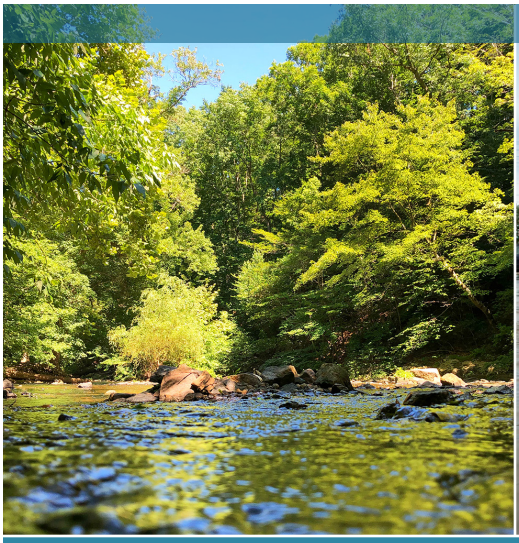
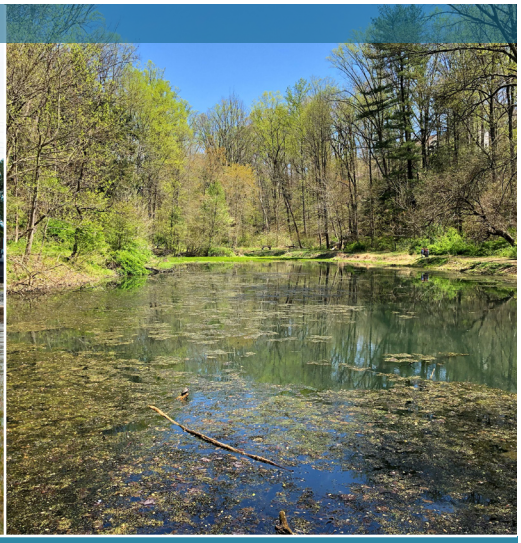
AN INVESTIGATION INTO MULTI-MUNICIPAL STORMWATER PLANNING

phase one | summary report





NOVEMBER 2025

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

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DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

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Managing Stormwater in Pennsylvania

Introduction

The Delaware Valley Regional Planning Commission (DVRPC), with funding from the Pennsylvania Department of Environmental Protection (PADEP) Coastal Zone Management (CZM) program, sought to explore ways to support municipalities in meeting their stormwater permitting requirements and improving water quality throughout the Delaware Estuary Coastal Nonpoint Pollution area. The project focused specifically on Delaware County, where municipalities expressed an interest in collaborative stormwater approaches. This initiative also aligned with the county's on-going work to update its Act 167 Stormwater Management Plan. DVRPC aimed to assess the feasibility of collaborative Municipal Separate Storm Sewer System (MS4) planning and implementation strategies within the county.

What is Stormwater?

Stormwater is rainwater or melted snow that has collected on the ground. Ideally, it infiltrates into the soil, recharging groundwater, or runs off naturally into streams, rivers, and other large water bodies. However, impervious surfaces such as asphalt, concrete, and compacted gravel prevent infiltration, leading to an increase in the speed at which a given volume of water enters rivers, lakes, and streams. This acceleration of flow magnifies the amount of flooding, erosion, and sedimentation that would otherwise occur in the absence of impervious surfaces. In addition, stormwater that flows over roadways, rooftops, parking lots, driveways, and sidewalks collects pollutants like debris, chemicals, trace metals, fertilizers, and bacteria before entering storm drains and local waterways. These pollutants, in combination with the sedimentation caused by high-velocity flows, degrade water quality, harm aquatic life, damage ecosystems, and pose risks to human health.[1]

How is Stormwater Regulated?

The Clean Water Act of 1972 established the National Pollutant Discharge Elimination System (NPDES), a permit program designed to regulate the discharge of any pollutant into the waters of the United States. While the initial focus was on point source pollution, the program later expanded to include nonpoint sources, such as pollutants caused by stormwater runoff. In 1990, the U.S. Environmental Protection Agency (EPA), the agency responsible for implementing the Clean Water Act, established the NPDES Phase I permit to regulate stormwater discharges from larger municipalities and certain industrial and construction sites. This was followed by the Phase II permit in 1999, which extended requirements to smaller municipalities. Ultimately, the goal of the NPDES permit program is to improve and protect water quality by reducing pollution entering streams and rivers.

In Pennsylvania, the EPA delegated oversight of this program to PADEP, which administers the MS4 program and issues permits. In addition to federal regulations, the Pennsylvania Stormwater Management Act of 1978 (commonly known as Act 167) requires counties to develop watershed-based stormwater management plans, known as Act 167 plans, for each watershed within the county or for the county as a whole. Municipalities covered by an Act 167 plan must adopt local stormwater ordinances to regulate development in a way that is consistent with their respective Act 167 plans.[2]

1 "Be Stormwater Smart." 2025. Pa.gov. https://www.pa.gov/agencies/dep/programs-and-services/water/clean-water/stormwater-management/be-stormwater-smart.html.

2 "StormwaterPA - MS4 Program." 2025. Stormwaterpa.org.https://www.stormwaterpa.org/ms4-program.html.

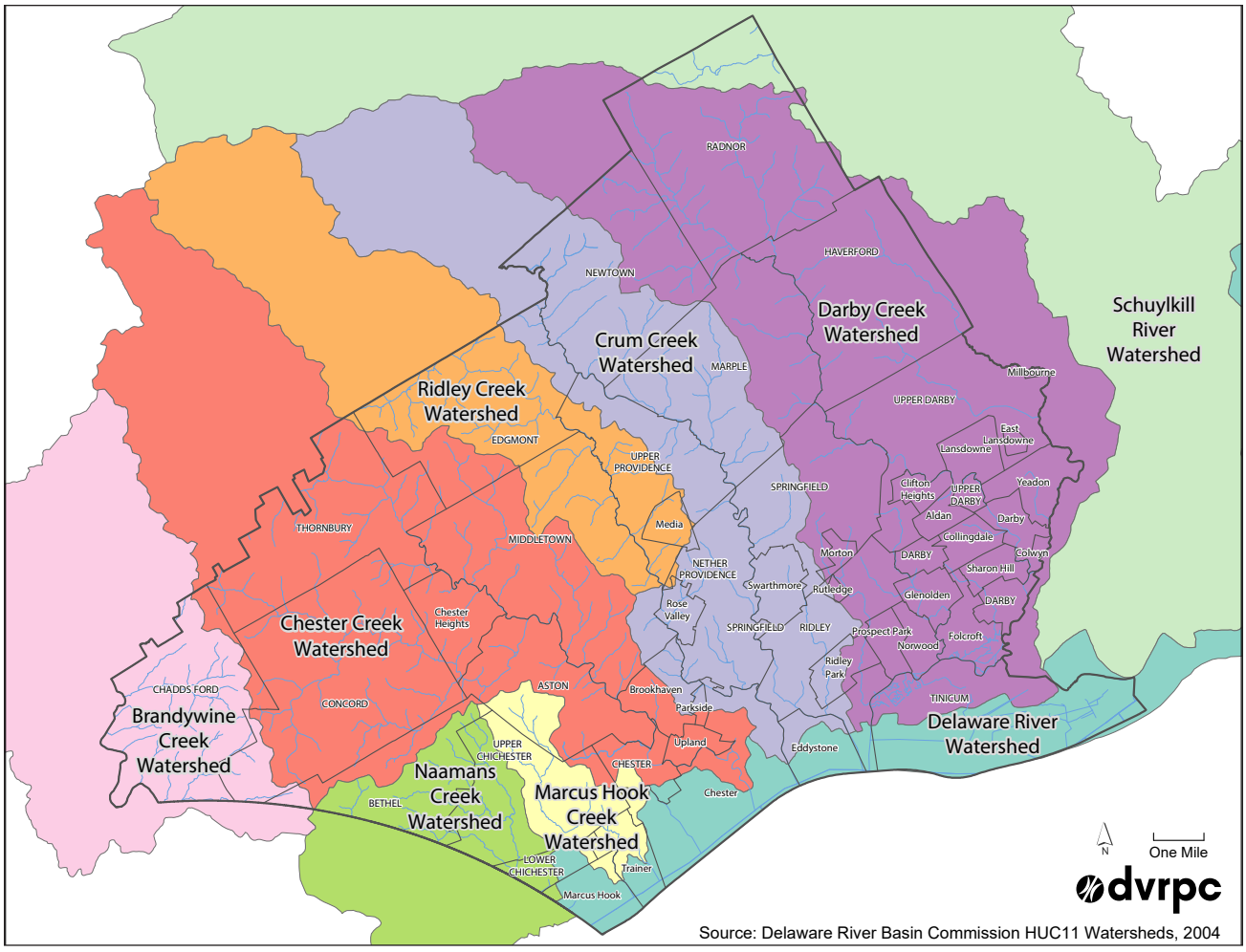
What are Municipal Separate Storm Sewer Systems (MS4s)?

An MS4 is a water conveyance system that is operated by a municipality or other large public entity, like a university, and is designed to collect and discharge stormwater runoff directly into local streams, rivers, and other water bodies. MS4s typically include structures such as underground pipes, drains, or retention basins. Unlike sanitary sewers, MS4s do not connect to water treatment plants. This means stormwater can enter streams and creeks without treatment, potentially carrying pollutants that may impact water quality.

Pennsylvania has one large MS4 (over 250,000 residents), one medium MS4 (between 100,000 and 249,999 residents), and 1,059 small MS4s (under 100,000 residents). Within the Delaware Estuary Coastal Zone (DECZ), there is one large MS4 (Philadelphia) and 28 small MS4 permits held by municipalities (there may be additional small MS4 permits held by institutions). This project focuses on the 16 Delaware County municipalities located within the DECZ; however, all 49 municipalities in Delaware County hold MS4 permits.

Delaware County is located within part or all of nine different 11-digit Hydrologic Unit Code (HUC 11) watersheds: Brandywine Creek, Chester Creek, Crum Creek, Darby Creek, Delaware River, Marcus Hook Creek, Naamans Creek, Ridley Creek, and Schuylkill River watersheds. **Figure 1: HUC11 Watersheds of Delaware County** illustrates the locations of watersheds and municipal boundaries. This map shows that watershed boundaries do not align with the municipal boundaries in Delaware County, underlining the need for administrative and environmental coordination between neighboring municipalities to ensure comprehensive stormwater planning.

Figure 1: HUC11 Watersheds of Delaware County



MS4 Requirements

Entities that operate MS4s are required to obtain an NPDES permit for their stormwater discharges. In Pennsylvania, small MS4s can apply for a general NPDES permit, known as the PAG-13 or, alternatively, for an individual permit. Under the PAG-13, permittees must develop a Stormwater Management Program (SWMP) that addresses six Minimum Control Measures or MCMs. Each MCM outlines actions municipalities must take to reduce pollution and manage stormwater effectively. A description of each MCM is in **Table 1: Minimum Control Measures** below.

Table 1: Minimum Control Measures

Minimum Control Measures	Description
#1: Public Education	Raise public awareness about the impacts of stormwater pollution by distributing educational materials, hosting workshops, or using the media to promote best practices for reducing stormwater pollution.
#2: Public Involvement	Engage the community through activities like public meetings, volunteer cleanups, citizen science programs, and opportunities for feedback on stormwater issues.
#3: Illicit Discharges	Prevent and eliminate illegal discharges (e.g., sewage or chemicals) through inspections, enforcement, and public reporting.
#4: Construction Stormwater	Manage stormwater runoff from active construction sites through erosion or sediment controls, permitting, site plan review, inspections, and public input opportunities.
#5: Post-Construction Stormwater	Promote long-term stormwater management, including retention ponds, green infrastructure, and ordinances, to manage runoff after development is complete.
#6: Municipal Operations	Integrate stormwater management into daily municipal operations like road maintenance, fleet management, waste disposal, and park maintenance to minimize pollution.

What are Pollutant Reduction Plans (PRPs)?

As part of the NPDES MS4 permit program, certain municipalities with surface waters that are impaired for nutrients and/or sediments are required to develop a Pollutant Reduction Plan (PRP). PRPs outline the steps a municipality will take to reduce its pollutant load,[3] specifically focusing on nutrient and sediment discharges into impaired local surface waters. PRPs must calculate the total pollutant load for each impairment and establish targets to meet a five-year reduction goal. PRPs often include maps, land cover calculations, cost estimates, operation and maintenance procedures, and a list of Best Management Practices (BMPs) that can be implemented to reduce pollutant loads. Guidance for developing a PRP is available on the PADEP website.

What are Total Maximum Daily Loads? (TMDLs)

A Total Maximum Daily Load (TMDL) is a calculation that defines the maximum amount of a specific pollutant that a waterway can receive without violating water quality standards. TMDLs identify the relationship between the source of pollution and the resulting impairment. For example, a stream might have a TMDL for nitrogen due to excess agricultural runoff. Additionally, TMDLs are tailored to specific water bodies or watersheds and account for both point and nonpoint sources of pollution. Once a water body is listed on the EPA's Section 303(d) list of impaired waters, the state is required to develop a TMDL for it.

[3] Pollutant load is defined as the amount of pollutants that are discharged into a body of water over a specific period of time.

Municipalities with TMDL obligations are required to apply for an individual MS4 permit rather than the PAG-13. In these instances, a TMDL implementation plan must be submitted with a municipality's MS4 permit application. Currently, no MS4s in the Delaware County portion of the DECZ are required to comply with a TMDL.

Although the Chester Creek watershed was listed as "Impaired for Aquatic Life" in the 2024 PA Integrated Water Quality Report, its condition does not currently warrant a TMDL. PADEP routinely evaluates waterways to update their impairment designations and TMDL requirements. If conditions in the Chester Creek watershed were to worsen, affected municipalities would be required to obtain individual permits instead of PAG-13 permits.

PRPs vs. TMDLs: What's the Difference?

While related, PRPs and TMDLs serve distinct but complementary roles in improving water quality. PRPs outline the specific actions a municipality will take to reduce stormwater pollutant loads and are often required for MS4 municipalities that discharge to impaired waters. In contrast, TMDLs define the maximum amount of a pollutant that a water body can receive while still meeting water quality standards. They provide the scientific basis and overall reduction goals for restoring water quality throughout an entire impaired water body, which may span multiple municipalities. In some cases, a municipality may be required to develop both a PRP and a TMDL plan. Stated more simply, a TMDL sets the goal (the what and the how much), and the PRP is the plan to reach it (the how-to).

Challenges to Meeting MS4 Requirements

Meeting MS4 requirements can be challenging for many municipalities, especially smaller municipalities with limited funding and staff resources. Developing SWMPs, PRPs, and TMDL plans requires specialized knowledge, such as calculating sediment load reductions, and can be costly and time-consuming. Many municipalities rely on their contracted municipal engineer to prepare these documents, often at significant expense.

Implementing stormwater BMPs, like bioswales or rain gardens, as may be called for in a PRP, often involves high capital costs. To fund these efforts, many municipalities pursue grants and other external funding sources. In addition to capital projects, municipalities must also carry out activities associated with the six MCMs, including conducting public outreach, teaching educational programs, and monitoring illicit discharges. Complying with administrative and reporting requirements also requires time and resources, further stretching limited municipal capacities.

Challenges for Older, Densely Developed Communities

Older, built-out municipalities in our region face unique stormwater obstacles. Many were originally settled along the Delaware River in the 17th and 18th centuries, when proximity to the water provided essential access to transportation and trade. Over time, these riverfront communities also became centers of industry, with factories and warehouses locating near waterways for access to shipping and power. Although land uses have changed over time, today, many of these communities lack sufficient open space to install the green stormwater infrastructure () needed to meet pollutant reduction targets. They also tend to have outdated gray stormwater infrastructure that was not designed to handle the volume and intensity of rainfall now occurring more frequently.

In Delaware County and throughout the DVRPC region, many of these older, densely developed communities also sit at the bottom of their watersheds. This means that they must manage not only the stormwater generated within their own borders but also the runoff, and associated pollutants, flowing into streams and

rivers from upstream municipalities. This downstream burden intensifies the challenges of meeting stormwater and water quality goals.

MS4 Program Update: New PAG-13 Permit Criteria

PADEP periodically updates the requirements for the MS4 permit program as part of the NPDES permitting process. These updates ensure municipalities and other permit holders comply with evolving federal and state water quality standards, including the Clean Water Act requirements. Each new permit cycle typically introduces revised BMPs, updated guidelines for pollution reduction planning, and changes to monitoring and reporting requirements.

The PAG-13 General Permit, which governs stormwater discharges from small MS4s, was first introduced in March 2003 and has undergone several updates. The current round of updates was shaped by a stakeholder engagement process led by PADEP. PADEP released an updated draft PAG-13 Permit in January 2025, followed by a 60-day public comment period that concluded in March. The updated permit is anticipated to take effect on October 1, 2026. A key change in the draft permit is a shift from PRPs to Volume Management Plans (VMPs), which focus on reducing the overall volume of stormwater discharged rather than targeting specific pollutants. The draft permit also encourages multi-municipal collaboration by offering credits for joint VMPs. Further details about the PAG-13 permit update can be found on PADEP's website.

Basin Naturalization Project
Source: Eastern Delaware County Stormwater Collaborative

Interviews with Municipalities, Key Stakeholders, and Existing Collaboratives

In early 2024, DVRPC staff conducted ten interviews with municipal officials, key stakeholders, and representatives of existing stormwater collaboratives (see **Table 2: Interviewees**) to gain insight into local stormwater needs and identify opportunities for collaboration. Staff developed tailored interview guides for the three types of interviewees (See **Appendix A: Interview Guides on page A-1**). Each interview was held online and attended by Michael Leventry, Manager of the Environmental Section at the Delaware County Planning Department, and Randy Brown, Section 309 Coordinator at PADEP.

Table 2: Interviewees

Type	Organization	Interviewee Name	Interviewee Title	Interview Date
Municipal Officials	**Marcus Hook Borough**	Bruce Dorbian	Former Director of Planning and Development	1/11/24
	Tinicum Township	David Schreiber Dennis O'Neill, P.E.	Township Manager Township Engineer, Herbert E. MacCombie Jr. Engineers	2/1/24
	Upper Chichester Township	George Needles	Township Manager	1/9/24
Existing Collaboratives	**Berks County MS4 Steering Committee and the Wyomissing Creek Watershed Coalition**	Ashley Showers Jeanne Johnston Nick Johnson, P.E.	Assistant Director Berks County Planning Commission Manager, Cumru Township Founder, Johnson Environmental Engineering	1/25/24
	Eastern Delaware County Stormwater Collaborative	Jamie Anderson Karen Holm	Coordinator Assistant Coordinator	1/11/24
	Perkiomen Watershed Conservancy	Jessie Kemper	Director of Conservation	1/25/24
Key Stakeholders	**Center for Watershed Protection**	Beth Uhler	Pennsylvania Director	1/11/24
	Clean Air Council	Eva Miari	Delaware County Programs Director	2/1/24
	Delaware County Conservation District	Ed Magargee Karen Wilwol	Former Executive Director Executive Director	1/25/24
	Penn State Extension Master Watershed Stewards	Meagan Hopkins-Doerr	Coordinator, Master Watershed Stewards of Chester & Delaware Counties	1/11/24

Municipal Officials Interview Findings

Outlined below are the findings from the municipal officials interviews. While each municipality has distinct issues due to differences in geography and governance, several common themes emerged, including limited internal capacity, reliance on consultants, and cautious interest in collaboration.

Upper Chichester Township

Creation of a Centralized Stormwater Authority

Upper Chichester Township is actively working to improve its stormwater management and MS4 compliance with the formation of a dedicated stormwater utility using American Rescue Plan Act funding and support

from external engineering consultants. The Southeastern Pennsylvania Stormwater Authority, established in January 2025, creates a sustainable and dedicated funding source to support stormwater efforts by issuing a stormwater fee to all property owners. This authority centralizes stormwater responsibilities that are currently spread across several municipal departments into a single operational entity that manages daily functions, system maintenance, and capital improvements. The authority sent the first bills to property owners on July 1, 2025. See **Case Study: Upper Chichester Township's New Stormwater Authority on page 9** for more information on the stormwater authority.

Past Projects and Management

The Township has completed a number of green infrastructure projects, including basin retrofits, rain gardens, and streambank restorations, mostly funded by grants. The Township tries to include stormwater management best practices in every capital project to save money and avoid complicated retrofits in the future. For example, in 2024, the Township received $100,000 from the Commonwealth Financing Authority's Watershed Restoration Protection Program to support streambank restoration at Bergdoll Park. This project built on previous investments, including $89,175 in PADEP funding and $172,677 in Township capital funds allocated in 2019 to improve water quality in the East Branch of Naamans Creek.

The Township relies on their contracted township engineer for plan development and MS4 compliance support. While internal collaboration exists across various departments, collaboration with neighboring municipalities has been limited due to staff turnover and challenges in securing buy-in.

Desire for Practical Tools and Peer Learning

Upper Chichester Township expressed interest in joining or supporting a regional collaborative through its stormwater authority, which has the ability to accommodate multi-municipal collaboration in the future. They requested more case studies to better understand collaborative models and interactive maps of existing BMPs. They also expressed an interest in regional educational events that bring together elected officials, municipal staff, and technical experts around stormwater.

Tinicum Township

Tidal Stormwater Constraints

Tinicum Township faces unique stormwater management challenges due to its location between two tidal water bodies, the Delaware River and Darby Creek. The Township relies heavily on tide gates and pump stations to manage stormwater discharge, especially during high tides when stormwater cannot freely drain.

Unique Public-Private Funding Partnerships

Tinicum Township's proximity to the Philadelphia International Airport presents both stormwater challenges and funding opportunities. Since the airport cannot meet its own stormwater requirements onsite due to infiltration limitations, it contributes financially to the township in an effort to meet its requirements with offsite green infrastructure efforts. These funds support projects such as stormwater retrofits at parks and municipal facilities within the Township. Tinicum Township also pursues state-level grants (e.g. seeking grants from PADEP, the Department of Conservation and Natural Resources, and the Department of Community and Economic Development) and relies on its township engineer for technical compliance.

Interest in Collaboration and Improved Communication

Tinicum Township has not historically been active in regional collaboration. Officials see potential in a stormwater collaborative, particularly for funding opportunities and shared solutions like addressing illicit discharges. There is a desire for more proactive and transparent coordination with entities like the John Heinz Refuge, whose efforts can influence the Township's stormwater outcomes.

Case Study: Upper Chichester Township's New Stormwater Authority

In 2025, Upper Chichester Township took a major step toward addressing its long-term stormwater challenges by establishing the Southeastern Pennsylvania Stormwater Authority. The creation of this independent authority provided the Township with a dedicated vehicle to manage stormwater infrastructure and regulatory compliance while ensuring a stable and equitable revenue stream. Although separate from the municipality, the authority was designed to work closely with Township leadership to advance shared goals around environmental protection, infrastructure resilience, and public service.

To fund the new authority, the Township adopted a stormwater fee of $11 per ERU per month, billed on a six-month cycle. ERU stands for equivalent residential units and is calculated by taking the average impervious area of all single-family home properties within the municipality. In Upper Chichester Township, one ERU equals up to 3,170 square feet of impervious surface. Single-family homes are charged at a flat rate of one ERU per month and non-residential properties are charged based on ERUs. This rate structure better reflects each property's contribution to stormwater runoff, creating a fairer system while still being conscious of the addition burden to residents. The monthly fee amount is based on an estimated annual operating budget of $1.5 million to cover day-to-day operations, MS4 compliance, long-term maintenance, and capital improvement projects.

Managing this program requires dedicated staffing, including an Executive Director who oversees planning, compliance, and project implementation. The Township and Authority established a management agreement that allows the Township's Public Works Department to handle maintenance and field operations, ensuring continuity of service while building specialized expertise within the Authority itself.

Community engagement was a critical component of the launch. To build public trust and awareness, the Township held public forums and provided information through township resources, explaining how the fee would work, how it was calculated, and why stormwater management mattered. Residents and business owners were invited to ask questions and provide feedback, and the Township rolled out an incentive program offering up to 30 percent credits for property owners who invest in on-site stormwater controls. Educational materials distributed through newsletters, social media, and the Township website reinforced these efforts, framing stormwater management as a shared responsibility across the community.

By creating the Southeastern Pennsylvania Stormwater Authority, Upper Chichester Township has positioned itself to meet its regulatory obligations, upgrade aging infrastructure, and reduce flooding risks, all while creating a fair and transparent system for funding. The new authority reflects a forward-thinking model that other municipalities in the region may look to as they face similar challenges in balancing environmental compliance, infrastructure needs, and community expectations.

Sources:
Upper Chichester Township, "Stormwater," https://www.upperchi.org/departments/public-works/stormwater/, accessd August 19, 2025.
Delaware County Coastal Zone Task Force June 12, 2025 Meeting Notes, Presentation by Gabrielle O'Connor and Casey LaLonde on the Southeastern PA Stormwater Authority.

Marcus Hook Borough

Limited Capacity and Upstream Collaboration Barriers

Marcus Hook Borough faces significant challenges due to its location at the bottom of the watershed. Flooding and stormwater management issues are exacerbated by runoff from upstream municipalities, which often prioritize development projects within their own borders rather than initiatives that would benefit larger sections of the watershed, and ultimately Marcus Hook Borough. Additionally, limited staffing also constrains the Borough's ability to engage consistently or lead in stormwater initiatives.

Reliance on External Consultants and Modest Grant Funding

The Borough depends heavily on its contracted township engineer for plan development, compliance, and outreach due to limited internal capacity. While they have accessed some grant funding (e.g., American Rescue Plan Act funds for rain gardens), Marcus Hook Borough has not pursued large-scale projects or hired dedicated stormwater staff, relying instead on borough budget allocations and consultants for MS4 compliance.

Interest in Collaboration but Need for Structure and Support

Marcus Hook Borough expressed interest in participating in a stormwater collaborative, particularly within the Marcus Hook, Naamans Creek, and Stony Creek subwatersheds. However, the Borough is cautious due to uncertainty about political will, staff capacity, and resource constraints. While the Borough is interested in regional efforts, such as the Naamans Marcus Hook Stony Creek (NMS) Watershed Alliance, staff indicated they have not been actively included in early conversations.

Key Takeaways

Reliance on Consultants Due to Limited In-House Capacity

All three municipalities rely on external engineering firms for stormwater planning and MS4 permit compliance. This ensures technical accuracy but may limit institutional knowledge and local flexibility. Budget and staffing constraints can prevent the existing municipal staff from engaging more deeply and proactively in the process.

Inconsistent Access to Funding and Grant Writing Support

While all three municipalities have accessed some state or federal grant funding, none have dedicated grant writers on staff or the capacity among existing staff to regularly pursue and manage grants. The lack of staff capacity makes it particularly hard to pursue larger, more impactful projects. Almost all of the municipalities relied on grant funding to implement GSI projects. Shared grant-writing support or technical assistance could significantly improve their capacity to implement more impactful stormwater projects.

Need for Improved Communication with Regional Stakeholders

Both Marcus Hook and Tinicum townships expressed a desire for more regular, transparent communication with key regional stakeholders, such as neighboring landholders or environmental organizations, whose projects have direct effects on local stormwater dynamics. Better coordination could help align priorities and avoid redundant or incompatible efforts.

Conditional Support for Regional Collaboration

Each municipality expressed interest in joining or supporting a regional collaborative, particularly if it lowers costs, improves access to grant opportunities, supports BMP implementation, or provides technical assistance. However, staff limitations, political uncertainty, and lack of clear structure or incentives were cited as barriers. Many noted that residents are often reluctant to support using their tax dollars to fund GSI projects in neighboring communities, even when those projects deliver shared water quality and MS4 benefits. For collaboration to succeed, it would need a clearly defined governance framework and demonstrable, equitable benefits for all participating municipalities.

Case Studies: Collaborative Approaches to Stormwater Management in PA

Existing multi-municipal collaborations across the state offer valuable lessons and models for meeting stormwater requirements more cost-effectively and efficiently. Whether through shared public education campaigns, joint planning efforts, or coordinated infrastructure projects, these partnerships demonstrate how collaboration can reduce duplication, lower costs, and improve environmental outcomes.

This section highlights four stormwater collaborative models from across Pennsylvania:

- Berks County MS4 Steering Committee;
- Perkiomen Watershed Conservancy Municipal MS4 Program;
- Wyomissing Creek Watershed Coalition; and
- Eastern Delaware County Stormwater Collaborative.

Darby Creek
Source: Darby Creek Valley Association

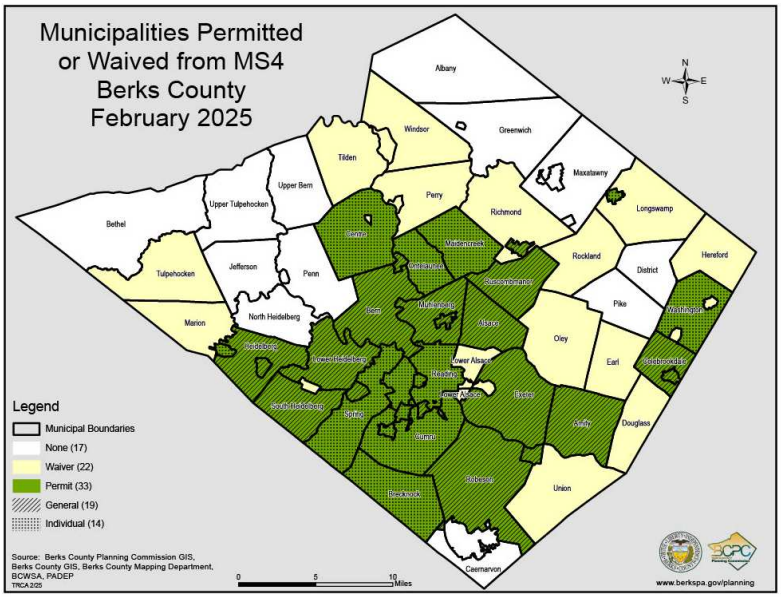
Berks County MS4 Steering Committee

pennsylvania COASTAL RESOURCES MANAGEMENT

Purpose and History

The Berks County MS4 Steering Committee was originally formed in 2003 by a group of local engineers to help municipalities address MS4 permit requirements on a regional level. The MS4 Steering Committee facilitates a Joint Cooperative Education Program, in which the Berks County Planning Commission, the Berks County Conservation District, and Berks Nature provide and report upon joint education and outreach efforts related to stormwater runoff, municipal stormwater systems, and the prevention of pollution from entering storm drains. These cooperative efforts focus on MCMs 1, 2, and 6, and help municipalities to fulfill their MS4 requirements related to education and outreach.

Service Area



Source: Berks County Planning Commission

Membership and Staffing

Thirty municipalities throughout Berks County participate in the MS4 Steering Committee. Engineers and solicitors of member municipalities may attend the Steering Committee meetings, which are held quarterly. The Berks County Planning Commission, Berks County Conservation District, and Berks Nature serve as the educational partners while the Berks County Planning Commission provides administrative and staffing support to the organization.

Storm Drain Mural in Topton Borough
Source: Borough of Topton

Governance Structure

The MS4 Steering Committee was formalized by an intergovernmental agreement in 2013 (before the MS4 permit update) to pool resources and fulfill the public education and outreach components of the MS4 permit. The agreement outlines Steering Committee membership structure, yearly dues, each municipality's responsibilities, and the education partners' responsibilities. The Steering Committee has open nominations for Chair and Vice Chair positions. The Treasurer position is staffed by the County Conservation District.

Funding

As the intergovernmental agreement outlines, each municipality pays annual dues (currently set at $900 per year) to participate. The dues are the same for each municipality regardless of population or land area. The dues fund the education and outreach programs; however, it was noted that not all of the members use the educational partners at the same level.

Services Offered

The Steering Committee works collaboratively to fulfill the public education and outreach components of the MS4 permit. They do that by organizing and providing the following:

- Public education and outreach efforts, including newsletters, website content, and community events such as tree plantings and trainings;
- YouTube Channel with educational videos for the general public and training videos for municipal employees;
- Student stormwater video contest;
- Municipal staff training; and
- Annual report summary for municipal MS4 reporting.

Lessons Learned

The Steering Committee noted that it takes work to not only start a collaborative effort but also to maintain it. Clear communication of the benefits of collaboration, especially with the public and elected officials, is key. They noted that it is important to celebrate all victories, both big and small. The Steering Committee also recommended that municipalities interested in forming a collaborative start by building off of existing stormwater efforts. They suggested reaching out to the partners already working on stormwater issues to create more intentional and formalized collaborations.

2023 Student Stormwater Video Contest Poster
Source: Berks County MS4 Steering Committee

Berks County MS4 Steering Committee
Leesport, PA

Ashley Showers, Assistant Director
Berks County Planning Commission
ashowers@berkspa.gov

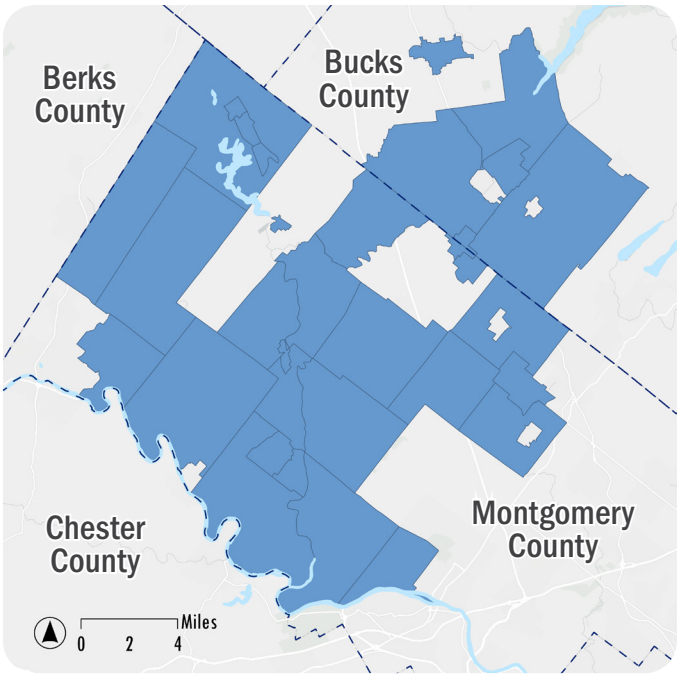
Perkiomen Watershed
Conservancy Municipal MS4 Program

pennsylvania
COASTAL RESOURCES MANAGEMENT

Purpose and History

The Perkiomen Watershed Conservancy (PWC), originally known as the Perkiomen Valley Watershed Association, was established in 1964 in response to unprecedented droughts and deteriorating water conditions. Since then, PWC has worked to conserve and protect the land and water resources of the Perkiomen Watershed through environmental education, watershed stewardship, and conservation programs. One of their many programs is the Municipal MS4 program, which helps municipalities in the watershed to meet the educational requirements of their MS4 permits.

Service Area



Source: PWC, DVRPC

Membership and Staffing

PWC's Municipal MS4 program is a voluntary, membership-based program that offers three membership levels with varying benefits and costs. Municipalities can enroll at any time and memberships last for a year before they need to be renewed. Approximately 30 to 35 municipalities are currently enrolled in the MS4 program. As a fee-for-service program, PWC is the sole entity responsible for administering the program.

Funding

The MS4 program is primarily funded through membership fees, which range from $250 per year to $1,000 per year. Additionally, PWC raises supplementary funds by charging fees for hosting events like rain barrel and rain garden construction workshops. PWC also actively pursues grant funding to support larger initiatives and infrastructure projects.

Services Offered

The MS4 Program offers various services depending on the membership level. Services range from providing municipalities with educational articles and flyers at the lowest level to hosting educational workshops and providing BMP funding through the Municipal MS4 Grant Program at the highest level. PWC also provides municipalities at the middle and highest levels with data to support a municipality's annual MS4 report, such as the number of volunteers involved, the amount of trash removed from a site, or the number of trees planted along a riparian area.

Program offerings have grown in recent years to include the Perkiomen Stormwater Symposium and the previously mentioned Municipal MS4 Grant Program in response to comments and requests from member municipalities. The now annual Stormwater Symposium is an all-day, in-depth exploration of stormwater management that serves

as a one-stop shop for municipal staff, covering all six minimum control measures.

Recent Achievements

Jacob Reiff Park
Source: PADEP

With grant funding from the Schuylkill River Restoration Fund, PWC recently partnered with Lower Salford Township to undertake the Jacob Reiff Park Floodplain Reconnection Project. The project focused on addressing flooding and water quality issues along the west branch of the Skippack Creek, which had extremely eroded streambanks due to consistent flash flooding and an inadequate riparian buffer. To address these concerns, PWC worked with volunteers to remove invasive plant species from the eroded streambank. The project team also worked to regrade 500 linear feet of streambank in order to reconnect the creek with its traditional floodplain. Then PWC, with support from volunteers, planted the regraded streambank with 1,000 live stakes, 100 trees, and 25 shrubs. They also created a large, two-acre rain garden, which was planted with 1,000 live stakes, 150 trees and shrubs, and 10,000 perennials.

The Jacob Reiff park project helped Lower Salford Township to meet EPA and PADEP requirements to reduce sediment and nutrients in several township streams, including Skippack Creek. In 2023, PADEP awarded PWC the Governor's Award for Environmental Excellence for this project.

PWC also coordinates an annual Plant-A-Thon event, focused on planting native trees, shrubs, and perennials across the Perkiomen watershed. In 2024, PWC, with the help of hundreds of volunteers, planted over 400 trees and over 2,500 perennials on nine different sites. These events help participating municipalities to meet their MS4 requirements, specifically MCM 2: Public Involvement. The Plant-A-Thon also contributes to water quality improvements, helping municipalities to meet the goals of their pollutant reduction plans.

PWC Plant-A-Thon 2024
Source: Jessie Kemper, PWC

Lessons Learned

PWC observed an increase in the number of municipalities participating in the program due to the addition of new benefits. However, they also pointed out that not every municipality takes full advantage of these opportunities. It is the responsibility of each municipality to schedule a workshop or submit a grant application. Additionally, PWC noted that while some collaboration has been seen among municipalities along the Skippack Creek, this is more the exception than the norm. They mentioned that municipalities with Environmental Advisory Commissions tend to show greater interest in collaboration.

Perkiomen Watershed Conservancy
perkiomenwatershed.org

Schwenksville, PA
610-287-9383

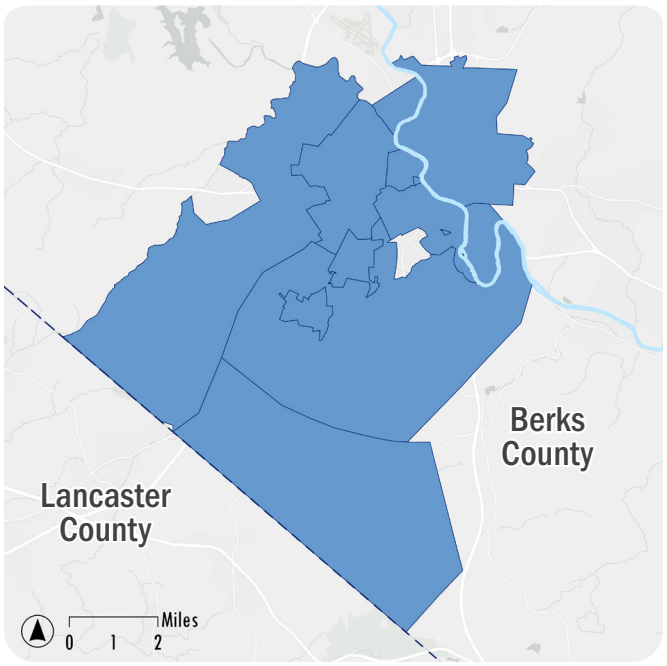
Wyomissing Creek Watershed Coalition

pennsylvania COASTAL RESOURCES MANAGEMENT

Purpose and History

The Wyomissing Creek Watershed Coalition (WCWC) is a partnership of municipalities formed to collaboratively address nonpoint source pollution within the Wyomissing Creek Watershed. The group began meeting informally in 2010 and formalized its partnership in 2012. WCWC coordinates its activities with the Berks County MS4 Steering Committee and focuses on collaboratively implementing projects that reduce pollutant load across the Wyomissing Creek Watershed to meet the requirements of the 2004 Sediment Total Maximum Daily Load (TMDL). The 2004 TMDL was unusual in that it established wasteload allocations for the entire watershed as opposed to individual municipalities. Under this structure, it was effectively impossible for individual municipalities to parse out their individual regulatory responsibility, making a joint pollutant reduction effort the only feasible option.

Service Area



Source: WCWC, DVRPC

Membership and Staffing

The 2004 TMDL regulates eight municipalities within the Wyomissing Creek Watershed, all of which are members of the WCWC. The WCWC typically meets monthly, and Johnson Environmental Engineering provides staffing and administrative support.

Governance Structure

The WCWC was formed and is governed by an intermunicipal agreement that includes cost-sharing measures. WCWC's activities are organized and administered by a Steering Committee. Participating municipalities designate a representative and an alternate to the WCWC Steering Committee, which selects members to serve as the Chairperson and Vice Chairperson. The Treasurer is selected from the municipality chosen to collect membership fees and assessments.

Funding

When the WCWC was formed in 2012, each municipality paid an initial membership fee of $5,000. Under WCWC's first intermunicipal agreement, which covered the development of the joint TMDL Implementation Plan, the eight municipalities evenly shared the budgeted costs, which totaled $96,000 over the five-year MS4 permit cycle (2013–2018). Participating municipalities contributed about $2,400 annually.

As it entered the next MS4 permit cycle (2018–2023), the WCWC recognized that they would need to implement significant capital projects to comply with their MS4 requirements. The WCWC estimated it would cost about $2 million over the five-year permit period to implement its proposed BMPs. Rather than sharing the increased costs

equally, the WCWC adopted a new intermunicipal agreement where costs are allocated based on a municipality's share of the urbanized area in the watershed. Blending this proportional obligation with the understanding that all municipalities benefit equally from the joint efforts, the WCWC chose to cap the largest municipalities' share of the costs at 20 percent. See **Table 3: WCWC Cost Share Calculations** at right for a breakdown on the municipalities' cost shares and urbanized area acreage.

The WCWC has also sought grant funding to supplement municipal contributions. They have successfully received grants through Altria and the Coldwater Heritage grant program in the past.

Table 3: WCWC Cost Share Calculations

Municipality	Urbanized Area Acerage	Share of Financial Responsibility
Brecknock	259	6.3%
Cumru	1,706	20.0%
Mohnton	490	11.9%
Reading	275	6.7%
Shillington	434	10.5%
Spring	1,942	20.0%
West Reading	188	4.6%
Wyomissing	2,065	20.0%
Total	**7,359**	**100.0%**

Source: 2017 Wyomissing Creek Watershed TMDL

Services Offered

The WCWC provides a forum for the eight participating municipalities to jointly develop required plans, such as the 2012 TMDL Implementation Plan, the Coldwater Conservation Plan in 2013, and an updated TMDL in 2017. The joint plans helped the WCWC to identify and prioritize BMPs that would allow the member municipalities to meet their required pollutant load reductions. The WCWC partnered with the Berks County MS4 Steering Committee and the Center for Watershed Protection to provide trainings to municipal staff and engineering consultants. They have also worked to implement BMPs throughout the watershed; although that has largely depended upon the availability of grant funding.

Recent Achievements

As noted above, in 2013, the WCWC partnered with the Berks County Conservation District to develop the Coldwater Conservation Plan, which assessed surface water in the Wyomissing Creek Watershed. The plan evaluated existing conditions, identified potential threats to the watershed, and recommended strategies for protecting and improving water quality throughout the watershed.

The WCWC has also sought out grant funding to install BMPs. With funding from Altria, they installed a rain barrel and overflow trench to capture runoff stormwater from a pavilion at Pennwyn playground in Cumru Township. In 2024, the WCWC received $315,488 in Community Project Funding through Representative Chrissy Houlahan to mitigate erosion of the Highbrook channel in Mohnton Borough. The project will provide a direct benefit to Mohnton residents by addressing hazardous conditions that threaten an apartment building and its handicapped access. It will also benefit the entire watershed by reducing sediment pollution entering Wyomissing Creek.

Lessons Learned

The WCWC found that, even through its municipalities are bound by the joint TMDL, maintaining a cohesive and effective group requires ongoing outreach and education. Frequent turnover among municipal staff and elected officials means it is essential to continually communicate the value WCWC brings to each member municipality. They also reflected on common challenges, such as securing buy-in to implement projects located in other municipalities, despite the shared pollutant reduction benefit, and addressing often overlooked logistical issues, like deciding which solicitor or engineer to use for different projects. They noted that in some cases, actions required approvals from every municipality's solicitor, adding time and complexity. Other ongoing hurdles include improving property owner understanding and cooperation, which is key to implementing projects successfully.

Wyomissing Creek Watershed Coalition
Leesport, PA

Nick Johnson, WCWC Secretary
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Eastern Delaware County Stormwater Collaborative

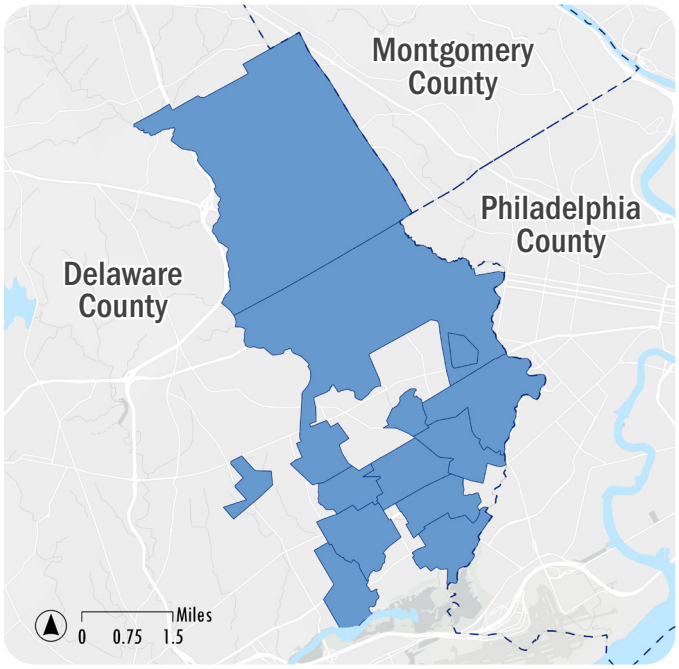
pennsylvania
COASTAL RESOURCES MANAGEMENT

Purpose and History

The Eastern Delaware County Stormwater Collaborative (EDCSC) is a partnership of municipalities working to improve stormwater management, water quality, and the local environment within the Darby Creek watershed. It helps its members meet their MS4 permit requirements through public outreach, educational initiatives, and on-the-ground projects.

The EDCSC grew out of a 2007–2009 study, undertaken by the Southeastern Pennsylvania Resource Conservation and Development (SEPA RC&D) Council, funded by the EPA, to explore the costs and benefits of multi-municipal MS4 collaboration in eastern Delaware County. Although the study faced data challenges, it helped start conversations between Delaware County and some municipalities about MS4 requirements and the potential for collaboration. The SEPA RC&D Council continued to meet with interested municipalities to explore options for MS4 collaboration, including the idea of a shared stormwater coordinator. In 2009, with support from the William Penn Foundation, the SEPA RC&D Council launched a pilot project that allowed them to hire a temporary stormwater coordinator to help participating municipalities comply with their MS4 requirements and guide the development of a formal collaborative structure. On December 1, 2011, four municipalities—Yeadon Borough, Sharon Hill Borough, Collingdale Borough, and Upper Darby Township—signed the EDCSC Agreement, formalizing the collaborative.

Service Area



Source: EDCSC, DVRPC

Membership and Staffing

Currently, eleven municipalities within the Darby Creek and Cobbs Creek watersheds participate in the EDCSC with the shared goal of meeting their MS4 requirements. They include Collingdale Borough, Darby Borough, Darby Township, East Lansdowne Borough, Glenolden Borough, Haverford Township, Morton Borough, Norwood Borough, Sharon Hill Borough, Upper Darby Township, and Yeadon Borough. In 2018, nine of these municipalities jointly created a pollutant reduction plan (PRP) to reduce sediment runoff into local waterways. The EDCSC is supported by two paid consultants who manage day-to-day operations, including grant writing, meeting coordination, budgeting, and conducting on the ground outreach and education to community members. They also collaborate with partners to implement BMPs to help meet collective water quality requirements.

Governance Structure

The EDCSC's Board is composed of a designated representative from each participating municipality. The Board meets monthly, with elections held annually in January.

Funding

Members pay $2,500 in annual dues, which are supplemented by grant funding. To date, the EDCSC has received $1,926,878 in grant funding for PRP project implementation and $1,263,897 in grant funding for education and outreach activities.

Municipalities in the PRP subgroup contribute additional funds toward implementing the PRP, based on their share of the total sediment load. Each municipality's share is calculated as a percentage of the combined sediment load for all participating members. That percentage is then applied to the total estimated project costs over the five-year permit period. For example, if a municipality generates 10 percent of the group's combined sediment load and the total PRP cost is $1 million, it would contribute $100,000 over the five-year permit period.

Services Offered

EDCSC supports members in meeting MS4 program requirements, particularly MCMs 1, 2, and 6, by providing public education materials, such as instructional videos on residential rain garden installation, and organizing community engagement events, such as downspout planter workshops. Recently, the EDCSC hosted three watershed and rain barrel workshops where each participant received a 55-gallon rain barrel. They also organized a pollinator workshop and rain garden tour at the Upper Darby Municipal Library, and a rain garden workshop at the Haverford Community Recreation and Environmental Center. EDCSC's online Resource Center is a useful repository of informative educational brochures related to stormwater management for different audiences.

EDCSC also partners with three other environmental nonprofits (Pennsylvania Resources Council, Darby Creek Valley Association, and Lower Merion Conservancy) in the Darby Creek Watershed to operate the Stream Smart House Calls program, which provides watershed residents with a free home stormwater audit and detailed information on how to better manage stormwater on their properties. The Stream Smart program also helps residents install downspout planters and rain gardens with native plants, as funding and volunteer support is available. This partnership also recently launched Growing Greener Communities, an initiative that promotes small-scale projects on a wide range of properties to strengthen the health of local waterways and communities.

Recent Achievements

In 2024, the EDCSC partnered with Glenolden Borough to undertake a major stormwater improvement project in Glenolden Community Park. Funded through grants from the PA Department of Conservation and Natural Resources, PA Growing Greener, PA Department of Community and Economic Development, National Fish and Wildlife Foundation, and the Delco Greenways Program, the project achieved multiple environmental and community benefits. It stabilized 490 feet of streambank and managed stormwater runoff from 26 acres through the construction of a 542-foot bioswale. The project also established a riparian buffer along Muckinipates Creek, enhancing habitat for pollinators and bird species. Educational signs and an ADA-accessible trail now connect visitors to the bioswale and creek. Together, these improvements support water quality, ecological health, and public access to natural spaces.

Lessons Learned

The EDCSC shows that regional collaboration strengthens municipal capacity for stormwater management while saving time and resources. By pooling funding, staff, and technical expertise, EDCSC's 11 member municipalities have jointly addressed MS4 permit requirements, developed a shared PRP, and secured over $3 million in grant funding, while increasing outreach and engagement to their community members. Their model shows how small municipalities can come together and utilize shared staffing to conduct consistent outreach and education, and execute joint infrastructure projects that have greater environmental impact and improved public visibility. Importantly, the collaborative's formal governance structure and modest member dues create a sustainable framework for long-term cooperation.

Eastern Delaware County Stormwater Collaborative Morton, PA
www.edscs.org edcscinfo@gmail.com

Perkiomen Watershed Conservancy Plant-A-Thon 2024
Source: Jessie Kemper, PWC

Case Studies: Key Stormwater Partners in Delaware County

Many organizations are already working in Delaware County to improve water quality. While reducing stormwater runoff or fostering municipal collaboration may not be their primary mission, much of their work supports or complements MS4 program requirements. This section highlights four local organizations and details how municipalities can partner with them to advance their stormwater management goals. The four organizations featured are:

- Delaware County Conservation District;
- Center for Watershed Protection;
- Clean Air Council; and
- Penn State Extension Master Watershed Stewards.

Storm Drain Street Art by Anya Finlay
Source: Shaun Bailey of the Partnership for the Delaware Estuary

Delaware County Conservation District

pennsylvania
COASTAL RESOURCES MANAGEMENT

About

The Delaware County Conservation District (DCCD) is one of 66 conservation districts across Pennsylvania established by the 1945 Soil Conservation District Act. Conservation Districts were initially created to improve soil and water conservation in response to the Dust Bowl of the 1930s. Today, county conservation districts work to help people and communities take care of the natural resources in their communities. In Delaware County, the DCCD works to ensure the wise use of Delaware County's natural resources and to protect and restore the natural environment through the conservation of its soil, water, and related resources. It does this by educating teachers, students, and the general public on environmental issues; providing technical assistance to landowners, farmers, and municipal leaders; managing specific environmental permitting processes on behalf of PADEP; and administering grant programs that support natural resource conservation.

Stormwater drain label from a joint event with Bethel Township and DCCD
Source: DCCD Facebook

Role in Stormwater Management

DCCD is one of the few county conservation districts that serves as the MS4 coordinator for county facilities. They monitor 18 county-owned facilities for illicit discharges, outfalls, and conduct stormwater management facility maintenance. They educate county employees about stormwater pollution and coordinate needed stormwater maintenance.

DCCD also administers the permitting programs highlighted below on behalf of PADEP:

- **Chapter 102 Erosion and Sediment Control:** Administers the state program to control sediment pollution from earth disturbance activities. As part of their MS4 Annual Reports, municipalities must report the number of sites DCCD inspected for erosion and sediment control;
- **National Pollution Discharge Elimination System (NPDES):** Processes applications and monitors compliance with stormwater discharge permits for construction activities;
- **Chapter 105 Waterways and Wetlands General Permitting:** Assists applicants by providing permit information and processes general permits for work within wetlands and streams; and
- **Pennsylvania Natural Diversity Inventory (PNDI):** Conducts computer checks to identify endangered or threatened plant and animal species within proposed construction areas.

DCCD also manages two grant programs that allow municipalities and nonprofit organizations in the county to implement projects that can help address their MS4 and/or PRP requirements: the Low Volume Road Program and the DCCD Mini-Grant Program. The Low Volume Road program aims to improve roadway stormwater management systems, and reduce maintenance costs for municipalities. The Mini-Grant program supports projects that improve conservation in the county with awards under $500. They also help to administer the Pennsylvania Horticultural Society's TreeVitalize Watershed program in Delaware County, which supports tree planting along stream corridors, adjacent upland areas, headwaters, and naturalized stormwater basins.

Recent Work

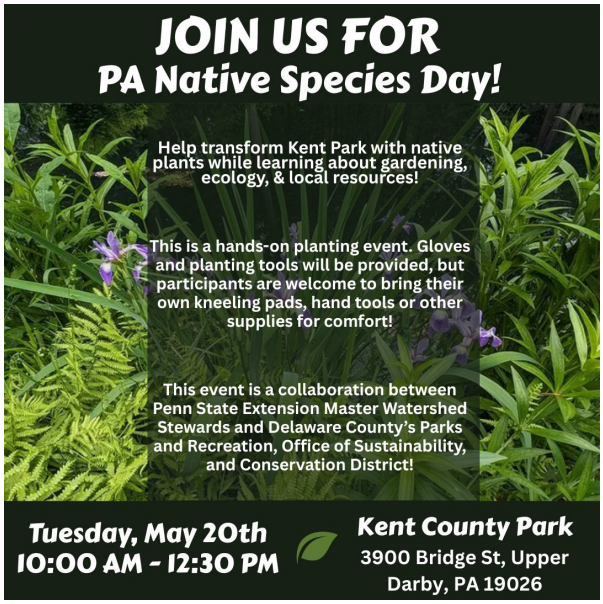
DCCD partners with other local environmental and community organizations to deliver educational workshops and implement projects that help to protect and restore the county's natural resources directly in communities. Recent examples include:

- Partnered with the Center for Watershed Protection to host a stormwater workshop for municipalities. Over sixty people attended.
- Hosted the annual Delaware County Pennsylvania Envirothon Competition in which teams from high schools across Delaware County compete against one another to test their knowledge on soils, aquatics, wildlife, forestry, and a current environmental issue.
- Partnered with the Borough of Prospect Park and the Darby Creek Valley Association to host a tree planting at a municipal park.
- Partnered with the NMS Watershed Alliance, Clean Air Council, and various municipalities to install storm drain markers throughout local communities.

DCCD engaging with residents at the Newlin Grist Mill's Race for the Watershed 5K
Source: DCCD Facebook

Takeaway

DCCD has a unique perspective on stormwater management efforts in Delaware County due to its role as the county MS4 coordinator. Although DCCD has a small team of six staff members, they have successfully partnered with environmental organizations and local governments to implement projects, such as riparian buffer repair. These initiatives help municipalities meet their MS4 and PRP requirements while simultaneously advancing DCCD's mission to restore and conserve Delaware County's natural resources.



Flyer from PA Native Species Day
Source: DCCD Facebook

Delaware County Conservation District
www.delcocd.org/

Media, PA
610-892-9484

Center for Watershed Protection

pennsylvania
COASTAL RESOURCES MANAGEMENT

About

Founded in 1992, the Center for Watershed Protection (CWP) is a national nonprofit made up of scientists, planners, engineers, and other environmental professionals focused on improving water quality and watershed health. With a regional office in Pennsylvania, CWP plays a significant role in supporting stormwater management efforts across the state. Operating primarily as a consulting organization, CWP offers fee-based services that help local governments and agencies implement science-based, practical solutions to complex water resource challenges.

Role in Stormwater Management

In Pennsylvania, CWP provides a range of technical services including support for stormwater collaboratives, consulting services for municipal stormwater programs, workforce trainings, retrofit assessments, green stormwater infrastructure design and implementation, and the development of interactive GIS tools to support local water quality efforts. CWP also focuses on facilitating the development and implementation of stormwater programs that align with the MS4 permit requirements. They help connect smaller municipalities to lead agencies or collaborative structures that can share resources that provide accessible annd ready-to-use information on stormwater management compliance.

In 2024, CWP developed the Pennsylvania MS4 Collaboration Toolkit, a comprehensive resource that documents existing stormwater collaboratives across the state and provides actionable tools for municipalities looking to form or strengthen their own partnerships. The toolkit emphasizes the value of regional collaboration in meeting water quality goals and includes case studies, implementation strategies, and governance models to inspire replication.

Recent Work

In addition to publishing the MS4 Collaboration Toolkit, CWP has partnered with local governments on numerous projects, including the work below:

- Provided extensive support to the Wyoming Valley Sanitary Authority, including training programs, stormwater retrofits, and BMP inventory assessments.
- Collaborated with the Berks County Conservation District to develop a Watershed Implementation Plan for the Upper Little Swatara Creek watershed.
- Partnered with the York County Stormwater Consortium to support MS4 permit compliance, apply for EPA grants focused on pollution prevention, led efforts to scale up biochar usage in the Chesapeake Bay watershed, and develop watershed-level planning documents.

CWP-led submerged gravel wetland and wildflower meadow in Chester County, PA using biochar to enhance soil health
Source: CWP Facebook

In 2024, CWP provided a multi-municipal MS4 training for over 20 Montgomery County municipalities, hosted by Lower Providence Township.
Source: CWP Facebook

Takeaway

CWP's depth of experience and technical expertise make it a valuable resource for municipalities and stormwater groups navigating MS4 compliance and regional collaboration. Through its research, on-the-ground support, and development of statewide tools like the MS4 Collaboration Toolkit, CWP is helping to streamline and strengthen stormwater efforts across Pennsylvania. Through its experience working with communities across PA, CWP highlighted the importance of local champions leading stormwater initiatives and the need for cost-effective, scalable solutions that can be shared among communities, both of which are essential for long-term success.

Center For Watershed Protection
cwp.org

Fulton, Maryland
410-481-8323

Clean Air Council

pennsylvania
COASTAL RESOURCES MANAGEMENT

About

The Clean Air Council (CAC) is a Philadelphia-based nonprofit dedicated to protecting public health and the environment across Pennsylvania and the surrounding region. As the city's oldest environmental health organization, CAC advances its mission through public education, community engagement, policy advocacy, and the enforcement of environmental laws. Its multidisciplinary team includes community organizers, engineers, public health educators, urban planners, and attorneys, working to address environmental threats at the community level.

Cobbs Creek Watershed Coalition clean up event, supported by the CAC
Source: Clean Air Coalition

Role in Stormwater Management

CAC is currently working on four major programs in Delaware County focused on air quality, water resources, climate resilience, and public health. These efforts include launching an air monitoring initiative along the I-95 corridor in partnership with Delaware County and with funding from PADEP and the EPA. They are also working with Johns Hopkins University to conduct a community health survey. CAC also has longstanding programs that promote watershed protection, including citizen training for environmental advocacy.

With leadership by Eve Miari, CAC is playing a key role in launching the Naamans Marcus Hook Stoney Creek (NMS) Watershed Alliance. Their goal is to establish a community-led, sustainable effort that reflects local priorities. While stormwater management is an important component, the group's broader mission is guided by the needs and concerns of the watershed's residents.

Recent Work

CAC's work spans the Mid-Atlantic region, with many recent initiatives focused around Delaware County, including:

- Collaborating with Marcus Hook Area Neighbors for Public Health and OLIN Studios on the Climate Resilient Communities project, which uses climate modeling to analyze potential flooding scenarios and their interaction with nearby industrial zones.
- Working with residents to install small-scale green infrastructure projects as a part of CAC's broader climate resilience efforts.
- Helping to launch the NMS Watershed Alliance, a recommendation that came from the 2014 Delaware River Watershed Conservation Plan.
- Training community members to advocate for watershed protection and review potentially problematic permit applications.

NMS Watershed Allliance Logo
Source: NMS Watershed Alliance Facebook

Takeaway

CAC demonstrates how community-centered advocacy, partnerships, and technical expertise can drive progress on environmental and stormwater management. By combining public health, policy, and grassroots engagement, CAC supports systemic change, local action, and empowering residents to advocate for more resilient communities across Delaware County and beyond.

Wilcox Park in Trainer Borough with new garden, storybook walk, and mural supported by CAC
Source: Friends of Wilcox Park Facebook

Penn State Extension
Master Watershed Stewards

pennsylvania
COASTAL RESOURCES MANAGEMENT

About

Penn State Extension is a non-credit educational organization within Penn State University dedicated to providing science-based education and resources to people, businesses, and communities across Pennsylvania. The Extension focuses on a broad range of programs and services, including agriculture, food safety, water quality, energy, and youth development. The Master Watershed Stewards (MWS) program is one of the Extension's many community-based programs. It leverages and empowers engaged community members, transforming them into an educated and organized volunteer force working to improve the health of Pennsylvania's streams, rivers, and other natural resources. There are MWS programs in counties across Pennsylvania, including a combined Chester and Delaware counties program.

New cohort of MWSs at Clayton Park in Delaware County
Source: Penn State MWS Facebook

To become a MWS, interested residents can apply with their local county-based program. Once selected, participants attend training classes focusing on a wide range of environmental resource topics, including groundwater, stream ecology, wetlands, soils, geology, native and invasive plants, water recreation, climate science, and stormwater management. They must also complete 40 hours of training and fulfill 20 hours of volunteer service within the first year to become a certified MWS. To maintain their certification, Stewards must record at least 20 volunteer hours and 10 continuing education hours each year

Role in Stormwater Management

In Chester and Delaware Counties, the MWS program partners with the Chester County Conservation District, the Chester County Water Resources Authority, the Delaware County Conservation District, local and regional watershed associations, municipalities, schools, libraries, conservation groups and other groups to improve the health of waterways in their communities. Their activities include organizing educational events like rain barrel building workshops, training volunteers, managing various volunteer initiatives like stream clean-ups or tree planting days, sampling water quality, conducting stream assessments, and designing and installing green infrastructure projects such as native gardens and rain gardens. As an organization committed to working with the community to improve the health of rivers and streams, most of the MWS's efforts help to address stormwater management and could help municipalities to meet their MS4, pollutant reduction plan (PRP), and/or total maximum daily load (TMDL) requirements.

Recent Work

The MWS program of Chester and Delaware counties trains a new cohort of 15 to 20 Stewards each year, with a focus on recruiting and educating a diverse group of volunteers. As of 2024, the statewide program has grown to include 911 trained Stewards residing in 42 counties across Pennsylvania. Collectively, they contributed 44,233 hours of service in 2024 alone. Since the program's inception in 2013, volunteers have logged a total of 198,460

hours, equivalent to an estimated $6.6 million in value. These hours encompass a wide range of watershed-related activities, including setting up educational displays, conducting outreach to residents, teaching students, organizing workshops, planting trees, and monitoring water quality.

In addition to training volunteers, MWS program staff help coordinate a variety of hands-on restoration and stewardship efforts. Recent projects include managing the installation of a one-acre native meadow at Rose Tree Park in Delaware County, planting over 150 live stakes to stabilize the streambank at Beaver Creek Dam, and converting a traditional mowed stormwater basin into a naturalized basin in Middletown Township.

MWSs at Smedley Park in Delaware County, learning about vernal pool restoration
Source: Penn State MWS Instagram

The MWS program of Chester and Delaware counties also recently developed a Watershed-Friendly Property Certification Program in partnership with the Nurture Nature Center. Funded by a PADEP Environmental Education grant, this program recognizes property owners who implement sustainable practices on their properties to help reduce stormwater runoff, conserve water, and support wildlife and pollinators. In 2022, PADEP recognized the program with the Governor's Award for Environmental Excellence.

Takeaway

The Chester and Delaware County MWS program is a valuable partner for municipalities seeking to improve stormwater management and meet MS4, PRP, and TMDL requirements. Backed by a network of trained volunteers, the program offers support for public education, community engagement, and on-the-ground projects such as green infrastructure installations, native plantings, and streambank stabilization. While the program does not coordinate municipal collaborations, it regularly works with boroughs and townships on one-day events, smaller-scale restoration efforts, and educational initiatives that deliver measurable water quality benefits. By leveraging MWS expertise and volunteer capacity, municipalities can enhance compliance efforts, engage residents, and make visible progress toward cleaner waterways.

MWSs engaging community members at the Chester River Fest
Source: Penn State MWS Facebook

Penn State Master Watershed Stewards
www.extension.psu.edu/programs/

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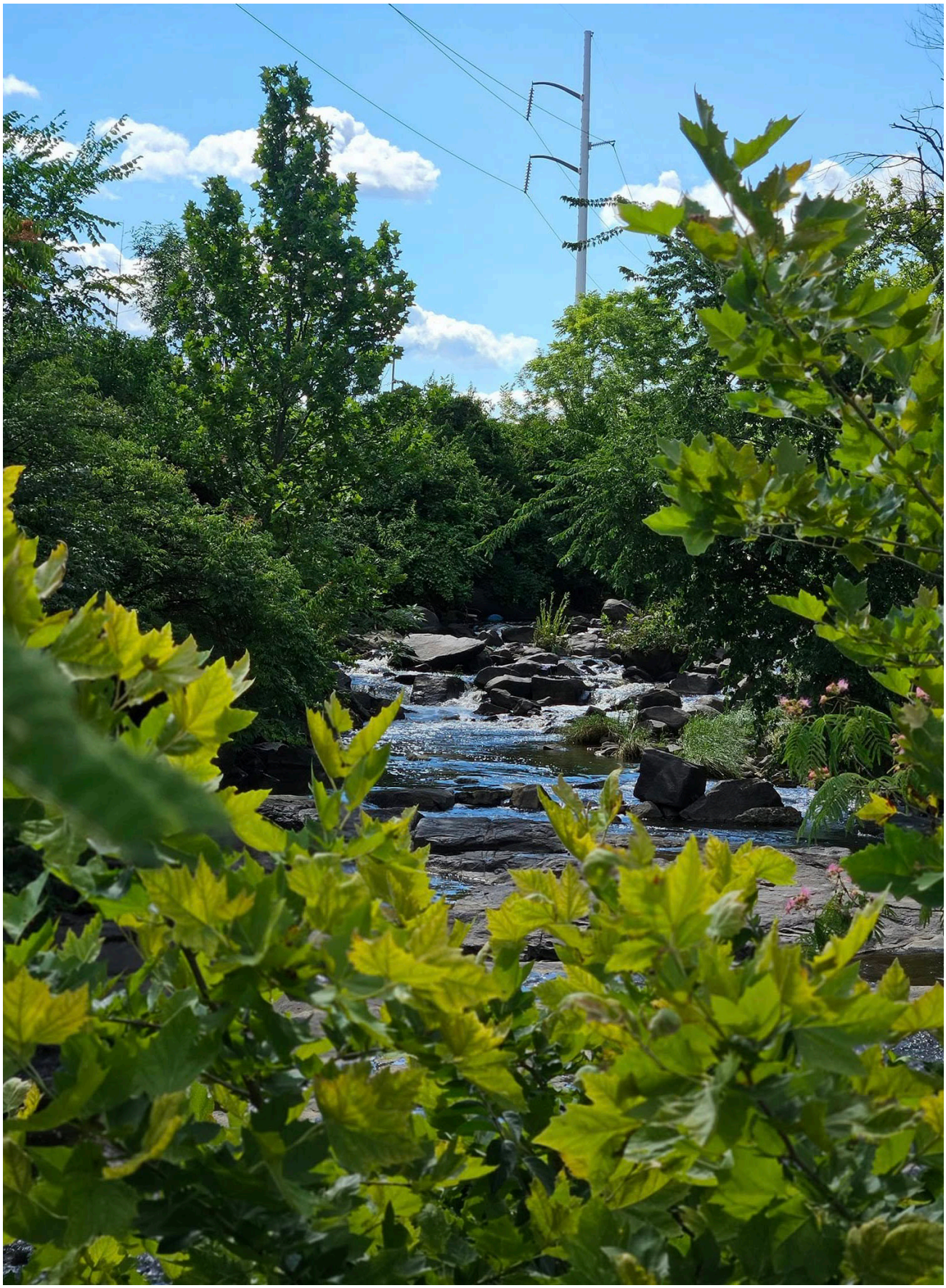

Naamans Creek
Source: Naamans Marcus Hook Stoney Creek (NMS) Watershed Alliance

Recommendations

The interviews underscored the many challenges that municipalities face, not only in meeting MS4 requirements, but also in effectively managing stormwater within their communities. At the same time, they revealed a range of promising local programs and collaborative models that could support municipalities in Delaware County. Improving stormwater management across Delaware County will require coordinated efforts from regional agencies, municipalities, and supporting organizations. The following recommendations identify practical steps that DVRPC, local governments, and key partners can take to reduce barriers, strengthen collaboration, and advance more effective, efficient, and sustainable stormwater strategies across the county.

Actions for DVRPC:

- **Facilitate multi-municipal collaboration** by working with the Delaware County Planning Department and other key stakeholders to explore opportunities for shared approaches to MCMs 1 and 2, drawing inspiration from models such as the Berks County MS4 Steering Committee and the Perkiomen Watershed Conservancy.
- **Coordinate with Delaware County's Act 167 planning process** to ensure DVRPC activities related to stormwater and flooding align with and enhance countywide stormwater management efforts.
- **Explore the development a countywide BMP inventory** by partnering with PADEP, municipalities, and key stakeholders to map existing BMPs throughout Delaware County to inform future stormwater planning and investment decisions.
- **Support infrastructure funding efforts** by continuing to participate in the Funding Navigator program, which is a nonprofit-led program that assists drinking water, wastewater, and stormwater systems in Southeastern PA to prioritize needs, develop competitive grant applications, and secure state and federal funds for infrastructure projects.
- **Advance understanding of local needs and barriers** by conducting additional outreach and interviews with municipalities, technical experts, and partner organizations to identify gaps and opportunities for more effective regional coordination. Potential interviewees may include:
  - **Municipalities** in the Naamans, Marcus Hook, and Stony Creek Watersheds such as Chester City, Lower Chichester Township, and Trainer Borough;
  - **Local and Regional Partners** such as Pennsylvania Sea Grant, Chester Ridley Crum Watershed Association, Wissahickon Clean Water Partnership, Delaware County Council of Governments;
  - **Institutional Stakeholders** such as Swarthmore College, and John Heinz National Wildlife Refuge; and
  - **Township Engineers** and other technical advisors.
- **Provide targeted education and outreach** to elected officials on the benefits of multi-municipal collaboration for stormwater management, highlighting cost savings, funding opportunities, and improved compliance outcomes.
- **Continue exploring opportunities to strengthen municipal resilience**, including supporting multi-municipal planning efforts and offering educational webinars or workshops on stormwater management.

Actions for Key Stakeholders and Supporting Organizations:

- **Provide targeted trainings** for engineers, policymakers, and other local decision-makers to support municipalities in meeting their MCM 1, 2, and 6 requirements and build capacity for effective stormwater management.
- **Support municipalities in navigating regulatory changes**, including the transition to updated PAG-13 guidelines, by offering technical assistance and clear guidance on roles, responsibilities, and compliance strategies.

- **Evaluate collaborative models** by conducting cost-benefit analyses of multi-municipal approaches to identify the most effective, scalable, and sustainable strategies for shared stormwater management.

Actions for Municipalities:

- **Pursue collaborative funding opportunities** by applying for joint grants with neighboring municipalities to support green stormwater infrastructure implementation and other shared stormwater projects.
- **Explore smaller-scale partnerships** with supporting organizations and nearby municipalities to coordinate efforts such as public education campaigns, community workshops, and volunteer-led initiatives (e.g., rain garden tours, tree giveaways).
- **Build relationships with local institutions,** such as universities and environmental centers, to co-develop green stormwater infrastructure projects, research efforts, or public engagement programs.
- **Stay informed about evolving regulations**, including the proposed changes to the PAG-13 permit, by attending trainings and informational webinars to understand the implications for their community.
- **Explore opportunities for multi-municipal collaboration** to meet MS4, PRP, and TMDL requirements by partnering with neighboring municipalities and key stakeholders to share resources and pursue joint projects.

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Appendices

A: Interview Guides

B: Funding Stormwater Management

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APPENDIX A:

Interview Guides

AN INVESTIGATION INTO MULTI-MUNICIPAL STORMWATER PLANNING

INTERVIEW GUIDE: MUNICIPALITIES

Date:
Interviewee:
Organization:

Background Questions

1. What is your position? (Prompt: Please describe your role at this institution)
2. How long have you been at this organization?
3. What do you see as your municipality's role in this field/issue area/region?
4. What are the main projects, programs, or plans related to stormwater that your municipality has been involved with in the past 5 years?
5. Who are your primary partners?

MS4 Requirement Questions

6. What are the biggest challenges your municipality faces in meeting your MS4 requirements?
    a. If funding, have you applied for grant funding in an effort to fund or partially fund their MS4 program?
    b. If, so what grants have you applied for? Were you successful in receiving those funds?
    c. If you have applied for but not received grant funding, do you have a professional grant writer on staff? If not, have they considered hiring one? Why or why not? If yes, have they had more success in receiving grants whether for MS4 related items or other items since hiring the grant writer?
7. Who prepares your Stormwater Management Plan, Pollution Reduction Plan, and/or TMDL Plan?
8. If answer to 7 is consultant, ask the following questions:
    a. In other areas of the state, MS4 permittees have hired stormwater coordinators to save money and also to have more internal knowledge of their MS4 program. Have you considered hiring a stormwater coordinator or similar position versus a consultant?
        i. If yes, but they have not moved in that direction, what is the reason, they have not?

9. How do you pay for:
    a. Plan development?
    b. BMP implementation?
    c. Documentation and record keeping for permit compliance?
10. Have you coordinated with local watershed groups, gardening groups, schools and colleges, local businesses, girl scouts/boy scouts, or others to help with implementation of BMPs or maintenance, etc.? With other MS4 permittees, including other municipalities, counties, PennDOT, etc.?
11. What data do you use to fulfill your MS4 requirements?
    a. Where do you get the data?
12. Are there other types of data that you would like to have access to, either to fulfill your MS4 requirements or to support other stormwater-related projects?

Stormwater Collaborative Questions

13. What would you want to get out of a stormwater collaborative? What function should it fulfill for your municipality?
14. Who would you want to collaborate with?
15. If a collaborative were to form, what kind of governance structure would <municipality name> be comfortable with?
    a. Would <municipality name> be willing to sign a formal agreement? *Under the MS4 program, permittees that collaborate on their PRP/TMDL plans must sign an intergovernmental agreement that identifies such things as how much credit each permittee is going to receive, who is going to be responsible for maintenance, etc.*
    b. Would <municipality name> be willing to contribute funding to a collaborative?
16. What are the biggest challenges for your municipality when it comes to:
    a. Forming or joining a stormwater collaboratives?
    b. To multi-municipal collaboration in general?

Big Picture Questions

17. What would you like to know about MS4 requirements or stormwater collaboratives? What information would help you do your job better or help your organization realize its mission/goals?
18. Who else should we be talking to about these issues (Please be as specific as possible)?

AN INVESTIGATION INTO MULTI-MUNICIPAL STORMWATER PLANNING

INTERVIEW GUIDE: EXISTING COLLABORATIVES

Date:
Interviewee:
Organization:

Background Questions

1. What is your position? (Prompt: Please describe your role at this institution)
2. How long have you been at this organization?
3. What is your organization's mission?
4. Is your work geographically focused? ☐ Yes ☐ No
    a. If yes, where:
5. What do you see as your organization's role in this field/issue area/region?
6. What are the main projects or programs your organization has been involved with in the past 5 years?
7. Who are your primary partners?

Data and Information Gathering

8. Do you collect information on stormwater collaboratives? Municipal actions and/or challenges related to MS4 requirements? ☐ Yes ☐ No
    a. If yes, explain:
9. Are there any studies or reports by your or other organizations/agencies that DVRPC should look at in regards to MS4 requirements in PA and/or multi-municipal stormwater collaboration?

Stormwater Collaborative Questions

10. Can you tell me about how, when, and why the _____ Collaborative was started?
11. How is the _____ Collaborative organized?
    a. What is the governance structure? Who is the lead agency?
    b. How were the goals and geographic boundaries identified?
    c. Where does the funding come from? Is there a fee for municipalities?

d. Are there paid staff? If not, who does what to keep it going?

e. How many members does the collaborative have? What kind of organizations participate?

f. Is a formal agreement required for participants?

12. What is expected of participating municipalities?

13. What is the primary role of the collaborative? What services or benefits does the collaborative provide?

14. What has been your biggest win as a stormwater collaborative?

Bigger Picture Questions

15. What are the biggest opportunities/advantages for forming stormwater collaboratives in PA?

16. What makes a stormwater collaborative successful?
    a. Does the collaborative structure affect if/how successful a collaborative is?

17. What are the biggest challenges to:
    a. Forming and maintaining stormwater collaboratives in PA?

    b. To multi-municipal collaboration?

    c. To municipalities meeting MS4 requirements?

18. What are the biggest changes to stormwater collaboration you have witnessed in the past 5 to 10 years?

19. What would you like to know about MS4 requirements or stormwater collaboratives? What information would help you do your job better or help your organization realize its mission/goals?

20. Who else should we be talking to about these issues (Please be as specific as possible)?

AN INVESTIGATION INTO MULTI-MUNICIPAL STORMWATER PLANNING

INTERVIEW GUIDE: KEY STAKEHOLDERS

Date:
Interviewee:
Organization:

Background Questions

1. What is your position? (Prompt: Please describe your role at this institution)
2. How long have you been at this organization?
3. What is your organization's mission?
4. Is your work geographically focused? ☐ Yes ☐ No
    a. If yes, where:
5. What do you see as your organization's role in this field/issue area/region?
6. What are the main projects or programs your organization has been involved with in the past 5 years?
7. Who are your primary partners?

Data and Information Gathering

8. Do you collect information on stormwater collaboratives? Municipal actions and/or challenges related to MS4 requirements? ☐ Yes ☐ No
    a. If yes, explain:
9. Are there any studies or reports by your or other organizations/agencies that DVRPC should look at in regards to MS4 requirements in PA and/or multi-municipal stormwater collaboration?

MS4 Requirement Questions

10. In your opinion, what are the biggest challenges municipalities face in fulfilling their MS4 requirements?
11. How does your organization help municipalities with their MS4 requirements (if not answered above)?
12. What is one thing, big or small, that would help municipalities fulfill their MS4 requirements?

Stormwater Collaborative Questions

13. What are the biggest opportunities/advantages for forming stormwater collaboratives in PA?

14. What makes a stormwater collaborative successful?
    a. Does the collaborative structure affect if/how successful a collaborative is?

15. What are the biggest challenges to:
    a. Forming and maintaining stormwater collaboratives in PA?

    b. To multi-municipal collaboration?

16. What are the biggest changes to stormwater collaboration you have witnessed in the past 5 to 10 years?

Big Picture Questions

17. What would you like to know about MS4 requirements or stormwater collaboratives? What information would help you do your job better or help your organization realize its mission/goals?

18. Who else should we be talking to about these issues (Please be as specific as possible)?

APPENDIX B:

Funding Stormwater Management

How Can Municipalities Fund Stormwater Management Projects?

Developing sustainable funding for stormwater management programs is a persistent challenge for municipalities, many of which are balancing limited staff capacity and competing budget priorities. While some municipalities fund stormwater projects through their capital improvement budgets, others frequently seek external funding through state or federal grants. As in the case of Upper Chichester Township, some municipalities are also exploring the implementation of stormwater fees, which are dedicated funding mechanisms that generate consistent revenue based on a property's impervious surface area or contribution to runoff.

Stormwater Management Grant and Loan Opportunities

Grants and low-interest loans can play a critical role in reducing the financial burden of stormwater management. These programs help support infrastructure improvements, environmental education, planning studies, and other initiatives that enable municipalities to comply with stormwater regulations. Below is a selection of relevant funding opportunities available from local, state, and national sources.

Table B-1: Stormwater Management Grant and Loan Opportunities

Local Programs

Program	Eligible Applicants	Purpose
City of Philadelphia Stormwater Grants	Property owners, project managers, and developers in Philadelphia	Supports projects that reduce stormwater runoff through green infrastructure; successful applicants may qualify for reduced monthly stormwater fees through the Stormwater Credits Program.

State Programs

Program	Eligible Applicants	Purpose
PA Small Water and Sewer Program	Municipalities or municipal authorities that own or maintain water, sewer, stormwater, or flood control systems	Provides $30,000–$500,000 grants for construction, improvement, expansion, rehabilitation, or repair of water, sewer, storm sewer, and flood control infrastructure.
PADEP Growing Greener Grant	Watershed associations, counties, municipalities, county conservation districts, councils of governments, 501(c)(3) nonprofits, educational institutions, municipal authorities	Funds watershed-based projects addressing nonpoint source pollution (stormwater, agricultural runoff, mine drainage, erosion, energy extraction). Prioritizes projects in environmental justice communities, Act 47 municipalities, and those with climate resilience co-benefits.
Pennsylvania Infrastructure Investment Authority (PennVEST)	Municipalities and authorities	Provides low-interest loans and grants to help communities fund drinking water, wastewater, stormwater, and nonpoint source pollution projects. The program supports both large-scale infrastructure improvements and small projects that protect public health, environmental quality, and economic vitality.
PADEP CZM 306 Program Grants	Local governments, county and regional planning agencies, state agencies, educational institutions, conservation districts, port authorities, and incorporated nonprofits working in the PA coastal zone.	Funds projects that improve water quality, enhance public enjoyment of and access to coastal resources, and mitigate the adverse impacts of stormwater runoff and nonpoint source pollution.

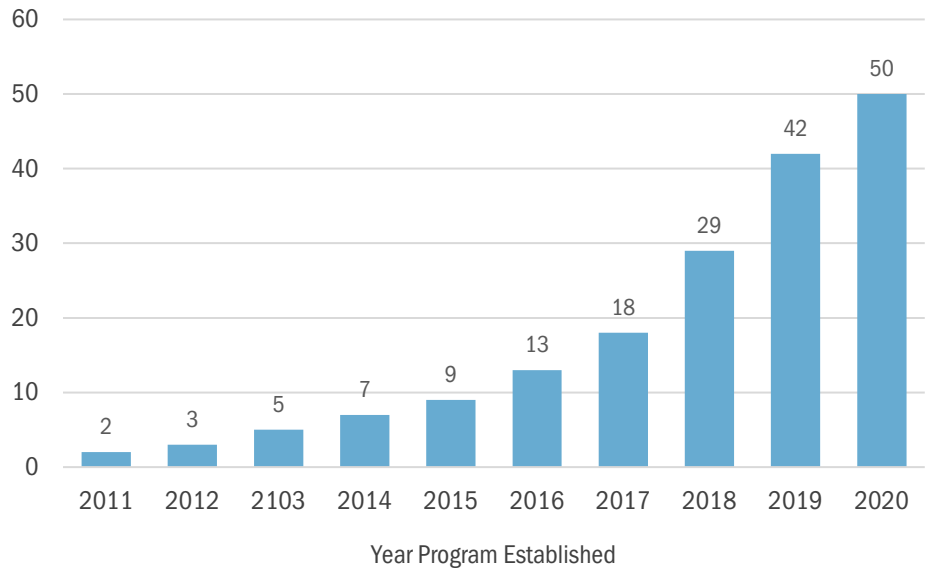
Federal Programs

Program	Eligible Applicants	Purpose
USDA Water and Waste Disposal Loan and Grant Program	State and local governmental entities, private nonprofits, and federally-recognized tribes	Provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas

Stormwater Fees

For MS4 communities, a stormwater fee can provide a reliable and dedicated funding source to meet growing regulatory, infrastructure, and climate resilience demands. These fees are typically charged to property owners to help cover the costs of maintaining stormwater infrastructure, meeting regulatory requirements, and implementing improvements that reduce runoff and improve water quality. Unlike general tax revenues, stormwater fees create a clear link between the fee charged and the service provided, helping to ensure that costs are distributed more equitably based on runoff contribution. Over the past 10 years, stormwater fees have become increasingly popular across Pennsylvania. **Figure B-1: Stormwater Fee Programs in Pennsylvania (2011–2020)** shows the rapid growth of these programs.

Figure B-1: Stormwater Fee Programs in Pennsylvania (2011–2020)



Source: Pennsylvania Environmental Council and Western Kentucky University Stormwater Utility Survey, 2020

Type of Stormwater Fees

Flat or Fixed Fees

In a flat fee system, all property owners pay the same rate regardless of property size or impervious surface. This approach is simple to administer but can lead to inequities, particularly when small landowners subsidize those with larger impervious areas.[1]

Tiered Fee System

This system places properties into one of several tiered buckets based on ranges of impervious surface. Properties with more impervious surfaces are placed into higher tiers and pay more. This option can improve equity over flat fees, but can be hard to administer accurately. The City of Philadelphia uses a combination of

[1] Philadelphia Water Department. 2025. "Stormwater Charge Protects Philly Waterways & Neighborhoods." City of Philadelphia. Accessed March 19, 2025. https://www.phila.gov/2021-10-21-stormwater-charge-protects-philly-waterways-neighborhoods.

fixed and tiered fees, applying a fixed stormwater fee to residential properties, while using a tiered system for non-residential parcels.

Equivalent Residential Unit (ERU)

This is one of the most common approaches. Under this system, a municipality or authority equates non-residential and multi-family properties to a specific number of single-family residences. They typically use the average impervious surface area for a single-family residential parcel (e.g., 3,000–3,500 square feet) to define one ERU.[2] Non-residential or larger properties are charged based on how many ERUs they contain. For example, a commercial property with 9,000 square feet of impervious surface would pay for three ERUs (if one ERU equals 3,000 square feet).

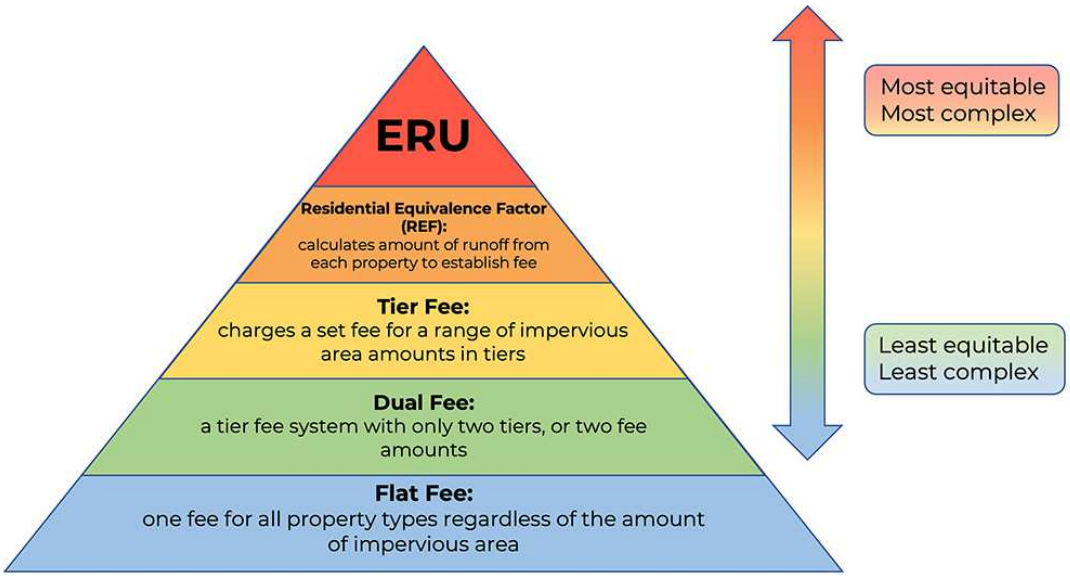
Residential Equivalency Factors (REFs)

REFs are similar in structure to ERUs, scaling stormwater fees with a multiplier based on how a property compares to a standard residential property. Unlike ERUs, REFs also account for site-specific factors, such as soil type, land use, and slope, to more accurately reflect each property's contribution to runoff.

Why this Matters?

Accurate and equitable stormwater fee structures help ensure that property owners are paying a fair share based on their stormwater impact, municipalities have the funding necessary to sustain infrastructure and meet regulatory demands, and communities are better prepared to handle increasing volumes of stormwater. See **Figure B-2: Stormwater Fee Structures** for a comparison of the different stormwater fee structures.

Figure B-2: Stormwater Fee Structures



Source: University of Connecticut NEMO, derived from work of Dr. Warren Campbell at Western Kentucky University

How Are Impervious Areas Measured?

Accurate impervious surface calculations are central to equitable fee design. Municipalities may use on-site assessments, aerial imagery, and/or geospatial tools and AI software. These tools help maintain consistency and reduce staff time, though initial data collection can be resource-intensive. Because land use can change, regular updates and consistent methodologies are critical.

[2] "Overview of Municipal Stormwater Fee Programs ."https://pecpa.org/wp-content/uploads/2023/09/2021-04-StormwaterFee_Guide_REV.pdf PEC, 2021.

AN INVESTIGATION INTO MULTI-MUNICIPAL STORMWATER PLANNING

phase one | summary report

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Abstract:
This report examines the challenges and opportunities municipalities face in meeting stormwater management requirements under Pennsylvania's Municipal Separate Storm Sewer System (MS4) program, with a focus on Delaware County. It provides an overview of federal and state stormwater regulations, explains key tools such as Pollutant Reduction Plans (PRPs) and Total Maximum Daily Loads (TMDLs), and highlights the unique difficulties for older, densely developed communities. The report summarizes insights from interviews with municipalities, stakeholders, and existing collaboratives, identifying common barriers such as limited staff capacity and difficulty accessing funding. It also explores models of multi-municipal collaboration that can improve compliance, reduce costs, and enhance water quality outcomes. Finally, the report presents recommendations for DVRPC, municipalities, and partners to strengthen regional coordination, support technical capacity, and expand funding opportunities for sustainable stormwater management.

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Vision

A Greater Philadelphia region that provides:

- A safe, modern, multimodal **transportation** network for all
- An innovative and connected **economy** with opportunity and shared prosperity
- Integrated, healthy, and walkable **communities**
- A preserved and restored natural **environment** and healthy ecological systems
- Clean, reliable, and affordable **infrastructure and utility services** resilient to the effects of extreme weather

Mission

As the Metropolitan Planning Organization (MPO) for Greater Philadelphia, the Delaware Valley Regional Planning Commission (DVRPC) builds consensus for a shared regional vision; enables data-based, community-centered solutions; and helps put plans into action.

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