

**NDSU Storm Water Pollution  
Prevention Program  
Public Awareness Meeting**

**March 15, 2006**



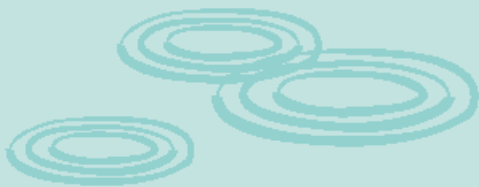
# SWPPP Awareness Meeting

- Storm Water—What's the Issue?
- Reasons for Concern
- Conceptions and Misconceptions
- Framework of the NDSU SWPPP
- Practical Examples
- Opportunity for Input



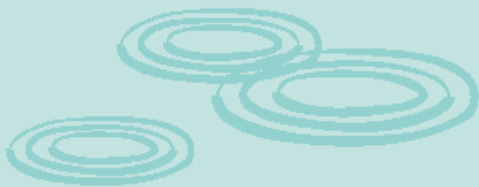
# Storm Water Runoff Definition

Storm water runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like parking lots, driveways, sidewalks, and streets prevent storm water from naturally soaking into the ground.



# Is Storm Water Runoff an Issue?

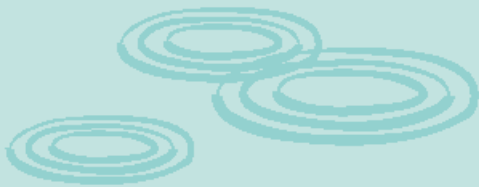
Storm water picks up debris, chemicals, dirt and other pollutants and ultimately will flow into a lake, stream, wetland, river, etc.



# The Effects of Pollution

## Polluted Runoff Adverse Impact Examples

- Drinking Water Sources
- Household Waste
- Nutrient Excess
- Sediment
- Bacteria
- Debris



# Reasons for Our Concern

- Federal Regulations
- State Permitting
- “It’s the right thing to do...”
  - Maintains Watershed Integrity
  - Ensures Longevity to Life of Receiving Streams



# Federal/State Regulations

- Clean Water Act (CWA) of 1972
  - Prohibits the discharge of any pollutant from a point source into a U.S. body of water unless that discharge is authorized by a NPDES permit
  - Phase I—1990 Large industries and MS4s
  - Phase II—1999 All MS4s (pop. < 100,000)
    - Present permit cycle 2003-2007



# Federal/State Regulations

## Phase II Timeline

- Date and Deadline
  - December 8, 1999—Phase II Rule Published
  - December 9, 2002—General Permits Issued
  - March 10, 2003—Permit Application Due
  - March 10, 2008—First Five Year Cycle, Permit Fully Implemented (December 31, 2007)





# Conceptions/Misconceptions

## Misconception:

Storm water runoff is natural and harmless because it consists of just rainwater.



## Where the Logic Fails:

The rain is not to blame for the problems caused by storm water runoff. Indeed, rainfall is natural and harmless, but the pollution that contaminates it during its journey over roads, parking lots, buildings and other urban structures is not.

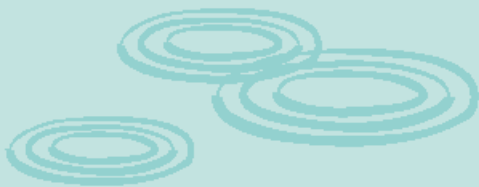
# Conceptions/Misconceptions

## Misconception :

Urban storm water discharges cause no significant harm to our lakes, rivers and oceans.

## Where the Logic Fails:

Urban storm water is one of the most significant sources of pollution in our nation's rivers, lakes and estuaries.



# Conceptions/Misconceptions

## Misconception :

Industrial sources pose a much greater pollution threat than urban storm water discharges.



## Where the Logic Fails:

Storm water runoff rivals or exceeds discharges from factories and sewage plants as a source of pollution throughout the United States.



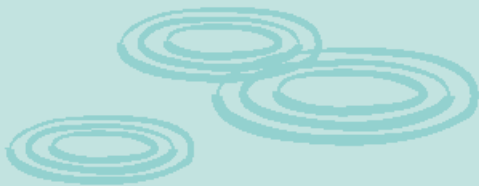
# Conceptions/Misconceptions

## Misconception :

Local governments cannot afford to pay the astronomical rates to implement even minimal measures to control pollution from storm water runoff.

## Where the Logic Fails:

Storm water management is not free, but neither is its price tag astronomical. Many workable and effective storm water management measures are affordable and within the bounds of existing municipal budgets.



# Conceptions/Misconceptions

## Misconception :

No real technical or management solutions exist to solve storm water problems.



## Where the Logic Fails:

Because humans create urban storm water pollution, humans can reduce or prevent it through responsible, efficient urban design, public works, pollution prevention, and homeowner practices.



# Phase II Rule / SWPPP Basics

The Phase II Rule defined the Storm Water Management Program as consisting of six Minimum Control Measures (MCMs), each of which had associated Best Management Practices (BMPs)



# Phase II Rule / SWPPP Basics

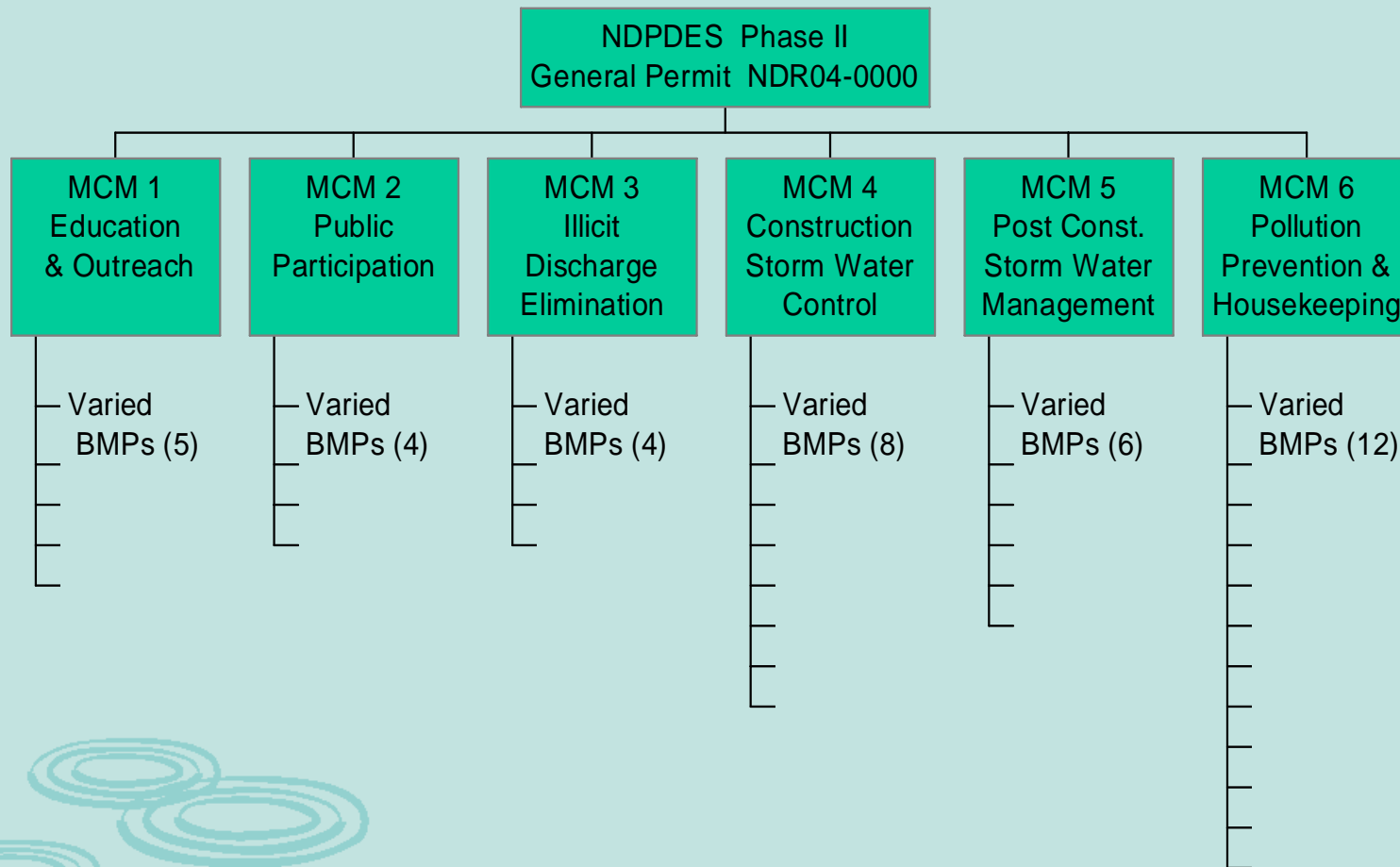
## Acronyms—MCM & BMP

An MCM is a portion of the Storm Water Pollution Prevention Program dealing with a specific goal, i.e. public education, or construction site issues.

A BMP is a specific method used to prevent or control storm water runoff and the discharge of pollutants, including sediment, into local water bodies.



# Hierarchy of Phase II Rule

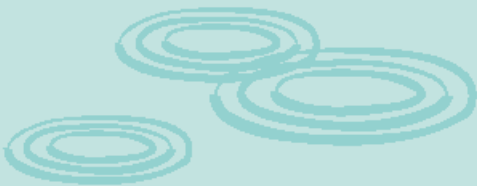




# Phase II Rule / SWPPP Basics

## SWPPP—Contains Six Distinct MCMs

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post Construction Runoff Control
6. Pollution Prevention & Good Housekeeping



# NDSU SWPPP MCM 1 BMPs

## 1. Public Education and Outreach

- Storm Water Related Public Education Program
- Classroom Presentation Programs
- Household Hazardous Waste Collection Program
- Partnership Outreach Through Public Education
- Annual Public Meeting



# NDSU SWPPP MCM 2 BMPs

## 2. Public Participation and Involvement

- Annual Campus-wide Student Litter Cleanup Program
- Student Adopt-A-Parking Lot Campaign
- University Information Line
- Plans for Public Input and Opinion/Public Information Meeting



# NDSU SWPPP MCM 3 BMPs

## 3. Illicit Discharge Detection and Elimination

- Storm Water Conveyance Map
- Illicit Discharge Detection, Identification and Elimination Program
- Illicit Discharge Detection and Enforcement Program
- Educational Outreach Program



# NDSU SWPPP MCM 4 BMPs

## 4. Construction Site (CS) Runoff Control

- Regulatory Mechanisms for Erosion Control
- Erosion Controls for Construction Site Operators
- Requirements for CS Operators Waste Control
- Construction Site Plan Reviews
- CS Inspection and Enforcement Procedures
- Information Submitted by Public
- Educational Outreach Program
- Operation of a Construction Site



# NDSU SWPPP MCM 5 BMPs

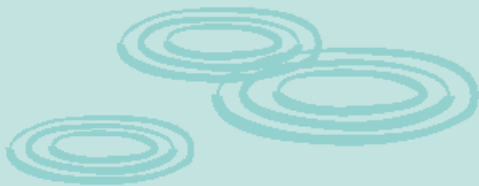
5. Post Construction Runoff Control
  - Storm Water Detention Requirements
  - Vegetative Practices Program
  - Long-Term BMP Inspection and Maintenance
  - Regulatory Mechanisms for Post Construction Runoff Control
  - Design Standards Program
  - Educational Outreach Program



# NDSU SWPPP MCM 6 BMPs

## 6. Pollution Prevention/Good Housekeeping

- Parking Lot and Street-Cleaning
- Storm Water Conveyance System Cleaning
- Vehicle Maintenance Facility/Procedures
- Illegal Dumping Control
- Hazardous Materials and Used Oil Programs
- Road Sand Application / Snow Removal
- Educational Outreach



# Example Sheet of Annual Report

**North Dakota National Pollutant Discharge Elimination System General Permit NDR04-0000  
North Dakota State University - Phase II MS4 SWPPP Best Management Practices  
2004 Permit Year Annual Report**

**Minimum Control Measure 1 - PUBLIC EDUCATION AND OUTREACH**

SWPPP SECTION	BMP DESCRIPTION	GOALS EXPECTED DURING THE 2004 PERMIT YEAR	GOALS ACCOMPLISHED DURING THE 2004 PERMIT YEAR	ASSESS BMP APPROPRIATENESS	BMP MODIFICATIONS OR DEVIATIONS FROM PREVIOUS YEAR'S GOALS	PUBLIC INPUT RECEIVED OR IMPLEMENTED DURING THE 2004 PERMIT YEAR	GOALS EXPECTED DURING THE 2005 PERMIT YEAR
1.III.A	<b>STORM WATER RELATED PUBLIC EDUCATION PROGRAM</b>	FURTHER DEVELOP STORM WATER WEBSITE FOR NDSU OSEH WEBSITE ADDRESSING ISSUES IDENTIFIED IN YEAR 1. DEVELOP A STORM WATER EDUCATIONAL MESSAGE USING OTHER RESOURCES	- WEB PAGE, UP AND RUNNING (WILL BE UPDATED SOON). HTTP://FACILITIES-MGMT.NDSU.NODAK.EDU/OSEH/NDUSA/FETY/OFFICER/HOME/PAGE.HTM  JOINED STUDENT ENVIRONMENTAL GROUP SEAC, STUDENT ENVIRONMENTAL ADVISORY COUNCIL, AS AN ADVISOR. WILL HAVE COMBINED EFFORT FOR "ADOPT	THE BMP FOR PUBLIC EDUCATION AND OUTREACH IS APPROPRIATE FOR OUR GOALS. THE CONTINUANCE OF THE OUTREACH WILL BE ENHANCED BY THE EDUCATIONAL/ACADEMIC PARTNERSHIPS DEVELOPED.	NONE	NONE	CONTINUE TO INVESTIGATE PARTNERSHIPS WITH OTHER NON-CITY ENTITIES
1.III.B	<b>CLASSROOM PRESENTATION PROGRAMS</b>	DEVELOP THE STORM WATER RELATED INFORMATION TO INCLUDE IN CLASSROOM PRESENTATIONS	WORK IN PROGRESS	BMP IS SUITED FOR THE INTENDED PURPOSE.			DEVELOP THE STORM WATER RELATED INFORMATION TO INCLUDE IN CLASSROOM PRESENTATIONS
1.III.C	<b>HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM</b>	DEVELOP THE HOUSEHOLD WASTE COLLECTION INFORMATION PROGRAM TO COINCIDE WITH THE CITY OF FARGO.	CONTINUED INVESTIGATION	BMP IS SUITED FOR THE INTENDED PURPOSE.			DEVELOP THE HOUSEHOLD WASTE COLLECTION INFORMATION PROGRAM TO COINCIDE WITH THE CITY OF FARGO.
1.III.D	<b>PARTNERSHIP OUTREACH THROUGH PUBLIC EDUCATION</b>	CONTINUE TO INVESTIGATE PARTNERSHIPS WITH OTHER NON-CITY ENTITIES	JOINED STUDENT ENVIRONMENTAL GROUP SEAC, STUDENT ENVIRONMENTAL ADVISORY COUNCIL, AS AN ADVISOR. WILL HAVE COMBINED EFFORT FOR "ADOPT A PARKING LOT" PROGRAM AND CONTEST FOR ILLICIT DISCHARGE TEMPLATE. STUDENTS WILL BE INVOLVED IN MARKING STORM DRAINS..	BMP IS SUITED FOR THE INTENDED PURPOSE.			CONTINUE TO INVESTIGATE PARTNERSHIPS WITH OTHER NON-CITY ENTITIES
1.III.E	<b>ANNUAL PUBLIC MEETING</b>	REVIEW/PRESENT PAST YEAR'S PERMIT ACCOMPLISHMENTS BY END OF MAR 2004; SUBMIT ANNUAL REPORT TO PRIMACY	ANNUAL PUBLIC MEETINGS HELD ON MARCH 10 AND 11, 2005, MEMORIAL UNION, CENTURY THEATER, 11:00-2:00	BMP IS SUITED FOR THE INTENDED PURPOSE.			REVIEW/PRESENT PAST YEAR'S PERMIT ACCOMPLISHMENTS BY END OF MAR 2006; SUBMIT ANNUAL REPORT TO PRIMACY



# Practical Examples of BMPs for Storm Water Pollution Control

- Recycling & Education
- Lawn Care & Landscaping
- Septic Systems
- Pet Waste
- Auto Care
- Commercial Endeavors
- Agricultural Practice



# Storm Water Pollution Solutions

## *Recycling & Disposal*

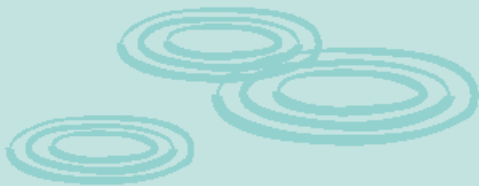
Properly dispose or recycle household products, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into the storm drains.



# Storm Water Pollution Solutions

## *Education*

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local water body.



# Storm Water Pollution Solutions

## *Lawn Care*

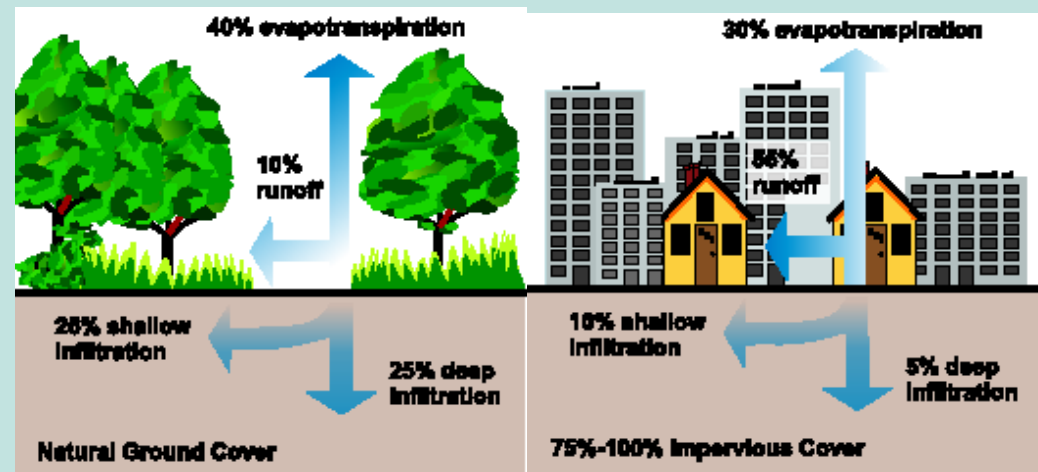
Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.



# Storm Water Pollution Solutions

## *Residential Landscaping*

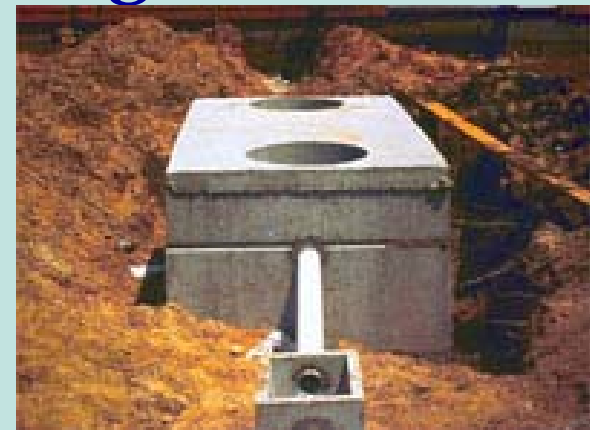
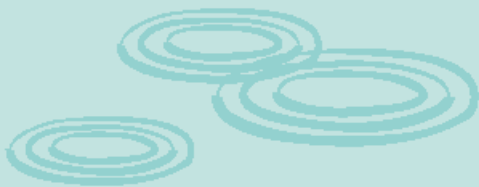
Planning options exist for storm water retention and detention.



# Storm Water Pollution Solutions

## *Septic Systems*

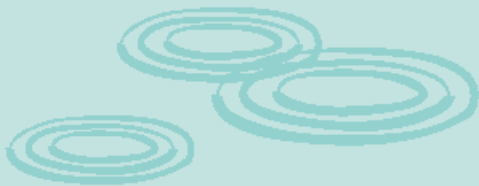
Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by storm water and discharged into nearby water bodies.



# Storm Water Pollution Solutions

## *Pet Waste*

Pet waste can be a major source of bacteria and excess nutrients in local waters.



# Storm Water Pollution Solutions

## *Auto Care*

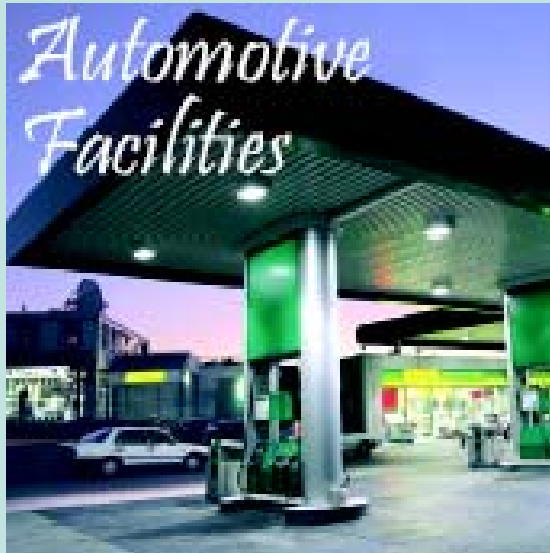
Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a water body.



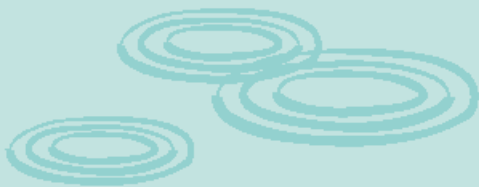


# Storm Water Pollution Solutions

## *Commercial Endeavors*



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil and other harmful fluids that can be picked up by storm water.



# Storm Water Pollution Solutions

## *Agriculture*

Lack of vegetation on stream banks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local water bodies.



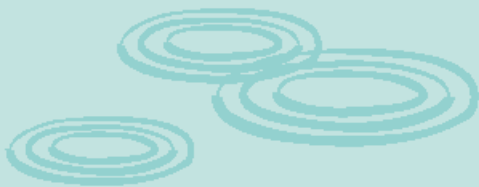
Excess fertilizers and pesticides can poison aquatic animals and lead to algae blooms. Livestock in streams can contaminate waterways.

# Storm Water Pollution Solutions

## *Construction*



Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the storm water system. Construction vehicles can leak fuel, oil and other harmful fluids that can ultimately be deposited in local water bodies.



# Practical Examples of Storm Water Pollution Control

- Construction Industry
  - Protect Natural Features
  - Vegetative Buffers
  - Site Stabilization
  - Storm Drain Inlet Protection
  - Dirt Stockpiles
  - Slopes
  - Construction Entrances
  - Construction Phasing
  - Silt Fencing



# Protect Natural Features

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.



# Protect Natural Features



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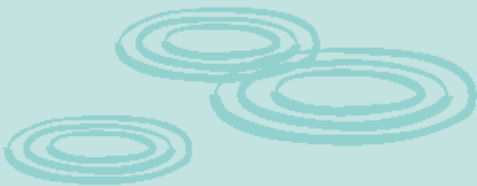


**Good**



# Vegetative Buffers

- Protect and install vegetative buffers along water bodies to slow and filter storm water runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.



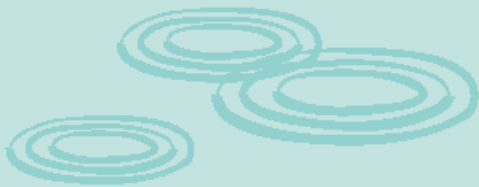
# Vegetative Buffers



**Bad**



**Good**





# Site Stabilization

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.



# Site Stabilization



**Bad**



**Good**



# Storm Drain Inlet Protection

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.



# Storm Drain Inlet Protection



**Bad**

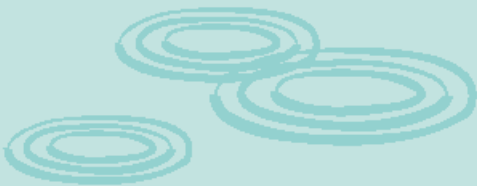


**Good**



# Dirt Stockpiles

- Cover or seed all dirt stockpiles



# Dirt Stockpiles



**Bad**



**Good**



# Slopes

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, or under drain, or divert storm water away from slopes.



# Slopes



**Bad**



**Good**





# Construction Entrances

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.



**Stabilized construction entrances allow dirt to be removed from tire treads and collected as trucks leave construction sites**



# Construction Entrances



**Bad**

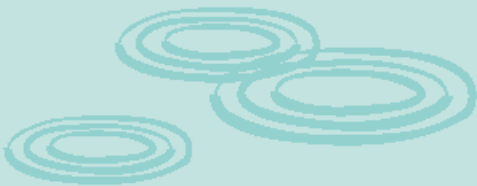


**Good**



# Construction Phasing

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.



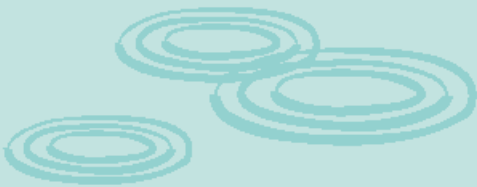
# Construction Phasing



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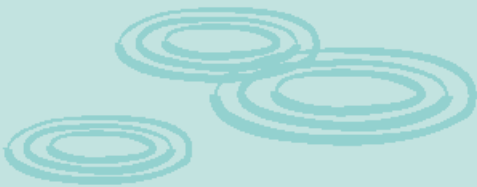


**Good**



# Silt Fencing

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure storm water is not flowing around the silt fence.



# Silt Fencing



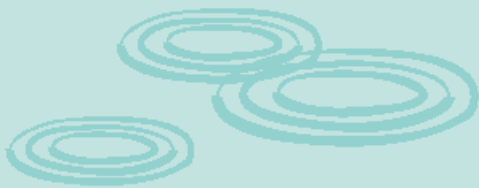
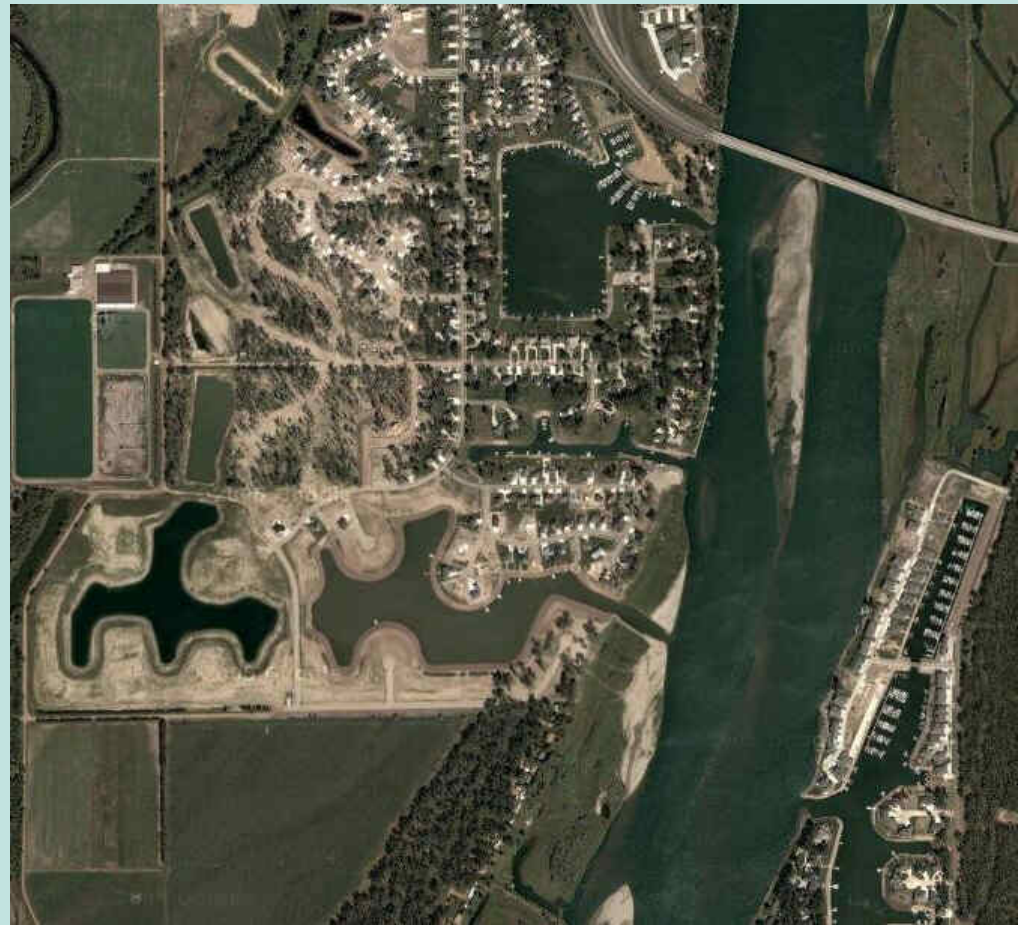
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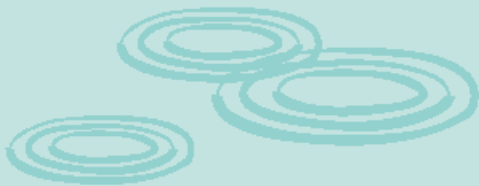


# Silting Example, Mandan, ND



# NDSU Storm Water Committee

<b>Name</b>	<b>Department</b>
Bob Barclay	Facilities Management
Malcolm Butler	Biological Sciences
Mike Borr	University Police and Safety Office
Gerald Erickson	AES Main Station Fargo
Bruce Frantz	Facilities Management
LeRoy Grosz	Facilities Management
Wei Lin	Civil/Industrial Engineering
Kevin Matheson	AES Administration





**Opportunity for Input...**  
**Comments/Questions ??**

