

Middlesex Township MS4 Permit Staff Training

October 16, 2025



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Thank you for inviting us to provide training today on the MS4 permit. We are going to provide a presentation on Middlesex Township's MS4 permit followed by a visit outside to view different types of municipal operations and the associated good housekeeping practices.



Today's Topics

- MS4 Permit
- Good Housekeeping
- Fix or Tell
- Roles and Responsibilities
- Q&A

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Explore with us

We will spend the next 20-30 minutes covering Middlesex Township's MS4 permit with particular emphasis on MCM #6, which is Pollution Prevention/Good Housekeeping for Municipal Operations. We are going to identify some common municipal operations and if good housekeeping is being practiced based on the pictures shown on the slide. We will end the presentation with roles of responsibilities of municipal staff before summarizing what was discussed. Please feel free to ask questions as they arise anytime during the presentation.



What is an MS4? It stands for the One M and Four S's at the beginning of each word – Municipal Separate Storm Sewer System.

MS4 Short Definition

- Network that conveys exclusively stormwater and is owned or operated by a municipality or similar regulated entity that discharges to “waters of the United States”

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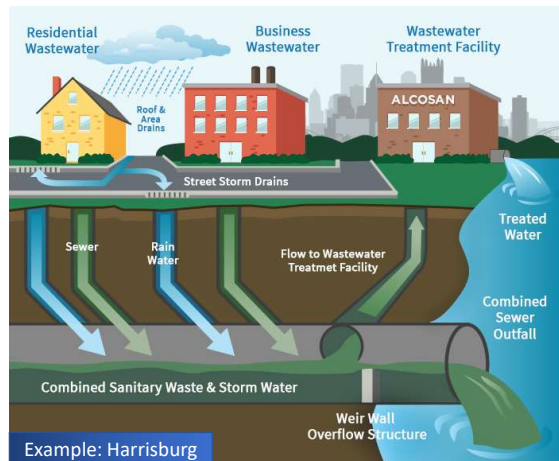
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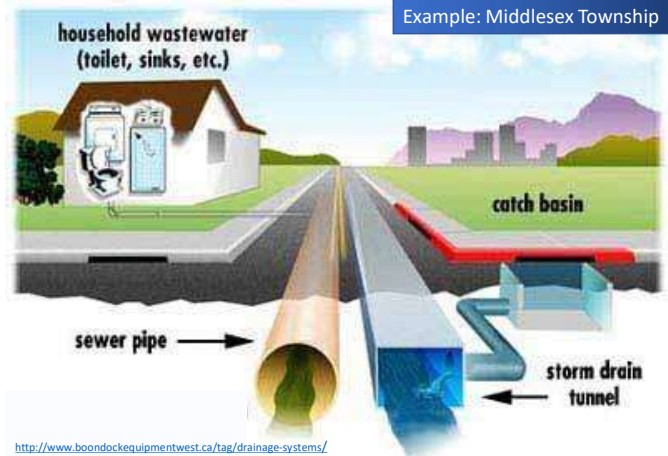
The basic definition of an MS4 is a network that conveys exclusively stormwater and is owned or operated by a municipality or similar regulated entity that discharges to “waters of the United States”.

Combined vs. Separate

...a Combined Sewer Overflow (CSO) is not possible from a Separate Storm Sewer System



Example: Harrisburg



Example: Middlesex Township

<http://www.boondockequipmentwest.ca/tag/drainage-systems/>

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There are two types of storm sewer systems. The picture on the left shows a Combined System. Stormwater and sanitary wastewater flow through the same pipes. Many older towns have this type of system. Rivers and streams were the early sewers. Waste was dumped into them. The streams were simply enclosed and both types of water were conveyed to the next larger watercourse. Wastewater treatment plants then started to treat the water.

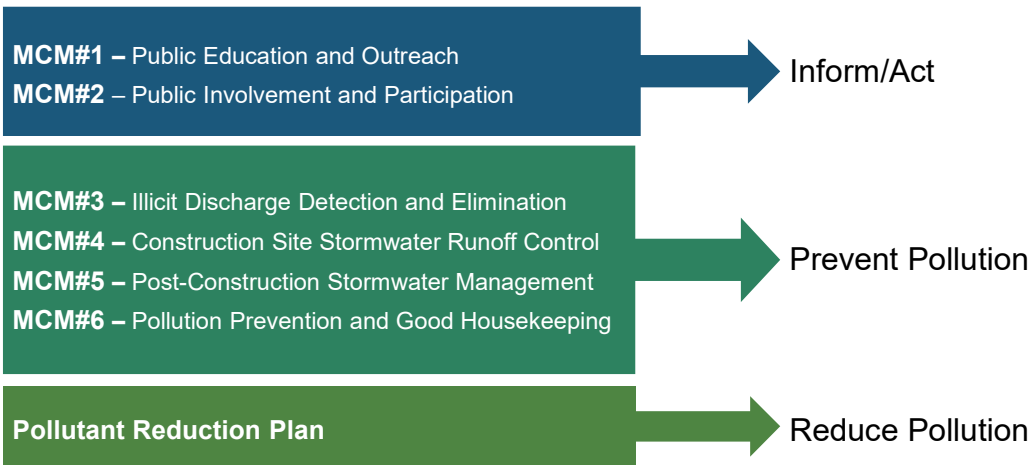
You can see the problem...more development increases runoff and when it rains, there is simply not enough capacity at the treatment plant. When that happens, untreated sewage is diverted away from the plant and discharges directly to receiving streams and rivers. The discharge is called a Combined Sewer Overflow or CSO.

(Click) Harrisburg is a local example.

The other kind is a separate storm sewer system. This is where sanitary and stormwater are piped separately. Historically, there has been no treatment to remove pollution associated with stormwater-only systems.

(Click) Middlesex Township is an example.

MS4 Basics – Minimum Control Measures (MCMs)



The Permit has six components called Minimum Control Measures (MCMs), plus a requirement to plan projects to prevent pollution. The MCMs and Pollution Reduction Plan fulfill three major objectives:

- Inform and Act
- Prevent Pollution
- Reduce Pollution that cannot be prevented

The first two MCMs are like a marketing plan; they inform and invite action. The goal of **MCM #1**, Public Education and Outreach, is to educate a target audience about the negative impacts of stormwater pollution, causes of pollution, and beneficial pollution prevention practices. **MCM #2**, Public Involvement and Participation, is the invitation to the target audience to personally act to prevent or reduce pollution. **MCM #3** requires monitoring to identify and halt non-water discharges from the storm sewer system. **MCM #4** focuses on prevention of escaping mud or construction-related discharges from construction sites, while **MCM #5** focuses on ensuring that stormwater control measures that sequester and treat pollution are well maintained and functional. **MCM #6** provides the framework to make sure staff knows the importance of pollution prevention; understands their roles in the MS4 program; and performs and documents their activities supporting pollution reduction and prevention. The **Pollution Reduction Plan** is the roadmap for installing projects to capture and treat pollution from public property in the regulated parts of the Township.

Pollutants Tracked by the MS4 Permit

A. Acidity: pH and Metals *(typical from mine drainage)*

B. Bacteria: Pathogens *(Usually associated with manure & sanitary waste)*

C. Compounds: Priority Organic Compounds *(like Chlordane, PCBs, & Benzene)*

D. Sediment

E. Nutrients: Phosphorus and Nitrogen

Focus of Pollution
Reduction Requirements

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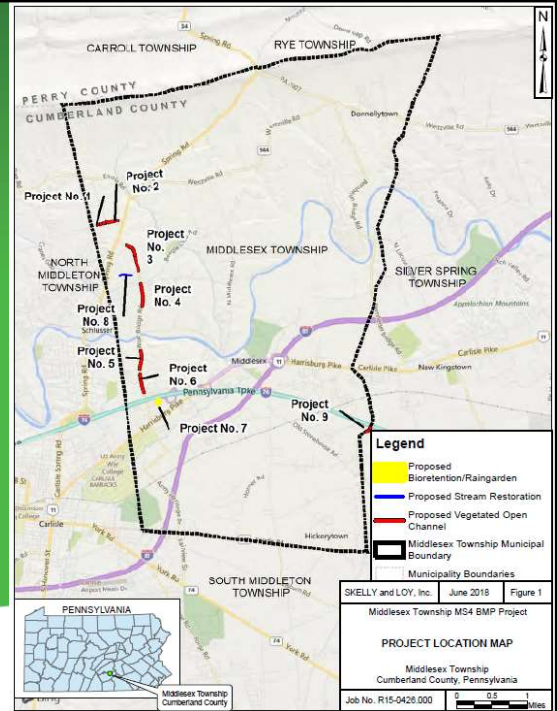
These pollutants are tracked by the MS4 Permit.

(click) Sediment and Nutrients are the focus of pollution reduction. This is because these two categories of pollution can be reduced through stormwater management. The others require additional mitigation strategies.

Pollutant Reduction Plan Projects

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Zach Zook's Maintenance Team constructed several Pollutant Reduction Plan (PRP) Projects. Funding for the projects is supplemented via the \$631,000 Mariner II Pipeline Grant the Township was awarded in 2018.



1

Project 4 Wolfs' Bridge Rd. north of West Middlesex Drive looking south

Photo from north end of project. Note the well vegetated and stable roadside channel that was installed in 2023-2024.



2

Project 4 Wolfs' Bridge Rd. north of West Middlesex Drive looking south

New inlet northwest of the intersection.



3

Project 4 Wolfs' Bridge Rd. north of West Middlesex Drive looking south

New inlet southwest of the intersection. Former condition was a crushed pipe, no endwall and significant erosion. It was unsafe and contributing pollution.

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4

Project 4 Wolfs' Bridge Rd. south of West Middlesex Drive looking north.

View from the southwest corner of the intersection



5

Project 4 Wolfs' Bridge Rd. south of West Middlesex Drive looking north

A new open channel was created to filter stormwater pollutants and convey stormwater. The channel is directly above an underground pipe that conveys the majority of roadway runoff.



6

Project 4 Wolfs' Bridge Rd. south of West Middlesex Drive looking north

East side of Wolfs Bridge Road. Inlet is a drop structure. Runoff in the pipe drops vertically in the inlet box dissipating runoff energy. A flat pipe continues to the discharging endwall.

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7

Project 4 Wolfs' Bridge Rd. south of West Middlesex Drive looking north.

Southern terminus of this 2024-2025 reporting period; west side. Inlet mid picture is a drop structure. Apron includes energy dissipater.



8

Project 2 east side of Sheaffer Road looking north during construction

Southern terminus of this 2024-2025 reporting period. This work ties into the established work from the previous reporting period.



9

Project 4 Wolfs' Bridge Rd. south of West Middlesex Drive looking north.

Southern terminus of this 2024-2025 reporting period; east side.

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What is Good Housekeeping?

- Clean and orderly properties to prevent water pollution
- Organized and complete documentation

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The goal of MCM#6 Good Housekeeping/Pollution Prevention for Municipal Operations is to ensure maintenance facilities discharge clean stormwater. Pollutant releases are prevented from entering the stormwater system and streams, rivers, lakes, and wetland through proactive management of potential pollutants and pollution-causing activities.

Good Housekeeping has two major components. It is both pollution prevention and keeping records of those activities.

MCM#6: Good Housekeeping and Pollution Prevention

Anderson Park Standard Operating Procedure

	Description	Responsible P
Trash & Refuse Management	1. Grounds inspected and litter deposited in refuse containers 2. Refuse containers emptied	1. Roadway Super 2. Certi Hay 1. R 2.
Pet Waste Management	1. Grounds inspected and waste deposited in refuse containers. 2. Refuse containers emptied	
Vegetation Management	1. Mow Grass 2. Collect Leaves 3. Trim trees & shrubs	

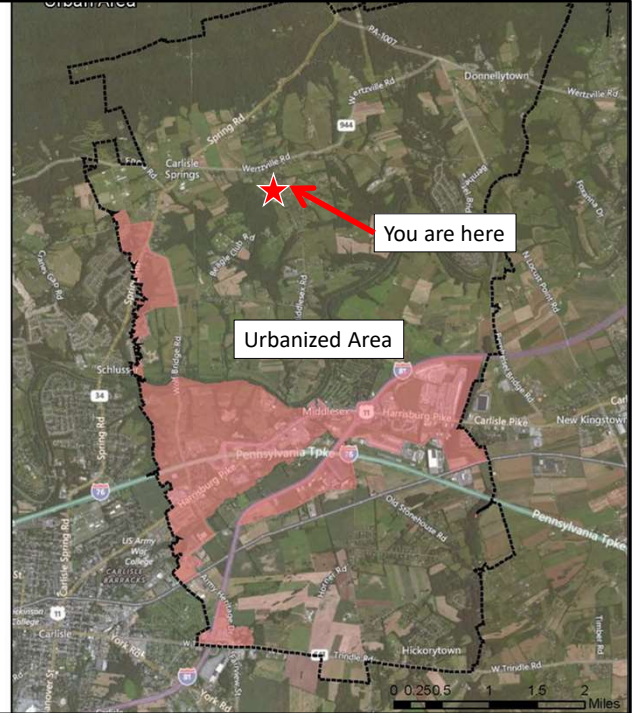
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MCM#6 focuses on the Township's operations and procedures to prevent and reduce pollution emanating from Township-owned property.

Middlesex Township Urbanized Area

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Remember at the beginning we said MS4 is all about Clean Water, Stormwater, Urban Water? The Urbanized areas regulated by the MS4 permit are delineated by the US Census Bureau in the latest 10-year Census. The designation is largely based on population density, but the US Census Bureau has incorporated a couple other criteria related to impervious surface.

Middlesex Township Regulated MS4

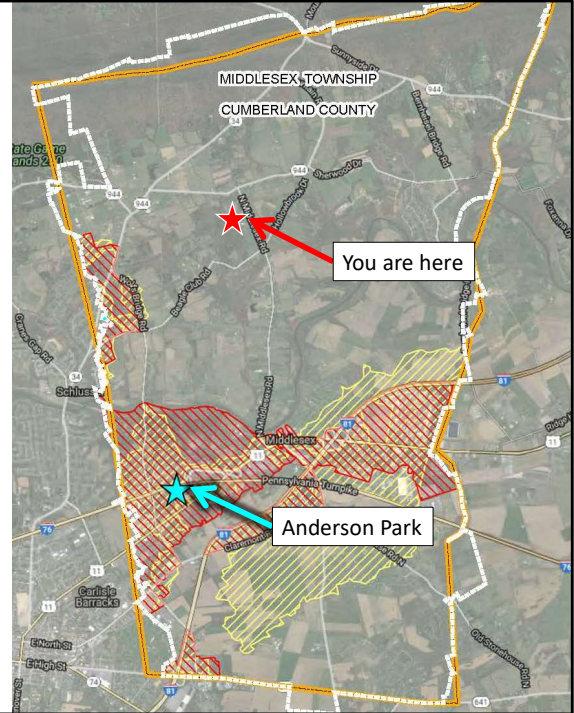
Urbanized Area
+ Contributory Drainage

Regulated MS4

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Yellow Hatch Area is
Contributing Drainage
and expands the
Regulated MS4 Area



The regulated area also includes adjacent land that flows into the urban area before reaching a stream, shown in yellow. Anderson Park is the only Township-owned property that is in the regulated MS4.

Good Housekeeping Activities

- Manage litter
- Collect pet waste
- Close refuse and recycling container lids
- Manage Vegetation
 - Mowing
 - Leaf and Debris Cleanup



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Anderson Park is the only site that is REGULATED. However, the Township wants all Township-owned properties to be kept ship-shape and clean, including the Township building with its maintenance and police operations. So what does the SOP say to Middlesex Maintenance Crew?

1. Zach Zook, as the Roadmaster, has the responsibility to make sure you do the jobs listed on the slide.
2. The SOP lists the MINIMUM frequency for completion of jobs.
3. Examples:
 - A. Collect and deposit trash and pet waste in trash bins 1x month...year round
 - B. Mowing 1x week...during the growing season
 - C. Leaf collection 2x in November
 - D. Trimming Trees and pick up debris, as needed
4. It provides other direction. For example, when you mow, you will direct clippings away from stormwater conveyance. So that means don't put clippings in gutters or inlets. If you do...you will need to sweep up, collect and dispose of the clippings because clippings are not pure water, so they are considered a pollutant. And of course they can cause other problems too, like blocking inlets and causing ponding water on roadways.
5. The SOP states that trash will be emptied and disposed by a certified hauler.

Fix or Tell

- **Fix** - Issues that can be easily resolved by personnel.



- **Tell** - Issues that cannot be easily resolved by personnel should be reported to management.

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When completing Good Housekeeping activities, you may notice issues that need to be fixed. It is important to know what you should resolve on your own and what you should report to management. Generally, you should undertake issues that you can resolve on your own and report issues that need more manpower, supplies, or is the responsibility of someone else. Be sure to clearly explain what the issue is to help management understand the situation and determine the best solution.

Fix or Tell

FIX	TELL
Minimal work effort - less than 50 minutes (ex. sweep mulch migrating towards an inlet)	Significant work effort - more than 50 minutes (ex. reorganize/clean entire storage shed)
Parts/material are available (ex. place secondary containment pallet under drum) and cost less than \$50	Parts/material are NOT available (ex. need to order a new pump hose) or cost more than \$50
Resolve by cleaning or removing debris/trash (ex. remove debris from inlet grate)	Stormwater basins, raingardens, and swales - debris causing damage or blocking water (ex. trash clogging basin outlet)
Part of typical job duty (ex. empty trash can)	Not typical job duty (ex. repair oil-water separator indicator light)
Vehicle/equipment leaks that can be stopped & cleaned up (ex. close valve, place absorbent)	Leaks requiring vehicle/equipment repair (ex. truck leaking oil)
Organizing supplies and equipment in a building. Picking up trash.	Major building issues (ex. holes in salt storage roof, bulging walls)

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Here are some general guidelines to follow when determining if an issue should be fixed right away or personnel tell management for follow up action. [Review table.]

Fix or Tell Practice Slides



The next slides are examples of common Good Housekeeping practices for different municipal operations. We want you to choose if the picture shows:

1. Satisfactory compliance;
2. Requires maintenance or repair; or
3. Shows a situation that management should be notified about.



Stored properly with secondary containment. No spills.

ROOMS WITH CONTAINER STORAGE

Stored Products*	• Stored in their designated area • Grouped by product • SDS (MSDS) hazard pictograms and/or labels on containers • Contents stored in appropriate containers • Containers in acceptable condition • Containers are not leaky	• Secondary containment pallet present, if required • Adequate supply of products • Flammable Liquid Cabinets, if required • Absorbent for cleaning up any leaks or spills	• Organize products and stored materials neatly • Repackage contents or remove any leaking containers • Replace missing or unreadable labels • Clean-up spills • Restock products, if necessary • Remove and dispose trash • Note deficiencies	• Are the products neatly organized? • Are the products stored in proper containers that are in good condition? • Are the products properly and clearly labeled? • Are the containers leak-free? • Is it dry (no spills)? • Are flammable fluids in labeled cabinet with doors closed? • Are secondary containment pallets free of bulges, spills, and leaks?
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Neat and Organized

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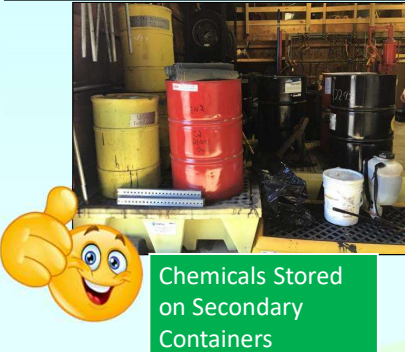
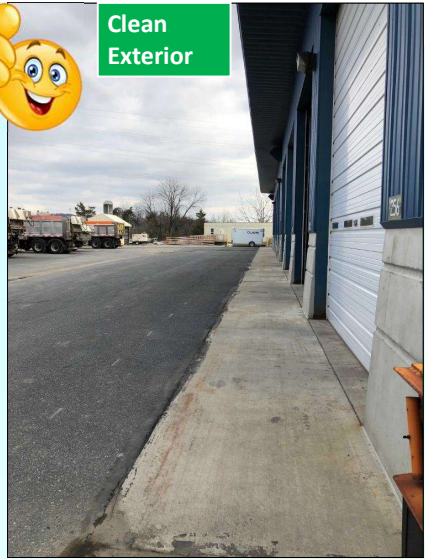
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STORAGE BUILDINGS (Truck Garages and Out-buildings)

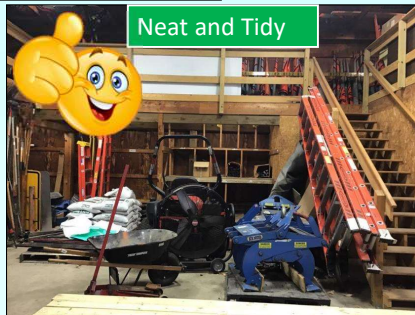
General Area	- Clean and tidy - Walls and floors clean - Generally organized appearance - Intact gutters and downspouts	- Check lighting and replace burned bulbs - Clean or replace dirty or damaged protective sleeves and emergency contact list, as required - Empty trash receptacle - Report damaged gutters to foreman for Facilities notification	- Is lighting functioning? - Are walls and floors clean? - Are gutters and downspouts intact?
Stored Liquid Product	- Stored in their designated area - Grouped by product - SDS hazard pictograms and/or labels on containers - Contents stored in original or appropriate containers - Containers in acceptable condition - Containers are not leaky	- Secondary containment pallet present, if required - Adequate supply of products - Flammable Liquid Cabinets, if required	- Organize products and stored materials neatly - Repackaging contents or remove leaking containers - Replace missing or unreadable labels - Clean-up spills - Restock products, if necessary - Remove and dispose trash - Note deficiencies
Building Interior and Exterior	- Building is damage-free: walls have no bulges or gaps that allow salt to escape. Roof has no obvious holes. - No leaking or migrating spills - No puddles inside building - Doors are closed	- Inspect wall condition (rust, holes, cracks) - Clean-up migrating material (especially tracking at downspout) - Remove and dispose trash - Close open doors - Note deficiencies	- Is the building in good condition (no structural damage)? - Are interior contents contained (not escaping from building)?



Clean Exterior



Chemicals Stored on Secondary Containers



Neat and Tidy

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Not weather-proof-
water accumulation in
tire casings



Weather-proof



Dry storage



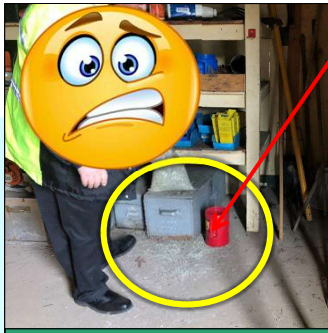
TIRE AND BATTERY STORAGE

Tires*	• Tires under cover or in protected storage area • Stacked neatly • Tires not stacked higher than 6 tires high • Area is dry (no standing water or water accumulating in the tire casings)		• Stack tires neatly with no more than 6 tires in a stack • Note deficiencies	• Does the tire storage area have capacity (not full)? ☐ • Is the area dry (no standing water or water accumulating in the tire casings)? ☐
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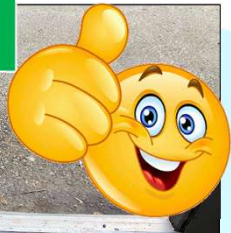
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Spilled material





Lip prevents material from escaping

LANDSCAPE PRODUCT STORAGE

Pesticides, Herbicides, & Fertilizer*	• Stored under roof in their designated area on secondary containment pallets • Grouped by product • SDS hazard pictograms and/or labels on containers • Contents stored in original or appropriate containers • Packaging is damage and leak-free	• Caution signs present • Secondary containment pallet present • Adequate supply of products	• Organize products and stored materials neatly • Repackage contents or remove any leaking containers • Replace missing or unreadable labels • Clean-up spills • Restock products, if necessary • Remove and dispose trash • Note deficiencies	• Are caution signs clean and legible? • Are the contents neatly organized? • Are the contents stored in proper containers? • Are the contents properly and clearly labeled? • Are the containers leak-free? • Is it dry (no spills)? • Are containers in original packaging or in correct, labeled alternative? • Is the container intact? • Are flammable fluids in labeled cabinet with doors closed? • Are secondary containment pallets free of bulges, spills, and leaks?
Adjacent Exterior Paved Surfaces*	• Paved surface (usually at doorway) free from tracked product, stains and residue		• Sweep pavement and around doorways and treat sweepings as hazardous waste • Note deficiencies	• Is the adjacent paving clean (no staining, residue, or damage indicating migration of pesticides, herbicides or fertilizers)?



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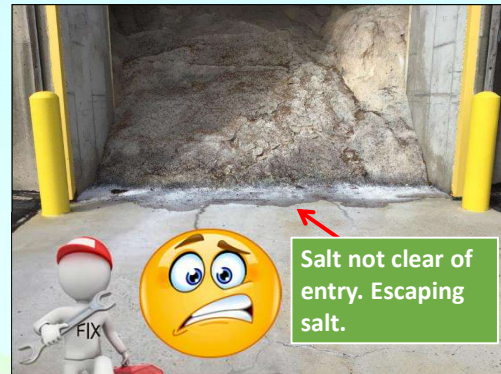
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Salt is clear from entry, behind line, dry, and below fill-to line. Building is damage-free.



SALT STORAGE

Salt Buildings* - Material located below fill-to line along the walls and 10-feet back from entry (April 1st to October 31st) - If salt cannot meet 10-foot setback from door (April 1st to October 31st), salt is required to be contained and dry. - Brooms and shovels stored in their designated areas - No puddles inside building - Building is damage-free. Walls have no bulges or gaps that allow salt to escape. Roof has no obvious holes. - Intact gutters and downspouts if present.	- Salt stockpile buildings - Fill Limit Lines - Delivery signs - Brooms, shovels	- Reposition migrating material to stockpile - Sweep residue and place on stockpile - Note deficiencies - Report damaged gutters to foreman for Facilities notification	- Is salt clear of entry for full width of entry? - Is salt located back from entry 10-foot minimum? (April 1st to October 31st) - Is salt that is closer than 10 feet (April 1st to October 31st) to entry covered completely, contained, and dry? - Is salt below fill-to line along the wall (not overfilled)? - Any delivery and handling signage clean and legible? - Is the building damage-free? - Walls are vertical with no bulges, holes or escaped material? - Roof has no holes? - Free of other structural damage? - Is the interior of building dry? - If present, are gutters and downspouts intact?
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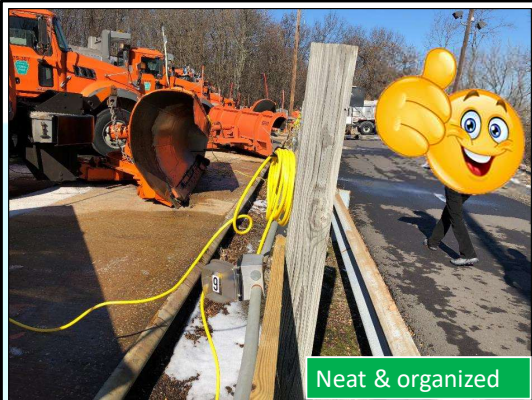
Salt not clear of entry. Escaping salt.



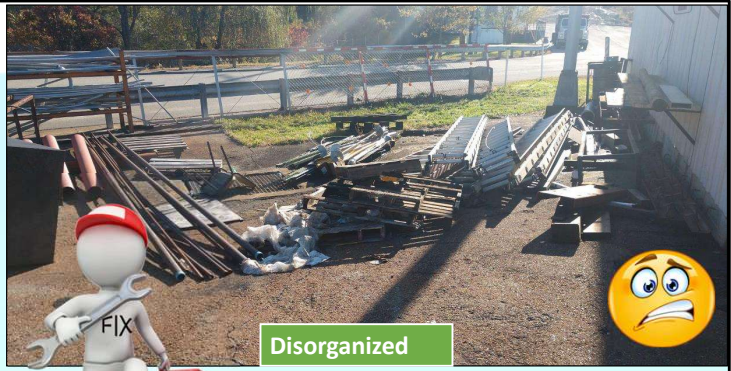
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Neat & organized



Disorganized



PARKING LOTS, LOADING AREAS, EQUIPMENT STORAGE AREAS & OTHER NON-LANDSCAPED/NON-GRASED AREAS

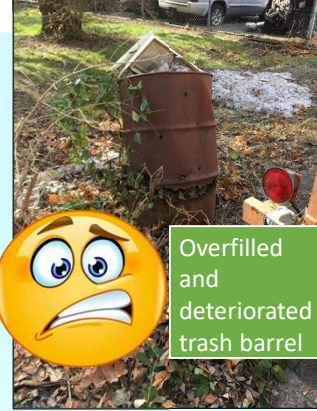
General Area*	• Clean and tidy • Generally organized appearance		• Gather litter and debris in the vicinity and bag for disposal in trash receptacle or dumpster	Is the area clean and organized?	☐
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Abundance
of junk



Overfilled
and
deteriorated
trash barrel

GENERAL SITE ASSESSMENT

General Site	• Clean and tidy • Generally organized appearance • Clean, obstruction free walkways • If present, outlets for charging (sure line) are operable, damage-free, and attached cords are coiled and hung.		• Gather litter and debris in the vicinity and bag for disposal in trash receptacle or dumpster • Neatly organize construction vehicles and materials • Check charging outlets and coil and hang attached cords. • Note deficiencies	• Is the site organized and clean? • Are walkways free of tripping hazards? • Are charging outlets operable if present? • Are electrical cords coiled and hung?
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Roles and Responsibilities

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In the final part of this presentation, we will go over the roles and responsibilities of Middlesex employees.

Middlesex MS4

- Middlesex is responsible for MCM #6
 - Prevention and reduction of pollution in stormwater is essential to the Stormwater Management Program (SWMP)
 - Organized and complete documentation

Middlesex Employees are critical for Success

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FROM WEB:
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Middlesex is responsible for all the MCMs, including MCM #6.

Challenges:

- Implementing stormwater control measures that prevent pollution in municipal operations
- Documenting the pollution prevention activities

Solutions:

- Prioritizing stormwater control measures based on greatest water quality improvements
- Organized and complete documentation

Middlesex staff will play a critical role in educating the public, identifying pollution, preventing pollution, and/or reducing pollution.

Middlesex MS4 Summary

Pollution Prevention

- No Illicit Discharges
- Control Construction E&S
- Functional Stormwater Management Systems
- Keep Township Properties Clean
- Prevent/Clean up spills and leaks

Pollution Reduction

- Construct Projects



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In summary, pollution prevention includes:

- Eliminating intentional or accidental releases of non-stormwater materials into the stormwater system that feeds the streams
- Preventing loose soil from leaving construction sites
- Ensuring stormwater management facilities designed to slow runoff or remove water pollution are functioning well
- Keeping Township properties clean
- Preventing pollution releases during Township's operation and maintenance activities

Pollution Reduction includes:

- Constructing projects to reduce pollution

Questions???



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