDURE:**

- In the event of a storm use the following steps:
  1. Identify all outfall locations.
  2. Collect and examine all samples from each outfall within the first 30 minutes (as practical; not to exceed 1 hour) of when water starts discharging.
  3. Note the nature of discharge (runoff or snowmelt).
  4. Find a well lit area to perform examination.
  5. Observe and document color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other indicators of pollution.
  6. Identify probable sources of any contamination found.

### **INSPECTION:**

- See Approach and Procedure Sections

### **MAINTENANCE:**

- Maintain outfall areas if needed as determined by inspections.

### **TRAINING:**

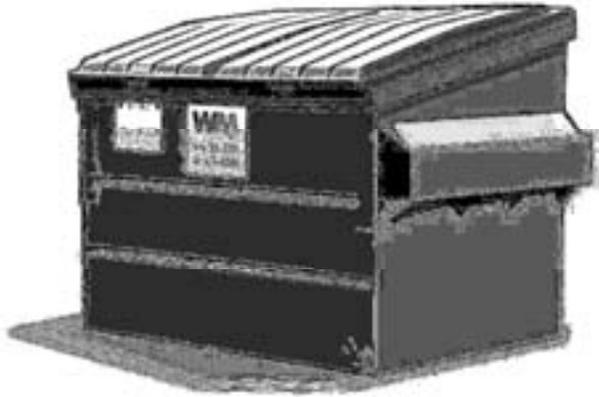
- The Importance of Protecting Water Quality
- Reporting Procedures
- Inspection Procedures
- Permit Requirements
- Training only needs to be administered to personnel in charge of conducting examinations.

### **DOCUMENTATION:**

- Monitoring should be reported using the Visual Storm Water Discharge Examination Report and filed appropriately.

### **LIMITATIONS:**

- Training of employees must continually be updated.



**DESCRIPTION:**

Building materials and other wastes must be properly managed and disposed of to reduce the risk of pollution from materials such as surplus or refuse building materials or hazardous wastes. Practices such as trash disposal, recycling, proper material handling, and spill prevention and cleanup measures can reduce the potential for stormwater runoff to mobilize wastes and contaminate surface or ground water.

**TARGETED POLLUTANTS**

Nutrients  
 Toxic Materials  
 Oxygen Demanding  
 Oil & Grease  
 Floatable Material

**APPROACH:**

- Designate an area for waste disposal that receives a minimal amount of stormwater runoff.
- Store waste in containers in a covered area or provide lids to cover the containers and keep water out in the event of a storm.
- Have a regular waste collection schedule to help prevent containers from overflowing.
- Use proper loading and unloading procedures to prevent spills.
- Schedule regular yard maintenance to keep surrounding area free of waste and debris.
- Clean up any spills upon occurrence.

**INSPECTION:**

- Inspection of waste area and containers should be performed quarterly to check for uncovered or damaged containers.
- Inspection of runoff area should be inspected quarterly to ensure pollutants are not entering the storm drain.

**MAINTENANCE:**

- Keep containers adequately covered in case of a storm event.
- Clean surrounding area according to maintenance schedule and as needed.
- Repair waste containers as deemed necessary by inspections.
- Use proper spill response procedures to clean up spills upon occurrence. Use dry cleanup procedures when necessary.

**TRAINING:**

- No special training is required.
- Other training as per Appendix G.

**DOCUMENTATION:**

- All inspections performed should be documented at the time of inspection using Site Compliance Evaluation sheet and filed appropriately.

**CONTROL IMPLEMENTATION RECOMMENDATIONS:**

- Store in covered location

**LIMITATIONS:**

- Training of employees must continually be updated.

## SOP-BUILDINGS – Dumpsters/Garbage Storage

1. Preparation:
  - a. Train employees on proper trash disposal.
    - i. Do in the annual “good housekeeping” training class
  - b. Locate dumpsters and trash cans in convenient, easily observable areas.
  - c. Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
    - i. The blue cans are for recyclable materials
  - d. 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 storm water.
    - i. All garbage cans and dumpsters have lids.
2. Process:
  - a. Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
    - i. Garbage cans and dumpsters are inspected weekly when they are dumped.
    - ii. Waste management is responsible for any repairs. 801-731-5542
  - 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.
3. Clean-up:
  - a. Keep areas around dumpsters clean of all garbage.
  - b. Have garbage bins emptied regularly to keep from overflowing.
    - i. Can and dumpsters are dumped weekly or more often as needed.
  - c. Wash out bins or dumpsters as needed to keep odors from becoming a problem.
4. Documentation:
  - a. Document training of employees. See employee training file.

## BMP: Drainage System Maintenance

HWM



### OBJECTIVES

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

### DESCRIPTION:

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter storm water runoff. The discharge of pollutants to storm water from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on/runoff.

### APPROACH:

#### **Pollution Prevention**

- Accomplish reduction in the amount of waste generated using the following source controls:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

#### **Suggested Protocols**

##### *General*

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent storm water run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Does not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.



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### TARGETED POLLUTANTS

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Subst.
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Controlling Litter**

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

**Waste Collection**

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

**Good Housekeeping**

- Use the entire product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.

**Chemical/Hazardous Wastes**

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.

**Run-on/Runoff Prevention**

- Prevent storm water run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

**Inspection**

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

**Training**

- Train staff in pollution prevention measures & proper disposal methods.
- Train employees and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Train employees and subcontractors in proper hazardous waste management.

**HWM Contin.**

**OBJECTIVES**

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution



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**TARGETED POLLUTANTS**

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- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

## HWM Contin.

### ***Spill Response and Prevention***

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

### ***Other Considerations (Limitations and Regulations)***

- Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

#### **REQUIREMENTS:**

##### ***Costs***

- Capital and O&M costs for these programs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

##### ***Maintenance***

- None except for maintaining equipment for material tracking program.

#### **SUPPLEMENTAL INFORMATION:**

##### ***Further Detail of the BMP***

###### *Land Treatment System*

Minimize runoff of polluted storm water from land application by:

- Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, and there is a closed drainage system.
- Avoiding application of waste to the site when it is raining or when the ground is saturated with water
- Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site
- Maintaining adequate barriers between the land application site and the receiving waters (planted strips are particularly good)
- Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins
- Performing routine maintenance to ensure the erosion control or site stabilization measures are working.