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Executive Summary

This report summarizes the activities and accomplishments of Pennsylvania's Nonpoint Source (NPS) Management Program in Federal Fiscal Year (FFY) 2021 (October 1, 2020 – September 30, 2021). The

Pennsylvania Department of Environmental Protection (DEP) prepared this report to inform the public and the U.S. Environmental Protection Agency (EPA) about Pennsylvania's progress in reducing nonpoint source pollution to surface waters. Nonpoint source pollution is a major source of water quality impacts to Pennsylvania's lakes, streams, and coastal areas. DEP coordinates Pennsylvania's NPS Management Program and works with federal, state, and local partners to implement best management practices (BMPs) to

Load Reductions

- 18,836,094 lbs./yr. Nitrogen Reductions
- 733,184 lbs./yr. Phosphorus Reductions
- 287,761 tons/yr. Sediment Reductions
- 5,723,846 lbs./yr. Iron Reductions
- 1,201,312 lbs./yr. Aluminum Reductions
- 19,066,154 lbs./yr. Acidity Reductions

restore and protect water quality. The NPS Management Program is funded, in part, by the U.S. EPA's Section 319(h) of the Clean Water Act (CWA). Pennsylvania DEP uses a watershed-based approach to organize and implement public and private sector efforts to restore and protect waters. DEP administers numerous grant programs specific to watershed restoration and water resource protection. These grant programs include the state Growing Greener Plus program, funded through the Environmental Stewardship Fund, and the federal CWA Section 319 Program. These grants support the development and implementation of BMPs, water quality monitoring, and Watershed Implementation Plans (WIPs). In the context of Pennsylvania's NPS Management Program, WIPs refer to local, manageably sized watersheds (catchments) in which restoration activities are believed to be capable of effecting positive and measurable water quality improvement outcomes.

The primary purpose of this report is to highlight Pennsylvania's use of Federal Section 319 funds to address nonpoint source pollution. However, this report also aims to document some of the vast efforts of DEP and other program partners working to implement the NPS Management Plan and to restore impaired watersheds. As such, the content of this report highlights several commendable programs, features projects that exemplify partnering and reducing nonpoint source pollution, details progress of NPS Management Plan implementation (Appendix A), and details progress on implementing selected WIPs (Appendix B). This report serves not only to display work performed to achieve the stated objectives. It also provides as an annual opportunity to reaffirm the goals and vision for the future of the NPS Management Program within Pennsylvania.



Overview

More than ninety-seven percent (97.1%) of Pennsylvania's water quality-impaired waterways area are

polluted from nonpoint source pollution, including abandoned mine drainage (AMD), urban and agricultural runoff, atmospheric deposition, on-lot sewage systems, earthmoving activities, stream hydromodification and timber harvesting. Pennsylvania's NPS Management Program established an overall strategy to implement watershed restoration and protection activities described in Pennsylvania's NPS Management Plan with the following vision and programmatic goals.

Vision Statement

Pennsylvania's NPS Management Plan will help guide the water resource protection and restoration efforts of Pennsylvania's environmental protection partnership. This plan outlines watershed restoration and protection goals for the purpose of guiding and documenting partnership efforts in a way that will most effectively address nonpoint source pollution issues impacting Pennsylvania's water resource.

NPS Management Program Goals

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities.

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

Goal 3: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.

Goal 4: Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

Goal 5: Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

Goal 6: Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.



Overview

Annual Statewide Load Reduction Achievements

	Nitrogen (lbs./yr.)	Phosphorus (lbs./yr.)	Sediment (tons/yr.)
Conservation Tillage			
and Cover Crop	12,087,049	301,798	253,006
Implementation			
Regulatory Programs	3,330,413	215,555	14,180
State and Federal	2 220 207	200.020	17 174
Conservation Programs	3,329,207	209,920	17,174
Other Non-	90.426	F 010	2 401
Governmental Program	89,426	5,910	3,401
Total:	18,836,094	733,184	287,761

Table 1: This table shows pollutant load reductions associated with non-AMD BMPs, highlighting the positive impacts these BMPs have on watersheds throughout the state. The nutrient and sediment load reductions were derived from BMP nutrient and sediment reduction efficiencies as identified in the Chesapeake Assessment Scenario Tool (CAST). BMP information for state regulatory programs includes data from the DEP, the Pennsylvania Department of Conservation and Natural Resources (DCNR), the State Conservation Commission (SCC), and Pennsylvania Game Commission (PGC). BMP information for state, federal, and non-profit conservation programs includes data from the DEP, the Pennsylvania Infrastructure Investment Authority (PENNVEST), SCC's Dirt, Gravel and Low Volume Roads (DGLVR) program, the SCC's Resource Enhancement and Protection (REAP) tax-credit program, and U.S. Department of Agriculture's (USDA) Pennsylvania Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA), Chesapeake Bay Foundation (CBF) and National Fish and Wildlife Foundation (NFWF).

	lron (lbs./yr.)	Aluminum (lbs./yr.)	Acidity (lbs./yr.)
Active Treatment	1,723,846	201,312	6,066,154
Passive Treatment	4,000,000	1,000,000	13,000,000
Total:	5,723,846	1,201,312	19,066,154

Table 2: This table shows pollutant load reductions associated with AMD remediation work, highlighting the positive impacts implemented AMD remediation BMPs have on watersheds throughout the state. These load reductions were derived with data from DEP's Bureau of Abandoned Mine Reclamation (BAMR) and estimates from Datashed, a Geographic Information Systems (GIS) web tool.

NPS Management Plan

NPS Management Plan

The NPS Management Plan establishes overall strategies implemented by partners in Pennsylvania to address nonpoint source pollution impacts. The Plan was updated to enhance the previous Pennsylvania NPS Management Program approved by EPA in 2014 in compliance with Section 319(b). The 2019 Update to the NPS Management Plan outlines ongoing efforts and activities to address nonpoint source pollution through 2024, based on adequate resources including necessary personnel. The NPS Management Plan will be updated again at the midpoint assessment to reflect recommendations from the aforementioned 2020 DEP NPS Management Program Assessment.

Pennsylvania's NPS Management Plan establishes six major goals. The six goals serve as the basis for evaluating the effectiveness of the Pennsylvania NPS Management Program over the course of the next five years.

Achievement of the goals will result from a unified effort. The tools available and the efforts expended are focused into two broad categories: protection and restoration. Examples of watershed protection activities include education and outreach, continued regulatory compliance and enforcement, and monitoring and data collection. Watershed restoration activities generally include technical and financial assistance as well as BMP implementation, operation, and maintenance. In Pennsylvania, certain entities or partners are responsible for only one of these activities, while others are engaged in many of these activities.

Successful achievement of the goals outlined below can only be realized if many partners successfully collaborate and coordinate their efforts and have adequate funds to effect change. In Pennsylvania, there exists a robust and experienced network of professionals engaged in water resource management, government, finance, education, planning, restoration, monitoring, and maintenance activities. This network is composed of citizens, non-governmental organizations, private industry, local government entities, county conservation districts (CCDs), state government entities, and federal government entities. The successful achievement of the goals outlined in the NPS Management Plan will be realized as those partners draw from the unique abilities inherent within their organizations. Collaboration is paramount to success.

1) Goal 1:

Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities.

2) **Goal 2**:

Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

3) **Goal 3:**

Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.

NPS Management Plan

4) Goal 4:

Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

5) **Goal 5:**

Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

6) **Goal 6:**

Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.

Objectives and Strategies

Pennsylvania's NPS Management Plan relies on the water quality protection and restoration efforts of DEP and an existing, robust, and effective network of agencies, non-profit entities, schools, and citizens. The NPS Management Plan uses reasonable milestones and interactive resource management techniques to maintain designated uses where the water resource is currently unimpaired and to restore impaired waters where the water resource is damaged by nonpoint source pollution.

The NPS Management Plan establishes environmental and programmatic indicators of success. The environmental results are measured by water quality improvements, nonpoint source pollution load reductions, and other observed improvements to the biotic community. Programmatic indicators are measured by work products and productivity calculated through tracking and documenting outcomes. The NPS Management Plan establishes 70 objectives that can be quantified or measured and progress on reaching the goals established in these objectives will be evaluated each year in the NPS Management Program Annual Report submitted by DEP to EPA. The objectives of the NPS Management Plan address nonpoint source pollution across Pennsylvania and are supportive of the goals established in the Pennsylvania Phase 3 WIP for the Chesapeake Bay.

Quantification of certain activities, such as public education, awareness, and action, is challenging; however, those activities are considered by Pennsylvania to be critical to the successful implementation of the NPS Management Plan.

Highlighted Programs

Eastern PA Coalition for Abandoned Mine Reclamation's Mine Mapping Program

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities

During the fiscal year from October 1, 2020, through September 30, 2021, the Eastern PA Coalition for Abandoned Mine Reclamation (EPCAMR) continued to enhance and develop a much greater understanding of Northeastern and Northcentral Pennsylvania's historic surface and underground mine mapping resources. Their goals are to show the hydrogeologic connections of past mining practices and mine pools beneath the minescarred landscapes to AMD, one of PA's leading nonpoint source pollution problems that polluted nearly 5,500 miles of streams across the Commonwealth.

EPCAMR will be using the mine maps that their staff are scanning, digitizing, geo-referencing, mosaicking, and cataloguing for the entire Anthracite and Northern Bituminous Regions of PA, with a concentrated focus on the four major Anthracite Coal Fields where most of the public, surface, and underground mine maps are concentrated. The original hard copy maps are housed and archived in DEP's Northeast Regional Office of the Bureau of Abandoned Mine Reclamation and the Pottsville District Mining Office and Deep Mine Safety Office. Several additional private collections include the Earth Conservancy's Blue Coal Corporation Collection in the Wyoming Valley's Northern Anthracite Coal Fields and the Girard Estates Collection in the Western Middle Anthracite Coal Fields. The maps have been placed into the online, interactive interface and management system called the PA Mine Map Atlas. EPCAMR staff have inputted tens of thousands of maps into the PA Historic Underground Mine Mapping Inventory System (PHUMMIS) over the last 8 years.

EPCAMR is beginning to use the maps that have been completed to develop additional 3D Underground Mine Pool Modeling for an area in the Southern Anthracite Coal Fields located in the Bear Creek sub-watershed of the Wiconisco Creek in Dauphin County, in partnership with the Dauphin County Conservation District (DCCD), Wiconisco Creek Restoration Association, Doc Fritchey Chapter of Trout Unlimited, PGC (State Game Lands 264), Susquehanna River Basin Commission (SRBC), and a private landowner. Various Lykens coal veins that currently discharge AMD from abandoned mine tunnels and features will be worked into the model to conservatively estimate the total mine pool volume that will be taken into consideration for the eventual conceptual design of a future AMD treatment system under a DEP Section 319 grant that EPCAMR is administering.

EPCAMR continued to research innovative ways to reuse mine pool water to develop unique solutions on how to use our underground mine pools more effectively in Eastern Pennsylvania. There is the potential, where technically and economically feasible, for data centers to serve as locations to utilize mine pool water as a cooling source. If grant funding becomes available, a preliminary design for a mine pool water-supplied heating, ventilation, and air conditioning (HVAC) cooling system, and an evaluation of suitable sites for data centers with access to mine water, could be targeted for further investigation. A project in Southwest Virginia, called the Project Oasis Final Report, provides an example of the potential in Central Appalachia.

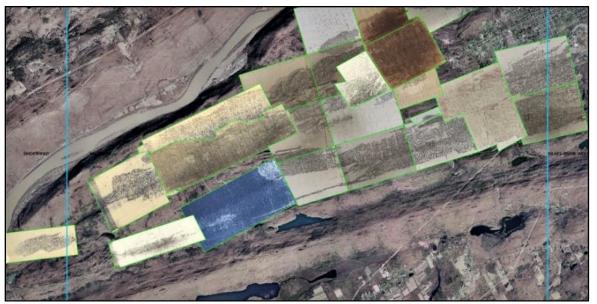


Figure 1: An image of adjacent mine maps for a particular coal vein in the Southern Wyoming Valley's Northern Anthracite Field that is being stitched together into a mosaic similar to a quilt for that particular coal vein.

Highlighted Programs

Western PA Coalition for Abandoned Mine Reclamation's Quick Response Program

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

Goal 3: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.

Since 1988, many projects have been funded throughout the Commonwealth to protect water quality from nonpoint source pollution. Floods, erosion, ice storms, and other events threaten projects such as AMD treatment systems, stream restoration projects, etc. Many of these projects are located in floodplains. Since these facilities serve environmentally valuable purposes, their loss or damage can be reasonably expected to result in environmental detriment. For this reason, it is prudent to take measures to facilitate the funding of repair of any such facilities in the event they are rendered ineffective.

The Quick Response program, administered by the Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR), provides funding for urgent or emergency repairs of Growing Greener-eligible water restoration projects.

The history of Quick Response goes back to 2005 when DEP issued a request for proposals (RFP) for the administration of an emergency response program for AMD remediation projects. WPCAMR successfully made application to Growing Greener in 2006 to create a "Quick Response" program (largely based on the RFP of the previous year) with a grant award of \$350,000. The program is a cooperative effort between DEP and WPCAMR. DEP provides the funding and oversight and WPCAMR provides the fiscal agility to quickly get funds to where they are needed. WPCAMR obtains the Growing Greener funding and then distributes funding to needy projects. DEP Watershed Managers are integral to the process, approving applicants and reimbursements. The time from the initial request to the time of authorization to proceed with work can be only a few days, depending on the urgency of the situation. The reimbursement time can be anywhere from as little as a week to as much as four to eight weeks.

Since the Quick Response Program started in 2006, WPCAMR has been awarded over \$1.4M from Growing Greener to repair water quality BMPs statewide with in-kind/cash match from individual project sponsors estimated currently at over \$428,000.

Quick Response Project Types

Project Type	Number of projects supported by Quick Response	Funding
AMD	97	\$1,084,108
Acid Deposition	1	\$11,236
Agriculture	0	\$0
Streambank/Shoreline Erosion	13	\$140,087
Stormwater	9	\$47,177
Total	120	\$1,282,608

Table 3: Breakdown, by project type, of the number of projects supported by Quick Response and funding provided.



Figure 2: Repair of failing AMD treatment system in Broad Top Township, Bedford County.



Figure 3: Completed repair of AMD treatment system in Broad Top Township, Bedford County.

Highlighted Programs

Resource Enhancement and Protection Program

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

What is REAP?

The Resource Enhancement and Protection (REAP) Program was created by Act 55 of 2007 and amended in 2019 as part of Pennsylvania's Farm Bill. REAP allows farmers, businesses and landowners to earn state tax credits for implementing agricultural BMPs on Pennsylvania farms. These practices protect natural resources, reduce nutrient and sediment pollution to waterways and enhance farm production. REAP applicants cover up-front costs of installation of the practice or purchase of eligible equipment. Upon completion of the REAP-eligible project, tax credits are awarded. REAP is a first-come, first-served program. Agricultural operations are eligible for up to \$250,000 of REAP tax credits in a 7-year period.

To be eligible, the operation must be compliant with Pennsylvania's Clean Streams Law with up-to-date erosion and sediment control (Ag E&S) plans, along with manure and nutrient management plans (NMPs) for all acres farmed. REAP also allows other Pennsylvania businesses to participate by sponsoring a farmer's project. The SCC awards the REAP tax credits on behalf of the Pennsylvania Department of Revenue.

Who is Eligible?

Any individual or business who is subject to taxation by the Commonwealth of Pennsylvania under any of the following taxes is eligible to participate in REAP: Personal Income Tax, Corporate Net Income Tax, Capital Stock and Franchise Tax, Bank Shares Tax, Title Insurance Company Premiums Tax, Insurance Premiums Tax and Mutual Thrift Institutions Tax.

REAP generates significant private investment, as farmers pay 25 – 50% of the total project costs for agricultural BMPs and equipment. REAP tax credits help producers make investments in the environment while enhancing the viability of the farm operation at the same time. The contribution of the REAP program to cleaner streams in Pennsylvania is significant. Implementation of BMPs, as well as investments in no-till and precision agricultural equipment, lead directly to reductions of nitrogen, phosphorus, and sediment discharges into surface waters in Pennsylvania. In addition, practices like no-till planting, precision application of nutrients, and cover crops work to improve the soil health of Pennsylvania's farmland. Improving soil health is key to long-term sustainability and decreasing pollution runoff. Nutrients are also a valuable resource that can be managed more efficiently for economic and environmental benefit. REAP has proven to be an effective tool; providing farmers with the resources necessary to reduce nutrient and sediment runoff from their farms, while increasing farm productivity and efficiency.

Overall, REAP provides funding levels of 50 - 90% of costs incurred in the implementation of agricultural BMPs that reduce nitrogen, phosphorus and sediment pollution. Eligible costs include planning and engineering, materials, labor—farmer, landowner or contractor, post construction expenses and one year of interest payments, if applicable.

- Projects eligible for 50% reimbursement: no-till planting equipment; precision nutrient application equipment; manure storage structures; cover crops; grazing practices; forested riparian buffers; others.
- Projects eligible for 75% reimbursement: BMPs that reduce pollution runoff from animal concentration areas; Nutrient/Manure Management Plans (MMPs); Conservation/Ag E&S Plans; others.
- Projects eligible for 90% reimbursement (In a TMDL-designated watershed) multi-species cover crops; forested riparian buffers (50+ ft wide); livestock exclusion from streams and associated practices; others.

Environmental Results

BMP Name	Number of Projects
Cover Crops	130
Conservation Equipment	228
Animal and/or Manure BMPs	56
Field Erosion and Stream BMPs	15
Plans	65

Table 4: This table shows the REAP BMPs from 10/1/2020 – 9/30/2021 to reduce nutrient and/or sediment pollutant loads.

Pollutant Load Reductions

Pollutant	Load Reductions
Nitrogen	370,366.1 lbs./yr.
Phosphorus	18,260.2 lbs./yr.
Sediment	3,001.7 tons/yr.

Table 5: Estimated calculations based on data provided by the Pennsylvania Department of Agriculture and using loading rates and reduction coefficients based on the Chesapeake Bay Watershed Model.



Figure 4: Riparian buffer planting is an eligible REAP project. Photo: USDA NRCS.

Highlighted Programs

Pennsylvania's Chesapeake Bay Phase 3 Watershed Implementation Plan Supporting Local Action – Partners, Projects, and Progress

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

Goal 3: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.

Goal 4: Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

Goal 5: Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

DEP's Chesapeake Bay Office (CBO) identified 2021 as the "Year of Action." Through extensive work, Pennsylvania is at an unprecedented turning point in improving its share of the Chesapeake Bay Watershed. Despite significant challenges brought on by the COVID-19 global pandemic beginning in 2020 and extending through 2021, many community leaders, farmers and other landowners, and sector partners persevered together and independently to improve local water quality. In 2019, four counties completed Countywide Action Plans (CAPs), which identify priority initiatives and water quality improvement projects that will propel the communities forward in a rapid and accelerated way. In 2020, four more counties joined in, having developed their CAPs and worked with DEP and other state and federal agency leaders. Moving into 2021, twenty-six more counties developed their CAPs with the support of the DEP Regional Offices and CBO. A total of thirty-four counties — all of the counties that were asked to participate in the CAP planning and implementation process — have completed their CAPs and are actively implementing their plans.

CBO has developed numerous tools and resources to support the counties in their CAP priorities. These tools include the Community Clean Water Planning Guide and customized Planning Toolboxes for each county as well as Community Clean Water Implementation Guides. CBO has also published the Pennsylvanian's Guide to Permitting Watershed Improvement Projects to help inform stakeholders who are interested in improving their streams of the steps and resources to obtain a permit. CBO works with SRBC to provide technical support to the counties such as developing county-specific modeled BMP scenarios using CAST and county snapshots that quickly disseminate information through concise and succinct handouts. CBO, DEP Regional Offices, and SRBC have held regular group and one-on-one virtual sessions with the county lead entities and interested stakeholders, such as conservation districts and county planning commissions. The purpose of these meetings is to inform counties and local leaders of how their local goals align with Chesapeake Bay restoration goals, discuss modeled nutrient and sediment reduction progress and water quality monitoring data, and identify where they can target resources to positively impact their local waters and the Chesapeake Bay. One example of providing

direction on how to focus in high impact areas is the incorporation of Section 319 WIP watersheds in the county-specific Planning Toolboxes as potential areas for additional focused efforts. Another way that DEP and SRBC has worked together to disseminate important and timely information is through the <u>Sediment and Nutrient Assessment Program (SNAP)</u> report. DEP provides funding to SRBC to produce this report, and for the first time ever this report was produced in a user-friendly story map format.

DEP's Nonpoint Source Management Quality Assurance Program Plan (QAPP) and BMP Verification Plan Addendum are published on <u>Tracking Pennsylvania's Progress</u> webpage. These documents provide information related to the data validation and BMP verification programs at DEP and other partnering entities. DEP and our local and state agency partners assess compliance and implementation through multiple regulatory and voluntary programs. Agricultural inspections, plans, and historic and new BMPs are documented and reported through a statewide centralized geo-database, <u>PracticeKeeper</u>, using consistent application of Standard Operating Procedures (SOPs) and web-based training modules. Data can be easily exported in standard reports and spreadsheets and are used to communicate progress toward local and state objectives, accomplishment of contractual and delegated required output measures (ROMs) and identify different funding sources of BMPs. PracticeKeeper is continually being enhanced to add more programs, with the addition of the statewide Section 319 and Growing Greener Plus grant programs planned for 2022.

CBO publishes a monthly e-newsletter, <u>Healthy Waters – Pennsylvania</u>. <u>Partners</u>. <u>Progress</u>. The purpose of this e-newsletter is to inform subscribers, interested stakeholders, and the general public of the activities undertaken by the CBO and our local, state, federal and non-profit partners. It also is a tool to provide announcements related to nonpoint source pollution prevention funding programs and highlight the counties' programs and projects.

More information related to the CAPs and the Planning Toolboxes can be found on DEP's <u>Countywide Action Planning</u> webpage under each county heading. Pennsylvania's <u>2020 Healthy Waters Healthy Communities Chesapeake Bay Progress</u> report can also be found PA's Phase 3 WIP webpage, under "Annual Reports."



Figure 5: Sun setting over the Susquehanna River at Harrisburg. Photo: DEP.

Highlighted Projects

Wild Brook Trout Restoration in Deer Creek through Abandoned Mine Drainage Remediation

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities

Deer Creek is a 23.6 square mile tributary to the West Branch Susquehanna River in northeast Clearfield County. The watershed contains 46 linear stream miles, 15.3 of which are listed as impaired by pH and metals from abandoned mine drainage. Since the development of the Watershed Implementation Plan in 2011, the Clearfield County Conservation District (CCCD) and the Deer Creek Watershed Association (DCWA) have been working on implementing the restoration priorities identified in the plan, starting with one of the worst discharge areas in the watershed at TDC 4.1, more commonly known now as the Deer Creek Passive Treatment System.

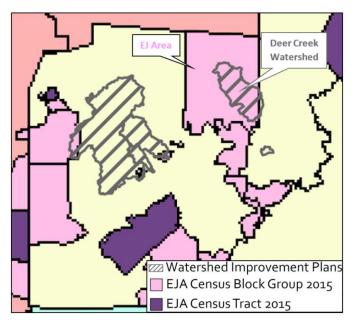


Figure 6: Map of Clearfield County, the Section 319 WIP watersheds as grey, and the Environmental Justice (EJ) Areas as pink or purple. The Deer Creek watershed is almost entirely located within an EJ Area, an area where 20 percent or more individuals live at or below the federal poverty line, and /or 30 percent or more of the population identifies as a non-white minority, based on data from the U.S. Census Bureau and the federal guidelines for poverty.

Project Spotlight: Construction of the Deer Creek Passive Treatment System was completed in December 2017. The system consists of a vertical flow pond, settling basin, vertical flow pond, and a final settling basin. It also contains a series of small limestone step pools to treat a small discharge that could not be directed into the main treatment cells due to elevation. By working on the worst discharge area in the watershed first, the hope was that there would be a noticeable improvement in the water quality and biological community at the mouth of Deer Creek, 2.5 miles downstream, with just a single project.

To document recovery, the CCCD has been monitoring water quality around the system as well as upstream and downstream in Deer Creek for the last 4 years. Results show that the system has been operating as expected,

alkalinity and pH increased while acidity, iron, manganese, and aluminum concentrations decreased. Similar water quality improvements were also documented at the mouth of Deer Creek, see Table 6.

Water Quality at the Mouth of Deer Creek

	Pre	Post	Difference
рН	4.50	6.30	1.80
Alkalinity	3.8 mg/L	6.75 mg/L	2.95 mg/L
Acidity	45.6 mg/L	10.00 mg/L	-35.60 mg/L
Iron	3.2 mg/L	1.99 mg/L	-1.21 mg/L
Manganese	5.70 mg/L	3.55 mg/L	-2.15 mg/L
Aluminum	3.30 mg/L	0.52 mg/L	-2.78 mg/L

Table 6: Changes in water chemistry indicate improvements at the mouth of Deer Creek post-system construction.

Prior to treatment, the final mile of Deer Creek was too impaired to support aquatic life. In August 2019, the CCCD and Trout Unlimited conducted a fishery survey at the mouth of Deer Creek to see if brook trout were able to repopulate this area of stream due to the water quality improvements from AMD treatment. They found several dace, madtoms, and shiners, as well as both wild brook and brown trout. Of particular importance was the fact that several age classes of brook trout were documented, including several young of the year trout. This is vital as it means that these brook trout were not just passing through this section of Deer Creek, they were able to reproduce here as well. This data was submitted to the PA Fish and Boat Commission (PFBC) and in January of 2021 and the Commission added this section of Deer Creek to the list of streams supporting naturally reproducing brook trout. In September 2021 another survey of this same area was conducted, and wild brook trout, including young of the year, were documented once again. This shows that brook trout have continued to survive in this once lifeless section of Deer Creek thanks to the ongoing water quality improvements generated by the Deer Creek passive treatment system.



Figure 7: CCCD Watershed Specialist Kelly Williams with young of year brook trout at the mouth of Deer Creek in August 2019. Photo: Rachel Kester, Trout Unlimited.

Highlighted Projects

Implementing Agricultural BMPs South Branch Plum Creek

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

The Indiana County Conservation District (ICCD) recently completed the third phase of restoration projects outlined in the South Branch of Plum Creek WIP. By implementing WIP projects, ICCD is actively working to reduce sediment loading within the watershed to meet TMDL goals.

With a \$285,092 DEP Section 319 grant for Project 1612, ICCD focused efforts on two agricultural operations. ICCD followed the headwaters-to-mainstem approach, as identified in the WIP, with the goal of reducing sediment pollutant loads from entering the stream. The projects were implemented in a DEP EJ area, Census Tract 9602, where there is 24 percent poverty based on data from the U.S. Census Bureau and the federal guidelines for poverty.

Most of the agriculture in the South Branch of Plum Creek exists in the Leisure Run, Reddings Run, and Goose Run subwatersheds, along with the upper reaches of the mainstem. Large sections of the lower mainstem lack riparian forested buffers and display excessive amounts of streambank undercutting and erosion. Much of this problem is due to landowners mowing the riparian areas for aesthetic reasons and cropland.

One of the major sources of pollution sediment in watershed is from grazing-related agriculture where cattle have unrestricted access to the stream. In many cases, the most efficient solution to this problem would be to install streambank fencing and restrict livestock stream access to stabilized crossings. In this phase, ICCD worked to improve water quality in the South Branch by implementing agricultural BMPs on livestock and animal operations within the watershed.

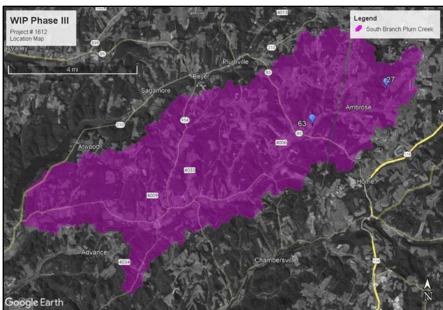


Figure 8: South Branch Plum Creek watershed project location map.

ICCD also focused on Ag E&S and MMP development, stream bank fencing installation, restricting livestock access to streams using stabilized stream crossings, improvements to animal waste management, riparian forest buffer establishment, and streambank stabilization and protection.

Project 27

Project 27 is a single farmstead 100-acre beef cattle operation with roughly 30 livestock animals on site. This project consisted of the installation of exterior and interior fences to create livestock paddocks for rotational grazing. A watering system consisting of a spring development, pumping plant, and livestock pipeline feeding seven watering facilities, as well as a livestock walkway.

Project 63

This project is located on a single-family beef cattle operation with roughly 30 livestock animals. ICCD installed animal trails and walkways, livestock water facility, livestock pipeline, livestock trough replacement, exterior and interior livestock fencing to increase the number of paddocks as per the rotational grazing plan, and an animal crossing.



Figure 9: Livestock watering facilities for beef cattle operation. Photo: ICCD.

Estimated Pollutant Load Reductions

WIP Project Number	Sediment (tons/yr.)	Nitrogen (lbs./yr.)	Phosphorous (lbs./yr.)
Project 27	20.91	415.79	113.10
Project 63	6.03	14.99	6.61
Total	26.94	430.78	119.71

Table 7: Nutrient and sediment load reductions for WIP projects 27 and 63.

Highlighted Projects

Treatment of Mine Drainage Improves Hubler Run

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities

Metals in discharges from abandoned coal mines impaired Pennsylvania's Hubler Run, prompting DEP to add 1.40 miles of the mainstem stream to the state's CWA section 303(d) list of impaired waters in 2005. DEP developed a TMDL and a watershed implementation plan to address the pollution sources entering Hubler Run. Project partners installed four passive treatment systems for a cost of over \$720,000 to address the impacts of the mine drainage discharges entering the stream. Water quality and aquatic habitat have been improving, and the stream was removed from the impaired waters list in 2018.

The Hubler Run watershed drains approximately 1.05 square miles in Clearfield County. This watershed is predominantly forested with some farmland, but it has experienced impairments from AMD discharges from drift mines, informal openings where coal had been mined for household use, and some surface mining completed in the 1960s. Hubler Run is a tributary of Alder Run; according to the Alder Run Operation Scarlift report published in 1977, the stream's water quality was declining due to acidity and metals from AMD.

A stream survey conducted by DEP indicated that Hubler Run was a degraded aquatic ecosystem with depressed aquatic life due to AMD impacts. As a result, DEP included 1.40 stream miles of the main stem of Hubler Run on the state's 2005 CWA section 303(d) list of impaired waters for not meeting the aquatic life designated use due low pH and elevated levels of metals.

DEP developed a TMDL in 2006 to serve as a pollution diet for the Hubler Run watershed. The TMDL set limits for metal loading (aluminum, iron and manganese) systematically along stations on Hubler Run. These limits, which differ at each station based on the existing site-specific pollutant loads, served as goals for remediation.

The Emigh Run/Lakeside Watershed Association received a CWA section 319 grant in 2004 to assess the watershed. Using TMDL assessment data, project partners developed a watershed implementation plan for Hubler Run, which was approved in 2007. More than six AMD seeps were identified and sampled, and four priority areas were listed in the watershed implementation plan. Passive treatment systems composed of anoxic limestone drains and limestone leach beds have been constructed to address each of the four priority areas.

Hubler Run Monitoring and TMDL Limits

Hubler Run monitoring	Iron (mg/L)	Aluminum (mg/L)	Manganese (mg/L)	Acidity (mg/L)
Before treatment	Not Detected	1.5	3.4	41.65
TMDL limits	Not Applicable	0.25	0.47	3.82
After treatment	0.12	0.09	0.56	0

Table 8. Data collected at TMDL point HR01 on Hubler Run show the TMDL limits and sample results for the pollutants of concern before and after treatment.

Monitoring has been occurring at the mouth of the stream at TMDL point HR01 since 2011. This point is downstream of the four constructed passive treatment systems. The TMDL data collected in 2005–2006 is considered the baseline. Data show that the treatment systems have improved water quality. For example, pH improved from a range of 4.1–5.7 in 2005–2006 (before treatment) to 6.65 in 2017 (after treatment). As a result of these improvements, Hubler Run was removed from the list of impaired waters in 2018. Project partners attribute the improvements of water quality to the passive treatment systems installed to address the AMD discharges in this watershed.

Multiple stakeholders partnered to address the water quality problems in the Hubler Run watershed, including the West Branch Sportsman's Association; Alder Run Engineering, LLC; Emigh Run/Lakeside Watershed Association; Skelly and Loy, Inc.; Canaan Valley Institute; and DEP. Emigh Run/Lakeside Watershed Association was awarded close to \$700,000 from the Section 319 Program, along with other funds from the Office of Surface Mining, the Foundation for Pennsylvania Watersheds and the Canaan Valley Institute, to construct the four passive treatment systems. It is estimated that these partners contributed an additional \$60,000.

Highlighted Projects

Pennsylvania Adaptive Toolbox for Conservation Saturation

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

Led by the SCC, the Pennsylvania Adaptive Toolbox for Conservation Saturation is being piloted in the Fishing Creek Watershed in Lancaster County. Funding was provided through a grant from NFWF to saturate a section of the watershed with agricultural BMPs with emphasis on building trust with the Plain Sect Community. The goal is to implement the state required Ag E&S Plans, MMPs, livestock exclusion fencing, stream restoration practices and riparian forest buffers. The project started in 2016 with public meetings and farm visits, and since then, every farm in the targeted area has developed and is implementing their Ag E&S Plan as well as a MMP, where applicable. A total of 32 farms received updated or new plans covering more than 2,200 acres. Livestock have been completely fenced out of the three targeted tributaries in this area while riparian forest buffers have been restored in the fenced off areas. Stream restoration projects have also been conducted to reconnect the floodplain by grading severely incised streambanks and restoring habitat for aquatic life. Livestock exclusion fencing and buffer restoration totaled 3.8 miles (5.1 acres of riparian buffer habitat) while stream restoration totaled 2.04 miles. A total of 13 livestock stream crossings were implemented as well. Various Ag E&S upland BMPs like grassed waterways, water control structures and animal heavy use area protection (AHUAP) were also implemented. Modeled load reductions for this work, using the CAST model and according to the grantee, accounted for the reduction of 654,454 pounds of sediment, 284 pounds of phosphorus and 924 pounds of nitrogen annually. Monitoring of herd health and ecological health improvements is ongoing and will provide a clear understanding of the impacts of this novel approach to watershed restoration coupled with agricultural profitability. Developing and using the Adaptive Toolbox to restore other similar watersheds in the future is the overarching goal of this project. Possible future funding sources for watershed restoration using the Adaptive Toolbox could be CAP Implementation Grants, Growing Greener Watershed Renaissance Initiative, and NFWF Most Effective Basin (MEB) funding.

The following is the program brochure that was distributed to the local community.



Figure 10: The Pennsylvania Adaptive Toolbox for Conservation Saturation brochure was provided by the Pennsylvania Conservation Commission to the agricultural community in the Fishing Creek Watershed, Lancaster County.

The Future of Nonpoint Source Pollution Management in Pennsylvania

Pennsylvania is enhancing its NPS Management Program by evaluating program planning and management. Pennsylvania is refreshing its current roster of WIPs by revising existing WIPs along with identifying and developing new WIPs. Updating old and drafting new WIPs is a collaborative process involving multiple programs within DEP as well as essential federal and local partners. In cases where Alternative Restoration Plans (ARPs) are drafted in satisfaction of TMDL requirements, DEP staff will collaborate to identify impaired small watersheds, secure active partners, and develop ARPs for implementation and when possible develop ARPs to meet the 9 elements of a Section 319 WIP for implementation with EPA Section 319 funding. Pennsylvania continues to work with EPA to develop a process for utilization of Section 319 funding to meet Chesapeake Bay Phase 3 WIP CAP objectives; this effort is currently being accomplished through targeting the local stakeholders' focus to those areas in counties that are covered by 319 WIPs.

Pennsylvania's NPS Management Program uses a watershed-based approach focused on partnerships, local empowerment, and collaboration among federal, state, and local organizations. Highlighting Pennsylvania's accomplishments to reduce nitrogen, phosphorus, sediment, iron, aluminum, and acidity pollutant loads in 2021, many key indicators illustrate Pennsylvania's ongoing progress in reducing nonpoint source pollutant loads.

Streamlining future nonpoint source pollution management is enhanced by using technology and tools to improve the permitting process. As such, DEP has launched an e-permitting system for the Water Obstructions and Encroachments Program (Chapter 105) to allow for a more efficient General Permit application submittal and review process for BMP implementation. The Pennsylvanian's Guide to

Appendices

Appendix A – Goals, Objectives, and Milestones

Appendix B – Detailed Progress on Selected WIPs (List B)

Appendix C – Pennsylvania NPS Management Program Funding

<u>Permitting for Watershed Improvement Projects</u> has also been published by DEP for the purposes of providing tools and resources to those who want to install projects to restore and protect water quality.

In 2019, the NPS Management Program revised its NPS Management Plan updating goals and objectives for the five year cycle of Federal Fiscal Year 2019 - 2024. Part of ensuring future success requires program review and adaptive management. The programmatic review includes evaluation of the current WIP roster to refocus efforts on WIPs with active stakeholder involvement and clearly defined plans with the goal to reduce the number of impaired stream miles and lake acres. This review also involved an independent third-party review of the program, the 2021 DEP NPS Management Program Assessment, which has provided additional insight, recommendations and will ultimately lead to continued success to achieve program and water quality goals. DEP's Section 319 program has implemented numerous recommendations, relating to staffing, grant applicants, program workflow and timeline, training and communication, and water quality improvements. Examples of the implemented recommendations include refilling vacant positions; improving grant applicant education and training opportunities for improved workplans and more efficient review process; and funding Chesapeake Bay Phase 3 WIP Countywide Action Plan BMPs, where possible, through the Section 319 grants program for the co-benefit of

implementing 319 WIP BMPs. The NPS Management Plan establishes overall strategies implemented by partners in Pennsylvania to address nonpoint source pollution impacts. The Plan was updated to enhance the previous Pennsylvania NPS Management Program approved by EPA in 2014 in compliance with Section 319(b). The 2019 Update to the NPS Management Plan now outlines ongoing efforts and activities to address nonpoint source pollution through 2024. The NPS Management Plan will be updated again at the midpoint assessment to reflect recommendations from the 2021 DEP NPS Management Program Assessment.

APPENDIX A:

Goals, Objectives, and Milestones

Pennsylvania's NPS Management Plan identifies goals, objectives, partners, programs, and resources to reduce nonpoint source pollution as required by EPA's Section 319(h) of the CWA. The NPS Management Plan contains six goals with corresponding objectives and milestones aligned with the goals of the CWA. Listed in the matrix below and subsequent pages, the goals, objectives, and milestones report quantifiable measures highlighting Pennsylvania's progress to reduce nonpoint source pollution during the 2021 reporting period. In many cases, the level of detail in tracking the measures have improved over time, resulting in data reporting being more specific than the original objective. Pennsylvania continues to make progress towards meeting water quality goals with continued support, funding, and local project implementation to reduce AMD-related, agricultural, and stormwater pollutant loads.

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with AMD and other energy resource extraction activities.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
1.1 Provide for the operation and maintenance of 46 Pennsylvania-operated AMD treatment systems each year for the next five years.	BAMR provided operation and maintenance for 46 systems	95 systems
1.2 Engage in land reclamation projects resulting in the reclamation of 500 acres of abandoned mine lands each year for the next five years.	349.79 acres	557.33 acres
1.3 Provide funding and other assistance for the installation of new AMD treatment systems annually for the next 5 years.	5 systems completed: Elk County (1 system) Allegheny County (1 system) Fayette County (2 systems) Clearfield County (1 system)	6 systems
1.4 Authorize four Quick Response projects each year for the next five years.	4 projects	11 projects
1.5 Provide engineering assistance under the Technical Assistance Grant for one AMD project each year for the next five years.	18 AMD projects	27 projects

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
1.6 Plug five oil and gas wells each year for the next five years.	412 plugged wells Conventional – 334 Unconventional – 78	743 plugged wells
1.7 Through load-reduction efforts with the installation of new AMD treatment systems, an additional 10,000 pounds of iron will be reduced from the nonpoint source pollutant stream each year.	403,496.6 lbs./yr.	412,172.7 lbs./yr.
1.8 Through load-reduction efforts with the installation of new AMD treatment systems, an additional 5,000 pounds of aluminum will be reduced from the nonpoint source pollutant stream each year.	7,645.7 lbs./yr.	29,469.06 lbs./yr.
1.9 Through load-reduction efforts with the installation of new AMD treatment systems, an additional 80,000 pounds of acidity will be reduced from the nonpoint source pollutant stream each year.	182,250 lbs./yr.	817,871.95 lbs./yr.
1.10 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of iron will continue to be reduced from the nonpoint source pollutant stream each year.	4,000,000 lbs./yr.	21,753,033 lbs./yr.
1.11 Through load-reduction efforts with the current operational passive treatment systems, 2,500,000 pounds of aluminum will continue to be reduced from the nonpoint source pollutant stream each year.	1,000,000 lbs./yr.	4,054,442 lbs./yr.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
1.12 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of acidity will continue to be reduced from the nonpoint source pollutant stream each year.	13,000,000 lbs./yr.	36,823,066 lbs./yr.
1.13 Through load-reduction efforts with state operated active treatment systems, 750,000 pounds of iron will continue to be reduced from the nonpoint source pollutant stream each year.	1,723,846.26 lbs./yr.	2,877,378.96 lbs./yr.
1.14 Through load-reduction efforts with state operated active treatment systems, 175,000 pounds of aluminum will continue to be reduced from the nonpoint source pollutant stream each year.	201,311.67 lbs./yr.	508,849.07 lbs./yr.
1.15 Through load-reduction efforts with state operated active treatment systems, 2,500,000 pounds of acidity will continue to be reduced from the nonpoint source pollutant stream each year.	6,066,154 lbs./yr.	11,787,475 lbs./yr.
1.16 Through load-reduction efforts with state operated active and passive treatment systems, 10 billion gallons per year (BGY) of water will be treated reducing nonpoint source pollutant entering waters of the Commonwealth each year.	18.12 BGY of water treated	34.52 BGY of water treated
1.17 Provide technical assistance under the Technical Assistance Grant for 15 AMD projects each year for the next five years.	13 projects (7 completed, 6 underway)	36 projects

Goal 2: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
2.1 Implement BMPs on 30 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or wise management of nutrients.	474 – Total 37 – Growing Greener funded projects 437 – Conservation Reserve Enhancement Program (CREP) projects	16,148 total projects
2.2 Support the review of 30 Nutrient Credit total trades documenting the purchase of nutrient and/or sediment credits annually.	23 nonpoint source credit certification requests were reviewed	
	23 nonpoint source credit verification requests were reviewed	8 nutrient trades involved nonpoint source-generated credits
	3 of 86 total trade (registration) requests reviewed involved nonpoint source-generated credits	
	17,950 of 376,104 total nitrogen credits traded were nonpoint source-generated credits	
	0 of 25,789 total phosphorus credits traded were nonpoint source-generated credits	

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
2.3 Conduct 2,000 agricultural compliance inspections on farms in the Chesapeake Bay Watershed each year.	1,948 small farms, non-Concentrated Animal Feeding Operations (CAFO), were inspected under the Chesapeake Bay Ag. Inspection program of which 1,588 farms were inspected by CCDs and 360 by DEP regional offices. 702 farms were inspected under the Act 38 Nutrient Management Program. Overall, 275,568 acres were inspected within PA's Chesapeake Bay watershed. 64% of the farms met planning requirements for MMPs and 69% met planning requirements for Ag E&S plans.	5,114 total farms inspected
2.4 Provide six full-time equivalents (FTEs) under a Technical Assistance Grant for designing and installing Agricultural BMPs.	7.5 FTEs engineering and technical staff	7.5 average FTE engineering and technical staff annually



Objective	EEV 2021 Total	EEV 2020 2024 Punning Total
Objective	FFY 2021 Total	FFY 2020-2024 Running Total
2.5 Support a minimum of 32 Chesapeake Bay Program Agricultural Technicians and eight Agricultural Engineers in the Chesapeake Bay watershed each year for the next five years.	27 Agricultural Technician contracts 8 Agricultural Engineer contracts	27 average Agricultural Technicians annually 8 average Agricultural Engineers annually
2.6 Provide support for the implementation of five innovative environmental technology projects (focused on agriculture) within the next five years.	1 award in 2021 with Conservation Innovation grant from USDA – NRCS	2 awards
2.7 Support the certification of 500 certified manure haulers within the Commonwealth annually.	740 certified manure haulers	1,530 total haulers
2.8 Support the certification of 200 certified Nutrient Management Specialists within the Commonwealth annually.	270 nutrient management specialists	555 nutrient management specialists
2.9 Maintain the implementation of approved Act 38 Nutrient Management Plans on 200,000 acres of farmland regulated as Concentrated Animal Operations (CAOs) and CAFOs each year for the next five years.	237,305.31 acres, CAO, CAFO and Volunteer Animal Operations (VAOs), totaling 1,264 plans	491,245.44 total acres

Souls, Objectives, and willestones		
Objective	FFY 2021 Total	FFY 2020-2024 Running
2.10 Support 750,000 acres of non-CAO/non-CAFO farmed acres under a Nutrient Management Plan or Manure Management Plan over the next five years.	506,676.76 acres of non-CAO/non-CAFO farmed acres under a NMP or MMP	Total 802,136.76 acres
2.11 Continue to encourage the use of the PA One Stop program to increase the number of fields entered into that system by 10% each year over the next five years.	22,537 fields (9% increase) entered covering 207,705 ac. (11% increase) and 3,245 farms (10% increase)	66,186 fields entered
2.12 Provide engineering assistance under the Technical Assistance Grant for 35 Agricultural projects each year for the next five years.	101 agricultural projects	233 total projects
2.13 Continue to implement PA's Chesapeake Bay Phase 3 Watershed Implementation Plan over the next five years.	Provided state grant funding for 18 county-based and county-hired coordinator positions in all CAP counties (Pilot, Tier 2, 3, and 4 counties) for planning and implementation. All 34 counties have completed CAPs and are implementing their plans. Nearly \$16 million in CAP Implementation block grant funds (federal and state funding sources) were made available to all counties in fall 2021 to apply for and to utilize for project implementation in calendar year 2022. DEP Region CAP Support Teams assisted with development of CAPs in Tier 3 and 4 counties and will continue to assist as Tier 3 & 4 counties transition into CAP implementation. DEP's Chesapeake Bay Office continued its work with various state and federal level action leaders as they collaborated on implementing Phase 3 WIP initiatives. Pennsylvania's annual progress updates will be reflected in its WIP Milestone progress report that will be submitted to EPA in January 2022.	

Goal 3: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with storm water runoff, as well as streambank and shoreline degradation.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
3.1 Conduct 500 site inspections under Chapter 105 and 8,000 site inspections for Chapter 102 programs annually for the next five years.	582 inspections under Chapter 105 Program 9,883 inspections under Chapter 102 Program	1,297 Chapter 105 inspections 19,564 Chapter 102 inspections
3.2 Continue to implement the Municipal Separate Storm Sewer Systems (MS4) program through oversight and verification that MS4 communities abide by their permit requirements.	DEP's Bureau of Clean Water continues to implement the MS4 program by developing the protocols and providing guidance and training for DEP staff and others in the regulated community.	
3.3 Implement five new Green Infrastructure/volume reduction/ flood mitigation projects over the next five years.	14 projects	15 projects
3.4 Implement 30 new, state-funded riparian buffer, stream restoration and/or stormwater management projects annually for the next five years.	6 riparian buffers (Growing Greener) 34 riparian buffers (CREP) stream restoration: 12 (Growing Greener), 3 (EPA Section 319 Program) 1 storm water (Growing Greener)	4,357 riparian buffer projects 32 stream restoration projects 7 storm water projects

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
3.5 Address 350 new Dirt, Gravel, and Low Volume Road projects each year for the next five years.	Dirt and Gravel Program • 262 projects • \$16,200,000 total cost • \$61,800 average cost/project Low Volume Road Program • 117 projects • \$5,900,000 total cost • \$50,400 average cost/project	1,012 total projects
3.6 Support using state managed funds, the completion of 15 miles of stream restoration and/or bank stabilization projects over the next five years.	6.4 mi. (Growing Greener) 0.7 mi. (319 Program)	9.4 total miles
3.7 Statewide, enroll 50,000 acres of new land in the CREP program over the next five years.	6,378.9 acres	98,325.71 total acres under CREP contract
3.8 Plant and protect 2,500 acres of riparian forest buffer over the next five years.	221.291 new acres 16.161 easement-protected acres	237.452 new and protected acres 15,594.21 acres under CREP contract

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
3.9 Develop 30 new forest management plans each year that cover approximately 5,000 acres of privately-owned forest land over the next five years.	34 plans 2,278 acres	61 total plans 5,557 total acres
3.10 Plant 10,000 new trees under the TreeVitalize program each year for the next five years.	2,467 trees	4,558 total trees planted
3.11 Encourage NPS pollution control activities within US Forest Service selected priority watersheds identified under the USFS Watershed Condition Framework within the borders of the Allegheny National Forest (ANF) to the extent that these priority "Functioning at Risk" watersheds within the ANF may be re-categorized as "Functioning Properly."	The 512,000-acre ANF is the only national forest in Pennsylvania and is managed by the USFS. The USFS has identified 42 watersheds and 1,500 miles of coldwater streams in ANF. Only two watersheds are "Functioning Properly" in the USFS Watershed Condition Classification system. USFS has prepared and finalized Watershed Restoration Action Plan (WRAP) for the "Functioning at Risk" Bear Creek watershed and the "Functioning at Risk" Farnsworth Branch watershed. USFS reports to have begun the implementation of the Bear Creek WRAP with the completion of four projects since 2012. The Bear Creek WRAP includes twelve remaining projects with an estimated cost of \$2,226,000 and full implementation by 12/31/2026. USFS reports to have begun the implementation of essential projects in Farnsworth Branch in 2021. A forest road segment was improved to reduce erosion. Also, a stream restoration project was completed in partnership with Trout Unlimited. The Farnsworth Branch WRAP includes thirteen remaining projects with an estimated cost of \$751,000 and full implementation by 12/31/2025.	

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
3.12 Provide engineering assistance under the Technical Assistance Grant for four Stream Restoration Projects each year for the next five years.	10 stream restoration projects	27 total projects
3.13 Provide technical assistance under the Technical Assistance Grant for 15 nonpoint source projects each year for the next five years.	64 projects (47 completed, 17 underway)	92 projects completed

Goal 4: Demonstrate the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.1 Continue to collect BMP data at the state, watershed, and subwatershed level.	PracticeKeeper, which is primarily used to track statewide agricultural plans and BMPs implemented by County Conservation Districts, is undergoing enhancements to allow for the acceptance of more grant-funded and non-cost shared BMP implementation data.	
4.2 Further develop and maintain PAOneStop to allow the NPS Program to collect the number of acres planned through the use of this tool and to spatially summarize data by watershed.	22,537 fields entered covering 207,705 ac. and 3,245 farms	569,029 total acres
4.3 Continue to develop and improve our Reclaimed Abandoned Mine Land Inventory System GIS Tool.	Version 21 completed (interactive & online)	Version 21 completed
4.4 Encourage continued use of Datashed GIS web tool such that at least 250 of the approximately 300 AMD Treatment Systems in Pennsylvania report load reductions and other information via this webbased database and ensure that access to this information is available to the public.	343 systems are in Datashed	343 total systems

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.5 Through the implementation and maintenance of the Water Quality Monitoring Network (WQN), the DEP will perform a combined total of 6,000 water quality samples and surveys each year over the next five years.	WQN Macroinvertebrate Samples: 134 WQN Water Chemistry Samples: 2,071	4,160 total samples
4.6 In addition to other monitoring efforts, the DEP will monitor 30 lakes each year for the next five years.	Trophic state lake studies: 11 WQN Lakes: 22	58 total lakes
4.7 Through monitoring and assessment efforts conducted by the DEP, over the next five years, 400 miles of streams previously impacted by nonpoint source pollution related causes shall be documented as newly delisted from Category 5 and/or Category 4a in the bi-annual Integrated Report.	For the period of 10/1/19 – 9/30/2021, 120.2 stream miles were fully restored, and 78.3 stream miles had 1 or more causes removed but still remain impaired.	120.2 stream miles fully restored

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.8 Through monitoring and assessment efforts conducted by the DEP, over the next five years, 900 lake acres previously impacted by nonpoint source pollution related causes shall be documented as newly delisted from Category 5 or Category 4a over the next five years.	For the period of 10/1/19 – 9/30/2021, 95 lake acres were fully restored, and 25.9 acres had 1 or more causes removed but still remain impaired.	95 lake acres fully restored
4.9 Implement grant funded projects designed to determine BMP effectiveness on at least three priority watersheds.	DEP staff are working with county staff to collect water quality data in 3 priority watersheds including the Kishacoquillas Creek in Mifflin County and Hamlin and Railroad Run in McKean County. Additional efforts include water quality data collection in cooperation with Ohio University in the North Fork Dunkard Fork basin in Greene County to measure progress associated with a basin-wide wetland mitigation project.	8 total watersheds
4.10 Continue to input all monitoring data collected by the PA DEP NPS Program into the Water Quality Exchange (WQX) System.	Water quality data is uploaded to the Water Quality Portal on a quarterly basis. This now includes additional water quality samples other than WQN samples. 3,973 samples from 586 sites were uploaded.	
4.11 Through state-wide NPS pollutant load-reduction efforts, 1 million pounds of nitrogen will be reduced from the nonpoint source pollutant stream each year.	18,836,094 lbs./yr. of nitrogen reduced	42,374,232 lbs./yr. of nitrogen reduced

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.12 Through state-wide load-reduction efforts, 300,000 pounds of phosphorus will be reduced from the nonpoint source pollutant stream each year.	733,184 lbs./yr. of phosphorus reduced	1,899,200 lbs./yr. of phosphorus reduced
4.13 Through statewide load-reduction efforts, 200,000 tons of sediment will be reduced from the nonpoint source pollutant stream each year.	287,761 tons/yr. of sediment reduced	504,139 tons/yr. of sediment reduced
4.14 Prevent waterbodies currently not listed as impaired for the aquatic life use designation from being listed as impaired for that designated use through implementation of existing regulatory programs.	National Pollutant Discharge Elimination System General Permits (storm water) – 1,733 Site Inspections – 5,619 Complaint Response – 1,835 NMPs (CAO) – 657 CAFOs (total in state) – 431 VAOs – 172 Chapter 105 Technical Assistance Contracts – 8,794 Total Number of General Permits Issued – 1,425 Chapter 105 Complaint Response – 656 Chapter 105 Total Inspections - 669	General Permits (storm water) – 3,336 Site Inspections – 11,539 Complaint Response – 3,919 NMPs (CAO) – 1,297 CAFOs (total in state) – 431 VAOS –172 Chapter 105 Technical Assistance Contracts – 17,036 Total Number of General Permits Issued – 2,888 Chapter 105 Complaint Response – 1,357 Chapter 105 Total Inspections – 1,269

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.15 Complete development of and maintain DEP's data collection framework by which information regarding the obtainment of nutrient and manure management plans on non-CAO/non-CAFO farms is collected and counted in terms of acres covered or farms planned.	DEP collects this data using PracticeKeeper entered by DEP, SCC, and the county conservation districts.	
4.16 DEP will continue to collect and report on the amount of biosolids land applied following the water quality criteria established under DEP's Municipal Waste regulations.	DEP's Bureau of Clean Water implements permitting and inspections regulating the beneficial reuse of sewage sludge (biosolids). Where applicable, applicants maximize the beneficial use of sewage sludge by land application under DEP's Municipal Waste regulations. The biosolids permits includes monitoring and reporting requirements for some types of biosolids. Not all types of biosolids quantities are reported to DEP so the total amount of biosolids land applied is not known. DEP's Clean Water Bureau compiles and maintains a spreadsheet of the reported amounts annually.	

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
4.17 Document farmer compliance with agricultural erosion and sedimentation control and manure management regulations in the Chesapeake Bay watershed by augmenting the long-standing Act 38 and CAFO inspection programs with the Chesapeake Bay enhanced inspection program addressing the non-CAO/non-CAFO farms, inspecting 5% of the farmlands in the watershed annually until all acres have been assessed.	Total Farms inspected = 2,650 Total Acres inspected = 275,568 (8.9%) Total number of non-CAO/non-CAFO farms inspected = 1,948 Total Acres of non-CAO/non-CAFO farms inspected = 145,990	517,057 total acres inspected 289,712 acres of non- CAO/non-CAFO farms inspected

Goal 5: Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
5.1 Annually provide a clear and concise report to the EPA, the general public, regulators, partners, and others interested in Pennsylvania's NPS pollution abatement efforts outlining the major accomplishments of Pennsylvania's NPS Program consistent with EPA reporting guidelines.	2021 NPS Management Program Annual Report	2020 NPS Management Program Annual Report 2021 NPS Management Program Annual Report
5.2 Develop 2 success stories per year.	Submitted two success stories:	4 success stories submitted total
5.3 Provide detailed BMP implementation reporting on 10 approved WIPs per year.	DEP is reporting on WIPs (Appendix B). These include:	22 WIPs reported total

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
5.4 Biannually submit to EPA the requisite "Semi-Annual Performance Report"	2 – Semi-Annual Progress Reports per year completed	4 Semi-Annual Progress Reports submitted
5.5 DEP will continue to input current information in the Watershed Plan Tracker (WPT) throughout the five-year life of the 2019-2024 NPS Management Plan to ensure accuracy of data.	36 WIPs are "complete" in WPT (7) WIPs are identified as "Not Initiated" and (8) WIPs are listed as "Initiated" in the WPT	

Goal 6: Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.

Objective	FFY 2021 Total	FFY 2020-2024 Running Total
6.1 Develop five new nonpoint source WIPs over the next five years.	Halfmoon Creek WIP Hammer Creek WIP Quittapahilla Creek WIP	9 WIPs
6.2 Update five existing WIPs over the next five years.	Two existing WIPs are in process of being revised but have not yet been finalized.	6 WIP revisions
6.3 Perform a detailed review of all current WIPs and close those no longer deemed appropriate for consideration.		

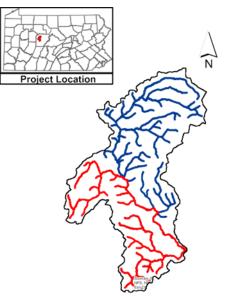
Anderson Creek, Clearfield County

WIP

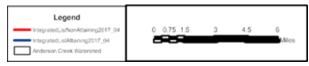
A TMDL was developed for this watershed which addresses high metals and acidity (pH) loadings and was completed in 2005. The Anderson Creek (WIP), completed in 2006, concentrates on the part of the watershed that is listed as impaired by AMD, noted by the red stream segments on the map. Priorities in the WIP address metals and low pH with the use of passive and active treatment systems plus land reclamation techniques when possible. The estimated cost of WIP implementation is \$13,000,000. Some partners that have been working towards WIP implementation include the Anderson Creek Watershed Association (ACWA), Pike Township, the CCCD, Western PA Conservancy, SRBC and Trout Unlimited (TU) who have slowly begun the work of restoring the watershed, concentrating in the Kratzer Run (Bilger Run) tributary. Currently, TU along with partners CCCD and SRBC are working to revise the WIP for Little Anderson tributary.

Recent Activities

The CCCD has installed an anoxic limestone drain on the Bilger 4.0 Discharge in the Bilger Run subwatershed using \$300,000 of 319 funds. CCCD has planted an 800 linear foot riparian forest buffer on both sides of the stream at an approximate width of 40 feet on each side in Montgomery Run using \$1,910 of Coldwater Heritage Funds. CCCD has an ongoing project using \$30,000 of private landowner funds that has reclaimed two of five acres of a coal refuse pile while also regrading and revegetating the work at this site. Trout Unlimited has received a grant to revise this WIP and is currently in the process of addressing comments on their draft WIP that has been submitted to EPA. TU will begin submitting proposals for stream restoration designs, permits and construction once the revised WIP is approved.



Anderson Creek Watershed



Watershed Description

The Anderson Creek Watershed is in Clearfield County and contains Environmental Justice Areas. This 78 square mile watershed is a tale of two different streams. The upper portion of the watershed is mostly forested with little disturbance. The DuBois Reservoir, the drinking water source for the City of DuBois and some other surrounding communities, can be found in this section. The lower section, starting at Little Anderson Creek, has been greatly disturbed by both clay and coal mining and is impaired by AMD discharges.

	Anderson Creek Watershed Project List (1999 to present)				
Program	Name of Project	Year	Cost of Project		
Name		Funded			
1712	Little Anderson Creek WIP Update	2017	\$60,700		
1711	Bilger Run Discharge 4.0 AMD Passive Treatment System	2017	\$300,000		
1205	Bilger Run Passive Treatment System	2012	\$41,000		
1107A	Updating AMD WIPs as Qualified Hydrologic Units – Anderson Creek	2011	\$10,000		
1012	Reasinger Site AMD Design Project	2010	\$74,535		
2919	Smouse Strip AMD Abatement Design Project	2009	\$133,022		
2813	KORB Design and Reclamation Project	2008	\$402,082		
2715	Bilger Run BR3.9 Project	2007	\$90,061		
2316	Anderson Creek Assessment and Restoration Plan	2006	\$50,623		
9961	Anderson Creek Watershed Project	1999	\$27,400		

Anderson Creek Watershed Load Reduction Goals and Accomplishments					
Sub Watershed	Pollutant ID	TMDL Required Load Reduction (lbs./day)	Load Reduction Achieved (lbs./day)	Percent Load Reduction Goal Achieved	
Anderson	Acidity	352	26	7%	
Creek	Aluminum	27	2	8%	
	Iron	21	2	10%	
	Manganese	2	0	0%	
Bilger Run	Acidity	158	54	34%	
	Aluminum	11	4	36%	
	Iron	26	3	12%	
	Manganese	26	7	27%	
Kratzer Run	Acidity	126	0	0%	
	Aluminum	14	0	0%	
	Iron	8	0	0%	
	Manganese	3	0	0%	
Little	Acidity	1456	17	1%	
Anderson	Aluminum	119	1	1%	
	Iron	145	1	1%	
	Manganese	51	2	3%	

Table 11: Load reduction goals are established in both the TMDL and the WIP. This table provides information on the load reduction goals as well as progress made in achieving those goals.

Anderson Creek - BMP Implementation Goals and Accomplishments					
Sub Watershed	ВМР	Goal Amount	Implemented Amount	Percent Goal Achieved	
Anderson Creek System	Vertical Flow Treatment	3	0	0%	
	Land Reclamation (ac.)	8	8	100%	
Bilger Run	Anoxic Limestone Drain	2	1	50%	
	AMD Treatment System	No goal established	1	N/A	
	Vertical Flow Treatment System	2	0	0%	
	Land Reclamation (ac.)	38	76	>100	
Kratzer Run	Limestone Leach Bed	2	0	0%	
	Pond	1	0	0%	
Little Anderson	Anoxic Limestone Drain	1	0	0%	
	AMD Treatment System	No goal established	1	N/A	
	Limestone Doser	1	0	0%	
	Vertical Flow Treatment System	3	0	0%	
	Land Reclamation (ac.)	81	81	100%	

Detailed Progress on Selected WIPs

Conewago Creek, Dauphin, Lancaster and Lebanon Counties

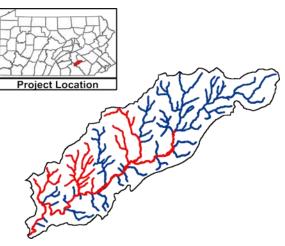
WIP

Most of the Conewago Creek Watershed is impaired by sediment and nutrients from agriculture. A TMDL was developed in 2001 and revised in 2006. The original WIP was completed by the Tri-County Conewago Creek Association (a nonprofit volunteer organization) working with a consultant in May 2006 with funding provided by the DEP Section 319 grant program. The WIP was revised in 2021 by Tetra Tech and will act as a fresh starting point for BMP implementation. The estimated cost for WIP implementation is \$55,000,000. The watershed is divided into subbasin A and subbasin B within the new WIP as this mirrors the TMDL. This is important, making BMP implementation and numeric reductions able to be tracked directly toward TMDL attainment through time.

Partners working to restore the Conewago Creek Watershed include: Tri-County Conewago Creek Association, Rettew Associates, DEP, DCCD, Lancaster County Conservation District, Lebanon County Conservation District, Penn State Agriculture and Environment Center, SRBC, U.S. Fish and Wildlife Service and Londonderry Township.

Recent Activities

Significant BMP implementation has occurred under the old WIP during its 15-year life as displayed in Project List table below. However, since none of the impaired stream segments have been removed from the Integrated Report during this time and because only roughly 50 percent of the TMDL load reductions have been attained, EPA and DEP agreed to revise the WIP in 2021 based on the Adaptive Management approach. Projects are currently ongoing and numeric modeling can now be tracked directly against the goals of the TMDL since the targeted basins now match the TMDL in the updated WIP as displayed in the following tables. This is a fresh start point for implementation.



Conewago Creek Watershed



Watershed Description

The Conewago Creek Watershed, located in the Susquehanna River Basin, covers 53.2 square miles in Dauphin, Lancaster and Lebanon Counties in Southcentral Pennsylvania. The headwaters start in State Game Lands #45, Lebanon County from where the creek flows southwesterly through predominantly agricultural areas. The lower part of the watershed is more developed with the creek eventually intersecting major highway systems including the Pennsylvania Turnpike and Pennsylvania Routes 283 and 230. The creek enters the Susquehanna River near the Three Mile Island Nuclear Facility in Dauphin County.

	Conewago Creek WIP Section 319 Project List (2007 to present)					
Project Number	Name of Project	Year Funded	Cost of Project			
1909	Conewago Creek Restoration Projects	2019	\$186,625			
1212	Conewago Creek Restoration Phase III	2012	\$223,500			
1023D	Conewago Creek Stream Restoration	2010	\$108,980			
2931B	Hershey Meadows Stream Restoration	2009	\$222,000			
2719	Phase I Restoration Project for Conewago Creek	2007	\$150,858			
2721	Hershey Meadows Stream Restoration Project	2007	\$34,000			

C	Conewago Creek - Load Reduction Goals and Accomplishments					
Sub Watershed	Pollutant ID	Target Load Reduction (lbs./day)	Load Reduction Achieved (Ibs./day)	Percent Load Reduction Goal Achieved		
Conewago A - Headwaters	Sedimentation- Siltation (tons/yr.)	148	0	0%		
	Phosphorus (lbs./yr.)	285	0	0%		
Conewago A – Little Conewago Creek	Sedimentation- Siltation (tons/yr.)	408	0	0%		
	Phosphorus (lbs./yr.)	713	0	0%		
Conewago Creek – Conewago Creek A	Sedimentation- Siltation (tons/yr.)	351	0	0%		
	Phosphorus (lbs./yr.)	655	0	0%		
Conewago A – Hoffer Creek	Sedimentation- Siltation (tons/yr.)	632	0	0%		
	Phosphorus (lbs./yr.)	952	0	0%		
Conewago B – Gallagher Run	Sedimentation- Siltation (tons/yr.)	208	0	0%		
	Phosphorus (lbs./yr.)	358	0	0%		
Conewago B – Brills Run	Sedimentation- Siltation (tons/yr.)	358	0	0%		
	Phosphorus (lbs./yr.)	1,359	0	0%		
Conewago B – Lynch Run	Sedimentation- Siltation (tons/yr.)	602	0	0%		
	Phosphorus (lbs./yr.)	995	0	0%		

Conewago Creek - Load Reduction Goals and Accomplishments					
Sub Watershed	Pollutant ID	Target Load Reduction (lbs./day)	Load Reduction Achieved (lbs./day)	Percent Load Reduction Goal Achieved	
Conewago B – Conewago Creek B	Sedimentation- Siltation (tons/yr.)	989	0	0%	
	Phosphorus (lbs./yr.)	2,914	0	0%	
Conewago B – 1 st Tributary North	Sedimentation- Siltation (tons/yr.)	156	0	0%	
	Phosphorus (lbs./yr.)	321	0	0%	
Conewago B – 1 st Tributary South	Sedimentation- Siltation (tons/yr.)	120	0	0%	
	Phosphorus (lbs./yr.)	285	0	0%	

Conewago Creek Basin A - BMP Implementation Goals						
Basin A	Conewago Headwaters	Conewago A	Little Conewago Creek	HofferCreek		
Conservation Tillage (ac.)	162.4	106	263	39.8		
Riparian Forest Buffer (ft.)	11,915.47	26,258.93	20175.7	41090.91		
Grazing Land Management (ac.)	0	28.2	0	39.6		
Streambank Stabilization (ft.)	4,109.02	2,102	18,331.6	19,512.1		
Agricultural Erosion and Sediment Control (ac.)	56.1	6.6	34.0	180.55		
Streambank Fencing (ft.)	5,824	0	0	9,811		
Nutrient Management (ac.)	88.4	185.19	229.14	223.7		
Contour Farming/Strip Cropping (ac.)	0	188.96	0	24.9		
Pervious Pavement (ac.)	0.1	0	0	0		
Bioswale new or retrofit (ac. treated)	14.75	9.97	34.83	308.15		
Riparian Buffer (ac.)	0.8	3.12	6.21	1.2		
Rain Garden (ac. treated)	0.22	0.33	0.02	0.13		
Constructed Wetlands (ac.)	0.15	0	0.27	0		
Retention basin (ac. treated)	11.6	0	0	0		

Basin B		Conewago Creek Basin B - BMP Implementation Goals						
Conservation Tillage (ac.) 0 127.6 69.1 67.8 0 8.6	Basin B	-	Brills Run	1 -	_	_		
Riparian Forest Buffer (ft.) 19,417.5 20,991.74 36,916.76 34,215.9 18,961.95 6,054.37	Conservation							
Buffer (ft.) 19,417.5 20,991.74 36,916.76 34,215.9 18,961.95 6,054.37	Tillage (ac.)	0	127.6	69.1	67.8	0	8.6	
Grazing Land Management (ac.)	Riparian Forest							
Management (ac.) 0 15.5 3.53 10.1 75 0 Streambank Stabilization (ft.) 0 0 18,670.32 8273 3296.71 3774 Agricultural Erosion and Sediment Control (ac.) 117.1 48 258.83 199.4 64.15 8.45 Streambank Fencing (ft.) 8,000 1,879 0 1,800 6,454 0 Nutrient Management (ac.) 73.58 106.67 112.59 211.85 90.86 12.05 Animal Waste Management System (Livestock) (% treated) 0 0 2.45 20.16 0 Contour Farming/Strip Cropping 0 0 61 0 0 0 Pervious Pavement (ac.) 0 0 1.2 131 0.67 0 Bioswale new or retrofit (ac. treated) 0 0 19.9 213.07 3.17 12.57 Riparian Buffer (ac.) 0 22.7 12.03 255 1.94 0 Rain Garden (ac. treated) 0 0 15.3 <td>Buffer (ft.)</td> <td>19,417.5</td> <td>20,991.74</td> <td>36,916.76</td> <td>34,215.9</td> <td>18,961.95</td> <td>6,054.37</td>	Buffer (ft.)	19,417.5	20,991.74	36,916.76	34,215.9	18,961.95	6,054.37	
(ac.) 0 15.5 3.53 10.1 75 0 Streambank Stabilization (ft.) 0 0 18,670.32 8273 3296.71 3774 Agricultural Erosion and Sediment Control (ac.) 117.1 48 258.83 199.4 64.15 8.45 Streambank Fencing (ft.) 8,000 1,879 0 1,800 6,454 0 Nutrient Management (ac.) 73.58 106.67 112.59 211.85 90.86 12.05 Animal Waste Management System (Livestock) (% treated) 0 0 0 2.45 20.16 0 Contour Farming/Strip Cropping 0 0 61 0 0 0 Pervious Pavement (ac.) 0 0 1.2 131 0.67 0 Bioswale new or retrofit (ac. treated) 0 0 19.9 213.07 3.17 12.57 Riparian Buffer (ac.) 0 22.7 12.03 255 1.94 0 Rain Garden (ac. treated) 0 0 <td< td=""><td>Grazing Land</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Grazing Land							
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Stabilization (ft.)	(ac.)	0	15.5	3.53	10.1	75	0	
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Nutrient Management (ac.) 73.58 106.67 112.59 211.85 90.86 12.05 Animal Waste Management System (Livestock) (% treated) 0 0 0 2.45 20.16 0 Contour Farming/Strip Cropping O O O 61 0 0 0 0 0 0 Pervious Pavement (ac.) 0 0 1.2 131 0.67 0 Bioswale new or retrofit (ac. treated) 0 0 19.9 213.07 3.17 12.57 Riparian Buffer (ac.) 0 22.7 12.03 255 1.94 0 Rain Garden (ac. treated) 0 0 15.3 23.42 0.25 0.06 Constructed 0 0 15.3 23.42 0.25 0.06								
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System (Livestock) (% treated) 0 0 0 2.45 20.16 0 Contour Farming/Strip Cropping 0 0 61 0 0 0 Pervious Pavement (ac.) 0 0 1.2 131 0.67 0 Bioswale new or retrofit (ac. treated) 0 0 19.9 213.07 3.17 12.57 Riparian Buffer (ac.) 0 22.7 12.03 255 1.94 0 Rain Garden (ac. treated) 0 0 15.3 23.42 0.25 0.06 Constructed 0 0 15.3 23.42 0.25 0.06								
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		J	<u> </u>	10.0	23.42	0.23	0.00	
Wetlands (ac.) 0 0 5.2 1.26 0		0	0	0	5.2	1 26	n	
Retention basin		J J	<u> </u>	5	5.2	1.20	<u> </u>	
(ac. treated) 0 0 13.8 163.39 0 42.2		0	0	13.8	163.39	0	42.2	

Core Creek/Lake Luxembourg, Bucks County

WIP

Due to the excessively high rates of sedimentation from highly erodible soils in the watershed, the lake reached its 100-yr. sediment capacity in just nine years. Lake Luxembourg was plagued by high turbidity and frequent algal blooms.

This lake was listed as impaired for Aquatic Life Use in the mid-1990's after which DEP developed a TMDL for total phosphorus (TP) and total suspended solids (TSS). The TMDL was finalized in 1999. Currently, both Lake Luxembourg and Core Creek are listed on Sublist 4a of the 2014 Integrated Report. Also, the Core Creek / Lake Luxembourg watershed is part of the Neshaminy Creek watershed, which also has a TMDL for TSS. A WIP was approved for this watershed in 2005. Partners working in the watershed include Bucks County Conservation District (BCCD), Bucks County Department of Parks and Recreation, County of Bucks and Middletown Township.

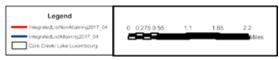
Recent Activities

The BCCD has added a 40 linear foot rock chute to a swale due to continued wetness of the channel that was causing gullying during storm events. The District has also installed 150 feet of fencing to delineate an animal concentration area (ACA) from a pasture, rather than have the entire paddock be an ACA. The paddock borders the stream so this work will reduce nutrients and sediment entering the stream at this site by improving the gazing land management BMP here. The District is also in the planning stages of their recent grants for this watershed with implementation expected in the summer of 2022.





Lake Luxembourg/ Core Creek Watershed



Watershed Description

Core Creek, located in Bucks County, is a tributary of Neshaminy Creek approximately 13.5 miles upstream of the Neshaminy Creek's confluence with the Delaware River. Under Public Law 566 funding, the 174-acre impoundment known as Lake Luxembourg was created in 1977 to provide local communities with a multi- purpose reservoir. The lake is the focal point of Core Creek Park, one of Bucks County's most-visited parks and managed by the Bucks County Parks Department. The Lake Luxembourg's watershed encompasses 6,033 acres (9.42 sq. mi); land use is currently mainly residential and disturbed (34.85%), agriculture (29.3%), forested (18.9%), urban (15.8%) and wetland/lake (1.1%). In the past 10 to 15 years, the land use in the Core Creek watershed experienced a major shift from agriculture to urban and suburban uses.

C	Core Creek/Lake Luxembourg WIP Section 319 Project List (1999 to Present)					
Project Number	Project Title	Year Funded	Cost			
2015	Lake Luxembourg Wetland BMP Implementation	2020	\$790,914			
1511	Lake Luxembourg Wetland Development	2015	\$153,145			
1217	Core Creek/Lake Luxembourg BMP Implementation	2012	\$293,900			
1016	Village Farm Nutrient Management Plan Implementation	2010	\$67,229			
2429	Lake Luxembourg Implementation Project	2004	\$96,000			
9938	Core Creek Watershed Restoration	1999	\$100,140			

Core Creek/Lake Luxembourg - Load Reduction Goals and Accomplishments						
Pollutant ID	TMDL Load Reduction Goal	Load Reduction Achieved	Percent Load Reduction Goal Achieved			
Nitrogen (lbs./yr.)	No established goal	448	N/A			
Phosphorus (lbs./yr.) Sedimentation-	725	250	34%			
Siltation (tons/yr.)	430	144	33%			

Core Creek/Lake Luxembourg - BMP Goals and Accomplishments					
BMP/Action	Goal Amount	Implemented Amount	Percent Action Implemented		
Infiltration Basin (ac.)	574	5	1%		
Wetland Creation (ac.)	3,600	2	1%		
Streambank & Shoreline Protection (ft.)	13,200	3,000	23%		
Riparian Forest Buffer (ac.)	5	2	39%		
Diversion (ft.)	no goal established	430	N/A		
Filter Strip (sq. ft.)	no goal established	4,500	N/A		
Grassed Waterway (ft.)	no goal established	885	N/A		
Heavy Use Area Protection (ac.)	no goal established	0.2	N/A		
Nutrient Management (ac.)	no goal established	6	N/A		
Roof Runoff Management (ft.)	no goal established	280	N/A		
Stormwater Runoff Control (units)	no goal established	4	N/A		
Stream Exclusion with Grazing Land Management (ft.)	no goal established	4,420	N/A		
Structure for Water Control (units)	no goal established	4	N/A		
Subsurface Drain (ft.)	no goal established	3,850	N/A		
Waste Storage Facility (units)	no goal established	1	N/A		

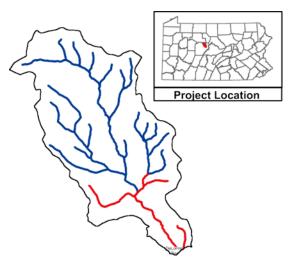
Deer Creek, Clearfield County

WIP

Deer Creek is an AMD-impaired watershed. A TMDL was completed in 2005. The primary causes of impairment are high metals and acidity (pH) loadings from past mining practices. The Deer Creek WIP was completed for the Deer Creek Watershed Association in 2011 with funding from Growing Greener. Partners working on implementing the plan include Deer Creek Watershed Association (DCWA), Clearfield County Senior Environment Corps, CCCD, TU and DEP. The estimated total cost to implement the WIP is \$4,000,000.

Recent Activities

The CCCD and DCWA have successfully completed the design, permitting and construction of a passive treatment system using vertical flow wetlands to treat the highest priority discharge within the watershed, TDC 4.1. Fishery surveys by the PFBC have detected multiple age classes of Eastern brook trout downstream of the treatment system and have subsequently added this section to the list of waters supporting natural trout reproduction. The entire length of the main stem of Deer Creek as well as Buck Run sustain a wild trout fishery now. Future work will involve operation and maintenance, monitoring and the reclamation of the few remaining AML sites in the headwaters along with general reforestation.



Deer Creek Watershed



Watershed Description

Deer Creek is a relatively large tributary of the West Branch of the Susquehanna River and is in an Environmental Justice Area. The Deer Creek Watershed encompasses approximately 23.5 square miles in Girard Township, Clearfield County.

Although impacted by AMD, the main stem of Deer Creek supports a healthy Eastern brook trout (*Salvelinus fontinalis*) fishery as documented by the PFBC in 2009. The last two miles of the stream were severely degraded and unable to support aquatic life. However, native brook trout have recolonized this reach following successful treatment of priority AMD discharges.

Deer Creek WIP Section 319 Project List (2012 to present)						
Project Name of Project Year Funded Cost of Project						
1609	Deer Creek AMD Treatment	2016	\$837,174			
1211	School Tributary Design and Permitting	2012	\$30,752			

	Deer Creek - BMP Imple	ementation Goals a	nd Accomplishments	
Sub Watershed	ВМР	Goal Amount	Implemented Amount	Percent Goal Achieved
TRDC 4.0	Land Reclamation (units)	3	0	0%
	Land Reconstruction, Abandoned Mined Land (units)	3	0	0%
	Limestone Doser (units)	1	0	0%
	Limestone Open Channel (units)	2	0	0%
	Limestone Sanding (units)	2	0	0%
	Passive Treatment System (unit)	4	1	25%
	Vertical Flow Treatment System (units)	2	0	0%
TRDC 7.0	Passive Treatment (units)	1	0	0%

С	eer Creek - BMP Imple	mentation Goals	and Accomplishmen	ts
Sub Watershed	ВМР	Goal Amount	Implemented Amount	Percent Goal Achieved
Deer 1.0	Land Reconstruction, Abandoned Mined Land (units)	1	0	0%
	Vertical Flow Treatment System (units)	2	0	0%
Deer 4.0	Passive Treatment (units)	1	0	0%
Deer 7.0	Passive Treatment (units)	2	0	0%
	Limestone Sanding (units)	1	0	0%
TRDC 3.0	Limestone Open Channel (units)	1	0	0%
TRDC 7.2	Passive Treatment (units)	1	0	0%

Deer Creek – Load Reduction Goals and Accomplishments						
Sub Watershed	Pollutant ID	TMDL Load Reduction	Load Reduction Achieved	Percent Load Reduction Goal Achieved		
TRDC 4.0	Acidity (lbs./day)	982	63	6%		
	Aluminum (lbs./day)	43	2	5%		
	Iron (lbs./day)	102	2	2%		
	Manganese (lbs./day)	98	2	2%		
TRDC 7.0	Acidity	358.4	0	0%		
TRDC 3.0	Acidity (lbs./day)	70	0	0%		
	Aluminum (lbs./day)	7	0	0%		
	Iron (lbs./day)	0.5	0	0%		
	Manganese (lbs./day)	7	0	0%		
Deer 1.0	Manganese (lbs./day)	143	0	0%		
	Aluminum (lbs./day)	90	0	0%		
	Acidity (lbs./day)	1,280	0	0%		
Deer 4.0	Aluminum (lbs./day)	69	0	0%		
	iron (lbs./day)	93	0	0%		
	Acidity (lbs./day)	2,286	0	0%		
TRDC 7.2	Acidity (lbs./day)	70	0	0%		
	Aluminum (lbs./day)	3	0	0%		
	iron (lbs./day)	6	0	0%		
	Manganese (lbs./day)	9	0	0%		

Detailed Progress on Selected WIPs

Hartshorn Run, Clearfield County

WIP

Hartshorn Run is an AMD-impaired watershed. The primary causes of impairment are high metals and Acidity (pH) loadings from past mining practices. A TMDL was approved in April 2004 and the Hartshorn Run Watershed Implementation Plan was completed in 2010. Partners working on implementing the plan include the CCCD, SRBC and Allegheny Mountain Chapter of Trout Unlimited. The estimated cost to implement the WIP is \$400,000.

Recent Activities

Activities in this watershed have been significantly impacted by the COVID-19 global pandemic. However, SRBC is partnering with the CCCD to secure funding for future AMD treatment. The Allegheny Mountain Chapter of Trout Unlimited will provide volunteer time for routine operation and maintenance once systems are constructed. CCCD maintains an educational sign on the Clearfield-Curwensville Rails to Trails near the mouth of Hartshorn Run.



Watershed Description

Hartshorn Run is a small tributary to the West Branch of the Susquehanna River, and is in Pike Township, Clearfield County. The watershed encompasses a drainage area of 4.61 square miles. Much of the watershed is forested with a handful of residential homes that can be found in the middle section. Approximately 1 mile from the confluence with the West Branch Susquehanna River, the stream splits into two branches. An old clay mine, Hartshorn Mine, can be found on the western branch and is the main source of pollution to Hartshorn Run. The eastern branch maintains a viable fish population including native brook trout.

Hartshorn Run WIP Section 319 Project List (2006 to present)				
Project Name of Project Year Cost of Project Funded				
1112	HAR07-HAR05 AMD Discharge Design	2011	\$90,572	
2621	Hartshorn Run Assessment and Restoration Plan	2006	\$9,539	

Hartshorn Run – BMP Goals and Accomplishments				
Sub Watershed	BMP/Action	Goal Amount (units)	Implemented Amount (units)	Percent Action Implemented
Hartshorn 3	Limestone Sanding (units)	1	0	0%
Hartshorn 4	orn 4 Constructed Wetland Anaerobic (units)		0	0%
	Limestone Doser (units)	1	0	0%

Hartshorn Run – Load Reduction Goals and Accomplishments				
Sub Watershed	Pollutant ID	TMDL Load Reduction	Load Reduction Achieved	Percent Load Reduction Goal Achieved
Hartshorn 3	Acidity (lbs./day)	89	0	0
Hartshorn 4	Acidity (lbs./day)	874	0	0
	Aluminum (lbs./day)	47	0	0
	Manganese (lbs./day)	11	0	0

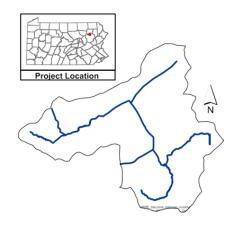
Harveys Lake, Luzerne County

WIP

Algal blooms have periodically plagued Harveys Lake throughout the 20th Century. This lake was placed on the Integrated List because of algal blooms and bacteria problems. While a sewage system improved the water quality of the lake, periodic blooms were still a major problem due to nonpoint source pollutant loading. These issues prompted the funding of the Phase I Diagnostic / Feasibility Study of Harveys Lake and its watershed under EPA's Clean Lakes Program. Using the study's results, DEP completed a phosphorus TMDL in 2002. A Watershed Implementation Plan then was completed in 2009. Partners working in the watershed include Harveys Lake Borough and their Environmental Action Committee. The estimated cost for WIP implementation is \$2,808,000.

Recent Activities

The water quality improvements resulted in Harveys Lake attaining the Aquatic Life Use as defined in DEP's Water Quality Standards (Chapter 93). Harveys Lake was delisted in the 2014 Integrated Report. Operation and maintenance of stormwater structures and other NPS projects to mitigate phosphorus from entering the lake are ongoing to maintain the Aquatic Life Use attainment. Street sweeping the road around the lake continues as it controls a source of phosphorus into the lake. In-lake water quality and stormwater efficiency monitoring continue as well. Hydrilla, a highly invasive and destructive aquatic plant, was found in Harveys Lake in 2014 near the public boat launch. Work continues to try to control this invasive plant.



Harveys Lake Watershed



Watershed Description

Harveys Lake is a 256 ha (632.8 acres) waterbody located in Luzerne County northeast of Wilkes-Barre. Harveys Lake is the largest natural lake, by volume, within Pennsylvania. The outflow of the lake forms the headwaters of Harveys Creek. Harveys Creek is a tributary to the Susquehanna River at West Nanticoke. The Harveys Lake watershed is 1,892 ha (4,673 acres) and is in the Upper Susquehanna-Lackawanna watershed.



	Harveys Lake WIP Section 319 Project List (2000 to present)				
Project Number	Name of Project	Year Funded	Cost of Project		
1717	Implementation of Stormwater BMPs within	2017	\$142,000		
	the Harvey's Lake watershed				
1422	Harveys Lake Borough, Large Stormwater	2014	\$88,439		
	BMP Implementation				
1218	Harveys Lake Stormwater BMPs	2012	\$366,100		
1126	Harveys Lake Stormwater BMPs	2011	\$565,700		
2832C	Design and Installation of Large Stormwater	2008	\$262,534		
	ВМР				
2630J	Harveys Lake Borough Prioritization of BMPs	2006	\$43,985		
	and Implementation				
2536	Prioritization of BMPs and Implementation	2005	\$34,380		
	Project				
2230	Demo Project of Small, Shoreline BMP	2002	\$134,260		
	retrofits Within in the Harveys Lake				
	Watershed				
2145	Harveys Lake Restoration – Phase II	2001	\$25,600		
2045	Harveys Lake Restoration	2000	\$99,995		

Harveys Lake – BMP Goals and Accomplishments				
BMP/Action	Goal Amount	Implemented Amount	Percent Action Implemented	
Access Road (units)	2	0	0%	
Baffle Boxes (units)	5	5	100%	
Road Ditch Creation/ Improvements (units)	6	0	0%	
Storm Water Wet Detention/Chemical Treatment System (units)	12	31	>100%	
Streambank & Shoreline Protection (ft.)	500	27,500	>100%	
Watershed Management Plan (units)	1	1	100	

	Harveys Lake – Load Reduction Goals and Accomplishments				
Pollutant ID	TMDL Load Reduction	Target Load Reduction	Load Reduction Achieved	Percent Load Reduction Goal Achieved	
Phosphorus (lbs./yr.)	230	230	200	87%	
Sediment-Siltation (tons/yr.)		No Goal Established	12	N/A	
Suspended Solids (lbs./yr.)		No Goal Established	114,230	N/A	

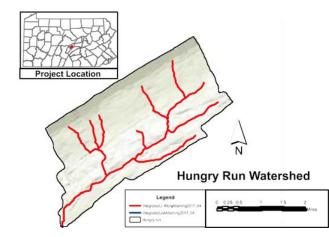
Hungry Run, Mifflin County

WIP

The Hungry Run WIP was completed in 2008 by the Mifflin County Conservation District (MCCD). The WIP deals with the primary impairments in Hungry Run which are sedimentation and nutrient loading resulting from agricultural practices located in the stream valley. Stream erosion due to storm water runoff is also occurring but to a lesser degree. The Hungry Run Sub watershed is specifically mentioned in the Kishacoquillas Creek Watershed Alternative Restoration Plan (September 2017). The load reduction goal for sediment is a 35% reduction to the pre-BMP sediment load.

Recent Activities

The MCCD has successfully saturated the Hungry Run Watershed with BMPs to the point of attaining the numeric load reduction goals for sediment set forth in the Alternative Restoration Plan, attaining a 55% reduction to sediment loads in the watershed. Recent monitoring of the watershed conducted by MCCD has also demonstrated attainment of water quality standards for aquatic life. DEP staff will be conducting a reassessment of the Hungry Run Watershed to verify attainment; the goal being the removal of all the stream segments of Hungry Run from the Integrated Report of Impaired Waters. MCCD has demonstrated success in gaining and maintaining landowner trust and cooperation as well as outstanding BMP tracking and collaboration with DEP. MCCD is a leader in watershed restoration and there are plans to have them present their successes at the annual meeting to teach other conservation groups throughout the state that may be working toward similar goals.



Watershed Description

Hungry Run is a tributary to the Kishacoquillas Creek in the Susquehanna River Basin. The eight square mile watershed, located in Mifflin County, is bounded by wooded ridges and Jack's Mountain. The watershed is primarily forested (62%) although the narrow stream valley is dominated by agricultural activities and some residential development.

Hungry Run WIP Section 319 Project List (2011 to present)					
Project Number	Name of Project	Year Funded	Cost of Project		
1618	NWQI – Monitoring Upper Kishacoquillas and Hungry Run Watersheds	2016	\$72,692		
1522	Surface Water Assessment in the Upper Kishacoquillas and Hungry Run Watersheds	2015	\$16,400		
1415	Hungry Run Watershed Continued Agricultural BMP Implementation	2014	\$527,655		
1315	Hungry Run Phase 2 Construction	2013	\$151,147		
1227B	NWQI Surface Water Assessments in the Upper Kishacoquillas and Hungry Run Watersheds	2012	\$31,848		
1121	Hungry Run Stream Restoration, Phase I	2011	\$39,191		

Hungry Run Watershe	Hungry Run Watershed – BMP Goals and Accomplishments				
BMP/Action	Goal	Implemented	Percent Action		
BiviP/Action	Amount	Amount	Implemented		
Diversion (ac.)	92	0	0%		
Residue Management, No-till & Strip Till	800	539	67%		
(ac.)					
Riparian Forest Buffer (ac.)	57	16	28%		
Barnyard Runoff Management (units)	10	5	50%		
Stream Exclusion with Grazing Land	35,376	10,359	29%		
Management (ft.)					
Heavy Use Area Protection (ac.)	1	1	100%		
Nutrient Management (ac.)	1,209	6	53%		
Waste Management System (units)	8	5	63%		
Waste Storage Facility (units)	8	6	75%		
Grassed Waterway (ft.)	400	400	100%		
Watershed Management Plan (units)	1	1	100%		
Animal Trails and Walkways (ft.)	200	1,645	>100%		
Access Road (ft.)	No goal	1,010	NA		
	amount				
Cover Crop (ac.)	No goal	214	NA		
	amount				
Fence (ft.)	No goal	10,359	NA		
	amount				
Infiltration Basin (sq. ft.)	No goal	3,600	NA		
	amount				
Livestock Stream Crossing (units)	No goal	5	NA		
	amount				
Livestock Use Protection (sq. ft.)	No goal	5,760	NA		
	amount				
Riparian Buffers – Vegetative (ac.)	No goal	0.3	NA		
	amount				
Roof Runoff Management (square ft.)	No goal	39,620	NA		
	amount				
Stream Channel Restoration (Stream	No goal	54	NA		
Bed/Habitat) (units)	amount				
Stream Channel Stabilization (ft.)	No goal	6,990	NA		
	amount				
Stream Habitat Improvement and	No goal	4,040	NA		
Management (ft.)	amount	0.0			
Streambank and Shoreline Protection (ft.)	No goal	9,365	NA		
	amount				

Hungry Run Watershed – Load Reduction Goals and Accomplishments				
Pollutant ID	Existing Load	Reduced Load	Percent Load Reduction Achieved	
Phosphorus (lbs/yr)	5,649	3,631	36%	
Sediment (lbs/yr)	1,461,188	661,469	55%	
	ARP Load	Load Reduction	ARP Percent Load Reduction Goal	
	Reduction Goal	Achieved	Achieved	
Phosphorus (lbs/yr)	53%	36%	68%	
Sediment (lbs/yr)	35%	55%	>100%	

Table 9: Represents the "Run with all BMPs" from Model My Watershed modeling results.

Middle Spring Creek and Gum Run, Cumberland and Franklin Counties

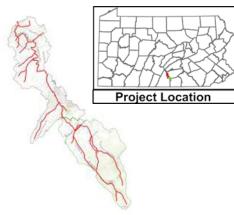
WIP

The Middle Spring, Gum Run, Mains Run Watershed Implementation plan was completed in 2009 by the Cumberland County Conservation District. The predominate land use in the Middle Spring Creek watershed is agriculture (81%) while 40% of the land use in the tributaries Gum Run/Mains Run watersheds is agriculture. The WIP is mainly concerned with reducing sediment from agricultural practices although some impacts are present from urban storm water runoff and habitat modification. The estimated cost to implement the WIP is \$2,500,000.

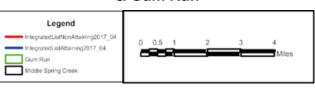
The Conodoguinet Creek TMDL, approved by EPA in 2001, along with MapShed modeling estimates, set a target load reduction of 316 tons/yr. for sediment/siltation for Middle Spring Creek. Another concern mentioned, but not covered in the scope of the WIP, are legacy sediments. Legacy sediments are sediments that have built up within the stream channel and floodplain from old mill dams. Two dams are present in the watershed, one partially breached and one still impounding water; they are both triggering problems by causing sedimentation, thermal pollution and eroding legacy sediments into the stream.

Recent Activities

Activities in this watershed have been significantly impacted by the COVID-19 global pandemic. Initial work done in the watershed was geared towards agricultural BMPs. However, Plain Sect farmers hesitant to work with governmental funds resulted in the need to approach this watershed differently. The focus shifted to urban storm water runoff sources in the lower watershed around Shippensburg Borough. The Cumberland County Conservation District has since developed the Middle Spring Creek WIP Implementation Phase II. The District is working on getting contacts and reaching out for sites within the updated WIP.



Middle Spring Creek & Gum Run



Watershed Description

Middle Spring Creek, a tributary of the Conodoguinet Creek is in Cumberland and Franklin Counties in the Susquehanna River Basin. The Middle Spring Creek Watershed contains Environmental Justice Areas. The headwaters are comprised of two main tributaries, Mains Run and Gum Run both of which start in the Michaux State Forest. Mains Run flows into Gum Run which then flows into Middle Spring Creek on the south side of Shippensburg Borough. Middle Spring Creek then flows north to its confluence with the Conodoguinet Creek.

	Middle Spring Creek WIP Section 319 Project List (2007 to present)				
Project Number	Name of Project	Year Funded	Cost of Project		
1611	Middle Spring Creek WIP Implementation Phase II	2016	\$62,912		
1023C	Installation of Agricultural BMP's for Middle Spring Watershed Implementation Plan	2010	\$6,283		
2727A	Middle Spring Creek Watershed Plan Development	2007	\$40,000		

Mains Run (Middle Spring Creek) – Load Reduction Goals and Accomplishments				
Pollutant ID	Target Load Reduction	Load Reduction Achieved	Percent Load Reduction Goal Achieved	
Sedimentation- Siltation (tons/yr.)	316	169	53%	
Nitrogen (lbs./yr.)	No Goal Established	301	N/A	
Phosphorus (lbs./yr.)	No Goal Established	145	N/A	

Middle Spring Creek – BMP Goals and Accomplishments							
BMP/Action Goal Amount Implemented Percent Actio							
Terraces and Diversions (ac.)	23	0	0%				
Wetland Restoration (ac.)	7	24	>100%				
Grazing Land Management (ac.)	111	10	9%				
Ag stream buffers (ft.)	23,232	4,754	20%				
Streamside Fencing (ft.)	16,896	2,640	16%				
Ag Stream Stabilization (ft.)	10,560	1,056	10%				
Urban Stream buffers (ft.)	2,640	2,100	80%				
Urban Stream stabilization (ft.)	1,056	0	0%				
Urban Storm Water Retrofits (ac.)	24	0	0%				
Dam Removal (units)	2	1	50%				

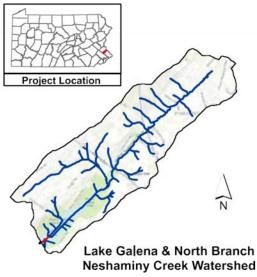
Gum Run / Mains Run – BMP Goals and Accomplishments							
BMP/Action Goal Amount Implemented Percent Action Amount Implemented							
Conservation Tillage (ac.)	38	101	>100%				
Terraces and Diversions (ac.)	25	0	0%				
Grazing Land Management (ac.)	146	10	7%				
Ag stream buffers (ft.) 15,840 6 0.04%							
Streamside Fencing (ft.) 1,584 0 0%							
Ag Stream Stabilization (ft.)	7,920	0	0%				

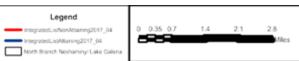
North Branch Neshaminy/Lake Galena, Bucks County WIP

In 2002, a TMDL assessment was completed for the entire Neshaminy Creek watershed, including the North Branch and Lake Galena. According to Pennsylvania's 303(d) list, the lake is being impaired by nutrients and suspended solids from various sources, including on-site wastewater, agriculture, urban runoff/storm sewers, and others. The Lake Galena watershed experienced a significant increase in residential development between 1992-2002, which was identified as an important source of sediment to the lake during that timeframe. The WIP was approved in 2010 and is targeting nutrients and sediment entering the lake. The priorities of the WIP are streambank stabilization and various agricultural and stormwater BMPs. Some partners working on implementing the plan include BCCD, the North Branch Watershed Association, Natural Resource Conservation Service, the Bucks County Department of Parks and Recreation and DEP.

Recent Activities

Activities in this watershed have been significantly impacted by the COVID-19 global pandemic. BCCD did continue to implement the BMPs of two equine operations in this watershed.





Watershed Description

Lake Galena, a 365-acre county- owned impoundment, is located approximately 3 miles northwest of Doylestown in Bucks County. The lake serves as the focal point of Peace Valley Park. The lake was created in 1974 by constructing an earthen dam across the North Branch of the Neshaminy Creek. Lake Galena was built for flood control, water supply and recreation. The North Branch Neshaminy watershed is 15.5 square miles. The land use, as of 2000, is 39% forested, 36% agriculture, 16% urban and 8% other. Urban development increased from 0.5 % in 1992 to 16% in 2000.

	North Branch Neshaminy WIP Section 319 Project List (1998 to present)					
State Project #	Name of Project	Year Funded	Cost of Project			
1413	North Branch Neshaminy Creek Watershed Restoration Phase II Implementation	2014	\$200,306			
1017	North Branch Neshaminy Creek Watershed Restoration Implementation – Phase I	2010	\$68,265			
9818	Lake Galena	1998	\$116,100			

North Branch Neshaminy Load Reductions Goals and Accomplishments Target Load Load Reduction Percent Load Pollutant ID Reduction Achieved **Reduction Goal** (lbs./day) (lbs./day) **Achieved** Nitrogen (lbs./yr.) 5,975 6,942 >100% Phosphorus 950 1,447 >100% (lbs./yr.) Sedimentation-332 853 >100% Siltation (tons/yr.)

North Branch Neshaminy Load Reductions Goals and Accomplishments						
Pollutant ID	Target Load Reduction (Ibs./day)	Load Reduction Achieved (lbs./day)	Percent Load Reduction Goal Achieved			
Nitrogen (lbs./yr.)	5,975	6,942	>100%			
Phosphorus (lbs./yr.)	950	1,447	>100%			
Sedimentation- Siltation (tons/yr.)	332	853	>100%			

North Branch Neshaminy -	North Branch Neshaminy – BMP Goals and Accomplishments				
BMP/Action	Goal Amount (units)	Implemented Amount (units)	Percent Action Implemented		
Conservation Tillage (ac.)	220	0	0%		
Contour Farming (ac.)	15	0	0%		
Cover Crop (ac.)	205	0	0%		
Raingarden/bioretention basin (ac.)	254	0	0%		
Wetland Creation (ac.)	42	0	0%		
Wetland Restoration (ac.)	2	0	0%		
Riparian Forest Buffer (ac.)	26	1	3%		
Streambank & Shoreline Protection (ft.)	17,424	1,575	9%		
Stream Exclusion with Grazing Land Management (ft.)	2,112	1,360	64%		
Nutrient Management (ac.)	86	25	29%		
Conservation Plan (ac.)	no goal established	585	N/A		
Critical Area Planting (ac.)	no goal established	0.4	N/A		
Diversion (ft.)	no goal established	1,710	N/A		
Fence (ft.)	no goal established	7,417	N/A		
Forest – Land Management (ac.)	no goal established	18	N/A		
Forage and biomass planting (ac.)	no goal established	2	N/A		
Grassed Waterway (ft.)	no goal established	1,300	N/A		
Heavy Use Area Protection (ac.)	no goal established	0.1	N/A		
Lined Waterway or Outlet (ft.)	no goal established	1,045	N/A		
Mulching (ac.)	no goal established	0.4	N/A		
Pasture & Hayland Planting (ac.)	no goal established	2	N/A		
Sediment Basin (units)	no goal established	1	N/A		
Structure for Water Control (units)	no goal established	4	N/A		



North Branch Neshaminy – BMP Goals and Accomplishments					
BMP/Action	Goal Amount (units)	Implemented Amount (units)	Percent Action Implemented		
Subsurface Drain	no goal	1,730	N/A		
(ft.)	established				
Tree/Shrub	no goal	1	N/A		
Establishment (ac.)	established				
Underground	no goal	403	N/A		
Outlet (ft.)	established				
Waste Storage	no goal	2	N/A		
Facility (units)	established				
Water & Sediment	no goal	1	N/A		
Control Basin	established				
(units)					

Pine Creek, Allegheny County

WIP

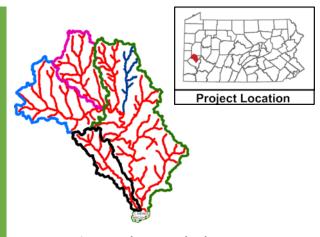
Pine Creek is an impaired, category 5, watershed. The primary causes of impairment are siltation and nutrients. Sources of aquatic life impairment are small residential runoff (nutrients) and land development (siltation).

Many sections are also impaired for recreational use from pathogens of unknown sources. The Pine Creek Watershed Implementation Plan was developed in 2009 with the goal of improving the water quality of the Pine Creek watershed by reducing nonpoint source pollution. The estimated WIP implementation cost is approximately \$4,900,000. A TMDL was developed and received EPA approval in 2013 for pathogens.

Several key stakeholders working to improve Pine Creek, including Etna Borough located near the mouth of Pine Creek's Main Stem and the Allegheny County Conservation District (ACCD). ACCD collaborates with several watershed associations to encourage projects in several of the Pine Creek sub-watersheds, including the Allegheny Watershed Alliance. The Pine Creek watershed benefits from the work of several watershed associations including the Pine Creek Watershed Coalition, North Area Environmental Council, Allison Park Sportsmen's Club, Penn's Woods West Trout Unlimited, municipalities and other non-profit organizations, such as Pine Creek Land Conservation Trust.

Recent Activities

Activities in this watershed have been significantly impacted by the COVID-19 global pandemic. However, a WIP revision was completed and approved in 2021. The revised WIP prioritizes three subwatersheds for restoration as critical areas.



Pine Creek Watershed



Watershed Description

Pine Creek is a 67.3 square mile watershed located entirely in northern Allegheny County in the southwestern Pennsylvania. A tributary to the Allegheny River, the watershed covers 14 municipalities and 13 sub-watersheds as delineated in the WIP. The Pine Creek Watershed contains Environmental Justice Areas.

	Pine Creek WIP Section 319 Project List (2008 to present)					
Project Number	Name of Project	Year Funded	Cost of Project			
1721	Etna Borough Green Streets Phase 3 Design	2017	\$60,050			
1615	Crouse Run Stream Restoration	2016	\$13,800			
1515	Etna Borough Green Streets Phase 2 Implementation	2015	\$554,936			
1318	Etna Borough Green Street Phase 2 Design and Permit	2013	\$41,700			
1223	North Fork Pine Creek Stream Restoration	2012	\$22,230			
1125	Green Streetscape Phase 1	2011	\$374,700			
1041	Green Streetscape Phase 1A	2010	\$40,800			
2931L	Pine Creek Stormwater BMP's	2009	\$38,260			
2937 (2931F)	Rain Garden Alliance Pine Creek (design and construction)	2009	\$90,000			
2943	Pine Creek Shaler Stormwater BMPs (design and construction)	2009	\$38,260			
2832D	Crouse Run Stream Channel Restoration	2008	\$46,641			
2822	Little Pine Creek Restoration Project	2008	\$133,055			

Pine Creek Watershed – Load Reduction Goals and Accomplishments

Sub Watershed	Pollutant ID	TMDL Load Reduction (lbs./year)	Load Reduction Achieved (lbs./year)	Percent Load Reduction Goal Achieved
Montour Run	Sedimentation- Siltation (lbs/yr.)	203,424	0	0%
Crouse Run	Total Nitrogen (lbs/year)	1,464	0	0%
	Total Phosphorus (lbs/Year)	1,197	0	0%
Fish Run	Sedimentation- Siltation (lbs/yr.)	325,421	0	0%
	Total Nitrogen (lbs/year)	442	0	0%
	Total Phosphorus (lbs/Year)	342	0	0%

Table 10: TMDL Load Reduction Goals refer to WIP load reduction goals found for the "Pine Cr" subwatershed.

Pine Creek - BMP Implementation Goals and Accomplishments						
Sub Watershed	ВМР	Goal Amount	Implemented Amount	Percent Goal Achieved		
Crouse Run	Riparian Forest Buffers (ft.)	8,280	0	0%		
	Stream Channel Stabilization (ft.)	13,000	0	0%		
	Wet Pond (units)	23	0	0%		
Fish Run	Stream Channel Stabilization (ft.)	3,500	0	0%		
	Wet Pond (units)	28	0	0%		
Montour Run	Stream Channel Stabilization (ft.)	2,000	0	0%		
	Wet Pond (units)	16	0	0%		

APPENDIX B: Detailed Progress on WIPs

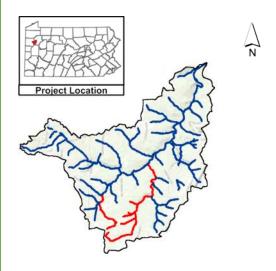
South Sandy Creek, Venango County

WIP

The South Sandy Creek is an AMD-impaired watershed. The primary causes of impairment are high metals and acidity (pH) loadings from past mining practices. The South Sandy Creek WIP was completed for the South Sandy Creek Watershed Association (SSWA) in February 2009 with funding from the Coldwater Heritage Partnership. No TMDL has been developed for the South Sandy Creek, to date. Partners working on implementing the plan include SSWA, BAMR, DEP, Office of Surface Mining (OSM) and Venango County Conservation District. The estimated cost for WIP implementation is \$1,345,000.

Recent Activities

Activities in this watershed have been significantly impacted by the COVID-19 global pandemic. The SSWA has continued to conduct monitoring according to their water quality sampling program in cooperation with DEP.



South Sandy Creek Watershed



Watershed Description

South Sandy Creek is a relatively large tributary of the Sandy Creek in the Ohio River Basin. Located in northwestern Pennsylvania, the South Sandy Creek Watershed is primarily within Venango County. The watershed encompasses close to 26-square miles. Approximately half of the watershed (approximately 8,300 acres) is located within State Game Lands 39, beginning at the Mercer/Venango county line to the mouth at Sandy Creek. In addition, a small portion of the northwest corner of the watershed is in State Game Lands 130.

APPENDIX B: Detailed Progress on WIPs

	South Sandy Creek WIP Section 319 Project List (2009 to present)				
Project Number	Cost of Project				
1313	Gadsby Project AMD Remediation Construction	2013	\$256,456		
2931H South Sandy AMD Project #5 2009 \$73,480					

South Sandy Creek Watershed – Load Reduction Goals and Accomplishments

Sub Watershed	Pollutant ID	Target Required Load Reduction	Load Reduction Achieved	Percent Load Reduction Goal Achieved
South Sandy	Aluminum (Ibs./day)	24	0	0%
	Iron (lbs./day)	46	0	0%
	Manganese (lbs./day)	5	0	0%
Williams Run	Aluminum (lbs./day)	52	12	23%
	Iron (lbs./day)	5	10	>100%
	Manganese (lbs./day)	51	3	7%
	Acidity (lbs./day)	0	150	>100%

APPENDIX B: Detailed Progress on WIPs

South Sandy Creek Watershed – BMP Implementation Goals and Accomplishments

Sub Watershed	BMP/Action	Goal Amount (units)	Implemented Amount (units)	Percent Action Implemented
South Sandy	Anoxic Limestone Drain (units)	1	0	0%
	Land Reclamation (ac.)	210	0	0%
Williams Run	Constructed Wetland Anaerobic (units)	1	0	0%
	Land Reclamation (ac.)	54	54	100%
	Land Reconstruction, AML (ac.)	15	15	100%
	Limestone Leach Bed/Pond (units)	1	1	100%
	Vertical Flow Treatment System (units)	2	0	0%
	Subsurface Drain (units)	1	1	100%
	Limestone Open Channel (units)	1	1	100%

APPENDIX C: Pennsylvania NPS Management Program Funding

State Sources (FY)	FFY 2018	FFY 2019	FFY 2020	FFY 2021
DEP	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)
Conservation District Watershed Specialists	2.9	2.9	2.9	2.9
Environment Stewardship and Watershed				
Protection (Growing Greener):				
Watershed Protection Grants	28.3	9.0	32.7	18.2
AMD Set-aside Grants	1.4	1.5	1.6	1.6
Countywide Action Plan		0.8	6.0	16.0
Implementation Grants				
Sub-total Sub-total	32.6	14.2	43.2	38.8
Conservation District Fund Allocation Program (line item plus UGWF monies)	4.4	4.5	4.5	4.5
Abandoned Mine Reclamation Program Annual Projects	0.0	0.2	0.0	0.0
PENNVEST –grant/loan funds awarded	6.5	5.7	1.6	20.3
Sub-total	11.0	10.4	6.1	24.9
Dirt, Gravel, and Low Volume Roads Pollution Prevention Program	26.1	26.0	26.1	25.8
Nutrient Management Fund (Transfer)	2.7	2.7	6.2	6.2
Conservation District Fund Allocation Program (line item plus UGWF monies)	2.8	2.8	2.8	2.9
Resource Enhancement and Protection Tax Credits Available	10.0	10.0	13.0	13.0
Sub-total	41.6	41.6	48.1	47.9
PUC				
Conservation District Funding from UGWF	3.9	3.9	3.9	4.1
Sub-total	3.9	3.9	3.9	4.1
CFA				
Act 13 NPS Funding (WR and AMD)	2.5	3.6	0.0	15.0
Sub-total	2.5	3.6	0.0	15.0
State Funding Sub-total	91.4	73.7	101.3	130.7

APPENDIX C:

Pennsylvania NPS Management Program Funding

Federal Sources (FFY)	FFY 2018	FFY 2019	FFY 2020	FFY 2021
U.S. EPA	(\$ in millions)	(\$ in millions)	(\$ in millions)	(\$ in millions)
Section 319	4.7	4.7	4.8	5.0
CBIG; State Fiscal Year Funding:				
Technical and Engineering Assistance	0.2	0.6	0.7	0.7
Ag Special Projects	-	-	0.0	0.0
Stormwater Projects	-	2.4	0.0	0.0
Countywide Action Plan Implementation Grant	-	0.9	0.8	0.3
Chesapeake Bay Regulatory and Accountability Program (CBRAP)				
Bay Techs	0.6	2.1	2.1	2.1
Engineering (Note – this was converted to CBIG in 2017)	-	-	-	-
Nutrient Mgmt.	0.6	0.6	0.6	0.6
Sub-total	6.1	11.3	11.1	8.6
NFWF				
Chesapeake Bay Small Watershed Grant-annual Funding (PA-specific grants)	1.0	1.3	2.0	8.4
Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant (PA-specific grants)	3.6	2.2	2.7	5.0
Sub-total	4.6	3.5	4.7	13.4
USDA Natural Resources Conservation Service Obligated Funding Levels				
Agricultural Management Assistance	0.4	0.2	0.4	0.6
Chesapeake Bay Watershed Initiative (CBWI)	CBWI was not reauthorized in the 2014 Farm Bill	CBWI was not reauthorized in the 2014 Farm Bill	CBWI was not reauthorized in the 2014 Farm Bill	CB CBWI was not reauthorized in the 2014 Farm
Environmental Quality Incentive Program (EQIP)	19.9	25.1	19.1	22.0
Regional Conservation Partnership Program (RCPP)	1.2	3.7	1.9	0.9
NWQI	0.4	0.9	3.5	1.5
Farm and Ranchland Protection Program	FRPP was replaced by ALE in the 2014 Farm Bill	FRPP was replaced by ALE in the 2014 Farm Bill	FRPP was replaced by ALE in the 2014 Farm Bill	FRPP was replaced by ALE in the 2014 Farm Bill
Agric Cons Easement Program – Ag Land Easements (ALE)	1.2	2.2	0.8	1.0
Conservation Stewardship Program (new contracts) (CSP)	1.4	3.9	6.2	7.9
Conservation Stewardship Program- Grassland Conservation Initiative (new contracts) (CSP-GCI)			0.0	0.1
Regional Conservation Partnership Program (new contracts) (RCPP-CSP)	0.1	0.1	0.0	0.0
Conservation Stewardship Program (funds obligated to pay on prior year contracts) (CSTP)	5.4	6.1	CSP obligation payments are no longer needed since in FY19 all funds were obligated	CSP obligation payments are no longer needed since in FY19 all funds were obligated

	1	GRP was replaced by		
Grasslands Reserve Program	by ALE in the 2014		ALE in the 2014	ALE in the 2014
Grassianas neserve i rogium	Farm Bill	Farm Bill	Farm Bill	Farm Bill
Healthy Forests Reserve Program	0.0	0.0	0.0	0.0
	0.1	WRP was replaced	WRP was replaced	WRP was replaced
Wetlands Reserve Program		by WRE in the 2014	by WRE in the 2014	by WRE in the 2014
wedands Reserve Frogram		Farm Bill	Farm Bill	Farm Bill
Agric Cons Easement Program – Wetland Reserve	0.0	0.2	0.3	0.6
Easements	0.0	0.2		
	WHIP was not	WHIP was not	WHIP was not	WHIP was not
Wildlife Habitat Incentive Program	reauthorized in	reauthorized in the	reauthorized in the	reauthorized in the
whalie Habitat meentive Frogram	the 2014 Farm Bill		2014 Farm Bill	2014 Farm Bill
	the 2014 Farm Bill	2014 (01111 0111		
Sub-total	30.0	42.5	32.1	34.6
CREP	17.8	16.6	14.1	15.1
(Includes Financial Incentives, Cost-Share and				
Rental Payments).				
Biomass Crop Assistance Program	-	-	-	-
Grassland Reserve Program	-	-	-	28.1
Sub-total	17.8	16.6	14.1	43.2
AML Reclamation Funding	55.7	53.8	32.2	27.4
(Includes AML, Clean Streams Initiative and				
Watershed Cooperative Agreement Program).				
Sub-total:	55.7	53.8	32.2	27.4
Federal Funding Sub-total:	114.3	127.7	94.2	127.1
Overall Annual Total:	205.7	201.4	195.5	257.8