



# Introduction to Stormwater Permitting



# Agenda

- I. Introduction**
- II. Required Permitting**
- III. Stormwater Pollution Prevention Plans (SWPPP)**
- IV. Best Management Practices (BMP)**
- V. Conclusion**



# Introduction



- **What is Stormwater ?**
  - **Runoff that is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground.**
  - **EPA Definition – Stormwater runoff, snow melt runoff, and surface runoff and drainage. (§ 122.26(b)(13) )**
  - **Runoff can accumulate debris, chemicals, sediment or other pollutants that could adversely affect water quality if discharged untreated.**
  - **Stormwater discharges are considered point sources and require coverage under an National Pollutant Discharge Elimination System (NPDES) permit**

# Introduction

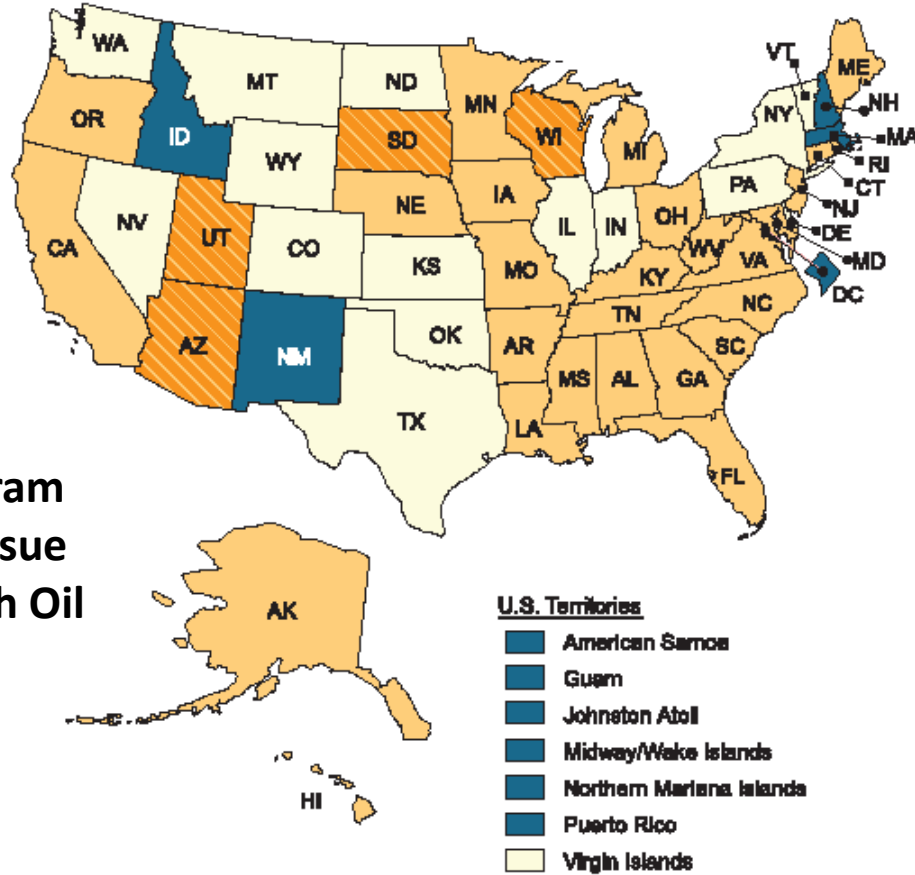
- **Why is stormwater runoff a concern?**
  - **Leading cause of U.S. Water Body Impairment (40% of those surveyed)**
  - **Polluted runoff is discharged, often untreated, directly into local water bodies.**
  - **When left uncontrolled, this water pollution can result**
    - **in the destruction of fish, wildlife, and aquatic life habitats;**
    - **a loss in aesthetic value;**
    - **and threats to public health due to contaminated food, drinking water supplies, and recreational waterways.**

# Required Permitting

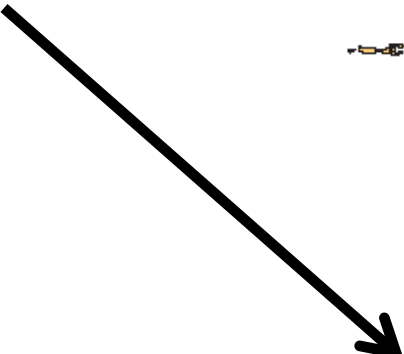
## Federal Clean Water Act (CWA, 1972)



- Point discharges of pollutants to waters of the United States are effectively prohibited, unless discharge is in compliance with a NPDES (National Pollutant Discharge Elimination System) permit.
- In 1987 CWA amended for regulating municipal and industrial stormwater discharges.
- In 1990 US EPA authorizes U.S. states to regulate stormwater discharges.

# State NPDES Program Authority



Partially Authorized –  
 Limitations to the Program  
 Ex. – TX & OK Cannot Issue  
 Permits Associated With Oil  
 and Gas



State NPDES Program Status	
	Fully authorized
	Fully authorized, including an approved biosolids program
	Partially authorized
	Unauthorized

# Permitting Authority

- **Most States are Authorized to oversee stormwater program**
  - 46 States Authorized
  - Permits are Issued by the State
- **States Under Federal Control**
  - Massachusetts
  - New Hampshire
  - Idaho
  - New Mexico
  - Washington, D. C.
  - U. S. Territories
- **Local Erosion & Sediment Control Permits could be required in addition to the above requirements by city or county agency**



## Permits are Required for ...

# Municipal Separate Storm Sewer Systems (MS4s) (not covering today)





# Construction Sites



# Industrial - Landfills/Land Application



# Industrial - Transfer Stations



# Industrial - Material Recovery Facilities

MATERIALS RECOVERY FACILITY



# Industrial - Recycling Operations



# Industrial - Waste-To-Energy Facilities



# When Do I Need a Permit?

- **All Solid Waste Facilities Require Stormwater Permits During Construction – Construction General Permit**
- **Landfills, Transfer Stations, Material Recovery Facilities, Waste-To-Energy Facilities and Recycling Operations are Industrial Facilities – Require Industrial Permit**

# When Do I Need a Permit? (cont'd.)

- **Landfills are Industrial Facilities – Require Industrial Permit**
  - **Landfills are also Long Term Construction Projects**
    - **New Cell Construction**
    - **Partial Closure Operations**
    - **Infrastructure Construction**
    - **Construction**
- 



# Who Gives the Permit

- **The General Permits Under Discussion are Federal**
- **As Mentioned Previously, 46 States Issue Stormwater Permits**
  - States Required to Comply with Federal Requirements
  - Same Categories for Compliance
  - Some Details Vary Between States
- **Local Government Stormwater Permits are Specific**
  - Erosion and Sediment Control Plans
  - Land Disturbance Permits

# Different Paths

- **Different Permits are Required for Different Situations**
- **Construction General Permit (CGP) – For Construction Activity**
- **Industrial Facility – Permanent Facility**

# CGP Requirements

- Updated February 16, 2012
- Required for Construction Activities with Land Disturbance > 1 acre
- Cannot avoid by Phasing Work in < 1 acre increments
- Obtained by General Contractor and/or Owner



# Industrial Facilities – Options

- **Individual Wastewater Discharge Permit (no one wants)**
- **No Exposure Certification (NEC)**
  - All industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.
  - Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products.
  - Exemption available if impossible to discharge stormwater
- **Multi-Sector General Permit (MSGP)(State General Permit?)**
  - 2008 MSGP became effective January 5, 2009
  - Covers groups of businesses that conduct similar operations
  - Less complicated and less expensive than Individual Permit
  - All MSGP requirements must be met or Individual Permit required

# MSGP Implementation

- Fact Sheets are available for each Sector
- Sector Determined by Standard Industrial Classification code or SIC code
- Primary SIC code categorizes the highest net revenue generating activity at the site



**INDUSTRIAL STORMWATER**  
FACT SHEET SERIES

Sector 1: Landfills and Land Application Sites

U.S. EPA Office of Water  
EPA-823-G-06-G17  
December 2006

**What is the NPDES stormwater permitting program for industrial activity?**

Activities, such as material handling and storage, equipment maintenance and cleaning, industrial processing or other operations that occur at industrial facilities are often exposed to stormwater. The runoff from these areas may discharge pollutants directly into nearby waterbodies or indirectly via storm sewer systems, thereby degrading water quality.

In 1990, the U.S. Environmental Protection Agency (EPA) developed permitting regulations under the National Pollutant Discharge Elimination System (NPDES) to control stormwater discharges associated with eleven categories of industrial activity. As a result, NPDES permitting authorities, which may be either EPA or a state environmental agency, issue stormwater permits to control runoff from these industrial facilities.

**What types of industrial facilities are required to obtain permit coverage?**

This fact sheet specifically discusses stormwater discharges from landfills and land application sites. Facilities and products in this group fall under the following categories, all of which require coverage under an industrial stormwater permit:

- Landfills
- Land application sites
- Open dumps that receive or have received industrial waste

These include sites subject to regulation under Subtitle D of the Resource Conservation and Recovery Act (RCRA) including municipal solid waste landfills (MSWLFs), industrial solid nonhazardous waste landfills, and industrial waste land application sites.

**What does an industrial stormwater permit require?**

Common requirements for coverage under an industrial stormwater permit include development of a written stormwater pollution prevention plan (SWPPP), implementation of control measures, and submittal of a request for permit coverage, usually referred to as the Notice of Intent or NOI. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at your facility to minimize the discharge of these pollutants in runoff from the site. These control measures include site-specific best management practices (BMPs), maintenance plans, inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site. The industrial stormwater permit also requires collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of implemented BMPs. For more information on EPA's industrial stormwater permit and links to state stormwater permits, go to [www.epa.gov/npdes/stormwater](http://www.epa.gov/npdes/stormwater) and click on "Industrial Activity."

# Sectors for Solid Waste Facilities

<b>Facility</b>	<b>SIC Code</b>	<b>Sector</b>
<b>Landfill</b>	<b>4953</b>	<b>L</b>
<b>Transfer Station</b>	<b>4212</b>	<b>P</b>
<b>Material Recovery Facility (MRF)</b>	<b>4953/5093</b>	<b>N</b>
<b>Recycling Operation</b>	<b>5093</b>	<b>N</b>

# Common Requirement

- **NPDES General Permits are Required for**
  - **Municipal (Not Covering Today – Not Related to Solid Waste Facilities)**
  - **Construction (CGP)**
  - **Industrial Facility**
- **There are different requirements for each General Permit – One thing they all require ...**

**Stormwater Pollution Prevention Plan  
(SWPPP)**

**We Need  
a Plan!**





**Some Plans are Quite Comprehensive**



# Some Plans are Quite Creative



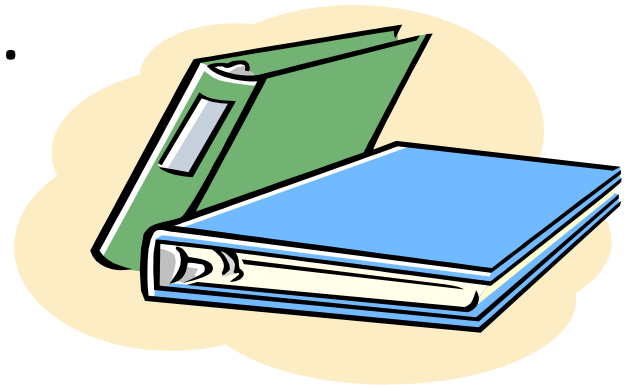
# No Plan Means Big Trouble



# What is a SWPPP?

**A SWPPP is a site-specific, written document that:**

- **Identifies potential sources of stormwater pollution;**
- **Describes stormwater control measures that are used to reduce or eliminate pollutants in stormwater discharges; and**
- **Identifies procedures that will be used to comply with the terms and conditions of the general stormwater permit.**
- **Developed to address the specific conditions at your site**
- **Keep up-to-date to reflect changes at your site both for your use and for review by the regulatory agencies responsible for overseeing your permit compliance.**



# CGP Procedures



- **Prepare a SWPPP for the Construction Activity**
  - Keep at Facility for Regulatory Inspection  
(Not submitted to Agency)
- **Submit a Notice of Intent (NOI)**
  - Notifies the regulatory authority of your intent to cover the project under the general permit
  - Minimum 14 Calendar Days Prior to Start of Construction
- **Construct Improvements as detailed in the SWPPP**
  - Conduct required inspections
  - Prepare specified reports
- **Submit a Notice of Termination (NOT)**
  - Construction Completed
  - Disturbed Areas Stabilized (70% Vegetative Cover on Non-paved Areas)
  - Keep records for Three (3) years after the Notice of Termination

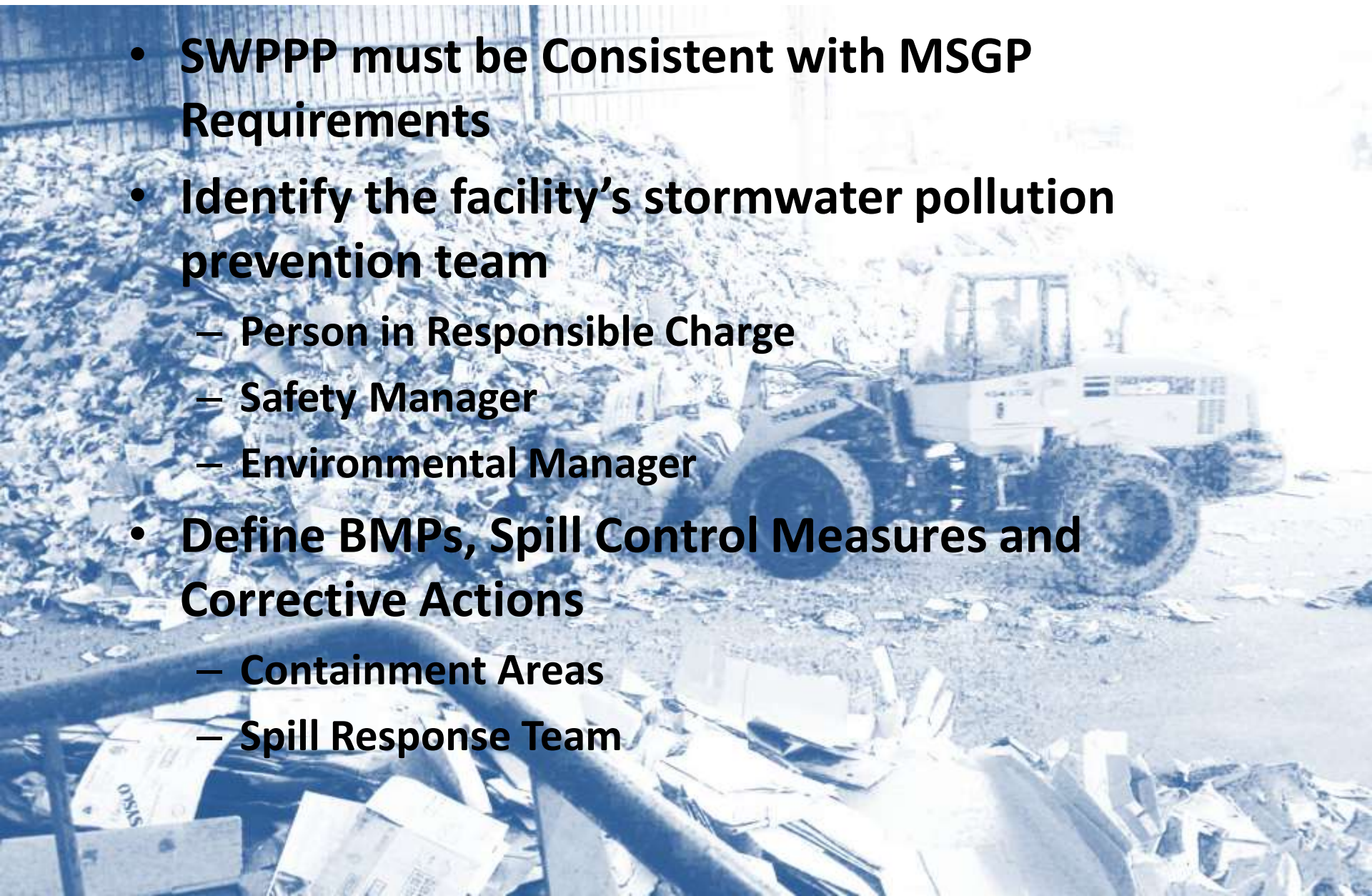
# Construction SWPPP

- **Description of Project & Potential Impacts**
    - Impaired Streams
    - Wetlands
    - Endangered Species
  - **Details on Best Management Practices (BMP) to be used**
    - Physical Controls (Ponds, silt fence, hay bales, matting, etc)
    - Housekeeping
    - Spill Prevention
- 
- A photograph of a calm stream flowing through a grassy field with trees in the background. The stream is in the foreground, reflecting the sky and the surrounding greenery. The background shows a line of trees under a bright sky. The overall scene is a natural, outdoor setting.

# Construction SWPPP

- **Site Plan (Pre & Post Construction)**
  - **Inspection & Reporting Requirements**
    - **Once/ week or Once/two weeks & within 24 hours of ½ “ rain event**
    - **Disturbed Areas, Material Storage/Stockpiles, Site Entrance/Exit, etc.**
  - **Certification – Applicant & Contractor**
- 

# Prepare Industrial Facility SWPPP

- **SWPPP must be Consistent with MSGP Requirements**
  - **Identify the facility's stormwater pollution prevention team**
    - **Person in Responsible Charge**
    - **Safety Manager**
    - **Environmental Manager**
  - **Define BMPs, Spill Control Measures and Corrective Actions**
    - **Containment Areas**
    - **Spill Response Team**
- 
- A blue-tinted photograph of an industrial facility. In the foreground, there is a large pile of debris, including cardboard boxes and other waste. In the background, a white front loader is parked on a paved area. The overall scene suggests a waste management or recycling facility.



# Industrial Facility SWPPP (cont'd.)

- **Minimum of Quarterly Visual Inspections (Monthly possible)**
  - Monitor permitted outfall(s) from the facility
- **Comprehensive Site Inspection Annually**
  - Inspect Stormwater Collection System
  - Inspect Containment Areas/Storage Areas
  - Inspect Discharge Structures/Outfalls
  - Assess Spill Response Equipment
  - Assess Adequacy of the Current SWPPP

# Industrial Facility SWPPP (cont)

- **Include Benchmark Monitoring**
- **Include Effluent Limitation Monitoring (Part 8 required testing)**
- **Specify Preparation & Submittal of Required Reports**
  - Annual Report
  - Monitoring Data
  - Exceedance Report
- **Annual Training Requirements**
- **Specific Sector Requirements**
- **Other MSGP or State-Issued Requirements**



**When SWPPP is Completed/In Place  
Submit NOI for Coverage Under the MSGP**

# Excerpt from MSGP Part 8

## Sector L - Landfills

### 8.L.9 Sector-Specific Benchmarks

Table 8.L-1 identifies benchmarks that apply to the specific subsectors of Sector L. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table 8.L-1.		
Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration <sup>1</sup>
<b>Subsector L1.</b> All Landfill, Land Application Sites and Open Dumps (Industrial Activity Code "LF")	Total Suspended Solids (TSS)	100 mg/L
<b>Subsector L2.</b> All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60 (Industrial Activity Code "LF")	Total Iron	1.0 mg/L

<sup>1</sup>Benchmark monitoring required only for discharges not subject to effluent limitations in 40 CFR Part 445 Subpart B (see Table L-2 above).

# Excerpt from MSGP Part 8 (cont)

## 8.L.10. Effluent Limitations Based on Effluent Limitations Guidelines (See also Part 6.2.2.1 of the permit.)

Table 8.L-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Industrial Activity	Parameter	Effluent Limit
Discharges from non-hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart B.	Biochemical Oxygen Demand (BOD <sub>5</sub> )	140 mg/L, daily maximum
		37 mg/L, monthly avg. maximum
	Total Suspended Solids (TSS)	88 mg/L, daily maximum
		27 mg/L, monthly avg. maximum
	Ammonia	10 mg/L, daily maximum
		4.9 mg/L, monthly avg. maximum
	Alpha Terpineol	0.033 mg/L, daily maximum
		0.016 mg/L monthly avg. maximum
	Benzoic Acid	0.12 mg/L, daily maximum
		0.071 mg/L, monthly avg. maximum
	p-Cresol	0.025 mg/L, daily maximum
		0.014 mg/L, monthly avg. maximum
	Phenol	0.026 mg/L, daily maximum
0.015 mg/L, monthly avg. maximum		
Total Zinc	0.20 mg/L, daily maximum	
	0.11 mg/L, monthly avg. maximum	
pH	Within the range of 6-9 standard pH units (s.u.)	

<sup>1</sup> Monitor annually. As set forth at 40 CFR Part 445 Subpart B, these numeric limitations apply to contaminated stormwater discharges from MSWLFs that have not been closed in accordance with 40 CFR 258.60, and to contaminated stormwater discharges from those landfills that are subject to the provisions of 40 CFR Part 257 except for discharges from any of the following facilities:

- landfills operated in conjunction with other industrial or commercial operations, when the landfill receives only wastes generated by the industrial or commercial operation directly associated with the landfill;
- landfills operated in conjunction with other industrial or commercial operations, when the landfill receives wastes generated by the industrial or commercial operation directly associated with the landfill and also receives other wastes, provided that the other wastes received for disposal are generated by a facility that is subject to the same provisions in 40 CFR Subchapter N as the industrial or commercial operation, or that the other wastes received are of similar nature to the wastes generated by the industrial or commercial operation;
- landfills operated in conjunction with CWT facilities subject to 40 CFR Part 437, so long as the CWT facility commingles the landfill wastewater with other non-landfill wastewater for discharge. A landfill directly associated with a CWT facility is subject to this part if the CWT facility discharges landfill wastewater separately from other CWT wastewater or commingles the wastewater from its landfill only with wastewater from other landfills; or
- landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes from public service activities, so long as the company owning the landfill does not receive a fee or other remuneration for the disposal service.

# Sampling a Representative Rain Event

- **Measurable Storm Event – Results in discharge from site**
- **Occurs at least 72 hours from the last Measurable Storm Event**
- **Sample must be taken within the first 30 minutes of discharge (varies from state to state)**

**What can you do to keep a solid waste facility compliant?**

**Best Management Practices (BMP)**



# Permit Summary

- **Permit Required for Construction Activity and Industrial Facilities**
- **Prepare SWPPP for the Site (Keep at Facility)**
  - Description of Potential Impacts
  - BMPs to be Utilized
  - Detail Inspections, Sampling and Reports
  - Training and Sector Specific Requirements
- **Submit NOI for Coverage Under the General Permit (CGP or MSGP)**
- **Install/Maintain BMPs as detailed in the SWPPP**
- **Conduct Inspections and Submit Reports as directed in the SWPPP**
- **For CGP, Submit NOT After Construction Completed/Disturbed Areas Stabilized**

# **Best Management Practices (BMP)**

- **Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants.**
- **Also includes treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.**

# These Folks Know How to Use a Broom





# Best Management Practices (BMP)

- Housekeeping
- Materials Management



# BMPs – Erosion Control

Slope Maintenance – Establish and maintain good vegetative cover on disturbed areas. Spot seed as necessary. Some slopes may require a reinforcement matting to hold soil, seed and fertilizer in place until germination.



# BMPs – Erosion Control

**Reinforcement Matting – Permanent erosion control solutions on closed slopes and in channels where desired performance exceeds the limits of natural vegetation. Matting helps accelerate vegetative establishment and then anchors the mature plants to the soil.**



# BMPs – Erosion Control

## Reinforcement Matting/Channel Lining

- Reinforces Soil and Hold in Place While Grass Lining is Established.
- Remains in Place to Anchor Vegetation
- Wood – Straw Blankets – Biodegradable
- Polypropylene – Permanent Soil/Vegetation Reinforcement



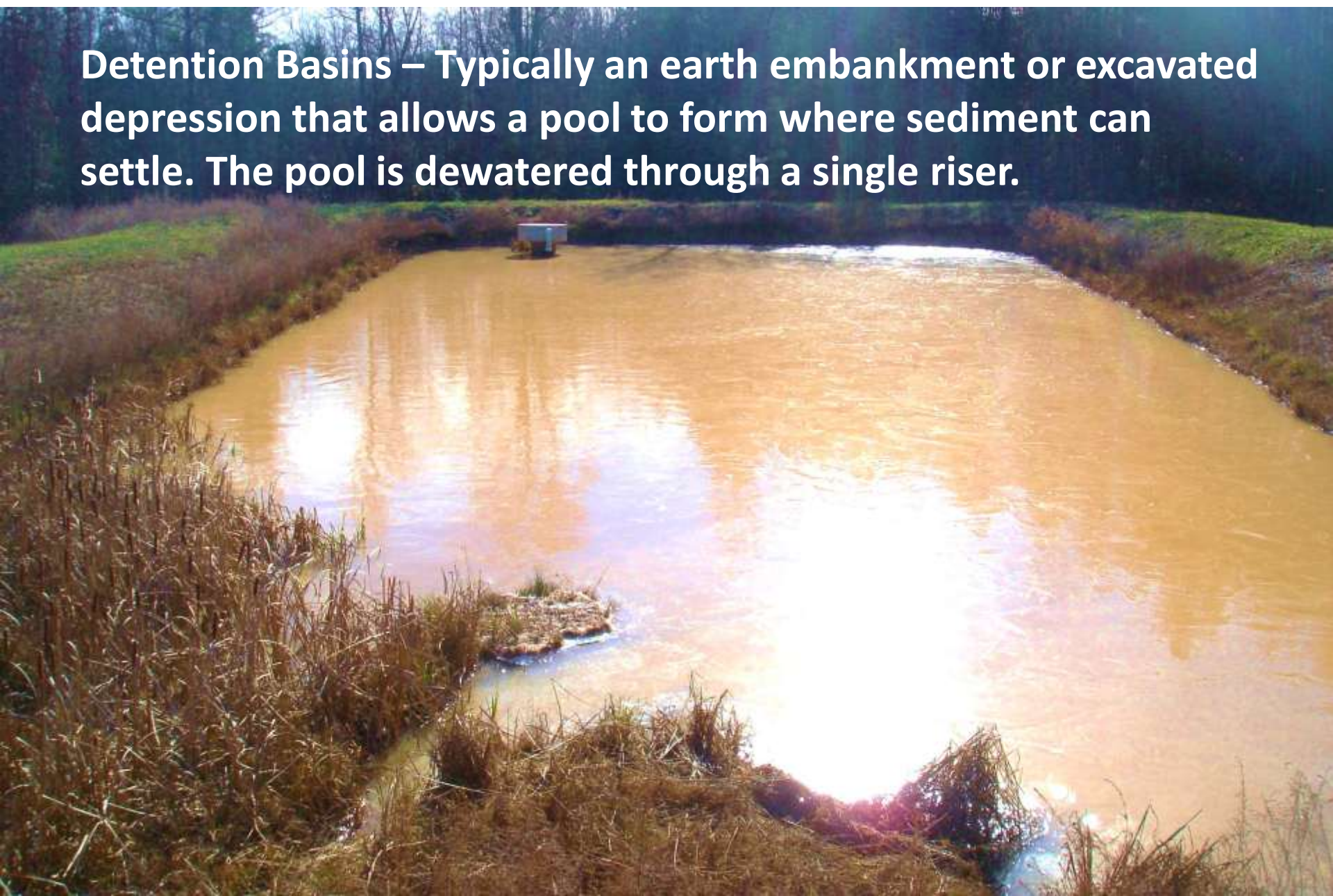
# BMPs – Erosion Control

**Rip Rap Channel Lining – Placing stone in a diversion channel will prevent runoff from eroding the channel bed. Stone must be adequately sized to resist movement under design flows. Revetment mattresses can also be used to armor a channel.**



# BMPs – Sediment Control Structures

**Detention Basins – Typically an earth embankment or excavated depression that allows a pool to form where sediment can settle. The pool is dewatered through a single riser.**



# BMPs – Sediment Control Features

**Check Dams** - Relatively small, temporary structures constructed across a swale or channel. Slow the velocity of concentrated water flows, a practice that helps reduce erosion of the channel. As stormwater runoff flows through the structure, the check dam slows flow in the channel and allows sediments to settle behind the structure.



**Maintenance** – Regular maintenance is critical to adequate performance. The picture above shows a series of check dams in good condition. The photo to the left shows a check dam where silt has built up behind the structure almost eliminated the ability to pool water and allow sedimentation to occur.

# BMPs – Sediment Control Features

**Check Dams (cont)** – Installation is key. Below is a photo of a check dam installed at the entrance to a detention basin. The channel and check dam were not installed properly. The channel eroded and the check dam was undercut. This led to significant erosion in the basin.





# BMPs – Sediment Control Features

**Silt Fence** - Temporary sediment barrier made of porous fabric. It's held up by wooden or metal posts driven into the ground, so it's inexpensive and relatively easy to remove. The fabric ponds sediment-laden stormwater runoff, causing sediment to be retained by the settling processes.



**Maintenance** – Regular maintenance is critical to adequate performance. The picture above shows a silt fence that has fallen and is no longer functioning properly. This type of fence should not be installed across a concentrated flow. Silt fence shown in photo to the level is a standard perimeter installation with sediment build up behind the fence removed to maintain function.

# BMP – Low Impact Development

## Bioretention (Rain Garden)

- Landscaping features adapted to provide on-site treatment of stormwater runoff.
- Commonly located in parking lot islands or within small pockets of open area.
- Depressions are designed to incorporate many of the pollutant removal mechanisms that operate in forested ecosystems.



# BMP – Low Impact Development

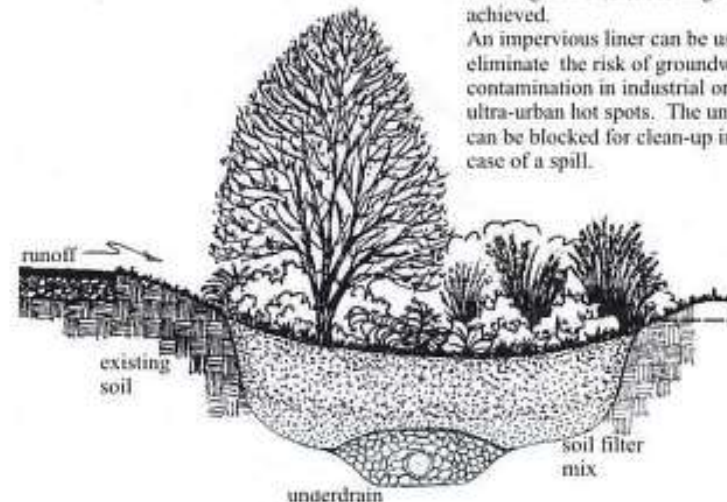
## Bioretention (Rain Garden) (Continued)

- Reduction of Copper, Lead and Zinc to 90%.
- Reduction of Phosphorus to 80% - Depth 2 to 3 feet.
- Reduction in Ammonia from 70 – 80%.
- Reductions in Total Suspended Solids, Chemical Oxygen Demand, Oil/Grease range from 60 – 90%.
- Reduction in Discharge Volume



HIGH FILTRATION FACILITY

The use of an underdrain ensures that the facility will drain at the desired rate. Partial groundwater recharge is also achieved. An impervious liner can be used to eliminate the risk of groundwater contamination in industrial or ultra-urban hot spots. The underdrain can be blocked for clean-up in the case of a spill.



# BMP – Low Impact Development

## **Bioretention - Recommended Maintenance (Partial List)**

- Inspect and Repair Soil Erosion Monthly
- Re-mulch Void Areas As Needed
- Add Mulch Once a Year
- Remove/Replace All Dead and Diseased Vegetation That Cannot be Treated – Twice per Year
- Treat All diseased Trees and Shrubs – As Needed Depending Upon Insect or Disease Infestation
- Replace Stakes After One Year
- Replace Deficient Stakes or Wires As Needed

# BMP – Low Impact Development

## Grassed Swale

- A vegetated, open-channel designed specifically to treat and attenuate stormwater runoff for a specified water quality volume.
- Vegetation slows the runoff to allow sedimentation, filtering through a subsoil matrix, and/or infiltration into the underlying soils.
- Variations include the grassed channel, dry swale, and wet swale.



# BMP – Low Impact Development

## Grassed Swale (continued)

- Performance dependent on:
  - Channel length and slope
  - Use of check dams to slow flows and allow for greater infiltration
- Metals Removal Directly related to Removal of Total Suspended Solids
- Removal Rate of Metals Greater Than Removal of Nutrients.



# BMP – Low Impact Development

## Articulating Blocks

- Concrete Blocks Connected with Geogrid/Cables to Form Blanket
- Allows Infiltration - Protects Soils - Provides Structurally Sound Surface
- Allows Vegetative Growth Through the Blanket
- Variety of Applications (Channel lining, Roadway Surface, Parking Area Surface)



# BMP – Low Impact Development

## Proprietary Design Examples

- Filtera Bioretention Systems - For effective stormwater management, the combination of landscape vegetation and a specially designed filter media allows bacteria, metals, nutrients and total suspended solids (TSS) to be removed naturally.





# BMP – Low Impact Development

## Proprietary Design Examples (cont)

- Stormwater Management StormFilter – Products that remove the most challenging target pollutants – including fine solids, soluble heavy metals, oil, and total nutrients – using a variety of sustainable media
- Stormceptor – Offers a range of versatile treatment systems that effectively remove stormwater pollutants.



**Stormceptor®**  
Stormwater pollutant removal (STC)

# BMP – Summary



- **Prevention – Housekeeping, Materials Management**
- **Erosion Control – Prevent Erosion from Occurring**
  - Slope Maintenance
  - Reinforcement Matting
  - Channel Linings (Matting, Rip Rap)
- **Sediment Control – Prevent Sediment from Leaving Site**
  - Ponds
  - Check Dams
  - Silt Fence
- **Low Impact Development – Reduce, Attenuate, Treat Stormwater**
  - Bioretention
  - Grassed Swale
  - Articulated Blocks
  - Proprietary Systems
- **Maintenance is the Key to the Success of All These Efforts**

# Course Summary

- **Stormwater Permitting is required for All Solid Waste Facilities**
- **Different Requirements for Individual States/Sectors**
- **A Good SWPPP is Critical to Successful Stormwater Management**
- **Implement Effective BMPs; Maintain to Keep them Functional**
- **Compliance is Ongoing Process**
  - **Keep the SWPPP Up to Date**
  - **Collect Samples and Submit Reports in Timely Manner**
  - **Implement and Maintain Functional BMPs**

# Resources

[http://cfpub.epa.gov/npdes/home.cfm?program\\_id=6](http://cfpub.epa.gov/npdes/home.cfm?program_id=6)

NPDES Stormwater Home Page

[http://cfpub.epa.gov/npdes/stormwater/indust.cfm?program\\_id=6](http://cfpub.epa.gov/npdes/stormwater/indust.cfm?program_id=6)

NPDES Stormwater Discharges for Industrial Facilities

<http://www.envcap.org/statetools/iswrl/iswrl.html>

Industrial Stormwater Resource Locator (for State Requirements)

# Contact Information



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