Understanding Municipal Separate Storm Sewer Systems (MS4s)

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Why is stormwater a problem?

- Urban Runoff is one of the leading sources of impairment in our rivers, lakes and estuaries (305(b) reports)
- Development in urban areas increases stormwater volume and velocity and decreases groundwater recharge
- 2001 and 2007 GAO Reports found that EPA needs better data to assess stormwater program's impact

What is an MS4? (Municipal Separate Storm Sewer System)

- The term “MS4” is commonly used to describe both:
  - The infrastructure used to convey stormwater runoff
  - The owner/operator of the infrastructure that is permitted to discharge this runoff

MS4 Definitions

Federal Regulations: 40 CFR 122.26(b)(8)

State Regulations: LAC33: IX: § 2511.B.4 (Large MS4) and B.16 (Small MS4)

MS4s must be owned or operated by the US, a state, city, town, borough, county, parish, district, or other public body

MS4 Infrastructure

- Some MS4s carry groundwater or piped streams; tidally-influenced MS4s can be linear or more complex
- MS4s may be open, piped, manmade, natural, or a combination of all of these things
- influenced, or have some other constant source of non-stormwater discharge
- A system which is a combined sewer or discharges directly to a POTW is not considered an MS4

Small MS4s (typically < 100,000 in population)

- According to 40 CFR 122.26(b)(16), small MS4s are similar to large and medium except they may be owned or operated by the **United States** and includes systems similar to separate storm sewer systems in municipalities such as **systems at military bases, large hospital or prison complexes, and highways and other thoroughfares** but does not include sewers in very discrete areas, such as individual buildings.

Regulated Small MS4s (aka Phase II)

- Operate a small MS4
- Located in an urbanized area (UA), as defined by the latest Decennial Census by the Bureau of the Census
- Permit coverage MAY be waived if the MS4 meets the requirements of LAC 33: IX § 2519.D-E

Maps for all UAs are available at:

http://www.epa.gov/npdes/stormwater/urbanmaps

MS4 as an Owner/Operator:

- **Must be a public body which owns and/or operates MS4 infrastructure**
- **Traditional MS4s are municipalities such as cities or parishes**
- **Non-traditional MS4s include:**
  - Departments of transportation
  - Airports
  - Universities
  - Federal installations or facilities

Traditional MS4s (Municipalities)

- Typically stormwater management duties fall to the public works department or similar agency
- Traditional MS4s use local ordinances (i.e., the municipal code) to enforce stormwater management requirements
- More recently, many municipalities are creating stormwater utilities to manage stormwater (and collect user fees from citizens to operate program)
  - Educate city council
  - Develop fair rates
  - Educate the public

Non-Traditional MS4s

- **Some stormwater program components may need to be modified or may not be applicable to non-traditional MS4s. For example:**
  - Many non-traditional MS4s do not review private construction plans like a municipality. The construction component would instead be focused on public construction projects
  - A public education program for a DOT may focus on employees or the traveling public
- **Non-traditional MS4s typically do not have ordinances or codes therefore must use other methods to gain compliance**
  - A DOT may use right-of-way permit conditions to ensure BMPs are used at a business discharging into the DOT MS4

Typical Government Structure of a Traditional MS4

- **Most states have two separate tiers of municipal government:**
  - Counties (Parishes in LA; Boroughs in AK; CT, RI and MA have largely eliminated Counties)
  - Municipalities (City, Town, Village)

    Some areas have no municipal government below the County level.

- **Special districts can also exist (Fire protection, sewer service, school districts, etc.)**

List of LA MS4 Permittees

- Large and Medium MS4s (Individual Permit Coverage):
  - New Orleans, Baton Rouge, Shreveport, and Jefferson Parish
- Small MS4s:
  - Covered under the general permit, LAR040000
  - 42 MS4s have obtained coverage

Municipalities

- Can range in size from very small (~100 people) to very large (NYC with 8+ million people)
- Most municipalities have a planning department or commission
- Other services may be contracted out (legal, maintenance, inspections, etc)

Stormwater within the Municipal Structure

- Often included in the Public Works, Engineering or Environmental Services Department (or equivalent)
- Sometimes included in the Planning Department or another department
- Stormwater staffing can range from a partial FTE to 20+ FTE
- Stormwater responsibilities are often spread across multiple municipal departments

Example MS4 Departments/Services

- **Agricultural Commissioner:** Vector Control, Weed Abatement Program
- **Air Pollution Control District:** Monitoring stations
- **Fire:** Training exercises, Equipment repair, Fire Prevention Program, Hydrant testing, Emergency response
- **General Services:** Vehicle Operations, Facilities maintenance
- **Public Health:** Animal Services, Vector control, Home visits
- **Public Works:** Construction/Lab, Flood Control, Roads, Traffic, Solid Waste
- **Sheriff:** General, SWAP, Drug labs/Bomb Squad

What about the permit?

- MS4 permits required for both Phase I (Large and Medium) and Phase II (Small) MS4s

- MS4 permits specify the activities the MS4 operator must implement to the maximum extent practicable

Overview of MS4 Permits

MS4 permits generally contain the following components:

- Entity (individual or group)
- Discharge Prohibitions
  - Authorized and un-authorized discharges
- Receiving Water Limitations
  - Special Provisions, monitoring, TMDLs, watershed planning requirements, etc.
- Stormwater Management Plan (SWMP) Components
  - Defines SWMP and program area requirements
- Definitions
- Standard Conditions

Stormwater Management Plan (SWMP)

- All MS4 permits require the development and implementation of a SWMP
- The SWMP generally contains the details of how the MS4 will implement the requirements in the permit
- Therefore, provisions in the SWMP are enforceable as permit requirements

Six Minimum Control Measures for Small MS4s (to be included in the SWMP)

1. Public Education and Outreach
   - educating citizens on proper use and disposal of chemicals, pesticides, etc.

2. Public Involvement Participation
   - comply with public notice and participation requirements; hold local hearings; encourage citizens' action groups

3. Illicit Discharge Detection and Elimination
   - Identify illegal dumping to the storm sewer system (untreated sanitary waste, paint, chemicals, etc.)

Six Minimum Control Measures for Small MS4s (to be included in the SWMP)

4. Construction Site Stormwater Runoff Control
   - Develop ordinances or other regulatory mechanisms for managing stormwater from activities that disturb > 1 acre of land
5. Post-Construction Stormwater Management in New Development and Redevelopment
   - Operation and maintenance of control structures; long-term implementation of BMPs
6. Pollution Prevention/Good Housekeeping for Municipal Operations
   - Utilize training materials from EPA to prevent and reduce stormwater pollution from maintenance barns, public works projects, etc.

The SWMP

- ..should address each minimum control measure and the permit requirements for each;
- ..should identify program priorities based on local pollutants or activities of concern;
- ..should describe a schedule for program implementation that identifies long-term goals and interim milestones;
- ..should be a “living document”;
- ..should address all the components required by the permit.

Common Compliance Problems

- Lack of intradepartmental coordination on stormwater issues
- Lack of co-permittee-specific SWMP
- Lack of SWMP planning documents
- SWMP does not identify pollutants of concern or program priorities
- Lack of measurable goals
- SWMP not revised or updated

Public Education and Participation

- Phase I regulations contain public education requirements for:
  - Illicit discharge elimination
  - Construction site operators
  - Pesticide, herbicide, and fertilizer application
- Phase II regulations contain the two minimum control measures which require small MS4s to address public education and public participation

Public Education and Participation

Public Education and Outreach

- Distribute educational materials to the community, or
- Conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff
- Public Involvement /Participation
- Comply with State, Tribal and local public notice requirements

Requirements

- MS4s are required to:
  - Develop an O&M program to prevent or reduce pollutant runoff from operations
  - Include employee training to prevent and reduce stormwater pollution from activities such as the maintenance of park and open space, buildings, and stormwater systems

Infrastructure Mapping and Characterization

- Should have maps showing all inlets, outfalls, storm drain conduits, stormwater management facilities receiving water bodies, catch basins, and structural stormwater controls.
  - This map should be readily available and the maintenance field staff should use ads reference to perform maintenance activities.
- Infrastructure assets or components should be named and/or numbered to allow tracking of maintenance and repairs.

Facility Inventory

- MS4 should have an inventory of all public facilities, including the following:
  - Public works yards
  - Public transit facilities
  - Wastewater and domestic water treatment plants
  - Sanitary sewer system overflow locations
  - Public parks/open areas
  - Public parking lots
  - Public buildings
  - Landfills and hazardous waste disposal sites, transfer locations, or storage facilities
- these facilities should be inspected for water quality impacts.
- Facilities required to apply for coverage under a general industrial stormwater permit should have a SWPPP and fill an NOI.

Roadways

- Street Sweeping – regular, documented, sweepings with debris disposed of in environmentally friendly manner and activities evaluated to determine effectiveness of program

- Public Streets, Roads, and Highways Maintenance – environmentally friendly practices used during maintenance / repair activities

- Deicing Activities – use and collection of environmentally friendly de-icing agents

Pesticides, Herbicides, and Fertilizer Applications

- Types of PHFs used
- Storage and disposal procedures
- Applicators
- BMPs in place to prevent a discharge

Poor housekeeping practices – paint cans left exposed

Batteries and drums left exposed to stormwater

Poor housekeeping practices – sloppy road paint storage

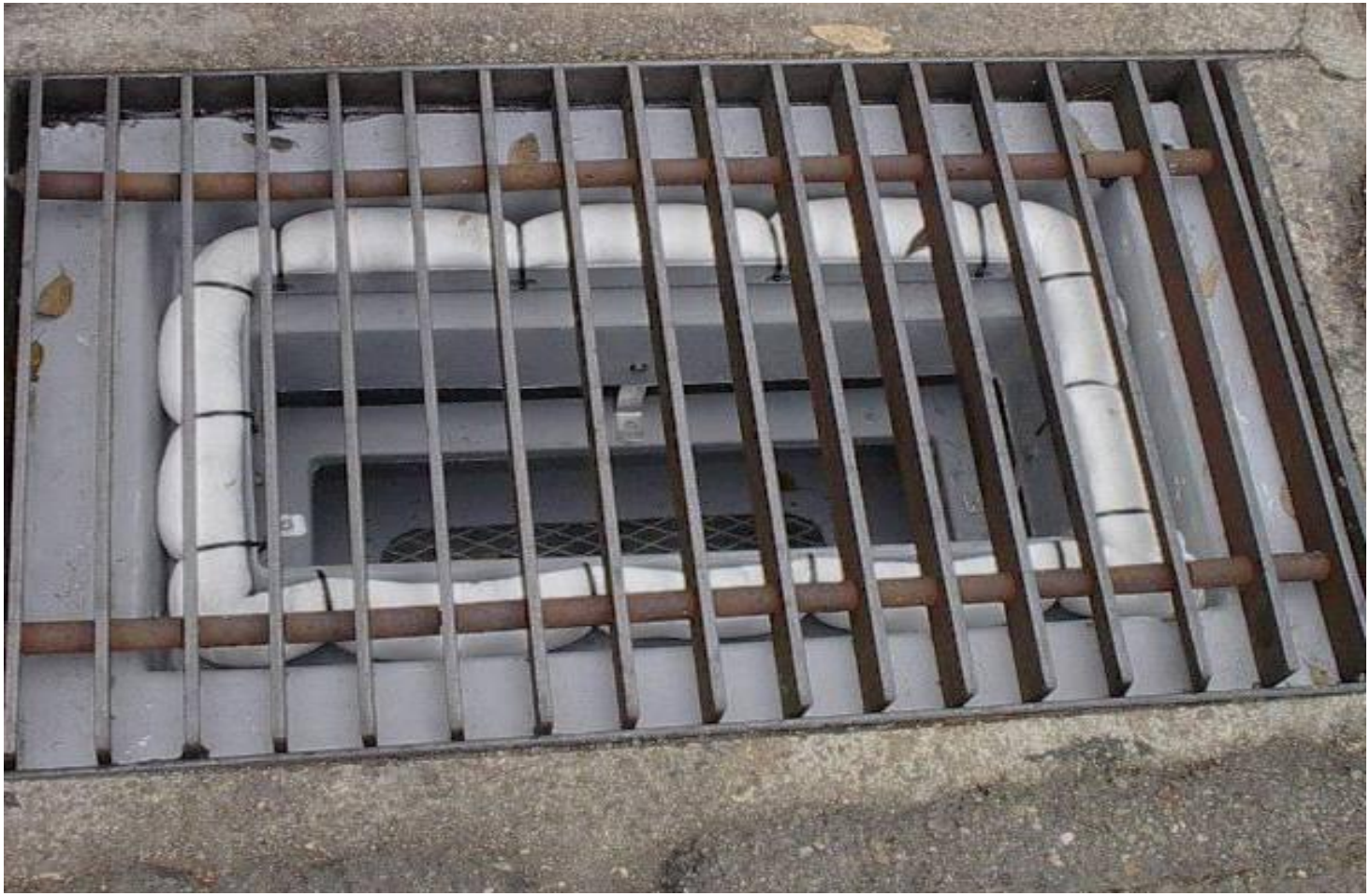
Poor housekeeping practices – failure to clean storm drain inlets

Poor housekeeping practices – failing to clean storm drain inlets

Wastewater discharge to the MS4

Clear signage for employees

Stormwater treatment practices in-use and maintained

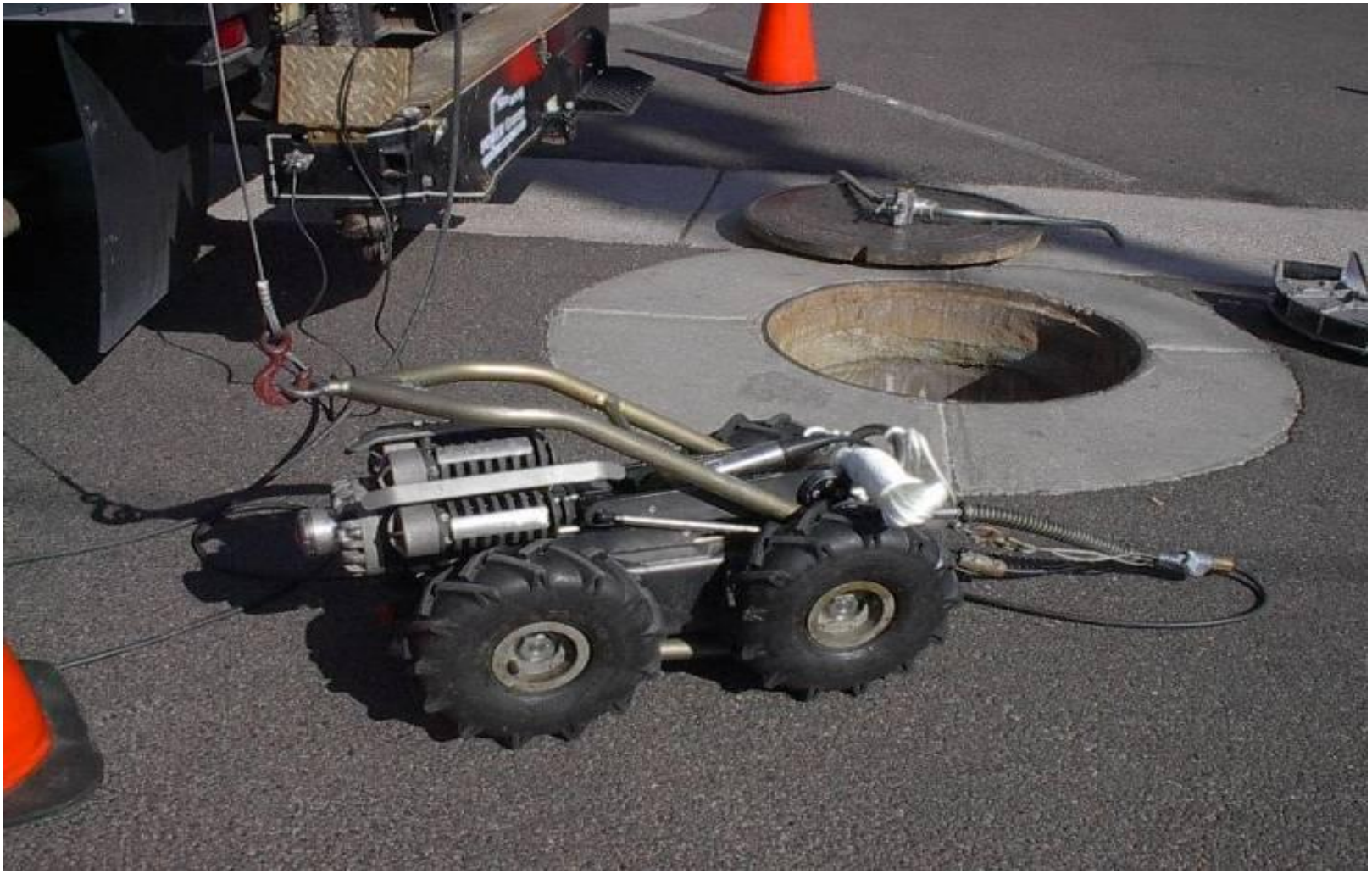


Stockpiles covered

Stockpiles covered

Catch basin cleaning

Video inspection of storm drains



Construction Site Run-off

- Construction General Permits:
  - Administered by State
  - Small: Covers all construction sites > 1 to 5 Acres
  - Large: Covers sites > 5 acres
- MS4:
  - Must develop & implement a construction site stormwater program to control discharges to MS4
  - Provides localized regulation/enforcement
  - Requires control of sites at least > 1 acre
  - Can be based on State and EPA requirements

Common Program Components

- Ordinance/Legal Authority
- Construction Site Inventory
- Construction Requirements and BMPs
- Plan Review Procedures
- Construction Site Inspections
- Enforcement
- Training and Education
- Public Construction Projects

Common Construction Problems

- Common issues identified during audits:
  - Building inspectors do not give a high priority to stormwater inspections
  - Inspectors lack authority to enforce
  - Inspection results are not documented
  - Inspections are not thorough
  - BMPs on plans are not verified in the field
  - MS4s are not tracking inspections and results
  - LPDES coverage is not verified
  - Plan review staff lack adequate guidance
  - CIP inspectors are not knowledgeable about the State's LPDES CGP

Construction Achievements

What Works for Municipal Programs?

- Using dedicated ESC control inspectors
- Pre- and post-storm event inspections
- Variety of enforcement mechanisms
  - Partial stop work orders
  - Delaying Building Dept. inspections and approvals if stormwater violations are not corrected
- Providing training to workers with site responsibilities
- Training plan review staff and inspectors
- MS4 programs that are consistent with state LPDES requirements

New Development & Significant Redevelopment

Phase II Minimum Control Measures

- Post-Construction Stormwater Management in New Development and Redevelopment
- Develop a program, using an ordinance or other regulatory means, to address runoff from new development and redevelopment projects that disturb ≥ 1 acre
- Implement strategies with a combination of structural and/or non-structural BMPs
- Ensure adequate long-term operation & maintenance (O&M) of BMPs

Phase II Minimum Control Measure:

- The BMPs chosen should:
  - be appropriate for the local community
  - minimize water quality impacts
  - attempt to maintain pre-development runoff conditions

- Participate in watershed planning efforts
- Assess existing ordinances, policies, and programs that address stormwater runoff quality
- Provide opportunities for public participation

Common Program Components

- Legal Authority
- Stormwater Design Standards
- Plan Review and Approval
- Construction Inspection of New Development Controls
- Maintenance/Enforcement
- Tracking and Monitoring
- Training and Education

Commercial, Industrial and High Risk Runoff

Phase I and II Programs

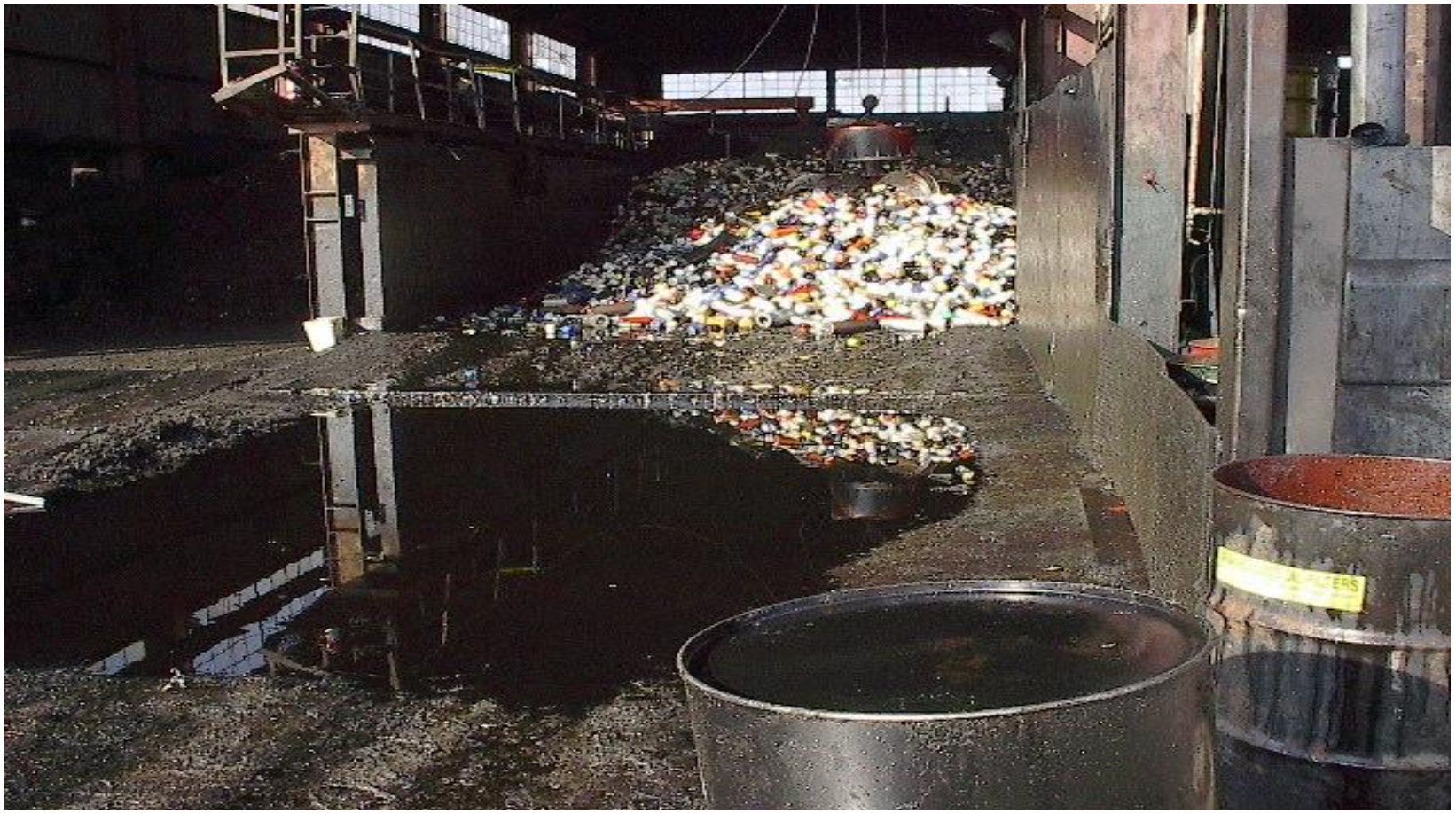
- A number of communities have identified commercial and light industrial as significant sources of stormwater pollutants
- Phase I – addresses commercial and industrial areas in management program
- Phase II – does not specifically address commercial or industrial areas, but includes a program component for illicit discharge and detection

Phase I Requirements for Industrial/Commercial Runoff

- Develop a program to monitor and control pollutants in stormwater discharges from the following sources:
  - Municipal landfills
  - Hazardous waste treatment, disposal and recovery facilities
  - Industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)
  - Industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the MS4
- The program includes:
  - Identifying priorities and procedures for inspections
  - Establishing and implementing control measures for discharges
  - Developing a monitoring program for stormwater discharges associated with industrial facilities

Poor Housekeeping

Failure to properly contain potential stormwater contaminants



Failure to promptly contain and clean-up spills and leaks

Long-term storage of oily scrap equipment without overhead cover or containment

Unauthorized discharge of facility wash water (vehicle or yard) to the street/storm drain

Illicit Discharge Detection and Elimination

Minimum Control Measure:
Illicit Discharge Detection and Elimination (IDDE)

MUST:

- Develop a sewer system map of all outfalls and the names of all receiving waters
- Prohibit non-stormwater discharges, through an ordinance or other means, and implement appropriate enforcement procedures
- Implement a plan to detect and address non-stormwater discharges
- Inform public of hazards associated with illegal discharges and improper disposal of waste

What is an Illicit Discharge?

- A discharge to an MS4 that is *not composed entirely of stormwater* except permitted discharges and fire fighting related discharges

• Unique frequency, composition & mode of entry
-Interaction of the sewage disposal system & the storm drain system
-Produced from “generating sites”

Example Illicit Discharges

- Examples of illicit discharges include:
  - Sanitary wastewater from improper connections or failing septic tanks
  - Irrigation runoff
  - Laundry washwater
  - Improper oil disposal
  - Construction site dewatering
  - Spills from roadway and other accidents

Common Program Components

- Legal Authority and Mapping
- Dry Weather Field Screening
- Investigation of Suspected Illicit Discharges and/or Improper Disposal
- Spill Prevention and Response
- Public Reporting
- Oils, Toxics, and Household Hazardous Waste Control
- Preventing Sanitary Sewer Seepage
- Municipal Staff Education and Training

Investigate Draining Liquid

Helpful Websites

- EPA MS4 Page: http://cfpub.epa.gov/npdes/stormwater/munic.cfm
- SWPPP for Construction Activities: www.epa.gov/npdes/swpppguide
- Model Ordinances: www.epa.gov/owow/nps/ordinance/
- EPA Stormwater Program: www.epa.gov/npdes/stormwater
- **LDEQ website: www.deq.louisiana.gov**