

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) TECHNICAL BULLETIN

The MS4 permit is an abbreviation for the Municipal Separate Storm Sewer System Permit. A municipal storm sewer system refers to publicly owned collection and/or conveyance structures where stormwater flows, such as road inlets, ditches, swales, gutters, streets, storm drains, stormwater basins, and culverts. A storm sewer system is designated as being “separate” when the pipes and conveyance structures are not connected to the sanitary sewer lines or a water treatment plant. Stormwater collected in a separate storm sewer system will discharge into local streams, rivers, and surface waters without going through treatment, either as surface runoff or through a pipe, called an outfall. A municipality with a combined storm and sanitary sewer system would not be covered under an MS4 permit.

WHY ARE MS4 PERMITS NEEDED?

When stormwater flows over streets, yards, and through conveyance systems in developed and urban areas, the surface water will pick up and transport nutrients, sediment, and other pollutants it comes into contact with to local waterways. Because runoff entering a separate storm sewer system will not go through

treatment, these pollutants in the stormwater will be discharged directly into surface water and degrade the water quality of our streams and rivers. Therefore, the MS4 program aims to improve overall water quality through reducing the amount of sediment, nutrients, and pollutants being introduced into stormwater, and ultimately into our waterbodies.

REGULATIONS

The Federal Agency, Environmental Protection Agency (EPA), oversees the Clean Water Act (CWA), which requires permitting regulations for stormwater discharges. In Pennsylvania, the EPA has delegated the MS4 program to the Pennsylvania Department of Protection (PADEP) for administration. The MS4 permit is a National Pollutant Discharge Elimination System (NPDES) permit. Majority of MS4s in Pennsylvania are classified as a Phase II “Small MS4.” A Municipality meets the requirements as needing MS4 permit coverage when a portion of the Municipality lies within an Urbanized Area, which is determined by the 2010 US Census Bureau. A Municipality may also be determined as needing MS4 permit coverage under discretionary designation by PADEP in certain circumstances. Municipalities operating an MS4 in Pennsylvania can get coverage under the PADEP PAG-13 General Permit for Stormwater Discharges from small MS4s or an Individual MS4 Permit. MS4 permits typically have a 5-year term of

Rain garden stormwater BMP



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coverage. PADEP has published guidance and requirements table to assist in identifying key information for each Municipality on whether an individual permit is required and why. Whether a Municipality can be covered under a general permit or need an individual permit is dependent on certain factors, including:

- **Total Maximum Daily Load (TMDL) Plan:** Per PADEP guidance, MS4s that are required to have a TMDL plan must apply for an individual MS4 NPDES permit. If an MS4 Municipality has one or more TMDLs with a wasteload allocation(s) (WLAs) for sediment or nutrients, a TMDL Plan must be developed as part of their MS4 requirements. The goal of a TMDL plan is to reduce the pollutant load long-term through achieving incremental reductions of the pollutant load in the 5-year permit terms.
- **Special Protection (SP):** If the MS4 has an outfall(s) that discharge to a Special Protection-designated surface water, which includes High Quality (HQ) and Exceptional Value (EV) streams, an individual permit would be required.

REPORTS

PADEP requires MS4 permittees to submit an annual MS4 status report, which is available to be completed electronically through PADEP's Greenport site. Additionally, at the end of the five-year permit cycle, MS4 permittees with Pollution Reduction Plans (PRPs) and/or TMDL plans must submit a report documenting compliance that the goals of these plans have been met within the 5 years. Taking the time throughout the year to properly document and track the MS4 program and status for your Municipality will make reporting each year and permit cycle a more seamless process. Many municipalities hire consultants to undertake the permitting and reporting requirements of the program, which can help ease the administrative burden as well as ensure compliance.



A badge place on a stormdrain to educate the public on stormwater

STORMWATER MANAGEMENT PROGRAM

In order to fulfill permit requirements, each permittee will need to develop and enact a stormwater management program (SWMP). A SWMP's intent is to reduce pollutants in stormwater discharge from the MS4 to the "maximum extent practicable." SWMPs are composed of six minimum control measures (MCMs), outlined below. Each MCM has associated Best Management Practices (BMPs) that PADEP has outlined that must be implemented and documented by the permittee to meet each MCM.

- **MCM #1 - Public Education and Outreach:** The Municipality shall develop educational materials and publications and perform outreach to the community to teach residents and raise awareness about stormwater discharge and management, stormwater pollution, environmental impacts, and water quality.
- **MCM #2 - Public Involvement and Participation:** The Municipality shall plan ways to, and encourage, for the public to

get involved in the SWMP and stormwater management and reduction activities locally. Teaming up with watershed groups and Environmental Advisory Committees (EACs) can provide support, create partnerships, and open up possible volunteer opportunities for the Public.

- **MCM #3 - Illicit Discharge Detection and Elimination:** The Municipality shall create and execute a detection and elimination plan for illicit discharges made to the separate storm sewer system to stop pollutants from entering the MS4 and waterways. Nothing other than rainwater, or an authorized non-stormwater discharge as according to PADEP's list in the General Permit, shall enter storm drains. Providing illicit discharge guidance to the public is a great way to meet multiple MCMs simultaneously.
- **MCM #4 - Construction Site Runoff Control:** Construction Site Runoff Control: The Municipality shall create and administer a program and regulations for erosion and sediment (E&S) control during active construction activities. Disturbed and exposed soil poses a major source of polluted runoff. Oftentimes, the Municipality includes E&S control requirements as part of their SALDO and/or stormwater management Ordinances. Additionally, Municipalities can create an agreement with their local County Conservation District to satisfy this MCM requirement, if they oversee the Chapter 102 Program.
- **MCM #5 - Post-Construction Stormwater Management:** The Municipality shall create and administer a program and regulations for new impervious construction to have adequate and permanent stormwater management on the developed land. New impervious surfaces increase the amount of stormwater runoff and therefore must be managed permanently to ensure additional stormwater does not leave the site post-development, therefore reducing overall flooding.. Oftentimes, the Municipality includes post-construction stormwater management requirements as part of their SALDO and/or stormwater management Ordinances. Additionally, Municipalities can create an agreement with their local County Conservation District to satisfy some of the MCM requirements, if they oversee the Chapter 102 Program.
- **MCM #6 - Pollution Prevention and Good Housekeeping:** The Municipality shall prevent and minimize possible pollutants from entering stormwater caused by municipal operations through developing a pollution prevent plan. Training shall be provided to Municipal staff, especially Public Works, on pollution prevention and other good housekeeping tips as part of regular municipal operations. Regular municipal operations can include road salt and chemical storage, street sweeping and road maintenance, vehicle washing, and more.

Stormwater inlet



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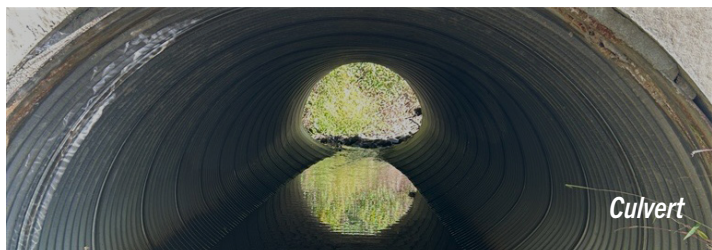


ADDITIONAL REQUIREMENTS

MS4 permits, in addition to requiring an SWMP with all six MCMs, require additional appendices and/or plans from permittees in certain cases. These requirements are specific to the 2018 MS4 permit term, and as new permit cycles begin, requirements will change. Additional plans include:

1. **Pollution Reduction Plans (PRPs):** PRPs are required for any MS4 with discharges to the Chesapeake Bay Watershed as well as discharges to impaired streams for nutrients and/or sediment. A PRP's intent is to reduce the amount of sediment and nutrients in MS4 stormwater that will eventually discharge to surface waters.
2. **Total Maximum Daily Load (TMDL) Plan:** A TMDL establishes the greatest amount of a pollutant that can be in a water body, and provides a value to aim toward in restoring water quality in impaired waters. TMDLs are approved by EPA. As mentioned above, A TMDL plan is required if an MS4 discharges to a watershed with a TMDL that has a wasteload allocation for nutrients and/or sediment. A TMDL plan serves to reduce the pollutant load to aid in meeting the required TMDL value.

A Municipality may have both a PRP and a TMDL plan. PADEP provides guidance, instructions, and resources on their website that provides more in-depth requirements and can aid in accurately developing a PRP or TMDL plan for your Municipality. Many municipalities hire consultants to prepare and manage these plans, including identifying and designing BMPs that will provide an adequate amount of pollutant reduction as stated in the plans.



BEST MANAGEMENT PRACTICES (BMPs)

BMPs are already identified, per PADEP, for the permittee to implement under each of the six MCMs of the SWMP. How each BMP was satisfied shall be included in each Annual Report with documentation showing how it was complied with. MCM BMPs can be

Best Management Practices that provide pollutant load reduction will also need to be installed per any PRPs and/or TMDL plans that an MS4 has. PADEP has created a table of "BMP Effectiveness Values" showing the percent reduction each BMP provides for Total Nitrogen, Total Phosphorus, and Sediment. These Pollutant Removal efficiency values can be used in calculating the pollutant reductions anticipated from BMPs to demonstrate how the PRP or TMDL Plan will achieve the minimum required reductions in pollutant loading.

PADEP has developed a Pennsylvania Stormwater Best Management Practices Manual that describes qualifying stormwater BMPs as well as Operation and Maintenance (O&M) information for each. This library, along with the BMP Effectiveness Table, can be used to select the most effective and appropriate BMPs for your MS4.

MUNICIPAL PARTNERSHIPS

MS4s have the opportunity, and are encouraged, to create partnerships with other MS4s to create and execute a joint PRP. Collaborating with other MS4s provides access to more project locations, additional resources and support, cost-sharing opportunities, and more. Stormwater does not adhere to Municipal boundaries; therefore, to solve many stormwater problems or flooding concerns, taking a regional and/or watershed-wide approach is often the most effective way to address and solve these issues.

UPDATES ON THE MS4 PROGRAM

PADEP is currently updating the PAG-13 NPDES MS4 General Permit for the next 5-year term, and a draft PAG-13 became available as of January 18, 2025, on the PADEP website. PADEP will announce an updated MS4 Notice of Intent (NOI) for coverage deadline once the final PAG-13 is published, which PADEP has announced will not be in 2026.

The draft PAG-13 documents suggest that a Volume Management Plan (VMP) will be required instead of a Pollution Reduction Plan when stormwater discharges to the Chesapeake Bay or to an impaired stream. Through MS4s better managing and reducing stormwater runoff volume by implementing a VMP, PADEP aims to reduce pollutant loading in streams and reduce flooding risks. Stormwater Control Measures (SCMs) that provide stormwater volume management shall be planned in VMPs and implemented to meet the required Volume Management Objectives (VMOs). Volume Management Objectives will most likely measure the cubic feet of storage per year, and PADEP has created and provided a draft 'Maximum Extent Practicable (MEP)' calculator spreadsheet, for Municipalities to determine their MEP VMOs for the upcoming PAG-13 General Permit.

For this upcoming permit cycle, the MS4 Regulated Urban Area will be any Urbanized Area (UA) as designated in the 2010 Census Bureau data, in addition to areas with a population of 50,000 or more per the 2020 Census. With this new definition, new MS4 Regulated areas may be designated. GIS Data for the MS4 Regulated Area is provided for public use on the PADEP's site.

Stay tuned for updates from PADEP on the new MS4 permit cycle and final PAG-13.

ADDITIONAL RESOURCES

- *Pennsylvania Department of Environmental Protection - Municipal Stormwater*
- *Pennsylvania Department of Environmental Protection - BMP Manual*
- *Pennsylvania Department of Environmental Protection - PRP & TMDL Plans*
- *Pennsylvania Clean Water Academy – MS4 Trainings*
- *Environmental Protection Agency - Stormwater*
- *Center for Water Protection - MS4 Collaboration Toolkit*



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