

# **Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan**

**Prepared by the  
Pennsylvania Department of Environmental Protection**

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## **DISCLAIMER**

The policies and procedures outlined in this document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect statutory or regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department of Environmental Protection (DEP) to give this plan that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this plan if circumstances warrant.

Nothing contained in this document shall be construed to establish a legal requirement on the part of the Commonwealth of Pennsylvania to appropriate funds, or to require the Commonwealth or any agency thereof to take actions not authorized by law.

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## EXECUTIVE SUMMARY

Half of the land area from Pennsylvania drains into the Chesapeake Bay primarily from the Susquehanna and Potomac River basins. The Susquehanna is the largest tributary to the Bay, providing half of the total freshwater flow and 90 percent of the freshwater flow to the upper bay. Without the support of Pennsylvania, the Chesapeake Bay cannot be restored. Even more importantly, the water that feeds into the bay is local to Pennsylvania. It is crucial that the local waters of Pennsylvania be restored for use by our citizens.

Pennsylvania and our neighboring states with river basins that drain into the Bay (Delaware, the District of Columbia, Maryland, New York, West Virginia, and Virginia) must create a Watershed Implementation Plan that describes the work to be done to reduce pollution. The U.S. Environmental Protection Agency (EPA) has assigned pollution reduction goals to each state and with a deadline of 2025. Each state's plan for meeting their phosphorus (P) and nitrogen (N) pollution reduction goals is outlined in Watershed Implementation Plans (WIPs).

Pennsylvania is committed to having all practices and controls in place by 2025 to achieve EPA's target date and this plan provides reasonable assurance that Pennsylvania will meet its Chesapeake Bay TMDL commitments. This draft document, formally known as the "Draft Phase 3 Watershed Implementation Plan," (Phase 3 WIP) spells out how the state government will work in partnership with local governments and the private sector to meet Pennsylvania's goals by 2025.

With 43 counties and over 49,000 miles of streams and rivers that flow into the Susquehanna and Potomac Rivers, most of the work outlined in this document will be specific and local in scale. Early in the process, the Commonwealth sought out the leaders in these communities to determine the best way to employ practices and projects to clean up the pollution entering their waterways. Four counties were selected to be early planners — Lancaster, York, Adams, and Franklin. The other 39 counties will follow, benefiting from the lessons learned in these four pilot counties.

This document is a comprehensive strategy based on unprecedented local-level support and engagement. In the previous two versions of the Pennsylvania's Watershed Implementation Plan, there has not been this level of partnership committed to moving forward to improving local water quality. For the first time, Pennsylvania has local planning goals in a form best suited for directly engaging local, regional and federal partners. We are also committed to moving forward with the programmatic and legislative priorities outlined within this plan.

In addition to state government officials, hundreds of individuals representing local government, universities, businesses, agriculture, and environmental organizations contributed their time and expertise to the development of this Phase 3 WIP. Through the preparation of this draft, we were guided by the principle that clean water is "Great

for PA, Good for the Bay.” This Phase 3 WIP planning process was an opportunity for Pennsylvania state government to serve our residents and businesses — cleaning up our water, lowering flood risks, and improving the quality of life in our communities.

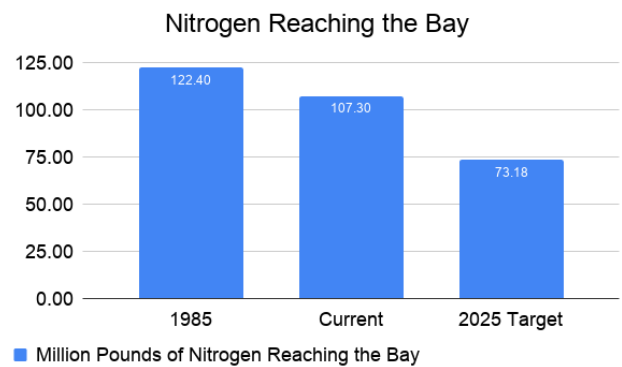
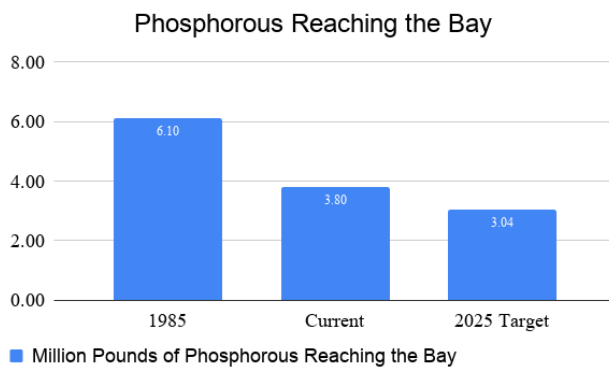
The Pennsylvania Department of Environmental Protection (DEP) is seeking public comment on this draft from April 12 through June 7, 2019. We hope you will take the time to review this document and its recommendations — and share your thoughts on how it can be improved. We invite you to submit your comments at this website: <https://www.ahs.dep.pa.gov/eComment/> or you may submit comments via email to [ecomment@pa.gov](mailto:ecomment@pa.gov).

### *A Brief History*

Pennsylvania’s efforts to reduce nutrients running into the Chesapeake Bay began in 1985. Since then, our state has invested over \$4 billion through loan and grant programs aimed at restoration efforts. While significant pollution reductions from those investments have been realized, more is needed. In 2009, the U.S. Environmental Protection Agency (EPA) set expectations for Pennsylvania and neighboring states to meet by 2025. In 2010, EPA established a Total Maximum Daily Load (TMDL) to address chlorophyll-A, dissolved oxygen and clarity impairments within the Bay.

In 2011, Pennsylvania submitted its Phase 1 WIP to EPA. The goal of the Phase 1 WIP was to identify pollutant sources and develop source specific solutions to achieve reductions. In 2012, Pennsylvania submitted its Phase 2 WIP to EPA. The development of the Phase 2 WIP relied heavily on public input and the inclusion of adaptive management principles in the plan.

Both the Phase 1 WIP and Phase 2 WIP led to significant progress. Many streams that once were heavily polluted are now places where residents gather to swim, fish, boat, and play. Pennsylvania has cut the amount of phosphorus pollution going downstream by more than 1/3, and the amount of nitrogen pollution by about 1/6.



However, of the nearly 49,000 assessed miles of streams in the Chesapeake Bay watershed, 11,446 miles of streams remain polluted. By 2025, Pennsylvania must

reduce nitrogen pollution levels by 34 million pounds per year and phosphorus levels by 0.7 million pounds per year.

### *Challenges*

One of Pennsylvania's top assets has proved to be one of the most significant challenges of the Chesapeake Bay restoration effort. Within the watershed, we have both rural challenges and urban challenges.

Pennsylvania is a state of nonpoint source "opportunities." Compared to the other states within the watershed, the scale of the nonpoint source challenges in Pennsylvania is one of the most significant factors that has impacted past progress, but one that also presents opportunities for future success. As a state with 33,000 farms within the Susquehanna and Potomac basins, the scale of nonpoint source opportunities is staggering.

Pennsylvania has steadily improved the capability to document reductions from programs not included in previous WIPs. There are many Best Management Practices (BMPs) happening "on the ground" than what has historically been accounted for in the EPA modeling used to estimate the pollutant loads going to the Bay. Additionally, Pennsylvania still does not receive full "credit" in the EPA Bay model for agriculture field practices such as conservation tillage.

Within Pennsylvania's share of the watershed, there are over 350 municipalities with NPDES permitting obligations, which is another challenge to addressing local and Chesapeake Bay water pollution. Pennsylvania is a large state that values our agricultural industry and local government partners. Since one size does not fit all, local level support is essential to meet the pollution reduction goals.

### *Consequences*

Failing to restore Pennsylvania's impaired waters will mean that our drinking water resources, outdoor recreation, wildlife, and public health and safety will remain impacted. Local communities will continue to suffer from pollution-related problems such as stormwater and flood damage, contamination of drinking water sources, fouled waterways, and lost recreation opportunities.

Additionally, if EPA determines that Pennsylvania can't meet its goals on its own, EPA has stated it may increase federal enforcement and compliance efforts. For example, EPA has outlined possible consequences including:

- New nitrogen and phosphorus numeric water quality standards for streams and rivers in Pennsylvania;
- More animal feeding operations, industrial and municipal stormwater sources, and urban areas to obtain Clean Water Act permits;
- Stricter nutrient or sediment reductions for those that already have permits;

- Redirection of EPA grant funding away from the state’s priorities to its own priorities.

### *Purpose of the Phase 3 WIP*

The Phase 3 WIP outlines how Pennsylvania will avoid these consequences and achieve its goals, because “Clean water is great for PA, and good for the Bay.” The Phase 3 WIP specifies the steps Pennsylvania will take through 2025 to meet local water pollution reduction goals in the Bay watershed. Pennsylvania will continue to implement the previous WIPs. This WIP builds on the strengths of those previous plans and further sharpens the focus on accelerating progress to meet the 2025 goals.

**Section 2, State Actions**, calls on the state government to coordinate the activities of all the partners, provide resources and technical assistance, and report on progress to the U.S. Environmental Protection Agency and our neighboring states, through a combination of programmatic and numeric strategies and priority initiatives. Pennsylvania DEP’s Chesapeake Bay Office will have responsibility for coordination of implementation support elements of Pennsylvania’s efforts to implement the Phase 3 WIP.

This section of the WIP describes what state partners are already doing to reduce pollutants, as well as the various legislative, programmatic, regulatory and compliance initiatives for which the state agencies have the lead. Among the significant initiatives described are the significant funding needs for the WIP that fall on the state agencies and state legislature to address. The Phase 3 WIP Funding Workgroup estimates that the current public investment in waterways cleanup in the areas upstream of the Chesapeake are approximately \$229 million per year. The total investment needed to achieve the 2025 goals is estimated to be \$485 million per year — an annual gap of \$257 million. This section describes the range of options the WIP partners recommend state legislature consider for long-term funding of the Phase 3 WIP with a strong preference for legislation that would create a dedicated and stable funding source for these investments. This section also discusses amendments to the Right-to-Know law, to reassure farmers that implementing BMPs on their land would not expose them to unfair scrutiny. Additionally, proposed fertilizer legislation would address a significant source of nitrogen and phosphorus flowing into Pennsylvania’s waterways.

In addition to the programmatic priorities and the actions already being taken, this section lays out a vision for how the agriculture, forestry, stormwater and wastewater sectors will achieve additional reductions of the pollution they contribute to Pennsylvania’s waterways and the Bay downstream. To develop the Phase 3 WIP, a “bottom up” approach was taken, with workgroups of stakeholders representing agriculture, forestry, stormwater, and wastewater sectors. This section of the WIP describes the new/additional actions for which the state partners will focus in each of these sectors in order to achieve the 2025 targets.

## *Agriculture*

As discussed above, the agricultural sector in Pennsylvania presents a significant nonpoint source opportunity. The Phase 3 WIP envisions that the state and its partners will work with agriculture in seven strategic areas:

1. Agricultural Compliance -- Ensure farmers are implementing their state required Agricultural Erosion and Sediment Control (Ag E&S) or conservation plan, Manure Management/Nutrient Management Plan, and implementing required barnyard runoff controls, where needed.
2. Soil Health -- Use crop and soil management practices that improve long-term soil health and stability.
3. Expanded Nutrient Management -- Non-manured farmlands use nutrient management plans and precision nutrient management practices.
4. Manure Storage Facilities -- Install and use manure storage systems that meet federal standards.
5. Precision Feeding -- Use precision feed management to reduce nitrogen and phosphorus in manure.
6. Integrated Systems for Elimination of Excess Manure -- Create integrated (county/regional) programs for removal of or beneficial use of excess manure.
7. Forest and Grassed Riparian Buffers -- Plant grassy vegetation or forest buffers along streams.

## *Forestry*

Pennsylvania's vast forest land is a significant asset to water quality. More than half of Pennsylvania's land area is forest (approximately 17 million acres). About 70% of Pennsylvania's forests are privately owned, including 5% held by forest products companies. Approximately 30% of Pennsylvania forests are public lands. These forests are natural pollution filters — holding rainfall, trapping polluted runoff and stabilizing soils.

However, many streamside forests have been cleared in agricultural, urban and suburban areas. Replanting streamside forest can reduce the amount of nutrient pollution entering waterways from 30% to as much as 90%. The Phase 3 WIP Forestry Workgroup proposed recommendations in the following five strategic areas:

1. Forested Riparian Buffers -- Plant trees and shrubs or grassy vegetation along streams
2. Tree Canopy -- Plant trees in developed areas.
3. Woods and Pollinator Habitat -- Convert lawn and turf areas to woods and meadows.
4. Forest and Natural Area Conservation -- Provide credits for land conservation and revise zoning and ordinances to conserve existing natural areas
5. Stream and Wetland Restoration -- Support efforts to restore local streams and wetlands.



To reach these goals, the state and local partners will need to offer additional technical and financial support to streamside property owners.

### *Stormwater*

Stormwater from developed land may carry pollutants such as sediment, car oil, lawn fertilizers, pesticides, pet waste, and trash into waterways. The Phase 3 WIP contains recommendations for the following five actions to further reduce stormwater related pollution to local waterways and the bay:

1. Implement pollutant reduction plans for Municipal Separate Storm Sewer Systems (MS4) Communities -- As one component of the 2018 permit, MS4 Permittees must implement management practices to achieve the reductions identified in their respective PRPs by 2023.
2. New riparian forest buffers -- Plant trees and shrubs along streams.
3. Control measures for illicit discharges -- DEP facilitate municipal ordinance amendments to control illicit discharges to storm sewer systems.
4. Industrial stormwater -- DEP develop preferred BMPs for use in industrial stormwater discharge permits to reduce pollutants of concern
5. Current Erosion and Sediment Control -- Continue permitting, inspecting, and ensuring compliance with Pennsylvania's erosion and sediment control and post-construction stormwater permit requirements, found in 25 Pa. Code Chapter 102

### *Wastewater*

Wastewater is the sewage or liquid industrial waste from homes, businesses, schools, industrial facilities and other institutions. Most wastewater in Pennsylvania is treated before it is released into waterways. Pennsylvania's wastewater sector has greatly reduced its contribution of nitrogen and phosphorus to the state's waterways. To reduce these pollutants even more would be extremely costly. The three priority strategies for Wastewater are:

1. Continue Current Treatment – Existing significant wastewater treatment systems will continue the successful treatment levels already achieved with biological nutrient removal.
2. Plant Optimization Program – Expand DEP's current assistance program to maximize operations at wastewater systems to achieve additional reductions where appropriate.
3. Municipalities Implement Onsite Septic System Inspection and Pumping Programs – As a requirement under the Act 537 Sewage Facilities Planning Act, municipalities are required to implement onsite septic system inspection and pumping programs. However, the implementation of these programs is not currently tracked or documented. These efforts, if properly tracked, could lead to additional reductions.

Finally, Section 2, proposes accounting for actions occurring in the state which reduce sediment, phosphorus and nitrogen pollution which are not currently credited in EPA's model. There are several very successful programs in place designed to improve

Pennsylvania’s local streams and waterways that do not currently report progress towards achievement of nutrient and sediment reductions to the Chesapeake Bay Program. There are also new initiatives underway in Pennsylvania that will also accelerate our progress. Section 2 provides details regarding these programs. This section includes the state’s commitment to expand the state’s capabilities to collect real-time water quality data to document water quality improvement and progress are also being explored.

These are all listed in the table below.

Sector	Description	Typical Associated CBP BMPs
Agriculture	Pennsylvania Department of Agriculture Farmland Preservation Program	Soil Conservation and Water Quality Plans; Animal Waste Management Systems; Barnyard Runoff Control; Loafing Lot Management; Forest Buffers; Grassed Buffers
	Nutrient Trading Program	Manure Treatment Technology; Manure Transport
Wastewater	Act 537 Sewage Facilities Program	Septic Denitrification; Septic Secondary Treatment; Septic Pumping
Stormwater (Developed)	NPDES MS4 Program – TMDL/Pollutant Reduction Plan BMPs (to date, all E&S and PCSM BMPs have been reported via NPDES Construction Stormwater Program*)	Urban Tree Canopy; Bioretention/Rain Gardens; Street Sweeping; Permeable Pavement; Impervious Disconnection; Stream Restoration; Stormwater Performance Standards (Retrofits) Stormwater Performance Standards (New); Urban Forest Buffers
	Redevelopment/Brownfields Retrofits	102.8(g)(2)(ii) Post Construction Stormwater Management BMPs
	CSO green infrastructure (including implementation due to enforcement/consent decrees)	Urban Tree Canopy; Green Roofs; Permeable Pavement; Bioretention/Rain Gardens; Bioswales; Urban Forest Buffers
	Oil and Gas – Erosion & Sediment Control General Permits (ESCGP)	E&S Control Level 3; Bioretention/Rain Garden; Vegetated Swale; Wet Ponds and Wetlands; Dry Extended Detention Ponds; Infiltration Practices; Stormwater Performance Standards (New); Forest Buffers
	Stormwater programs that result in net increase (greater than 1:1 ratio)	Urban Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
Water Obstruction and Encroachments Program	Wetland Mitigation (greater than 1:1 ratio)	Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
	Net Increase in Wetland Restoration/Creation due to compliance and enforcement	Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
Waterways Engineering Program	Legacy Sediment	Removal of legacy sediment and local stream restoration in areas neighboring a removed dam
Pennsylvania Fish and Boat Commission	Stream Restoration Program	Streambank Fencing, Forest Buffers, Stream Restoration, Wetland Creation
Chesapeake Bay Foundation	Keystone 10 Million Tree Partnership	Forest Buffers

**Section 3, Countywide Actions**, outlines how the counties located within the basin can reduce pollution flowing into Pennsylvania’s streams that drain into the Chesapeake Bay. Forty-three of Pennsylvania’s counties contain waterways that drain to either the Susquehanna or the Potomac rivers.

The EPA has modeled Chesapeake Bay pollution sources including pollution entering Pennsylvania’s waterways and where it originates. Each Pennsylvania county has its own goal to reduce its share of pollution. Some counties have more work to do than others. The Phase 3 WIP Steering Committee has grouped the 43 counties into tiers. Tier 1 counties have the most pollution to reduce, and Tier 4 counties have the least.

Continuing the “bottom up” approach to meet the restoration goals, the Commonwealth will work with each of these counties to develop Countywide Action Plans (CAPs) for clean water that are realistic and able to be accomplished by local communities. County-level planning is the most feasible planning scale in terms of size, number, existing data, and ability to organize resources. Pennsylvania’s nitrogen and phosphorus reduction targets are broken down into local planning goals for each of these 43 counties.

It is important to note that the county clean water goals do NOT establish any new requirement or regulatory obligation on counties. These goals are simply a way for Pennsylvania to engage with local partners on shared issues and focus resources on efforts that help Pennsylvania reach its Chesapeake Bay goals.

Each of these counties will receive a county-specific pollution reduction goal, planning tools, and a customized technical toolbox. County leaders can use the toolbox to develop a mix of approaches that best fits the local needs and desires for local waterways. Some of the options are: environmental education, regulation and permitting, public works investments, restoration projects, and assistance to streamside property owners.

As part of the Phase 3 WIP planning process, Pennsylvania invited four counties to participate in a pilot project to develop local CAPs. Lancaster and York counties began in spring 2018, with Adams and Franklin counties beginning in fall 2018. The draft Phase 3 WIP recommends that the remaining counties complete their action plans within the next 18 months. The Tier 1 and 2 counties will be prioritized, as these eight counties collectively have 54% of PA’s nitrogen and 42% of PA’s phosphorus loads to address. The remaining 35 Tier 3 and 4 counties will complete their plans following the priority counties. This will target the remaining 46% of PA’s nitrogen and 58% of PA’s phosphorus goals.

**Section 4, Communication and Engagement Strategy**, acknowledges that it will take a team effort to accomplish the initiatives included the Phase 3 WIP. This section outlines how the state has — and will — coordinate the effort among dozens of partners through 2025.

The process for developing the draft Phase 3 WIP has been inclusive and transparent, with dozens of organizations and scores of individuals actively engaged in all elements of the Phase 3 WIP. Nearly 100 people from the public and private sectors serve on the Phase 3 WIP Steering Committee and workgroups. All Steering Committee and workgroup meetings are open to the public.

The Phase 3 WIP planning committee developed a matrix of conferences, meetings, and professional periodicals that will deliver information about the Phase 3 WIP to industry sectors and stakeholders. For the general public, DEP has developed a “Healthy Waters, Healthy Communities” communication campaign to guide its media and digital outreach. At the county level, the planning teams will also provide outreach to civic and business leaders and citizens as they write their Countywide Action Plans.

**Section 5, Existing and Needed Resources** describes how the Phase 3 WIP goals will require an increased investment of approximately \$257 million per year and outlines where the money comes from currently, how it is used, and possible sources of additional financial resources.

Existing	Existing Resources 2018	\$ 216,142,282
	Existing Staff Resources	\$ 12,959,147
	Total	\$ 229,101,429
Total Needed Resources	Statewide Practice Implementation	\$ 459,393,000
	Staffing Resources	\$ 26,483,596
	Total	\$ 485,876,596
Annual Funding Gap		\$ 256,775,167

Another option to consider is a phased approach to filling this funding gap. With this approach, at a minimum, at least \$120 million annually for BMP implementation is recommended as a first phase for implementation. With this option, the top four more effective priority initiatives are identified. These four initiatives alone will help to achieve 50% of the nitrogen reduction goal and 75% of the phosphorus reduction goal. Some percentage of the \$26 million in estimated technical support resources would also be needed. See the table below.

<i>Priority Initiative</i>	<i>Cost in millions</i>	<i>Nitrogen Reduction</i>	<i>Phosphorus Reduction</i>
Agricultural Compliance	\$33.1	14%	12%
Soil Health	\$32.9	14%	14%
Grass Buffers	\$9.2	8%	37%
Forested Buffers	\$41.4	14%	49%
<b>TOTAL</b>	<b>\$116.6</b>	<b>45%</b>	<b>75%</b>

Currently, there are approximately 32 agency staff involved in the Chesapeake Bay cleanup effort, however it is projected that this number will need to increase to 80. There are approximately 93 external agency staff supporting this effort and an additional 189 people are needed.

**Section 6, Federal Role**, outlines the federal role of the Chesapeake Bay restoration effort. There are federal facilities operated by the U.S. Department of Defense, National Park Service, U.S. Fish and Wildlife Service and the General Services Administration in 24 counties in Pennsylvania's portion of the Chesapeake Bay watershed. Each of these federal facilities have nutrient reduction goals assigned and are required to submit a plan to the Commonwealth for how they will achieve these reduction goals. The Department of Defense has submitted its plan. DEP is working with EPA and the other federal agencies to complete the plans for the other federal agencies. The total annual reduction goals from these federal facilities is 97,358 pounds of nitrogen and 9,316 pounds of phosphorus.

Successful implementation of the WIP will require improved coordination and cooperation between the Commonwealth and federal agencies to track and report on the work they do together to meet Phase 3 WIP goals. Additionally, Pennsylvania will continue to need funding from EPA for pollution reductions projects. This section highlights three areas of improvement:

- Tracking and reporting efforts by the Natural Resources Conservation Service (NRCS) to install many of the pollution prevention practices described in this document.
- Closing gaps in how the partners measure and report on wetland restoration projects.
- Revisions to the EPA's Clean Water Act Section 319 grants to make those funds available for projects that meet the goals of the Phase 3 WIP.

**Section 7, Milestones and Progress Reporting**, describes the action steps that Pennsylvania will take to implement the priority initiatives in the Phase 3 WIP. Progress on these action steps will be reported every six months in addition to the annual progress report completed by the counties on their Countywide Action Plans and the updates to these action steps that will be done every two years.

The action steps are divided into five categories:

1. Communication and Outreach
2. Funding and Resources
3. Expanding Capacity for Technical Assistance
4. Reporting and Tracking
5. Compliance

**Section 8, Accounting for Growth**, takes into account growth within the watershed. Development of the Phase 3 WIP is just the first step in this final phase of TMDL implementation, to be followed by a series of further planning and implementation activities necessary to restore and maintain the health of the Chesapeake Bay and restoration of local waters. Future activities will include implementation of practices; bi-annual tracking and reporting of implementation for evaluation of milestone progress;

and refinement of the Chesapeake Bay model. Federal, state and local coordination and partnership in these activities is vital.

To ensure sufficient progress that will achieve the 2025 targets, and to avoid possible consequences if progress is not sufficient, Pennsylvania will continuously evaluate technical issues regarding the pace of implementation. Pennsylvania will also evaluate feasible implementation rates and share this information with the Pennsylvania partnership and stakeholders in advance of developing milestones.

Pennsylvania's framework to offset this growth includes:

- Conserving and protecting wetlands
- Conserving and limiting development in riparian areas
- Modernizing local planning and zoning to conserve critical forests and habitats
- Preserving farmland as part of a holistic approach to conserving working lands

**Section 9, Climate Change**, discusses how the Phase 3 WIP will account for the trend that climate scientists forecast related to more rain and more frequent intense storms in Pennsylvania. These anticipated climate change effects create new challenges for the local waterway cleanup effort.

The Chesapeake Bay Program Partnership has used computer models to predict how climate change will influence nutrient loads in 2025. These scientists believe Pennsylvania will need to reduce another 4.135 million pounds of nitrogen and 0.141 million pounds of phosphorus due to the changing weather patterns.

The Phase 3 WIP calls for many actions that are beneficial in a changing climate. The actions that reduce pollution also restore soil health, soften the blow from floods, create habitat, and capture carbon from the atmosphere. This section provides recommendations for making the most of the opportunities to target investments in areas that accelerate waterways cleanup and prepare our communities for a changing climate.

**Section 10** concludes Pennsylvania's Phase 3 WIP. The total projected annual reduction for phosphorus in the Phase 3 WIP will be 824,000 pounds. Since Pennsylvania is successful in meeting and overachieving the 2025 reduction goal for phosphorus by 68,079 pounds, we are proposing to exchange that phosphorus reduction for nitrogen reduction based on the EPA's provided conversion factors. For the Susquehanna River Basin, one pound of phosphorus may be exchanged for 2.36 pounds of nitrogen. In the Potomac River Basin, one pound of phosphorus may be exchanged for 1.58 pounds of nitrogen. This results in Pennsylvania achieving an additional 155,664 pounds reduction of nitrogen.

In addition, with the four completed Countywide Action Plans, Pennsylvania is projecting reductions of 22.57 million pounds annually through the implementation of the Phase 3 WIP as currently drafted. Pennsylvania commits to have practices and controls in place by 2025 necessary to achieve the final Phase 3 WIP phosphorus and nitrogen targets.

Pennsylvania, in conjunction with the Partnership, will utilize an adaptive management approach to achieve our collective desired outcome. The two-year milestones and bi-annual progress reporting will allow for the assessment of the implementation progress and targeted adjustments to programs and priorities to ensure the practices and controls called for in the Phase 3 WIP are achieved by 2025. The additional reductions needed will be achieved through the completion of the remaining Countywide Action Plans and the remaining priority initiatives described in Section 2 that have not yet been quantified.

Development of the Phase 3 WIP is just the first step in this final phase of TMDL implementation, to be followed by a series of further planning and implementation activities necessary to restore and maintain the health of the Chesapeake Bay and restoration of local waters. Future activities will include implementation of practices; bi-annual tracking and reporting of implementation for evaluation of milestone progress; and refinement of the Chesapeake Bay model. Federal, state and local coordination and partnership in these activities is vital.

To ensure sufficient progress that will achieve the 2025 targets, and to avoid possible consequences if progress is not sufficient, Pennsylvania will continuously evaluate technical issues regarding the pace of implementation. Pennsylvania will also evaluate feasible implementation rates and share this information with the Pennsylvania partnership and stakeholders in advance of developing milestones.

## SECTION 1. INTRODUCTION

### I. BACKGROUND

In 2010, the Chesapeake Bay Total Maximum Daily Load (TMDL) was established by the U.S. Environmental Protection Agency (EPA). This historic clean-up plan provides a guide for reducing pollution and restoring clean water to the Chesapeake Bay and its local rivers and streams. To guide these efforts, Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia (collectively referred to as the “Bay jurisdictions”) created a series of roadmaps—known as Watershed Implementation Plans, or WIPs—describing how each will achieve the pollution reductions called for in the TMDL.

There are three phases of WIPs. Phase 1 and 2 WIPs were developed in 2010 and 2012, respectively, and describe actions to be implemented by 2017 and 2025 to achieve the goals of the TMDL. Phase 3 WIPs, under development in the 2017 to 2019 timeframe, describe actions the seven Bay jurisdictions intend to implement through 2025 to meet Chesapeake Bay restoration goals, based on a 2017 midpoint assessment of progress.

The Phase 3 WIP builds on strengths and seeks to address the weaknesses of the Phase 1 and Phase 2 WIPs. Pennsylvania will continue to implement pollutant reduction activities identified in those earlier WIPs. The Phase 3 WIP specifies the steps Pennsylvania will take through 2025 to meet local water pollution reduction goals in the Chesapeake Bay watershed.

Pennsylvania Department of Environmental Protection (DEP) is the primary state agency with the statutory mandate to implement the Chesapeake Bay TMDL under the federal Clean Water Act in Pennsylvania and is therefore the lead author of this document. DEP notes however, that the Phase 3 WIP development process was built on the fundamental recognition of the need to approach identification and implementation of goals and actions in a much more deeply collaborative fashion with all public, private, federal, state and local stakeholders. While DEP is the drafter of this document, Pennsylvania’s Phase 3 Chesapeake Bay TMDL Watershed Implementation Plan will only be successful if all engaged in the development of the recommendations on which it is based continue to work together to make this plan a reality.

It is important to recognize that Pennsylvania is unique to the rest of the states in the Bay jurisdictions and will require a unique approach to meeting water pollution reduction goals. Pennsylvania is a large state and therefore inherently has a significant impact on the water quality of the Chesapeake Bay. For example:

- Pennsylvania encompasses 35.2% of the Chesapeake Bay Watershed
- The Susquehanna River provides 50% of the total freshwater flow to the Chesapeake Bay. Pennsylvania’s portion of the Potomac River basin provides an additional 2%.



- Pennsylvania is responsible for 69% of the remaining basinwide nitrogen load reductions by 2025.

Pennsylvania is a state of nonpoint source “opportunities.” Compared to the other states in the watershed, the scale of the nonpoint source challenges in Pennsylvania is one of the most significant factors that has impacted past progress and will impact future success. For example:

- Agriculture Sector:
  - Of the 33,000 Farms, less than 400 are large enough to be considered a Concentrated Animal Feeding Operation (CAFOs) or Concentrated Animal Operation (CAO), needing a National Pollutant Discharge Elimination System Permit
  - All farms with animals must comply with Manure Management and Agriculture Erosion and Control (E&S) Plan Regulations
- Urban Stormwater
  - There are over 350 Municipal Separate Sewer Systems (MS4s) in Pennsylvania’s portion of the Chesapeake Bay Watershed.
  - Nearly 75% of developed acres are outside of an MS4 or combined sewer system area. As a result, existing permitting and compliance programs cover very little of the urban sector’s contribution.
- Wastewater
  - Met the required 2017 reduction goals three years early at a cost of \$1.4 billion
  - Are on track to meet the 2025 goals without further enhancements

With the establishment of the TMDL, the need for consistent and broad-ranging BMP data became critically important to attain adequate yearly progress. These data sources and systems include permit programs, grant and cost-share awards, and special efforts to collect and report BMPs that have not been previously accounted for or are implemented outside of government oversight. Each December 1<sup>st</sup>, Pennsylvania reports these BMPs to the EPA Chesapeake Bay Program Office. There have been growing pains in developing this capacity while also working with limited funding. Since 2010, improvements in data collection through programs and new data sources has been steady. Improving the data management protocols and the capability to document progress was one of six priorities identified as part of the 2016 Pennsylvania Restoration Strategy announced by Governor Wolf to accelerate progress. The results have shown that with each refinement of the Bay Watershed Model, Pennsylvania is able to demonstrate increased reductions.

It is also important to note that currently, Pennsylvania still does not receive full credit for many currently implemented practices, particularly through permit programs, grant and cost-share awards. Improvements in data collection around these practices are

being addressed in this Phase 3 WIP at both the state and local level. Additionally, DEP is evaluating its permitting requirements to facilitate a smooth process for those that seek to implement BMPs and these relevant programs be aligned with the priorities in the WIPs development to meet the Chesapeake Bay TMDL. As part of that effort, DEP has identified the need for more timely responses when state and federal partners have a role in the permit process and recommend shorter review times should be evaluated by state and federal counterparts.

## II. PENNSYLVANIA'S COLLABORATIVE PROCESS

Crucial to the development and future implementation of the Phase 3 WIP is the “bottom-up” approach that was taken, focusing on impacts and projects at the local level, with the state as a committed partner in the effort. To facilitate this approach, a comprehensive, sustained engagement strategy was necessary and is described in detail in [Section 4, “Communication and Engagement Strategy.”](#)

This strategy has three dimensions:

1. Widespread collaboration with multiple partners from multiple sectors and localities in developing, writing and implementing the Phase 3 WIP;
2. Strategic inclusion and engagement with different sectors and localities throughout the Phase 3 WIP planning process, to ensure that all concerns, needs and goals are addressed throughout the planning process;
3. A strategic communication effort to ensure understanding of and support for the plan among key stakeholders as well as throughout the watershed.

These extensive efforts facilitated widespread improved understanding of the requirements for Phase 3 WIP, in diverse and sustained collaboration, and in new partnerships. As a result, the Phase 3 WIP has widespread shared ownership, is well informed by those working on the ground, and enhances reasonable assurance that Pennsylvania will achieve improvements in local water quality and the 2025 Chesapeake Bay targets.

Completed efforts include the following:

1. Widespread collaboration in developing and writing the Phase 3 WIP:
  - An active 20-member Steering Committee;
  - Seven active workgroups, including one dedicated to Communication and Engagement;
  - The completion of the pilots in four counties for the development of the countywide action plans.

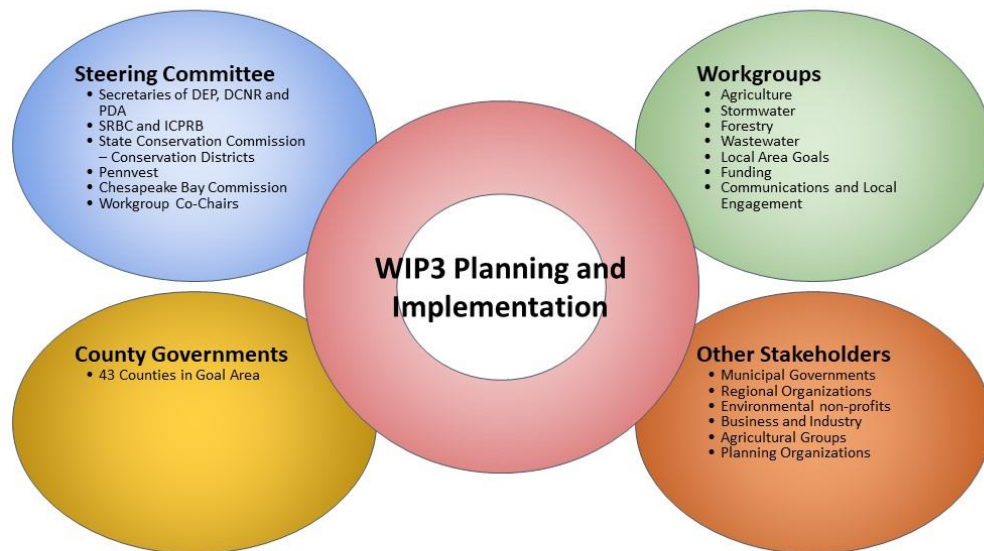
2. Strategic inclusion and engagement throughout the planning process:
  - June 5, 2017 Phase 3 WIP Kickoff and Listening Session that attracted some 240 participants from multiple sectors and communities;
  - April 10, 2018 Session with nearly 200 participants to review and discuss local planning and a Community Clean Water Toolbox to be used in the development of the countywide action plans;
  - Aug. 30, 2018 PA Best Management Practice Verification Program Planning Summit;
  - Other forums, focus groups and roundtables focused on the completion of the sector-specific action plans for the Phase 3 WIP and other issues of interest to local governments in the watershed.
3. Strategic communication effort:
  - Development of a “Healthy Waters, Healthy Communities” communications strategy;
  - Development of accurate, readable, accessible outreach material.

A complete summary of the input received from the different listening sessions, forums, focus groups, etc. can be found in [Appendix 2, Summary of Local Engagement](#).

#### **A. Phase 3 WIP Steering Committee and Workgroups**

To coordinate and lead this effort, a Pennsylvania Phase 3 WIP Steering Committee was created. Nearly 100 people from the public and private sectors are members of this Phase 3 WIP Steering Committee or one of seven Workgroups as illustrated in Figure 1.1. All Steering Committee meetings and Workgroup meetings were open to the public.

**Figure 1.1 – Collaborative Process Framework**



Chaired by the Secretary of DEP, members of the Steering Committee included the Secretaries of Agriculture and of Conservation and Natural Resources; the Chair, Chesapeake Bay Commission; Executive Secretary, State Conservation Commission; Executive Director, Susquehanna River Basin Commission; Executive Director, Interstate Commission of the Potomac River Basin; Executive Director, Pennsylvania Infrastructure Investment Authority; and the Workgroup Co-chairs.

The mission of the Steering Committee was to advise DEP in the effective development of Phase 3 WIP so that the final plan:

1. Is implementable to achieve the TMDL nutrient and sediment load reduction allocations for Pennsylvania.
2. Results in local water quality improvement while restoring the Chesapeake Bay.
3. Addresses the EPA's expectations as described in their finalized "Expectations for the Phase III Watershed Implementation Plans" documentation including:
  - a. Pollutant Source Sector-specific plans for reductions;
  - b. Local area planning goals;
  - c. A consideration of climate change, Conowingo Dam and sector growth, depending on partnership resolution of these issues.
4. Addresses the additional special conditions and expectations EPA has delineated for Pennsylvania due to the commonwealth's current "backstop" status for the agriculture and urban sectors.

5. Includes stakeholder input, public engagement and comment.

The seven workgroups established to develop the Phase 3 WIP were:

- Agriculture
- Communication and Engagement
- Forestry
- Funding
- Local Area Goals
- Stormwater
- Wastewater

Each workgroup was co-chaired by leaders in the private, nonprofit and public sectors, and had dedicated state agency staff support. They set their own meeting schedules and conducted their own outreach to their relevant constituencies. These meetings were open to the public, and workgroups occasionally shared joint meetings. The dates and times of these meetings were posted on the DEP Phase 3 Steering Committee Actions webpage.

The workgroup co-chairs, besides being part of the Steering Committee, also met monthly to coordinate efforts. The workgroup co-chairs meetings were facilitated by an independent facilitator, Jennifer Handke, Consulting with a Purpose. Ms. Handke also provided support to individual workgroups.

A complete listing of the members of the Steering Committee and the seven workgroups can be found in [Appendix 1, Steering Committee and Workgroup Members](#). A summary of the recommendations from the seven workgroups can be found in County and Phase 3 WIP Workgroup Recommendations.

## **B. Four County Pilot Planning Process**

With support from the EPA Chesapeake Bay Program Office, the Susquehanna River Basin Commission (SRBC), DEP and the Communications and Engagement Workgroup, the Local Area Goals Workgroup developed a planning process and a county-specific Community Clean Water Toolbox. The purpose of this planning process and the toolbox was to assist in the development of the local Countywide Action Plans (CAPs) as defined in [Section 3. Countywide Actions](#). They were pilot tested in Lancaster, York, Franklin and Adams County in the summer and fall of 2018. Lancaster and York presented their final CAP to the Steering Committee in January 2019; Franklin and Adams in March 2019.

The CAPs are intended primarily to improve local water quality and to provide related benefits for those localities. The CAPs developed by the counties included priority goals and initiatives, action steps, the identification of responsible parties, and available and needed technical and financial resources. In addition, the four pilot counties shared

lessons learned throughout the process to make the development of CAPs in other counties across Pennsylvania's Chesapeake Bay watershed more efficient and effective.

On September 21, 2018, midway through the pilot projects, the pilot counties gathered to share updates. Pilot counties shared their local planning process and identified challenges, lessons learned, and recommendations for a more effective process.

In November and December 2018, joint planning meetings were held with each of the four pilot counties and the Steering Committee workgroup co-chairs, DEP Chesapeake Bay Program office staff and the Phase 3 WIP technical support team. The purpose of these meetings was to share both county planning team and state Phase 3 WIP workgroup draft recommendations for nutrient reduction, identify overlaps and resulting nutrient reductions, explore areas for further reductions, and recommend and decide next steps for moving forward together. The final CAPs for the four counties are a merging of the Phase 3 WIP workgroup sector recommendations and the identified local initiatives and priorities.

Relevant lessons from this pilot process were incorporated into a revised Community Clean Water Planning Guide and county specific Toolbox that will be provided to other counties.

### **C. Engagement Strategy**

The Engagement Strategy is designed to raise awareness, increase knowledge, and inspire actions to help reduce nonpoint source pollution in local streams and rivers in Pennsylvania. This plan is targeted to residents, municipal officials, legislative leaders, farms, and businesses in Pennsylvania's 43 counties in the Chesapeake Bay watershed as well as statewide.

The plan contains three goals:

1. Help Pennsylvania make significant progress in reducing the amount of nitrogen, phosphorus, and sediment Pennsylvania is putting into local waters and, ultimately, the Chesapeake Bay.
2. Demonstrably increase target audience's awareness and knowledge of the value and benefits of healthy local streams and rivers; the negative impacts on nonpoint source pollution; and actions they can take.
3. Demonstrably increase behavior in target audience to reduce these pollutants.

Principles used to accomplish these goals may be summarized as follows:

- Stay focused on restoration of Pennsylvania's waters.

- Stay mainstream. Stay in the lived, real world. Less governmental, policy, academic emphasis.
- Increase positive mainstream media coverage (beyond watershed niche reporters that are already known).
- Enlist and leverage boundary spanners: Farmers, hunters and other outdoor sportsmen/women, business owners, sports figures, and others who are not conventional environmental advocates to show support of clean water to their audiences through their own channels
- Create positive peer pressure by publicly recognizing actions, progress, and successes of early adopters across audiences by highlighting success stories using appropriate Commonwealth channels, such as social media, press events, and blog/newsletter stories.

Partners engaged in the effort to raise awareness and promote plan engagement goals include Pennsylvania Department of Agriculture (PDA) Communications Office; Pennsylvania Department of Conservation and Natural Resources (DCNR) Communications Office; Phase 3 WIP Communications and Engagement Workgroup, DEP Chesapeake Bay Office; other Bureaus within DEP's Office of Water Programs, and private industry.

A critical piece to the success of the Phase 3 WIP is the development and distribution of a clear and easy to understand message. To properly distribute this message, Partners needed to:

- Identify the appropriate audience(s).
- Develop different outreach materials that were understandable and easy to access.
- Identify appropriate methods to reach those audiences.
- Identify committed partners, who were trusted members of those audiences, to help in the delivery of these materials and their messages.

To address this outreach need, three things were done:

1. DEP hired a Communications and Marketing firm to help with the development of outreach materials and the identification of methods to reach different target audiences. Work products include summary informational sheets, graphics for presentations, whole overview presentations to brief the counties and the basics for the larger WIP presentation. Additionally, the firm provided the framework for the updated WIP website and translational of technical language to be readable for the general public.
2. The Steering Committee created the Communications and Engagement Workgroup to facilitate the development and definition of the message for different target audiences and to serve as the core group of committed partners to help with the delivery of these materials and their messages.

3. Through a federal grant, DCNR is engaging a contractor to prioritize the riparian buffer landscape, particularly in southcentral Pennsylvania, for outreach, design outreach strategies, design landowner-specific outreach messages and modes of communication and develop targeted messaging and delivery strategies based on consumer patterns.

### **III. PARTNERSHIP AGREEMENT**

To support Chesapeake Bay cleanup efforts, all the states in the watershed, including Pennsylvania, Maryland, Virginia, Delaware, New York, West Virginia and the District of Columbia and several federal agencies formed the Chesapeake Bay Program Partnership (Partnership). The lead federal agency is the Environmental Protection Agency (EPA), but the other federal agencies involved are the US Departments of Agriculture, Commerce, Defense, Homeland Security, Interior and Transportation. Also involved are the US Geological Survey, National Park Service, the US Fish and Wildlife Service, and the US Army Corps of Engineers. Another key member of the “Partnership” is the Chesapeake Bay Commission. This Commission is comprised of representatives of the state house and senate for the states of Pennsylvania, Maryland and Virginia and the Cabinet-level head of the lead environmental agency for these states responsible for the implementation of the Chesapeake Bay Program. In 2014, the Partnership executed the non-binding “Chesapeake Bay Watershed Agreement” (2014 Watershed Agreement), through which the parties committed to work together on specific priority management strategies to clean up local watersheds and the Chesapeake Bay.

The 2014 Watershed Agreement established ten goals: sustainable fisheries, vital habitats, improved water quality (of which the implementation of the TMDL is one component), toxic contamination, healthy watersheds, stewardship (including diversity, local leadership and citizen stewardship), land conservation, public access, environmental literacy and climate resiliency. There are 31 management strategies and associated workplans with identified action items and indicators for these goals. These goals and outcomes are all designed to further restore and protect the Chesapeake Bay.

Early in the process of the 2017 Midpoint Assessment of the TMDL, the Partnership recognized a significant overlap in priorities identified in the 2014 Watershed Agreement and the priorities being flagged for the Phase 3 WIPs including:

- Sustainable Fisheries -Fish Habitat
- Vital Habitats:
  - Brook Trout
  - Submerged Aquatic Vegetation
  - Forest Buffers
  - Tree Canopy
  - Wetlands
  - Stream Health



- Land Conservation - Protected Lands
- Healthy Watersheds
- Public Access
- Toxics Contaminants
- Climate Resiliency

Many of the priority initiatives identified under [Section 2, State Actions](#) to achieve the TMDL also address priorities in the 2014 Watershed Agreement.

#### **IV. PHASE 3 WIP PLANNING TARGETS FOR PENNSYLVANIA**

The Partnership assigned planning targets for Pennsylvania based on the estimated amount of nutrient loadings that reach the Chesapeake Bay from Pennsylvania waters. These planning targets are the reduction numbers that Pennsylvania's Phase 3 WIP must demonstrate will be achieved by having all practices in place by 2025.

Because Pennsylvania's focus is on local water quality, Pennsylvania works with two sets of planning targets for its nutrient loading goals because not all the nutrients that reach Pennsylvania's waterways reach the Chesapeake Bay. A good analogy is to think of the goal numbers for Pennsylvania's local waterways as "how" we improve our local waterways, which has the most impact on Pennsylvanians, and the goal numbers for the Chesapeake Bay as the "why" we use these numbers to fulfill the goal of the Chesapeake Bay TMDL.

These two sets of loads and reduction numbers come from the Chesapeake Bay Programs Office tool called the Chesapeake Assessment Scenario Tool (CAST). As defined in EPA's "[Expectations for the Phase III Watershed Implementation Plans](#)" document, Pennsylvania is required to reduce its annual pollution loads of nitrogen and phosphorus to the Chesapeake Bay.

CAST defines the nutrient load delivered to the Chesapeake Bay as *Edge of Tide* (EOT). Pennsylvania will need to reduce 34.13 million pounds of nitrogen and 0.756 million pounds of phosphorus annually to successfully meet the 2025 planning target.

For Pennsylvania to achieve the reduction needed for the Chesapeake Bay, Pennsylvania has decided to work with "local waterways" nutrient loads to resonate a stronger message with its citizens. "Local waterways" is defined in CAST as loads delivered to the *Edge of Stream* (EOS). For Pennsylvania to achieve the reduction needed for its local waterways, Pennsylvania must reduce 51.06 million pounds of nitrogen and 2.02 million pounds of phosphorus annually to successfully meet the 2025 planning target.

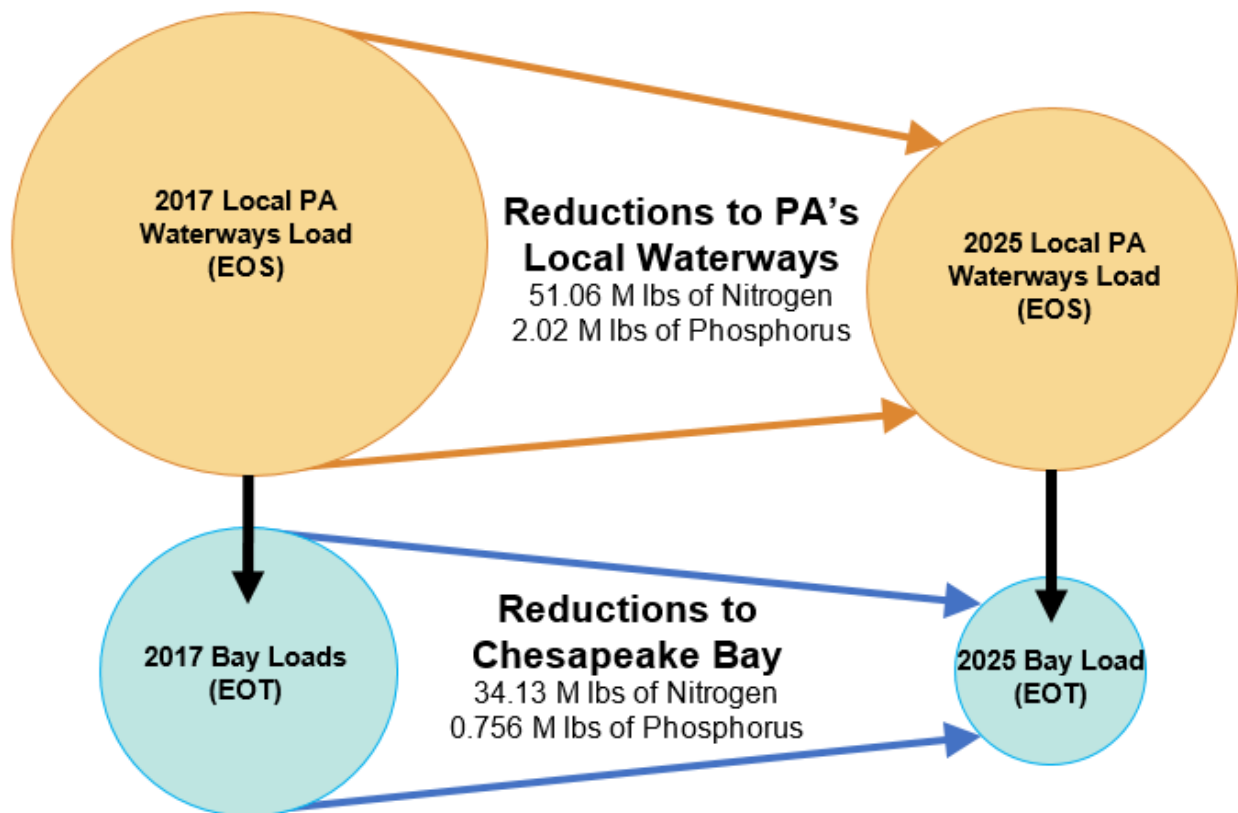
The Edge of Tide reductions goals are lower than the Edge of Stream reductions goals because of an attenuation, or reduction, process. When nitrogen and phosphorus enter local waterways, these loads are much higher than when the same loads reach the

Chesapeake Bay. Aquatic ecosystems help remove “some” nitrogen and phosphorus as the runoff from storm events travels across Pennsylvania’s waterways and toward the Chesapeake Bay.

Each county in Pennsylvania’s Chesapeake Bay watershed has a varied attenuation factor based on geographic proximity to the Chesapeake Bay. CAST accounts for the variation in attenuation and calculates the difference between the loads delivered to the Chesapeake Bay (EOT) and the loads delivered to the “local waterways” (EOS).

Figure 1.2 illustrates the differences between these two numbers.

**Figure 1.2 Pennsylvania Planning Targets**



Please note that these planning targets do not include any additional reductions that will be achieved through the separate Phase 3 WIP being developed to address the additional six million pounds per year of nitrogen and 260,000 pounds of phosphorus attributed to the loss of trapping capacity behind Conowingo Dam. The Partnership has agreed to address this additional loading together in this separate Phase 3 WIP. It also does not include any additional reductions that will be assigned in the future due to climate change as discussed in [Section 9, Climate Change](#).

## V. EPA EXPECTATIONS FOR THE PHASE 3 WIP

EPA provided the jurisdictions written “expectations” of what they wanted to see in the Phase 1 and Phase 2 WIPs in 2009 and 2011, respectively. For the Phase 3 WIP, EPA provided final “Expectations for the Phase III Watershed Implementation Plans” to the jurisdictions on June 19, 2018. For Pennsylvania, EPA highlighted:

- Comprehensive strategies for engagement of the full array of Pennsylvania local, regional and federal partners in WIP implementation.
- Local planning goals below the state major basin scales and in the form best suited for directly engaging local, regional, and federal partners.
- Definition of programmatic and numeric implementation commitments between 2018 and 2025 needed to achieve the Phase 3 WIP planning targets.

EPA recognizes that the Phase 3 WIP commitments may need to be modified as part of the adaptive management process during the 2018-2025 timeframe and expects the jurisdictions to update those programmatic and/or numeric commitments, as appropriate, through their two-year water quality milestones. Based upon EPA’s conclusion that Pennsylvania has not demonstrated adequate progress, EPA requested that Pennsylvania report progress on a six-month basis.

EPA also identified additional expectations for Pennsylvania to accelerate its progress towards achievement of the planning goals. These additional expectations can be summarized as follows:

- Commitment to programmatic, policy, legislative, and regulatory changes needed to implement Pennsylvania’s Phase 3 WIP; citing such initiatives as an Agriculture Recognition or Certainty Program, expansion of the Act 38 Nutrient Management Program, further restrictions on winter spreading of manure, development of an agriculture cost share program and tax incentive programs and revisions to the nutrient trading program regulations as examples.
- Commitment to the level of staff, partnerships, and financial resources needed to successfully implement the Phase 3 WIP.
- Commitment to additional reporting and tracking requirements for EPA grant monies and the use of 3<sup>rd</sup> parties to expeditiously spend EPA grant monies.
- Consideration of additional reductions of loadings from point sources.

## VI. PENNSYLVANIA REASONABLE ASSURANCE FOR PENNSYLVANIA’S PHASE 3 WIP

Pennsylvania’s Phase 3 WIP must provide “reasonable assurance” that nonpoint source controls will achieve the load reductions required of the state in the Chesapeake Bay TMDL. *See Section 7 of the 2010 Chesapeake Bay TMDL.* In Section 7.1 of the Chesapeake Bay TMDL, EPA explains that it will use best professional judgement to assess “reasonable assurance,” using criteria including whether practices included in a state’s WIP to reduce nonpoint source pollutant loads: (1) exist; (2) are technically

feasible at a level required to meet allocations; and (3) have a high likelihood of implementation.

NPDES permitting programs demonstrate reasonable assurance that waste load allocations (WLAs) in the TMDL will be achieved, because by regulation, those permits include specific numeric or narrative effluent limits and other permit terms and conditions that require discharges be consistent with “the assumptions and requirements of any available [WLA]” in an approved TMDL. *Id.*

Pennsylvania’s Phase 3 WIP demonstrates reasonable assurance through a comprehensive, integrated framework of federal, state, local collaboration in a variety of regulatory programs and voluntary initiatives. The Phase 3 WIP is founded on, and reasonable assurance is demonstrated in large measure through, the intensive “bottom-up” local engagement process undertaken since the 2017 milestones.

Additionally, reasonable assurance is provided by robust non-NPDES permitting programs that require controls that reduce nitrogen, phosphorus and sediment pollutant loads, and require compliance with Pennsylvania Water Quality Standards and antidegradation requirements, and include permit review, oversight and inspection.

Pennsylvania’s Phase 3 WIP also includes many nonpoint source control actions and initiatives which contribute to the demonstration of reasonable assurance. For example, the agriculture component in the Phase 3 WIP includes regulatory and non-regulatory initiatives. Non-regulatory and non-permitting initiatives include the expansion and reporting of soil health related practices (includes implementation of conservation tillage and no-till, cover crops, and enhanced nutrient management); dairy precision feeding; utilization of expanded forested and grassed riparian buffers; and stream restoration/legacy sediment removal and ecosystem restoration projects.

A final contributor to reasonable assurance is the Pennsylvania programs and initiatives that in past WIPs, Pennsylvania has not accounted for or adequately accounted for that achieve net reductions in bay pollutants of concern. DEP has steadily improved the capability to document reductions from programs not included in previous WIPs. These programs and initiatives are detailed in [Section 2. State Actions](#). In the Phase 3 WIP, Pennsylvania is committed to accounting for these reductions in the Chesapeake Bay watershed which should enhance reasonable assurance that Pennsylvania will meet the 2025 targets.

During the Phase 3 WIP planning process, as the Chesapeake Bay Program presented data and information to the Phase 3 WIP Steering Committee and county pilot partners, Pennsylvania became more aware of discrepancies between what is on the ground and what is being reported by the Chesapeake Bay model. Pennsylvania recognizes that this is due to challenges it has historically had with collecting and reporting data, as well as challenges with Pennsylvania’s data fitting properly into the Chesapeake Bay model. Going forward, Pennsylvania welcomes continued discussions with the Partnership on

these reporting challenges as we continue to adaptively manage the program together to accurately reflect real world circumstances beyond the model.

Pennsylvania commits to have all practices and controls in place by 2025 necessary to achieve the final Phase 3 WIP phosphorous and nitrogen. Pennsylvania in conjunction with the Partnership will utilize an adaptive management approach to achieve our collective desired outcome. The two-year milestones and bi-annual progress reporting will allow for the assessment of the implementation progress and targeted adjustments to programs and priorities to ensure the practices and controls called for in the Phase 3 WIP are achieved by 2025.

DRAFT

## SECTION 2. STATE ACTIONS

### I. EXISTING REDUCTION EFFORTS TO DATE

#### A. Introduction

Pennsylvania has been working in support of Chesapeake Bay restoration since the mid-1980's. The establishment of the Chesapeake Bay Total Daily Maximum Load (TMDL) in 2010 ratcheted up the need for improved data collection to support TMDL compliance tracking and initiated additional local watershed restoration planning.

Figure 2.1 shows nitrogen loads from Pennsylvania to the Chesapeake Bay between 1985 and 2017. Loading rates from 1985 to 2017 reflect annual load results reported from annual BMP Progress Runs. In 1985, 122 million pounds per year (M lbs/yr) of nitrogen flowed from Pennsylvania to the Chesapeake Bay. By 2017, that amount had dropped by 14.71 M lbs/yr to an annual loading rate of 107 M lbs/yr. Current efforts will continue to reduce this rate. The TMDL requires that by 2025, Pennsylvania will decrease its annual load of nitrogen to 73.18 M lbs/yr (an additional reduction of 34.13 M lbs/yr of nitrogen).

**Figure 2.1 - Pennsylvania's Nitrogen Load to the Chesapeake Bay**

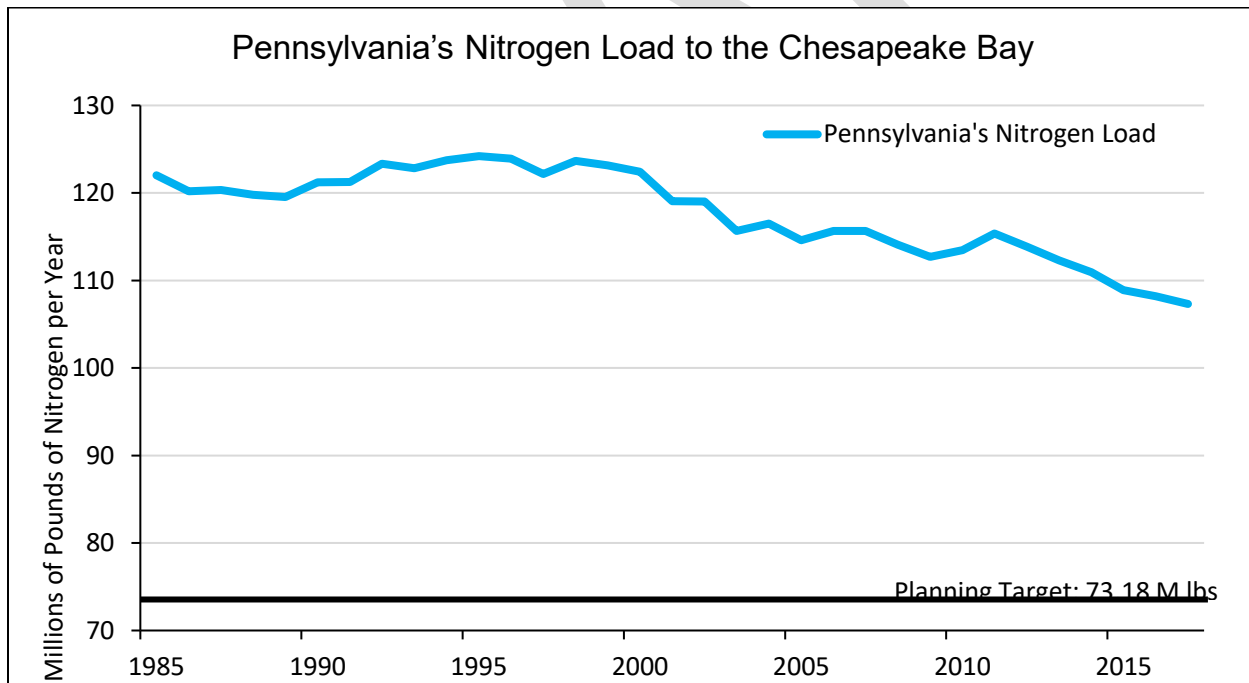
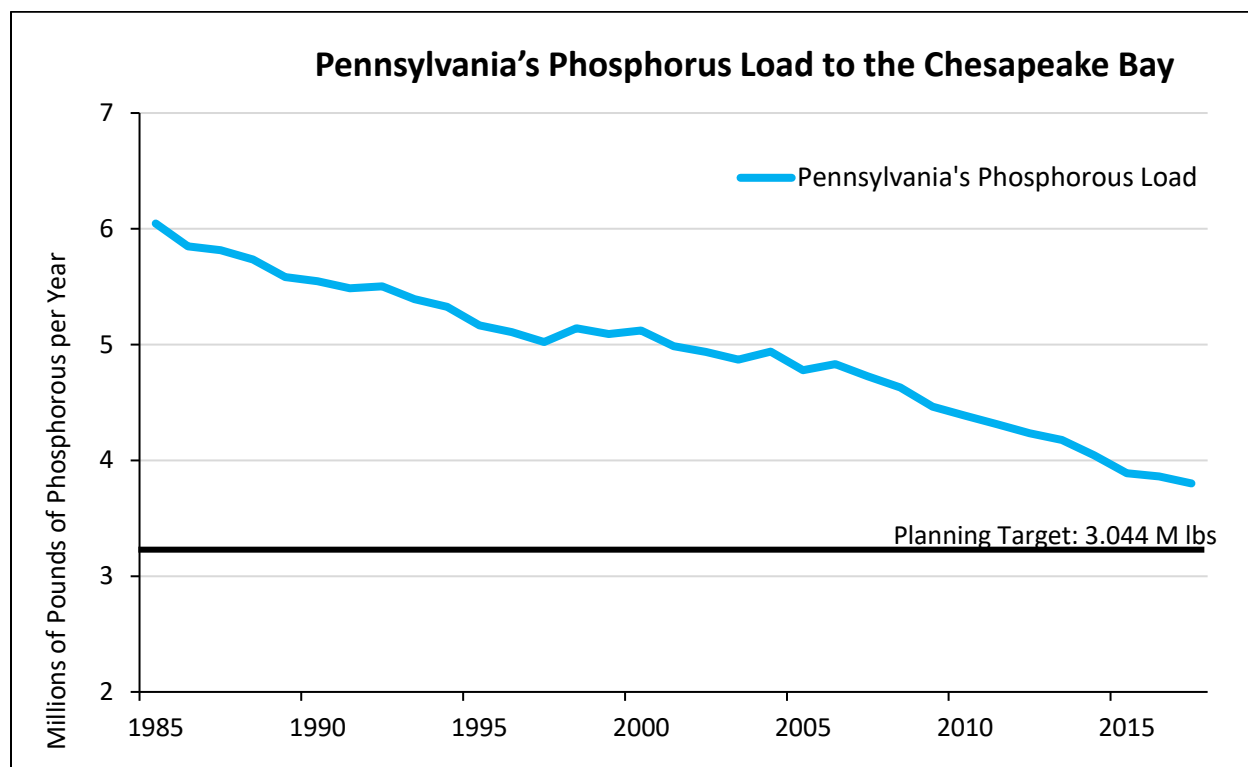


Figure 2.2 shows phosphorus loads from Pennsylvania to the Chesapeake Bay between 1985 and 2017. Loading rates from 1985 to 2017 reflect annual load results reported from annual BMP Progress Runs. In 1985, 6 M lbs/yr of phosphorus flowed from Pennsylvania to the Chesapeake Bay. By 2017, this rate had decreased by 2.25 M lbs of phosphorus to an annual loading rate of 3.8 M lbs/yr of phosphorus.

Current efforts will continue to reduce this rate. The TMDL requires that by 2025, Pennsylvania will reduce its annual load of phosphorus to 3.044 M lbs/yr (an additional reduction of 0.756 M lbs/yr of phosphorus).

**Figure 2.2 - Pennsylvania's Phosphorus Load to the Chesapeake Bay**



The achievement of nitrogen reductions will continue to be a primary driver in Pennsylvania's overall attainment of the TMDL.

With the establishment of the TMDL, the need for consistent and broad-ranging BMP data became critically important to attain adequate yearly progress. These data sources and systems include permit programs, grant and cost-share awards, and special efforts to collect and report BMPs that have not been previously accounted for or are implemented outside of government oversight. Each December 1<sup>st</sup>, Pennsylvania reports these BMPs to the EPA Chesapeake Bay Program Office. There have been growing pains in developing this capacity while also working with limited funding. Since 2010, improvements in data collection through programs and new data sources has been steady. Improving the data management protocols and the capability to document progress was one of six priorities identified as part of the 2016 Pennsylvania Restoration Strategy announced by Governor Wolf to accelerate progress. The results have shown that with each refinement of the Bay Watershed Model, Pennsylvania is able to demonstrate increased reductions.

The process of data collection and reporting to EPA is documented in the Pennsylvania Quality Assurance Project Plan (QAPP) which is updated annually. These annual

Progress Run submissions are the basis of the numeric assessment of Pennsylvania's BMP implementation. Progress on other programmatic BMP goals are reported annually and revised every two years in milestone documents. These documents are prepared for and reviewed by EPA as part of EPA's assessment of TMDL compliance.

## **B. The 2016 Chesapeake Bay Restoration Strategy**

In 2016, DEP, PDA and DCNR working with several partners and stakeholders, collaborated on the 2016 Chesapeake Bay Restoration Strategy, which developed several short, mid and long-term recommendations, aimed at augmenting the approach to water quality improvements in the Chesapeake Bay watershed. The Phase 3 WIP builds on the progress that has been achieved in implementing the 2016 Restoration Strategy described below.

### **1. Increased Compliance Program Efforts**

DEP and Conservation District staff increased inspection and compliance efforts in the agriculture sector using existing staff who inspected 10 percent of farms in the Chesapeake Bay watershed annually. The Chesapeake Bay Agricultural Inspection Program (CBAIP) is now an integral part of DEP's compliance efforts. This program is now successfully reporting practices to the EPA Chesapeake Bay Program for progress reporting based on the results of these inspections. DEP also increased outreach and program development for urban stormwater systems.

### **2. Quantification of Undocumented Practices**

The 2016 Restoration Strategy called for increased focus on local water quality improvement and protection by locating and quantifying previously undocumented BMPs, and putting new high-impact, low-cost BMP projects on the ground in watersheds that are currently impaired by agriculture or stormwater. An additional 15% of available statewide water quality funding (\$1,250,000) was shifted to Bay work to essentially create the whole data system for tracking BMPs, including completion of the Pennsylvania State University survey detailed below, purchasing the PracticeKeeper software and the developing the BMP warehouse that PracticeKeeper informs.

The Chesapeake Bay Program Partnership approved the procedures and protocols developed as part of the two projects below for future BMP verification efforts. As a result, any state in the Chesapeake Bay watershed can use these two methodologies as part of their BMP verification program. Both methodologies are an integral part of Pennsylvania's BMP Verification Plan moving forward, as described below under VI., Addressing Under-Reported Best Management Practices. (See Figure 2.6 below.)

#### **a. The Pennsylvania State University Survey**

Penn State developed and sent out a survey to roughly 22,000 Pennsylvania Chesapeake Bay watershed farmers requesting that they voluntarily report non-cost



share BMPs in January 2016. 6,751 farmers completed questionnaires (30%, a notably good response); Penn State Extension staff completed verification of 10% of the surveys received across the watershed of voluntary practices installed. The results of this survey were announced on December 16, 2016, and demonstrated overwhelmingly that many farmers have, and will continue to, install BMPs without state and federal financial support. The survey catapulted the commonwealth's commitment to documenting these previously unreported, voluntarily installed BMPs within the Chesapeake Bay Watershed Model.

Results were as follows:

- 475,800 acres of nutrient/manure management;
- 97,562 acres of enhanced nutrient management;
- 2,164 animal-waste storage units;
- 2,106 barnyard runoff-control systems;
- 55,073 acres of agricultural erosion and sedimentation control plans;
- 228,264 acres of conservation plans;
- more than 1.3 million linear feet of stream-bank fencing;
- 1,757 acres of grass riparian buffers; and
- 5,808 acres of forested riparian buffers.

DEP reported these results to the EPA Chesapeake Bay Program Office for inclusion in the Chesapeake Bay Watershed Model for progress reporting. Using Scenario Builder and CAST, Pennsylvania received credit reduction of approximately 1,047,704 pounds of nitrogen per year, 79,620 pounds of phosphorus per year and 10,395,906 pounds of sediment per year as a result of these practices.

The lessons learned from this effort have been incorporated into the revised BMP Verification Program Plan, which includes recommendations for future producer surveys. Options are being explored on how to continue this survey using these approved protocols on a regular basis as an alternative approach for the verification of agricultural BMPs historically and in the future.

#### ***b. NRCS Remote Sensing Project***

United States Department of Agriculture's (USDA) Natural Resources and Conservation Services (NRCS) explored the use of aerial photography and digital land cover data as a means of documenting and verifying the installation of over 28 different BMPs through a pilot project. Using the results of this pilot project, the Chesapeake Bay Program Agricultural Workgroup approved a standard methodology for the verification of undocumented BMPs using remote sensing technologies on January 26, 2017. As long as states show that these standard methodologies are utilized, the data collected using these technologies will now be accepted into the Watershed Model for the purposes of documenting progress. The lessons learned from this pilot project are being incorporated into the revised BMP Verification Program Plan.

### 3. Data Management and Tracking System

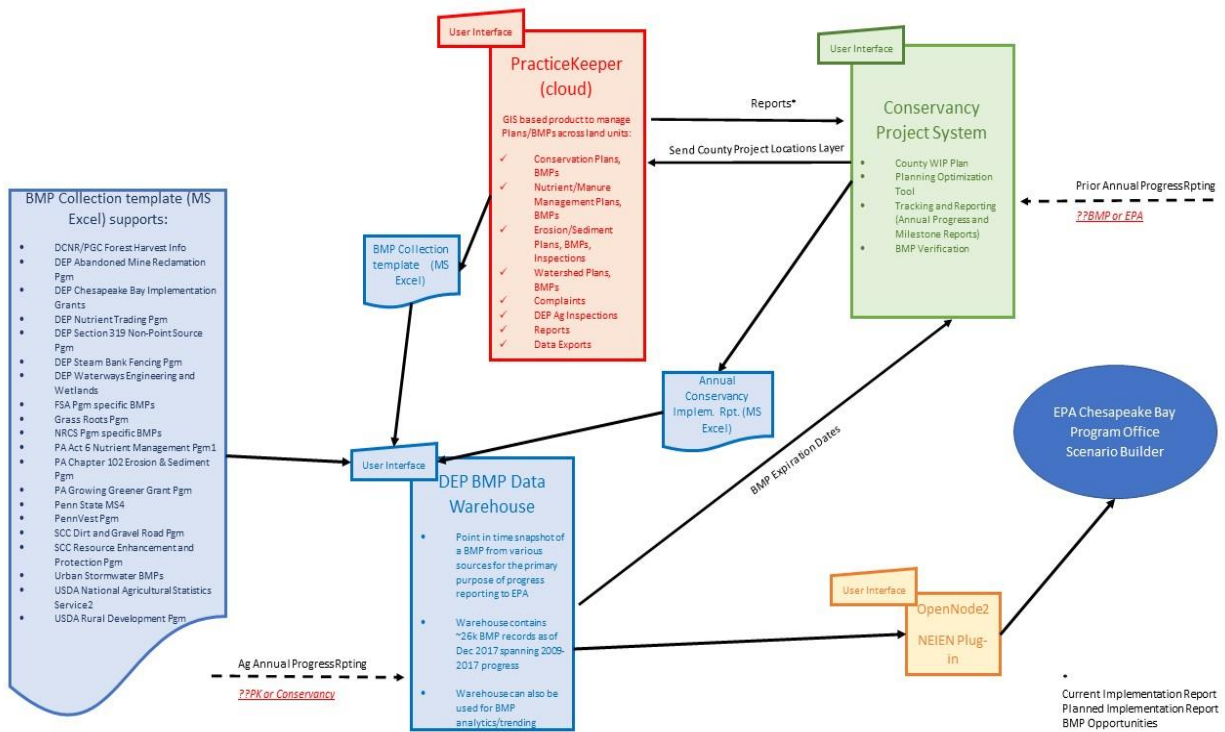
The 2016 Restoration Strategy also called for improving reporting, record keeping, and data systems to provide better and more accessible documentation of progress made toward Pennsylvania's restoration effort, including consideration of establishing mandatory reporting requirements for the agriculture sector.

Figure 2.5 below illustrates the flow of BMP data from the DEP BMP Warehouse through the National Environmental Information Exchange Network (NEIEN), and finally reporting to the EPA Chesapeake Bay Program Office. The DEP BMP Warehouse is the central collection application that serves as a pipeline to transfer this data.

For the 2018 Progress Run, data were collected from the program sources in the blue box on the left side of the figure (when available) or from PracticeKeeper (red box) and imported into the BMP Warehouse using formatted Excel templates. This data reporting process is documented in Pennsylvania's Quality Assurance Project Plan (QAPP). Annual report records are available as backup from each reporting source or program.

The green box (top-right) contains the anticipated Chesapeake Conservancy Project that will include optimization, goal tracking, and milestone reporting to support the Countywide Action Plans (CAPs). The Chesapeake Conservancy Project will incorporate the recently developed *Watershed Data Dashboard* from the EPA Chesapeake Bay Office and the *FieldDocs* application from Chesapeake Commons. While not finalized, it is planned that some form of public access to report BMPs will be included within this application. The details of the data flow and communications between these applications are not final and planning meetings with the Chesapeake Conservancy are on-going. The Conservancy Project will give local Phase 3 WIP planners the ability to locate and track their implementation progress, generate local BMP reports, and provide a platform for local BMP verification and is anticipated to be complete by late 2020.

**Figure 2.5 Schematic for Data and Tracking System**



**4. Strategic Legislative, Programmatic and Regulatory Changes**

The 2016 Restoration Strategy also recommended the identification of strategic legislative, programmatic or regulatory changes that would give Pennsylvania the additional tools and resources necessary to meet the 2025 TMDL reduction goals.

**5. Create a Chesapeake Bay Program Office**

The 2016 Restoration Strategy also called for establishing a new Chesapeake Bay Office within DEP to assure the proper development, implementation and coordination of the commonwealth’s efforts for restoration of the Chesapeake Bay, and administering DEP’s Chesapeake Bay Program grant.

This DEP office has been in place since March 2016. A complete description of the role and responsibilities of this office and proposed expansion of the office is described below under State Agency Capacity.

**6. Seek Additional Resources for Water Quality Improvement**

Finally, the 2016 Restoration Strategy called for obtaining additional resources for water quality improvement by seeking new sources of funding, which will have Chesapeake Bay compliance as a primary goal. Following up on this, for the past two Growing Greener grant rounds, DEP has set-aside additional grant monies for the Chesapeake

Bay. In addition, at the 2016 Chesapeake Bay Executive Council meeting, EPA, USDA and the commonwealth committed an additional \$28 million dollars to enhance federal and state investments in Pennsylvania to accelerate nutrient reductions. This joint strategy strengthened existing partnerships between EPA, USDA, state agencies and the conservation districts to assist farmers and provided some agriculture-led initiatives to improve local water quality such as the new Agriculture Plan Reimbursement Program implemented by DEP and the Multi-functional Buffer Program implemented by DCNR that is described below under the forestry unit of Existing Programs.

#### **a. Agriculture Plan Reimbursement Program**

The Agriculture Plan Reimbursement Program provides direct reimbursement to farmers for the costs incurred for the development of nutrient management, manure management and agriculture erosion and sediment control plans for their farms. The farmers have until April 1 of each year to apply to participate in the program and May 30 to submit the completed plans to one DEP's two contractors for reimbursement. Team Ag administers the program for DEP in the southcentral part of the watershed, Larson Design the northcentral and northeast part of the watershed. This program is in its second year. At the end of the first year, the program had reimbursed farmers for 750 plans, covering approximately 180,000 acres for approximately \$770,000.

## **II. EXISTING STATE AND FEDERAL PROGRAMS THAT DIRECTLY RESULT IN REDUCTIONS**

Table 2.1 is a summary of the programs that have reported nutrient and sediment reductions to the DEP Chesapeake Bay Program Office for the purpose of documenting progress toward achievement of the nutrient and sediment reduction goals. The majority of the reported annual reductions from nonpoint sources are from the agriculture sector. Most of reductions from the urban stormwater sector are through the implementation of the Chapter 102 NPDES construction permits. The Chapter 102 permits include requirements for post construction stormwater management BMPs and erosion and sediment control BMPs, however Pennsylvania does not receive full credit for these practices. Improvements in data collection around these practices are currently being addressed. There are also reductions attributed to the forestry, or the natural sector. These reduction categories in Table 2.1 are described in more detail below the table.

An important takeaway from Table 2.1 is the relative significance of agricultural field practices such as conservation tillage, cover crops, and nutrient management. These "annual" management practices are applied across such significant acreages that even modest changes in implementation have a significant impact in documenting nutrient reductions. It is also important to note that currently, Pennsylvania still does not receive full credit for these practices. Improvements in data collection around these practices are being addressed in this Phase 3 WIP at both the state and local level.

**Table 2.1 Existing Programs Reporting Practices for Annual Progress Reporting (2017)**

Sector	Agency / Program	Description	Reductions	
			Nitrogen	Phosphorus
Agriculture	State Conservation Commission (SCC) Act 38 Nutrient Management Program	Nutrient Management Plans and BMPs on Concentrated Animal Feeding Operations	867,000	14,000
		Manure Transport	9,000	(237)
	DEP Agriculture Inspection Program	Manure Management Plans and Ag E&S BMPs	To Report in 2018	
	Resource Enhancement and Protection Program (REAP)	Agriculture practices	23,000	1,000
	DEP Stream Bank Fencing Program	Agriculture Pasture Fencing Practices	1,000	200
	Natural Resource Conservation Service and Farm Service Agency, Conservation Reserve Enhancement Program	Technical and Financial Assistance Programs	210,000	6,100
	Capital Resource Conservation and Development	Conservation Tillage	4,221,000	426,700
Cover Crops		572,000	200	
Forestry	Department of Conservation Natural Resources(DCNR), Bureau of Forestry	Forest harvest BMPs on state lands	55,000	700
	Pa Game Commission	Forest harvest BMPs on state lands	16,000	200
Urban Stormwater	Chapter 102 Post Construction Stormwater Management	PCSM BMPs E&S BMPs	28,000	1,000
	State Conservation Commission, Penn State University -- Dirt and Gravel Road Program	Rural Road BMPs	Sediment Only	
	Department of Defense (DOD) - Federal land	Federal land BMPs	14,000	1,100
Combination	DEP Growing Greener	Agriculture and Urban BMPs.	3,000	400
	DEP-Waterways Engineering Chapter 105 Program	Stream restoration/ stabilization data	6,000	1,600
	EPA Chesapeake Bay Grants	Agriculture and Urban Stormwater Practices	38,000	900
	EPA Section 319 Nonpoint Source Grants	Agriculture and Urban Stormwater Practices	4,000	200
	National Fish and Wildlife Foundation	Practices installed as part of projects	3,000	400
	Pennvest (NPS only)	Nonpoint source control practices through grants and loans	4,000	200

Source: CAST modeling of 2017 Progress Run input files by SRBC, March 2019.

## **1. Agriculture**

### **a. National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) Program**

DEP has been administering the NPDES CAFO program in Pennsylvania for approximately 20 years. A discharge of pollutants from the production area is not authorized except during extraordinarily heavy precipitation events called “design storm events.” CAFO permits require the use of BMPs that meet certain “design-storm” requirements to prevent pollutant discharges during storm events.

The inspection frequency of CAFOs in Pennsylvania is robust. All CAFOs are inspected annually as part of the Nutrient Management Program, as described below. Additionally, as part of the NPDES CAFO program each CAFO is inspected on at least once every five years.

### **b. Nutrient Management Program**

Pennsylvania’s Nutrient Management Law, Act 6 of 1993, was among the first in the nation to establish specific nutrient management planning requirements through law and regulation. The Pennsylvania State Conservation Commission (SCC) is responsible for implementing the law, with the Nutrient Management Advisory Board (NMAB), which serves the SCC in an advisory capacity.

In 2005, the legislature amended the original nutrient management law by enacting Act 38 of 2005. The implementing regulations placed a greater emphasis on phosphorus management in addition to the existing nitrogen management practices. The Act 38 nutrient management regulation also establishes year-round setbacks for manure applications with respect to certain bodies of water; specifically, perennial and intermittent streams, lakes, ponds and existing open sinkholes for regulated entities.

All agricultural operations that are permitted as CAFOs under the federal NPDES permit are required to have and implement an Act 38 Nutrient Management Plan (NMP). All Concentrated Animal Operations (CAOs) that meet the animal density threshold of 2.0 Animal Equivalent Units (AEUs) per acre are required to have and implement an Act 38 NMP. These NMPs are written by certified planners, reviewed by certified conservation district or SCC staff, and publicly approved/disapproved by the local conservation district board of directors. All farms with approved Act 38 NMPs are inspected by conservation district or SCC staff annually. This inspection includes identifying that current NMPs and Agriculture Erosion and Sediment Control (Ag E&S) plans exist but also that the plans are being implemented in accordance with the schedule of operations.

In addition to the annual status review inspections, on-site farm visits are executed for all new and amended NMPs. NMPs are amended at least once every three years. This farm visit and plan review includes verifying the existence of a current Ag E&S plan and

that the NMP includes a schedule of operations for BMP implementation complementary to the current Ag E&S plan.

**c. *Chesapeake Bay Agricultural Inspection Program (CBAIP)***

DEP and conservation districts inspect the agricultural land within Pennsylvania's portion of the Chesapeake Bay Watershed. The required compliance metric is that the agricultural operations meet the environmental planning requirements for DEP Chapter 102 Erosion and Sediment Control on agriculture lands (Ag E&S) and Chapter 91 Manure Management Planning (MMP). Beginning in 2016 as part of the Chesapeake Bay Restoration Strategy, DEP's Chesapeake Bay Agricultural Inspection Program focused on less intensive, smaller scale agricultural operations (those operations that are not regulated by NPDES CAFO permits or the Act 38 Nutrient Management Program). More information regarding this inspection program can be found in the [Chesapeake Bay Agricultural Inspection Program SOP \(BCW-INSP-018\)](#).

**d. *Resource Enhancement and Protection (REAP) Program***

The Resource Enhancement and Protection (REAP) program was established in 2007 as an opportunity for farmers and landowners to offset costs associated with the implementation of conservation BMPs and the purchase of conservation equipment (like no-till planting equipment). It is a first-come, first-served program administered by the SCC. Eligible applicants can receive 50% or 75% (depending on the BMP) of out-of-pocket expenses in the form of Pennsylvania tax credits.

An applicant's eligibility for the REAP program is determined by compliance with the Pennsylvania Clean Streams Law, namely compliance with the Conservation or Ag E&S Plan, and Nutrient/Manure Management Plan obligations. Individuals that are qualified to verify a REAP applicant's compliance status include conservation district employees, NRCS employees and private sector agriculture technical service providers who have Act 38 Nutrient Management Certification. A farmer must have their Ag E&S and MMP compliance status verified each time they apply.

Farmers must be on-schedule for full implementation of the plans and any animal concentration area-related practice listed in the plan must be fully implemented before an applicant is eligible for REAP credits. Often, REAP applicants have completed NRCS/EQIP projects or have worked closely with their conservation district on other projects on the farm. Since 2007, approximately 70% of REAP applicants had their compliance status verified by either a conservation district or NRCS. The rest have been verified by qualified private service providers.

## **2. Forestry**

### **a. DCNR Community Conservation Partnerships Program (C2P2) Buffer Grants**

The DCNR Riparian Forest Buffer Program provides financial assistance to identify locations in need of riparian forest buffers and to design, establish, monitor, and provide short-term maintenance for those buffers. Applicants are encouraged to include the Multifunctional Buffer Concept in their proposed project. Eligible activities include landowner outreach, buffer design, site preparation and buffer installation, plant materials and tree shelters, and short-term maintenance (approximately 3 years). DCNR considers a variety of forest buffer project types, including conventional riparian forest buffers and multifunctional buffers. Approximately \$500,000 is awarded to partners annually through this program, if funding is available. Each annual grant round typically results in 75-100 acres of Riparian Forest Buffer plantings across Pennsylvania, both within and outside of the Chesapeake Bay Watershed. Grants require a 1:1 match from partners. Matches can be cash or non-cash, such as in-kind staff, volunteers, equipment usage, etc. Eligible applicants include local governments in Pennsylvania, non-profits, and educational organizations.

### **b. DCNR/PENNVEST Pilot Grants**

DCNR has partnered with the Pennsylvania Infrastructure and Investment Authority (PENNVEST), to provide a special grant round through the C2P2 program for three years specifically for testing the “multifunctional buffer concept”. A multifunctional buffer is a riparian forest buffer that provides opportunities for harvesting products such as nuts, berries, woody florals, forbs, and potentially woody biomass, with the idea that the potential to gain an income from buffered streamside land might interest new landowners in buffer implementation. The final round of the current pilot grants will be opened to applicants in late 2019. During each round so far, approximately \$1 million has been awarded to partners. At this point, it is unclear whether PENNVEST and DCNR will be able to make additional monies available to partners through this effort beyond the final \$1 million to be awarded in late 2019/early 2020. As available, funds are awarded to partners for implementation projects both within and outside of the Chesapeake Bay Watershed in PA.

### **c. TreeVitalize Grants**

TreePennsylvania, an independent non-profit agency, manages the statewide TreeVitalize grant program. Funding is provided by DCNR to promote and develop sustainable urban forestry programs in Pennsylvania. Annual grant terms provide the opportunity for funding in three priority areas: tree planting, urban riparian buffers, and community forestry management. Tree planting grants provide assistance for tree plantings in community and urban areas along streets, parks, and other publicly-accessible areas. Urban riparian buffer grants provide assistance for urban riparian buffer tree plantings adjacent to community and urban waterways. Community forestry



management grants provide assistance for tree care management plans, tree inventories, pruning, short term employment (including internships), educational workshops, webinars, urban wood utilization, ordinance development, land banks design, urban agriculture design, and other aspects of urban forestry. Approximately \$100,000 is currently awarded annually.

#### **d. *Stream ReLeaf***

A DCNR project funded by National Fish and Wildlife Foundation (NFWF) through an Innovative Nutrient and Sediment Reduction (INSR) grant of \$750,000, Stream ReLeaf funded buffers in seven south-central PA counties through a streamlined, flat-rate method to help partners implement projects in areas of high nutrient-loading. While the original funds made available through this program are nearly expended as of spring 2019, a valuable lesson learned through the implementation of this program is that a large appetite exists for riparian forest buffer implementation, even in traditionally buffer-resistant areas, if a streamlined, easy-to-access, flexible, flat-per-acre-rate buffer implementation program is available to partners. In less than two years, 95 acres of buffer were planted with \$380,000 with zero outreach efforts apart from notifying partners of available funding and how to access.

#### **e. *State-Owned Forest Lands***

Commonwealth-owned lands are periodically timber harvested as part of on-going forest management. Contracts awarded for these activities mandate that Forest Harvesting BMPs be implemented throughout this process and acreages of implemented BMPs are reported from the Pennsylvania Game Commission and DCNR annually.

### **3. *Urban Stormwater***

#### **a. *Chapter 102 Erosion and Sediment Control Program***

DEP and delegated conservation districts administer the statewide Erosion and Sediment Control (E&S) and Post Construction Stormwater Management program under *25 Pa. Code Chapter 102*. Inspections are performed on active sites and upon permit termination. Permits are required for the following activities: construction activities with earth disturbances greater than or equal to one acre, not including agricultural plowing or tilling; animal heavy use areas; timber harvesting activities or road maintenance activities; and Oil and Gas Activities that involve 5 acres or more of earth disturbance. A Chapter 102 permit requires E&S and post-construction stormwater management (PCSM) BMPs.

#### **b. *Dirt and Gravel Road Program***

Pennsylvania's Dirt Gravel, and Low Volume Road Maintenance Program provides funding to eliminate stream pollution caused by runoff and sediment from the

commonwealth's comprehensive network of unpaved and low volume public roads. The program was enacted into law in April 1997 as Section 9106 of the PA Vehicle Code, and expanded in 2014 to dedicate \$20 million to unpaved roads and \$8 million to paved low volume roads. The goal of the program is to implement Environmentally Sensitive Maintenance practices aimed at reducing the environmental impacts of public roads, while reducing long-term maintenance costs.

### **c. *Stream Restoration, Flood Protection***

DEP administers the Waterway and Wetland Protection, and the Submerged Lands License Agreement (SLLA) programs under the Pennsylvania's Dam Safety and Encroachments Act, Pennsylvania's Clean Streams Law, and the Chapter 105 regulations. Stream restoration and stabilization projects associated with this regulatory program contribute pollutant reductions to Pennsylvania's Chesapeake Bay goals.

## **4. *Grant and Low-Interest Loan Programs***

### **a. *PennVest***

The Pennsylvania Infrastructure Investment Authority (PENNVEST), supports communities and citizens of Pennsylvania by funding sewer, storm water, and drinking water projects throughout the Commonwealth. These projects not only contribute to improving Pennsylvania's environment and the health of its people, they also provide opportunities for economic growth and jobs for Pennsylvania's workers.

In funding point source (treatment plants), stormwater and non-point source (e.g. manure storage) projects, PENNVEST's low-cost financial assistance and grants help improve rivers and streams in communities for the enjoyment of citizens and the protection of natural resources.

### **b. *Growing Greener***

Voter-approved bond initiatives, Growing Greener I and II, have provided significant funding to reduce the backlog of farmland preservation projects, protect open space, eliminate the maintenance backlog in state parks, clean up abandoned mines, and restore watersheds. These funds have also been used for recreational trails and local parks, to help communities address land use, and provide new and upgraded water and sewer systems. The funds are distributed among four state agencies: the Department of Agriculture to administer farmland preservation projects; the Department of Conservation and Natural Resources for state park renovations and improvements; and PENNVEST for water and sewer system upgrades; and DEP is authorized to allocate these funds in grants for watershed restoration and protection, abandoned mine reclamation, and abandoned oil and gas well plugging projects.

### **c. EPA Grant Programs**

Both the EPA Chesapeake Bay Implementation Grant Program and the Section 319 Nonpoint Source Program Grant are used to implement agriculture, urban stormwater and stream restoration projects. The Chesapeake Bay Implementation Grant is also the funding source for the DEP Streambank Fencing Program. This program is implemented in the Northeast region of the state where the DEP regional office works directly with landowners to install streambank fencing along streams. This program is going to be expanded to the Northcentral region as well. Additionally, blocks grants would be awarded to the pilot counties and others thereafter using comprehensive local water quality plans, such as CAPs, as their application.

### **III. PHASE 3 WIP PRIORITY INITIATIVE STATE NUMERIC COMMITMENTS**

DEP, PDA, DCNR, the other members of the Phase 3 WIP Steering Committee and workgroups plus many other local government, agriculture, environmental, community, academic and business partners (Phase 3 WIP partners) participated in development of the goals, recommendations and action steps described in this section.

The programs described in this section will move forward as part of a broader, watershed-wide effort in concert with the countywide action plans. These initiatives will become part of each county's countywide action plan as they are developed as described in Section 3 Countywide Actions. Through the planning process implemented at the county level, these recommendations will be tailored to meet the county-specific demographics, conditions and priorities. The specific goals, recommendations and action steps are summarized below. Table 2.2, Summary of Reductions provides the expected reductions from each priority initiative.

**Table 2.2 Summary of Reductions from Priority Initiatives**

Priority Initiative	Nitrogen Reduction (to Pennsylvania Streams)	Phosphorus Reduction (to Pennsylvania Streams)	Estimated Annual Cost for Practice Implementation <sup>1</sup>
<b>Agriculture</b>			
<b>Total</b>	<b>28,572,000</b>	<b>1,790,000</b>	<b>\$313,140,000</b>
Agriculture Compliance	7,381,000	251,000	\$33,105,000
Soil Health	7,337,000	298,000	\$32,980,000
Expanded Nutrient Management	755,000	34,000	\$20,853,000
Manure Storage Facilities	7,167,000	300,000	\$214,042,000
Precision Feeding	604,000	61,000	(-\$1,687,000)
Integrated Systems for Elimination of Excess Manure	1,230,000	101,000	\$4,666,000
Grassed Riparian Buffers	4,098,000	747,000	\$9,183,000
<b>Stormwater<sup>1</sup></b>			
<b>Total</b>	<b>296,000</b>	<b>39,250</b>	<b>\$78,552,000</b>
Meet Current MS4 Permit Requirements	179,000	34,000	\$74,033,000
New Riparian Forest Buffers	7,000	1,000	\$68,000
Control Measures for Illicit Discharge	3,000	150	\$898,000
Industrial Stormwater	2,000	100	\$3,553,000
Fertilizer Legislation	105,000	4,000	TBD
Meet Current Erosion and Sediment (E&S) Control and Post Construction Stormwater Management (PCSM) Requirements	TBD	TBD	TBD
<b>Forestry</b>			
<b>Total</b>	<b>7,681,000</b>	<b>1,029,000</b>	<b>\$67,701,000</b>
Forested Riparian Buffers	7,445,000	993,000	\$41,439,000
Tree Canopy	180	10	\$5,400
Woods and Pollinator Habitat	86,000	5,300	\$1,046,000
Forest, Farm, and Natural Areas Conservation	TBD	TBD	TBD
Stream and Wetland Restoration	147,000	29,000	\$27,303,000
<b>Total Workgroup Recommendation Reductions (to Pennsylvania Streams)</b>	<b>33,239,000</b>	<b>2,123,000</b>	<b>\$459,393,000</b>
<b>Reductions Delivered to Chesapeake Bay</b>	<b>22,371,000</b>	<b>893,000</b>	<b>\$459,393,000</b>

<sup>1</sup>These costs are for the costs of practice implementation and are averaged over the life span of the practice. For a complete explanation of what these costs cover, see [Section 5. Existing and Needed Resources](#). They do not include costs associated with technical assistance, engineering and design.

### **A. Agriculture**

The 15-member Agriculture Workgroup produced an action plan that seeks to maintain a vibrant and productive agricultural sector while also meeting local water quality goals that will contribute to cleaning up the Chesapeake Bay and the Pennsylvania Partners and other stakeholders are adopting the action plan as part of the Phase 3 WIP. In

addition to compliance with basic regulatory obligations, the plan focuses on three key elements: Soil health; Manure and nutrient management; and Riparian ecosystem improvements and restoration.

These reductions will be made as part of seven priority initiatives:

1. Agricultural Compliance
2. Soil Health
3. Expanded Nutrient Management
4. Manure Storage Facilities
5. Precision Feeding
6. Integrated Systems for Elimination of Excess Manure
7. Forest and Grassed Riparian Buffers

### **1. *Agricultural Compliance***

Action: Ensure farmers are implementing their state required Agricultural Erosion and Sediment Control (Ag E&S) or conservation plan, Manure Management/Nutrient Management Plan, and implementing required barnyard runoff controls, where needed.

- Goal 1: Continue the compliance, inspection and enforcement programs associated with Pennsylvania's Clean Streams Law and federal requirements.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **2. *Soil Health***

Action: Use crop and soil management practices that improve long-term soil health and stability.

- Goal 1: Conservation tillage on 67% of croplands used for production of corn silage, small grain and double cropped lands.
- Goal 2: No-till on 67% of lands used for production of other crops.
- Goal 3: Non-harvested cover crops on 33-50% of croplands.
- Goal 4: Prescribed grazing on 50% of pastures.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **3. Expanded Nutrient Management**

Action: Non-manured farmlands use nutrient management plans and precision nutrient management practices.

- Goal 1: 20% of non-manure croplands have Nutrient Management Plans.
- Goal 2: 20% of non-manure croplands use the “4Rs” principles of “Right Source, Right Rate, Right Time and Right Place” for increased nitrogen and phosphorus reductions.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **4. Manure Storage Facilities**

Action: Install and use manure storage systems that meet federal standards.

- Goal 1: 90% of swine and poultry operations have adequate manure storage facilities.
- Goal 2: 75% of other livestock operations have adequate manure storage facilities.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **5. Precision Feeding**

Action: Use precision feed management to reduce nitrogen and phosphorus in manure.

- Goal 1: 33% of cows fed with precision management.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

## **6. *Integrated Systems for Elimination of Excess Manure***

Action: Create integrated (county/regional) programs for removal of or beneficial use of excess manure.

- Goal 1: Develop coordinated regional systems for removing excess manure (through treatment or transportation) from the Chesapeake Bay watershed.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

## **7. *Forested and Grassed Riparian Buffers***

Action: Plant grassy vegetation or forest buffers along streams

- Goal 1: 15% of non-buffered streamside farm lands add 35 ft wide grassed buffer.
- Goal 2: 25% of non-buffered streamside farm lands add 35 ft wide forested buffer.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

In Table 5.3 in [Section 5, Existing and Needed Resources](#), is a summary of the existing and new state agency resources needed within DEP, PDA, the State Conservation Commission to implement these priority initiatives. In addition to these resources, the Phase 3 WIP Agriculture Workgroup performed a workload analysis and estimated 87 people from a combination of private industry, non-governmental organizations and federal agencies dedicated to the delivery of technical assistance, planning BMP practice design and engineering above what is already dedicated to this effort may be needed. The amount of existing resources or the cost of these additional resources is unknown at this time.

## **B. Forestry**

Forestry conservation practices such as riparian forest buffers and upland tree plantings are both cost-effective for improving water quality while also providing significant environmental and social benefits in both agricultural and developed areas. Trees along streams improve habitat, reduce flooding impacts, and provide shade to cool waterways. Trees in backyards and communities increase property values and improve human health. These restoration activities help connect citizens to their local watersheds.

The 15-member Forestry Workgroup produced an action plan with forestry practices that seek to reduce nitrogen and phosphorus pollution and meet water quality standards and the Pennsylvania Partners and other stakeholders are adopting the action plan as part of the Phase 3 WIP.

This action plan is divided into the following five priority initiatives:

1. Forested Riparian Buffers
2. Tree Canopy
3. Woods and Pollinator Habitat
4. Forest and Natural Area Conservation
5. Stream and Wetland Restoration

Note that some of these practices are developed specifically to reduce nitrogen and phosphorus, but some are being instituted for other reasons where nitrogen and phosphorus reductions are co-benefits.

### **1. *Forested Riparian Buffers***

Action: Plant trees and shrubs or grassy vegetation along streams.

- Goal 1: 83,000 acres of forested riparian buffer on agricultural lands.
- Goal 2: 2,650 acres of forested riparian buffer in developed areas.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **2. *Tree Canopy***

Action: Plant trees in developed areas.

- Goal 1: 50 acres of urban tree canopy planted (15,000 trees).

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).



### **3. Woods and Pollinator Habitat**

Action: Convert lawn and turf areas to woods and meadows.

- Goal 1: 5,000 acres of lawns to woods.
- Goal 2: 5,000 acres of lawns to meadows.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **4. Forest, Farm and Natural Area Conservation**

Action: Provide credits for land conservation and revise zoning and ordinances to conserve existing natural areas.

- Goal: 20,000 acres of land conserved annually.

NOTE: The estimated annual cost for these actions cannot be determined due to variations in the cost of land “crediting” programs across the watershed.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **5. Stream and Wetland Restoration**

Action: Support efforts to restore local streams and wetlands.

- Goal 1: 60,000 linear feet of urban and non-urban streams restored per year utilizing appropriate measures for the site such as stabilization, natural stream channel design, floodplain restoration, etc.
- Goal 2: 400 acres of wetlands restored per year.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

In Table 5.3 in [Section 5, Existing and Needed Resources](#), there is a summary of the existing and new state agency resources needed within DCNR and the conservation districts to implement these forestry priority initiatives.

## **C. Stormwater**

The 12-member Phase 3 WIP Stormwater Workgroup developed an action plan for BMPs to help localities reduce nitrogen and phosphorus and meet local water quality

standards and the Pennsylvania Partners and other stakeholders are adopting the action plan as part of the Phase 3 WIP.

This action plan prioritized:

1. MS4 Pollutant Reduction Plans
2. Riparian Forest Buffers
3. Control measures for illicit discharge
4. Industrial stormwater
5. Erosion and Sediment (E&S) Control and Post Construction Stormwater Management (PCSM) Program

### **1. *Implement Pollutant Reduction Plans (PRPs) for Municipal Separate Storm Sewer System (MS4) Communities***

Action: As one component of the 2018 permit, MS4 Permittees must implement management practices to achieve the reductions identified in their respective PRPs by 2023.

- Goal 1: MS4s in the Chesapeake Bay watershed implement BMPs in current MS4 NPDES permits by 2023.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **2. *New Riparian Forest Buffers***

Action: Plant trees and shrubs alongside streams.

- Goal 1: Incentivize and facilitate new acres of riparian forest buffers associated with DEP-administered stormwater programs including MS4, Stormwater Construction, Combined Sewer Overflow (CSO) and Industrial Stormwater permits.

These acres are in addition to the riparian forest buffers identified as part of the Forestry and Agriculture Workgroup and are listed here due to their association with MS4 communities.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **3. Control Measures for Illicit Discharges**

Action: DEP facilitate municipal ordinance amendments to control illicit discharges to storm sewer systems.

- Goal 1: Municipal ordinance adoption for control of residential pool drainage.
- Goal 2: Municipal ordinance adoption for control of residential car washing draining.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **4. Industrial Stormwater**

Action: DEP develop preferred BMPs for use in industrial stormwater discharge permits to reduce pollutants of concern.

- Goal 1: Implementation of Chesapeake Bay BMPs by industrial stormwater discharge permittees.
- Goal 2: Identify appropriate industrial stormwater permits suitable for impervious surface retrofit BMPs with the goal of facilitating industrial impervious surface to pervious cover or other volume reduction retrofit BMP.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

### **5. Continue to Implement Erosion and Sediment (E&S) Control and Post Construction Stormwater Management (PCSM) Program**

Action: Continue permitting, inspecting, and ensuring compliance with Pennsylvania's erosion and sediment control and post-construction stormwater permit requirements, found in 25 Pa. Code Chapter 102.

- Goal 1: Increase the number of county conservation districts with post-construction stormwater delegation, including an inspection component.

Responsible Parties: See the Progress and Tracking Template for a specific listing of individual agencies involved in specific action steps designed to implement this priority initiative. A summary of the key action steps that will be reported every six months can be found in [Section 7, Milestones and Progress Tracking](#).

Table 5.3 in [Section 5, Existing and Needed Resources](#), provides a summary of the existing and new state agency resources needed within DEP to implement these stormwater priority initiatives.

#### **D. Wastewater**

Wastewater is the liquid waste, sewage, or industrial waste from homes, businesses, schools, industrial facilities and other institutions. Treated wastewater makes its way directly or indirectly into our waters. If wastewater contains excess nitrogen and phosphorus, it supports the growth of algae blooms that create low-oxygen “dead zones” that suffocate marine life. Excess nitrogen and phosphorus in fresh water streams can impact aquatic life and other surface water uses. Wastewater treatment provides protection of water resources and public health and allows water to return to the environment safely.

Previously, the Pennsylvania wastewater sector was required to reduce their contribution of nitrogen (N) and phosphorus (P) from their treatment plants. The original wastewater contribution to receiving streams was 11% of the nitrogen load, and 18% of the phosphorus load (found in the 2004 Pennsylvania Bay Tributary Strategy, DEP). Their 33% required reduction would result in a 4% nitrogen decrease, and a 6% phosphorus decrease by 2025. The 190 wastewater plants, using Biological Nutrient Reduction (BNR) techniques (with some plants treating to a level between BNR and Enhanced Nutrient Reduction (ENR)) proved highly successful in removing nutrients, and allowed these plants to meet both their 2017 midpoint goals and 2025 final goals years ahead of schedule. These goals were achieved at an estimated cost of \$1.4 billion. The cost projections were done by the former Metcalf and Eddy engineering firm (now AECOM), under contract with the state, spending six months studying Pennsylvania wastewater plants in the Chesapeake Bay watershed.

Current information on Wastewater Treatment Plants (WWTPs) in the Chesapeake Bay may be found in the Wastewater Supplement to the Phase 3 WIP. This supplement provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP’s current implementation strategy for wastewater. This document is updated periodically to reflect changes due to DEP’s permit actions as well as changes to strategies in managing the wastewater sector’s allocated loads under the TMDL.

Pennsylvania and other states also have created nutrient trading programs that allow wastewater treatment plants to design upgrades with greater nutrient reductions, then sell nutrient credits to other facilities. This promotes cost-effective reduction.

The 14 members of the Wastewater Workgroup researched the feasibility of treating to ENR in Pennsylvania. ENR effluent total nitrogen and total phosphorus concentrations are 3.0 mg/l and 0.4 mg/l, respectively. Currently, the 190 significant wastewater treatment systems with BNR effluent load limits, reached their 2025 nitrogen and phosphorus reduction goals in 2018 (seven years ahead of schedule). BNR effluent total nitrogen and total phosphorus concentrations are 6.0 mg/l and 0.8 mg/l,

respectively. Although a number of these systems are treating to a level between BNR and ENR, they are currently obligated to meet an annual load limit based on BNR requirements.

Priority initiatives that have the potential to directly result in nutrient reductions that will be explored for Wastewater include:

1. Continue Current Treatment
2. Plant Optimization Program
3. Municipalities Implement Onsite Septic System Inspection and Pumping Programs

### **1. *Continue Current Treatment Course***

Given the ongoing reduction success, one priority initiative is to continue the treatment course described above. The ongoing tracking of the 190 publicly owned treatment works and their wasteload allocations is described in the Wastewater Supplement to the Phase 3 WIP that will continue to be updated on a regular basis.

### **2. *Plant Optimization Program***

DEP's treatment plant optimization program helps troubled facilities get into compliance with permitting requirements. DEP will further investigate the feasibility of how this program could be expanded to help facilities optimize their process for nutrient removal by establishing a facility nutrient removal optimization program. The existing DEP optimization program does not have the capacity to run such a program, and expansion of the program would include a section dedicated to statewide implementation. Varying degrees of implementation could be considered to make the effort slightly less costly; however, the reduction in proposed DEP staffing would shift the burden to the facility to hire operations consultants.

Table 5.3 in [Section 5, Existing and Needed Resources](#), provides a summary of the existing and new state agency resources needed within DEP to implement this initiative. These costs include not only the cost for staff but the additional costs for equipment and lab analyses.

### **3. *Municipalities Implement Onsite Septic System Inspection and Pumping Programs***

Properly operated and maintained systems provide better protection of local ground water resources as well as a reduction to the total nitrogen loading to the Chesapeake Bay. If all municipalities with on-lot systems would implement sewage management programs that include inspection of the on-lot system and pumping of septic tanks, a 5% reduction, 144,000 lbs, of total nitrogen could be realized.

Sewage management programs that incorporate septic system inspection and pumping are recommended. On-lot system oversight is the responsibility of municipalities per the PA Sewage Facilities Act.

To facilitate the implementation of this recommendation, DEP proposes to investigate the feasibility of developing a GIS based online monitoring and reporting program that municipalities can use to report on-lot system operation and maintenance information for Chesapeake Bay reporting. See the action step on the Progress and Reporting Template and in [Section 7, Milestones and Progress Reporting](#).

#### IV. PHASE 3 WIP PRIORITY INITIATIVE STATE PROGRAMMATIC AND NARRATIVE COMMITMENTS

##### A. Legislative

Several legislative actions are proposed related to funding, practice implementation or authority for further reductions.

##### 1. Provisions and Options for a Dedicated Fund

To meet 2025 reduction goals, the estimated funding gap between existing and available funding is approximately \$257 million annually. While it is recognized that some of this gap may already be covered through private investment that is not currently tracked, a significant increase in public funding is necessary if the Phase 3 WIP is going to be successful. This is based on the summary results in Table 2.3 Implementation Costs for Top Priority Initiatives, below. These four priority initiatives alone will help to achieve half of the nitrogen reduction goal and 75% the phosphorus reduction goal.

**Table 2.3 Implementation Costs for Top Priority Initiatives**

Priority Initiative	Cost in millions	Nitrogen Reduction	Phosphorus Reduction
Agricultural Compliance	\$33.1	14%	12%
Soil Health	\$32.9	14%	14%
Grass Buffers	\$9.2	8%	37%
Forested Buffers	\$41.4	14%	49%
<b>TOTAL</b>	<b>\$116.6</b>	<b>45%</b>	<b>75%</b>

Any funding program legislation should include provisions for local water quality improvement across the state. However, targeting funding to the Chesapeake Bay watershed is recommended.

One or more of the following options are offered for consideration. It is expected a combination of funding sources may be needed.

**a. Restore Pennsylvania**

This bill proposes a \$4.5 billion bond initiative to restore critical infrastructure in Pennsylvania. The initiative includes investments for critical flood control infrastructure, green infrastructure and municipal and institutional stormwater management improvements. Among other things, the initiative will protect open space, address maintenance needs in state parks, preserve working farms, fund best management practices on farms, clean up abandoned mines and restore watersheds, provide funds for recreational trails and local parks, help communities address land use and provide new and upgraded water and wastewater systems.

**b. Water Use Fee (HB20, 2017-2018 Session)**

This proposal would assess a fee on large non-residential entities that take water for commercial use. A 2018 study by the Legislative Budget and Finance Committee estimated that modest fees on each gallon of water withdrawn over 10,000 gallons per day could generate millions of dollars statewide.

**c. Bottled Water Tax**

This proposal would remove the sales tax exemption for bottled water, tea and similar beverage purchases.

**d. Keystone Tree Fund (SB108, HB374 2019-2020 Session)**

This bill proposes to create a fund where individuals could contribute to the fund through a check-off box on their driver's license. The funds would be used to support buffer and urban tree plantings. Consideration of the operation and maintenance costs should be part of the fund once created.

**e. Specialty License Plate**

Create a "Clean Water PA" license plate, enabling car buyers to show their support for environmental protection and to contribute to the goals of water quality improvement.

**2. Legislation to Facilitate Practice Implementation**

The following is a list of legislative options that could facilitate the implementation of priority BMPs to achieve the necessary nutrient and sediment reductions to restore local water quality and the Chesapeake Bay:

**a. Revisions to Pennsylvania's Clean Stream Law**

Existing language in Section 702 of Pennsylvania's Clean Streams Law, 35 P.S. 691.702, prohibits commonwealth agencies or political subdivisions from requiring fencing for the purpose of keeping farm livestock out of the streams. This statutory

provision impedes progress in water quality improvement and should be repealed or amended.

***b. Nutrient Reduction Procurement Program (SB799, 2017-2018 Session)***

The bill proposes to create a “Clean Water Procurement Program” and a “Water Innovation and Improvement Fund” to achieve nutrient reductions. Through this program, the commonwealth would achieve nutrient and sediment reductions through direct purchase of credits generated from load reduction activities. These purchases would be through long-term contracts selected through a request for proposals process. For this to be successful, a source of funding for the commonwealth to buy these reductions is needed.

***c. Integrators and Private Investors***

In order for conservation investors to dedicate a portion of their investment to best management practices, they must see some return on their investment. In other words, the investor gets a return on investment from public funds once the investor has met pre-determined standards or requirements. This form of public-private partnership may be difficult for local governments to implement due to procurement limitations at the municipal level. Legislation to amend provisions governing municipal procurement may be needed to address this limitation.

***3. Other Legislation to Facilitate Reductions***

The following three legislative actions would facilitate nutrient and sediment reductions. These legislative actions will be pursued as soon as possible.

***a. Revisions to the Pennsylvania’s Right to Know Law***

The Phase 3 WIP partners recommend an amendment of the Pennsylvania Right to Know Law to create exemptions from public record production requirements and to extend confidentiality protections to any farm-specific information reported by the agricultural industry. Without this protection, most landowners are reluctant to report BMPs that they have installed with their own resources. Such an amendment ensuring the confidentiality of information submitted to regulatory agencies would facilitate the Commonwealth’s efforts to track and verify the implementation of best management practices (BMPs) at agricultural facilities. This lack of confidentiality is significantly hindering Pennsylvania’s ability to track progress towards meeting the reduction goals.

***b. PA Farm Bill***

This package of legislation, funded at \$24 million, proposes to provide support and continued investments in the commonwealth’s agriculture industry. \$6 million of the PA Farm Bill proposal will fund technical assistance and the installation of best



management practices on farms through a mix of low-interest loans, tax credits, and grants. Funding will be targeted to high-priority areas within the Chesapeake Bay watershed.

***c. Fertilizer Legislation (SB792, 2017-2018 Session)***

The current version of the proposed legislation intends to (1) provide for the labeling, application, recordkeeping, packaging, use, sale and distribution of agricultural fertilizer as well as turf or other specialty fertilizer (2) provide consumer protection through licensing, labeling and sampling, (3) establish professional fertilizer applicator certification, (4) provide a means of consumer education and outreach, (5) ensure that applicators follow best practices when applying fertilizer and will comply with the Chesapeake Bay Program Partnership protocols for achieving nutrient reductions. This legislation would reduce nitrogen runoff by 105,000 pounds per year to Pennsylvania's streams. Phosphorus runoff would be reduced by 4,000 pounds per year.

***d. Restore Act 167 Funding***

DEP will advocate for restoration of the Act 167 stormwater management planning reimbursement funding to be restored in future budget cycles.

**B. Regulatory**

***1. Chapter 105 Regulatory Amendments***

DEP is considering proposing amendments to Chapter 105 including clarifying waiver provisions and a new section to clearly outline the environmental assessment requirements associated with a restoration project such as a stream, wetland, or a floodplain restoration project within the watershed context. In the interim, DEP will also consider revisions or clarifications to existing permits, policy, guidance and other information that promotes and enhances water quality and aquatic resources through existing requirements. This will help with the implementation of stream and wetland restoration projects.

***2. Enhanced BMP Requirements for Agriculture Erosion and Sediment Control***

If needed in the future, revisions to current language in the Chapter 102 Erosion and Sediment Control regulations to provide authority in the agricultural erosion and sediment control requirements for mandatory installation of additional priority BMPs in watersheds identified by DEP as impaired may be considered.

## **C. Programmatic & Policy**

The following programmatic and policy enhancements will be implemented to address either the four pilot county or Phase 3 WIP workgroup recommendations.

### **1. *Enhanced Nutrient Management Planning for Biosolids***

Municipal biosolids (sewage sludge) may be land applied onto Pennsylvania's agricultural lands, including those agricultural lands in the Chesapeake Bay watershed. While providing nutrient benefits to those farms that utilize biosolids, the increased presence of biosolids is adding to the nutrient management challenge that already exists on Pennsylvania's lands. Current regulatory standards require generators of biosolids to perform nitrogen-based nutrient management planning and implementation when land applying biosolids on agricultural land. DEP will explore the expansion of required management planning and implementation for biosolids to also include management of phosphorus consistent with the nutrient management planning standards established for animal manure. DEP believes this can be addressed through further consideration of the Phosphorus Index and potentially incorporating a revised Phosphorus Index into future planning requirements.

### **2. *Enhanced NPDES Stormwater Construction Consideration of MS4 Priority Restoration BMPs***

The workgroups recommend DEP facilitate greater collaboration between NPDES Stormwater Construction permit applicant use of BMPs identified as MS4 priorities, such as impervious surface restoration, storm sewer disconnection, and other retrofitting activities to address increases in stormwater. DEP will evaluate the best mechanisms to enhance this coordination. DEP will also explore opportunities for use of Chesapeake Bay priority practices in other programs it administers such as detailed more fully above.

### **3. *Chapter 102 Erosion and Sediment Control and Stormwater Management***

DEP is currently updating the Stormwater BMP Manual, which will include updated recommendations for calculating BMP water quality, volume and rate efficiencies. Future initiatives related to the stormwater management programs include prioritized reviews of permit applications within the Chesapeake Bay watershed or with specific Chesapeake Bay improvement BMPs, such as Forested Buffers or other Restoration BMPs (such as Stream Restoration, Wetland Restoration, Landscape Restoration, etc.) Additionally, a Pennsylvania General Permit (PAG-01) for construction sites between one and five acres is being developed; prioritized reviews of permit applications within the Chesapeake Bay watershed or with BMPs that would net the greatest improvement to water quality may also incentivize implementation. These programs will be tracking and reporting those outputs for Chesapeake Bay Program annual progress.

#### **4. Stormwater Management Act (Act 167) Program Improvements**

The multiple recommendations related to the Act 167 Program also focused on integration of Act 167 plans with other planning efforts and more robust compliance and enforcement. DEP will prioritize Act 167 compliance and enforcement to align with Phase 3 WIP priorities and will undertake education and outreach related to the benefits of Act 167. DEP will also undertake outreach and training refinements to these programs underway since 2002, and as reflected in the 2010 amendments to the Chapter 102 regulations. DEP will propose hiring two additional employees to implement these efforts.

#### **5. Bradford County Stream Reconstruction Pilot Program**

DEP plans to provide, by delegating the Bradford County Conservation District (District), the ability to authorize stream reconstruction actions under the Chapter 105 Water Obstructions and Encroachments Program Emergency Permit. The activities authorized under this special Emergency Permit will utilize the “Bradford County Stream Reconstruction Pilot Program (Program)” and the “Emergency Stream Intervention Protocol Manual” during a 3-year trial and assessment period. Work under these Emergency Permits includes removal of debris, bank stabilization and removal of accumulated silt and sediment from stream channels beyond the normal maintenance area. The authorization for the excavation/removal of debris, sand, gravel, bedrock material, deposited or collected in and along the floodway will be addressed using this Emergency Permit. DEP will meet periodically with the conservation district to assess the capacity of, and level of accomplishment that, the Program provides through the implementation of remedial actions and alleviation of adverse public health, safety, and environmental conditions before and after flood events.

The trial and assessment period of 3 years was determined to be a sufficient time period to demonstrate effectiveness of the pilot because it is long enough that some flooding is likely to occur. Once the pilot program assessment is complete, a determination may be made on the applicability for other areas or counties.

#### **6. Real-time Water Quality Data**

Currently DEP, Division of Water Quality (DWQ) operates the Water Quality Network (WQN). WQN data is used to generate pollutant loads, yield and trends. These statistical evaluations of water quality data are one of the most powerful water quality datasets that inform water quality improvements in the Chesapeake Bay watershed. They answer questions like, “How much nitrogen, phosphorus and sediment has the Susquehanna River contributed to the Bay at any specific time?” These data and evaluations have been incorporated into the WIP development. In addition to WQN, DWQ staff operate and coordinate the collection of continuous instream water quality data that is available, as least initially as preliminary data, on the USGS website. This data is supplemental to the WQN data and provides real-time information, but is not appropriate to be used as a real-time barometer of water quality. Water quality

conditions fluctuate greatly and are primarily driven by the amount and timing of precipitation. This makes it very difficult to provide a real-time characterization of water quality and creates the need to rely on long-term water quality data to measure changes in water quality.

What is not accounted for, are the many water quality improvements that may be occurring on a much smaller scale. The difficulty in characterizing this is the time lag that occurs from implementation of BMPs to the actual resulting change in water quality. DWQ staff along with regional DEP biologist and county staff are actively pursuing these characterizations, with the goal of deploying additional super gages in the lower Susquehanna River and potentially some bad acting tributaries (Conestoga River). The real-time data would be available and would also provide additional information for bi-annual and milestone reporting.

This effort will require a moderate reorganization of effort, approximately \$600K and at least one additional staff.

#### ***D. Incentives or Methods to Accelerate Practice Implementation***

There are several different funding sources across multiple agencies in the Commonwealth that can contribute to nutrient reductions for the Chesapeake Bay. Each program has their own procedures, timeline, criteria and goals for the selection and awarding of program funds. In many cases, these criteria and goals are similar. More importantly, where appropriate, the funding from these programs could be combined or better coordinated to achieve additional workforce development, economic development and the promotion of new businesses goals within the Commonwealth in a more efficient and cost-effective manner. To achieve this outcome, the Commonwealth will look at the programmatic goals of the different agency funding sources and combine them where appropriate or, at a minimum, look for ways to better coordinate them.

##### ***1. Use of “Block Grants”***

Where possible, the combination of different state and federal funding sources can be more effectively utilized if provided in the form of a “block grant” where the funds can be managed to meet changing local conditions. These “block grants” would be awarded using comprehensive local water quality plans, such as the Countywide Action Plans, as the application.

##### ***2. Creation of County State Revolving Loan Fund***

PENNVEST will utilize federal State Revolving Loan Fund monies to facilitate the creation of county or regional revolving loan funds to implement practices in a streamlined manner. With these funds, PENNVEST can offer counties or other local/regional entities low-interest loans for capital improvements and grants for practices, coordinate loans with other existing programs or supplement other federal and state funding programs with low interest loans.

### **3. *Expansion of Existing Funding Programs Like REAP, TreeVitalize and Growing Greener***

The Funding Workgroup looked at different existing funding programs and recommended that the Resource Enhancement and Protection (REAP) program, administered by the State Conservation Commission, be expanded by \$10 to \$20 million per year; identified revisions to the criteria of the TreeVitalize Program implemented by the Department of Conservation and Natural Resources; and identified revisions to the criteria of the Growing Greener 2 Program and the creation of Growing Greener 3 with Chesapeake Bay focused funding, all as effective means to accelerate implementation of priority practices.

### **4. *Establishment of a “One-Stop-Shop” for Technical Assistance***

This concept is to create a technical and financial assistance program that allows for farmers and municipalities with high quality, high priority projects to maximize the use of existing programs to implement those projects. This “One-Stop-Shop” would be based on a first-come, first-served concept to allow farmers and urban centers to competitively apply for a mix of grants, loans and technical consultants that best address their specific needs. The intent is to expedite the process to provide farmers and urban centers a combination of local, state and federal technical and financial assistance to achieve water quality restoration goals. PENNVEST is proposing to pilot this concept in the two Tier 1 counties using EPA State Revolving Loan Fund administrative funds. Depending on the results of this pilot project, these “One-Stop-Shops” may be expanded to other counties.

### **5. *Practice Installation on State Lands***

Pennsylvania state agencies and state affiliated agencies should put buffers and other BMPs in place on state-owned lands wherever feasible. Possibilities include roadways, parks, school and college campuses, and prisons. The Phase 3 WIP Funding Workgroup further recommended this initiative be supported by an Executive Order.

### **6. *Enhanced BMP Requirements for Agriculture Erosion and Sediment Control***

DEP will evaluate how to ensure Agricultural E&S Plans include enhanced BMPs in watersheds identified by DEP as impaired or having a TMDL. At a minimum, DEP will revise the appropriate technical guidance documents to highlight the recommended priority practices identified within the Phase 3 WIP to achieve the priority initiatives identified. DEP will also consider the development of applicable technical guidance documents specific to the implementation of the priority initiatives defined by the Phase 3 WIP.

## **7. Review and Consideration of DEP Permitting Process Modifications**

DEP is evaluating its permitting requirements to facilitate a smooth process for farmers and others that seek to resolve existing resource concerns or prevent future impacts by increasing the implementation of BMPs. Projects that reduce or even eliminate existing discharges or have an overall positive environmental benefit, will be considered for prioritization and an incentivized process to ensure that BMPs are installed in an efficient, cost-effective manner as soon as possible. Chapter 105 regulatory amendments, PAG-01 and the Bradford County Pilot Project described in other sections, are examples of efforts underway.

### **V. ANTICIPATED REDUCTIONS FROM CAP DEVELOPMENT AND IMPLEMENTATION / MERGING THE STATE PRIORITY INITIATIVES FOR NUMERIC REDUCTIONS WITH THE CAPS**

This section describes the priority initiatives that will be implemented to reduce the current nitrogen and phosphorus nutrient loads. The load reductions achieved from these priority initiatives are summarized in [Table 2.2, Summary of Reductions from Priority Initiatives](#) (above). The reductions identified in this table account for the entire Pennsylvania Bay Watershed and do not account for individual county progress. Watershed-wide runs cannot account for variation in county plans.

The variation in county plans and nutrient reductions is summarized in Table 2.4 Pennsylvania Nutrient Reduction Priority Initiatives at the County Scale.

As detailed in Section 1. IV. above, because Pennsylvania's focus is on local water quality, Pennsylvania works with two sets of planning targets for its nutrient loading goals because not all the nutrients that reach Pennsylvania's waterways reach the Chesapeake Bay. These two sets of loads and reduction numbers come from the Chesapeake Bay Programs Office tool called the Chesapeake Assessment Scenario Tool (CAST), which defines the nutrient load delivered to the Chesapeake Bay as *Edge of Tide* (EOT). For Pennsylvania to achieve the reduction needed for the Chesapeake Bay, Pennsylvania works with "local waterways" nutrient loads to resonate a stronger message with its citizens. "Local waterways" is defined in CAST as loads delivered to the *Edge of Stream* (EOS). The EOT reductions goals are lower than the EOS reductions goals because of an attenuation, or reduction, process. CAST accounts for the variation in attenuation and calculates the difference between the loads delivered to the Chesapeake Bay (EOT) and the loads delivered to the "local waterways" (EOS).

**Table 2.4 -- Pennsylvania Nutrient Reduction Priority Initiatives at the County Scale**

**Total Nitrogen and Phosphorus Reductions Local Waterways vs. Bay Totals**

County	TN Reduction-Local Waters (EOS)	% of Local Planning Target - N	TN Reduction-Bay (EOT)	TP Reduction-Local Waters (EOS)	% of Local Planning Target - P	TP Reduction-Bay (EOT)
Lancaster*	9,197,613	80%	5,885,735	521,292	111%	270,438
York*	3,213,027	80%	2,147,355	84,702	Goal Met	32,085
Franklin*	1,326,616	46%	1,108,708	69,653	70%	39,220
Lebanon	1,622,851	74%	1,113,876	93,747	126%	38,870
Cumberland	1,358,404	62%	930,296	78,904	267%	32,248
Centre	844,571	47%	513,366	49,237	112%	13,736
Bedford	1,028,464	61%	548,389	99,639	95%	24,363
Adams*	830,616	56%	518,300	39,284	99%	20,612
Northumberland	1,004,274	68%	739,067	31,982	102%	12,823
Perry	913,082	62%	657,080	56,633	91%	19,197
Snyder	965,004	67%	689,158	62,202	85%	22,565
Huntingdon	864,385	61%	601,679	64,296	106%	20,956
Columbia	814,022	58%	585,015	53,210	91%	20,128
Mifflin	769,213	64%	568,812	44,978	98%	16,353
Lycoming	662,694	56%	449,668	42,896	68%	14,425
Schuylkill	642,856	59%	395,271	32,475	91%	11,731
Bradford	814,839	88%	500,163	79,980	65%	28,325
Union	611,214	66%	452,479	33,892	111%	13,001
Juniata	541,930	60%	393,751	41,459	90%	13,900
Chester	473,022	54%	418,437	23,540	79%	19,607
Clinton	471,758	55%	319,595	37,256	58%	11,814
Tioga	414,958	49%	204,522	43,786	56%	13,599
Susquehanna	360,663	45%	173,799	43,020	53%	13,889
Dauphin	666,692	84%	476,829	28,273	Goal Met	11,010
Clearfield	200,471	30%	108,252	16,794	27%	4,580
Fulton	392,238	61%	307,221	39,255	85%	16,189
Berks	381,826	60%	258,930	19,046	113%	8,245
Blair	805,920	150%	526,559	57,429	Goal Met	24,991
Lackawanna	103,839	20%	45,574	7,490	73%	2,441
Luzerne	340,431	68%	235,211	16,715	93%	5,956
Montour	271,687	56%	187,206	9,393	Goal Met	3,523
Cambria	237,613	51%	114,242	16,193	51%	4,101
Sullivan	164,341	53%	89,579	12,081	48%	3,589
Potter	140,026	50%	69,354	22,571	54%	5,007
Somerset	102,480	64%	87,419	8,455	68%	3,662
Wyoming	138,346	90%	89,763	12,334	338%	4,572
Elk	24,220	24%	11,863	3,261	27%	677
Indiana	55,574	56%	27,153	3,580	62%	622
Cameron	24,947	26%	11,508	2,209	16%	509
Wayne	12,253	30%	4,293	1,608	39%	457
McKean	1,106	26%	369	180	22%	40
Jefferson	1,403	51%	728	55	53%	12
Carbon	312	Goal Met	246	22	9%	11
<b>Total</b>	<b>33,811,798</b>	<b>66%</b>	<b>22,566,820 (66%)</b>	<b>2,005,009</b>	<b>98%</b>	<b>824,079 (109%)</b>

County\*: Represents a county that has completed their countywide action plan

Figure 2.6 shows nitrogen reduction progress and projected reductions for the 43 Pennsylvania counties in the Chesapeake Bay watershed.

- The purple bar shows county progress towards reducing annual nitrogen loads from 1985 – 2017.
- The green bar shows the reductions from the state nutrient reduction priority initiatives described in [Section 2, State Actions](#).
- The blue bar shows reductions from completed Countywide Action Plans.
  - As counties finish the planning process, reductions will be updated, and the bar will change from green to blue.
- The percentage achieved represents the total reductions from either a Countywide Action Plan or the priority initiatives compared to the 2025 reduction goal.
- The red bar shows how much more each county needs to reduce to reach the 2025 planning goal. Figure 2.7 shows the same information for phosphorus reduction.

The state nutrient reduction priority initiatives serve as a starting point for counties as they complete their individual planning processes. Once a county's planning process is completed, its progress will be updated to reflect the results of its planning process.



Figure 2.6 – Nitrogen Reductions by County

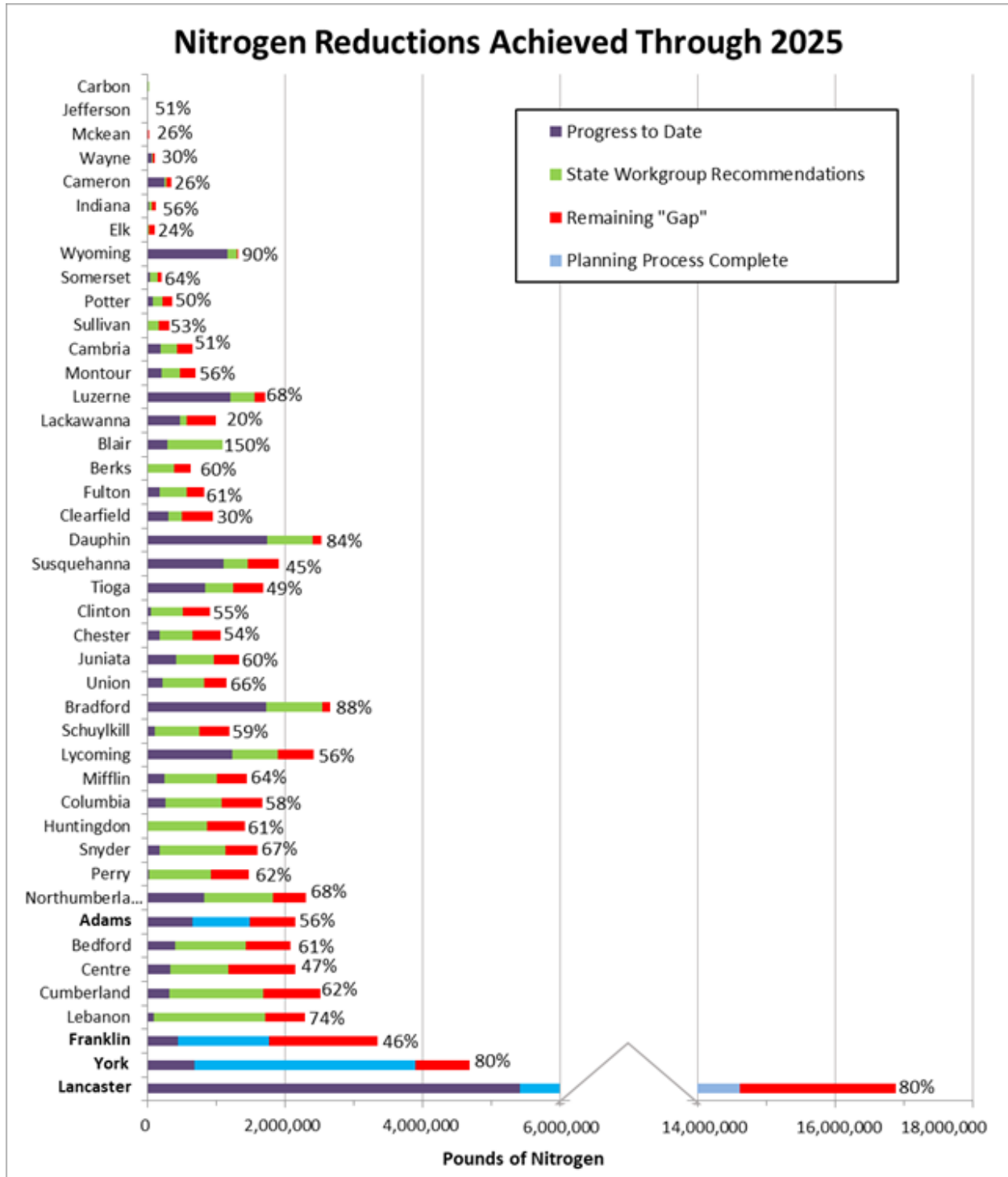
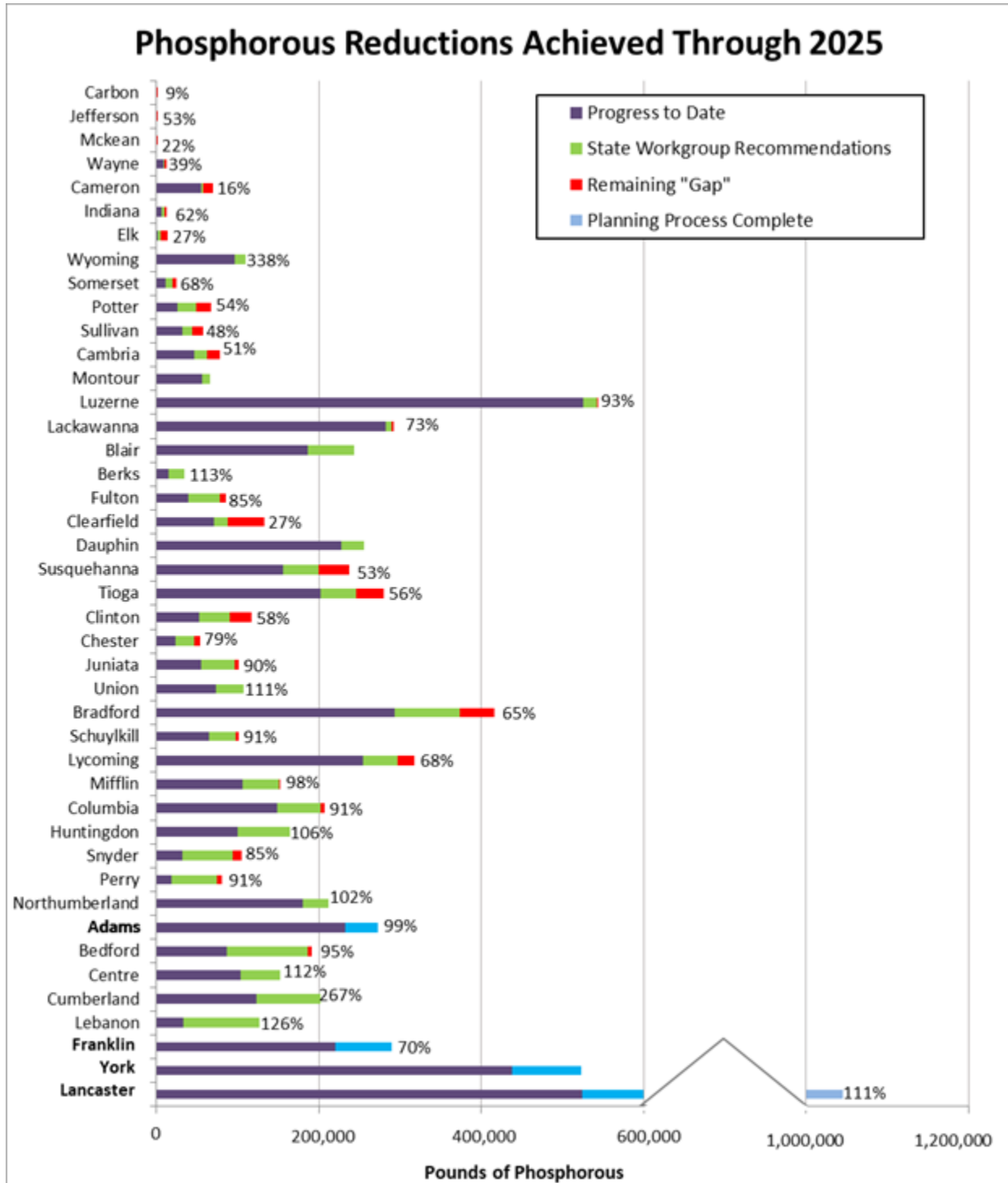


Figure 2.7 Phosphorus Reductions by County



## **VI. ADDRESSING UNDER-REPORTED BEST MANAGEMENT PRACTICES**

### **A. Existing Tracking, Reporting and Verification Protocols**

Pennsylvania has existing tracking, reporting and verification protocols in place that are accepted by the Chesapeake Bay Program Partnership. DEP has also taken steps since 2016 to enhance the capabilities of several programs to capture and document practices that have been put on the ground including:

- The creation of a central BMP Warehouse to house all the practices reported to DEP that have been implemented.
- The creation of software tools to facilitate the reporting of practices by those responsible for their implementation, including the geo-database PracticeKeeper for use by DEP and conservation district staff involved in agriculture and construction stormwater compliance inspections, and an interactive website for use by Municipal Separate Storm Sewer Systems (MS4s) for the submittal of annual reports.

In addition, DEP worked with the Phase 3 WIP partners to revise the existing BMP Verification Program Plan, engaging over 60 people who have different roles in BMP tracking and reporting. The resulting Pennsylvania BMP Verification Program ensures all practice implementation is accurately documented and verified, with the goal of a realistic and implementable process that meets the Chesapeake Bay Program Partnership Verification Program protocols.








While Pennsylvania is committed to working with EPA and the Chesapeake Bay Program to continue to implement and strengthen BMP verification activities that balance verification work and limited resources, this revised BMP Verification Program Plan focuses on verification of our Phase 3 WIP priority BMPs for control of nitrogen, phosphorous, and sediment in the Agriculture, Urban Stormwater and Forestry sectors.

Figure 2.6 shows the priority BMPs by sector and color-coded verification methodologies approved by the Chesapeake Bay Program Partnership and selected for the verification of these priority practices. Some BMPs have more than one verification methodology.

**Figure 2.6 – Priority BMPs and Verification Methodologies Matrix**

WIP Priority BMPs for Verification	Agriculture	Manure Transport	Tillage Practices	Dairy Precision Feeding	Cover Crop (Traditional)	Nutrient Management - Core Nitrogen and Core Phosphorus	Soil Conservation and Water Quality Plans	Nutrient Management- Supplemental Nitrogen and Phosphorus	Animal Waste Management Systems	Agriculture
		Manure Treatment Technologies	Prescribed Grazing	Barnyard Runoff Controls and Loafing Lot Management	Cover Crop (Commodity)	Grassed Buffers- with and without Stream Fencing	Forested Buffers- with and without Stream Fencing	Stream Restoration	Wetland Restoration	
	Urban Stormwater	Dry Detention Ponds and Hydrodynamic Structures	Dry Extended Detention	Vegetated Open Channels	Performance Standards: Bioretention Practices	Performance Standards: Infiltration Practices	Wet Ponds and Wetlands	Urban Forest Buffers	Stream Restoration	Urban Stormwater
		Riparian Forest Buffers	Urban Forest Expansion/ Conservation Landscaping	Urban Tree Canopy Expansion	Ag Stream Restoration	Urban Stream Restoration	Wetland Creation	Wetland Restoration	Forestry	

**Approved Methodologies:**

	Survey		Remote Sensing using Aerial Imagery
	Survey and/or Inspection		Remote Sensing using Aerial Imagery and/or Inspection
	Inspection		Remote Sensing using Lidar
			Remote Sensing using Lidar and/or Inspection

The BMP Verification Program Plan focuses on the plan for verifying the priority BMPs in sectors with non-point source pollution concerns.

The plans outlines:

- 1) Four sections: Agriculture, Urban Stormwater, Forestry, and Plan Implementation;
- 2) The WIP priority initiatives in each sector;
- 3) The sector-specific inspector/verifier qualifications listing the requirements for verifying that the priority BMPs are installed and functioning as designed;
- 4) Each WIP priority initiative and the associated priority BMPs for implementation and verification as part of that initiative; and finally,

- 5) An outline of existing programs and new verification projects that Pennsylvania will use to verify the priority BMPs listed prior.

The goal of Pennsylvania's BMP Verification Program Plan is to build a comprehensive, implementable program which verifies that priority practices identified in the Phase 3 WIP are installed, operational and continue to provide pollution reductions. This verification plan not only functions as a part of the data quality assurance, but also as an integral part of the Phase 3 WIP so that, as the Countywide Action Plans are implemented, and as needs and resource allocations change, this plan may be updated to include other projects and proposals.

## **B. Tracking, Reporting and Verification Improvement Initiatives**

More work is needed for Pennsylvania to capture all the undocumented practices that have either already been installed or will be installed in the future without public assistance or with funding sources not tracked by the current program.

Specifically, DEP is taking the following immediate action steps:

### **1. CAP Refinement Planning and Prioritization Tool**

Using funding from Pennsylvania's Chesapeake Bay Regulatory and Accountability Program Grant, the Chesapeake Conservancy and EPA Chesapeake Bay Program Office are working on software for a planning and prioritization tool for use in the development and future refinement of the CAPs. This software should be ready for use when the next two-year cycle begins where milestones from the CAPs need to be revised. A more detailed description of this tool and how it fits into the existing data management system is included above under [Existing Programs](#).

### **2. LIDAR Pilot Project**

Solicit requests for proposal for a pilot project for the use of LIDAR and remote sensing technology to identify BMPs installed for the control of stormwater as part of development activities described in the revised Pennsylvania BMP Verification Program Plan. This proposal will also include the utilization of third party individuals to do onsite verification of the results of this analysis.

### **3. PracticeKeeper Enhancement**

Continue enhancements to PracticeKeeper to allow for the capture of additional practices by other partners beyond conservation districts and DEP program staff.

### **C. Verification Goals**

In addition to the existing verification protocols and improvement initiatives listed above, Pennsylvania will explore an adjustment to the overall verification concept to be less of a routine practice and more of an audit process. If this shift can be made, more resources can be utilized to implement BMPs and install monitoring devices. Verification data will continue to be available and could be extrapolated for broader use.

## **VI. ACCOUNTING FOR STATE ACTIONS NOT CURRENTLY CREDITED TO PENNSYLVANIA**

There are several programs in the commonwealth that are integral to the improvement and protection of local waters that are either not tracked by Pennsylvania to report progress of achieving the nutrient and sediment reduction goals, or not accounted for within the context of the Chesapeake Bay Program. A concentrated effort to track and report these efforts is a key component of Pennsylvania's strategy to achieve these planning goals by 2025. Provisions for ongoing verification of the practices installed by these programs will also be incorporated into Pennsylvania's BMP Verification Program Plan.

### **A. Agriculture**

#### ***1. Farmland Preservation Program***

Pennsylvania leads the nation in the number of farms and acres permanently preserved for agricultural production. This is made possible under the Pennsylvania Agricultural Conservation Easement Purchase Program, a program that enables state and county governments to purchase conservation easements from farmers. The program was established in 1988. To date 5,329 farms have been approved for easement purchases totaling 552,702 acres.

The program guarantees a future food supply and contributes to a healthier economy. It also assures a way of life Pennsylvanians cherish will continue for generations to come.

Farms participating in the program are required to be inspected biennially. County farmland preservation programs are required to verify that the deed of easement is being followed, including verification that a conservation plan is being implemented.

#### ***2. Nutrient Trading Program***

DEP issued an interim Final Trading Policy in October 2005, which was finalized in November 2006. This policy was the basis for the development of the Nutrient Credit Trading Program. The primary purpose of the program is to provide a more cost-efficient way for National Pollutant Discharge Elimination System (NPDES) permittees in the Chesapeake Bay Watershed to meet their effluent cap load limits for nutrients.

The Program involves three steps: certification, verification, and registration:

1. *Certification* means approval has been given by DEP for a pollutant reduction activity to generate credits. The approved credit generator may or may not generate credits during a compliance year. Generated credits must be verified by DEP before they may be sold and registered to an NPDES permit.
2. *Verification* means approval has been given by DEP that a generator has used their approved verification plan to demonstrate that a pollutant reduction activity generated credits during the compliance year. Verified credits may be sold.
3. *Registration* means approval has been given by DEP for a sale of credits upon review of an agreement between a buyer and seller. Registered credits may be applied to meet NPDES permit cap load requirements or resold.

Trades can take place through direct communication between credit buyers and credit generators, or the participating parties may use PENNVEST nutrient credit auctions to buy or sell credits. Credits bought/sold through PENNVEST auctions must still go through all three steps in the DEP Nutrient Trading Program.

### **B. Act 537 Sewage Facilities Program**

Septic denitrification, septic secondary treatment and septic pumping can achieve net reductions in bay pollutants of concern, and will be tracked to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward.

### **C. Stormwater**

DEP and delegated conservation districts administer the statewide Erosion and Sediment Control (E&S) program under 25 Pa. Code Chapter 102. Inspections are performed on active sites and upon permit termination. Permits are required for the following activities:

#### **1. E&S Permits**

Timber harvesting and road maintenance activities involving 25 or more acres of earth disturbance. An E&S Permit is required under Pennsylvania's Clean Streams Law for these activities, rather than a NPDES permit.

#### **2. ESCGP Permits**

Oil and gas activities (e.g., exploration, production, processing, treatment operations or transmission facilities) involving five or more acres of earth disturbance. The E&S permit is required under Pennsylvania's Clean Streams Law for these activities. If eligible, persons conducting these activities may submit a Notice of Intent (NOI) for coverage under the E&S General Permit (ESCGP-3).

### ***3. Redevelopment and Brownfields Post Construction Stormwater Management***

When a redevelopment project triggers a Chapter 102 permit, the permittee must manage 20% of the existing impervious area as if it were a “meadow in good condition,” which decreases the post construction stormwater runoff generated from the project site when compared with the existing developed condition. The intent of this provision is to provide some stormwater controls on property that was previously developed with little or no stormwater BMPs. This “retrofit” stormwater runoff requirement can result in a net reduction of bay pollutants of concern. These net reductions in bay pollutants will be tracked to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward.

### ***4. Municipal Separate Storm Sewer System (MS4) Permits***

Municipalities and other entities such as universities and prisons that meet certain standards must obtain NPDES permit coverage for discharges of stormwater from their municipal separate storm sewer systems (MS4s).

In Pennsylvania, there are two large MS4s, no medium MS4s, and 1,059 small MS4s. MS4s must apply for NPDES permit coverage or a waiver if they are located in an urbanized area as determined by the latest Decennial Census by the U.S. Census Bureau, or if they are designated as needing a permit by DEP.

For the current permit term, MS4s that discharge to surface waters impaired for certain pollutants or that discharge to waters in the Chesapeake Bay watershed are required to develop Pollutant Reduction Plans (PRPS) or TMDL Plans. To date, reductions of Chesapeake Bay pollutants from MS4 PRP efforts has not been credited. DEP will ensure that such efforts are credited going forward.

### ***5. PennDOT, Turnpike Commission and Other Institutional MS4 Permits***

DEP anticipates additional reductions from the Pennsylvania Department of Transportation (PennDOT) and Turnpike Commission and other institutional MS4 permits which have not yet been renewed with the new PRP requirement. PennDOT and the Turnpike Commission are actively pursuing BMP installation, both independently and in collaboration with municipalities, with the understanding that qualifying BMPs will be creditable to their upcoming permit term.

### ***6. CSO Green Infrastructure***

Combined Sewer Overflows (CSOs) that utilize green infrastructure practices to reduce stormwater flows into their systems that achieve net reductions in the discharge of Chesapeake Bay pollutants of concern will be tracked to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward.



## **7. Industrial Stormwater Permits**

Certain specific classes of industrial facilities must apply for Industrial Stormwater NPDES permit coverage. For those facilities that qualify for PAG-03 General Permit coverage, an alternative to obtaining permit coverage is to request “No Exposure Certification” if the facility qualifies. In general, all industrial materials and activities must be stored and conducted indoors or under roof for a facility to qualify for No Exposure Certification. The No Exposure Certification alternative is not available to facilities in High Quality or Exceptional Value watersheds and must be renewed every five years. Some industrial stormwater permittees utilize practices that reduce Chesapeake Bay pollutants. DEP commits to finding opportunities to achieve further reductions from this class of permittees through incentivized priority BMPs installation.

### **D. Legacy Sediment Programs**

Projects for removal of legacy sediment and local stream restoration in areas neighboring a removed dam have been shown to provide nutrient and sediment reductions at significantly lower costs with much lower impact in acreage in land affected, relative to more traditional land conservation practices. DEP will pursue and track legacy sediment reduction and restoration projects as an integral component of Pennsylvania’s Phase 3 WIP to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward.

### **E. Permitting Wetland, Stream Restoration and/or Riparian Buffer Restoration or Replacement Above 1:1 Ratio**

Currently there exists a barrier to wetland restoration and enhancement goals, in relationship with wetland regulatory program programs that doesn’t exist with the establishment of practices with other water regulatory programs. The Chesapeake Bay Program doesn’t acknowledge that wetland gains established under state regulatory permitting and compliance programs can be reported for purposes of meeting the wetland restoration and enhancement goals. DEP believes that it is both reasonable and practicable to track the regulatory wetland gains greater than the 1:1 ratio impact to mitigation within Pennsylvania’s portion of the Chesapeake Bay watershed, especially considering that the standards that are commonly associated with these practices are the same. To accomplish this, DEP intends to track all wetland restoration and enhancement acreage gains through regulatory means via DEP’s eFACTS database to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward. This database currently has the components to track this information. Further collaboration by DEP with the Wetland Expert Panel and the Chesapeake Bay Program Modeling Team to improve wetland reporting is also anticipated.

## **F. Compliance and Enforcement Wetland and/or Stream Restoration or Replacement Above 1:1 Ratio**

Compliance and enforcement actions by DEP which result in wetland, stream or riparian buffer restoration or replacement at greater than 1:1 ratio reduces Chesapeake Bay pollutants of concern which DEP will track to ensure such efforts are credited toward achieving the Pennsylvania Chesapeake Bay goals going forward.

## **G. Fish and Boat Commission Stream Restoration Initiative**

The Pennsylvania Fish and Boat Commission (PFBC) works with a diverse group of partners including local, state and federal agencies, nonprofit organizations and landowners to develop and implement stream restoration projects in the Northcentral Region of the Susquehanna River watershed. The current program focuses on instream fish habitat enhancement and bank stabilization but plans to expand the program include the incorporation of riparian buffer plantings and streambank fencing when feasible.

Using the current program as an example, DEP and the PFBC are also looking into the feasibility of expanding this initiative into other areas of the watershed, starting with one or more of the four pilot counties including Franklin, Adams, York or Lancaster. To accomplish this, additional staff resources at the PFBC will be needed.

## **H. Chesapeake Bay Foundation Keystone 10 Million Trees Partnership**

The Keystone 10 Million Trees Partnership, coordinated by the Chesapeake Bay Foundation, is a collaborative effort to add 10 million new trees by the end of 2025 by increasing agricultural, urban, and suburban forested riparian buffers, urban and suburban tree canopy, and abandoned mine land reclamation.

Launched in spring 2018, a coalition of diverse organizations are committed to making the Keystone 10 Million Trees Partnership goal a reality. This growing list of partners includes a range of local, regional, and national conservation groups, commonwealth and federal government organizations, nursery and tree supply businesses, and other businesses throughout Pennsylvania and the Mid-Atlantic.

The Partnership will accelerate native tree planting efforts in identified locations, raise public awareness, and help establish sustainable, science-based management of tree planting and ongoing tree care and maintenance.

Ultimately, adding 10 million native trees to Pennsylvania's landscape will not only help achieve local and regional water quality goals, but also reduce nuisance flooding, improve air quality, beautify communities, protect sources of public drinking water, along with boosting the local economy.

Table 2.4 is a tabulation of the programs discussed above and identifies these programs and the BMPs typically associated with them to show the scope of practices that could be reported from each program.

**Table 2.4 Other Programs that Enhance Pennsylvania’s Programmatic Capacity**

Sector	Description	Typical Associated CBP BMPs
Agriculture	Pennsylvania Department of Agriculture Farmland Preservation Program	Soil Conservation and Water Quality Plans; Animal Waste Management Systems; Barnyard Runoff Control; Loafing Lot Management; Forest Buffers; Grassed Buffers
	Nutrient Trading Program	Manure Treatment Technology; Manure Transport
Wastewater	Act 537 Sewage Facilities Program	Septic Denitrification; Septic Secondary Treatment; Septic Pumping
Stormwater (Developed)	NPDES MS4 Program – TMDL/Pollutant Reduction Plan BMPs (to date, all E&S and PCSM BMPs have been reported via NPDES Construction Stormwater Program*)	Urban Tree Canopy; Bioretention/Rain Gardens; Street Sweeping; Permeable Pavement; Impervious Disconnection; Stream Restoration; Stormwater Performance Standards (Retrofits) Stormwater Performance Standards (New); Urban Forest Buffers
	Redevelopment/Brownfields Retrofits	102.8(g)(2)(ii) Post Construction Stormwater Management BMPs
	CSO green infrastructure (including implementation due to enforcement/consent decrees)	Urban Tree Canopy; Green Roofs; Permeable Pavement; Bioretention/Rain Gardens; Bioswales; Urban Forest Buffers
	Oil and Gas – Erosion & Sediment Control General Permits (ESCGP)	E&S Control Level 3; Bioretention/Rain Garden; Vegetated Swale; Wet Ponds and Wetlands; Dry Extended Detention Ponds; Infiltration Practices; Stormwater Performance Standards (New); Forest Buffers
	Stormwater programs that result in net increase (greater than 1:1 ratio)	Urban Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
Water Obstruction and Encroachments Program	Wetland Mitigation (greater than 1:1 ratio)	Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
	Net Increase in Wetland Restoration/Creation due to compliance and enforcement	Forest Buffers; Stream Restoration; Wetland Restoration; Wetland Enhancement; Wetland Creation
Waterways Engineering Program	Legacy Sediment	Removal of legacy sediment and local stream restoration in areas neighboring a removed dam
Pennsylvania Fish and Boat Commission	Stream Restoration Program	Streambank Fencing, Forest Buffers, Stream Restoration, Wetland Creation
Chesapeake Bay Foundation	Keystone 10 Million Tree Partnership	Forest Buffers
* Pennsylvania does not receive full credit for these practices, improvements in data collection around them are currently being addressed.		

## VII. STATE AGENCY CAPACITY

### A. DEP Chesapeake Bay Office

There are several roles and responsibilities for the DEP Chesapeake Bay Office. Three of these roles and responsibilities are:

#### ***1. The Coordination of the Development of the Phase 3 WIP***

The Chesapeake Bay Office coordinated development of the Phase 3 WIP, which includes the updating of milestones and action steps on a two-year basis and progress reporting on a six-month basis. The milestones will be updated using the same template used by the workgroups and counties to develop their respective action plans. Progress reporting will be done using Figure 7.1, Progress Reporting Template. The action steps that will be tracked on a six-month basis using this template are identified in Section 7, Milestones and Progress Reporting. A complete list of all the action steps using the Progress Reporting Template can be found here.

#### ***2. The Coordination and Oversight for the Implementation of Support Elements of the Phase 3 WIP***

The Chesapeake Bay Office Phase 3 WIP implementation and support includes the development processes associated with: 1) Countywide Action Plan described in Section 2, Countywide Action Plan Development, Coordination and Administration; 2) The BMP Verification Program Plan that ensures successful tracking of progress and verification that practices installed on the ground are operating properly; and 3) The EPA Chesapeake Bay Accountability and Regulatory Program and Chesapeake Bay Implementation Grants.

#### ***3. The Coordination of Pennsylvania's Activities Related to the Other Identified Goals and Outcomes***

The Chesapeake Bay Partnership identified additional goals and outcomes in the 2014 Chesapeake Bay Watershed Agreement. Those goals and outcomes focus on activities or areas that can have a direct impact on, and facilitate successful implementation of, the Phase 3 WIP. The goals and outcomes most relevant to Pennsylvania's Phase 3 WIP identified by the Chesapeake Bay Program Partnership relate to the following: Brook Trout; Climate Resiliency; Fish Habitat; Forest Buffers; Healthy Watersheds; Protected Lands; Public Access; Stream Health; Tree Canopy and Wetlands.

The Chesapeake Bay Office currently has five people filling the different roles and responsibilities described above. Table 5.4 in Section 5, Existing and Needed Resources, includes a listing of these staff and the additional 12 staff needed to implement the additional work described in this Section and in [Section 3, Countywide Actions](#).

## **B. Other DEP and State Agency Capacity**

### **1. SCC and Conservation Districts – CAFO and NMP Oversight**

The State Conservation Commission (SCC) employs a Nutrient and Odor Management Program Director who oversees all Act 38-related activities. An additional staff of five people (four nutrient managers and one odor manager) work in conjunction with staff from 57 delegated county conservation districts, to implement and enforce the provisions of the Act 38 nutrient management regulations.

Conservation districts are delegated authority to review and approve Nutrient Management Plans; to perform site visits for new and amended Nutrient Management Plans; investigate complaints; and to perform annual status reviews (inspections) of all Act 38-regulated agricultural operations. Where there is no delegation, the SCC takes on those tasks.

In addition to the annual on-site inspections, conservation districts also perform complaint investigations under the Nutrient Management and Chapter 91 Manure Management delegation agreement. Complaint processing and follow-up include both CAFO and non-CAFO agricultural operations.

#### ***b. Other Agency Staff***

To implement the various initiatives and enhancements described above, DEP, DCNR, PDA, and the SCC have existing staff resources to devote to this effort. However, additional resources will also be needed. Table 5.4 in [Section 5, Existing and Needed Resources](#) includes a listing of both the existing and additional staff resources needed.

## **VIII. KEY ACTION STEPS**

To track and report progress, key action steps were selected to be reported on a six-month basis for the initiatives described above. These are summarized on [Section 7, Milestones and Progress Reporting](#). The details on the action steps can be found in the Progress and Reporting Template.

## SECTION 3. COUNTYWIDE ACTIONS

### I. BACKGROUND

Since April 2017, a collaborative effort has been underway to develop Countywide Action Plans (CAPs). The initiative has included representatives from government agencies, the state legislature, county and local governments, industry associations, non-governmental organizations (NGOs), and citizens. The Environmental Protection Agency (EPA) has expressed support for jurisdiction-specific plans tailored to the unique considerations of each state and the District of Columbia. To that end, Pennsylvania created a Local Area Goals Workgroup to investigate options and make recommendations for local planning in the commonwealth.

In fall 2017, the workgroup looked at several geographic options for assigning local planning goals for nitrogen and phosphorus (from land-river segments (505) to sub-basins (6)). Based upon their recommendation, the Phase 3 WIP Steering Committee decided that county-based goals would be the most feasible in terms of size, number, existing data levels, and ability to organize resources. Pennsylvania’s nitrogen and phosphorus reduction targets are broken down into local planning goals for each of these counties. As a group, these local pollution reductions will help Pennsylvania reach its clean water goals. To calculate the local planning goal for each county, it was further decided that each county would achieve an equal percentage of the total level of effort possible, (or “Everybody does Everything, Everywhere.”)

The 43 counties in Pennsylvania’s Chesapeake Bay watershed were further divided into four tiers, based on the relative opportunity to improve water quality in the Chesapeake Bay through nutrient reductions in each county. Each tier is assigned 25% of the total planning targets for Pennsylvania. Table 3.1 is a listing of each county in the watershed and the tier to which they were assigned.

**Table 3.1 – County Tiers**

Tier 1 - First 25% of Reductions	Tier 2 - Second 25% of Reductions	Tier 3 - Third 25% of Reductions		Tier 4 - Last 25% of Reductions	
Lancaster York	Franklin Lebanon Cumberland Centre Bedford	Adams Northumberland Perry Snyder Huntingdon Columbia Mifflin Lycoming	Schuylkill Bradford Juniata Clinton Tioga Susquehanna Clearfield Fulton	Union Chester Dauphin Berks Blair Lackawanna Luzerne Montour Cambria Sullivan	Potter Somerset Wyoming Elk Indiana Cameron Wayne McKean Jefferson Carbon

## II. THE FOUR COUNTY PILOT PROJECT

With support from the EPA Chesapeake Bay Program Office, the Susquehanna River Basin Commission (SRBC), DEP and the Communications and Engagement Workgroup, the Local Area Goals Workgroup developed a planning process and a county-specific Community Clean Water Toolbox. The purpose of this planning process and the toolbox was to assist in the development of the local Countywide Action Plans (CAPs) that are intended primarily to improve local water quality and to provide related benefits for those localities.

As part of the Phase 3 WIP planning process, four counties participated in a pilot project to develop local CAPs. Lancaster and York counties began in spring 2018, with Adams and Franklin counties beginning in late summer 2018.

During this process, the pilot counties gathered to share updates including their local planning process, identified challenges, lessons learned, and recommendations for a more effective process. Additionally, joint planning meetings were held to share both county planning team and state Phase 3 WIP workgroup draft recommendations for nutrient reduction, identify overlaps and resulting nutrient reductions, explore areas for further reductions, and recommend and decide next steps for moving forward together.

The final CAPs for the four counties are a merging of the Phase 3 WIP workgroup sector recommendations and the identified local initiatives and priorities. The result of this process is a brand new, bottom-up, county-based clean water planning approach that brings all levels of partners together for collaboration. Using this locally-driven planning approach, the state and local communities can share responsibilities, resources and plan how to address local water quality goals, resulting in CAPs that are realistic and implementable.

### A. Programmatic and Numeric Results for the Four Pilot Counties

Table 3.2 represents the total reductions achieved from Pennsylvania's four completed CAPs. The percentage for the counties is based on each county's respective planning goal, and the total percentage is based on Pennsylvania's overall 2025 planning goal. These are the total reductions from each county's respective breakout of sector.

**Table 3.2 Summary of Pilot County Results**

	<b>Nitrogen (pounds)</b>	<b>Percent of County Goal</b>	<b>Phosphorus (pounds)</b>	<b>Percent of County Goal</b>
Adams	830,616	56%	39,284	99%
Franklin	1,326,616	46%	69,653	70%
Lancaster	9,197,613	80%	521,292	111%
York	3,213,027	80%	84,702	100%
<b>Total</b>	<b>14,567,872</b>	<b>29% (PA)*</b>	<b>714,931</b>	<b>35% (PA)*</b>

\* Reductions from the CAPs represent isolated suites of BMPs, whereas the statewide reductions take into account the interaction between all BMPs.

## 1. Lancaster County's Countywide Action Plan (CAP) Summary

Lancaster County's Clean Water Partners (CWP) are taking the lead in the implementation of Lancaster County's CAP. The below summary includes the current conditions for Lancaster County, pollution reduction progress, and the BMPs identified to achieve these reductions. All the numbers below represent nutrient goals and reductions to local waterways. The process that Lancaster County underwent to develop their plan is detailed in the Community Clean Water Planning Guide that will be provided to other counties.

### a. Current Conditions

Lancaster County is the highest loading county in Pennsylvania's Chesapeake Bay Watershed. It is important to acknowledge Lancaster County's unique situation as there are twice as many dairy cows in Lancaster County as in Maryland and 25 percent more than found grazing in all of Virginia; twice as many farms in the county than all of Delaware; and the number of layer chickens, beef cattle and pigs is more than in all the rest of the parts of Pennsylvania, Maryland, Virginia, Delaware and New York that are located in the Chesapeake Bay watershed. Current loading rates are 27.19M pounds (lbs) of nitrogen and 1.27M lbs of phosphorous annually. By 2025, Lancaster County's goal is to reduce 11.46M lbs of nitrogen and 0.47M lbs of phosphorous annually. Table 3.3 shows Lancaster County's current load for nitrogen and phosphorus and the reduction goals for each.

**Table 3.3 Summary of Lancaster County's Pollutant Reduction Goal**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Current</b>	27,193,871	1,265,040
<b>Goal</b>	11,464,871	468,305

### b. Pollutant Reduction Progress

Lancaster County has developed a plan to reduce approximately 9.20M lbs (80%) of the nitrogen goal and approximately 0.52M lbs (100%) of the phosphorous goal. There is no planning target for sediment, but the CAP reduced approximately 287.61M lbs of Sediment (32%) of the current load. Table 3.4 shows Lancaster County's reduction goal for nitrogen and phosphorus and the reduction amount and percentage achieved in the plan for each.

**Table 3.4 Summary of Lancaster County's Pollutant Reduction Progress**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Goal</b>	11,464,871	468,305
<b>Amount Achieved</b>	9,197,613	521,292
<b>Percent Achieved</b>	80%	100%



When the phosphorus goal is exceeded, the excess phosphorus can be converted into nitrogen reductions.

**c. Best Management Practices (BMPs)**

Lancaster County has identified a list of BMPs that result in a total reduction of approximately 9.20M lbs of nitrogen and approximately 0.52M lbs of phosphorus. Table 3.5 provides their list of the specific BMP commitments and quantities of each. The full details of their BMPs is included in their CAP. Appropriate flexibility for practices is allowed in order to meet or exceed their proposed reductions.

**Table 3.5 Lancaster County’s BMP List**

BMP Name	Quantity	Units
Nutrient Management Core N	150,000.00	Acres
Nutrient Management Core P	150,000.00	Acres
Nutrient Management N Placement	6,661.00	Acres
Nutrient Management N Rate	6,661.00	Acres
Nutrient Management N Timing	6,661.00	Acres
Nutrient Management P Placement	6,661.00	Acres
Nutrient Management P Rate	6,661.00	Acres
Nutrient Management P Timing	6,661.00	Acres
Tillage Management-Conservation	80,000.00	Acres
Tillage Management-High Residue	110,000.00	Acres
Cover Crop Commodity	11,000.00	Acres
Cover Crop Traditional	2,500.00	Acres
Cover Crop Traditional with Fall Nutrients	100,000.00	Acres
Manure Transport	150,000.00	Tons
Animal Waste Management System	100,000.00	Number of Systems
Manure Treatment Technologies	20,000.00	Tons
Grass Buffer-Streamside with Exclusion Fencing	2,500.00	Acres
Barnyard Runoff Control	100.00	Acres
Soil Conservation and Water Quality Plans	200,000.00	Acres
Precision Intensive Rotational/Prescribed Grazing	10,000.00	Acres
Manure Incorporation	10,000.00	Acres
Forest Buffer - Narrow	100.00	Acres
Forest Buffer	6,000.00	Acres
Non-Urban Stream Restoration	40,000.00	Linear Feet
Wetland Restoration - Floodplain	50.00	Acres
Urban Stream Restoration	5,280.00	Linear Feet
Bioretention/raingardens	202.00	Acres Treated
Erosion and Sediment Control Level 2	500.00	Acres
Filter Strip Runoff Reduction	10.00	Acres Treated
Wet Ponds and Wetlands	290.00	Acres Treated
Storm Drain Cleanout	29,610.00	Pounds of Sediment
Grey Infrastructure	23,772.00	Acres Treated

BMP Name	Quantity	Units
Dirt and Gravel Roads	158,000.00	Feet
Street Sweeping	63.00	Acres
Dry Ponds	312.00	Acres Treated
Infiltration Practices	70.00	Acres Treated
Extended Dry Basin	77.00	Acres Treated
Vegetated Open Channel	384.00	Acres Treated
Forest Buffer	10.00	Acres
Impervious Surface Reduction	50.00	Acres
Nutrient Management Plan	10,577.00	Acres
Bioswale	1,998.50	Acres Treated
Forest Buffer	201.31	Acres
Urban Stream Restoration	23,866.00	Feet
Non-Urban Stream Restoration	23,900.00	Linear Feet
Filtering Practices	610.10	Acres Treated
Infiltration Basin	18.60	Acres Treated
Mechanical Broom Technology - 1 pass/4 weeks	92.00	Acres
Permeable Pavement	0.89	Acres Treated
Stormwater Performance Standard-Runoff Reduction	892.44	Acres Treated
Stormwater Performance Standard-Stormwater Treatment	118.34	Acres Treated
Dry Extended Detention Ponds	224.79	Acres Treated
Dry Detention Ponds and Hydrodynamic Structures	74.10	Acres Treated
Wetland Creation - Floodplain	2.00	Acres
Tree Planting - Canopy	50.00	Acres
Septic Connection	3,000.00	Number of Systems
Pumpout	10,000.00	Number of Systems
Land Retirement to Ag Open Space	500.00	Acres

#### d. Local Benefits

To restore the health of Lancaster County watersheds and streams, hard work is needed to address pollution. Collaboration between groups will increase the pace as well as the collective impact of the work. Increased support for restoration efforts will improve habitat for fish and waterfowl, prevent erosion, improve soil quality, and provide recreational and economic opportunities to all Lancaster County residents.

#### e. Additional Details

Details on the planning process to develop Lancaster County's CAP, can be read in the Community Clean Water Planning Guide. Additionally, links to the following documents can be found here:

- Snapshot summary
- CAP Narrative
- Planning Templates (6)

## 2. York County's Countywide Action Plan (CAP) Summary

The York County Coalition for Clean Water, led by the York County Planning Commission, coordinated the transparent planning process for York County's CAP. The below summary includes the current conditions for York County, pollution reduction progress, and the Best Management Practices (BMPs) identified to achieve these reductions. All the numbers below represent nutrient goals and reductions to local waterways. The process that York County underwent to develop their plan is detailed in the Community Clean Water Planning Guide that will be provided to other counties.

### a. Current Conditions

York County is the second highest loading county in Pennsylvania's Chesapeake Bay Watershed. By 2025 York County's goal is to reduce approximately 4.00M lbs of nitrogen annually, they have already achieved their phosphorous goal. Table 3.6 shows York County's current load for nitrogen and phosphorus and the reduction goals for each.

**Table 3.6 Summary of York County's Pollutant Reduction Goal**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Current</b>	11,993,095	446,995
<b>Goal</b>	4,004,187	0

### b. Pollutant Reduction Progress

York County has developed a plan to reduce approximately 3.21M lbs (80%) of nitrogen and approximately 84.70K lbs (100%) of phosphorous. There is no planning target for sediment, but York County's plan reduced approximately 354.83M lbs (37%) of the current load. Table 3.7 shows York County's reduction goal for nitrogen and phosphorus and the reduction amount and percentage achieved in the plan for each.

**Table 3.7 Summary of York County's Pollutant Reduction Progress**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Goal</b>	4,004,187	0
<b>Amount Achieved</b>	3,213,027	84,702
<b>Percent Achieved</b>	80%	100%

When the phosphorus goal is exceeded, the excess phosphorus can be converted into nitrogen reductions.

### c. Best Management Practices (BMPs)

York County has identified a list of BMPs in their CAP that result in a total reduction of approximately 3.21M lbs of nitrogen. Table 3.8 provides their list of the specific BMP

commitments and quantities of each. The full details of their BMPs is included in their CAP. Appropriate flexibility for practices is allowed in order to meet or exceed their proposed reductions.

**Table 3.8 York County’s BMP List**

<b>BMP Name</b>	<b>Amount</b>	<b>Units</b>
Tree Planting - Canopy	4.25	Acres
Bioswale	7.80	Acres Treated
Forest Buffer	22.20	Acres
Wetland Restoration	6	Acres
Infiltration Basin	32.40	Acres Treated
Bioretention/raingardens	37	Acres Treated
Stormwater Performance Standard-Stormwater Treatment	216.48	Acres Treated
Stormwater Performance Standard-Runoff Reduction	0.34	Acres Treated
Urban Stream Restoration	56,688	Linear Feet
Nutrient Management Plan	50,000	Acres
Forest Buffer	76	Acres
Bioretention/raingardens	2.50	Acres Treated
Land Retirement to Ag Open Space	1,500	Acres
Nutrient Management Core N	185,000	Acres
Nutrient Management Core P	88,400	Acres
Nutrient Management N Rate	88,400	Acres
Nutrient Management N Timing	88,400	Acres
Tillage Management-High Residue	90,000	Acres
Tillage Management-Conservation	35,000	Acres
Cover Crop Traditional	55,000	Acres
Animal Waste Management System	3,000	Animal Units
Barnyard Runoff Control	70	Acres
Precision Intensive Rotational/Prescribed Grazing	16,000	Acres
Non-Urban Stream Restoration	5,000	Linear Feet
Grass Buffer	6,000	Acres
Forest Buffer	6,000	Acres
Manure Incorporation	10,000	Acres
Off Stream Watering Without Fencing	500	Acres
Tree Planting	100	Acres
Soil Conservation and Water Quality Plans	180,000	Acres
Wetland Restoration - Floodplain	12	Acres
Erosion and Sediment Control Level 2	17,500	Acres
Dirt & Gravel Road Erosion & Sediment Control – Driving Surface Aggregate + Raising the Roadbed	31,680	Feet
Dirt & Gravel Road Erosion & Sediment Control – Driving Surface Aggregate with Outlets	168,960	Feet
Dirt & Gravel Road Erosion & Sediment Control – Outlets only	31,680	Feet
Forest Buffer	20	Acres
Forest Buffer-Streamside with Exclusion Fencing	2.50	Acres
Grass Buffer-Streamside with Exclusion Fencing	5	Acres

BMP Name	Amount	Units
Forest Buffer-Narrow with Exclusion Fencing	2.50	Acres
Grass Buffer-Narrow with Exclusion Fencing	5	Acres
Grass Buffer	5	Acres
Grass Buffer - Narrow	5	Acres
Non-Urban Stream Restoration	73,500	Linear Feet
Urban Stream Restoration	7,000	Linear Feet
Wetland Restoration - Headwater	7	Acres
Wetland Restoration - Floodplain	7	Acres
Wetland Creation - Floodplain	7	Acres
Wetland Creation - Headwater	7	Acres
Wetland Enhancement	7	Acres

#### **d. Local Benefits**

Storm events are the number one way for nutrients and sediment to enter waterways. Increased runoff impacts flooding, water quality, habitat, etc. Flooding affects safety, property, infrastructure and economics. York County relies on local water sources to supply drinking water to its residents. Livestock, just like humans, depend on clean water.

#### **e. Additional Details**

Details on the planning process to develop York County's CAP, can be read in the Community Clean Water Planning Guide Links to the following documents can be found here:

- Snapshot summary
- CAP Narrative
- Programmatic Recommendations Template
- Planning Templates

### **3. Franklin County's Planning Process**

Franklin County's Planning Commission took the lead, in partnership with the Franklin County Conservation District, in the development and implementation of the Franklin County CAP. The below summary includes the current conditions for York County, pollution reduction progress, and the BMPs identified to achieve these reductions. All of the numbers below represent nutrient goals and reductions to local waterways. The process that Franklin County underwent to develop their plan is detailed in the Community Clean Water Planning Guide that will be provided to other counties.

#### **a. Current Conditions**

Franklin County is the third highest loading county in Pennsylvania's Chesapeake Bay Watershed. By 2025, Franklin County needs to reduce approximately 2.90M lbs of

nitrogen and approximately 99.99K lbs of phosphorous. Table 3.9 shows Franklin County’s current load for Nitrogen and Phosphorus and the reduction goals for each.

**Table 3.9 Summary of Franklin County’s Pollutant Reduction Goal**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Current</b>	7,793,008	394,218
<b>Goal</b>	2,897,708	99,992

**b. Pollutant Reduction Progress**

Franklin County has developed a plan to reduce approximately 1.33M lbs (46%) of the nitrogen goal and approximately 69.65K lbs (70%) of the phosphorous goal. There is no planning target for sediment, but Franklin County’s plan reduced approximately 75.84M lbs of sediment (18%) of the current load. Table 3.10 shows Franklin County’s reduction goal for Nitrogen and Phosphorus and the reduction amount and percentage achieved in the plan for each.

**Table 3.10 Summary of Franklin County’s Pollutant Reduction Progress**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Goal</b>	2,897,708	99,992
<b>Amount Achieved</b>	1,326,616	69,653
<b>Percent Achieved</b>	46%	70%

**c. Best Management Practices (BMPs)**

Franklin County has identified a list of BMPs that result in a total reduction of approximately 1.33M lbs of nitrogen and approximately 69.65K lbs of phosphorous. Table 3.11 provides their list of the specific BMP commitments and quantities of each. The full details of their BMPs is included in their CAP. Appropriate flexibility for practices is allowed in order to meet or exceed their proposed reductions.

**Table 3.11 Franklin County’s BMP List**

<b>BMP Name</b>	<b>Quantity</b>	<b>Units</b>
Bioswale	68.09	Acres Treated
Infiltration Basin	62.64	Acres Treated
Bioretention/raingardens	363.94	Acres Treated
Stormwater Performance Standard-Runoff Reduction	35.12	Acres Treated
Stormwater Performance Standard-Stormwater Treatment	340.08	Acres Treated
Urban Stream Restoration	24,502	Feet
Forest Buffer	164.11	Acres
Permeable Pavement	0.31	Acres Treated
Street Sweeping	5.52	Miles

<b>BMP Name</b>	<b>Quantity</b>	<b>Units</b>
Wetland Restoration	65.00	Acres Treated
Tree Planting - Canopy	160.00	Acres
Tillage Management-Conservation	29,000	Acres
Tillage Management-High Residue	57,000	Acres
Tillage Management - Low Residue	10,000	Acres
Cover Crop Traditional	32,000	Acres
Cover Crop Traditional with Fall Nutrients	16,000	Acres
Cover Crop Commodity	0	Acres
Precision Intensive Rotational/Prescribed Grazing	6,500	Acres
Soil Conservation and Water Quality Plans	184,000	Acres
Nutrient Management Core N	161,400	Acres
Nutrient Management Core P	161,400	Acres
Nutrient Management N Timing	17,000	Acres
Nutrient Management N Rate	17,000	Acres
Nutrient Management P Timing	17,000	Acres
Nutrient Management P Rate	17,000	Acres
Manure Transport	10,000	Dry Tons
Non-Urban Stream Restoration	12,000	Linear Feet
Forest Buffer-Streamside with Exclusion Fencing	50	Acres
Forest Buffer-Narrow with Exclusion Fencing	50	Acres
Grass Buffer-Streamside with Exclusion Fencing	50	Acres
Grass Buffer-Narrow with Exclusion Fencing	50	Acres
Forest Buffer	100	Acres
Forest Buffer - Narrow	50	Acres
Grass Buffer	100	Acres
Grass Buffer - Narrow	50	Acres
Wetland Restoration - Floodplain	50	Acres
Off Stream Watering Without Fencing	8,500	Acres
Land Retirement to Ag Open Space	500	Acres
Animal Waste Management System	30,000	Animal Units
Tree Planting	40	Acres
Barnyard Runoff Control	134	Acres
Dairy Precision Feeding and/or Forage Management	3,000	Animal Units

#### **d. Local Benefits**

Franklin County promotes voluntary conservation and good stewardship of natural resource to maintain a balance and harmony between a profitable agricultural economy and other land uses to enhance their quality of life. The efforts of this planning project are indicative of this local mind set and are intended to protect their resources and those of their neighbors downstream.

**e. Additional Details**

Details on the planning process to develop Franklin County’s CAP can be read in the Community Clean Water Planning Guide. Links to the following documents can be found here:

- Snapshot summary
- CAP Narrative
- Programmatic Recommendations Template
- Planning Templates

**4. Adams County’s Countywide Action Plan (CAP) Summary**

Adams County’s Planning Commission took the lead, in partnership with the Adams County Conservation District, in the development and implementation of the Adams County CAP. The below summary includes the current conditions for Adams County, pollution reduction progress, and the BMPs identified to achieve these reductions. All of the numbers below represent nutrient goals and reductions to local waterways. The process that Adams County underwent to develop their plan is detailed in the Community Clean Water Planning Guide that will be provided to other counties.

**a. Current Conditions**

Adams County is one of the higher loading counties in Pennsylvania’s Chesapeake Bay Watershed. Adams County’s goal is to reduce approximately 1.49M lbs of nitrogen and approximately 39.5K lbs of phosphorous by 2025. Table 3.12 shows York County’s current load for Nitrogen and Phosphorus and the reduction goals for each.

**Table 3.12 Summary of Adams County’s Pollutant Reduction Goal**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Current</b>	4,721,732	360,406
<b>Goal</b>	1,494,803	39,509

**b. Pollutant Reduction Progress**

Adams County has developed a plan that intends to reduce approximately 830.62 K lbs. (56%) of the nitrogen goal and approximately 39.28K lbs. (99%) of the phosphorous goal. Sediment reductions are not required but this planning effort provides for a reduction of approximately 49.66M lbs (15%) of the current load. Table 3.13 shows Adams County’s reduction goal for nitrogen and phosphorus and the reduction amount and percentage achieved in the plan for each.



**Table 3.13 Summary of Adams County’s Pollutant Reduction Progress**

	<b>Nitrogen (lbs annually)</b>	<b>Phosphorus (lbs annually)</b>
<b>Goal</b>	1,494,803	39,509
<b>Amount Achieved</b>	830,616	39,284
<b>Percent Achieved</b>	56%	99%

When the Phosphorus goal is exceeded, the excess Phosphorus can be converted into Nitrogen reductions.

**c. Best Management Practices (BMPs)**

Adams County has identified a list of BMPs that result in a total reduction of approximately 830.62K lbs. of nitrogen. Table 3.14 provides their list of the specific BMP commitments and quantities of each. The full details of their BMPs is included in their CAP. Appropriate flexibility for practices is allowed in order to meet or exceed their proposed reductions.

**Table 3.14 Adams County’s BMP List**

<b>BMPs</b>	<b>Amount</b>	<b>Units</b>
High Residue Till	55,500	Acres Annually
Conservation Till	13,000	Acres Annually
Cover Crops	30,000	Acres Annually
Cover Crop with Fall Nutrients	10,000	Acres Annually
Prescribed Grazing	3,500	Total Acres
Soil Conservation/Water Quality Plans	101,000	Acres Annually
Manure Incorporation	10,000	Acres Annually
Nutrient Management Core N	104,000	Acres Annually
Nutrient Management Rate N	10,000	Acres Annually
Nutrient Management Time N	10,000	Acres Annually
Nutrient Management Core	104,000	Acres Annually
Nutrient Management Rate P	10,000	Acres Annually
Nutrient Management Time P	10,000	Acres Annually
Stream Restoration Ag (feet)	10,000	New Linear Feet
Grass Buffer with Exclusion Fencing	200	New Acres
Forrest Buffer with Exclusion Fencing	100	New Acres
Grass Buffer	1,000	New Acres
Forest Buffers	500	New Acres
Saturated Buffers	??	
Wetland Restoration	25	Acres
Land Retirement to Open Space	1,500	New Acres
Forest Harvesting Practices	100	%
Waste Storage Facilities	4,000	New Animal Units
Barnyard Runoff Controls	15	New Acres
Dairy Precision Feeding	8,000	Total Dairy Cows Receiving

<b>BMPs</b>	<b>Amount</b>	<b>Units</b>
Dry Detention Ponds	0.5	Acres Treated
Retrofit Runoff Reduction	144.75	Acres Treated
Stream Restoration Urban	3,750	Linear Feet
Forest Buffer	16	Acres
Permeable Pavement	2.5	Acres
Street Sweeping	60	Miles

#### **d. Local Benefits**

Adams County promotes voluntary conservation and good stewardship of natural resources to maintain a balance and harmony between a profitable agricultural economy and other land uses to enhance their quality of life. The efforts of this planning project were indicative of this local mind set and were intended to protect their resources and those of their neighbors downstream.

#### **e. Additional Details**

Details on the planning process to develop Adams County's CAP can be read in the Community Clean Water Planning Guide. Links to the following documents can be found here:

- Snapshot summary
- CAP Narrative
- Programmatic Recommendations Template
- Planning Templates

### **III. TOTAL PHOSPHORUS REDUCTION TO THE BAY**

The four completed CAPs resulted in a decrease of 69,000 lbs of phosphorus. Once the remaining counties in Pennsylvania's portion of the Chesapeake Bay Watershed complete their respective CAPs, the total annual load reduction will be 824,000 lbs.

Pennsylvania was successful in meeting and overachieving the 2025 reduction goal for phosphorus. In collaboration with EPA's Bay Program Office it was determined an exchange ratio may occur if excess Pennsylvania was to over achieve a nutrient reduction goal. Pennsylvania has overachieved their 2025 phosphorous goal by 68,079 pounds of phosphorus and may exchange that for Nitrogen reduction based on the EPA's provided conversion factors. For the Susquehanna River Basin 1 pound of phosphorus may be exchanged for 2.36 pounds of nitrogen. In the Potomac River Basin 1 pound of phosphorus may be exchanged for 1.58 pound of nitrogen. This results with Pennsylvania achieving an additional 155,664 pound of nitrogen.

#### **IV. TOTAL NITROGEN REDUCTION TO THE BAY**

Pennsylvania has four completed CAPs (Lancaster, York, Franklin and Adams) the results of the CAPs completed so far for Pennsylvania result in an additional decrease of approximately 0.3 M lbs of nitrogen, for a total annual load reduction of approximately 22.57 M lbs.

Pennsylvania was successful in meeting and overachieving the 2025 reduction goal for phosphorus. In collaboration with EPA's Bay Program Office it was determined an exchange ratio may occur if excess Pennsylvania was to over achieve a nutrient reduction goal. Pennsylvania has overachieved their 2025 phosphorous goal by 68,079 pounds of phosphorus and may exchange that for Nitrogen reduction based on the EPA's provided conversion factors. For the Susquehanna River Basin 1 pound of phosphorus may be exchanged for 2.36 pounds of nitrogen. In the Potomac River Basin 1 pound of phosphorus may be exchanged for 1.58 pound of nitrogen. This results with Pennsylvania achieving an additional 155,664 pound of nitrogen.

Pennsylvania commits to have practices and controls in place by 2025 necessary to achieve the final Phase 3 WIP phosphorous and nitrogen targets. Pennsylvania in conjunction with the Partnership will utilize an adaptive management approach to achieve our collective desired outcome. The two-year milestones and bi-annual progress reporting will allow for the assessment of the implementation progress and targeted adjustments to programs and priorities to ensure the practices and controls called for in the Phase 3 WIP are achieved by 2025. See [Section 2. State Actions](#) for how these commitments will be achieved.

#### **V. TIER 2, 3 AND 4 COUNTY ENGAGEMENT**

##### **A. The CAP Development Process**

The county-based planning process provides an opportunity for everyone involved to learn more about their local waters. The planning process will start with a review of the county waters, the nutrients and pollutants running into them, and how local actions can reduce this. It will end with the development of Countywide Action Plans (CAPs) for all 43 counties in Pennsylvania's Chesapeake Bay watershed. To assist with the development of a CAP, each county planning team will receive county-specific planning tools, templates, a customized technical toolbox and technical support resources described below as they complete the process. The development process is detailed in the County and Phase 3 Workgroup Recommendations document.

## B. Agency Support Team

Each county planning team will be provided technical support resources as they complete the planning process. The technical support team will be comprised of:

- **Internal Coordinator:** This coordinator is a member of the DEP Chesapeake Bay Office. The internal coordinator serves as the point of contact for the technical support team and the county planning team. The internal coordinator is responsible for:
  - managing external coordinators, facilitator and technical contract staff.
  - oversight and management of technical contracts.
  - facilitating state resources for local planning and implementation.
  - assisting with the permitting and grant process for external coordinators.
  - helping in coordination with the verification process.
  - management and oversight of annual reporting and two-year milestone tracking.
- **External Coordinator:** The external coordinators serve as the point of contact to their assigned county(ies) and are funded through an agreement between DEP and the lead agency of the county planning team. These coordinators provide regular progress updates to the DEP internal coordinator. They would support county efforts to develop and implement the CAP by:
  - facilitating planning team efforts and coordinating regular meetings.
  - seeking financial resources to support county efforts (grants, partnerships, etc.).
  - helping counties with permitting of plan related projects.
  - developing and updating county plans and progress as needed.
  - submitting annual reports.
  - coordinating verification process within their designated county(ies).
- **Technical Coordinator:** The technical coordinator(s) are either a member of the EPA Chesapeake Bay Program Office or contracted by DEP to provide technical support to the county planning team. These coordinators report to the DEP Internal Coordinator. The Technical Coordinator will:
  - be responsible for providing information and facilitation of planning tools through the planning and implementation process.
  - assist with reporting and tracking of milestones and annual progress.
  - assist in model runs for plan development and during annual milestone updates.
- **Facilitation Coordinator:** The facilitation coordinator reports to the DEP Internal Coordinator. This coordinator is contracted by DEP to provide:
  - facilitation services.
  - organizational support.

## **C. Schedule for Implementation**

The completion and implementation of the CAPs will be done in a staged approach, incrementally scaling the resources and coordination of planning efforts. The staged approach rolls out in two phases over 18 months. Phase 1 uses the additional time to focus efforts on the eight higher loading Tier 1 and Tier 2 counties (54% of PA's nitrogen and 42% of PA's phosphorus loads). This approach allows for additional outreach to Tier 3 and 4 counties before their planning starts.

### **1. Staged Approach, Phase 1**

*Staged Approach, Phase 1*, focuses on planning and long-term implementation of the Phase 3 WIP. It includes continuation of the pilot process in the four pilot counties as they transition into implementation of their CAPs.

Phase 1 also begins the planning process for the four remaining Tier 2 counties. Tier 2 counties will be given 6 to 8 months to build countywide coalitions and develop CAPs. The Tier 2 counties begin the implementation phase immediately after plan development. This stage is proposed to begin July 1, 2019.

### **2. Staged Approach, Phase 2**

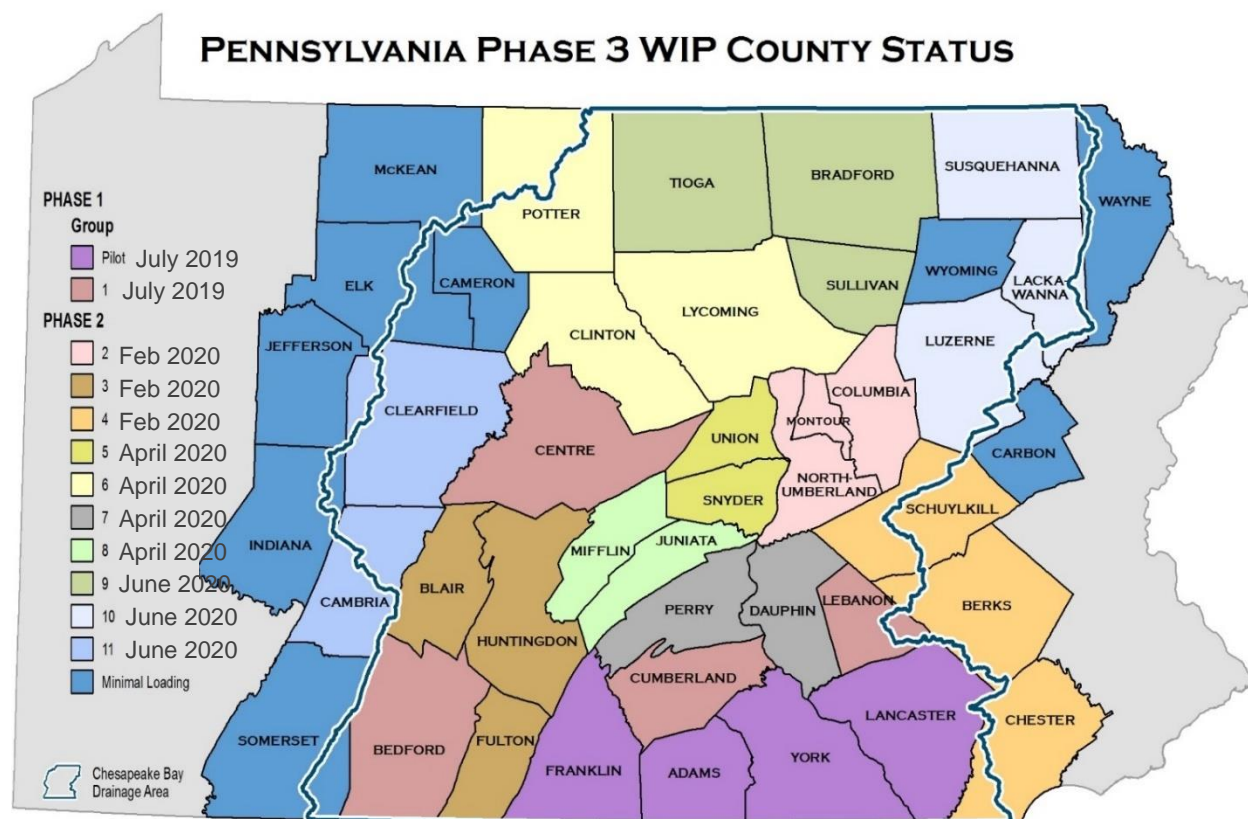
*Staged Approach, Phase 2*, focuses on planning and long-term implementation of Pennsylvania's WIP for 28 of the remaining 35 Tier 3 and Tier 4 counties, and target the remaining 46% of Pennsylvania's nitrogen and 58% of phosphorus loads.

During Phase 2, the technical support team described above will provide support on a regionalized basis for Tier 3 and 4 counties. The regionalized planning efforts group counties together, leveraging existing regional partnerships where feasible. Each county will still be required to submit an individual CAP but will be encouraged to work together with other counties during the planning effort.

Phase 2 begins after the completion of the planning process for Phase 1 counties, sometime around February 2020, depending on the availability of resources. All Tier 3 and Tier 4 counties will be given 6 to 8 months for planning and will immediately switch to the implementation phase once planning is complete.

Figure 3.3 is a graphical representation of this staged approach and shows which counties are involved in each phase. These phases are well thought out and planned in detail, but there remains flexibility to adjust if opportunities and/or limitations become apparent over time.

**Figure 3.3 – CAP Development Staged Approach**



### **3. Counties with Minimal Loadings**

There are currently nine counties with less than 200,000 pounds of nitrogen per county: Somerset, Wyoming, Elk, Indiana, Cameron, Wayne, McKean, Jefferson, and Carbon. Progress in these counties based on existing programs will continue to be documented and tracked. No additional staff resources will be devoted to additional planning efforts in these counties.

#### **D. Resource Needs**

This initiative is one of the core responsibilities for the DEP Chesapeake Bay Office. As a result, the resource needs for this initiative are incorporated into the overall description for this office in [Section 2, State Actions](#) and listed in Table 5.4 in Section 5, Existing and Needed Resources.

## **IV. KEY ACTION STEPS**

To track and report progress, key action steps were selected to be reported on a six-month basis for the initiatives described above. These are summarized on [Section 7, Milestones and Progress Reporting](#). The details on the action steps can be found in the Progress and Reporting Template.

## **SECTION 4 COMMUNICATION AND ENGAGEMENT STRATEGY**

### **I. BACKGROUND**

Local engagement, communication and outreach will continue to occur at multiple levels and in multiple ways as the Phase 3 WIP actions are implemented. This intentional, strategic engagement is key to the successful implementation of the Phase 3 WIP and improvement of local waters. The Communications Offices of DEP, DCNR and PDA, in partnership with the Phase 3 WIP Communications and Engagement Workgroup, have the lead in conducting this effort as the Phase 3 WIP is implemented.

Building on the “Healthy Waters, Healthy Communities” Communications Strategy described in [Section 1, Introduction](#), engagement, communication and outreach will continue as the Phase 3 WIP is finalized and implemented. The Communication and Engagement workgroup has identified the strategies and actions described below. Their work is intended not only to facilitate such engagement but to inspire people to want to become involved and take actions through implementation of practices.

### **II. ENGAGEMENT, COMMUNICATION AND OUTREACH DURING REVIEW OF THE DRAFT PLAN**

The draft Phase 3 WIP is being submitted to EPA and the Chesapeake Bay Program Partnership on April 12, 2019. This will start a formal public comment period through June 7, 2019. Pennsylvanians will not know to comment unless they are aware of that opportunity. In response to recommendations from the Communication and Engagement Workgroup, tactics will focus on encouraging public review of the draft Phase 3 WIP upon its release on April 12. DEP and its sister agencies will focus on the developmental tactics, while the Communications and Engagement Workgroup will lead delivery-related tactics.

#### **A. Developmental Tactics**

The cornerstone of the communications strategy during the public comment period will be the DEP website focused on the Phase 3 WIP. At the start of this effort, DEP developed an actively maintained, accessible website suited both for participants active in the development and implementation of the Phase 3 WIP and the general public. It is at [www.dep.pa.gov/chesapeakebay/phase3](http://www.dep.pa.gov/chesapeakebay/phase3).

To fully achieve the goals of this communications effort, DEP will add further enhancements including a “resource email account” to allow interested parties to submit questions, comments and concerns about the Phase 3 WIP and the Chesapeake Bay Program, and the accessibility of information and comment mechanisms has been refined by the agencies’ communication professionals so that they are “user friendly.” This resource account will also be available for those wanting to express interest in participating in future countywide action plan development and implementation.

Other resources identified by the Communications and Engagement Workgroup to be developed by DEP include:

- A series of informational sheets outlining the details in the Phase 3 WIP to use at events and in public forum discussions
- Notices about the opportunity to comment that could be included in mailings to drinking water and wastewater systems, Conservation Districts, PDA, Pennsylvania Cooperative Extension, and consultants/advisors

In addition, the communication offices of DEP, DCNR, and PDA will undertake the following actions to promote the opportunity to comment on the draft Phase 3 WIP:

- Providing links through all three agencies websites to the DEP webpage for the draft Phase 3 WIP
- Promote the opportunity in departmental newsletters
- During PDA's focused three weeks of intentional conservation outreach and messaging, highlight the comment opportunity
- The Secretaries of the three agencies will use speaking events to encourage input on the draft WIP when appropriate

DEP, at a minimum will also meet with the following advisory groups to solicit input during the public comment period:

- Joint meeting of the Pennsylvania delegates to the Chesapeake Bay Program Partnership Local Government and Citizen Advisory Committees – April 18, Susquehanna River Basin Commission, Harrisburg
- Agriculture Advisory Board – April 25, DEP Southcentral Regional Office, Harrisburg
- Citizen Advisory Committee – May 22, Room 105, Rachel Carson State Office Building, Harrisburg
- Water Resources Advisory Committee -- May 23, Room 105, Rachel Carson State Office Building, Harrisburg
- Conservation and Natural Resource Council – May 29

DEP will conduct a webinar for county conservation districts within the first few weeks of the public comment period to describe the phased approach for the development of the Countywide Action Plans described in [Section 3, Countywide Actions](#) and the proposed schedule so that those impacted will know what to expect and can plan accordingly.

### **1. *Delivery Tactics***

The Communications and Engagement Workgroup will identify industry and public events to present information about the Phase 3 WIP and encourage input through the public comment period. Some of those events include:

- Utility Management meetings held in the DEP Regional Offices



- Industry or Topic Specific Workshops as agendas allow.
- Industry Conferences as agendas allow including:
  - The Pennsylvania State Association of Township Supervisors Annual Conference – April 14 -17
  - Pennsylvania Land Conservation Conference hosted by the Pennsylvania Land Trust Alliance -- May 16–18
  - Choose Clean Water Coalition Conference – May 20-22
  - Pennsylvania Water Environment Association – June 2-4

In addition, where appropriate, focus groups will be organized to target sectors, such as farmers. For example, the Phase 3 WIP Agriculture Workgroup is hosting four small focus group forums with farmers in April to solicit input on the agriculture components of the Phase 3 WIP and the Phase 3 WIP Forest Workgroup will solicit comment through the 60+ member Riparian Forest Buffer Advisory Committee.

More broadly, all workgroup members, Co-chairs and Steering Committee members will be asked to send the DEP website link for the Phase 3 WIP to members, list serves, and other communication vehicles.

## **B. Engagement, Communication and Outreach During Phase 3 WIP Implementation**

Much of what will be used for engaging the public during the comment phase will be used for engagement around implementation.

### **1. Messages**

Local messaging will emphasize the importance for all the partners involved in the CAP, both at the state and local level, to be committed to the completion of action items and the actual implementation of the plan.

Again, building on the communications strategy already established and described above, key messages that will be used in the development of additional outreach materials to motivate people to put practices on ground include the following:

- The economic benefit of cleaner water, such as lower tillage and equipment costs, and improved crop, herd and soil health
- The health and environmental benefits of cleaner water, such as herd and soil health improvements, more productive fisheries, and recreation opportunities
- Voluntary actions can reduce the need for government intervention

## 2. Message Delivery

These messages will be delivered through the following mechanisms:

- DEP Healthy Waters, Healthy Communities: Pennsylvania in the Chesapeake Bay Watershed StoryMap – This is a web-based outreach tool that is being created:
  - To increase Pennsylvanians' awareness and knowledge of the value of healthy local waters to their lives; nonpoint source water pollution in our part of the Chesapeake Bay Watershed; efforts underway by many people and organizations to reduce it, including DEP's and other state agencies' work; and what they can do to help.
  - To be the big-picture digital home for the story of all the DEP-led and -partnered work happening in Pennsylvania's part of the Chesapeake Bay Watershed and a jumping-off point to other storymaps and websites for more specific facets.
  - Note - The StoryMap will have links to other information shared by partners, other agencies, and groups of interest.
- Milestones and Progress Reporting –
  - Milestones and action steps for the Phase 3 WIP must be updated every two years. This updating will allow for adjustments to be made and for those who are actively implementing elements of the Phase 3 WIP and the CAPs to adaptively manage the progress they are making based on the lessons learned.
  - Programmatic milestones and action steps will be reported every six months using the Progress and Reporting Template to the EPA Chesapeake Bay Program Office. In addition, progress on BMP implementation will be reported on an annual basis to the EPA Chesapeake Bay Program Office.
- The potential development of recorded webinars and videos for use on the website, YouTube, Facebook, or as Public Service Announcements (PSA's) to include:
  - The State Priority Initiatives and action plans for each sector
  - Webinars relating to priority BMPs, their implementation, and potential funding sources
  - The economics and benefits of specific practices, including stakeholder testimonials
  - Short messages from the agency Secretaries
  - How to leverage partnerships and sources of funding for technical and financial assistance
- Whenever possible, the use of outreach means such as:
  - Regular meetings with key stakeholder communicators (agency and partners) to keep the messaging about implementation going

- Existing social media platforms of agencies and partners
- Agency Education Centers
- Fact sheets on the CAPs, elements of the Phase 3 WIP
- Short messages on company bills to customers, such as utility bills
- Development and implementation of outreach campaigns focused on:
  - The Countywide Action Plan planning effort to include:
    - Letters/Fact Sheet to remaining counties
    - Opportunities for counties to share what's been done
    - Opportunities for stakeholders to share and be proud of accomplished practices
    - Case studies to showcase cost savings

### **III. RESOURCES**

In addition to existing program staff in DEP, DCNR, and PDA's communications offices, support will be needed for the immediate future for the development of outreach materials as described above. This effort will be funded through the EPA Chesapeake Bay Regulatory and Accountability Program Grant. Table 5.4 in Section 5, Existing and Needed Resources has a summary of the resource needs for the next two years needed to complete this communications and engagement strategy.

### **IV. KEY ACTION STEPS**

To track and report progress, key action steps were selected to be reported on a six-month basis for the initiatives described above. These are summarized on [Section 7, Milestones and Progress Reporting](#). The details on the action steps can be found in the Progress and Reporting Template.

## SECTION 5. EXISTING AND NEEDED RESOURCES

### I. INTRODUCTION

This section identifies the existing financial and staffing resources in Pennsylvania, the costs associated with the actions identified in the WIP, and the additional resources that are needed to meet the Chesapeake Bay TMDL goals.

### II. APPROACH TAKEN

#### A. Data Collection Efforts

The Phase 3 WIP Funding Workgroup collected data from four sources:

- State and federal funding programs and the amount of funding reported as spent in those programs
- The Phase 3 WIP workgroups and their identification of technical and financial resources available and needed.
- The four pilot counties and their identification of resources available and needed during the pilot planning process for their CAPs.
- The EPA Chesapeake Bay Program data system and CAST model for cost information on BMPs.

The results are summarized below in Table 5.1.

### III. SUMMARY OF RESULTS

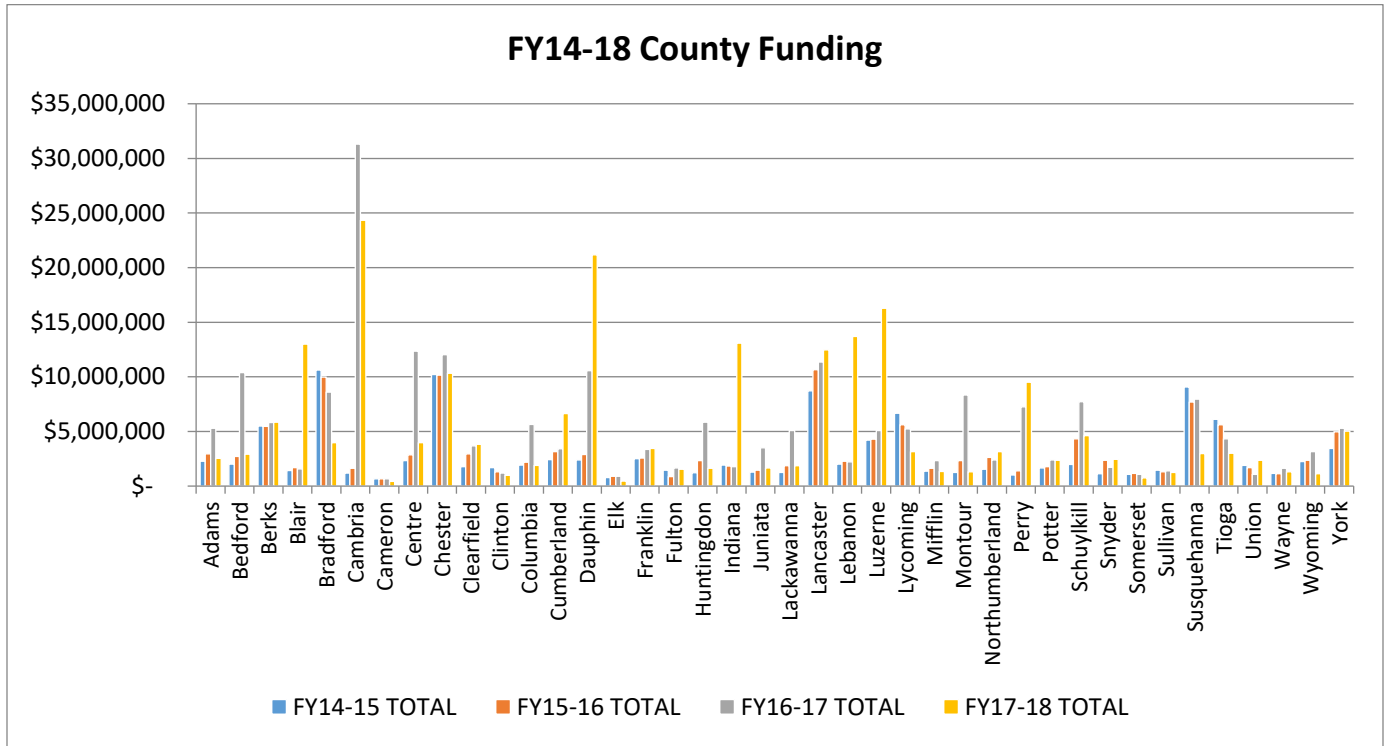
#### A. State and Federal Agency Fiscal Data by County

One of the earlier efforts taken on by the Funding Workgroup was to compile the fiscal data from a wide range of state and federal agencies that relate to restoration of local waters and in turn the Chesapeake Bay. Table 5.1 below is a summary of this effort and shows the amount of financial resources provided to all the counties within the Chesapeake Bay watershed from these state and federal funding sources in the past four years. Figure 5.1 is a graphic representation of this data arranged by county. Figure 5.2 is the same data with the counties arranged by the Tiers as described in [Section 3, Countywide Actions](#).

**Table 5.1 -- State and Federal Agency Fiscal Data for Last Four Years**

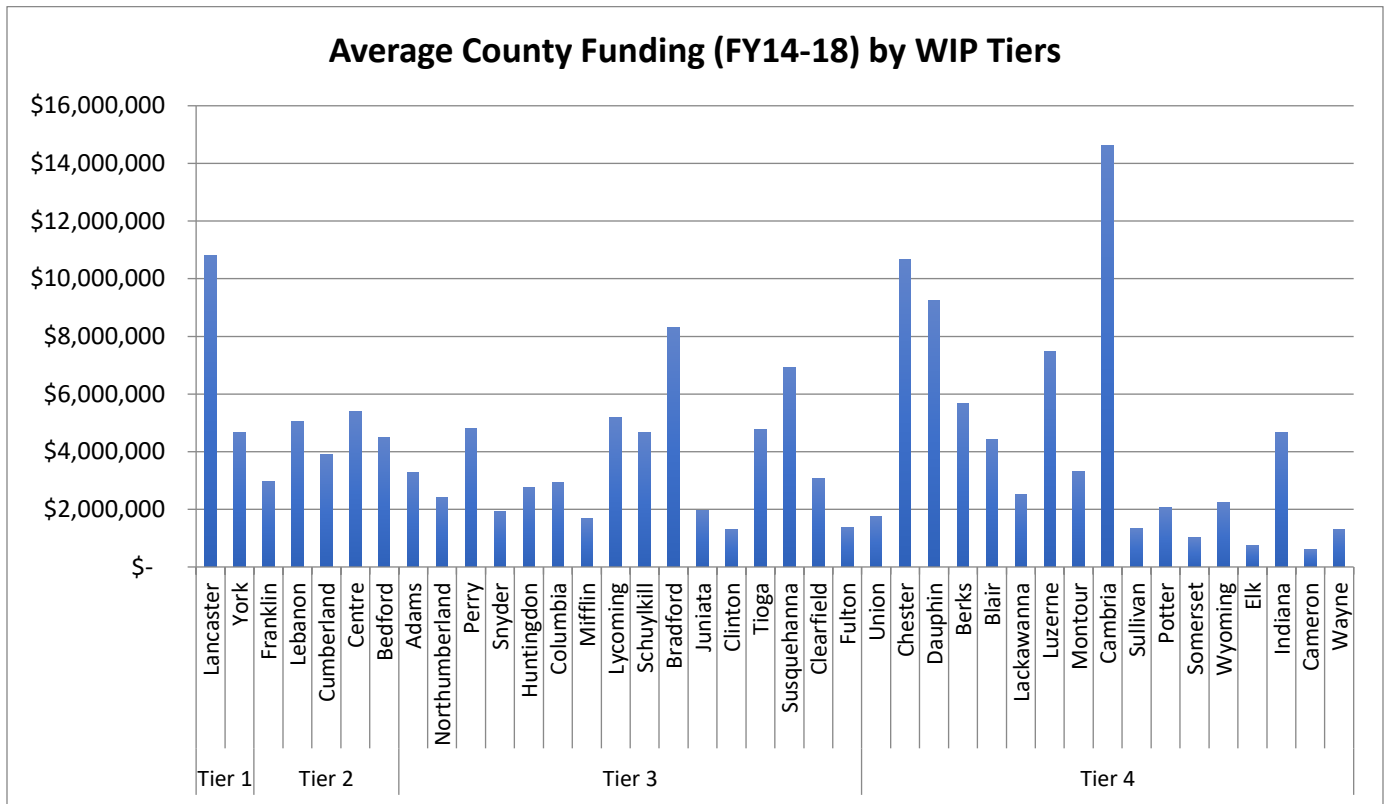
<b>Program</b>	<b>Total FY 14-15</b>	<b>Total FY 15-16</b>	<b>Total FY 16-17</b>	<b>Total FY 17-18</b>
<b>Federal Funding</b>				
Natural Resource Conservation Service	\$ 12,925,363	\$ 17,616,201	\$ 20,441,044	\$ 19,421,415
EPA Section 319 Program	\$ 358,351	\$ 3,675,619	\$ 3,182,323	\$ 1,137,168
<i>Subtotal</i>	\$ 13,282,714	\$ 21,291,820	\$ 23,623,367	\$ 20,558,583
<b>Combination of Federal and State Funding</b>				
Chesapeake Bay Program	\$ 6,542,018	\$ 7,914,830	\$ 5,076,147	\$ 10,253,893
PennVest NPS Stormwater	\$ 2,382,455	\$ 1,309,168	\$ 77,193,402	\$ 101,759,521
<i>Subtotal</i>	\$ 8,924,473	\$ 9,223,998	\$ 82,269,549	\$ 112,013,414
<b>State Funding</b>				
ACT 13 - Unconventional Gas Well Funding	\$ 33,891,325	\$ 27,713,077	\$ 25,683,372	\$ 4,064,919
Ch. 102/NPDES and Ch. 105 Program Permit Processing Fees	\$ 4,578,500	\$ 5,256,512	\$ 4,757,457	\$ 5,120,336
Conservation District Fund Allocation Program	\$ 2,073,288	\$ 2,074,040	\$ 2,104,184	\$ 2,105,195
Growing Greener	\$ 9,126,533	\$ 12,953,685	\$ 20,743,372	\$ 9,552,272
Environmental Education Grants	\$ 16,726	\$ 246,256	\$ 267,641	\$ 270,698
Department of Community and Economic Development: Watershed Protection Program	\$ 282,985	\$ 1,002,300	\$ 2,240,000	\$ 375,000
Dirt and Gravel Roads Program	\$ 16,310,567	\$ 16,353,594	\$ 15,976,856	\$ 16,777,700
Department of Agriculture	\$ 26,129,555	\$ 31,097,484	\$ 34,966,497	\$ 33,994,499
Department Conservation Natural Resources	\$ 2,282,170	\$ 3,736,666	\$ 8,972,849	\$ 10,714,286
<i>Subtotal</i>	\$ 94,691,649	\$ 100,433,614	\$ 115,712,228	\$ 82,974,905
<b>Total</b>	<b>\$ 116,899,836</b>	<b>\$ 130,949,432</b>	<b>\$ 221,605,144</b>	<b>\$ 215,546,902</b>

**Figure 5.1 Funding by County from FY14-FY18**



DRAFT

**Figure 5.2 Average County Funding (FY2014-18) by WIP Tiers**



**B. Priority Initiative Costs, Numeric Commitments**

Table 5.2, Summary of Priority Initiative Costs, is an overview of the BMP installation costs to implement the numeric commitments identified in Section 2, State Actions that will be needed on an annual basis. The annualized costs are derived from the Chesapeake Bay Program’s Chesapeake Assessment Scenario Tool (CAST). Costs are estimated in 2010 dollars. Capital and opportunity costs are amortized over the BMP lifespan and added to annual operations and maintenance (O&M) costs for a total annualized cost. The interest rate for capital and opportunity costs is 5%. Costs are those incurred by both public and private entities. Costs represent a single year of cost rather than the cost over the entire lifespan of the practice. Default costs were prepared for EPA using existing data. Chesapeake Bay jurisdictions were provided with the opportunity to review and amend the unit costs for BMPs in the Phase 2 WIP. (<https://cast.chesapeakebay.net/CostProfile>)

These costs do not include the associated technical assistance costs provided at the local level to facilitate the implementation of these BMPs.

**Table 5.2 Summary of Priority Initiative Costs**

<b>Statewide Workgroup Recommendation</b>	<b>Annual Projected Cost</b>
<b>Agriculture</b>	
<i>Total</i>	\$313,140,000
Agriculture Compliance	\$33,105,000
Soil Health	\$32,980,000
Expanded Nutrient Management	\$20,853,000
Manure Storage Facilities	\$214,042,000
Precision Feeding	(\$1,687,000)
Integrated Systems for Elimination of Excess Manure	\$4,666,000
Grassed Riparian Buffers	\$9,183,000
<b>Stormwater</b>	
<i>Total</i>	\$78,552,000
Meet Current MS4 Permit Requirements	\$74,033,000
New Riparian Forest Buffers	\$68,000
Residential Pools and Car Washing	\$898,000
Industrial Stormwater	\$3,553,000
Fertilizer Legislation	TBD
<b>Forestry</b>	
<i>Total</i>	\$67,701,000
Forested Riparian Buffers	\$41,439,000
Tree Canopy	\$5,400
Woods and Pollinator Habitat	\$1,046,000
Forest, Farm, and Natural Areas Conservation	TBD
Stream and Wetland Restoration	\$27,303,000
<b>Total Workgroup Implementation Annual Costs</b>	<b>\$459,393,000</b>

<sup>1</sup>Hypothetically, based on the Phase 3 WIP Stormwater Workgroup recommendations as written, an early estimate of the potential annual a cost is \$101,000,000. These costs will be re-calculated after these recommendations are considered during the public comment period for this permit and the final elements of this permit defined.

A word of caution is warranted when using these cost estimates. CAST cost estimates are intended to be a starting point for users to create their own BMP cost projections. Many of the CAST estimates originate from documents and communications that are at least 10 years old. Accounting for inflation could have roughly raised these estimates by approximately 15% and was not done. In addition, cost estimates will differ from locale to locale for reasons beyond inflation.

CAST BMP costs often reflect a single point estimate derived from multiple sources and ranges of costs. While not fully inventoried, the data and sources of costs feeding into CAST have inherent variability. Original sources of costs are not consistent in how they account for major components, such as cost of land, intensity of O&M, management



and coordination (to secure opportunities). As an average, the CAST estimates mask the variability in the underlying data.

Other important sources of variability in the costs include:

- Changes in technology and inputs to BMPs. The cost structure to inputs for many of these practices have changed in the last 10 years. County estimates reflect each area's understanding of current prices and current technologies.
- Any given BMP is likely to use different ratios of labor and capital/equipment reflecting the entity's ability to leverage its existing resources (equipment, capital, labor). This mix can substantially change cost of a given BMP.
- Design and scale can significantly drive cost estimate variation by several orders of magnitude.
- Local costs differences. In addition to changes through time in input costs, local economic conditions can also account for cost variability, particularly with respect to labor and materials.
- Differences in assumptions about O&M. Different practices and approaches to BMP O&M can explain variation and uncertainty in costs for any given BMP. For example, some organizations assume that tree planting or riparian buffer plantings require a five-year rather than three-year establishment period. Changes in this assumption not only impact the "capital costs" but also have flow-on effects for ongoing maintenance requirements.

Table 5.3 below provides a summary of the existing state agency and external staff resources that are currently supported with either state or federal funding devoted to providing the technical and compliance assistance and support to implement the priority initiatives listed in Table 5.2. This table also lists the additional resources that will be needed. A complete description of these priority initiatives can be found in Section 2, State Actions.

**Table 5.3 Summary of Resources, Priority Initiatives, Numeric Commitments**

<b>State Actions, On the Ground Implementation</b>						
<b>Activity</b>	<b>Position</b>	<b>Agency</b>	<b>Number</b>		<b>Cost</b>	
			Existing	New	Existing	New
<b>Agriculture</b>						
Agriculture Compliance	Permit Engineers, Compliance Specialists Inspectors	DEP – Regional Offices	11	10.5	\$1,400,000	\$1,161,492
Nutrient and Odor Management (Act 38)	Conservation Program Specialists	State Conservation Commission	7		\$728,000	
Nutrient Management Support (Act 38)	Penn State Extension	Penn State University	5		\$356,000	
Nutrient Management (Act 38)	Technicians	Conservation Districts	39		\$2,180,040	\$218,004
Technical Assistance, Planning, Inspections	Bay Technicians	Conservation Districts	35	50	\$2,171,612	\$3,277,500
BMP Design, Engineering Support	District Engineers	Conservation Districts	8	10	\$573,250	\$716,563
<i>Subtotal Agriculture (Agency Resources)</i>			18	10.5	\$2,128,000	\$1,161,492
<i>Subtotal Agriculture (External Resources)</i>			87	60	\$5,280,902	\$4,212,067
<b>Stormwater</b>						
Outreach	Water Quality Specialists	DEP – Bureau of Clean Water		3		\$328,000
Post-Construction Stormwater Inspections	Water Quality Specialists	DEP – Regional Offices		2		\$219,000
MS4 Annual Report Reviews	Water Quality Specialists	DEP Regional Offices		2		\$175,000
MS4 Permit Reviews	Engineer	DEP Regional Offices		3		\$417,500
MS4 Inspections	Water Quality Specialist	DEP Regional Offices		3		\$351,000
Water Quality Monitoring	Aquatic Biologist	DEP – Bureau of Clean Water		1		\$600,000
<i>Subtotal Stormwater (Agency Resources)</i>				13		\$2,090,500

State Actions, On the Ground Implementation						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
<b>Forestry</b>						
Watershed-wide Forestry BMP Leadership and Management	Program Manager	DCNR	0	1	0	\$116,250
Watershed-wide Forestry BMP coordination, communication, interagency cooperation, guidance	Program specialists	DCNR	3	4	\$305,226	\$406,968
Grants administration	Recreation and Conservation Advisor 2	DCNR	.25	4	\$21,787	\$348,588
Riparian Forest Buffer outreach and technical assistance (including identifying funding for landowners)	Foresters	DCNR	5	15	\$390,600	\$1,171,800
Riparian Forest Buffer outreach and technical assistance (including identifying funding for landowners)	Resource conservation technician	Conservation Districts	5	20	\$390,600	\$1,562,400
<i>Subtotal Forestry (Agency Resources)</i>			8	24	\$717,613	\$2,043,722
<i>Subtotal Forestry (External Resources)</i>			5	20	\$390,600	\$1,562,400
<b>Wastewater</b>						
Optimization Program	Water Program Specialists	DEP – Bureau of Clean Water	1.5	4.0	\$250,000	\$1,260,000
<i>Subtotal Wastewater (Agency Resources)</i>			1.5	4.0	\$250,000	\$1,260,000
<b>Total Numeric Commitments (Agency Resources)</b>			<b>27.5</b>	<b>51.5</b>	<b>\$3,095,613</b>	<b>\$6,555,714</b>
<b>Total Numeric Commitments (External Resources)</b>			<b>92</b>	<b>80</b>	<b>\$5,671,502</b>	<b>\$5,774,467</b>

**\*Notes:** In calculating the resource needs for Forestry Implementation, the following factors were considered:

1. Primary Forestry BMPs include urban and agriculture riparian forest buffers, turf to trees and meadows, and tree canopy.
2. Existing resources are calculated as FTEs, not necessarily dedicated staff.
3. DCNR program specialists would be placed in Bureau of Forestry and Bureau of Recreation and Conservation
4. Resource conservation technicians in Conservation Districts would focus primarily on agricultural riparian forest buffers
5. Foresters in DCNR would focus on agricultural riparian forest buffers, urban riparian forest buffers, turf to trees and meadows, and tree canopy.

### C. Priority Initiatives, Programmatic and Narrative Commitments

Section 2, State Actions identifies several priority initiatives that have existing staff resources devoted to them, or will require additional staff resources, to implement the proposed programmatic enhancements. These additional resources are also connected to initiatives in Section 3, Countywide Actions and Section 4, Communication and Engagement Strategy.

A complete description of these priority initiatives can be found in the respective sections, to include:

1. Implementation of the BMP Verification Program Plan
2. Administrative activities of the DEP Chesapeake Bay Office
3. Implementation of legislative initiatives such as the proposed Fertilizer Bill
4. Expansion of existing technical assistance, compliance and enforcement, and funding programs
5. Development and implementation of the Countywide Action Plans (CAPs)
6. Implementation of the Communication and Engagement Strategy

Table 5.4, Summary of Resources, Priority Initiatives, Programmatic and Narrative Commitments provides the existing state agency and external staff resources that are currently supported with either state or federal funding devoted to this effort. This table also summarizes the additional resources needed to support the implementation these priority initiatives.

**Table 5.4 Summary of Resources, Priority Initiatives, Programmatic and Narrative Commitments**

State Actions						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
BMP Verification Tracking and Reporting Milestone Tracking	Water Program Specialist, Licensed Geologist	DEP – Chesapeake Bay Office	1	1	\$100,000	\$100,000
BMP Verification Tracking and Reporting	Contractor Support	Multiple public and private agencies			\$540,000	
EPA Grant Development, Management	Administrative Officer or Water Program Specialist	DEP -- Chesapeake Bay Office		1		\$100,000
Project Management, Program Evaluation	Water Program Specialist	DEP— Chesapeake Bay Office	1		\$100,000	
Supervisor, Coordination with Bay Program Partnership	Administrative Officer or Environmental Group Manager	DEP -- Chesapeake Bay Office	1		\$105,000	
Contract Management, Invoicing, Personnel Support	Administrative Officer 1	DEP – Chesapeake Bay Office	1		\$87,032	
Office Manager	Program Manager	DEP— Chesapeake Bay Office	1		\$110,000	
Act 167 Outreach, Compliance and Enforcement	Water Program Specialists	DEP – Bureau of Clean Water		2		\$200,000

State Actions						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
Support for REAP and PA Farm Bill	Administrative Officer 1	State Conservation Commission		1		\$87,032
Additional Support for REAP (\$10-\$20 million increase)	Administrative Officer 1	State Conservation Commission		2		\$174,064
Technical Assistance to counties	Program Specialist	State Conservation Commission		3		\$295,530
Farmland Preservation Conservation Coordinator and Compliance	Administrative Officer 2	Department of Agriculture, Bureau of Farmland Preservation		2		\$98,152
Policy and District Operations and Outreach	Executive Policy Specialist	State Conservation Commission		1		\$61,203
Deputy Secretary for Water Quality, Conservation and Farmland Preservation	Deputy Secretary	Department of Agriculture		1		\$115,000
Fertilizer Bill Compliance	Inspectors	Department of Agriculture, Bureau of Plant Industry		3		\$147,228
Fertilizer Bill Administration	Program Specialist	Department of Agriculture, Bureau of Plant Industry		1		\$56,059
<i>Subtotal (Agency Resources)</i>			5	18	\$502,032	\$1,434,268
<i>Subtotal (External Resources)</i>					\$540,000	
Countywide Actions						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
Supervisor	Administrative Officer 4 or Environmental Group Manager	DEP – Chesapeake Bay Office		1		\$120,000
Support to counties in plan development and implementation	Water Program Specialists	DEP – Chesapeake Bay Office		8		\$800,000
Contract Management, Invoicing	Management Technician	DEP – Chesapeake Bay Office		1		\$80,000
County External Coordinators		Counties		18	\$1,800,000	
Technical Support	Contractors	SRBC, EPA, Others		9	\$900,000	
Facilitation	Contractor	Consulting with a Purpose		1	\$200,000	
<i>Subtotal (Agency Resources)</i>				10		\$1,000,000
<i>Subtotal (External Resources)</i>				28	\$2,900,000	

State Actions						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
<b>Communication and Engagement Strategy</b>						
Activity	Position	Agency	Number		Cost	
			Existing	New	Existing	New
Development of outreach materials for two years	Contractor	Water Words That Works	1		\$200,000	
Development of videos		Commonwealth Media Services		1	\$50,000	
<i>Subtotal (External Resources)</i>			1	1	\$250,000	
<b>Total Programmatic and Narrative Commitments (Agency Resources)</b>			<b>5</b>	<b>28</b>	<b>\$502,032</b>	<b>\$2,434,268</b>
<b>Total Programmatic and Narrative Commitments (External Resources)</b>			<b>1</b>	<b>29</b>	<b>\$3,690,000</b>	<b>-</b>

## D. Countywide Action Plans

The four pilot counties (Adams, Franklin, Lancaster and York) worked to identify priorities, practices and resources needed to improve their local waters. The Funding Workgroup decided to use a two-prong approach to estimate the cost associated with implementing the priorities and practices identified by each county. Both methods were based on Pennsylvania specific default costs in the CAST model.

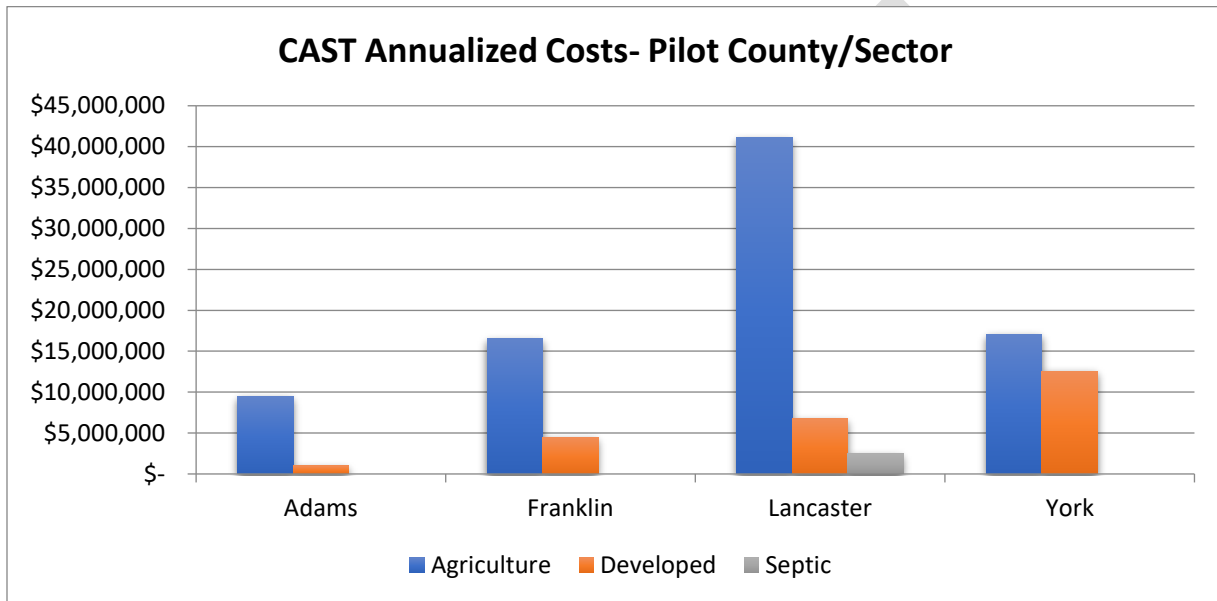
### 1. Cost Estimate from County Templates for BMP Input into CAST

The first method to estimate the costs for implementation of BMPs used the default annualized CAST costs to be consistent with the above estimates used for the WIP workgroup recommendations. A brief description of how the Funding Workgroup used data submitted by the four pilot counties to calculate these annualized costs using CAST is described below.

Costs are estimated in 2010 dollars. Capital and opportunity costs are amortized over the BMP lifespan and added to annual O&M costs for a total annualized cost. The interest rate used for capital and opportunity costs is 5%. Costs are those incurred by both public and private entities. Costs represent a single year of cost rather than the cost over the entire lifespan of the practice. Default costs were prepared using existing data. The Chesapeake Bay Program states are able to review and amend the unit costs for BMPs in the Phase 3 WIP if they have a source of more accurate data.

**Table 5.5 Annualized CAST Costs for Pilot Counties**

	<b>Adams</b>	<b>Franklin</b>	<b>Lancaster</b>	<b>York</b>	<b>Total</b>
Agriculture	\$ 9,480,000	\$16,530,000	\$ 41,100,000	\$ 17,100,000	\$ 84,200,000
Developed	\$ 1,040,000	\$ 4,470,000	\$ 6,720,000	\$12,570,000	\$24,800,000
Septic	\$ -	\$ -	\$ 2,460,000	\$ -	\$ 2,460,000
<b>Total</b>	<b>10,520,000</b>	<b>\$21,000,000</b>	<b>\$ 50,280,000</b>	<b>\$29,670,000</b>	<b>\$111,460,000</b>



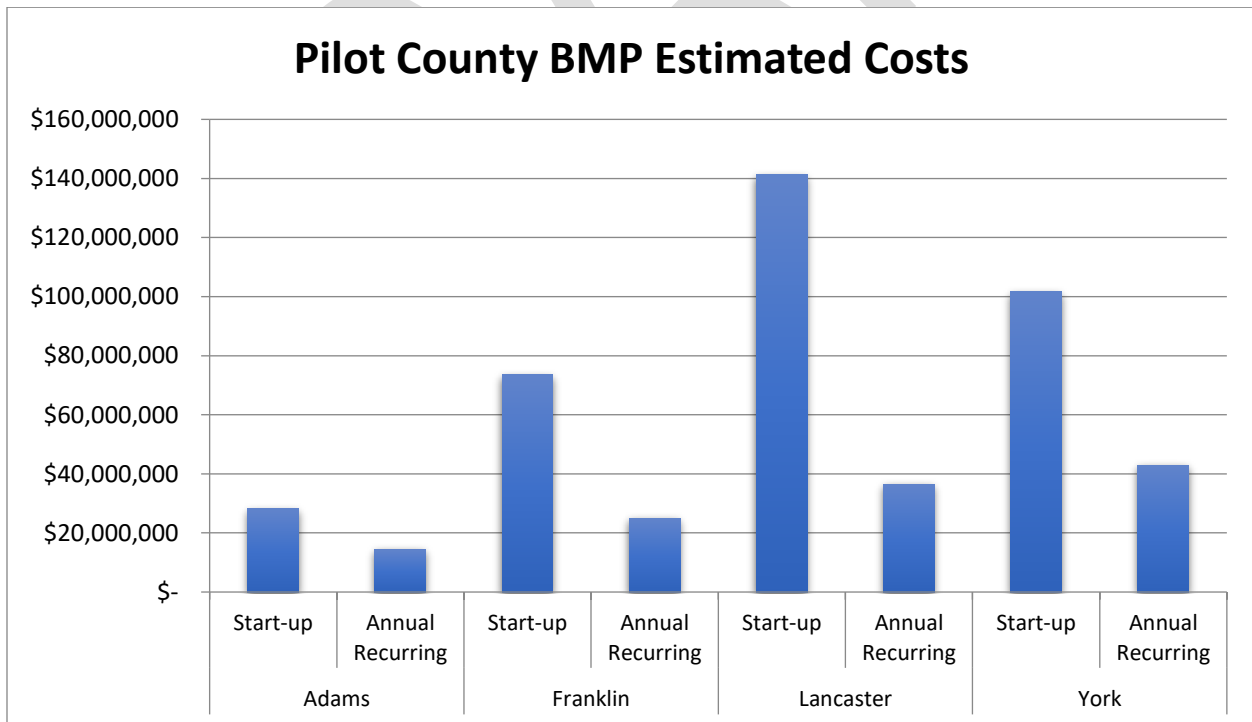
To better characterize the start-up and ongoing cost, the same CAST estimates were used to calculate the start-up costs by including the Capital and Opportunity costs as well as first year of O&M. Annual recurring costs were calculated by adding the ongoing O&M and Opportunity costs to the BMP practices that are annual (Conservation Tillage, Cover Crops, Manure Transport etc.) These are summarized in Table 5.6.

**Table 5.6 CAST Costs- Initial Upfront Costs and Annual Ongoing Costs for Pilot Counties**

	Adams		Franklin	
	Start-up	Annual Recurring	Start-up	Annual Recurring
Agriculture	\$ 21,000,000	\$ 14,100,000	\$ 50,500,000	\$ 23,200,000
Developed	\$ 7,100,000	\$ 300,000	\$ 22,400,000	\$ 1,700,000
Septic	\$	\$	\$	\$ -
<b>Total</b>	<b>\$ 28,100,000</b>	<b>\$ 14,400,000</b>	<b>\$ 72,900,000</b>	<b>\$ 24,900,000</b>

	Lancaster		York	
	Start-up	Annual Recurring	Start-up	Annual Recurring
Agriculture	\$ 95,400,000	\$ 32,700,000	\$ 54,500,000	\$ 27,500,000
Developed	\$ 14,500,000	\$ 3,600,000	\$ 47,200,000	\$ 15,400,000
Septic	\$ 31,400,000	\$ 300,000	\$ -	\$
<b>Total</b>	<b>\$ 141,300,000</b>	<b>\$ 36,600,000</b>	<b>\$ 101,700,000</b>	<b>\$ 42,900,000</b>

	TOTAL	
	Start-up	Annual Recurring
Agriculture	\$ 221,400,000	\$ 97,500,000
Developed	\$ 91,200,000	\$21,000,000
Septic	\$ 31,400,000	\$300,000
<b>Total</b>	<b>\$ 344,000,000</b>	<b>\$ 118,800,000</b>





## 2. Pilot Counties - Additional Resources Needed

The four pilot counties identified other resources outside of the cost for BMP implementation listed above. These costs were most often addressing staffing needs to draft, coordinate, implement and report BMPs. However, counties also identified other interests such as technology to report BMPs and enhancements to existing water quality monitoring to track progress of local waters. Table 5.7 is a summary of identified additional resources by each pilot county.

**Table 5.7 Additional Resources by County**

<b>Adams County</b>	<b>Annual Costs</b>
7- FTE (Ag Technicians for plan writing/permitting)	\$ 350,000
Enhance Water Quality Monitoring within the county	\$ 20,000
<b>Total</b>	<b>\$ 370,000</b>
<b>Franklin County</b>	<b>Annual Costs</b>
1- County FTE (Integrate Planning Efforts)	\$ 80,000
Establish a centralized data collection and reporting system	TBD
3- County FTE Agriculture Coordinators	\$ 240,000
1- County FTE Stormwater Coordinator	\$ 80,000
Enhance WQ Monitoring Network	TBD
2- County FTE Outreach Coordinators	\$ 160,000
<b>Total</b>	<b>\$ 560,000</b>
<b>Lancaster County</b>	<b>Annual Costs</b>
Data Management	\$ 710,000
Agriculture	\$ 4,400,000
Stormwater	\$ 1,980,000
Buffers	\$ 1,147,000
Stream Restoration	\$ 2,200,000
Land Use and Preservation	\$ 5,500,000
<b>Total</b>	<b>\$ 15,937,000</b>
<b>York County</b>	<b>Annual Costs</b>
1- County staff to coordinate WIP Implementation	\$ 80,000
2- Act 167 Enforcement Staff	\$ 150,000
12- Staff (Ag Implementation)	\$ 1,200,000
WQ Monitoring Network	\$ 300,000
<b>Total</b>	<b>\$ 1,730,000</b>

### E. The Annual Funding Gap

From Table 5.1 the average resources dedicated to efforts relating to improving Pennsylvania waters over the last four fiscal years is approximately \$172 million, with the most recent FY2018 at \$216 million. Additionally, combining Tables 5.3 and 5.4,

Table 5.8 is a summation of staffing resources that are already existing that are dedicated to this effort which is approximately \$12.9 million annually.

The statewide workgroups estimated the total annual resources needed at approximately \$459 million, plus an additional \$26.5 million needed for additional staffing resources, also totaled in Table 5.8. Using the most recent existing funding, the funding gap for the WIP Workgroup scenarios is approximately \$257 million annually, as itemized in Table 5.9, Funding Gap Scenario.

**Table 5.8 Total of Existing and New Resource Needs**

	Number		Cost	
	Existing	New	Existing	New
<b>Total (Agency Resources)</b>	32.5	79.5	\$3,597,645	\$8,389,982
<b>Total (External Resources)</b>	93	109	\$9,361,502	\$5,774,467
<b>TOTAL</b>	<b>125.5</b>	<b>188.5</b>	<b>\$12,959,147</b>	<b>\$14,164,449</b>
<b>GRAND TOTAL</b>	<b>312</b>		<b>\$26,483,596</b>	

**Table 5.9 Funding Scenario Gap**

<b>Existing</b>	Existing Resources 2018	\$ 216,142,282
	Existing Staff Resources	\$ 12,959,147
	Total	\$ 229,101,429
<b>Total Needed Resources</b>	Statewide Practice Implementation	\$ 459,393,000
	Staffing Resources	\$ 26,483,596
	Total	\$ 485,876,596
<b>Annual Funding Gap</b>		<b>\$ 256,775,167</b>

The four pilot counties' estimates highlight the substantial differences in costs based on BMP selection. The costs from the four pilot counties total \$111 million annually for practices implemented with an additional \$18.6 million needed for additional resources (staffing, monitoring etc.). These figures should not be extrapolated to the rest of the 39 counties in the Chesapeake Bay watershed, as each county will have different local planning goals and local priorities. The Funding Workgroup hopes there will be opportunities to reduce the implementation costs through learning and economies of scale as the Countywide Action Plans are developed and implemented.

While the funding gap is approximately \$257 million annually in terms of federal and state funding, the Phase 3 WIP does not have to be completed through strictly the above-mentioned funding sources. Table 5.1 above captures many funding sources and catalogs available dollars. However, for many of the devoted resources there is often a match required from either a private landowner or other stakeholder that is implementing the practices on the ground. Also, recent surveys show a large amount of water quality improvements come from private dollars either directly or indirectly that have not been captured in Table 5.1. As mentioned throughout the document, it would

be valuable to capture not only all practices going on the landscape but also all resources being expended through this effort.

As mentioned in [Section 2, State Actions](#), another approach would be to look at a phased approach to filling this funding gap. With this approach, at a minimum, at least \$120 million annually for BMP implementation is recommended as a first phase for implementation. This is based on the summary results in Table 2.2, Summary of Reductions from Priority Initiatives in Section 2, State Actions. In Table 5.10 below, the four more effective priority initiatives are identified. These four initiatives alone will help to achieve half of the nitrogen reduction goal and 75% the phosphorus reduction goal. Some percentage of the \$26 million in estimated technical support resources would also be needed.

**Table 5.10 Implementation Costs for Top Priority Initiatives**

<i>Priority Initiative</i>	<i>Cost in millions</i>	<i>Nitrogen Reduction</i>	<i>Phosphorus Reduction</i>
Agricultural Compliance	\$33.1	14%	12%
Soil Health	\$32.9	14%	14%
Grass Buffers	\$9.2	8%	37%
Forested Buffers	\$41.4	14%	49%
<b>TOTAL</b>	<b>\$116.6</b>	<b>45%</b>	<b>75%</b>

#### **F. The Cost of Not Filling This Gap**

Failure to meet the federal Chesapeake Bay TMDL could have significant and wide-ranging consequences for the commonwealth.

First and foremost, a lack of substantial progress in restoring Pennsylvania’s impaired waters will mean continued negative impacts to drinking water resources, outdoor recreation, wildlife, and public health and safety. Local communities will continue to suffer from pollution-related problems such as stormwater and flood damage, nitrogen and bacterial contamination in drinking water sources, degradation of aquatic resources, loss of fisheries, and many more issues (each of which create their own societal costs and economic losses) that could have been addressed through a robust and timely implementation of the Phase 3 WIP.

Beyond the consequences to local communities that would be felt by failing to implement the Phase 3 WIP, an array of backstop measures and consequences have been outlined in the Chesapeake Bay TMDL ([Chesapeake Bay TMDL Section 7: Reasonable Assurance and Accountability Framework](#)) and correspondence from U.S. EPA to the Principals’ Staff Committee in December 2009.

Most specifically, EPA delineated the following potential consequences in the EPA Expectations for the Phase 3 WIP, dated July 19, 2018:

- EPA may continue to target federal enforcement and compliance assurance in the watershed which could include both air and water sources of nitrogen, phosphorus and sediment.
- EPA may expand NPDES permit coverage through designation to additional animal feeding operations, other industrial and municipal stormwater sources and/or urbanized areas.
- EPA may redirect Chesapeake Bay or other EPA grant funding to other third-party entities to implement practices in priority areas or direct Chesapeake Bay funding to identified priorities in the EPA evaluations if Pennsylvania does not adequately target workplans and funding toward priority actions.
- EPA may establish finer scale nutrient or sediment reductions for municipal and industrial wastewater facilities, concentrated animal feeding operations and regulation municipal separate storm sewer systems as well as require additional load reductions above and beyond what has already been accomplished from the wastewater sector.
- EPA may initiate a process to propose promulgating nitrogen and phosphorus numeric water quality standards for appropriate streams in Pennsylvania that are within the Chesapeake Bay Watershed.

Additionally, Pennsylvania could face opposition from other states and environmental organizations if it fails to comply with the TMDL.

## SECTION 6. FEDERAL ROLE

### I. FEDERAL FACILITIES

EPA, in partnership with the states, have developed planning goals for all the federal facilities in the Chesapeake Bay watershed. Table 6.1 is a summary of the total nitrogen reductions addressed by the different federal facilities in Pennsylvania by county. Table 6.2 is the same table for phosphorus.

**Table 6.1 Nitrogen Reductions for Pennsylvania Federal Facilities by County**

County	Department of Defense			National Park Service			US Fish and Wildlife Service			General Services Administration			Total Reduction 2017-2025
	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	
Adams	2,267	1,818	449	26,590	20,406	6,185	-	-	-	-	-	-	6,834
Bedford	3,666	2,976	689	-	-	-	-	-	-	-	-	-	689
Berks	-	-	-	2,296	2,237	59	-	-	-	-	-	-	59
Blair	59	37	22	3,839	3,264	574	-	-	-	-	-	-	597
Bradford	-	-	-	-	-	-	-	-	-	-	-	-	-
Cambria	-	-	-	1,517	1,208	309	-	-	-	-	-	-	309
Cameron	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-
Centre	15,883	15,176	707	-	-	-	-	-	-	-	-	-	707
Chester	-	-	-	-	-	-	-	-	-	-	-	-	-
Clearfield	5,711	5,621	89	-	-	-	-	-	-	-	-	-	89
Clinton	1,376	1,196	181	-	-	-	856	640	215	-	-	-	396
Columbia	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumberland	64,483	40,634	23,849	8,734	7,713	1,022	-	-	-	-	-	-	24,871
Dauphin	29,034	23,185	5,850	3,183	3,056	127	-	-	-	-	-	-	5,978
Elk	-	-	-	-	-	-	-	-	-	-	-	-	-
Franklin	81,489	61,344	20,145	859	771	88	-	-	-	0.5	0.3	0.20	20,233
Fulton	-	-	-	-	-	-	-	-	-	-	-	-	-
Huntingdon	119,271	111,169	8,102	-	-	-	-	-	-	-	-	-	8,102
Indiana	-	-	-	-	-	-	-	-	-	-	-	-	-
Jefferson	-	-	-	-	-	-	-	-	-	-	-	-	-
Juniata	-	-	-	-	-	-	-	-	-	-	-	-	-
Lackawanna	308	282	26	-	-	-	-	-	-	-	-	-	26
Lancaster	327	205	121	-	-	-	-	-	-	-	-	-	121
Lebanon	78,147	59,433	18,714	863	836	27	-	-	-	-	-	-	18,741
Luzerne	885	569	316	-	-	-	-	-	-	27	17	9.70	326
Lycoming	-	-	-	-	-	-	-	-	-	9	3	5.30	5
Mckean	-	-	-	-	-	-	-	-	-	-	-	-	-
Mifflin	207	132	75	-	-	-	-	-	-	-	-	-	75
Montour	-	-	-	-	-	-	-	-	-	-	-	-	-
Northumberland	163	119	44	-	-	-	-	-	-	-	-	-	44
Perry	-	-	-	508	426	81	-	-	-	-	-	-	81
Potter	-	-	-	-	-	-	-	-	-	-	-	-	-
Schuylkill	8	5	3	1,550	1,507	42	-	-	-	-	-	-	45
Snyder	-	-	-	-	-	-	-	-	-	-	-	-	-
Somerset	-	-	-	-	-	-	-	-	-	-	-	-	-
Sullivan	-	-	-	-	-	-	-	-	-	-	-	-	-
Susquehanna	177	115	63	-	-	-	-	-	-	-	-	-	63
Tioga	28,513	24,699	3,814	-	-	-	-	-	-	-	-	-	3,814
Union	56	37	19	-	-	-	-	-	-	-	-	-	19
Wayne	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-	-	-	-	-	-	-	-
York	17,754	12,419	5,335	-	-	-	-	-	-	-	-	-	5,335
<b>Total</b>	<b>449,784</b>	<b>361,171</b>	<b>88,613</b>	<b>49,939</b>	<b>41,425</b>	<b>8,515</b>	<b>856</b>	<b>640</b>	<b>215</b>	<b>36</b>	<b>21</b>	<b>15</b>	<b>97,358</b>

**Table 6.2 Phosphorus Reductions for Pennsylvania Federal Facilities by County**

County	Department of Defense			National Park Service			US Fish and Wildlife Service			General Services Administration			Total Reduction 2017-2025
	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	2017 Load	2025 Target	Reduction	
Adams	244	200	44	4,966	4,296	669	-	-	-	-	-	-	713
Bedford	297	250	47	-	-	-	-	-	-	-	-	-	47
Berks	-	-	-	105	102	3	-	-	-	-	-	-	3
Blair	2	1	1	416	314	102	-	-	-	-	-	-	103
Bradford	-	-	-	-	-	-	-	-	-	-	-	-	-
Cambria	-	-	-	81	55	26	-	-	-	-	-	-	26
Cameron	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-
Centre	1,363	1,261	102	-	-	-	-	-	-	-	-	-	102
Chester	-	-	-	-	-	-	-	-	-	-	-	-	-
Clearfield	460	451	9	-	-	-	-	-	-	-	-	-	9
Clinton	101	92	9	-	-	-	65	43	23	-	-	-	32
Columbia	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumberland	3,633	2,157	1,476	591	459	131	-	-	-	-	-	-	1,607
Dauphin	2,125	1,621	503	85	78	7	-	-	-	-	-	-	510
Elk	-	-	-	-	-	-	-	-	-	-	-	-	-
Franklin	7,056	4,696	2,360	50	37	13	-	-	-	0.04	0.02	0.02	2,373
Fulton	-	-	-	-	-	-	-	-	-	-	-	-	-
Huntingdon	10,904	9,605	1,299	-	-	-	-	-	-	-	-	-	1,299
Indiana	-	-	-	-	-	-	-	-	-	-	-	-	-
Jefferson	-	-	-	-	-	-	-	-	-	-	-	-	-
Juniata	-	-	-	-	-	-	-	-	-	-	-	-	-
Lackawanna	31	26	5	-	-	-	-	-	-	-	-	-	5
Lancaster	7	4	3	-	-	-	-	-	-	-	-	-	3
Lebanon	3,855	2,223	1,632	34	15	19	-	-	-	-	-	-	1,651
Luzerne	25	15	10	-	-	-	-	-	-	1.16	0.68	0.49	10.33
Lycoming	-	-	-	-	-	-	-	-	-	0.29	0.09	0.20	0.20
Mckean	-	-	-	-	-	-	-	-	-	-	-	-	-
Mifflin	18	10	8	-	-	-	-	-	-	-	-	-	8
Montour	-	-	-	-	-	-	-	-	-	-	-	-	-
Northumberland	6	4	2	-	-	-	-	-	-	-	-	-	2
Perry	-	-	-	45	39	6	-	-	-	-	-	-	6
Potter	-	-	-	-	-	-	-	-	-	-	-	-	-
Schuylkill	0	0	0	40	39	1	-	-	-	-	-	-	1
Snyder	-	-	-	-	-	-	-	-	-	-	-	-	-
Somerset	-	-	-	-	-	-	-	-	-	-	-	-	-
Sullivan	-	-	-	-	-	-	-	-	-	-	-	-	-
Susquehanna	15	11	4	-	-	-	-	-	-	-	-	-	4
Tioga	3,599	3,030	569	-	-	-	-	-	-	-	-	-	569
Union	3	2	1	-	-	-	-	-	-	-	-	-	1
Wayne	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-	-	-	-	-	-	-	-
York	1,299	1,068	231	-	-	-	-	-	-	-	-	-	231
<b>Total</b>	<b>35,043</b>	<b>26,727</b>	<b>8,316</b>	<b>6,412</b>	<b>5,434</b>	<b>977</b>	<b>65</b>	<b>43</b>	<b>23</b>	<b>1.49</b>	<b>0.79</b>	<b>0.70</b>	<b>9,316</b>

Each agency is expected to submit a plan to address the nutrient loadings assigned to their respective facilities. See the Department of Defense’s plan .

Pennsylvania continues to work with EPA to solicit the plans for the other federal agencies in the watershed.

## **II. FEDERAL AGENCY SUPPORT AND COORDINATION**

### **A. Coordination Between the Natural Resource Conservation Service and EPA**

As part of the Chesapeake Bay Program Partnership, EPA and the Natural Resource Conservation Service (NRCS) work very closely together. One area in which state partners in the Chesapeake Bay Partnership have identified the need for improved coordination between the two agencies involves the tracking and verification of practices installed by NRCS. Due to provisions in the Federal Farm Bill related to the confidentiality of some cost-share data and NRCS program staff interpretation of these restrictions, most states only receive this data in an aggregated format. While this aggregated format allows for progress reporting, it does not allow for ongoing verification of these practices once the credit life of the practice has expired. Without the exact location of these practices, the states cannot find them in order to meet the Chesapeake Bay Program Partnership protocols for verification. As a result, the reductions associated with these practices will be eliminated as part of the progress documentation over time. EPA, as the lead agency responsible for coordination between all the federal agency partners involved in the Chesapeake Bay Program, should take the lead and resolve this issue with NRCS. This would help Pennsylvania, and all the states in the Chesapeake Bay watershed succeed.

### **B. Coordination with the EPA Chesapeake Bay Program Office and the Wetland Workgroup**

One of the primary goals of the Wetland Workgroup, within the Chesapeake Bay Program Partnership, is to facilitate the implementation of projects that protect, restore, and enhance tidal and non-tidal wetlands across the Chesapeake Bay watershed; and to coordinate the collection and organization of wetland restoration data reported by the Chesapeake Bay Program. A significant gap that is hampering this goal is the inability to report wetland gains achieved through state and federal regulatory actions that are greater than 1:1 (acreage or function). DEP recommends that the EPA Chesapeake Bay Program Office accept the reporting of wetland gains greater than 1:1 from all regulated activities by state or federal programs.

### **C. Coordination with the Chesapeake Bay Program Office and DEP's Nonpoint Source Management Program**

The Nonpoint Source Management Program is part of DEP's Office of Water Resources Planning and provides grants to assist watershed associations, county conservation districts and other non-profit organizations in addressing nonpoint source pollution. This grant program manages funds awarded to DEP by the U.S. EPA's Section 319(h) of the Clean Water Act. Funds awarded to DEP are used in part to fund programmatic efforts and in part are used as sub-grants to local partners for the implementation of water quality improvement projects specified in EPA-approved 319 Watershed Implementation

Plans (WIPs). Currently, 319 grant funded projects must be associated with implementation of an EPA-approved 319 WIP. DEP recommends that funding through this program be made available to implement priorities in the WIPs developed to meet the Chesapeake Bay TMDL goals as well.

#### **D. Coordination with DEP Regulatory Programs and Other State and Federal Agencies**

In addition to the above listed Chesapeake Bay specific coordination, DEP's regulatory programs work closely with their state and federal partners to coordinate permitting efforts for applicants. DEP has identified the need for more timely responses when state and federal partners, including but not limited to, PA Fish and Boat Commission, PA Historical and Museum Commission, US Fish and Wildlife, and Army Corps of Engineers, have a role in our permit process. While this coordinated review effort allows for a more linear application process for the applicant, it sometimes creates backlogs in DEP's permit decision process. DEP recommends that permitting through these programs be aligned with the priorities in the WIPs development to meet the Chesapeake Bay TMDL. Shorter review time should be evaluated by state and federal counterparts.

DRAFT



## SECTION 7. MILESTONES AND PROGRESS REPORTING

### I. COORDINATION AND TRACKING OF PROGRESS

DEP’s Chesapeake Bay Office coordinates development and implementation of the Phase 3 WIP. This includes the updating of milestones and action steps on a two-year basis and progress reporting on a six-month basis. The milestones will be updated using the same template used by the workgroups and counties to develop their respective action plans. Progress reporting will be done using Figure 7.1, Progress Reporting Template.

The action steps that will be tracked on a six-month basis using this template are identified below. A complete list of all the action steps using the Progress Reporting Template.

**Figure 7.1 – Progress Reporting Template<sup>1</sup>**

Phase 3 Watershed Implementation Plan (WIP) Progress and Milestones Template												
<span style="color: green;">Green</span> - action has been completed or is moving forward as planned <span style="color: orange;">Yellow</span> - action has encountered minor obstacles <span style="color: red;">Red</span> - action has not been taken or has encountered a serious barrier												
Action #	Description	Performance Target(s)	Responsible Party(ies) and Partnerships	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Resources Available		Resources Needed		Progress to Date	Justification for Change to Action Item
							Technical	Financial	Technical	Financial		
<b>Priority Initiative 1:</b>												
1.1												
1.2												
<b>Priority Initiative 2:</b>												
2.1												
2.2												

<sup>1</sup>Responsible Party as used in this template is defined as the lead individuals or organizations involved in the implementation of the action step.

### II. KEY ACTION STEPS

Key action steps are identified to implement elements of the Phase 3 WIP. Progress on these action steps will be reported on a six-month basis. These action steps are

grouped around five priority initiatives and numbered using the same numbering protocol of:

- Phase 3 WIP Section Number First
- Priority Initiative Number Second (See below for the initiatives and their respective numbers)
- Action Step Number within the priority initiative

For example, Action Step 4.2.1 is the first action step to further the Funding and Resources Priority Initiative in Section 4 of the Phase 3 WIP.

The five priority initiatives are:

1. Communications and Outreach
2. Funding and Resources
3. Expanding Capacity for Technical Assistance
4. Reporting and Tracking
5. Compliance

The action steps can be summarized as follows:

#### **A. Communications and Outreach**

##### **4. Section 2, State Actions**

###### **a. Agriculture**

- 2.1.1A – Continue communication, outreach and stewardship programs to increase the use of conservation tillage and no-till practices.
- 2.1.2A – Continue communication, outreach and stewardship programs to increase implementation of cover crops.
- 2.1.3A – Continue communication, outreach and stewardship programs to increase implementation of pasture management.

###### **b. Forestry**

- 2.1.1F – Implement a comprehensive communication/outreach strategy to engage farmers/landowners in planting and maintaining riparian forest buffers.
- 2.1.2F – Implement a communication/outreach program to engage a variety of turf owners to plant trees and meadows on their properties.
- 2.1.3F – Communicate the importance and values of forests to facilitate and encourage state and local land conservation programs.

21.4F – Emphasize the full range of benefits and co-benefits of stream and wetland restoration to facilitate additional implementation.

### **5. Section 3, Countywide Actions**

3.1.1 – Develop communications and outreach strategy for staged approach to WIP planning and implementation in all counties.

3.1.2 – Conduct outreach via webinars and one-on-one meetings to provide overview of WIP, define the expectations, and discuss next steps to prepare counties for the WIP planning process.

3.1.3 – Begin implementation of WIP plans completed by four pilot counties.

3.1.4 – Seek staffing to support this large-scale coordination and support effort.

### **6. Section 4, Communication and Engagement Strategy**

4.1.1 – Complete the public comment period and provide a response to comments received.

4.1.2 – Develop the outreach materials, webinars, templates for letters and mailings and success stories identified by the Communications and Engagement Workgroup for their use in message delivery and outreach.

4.1.3 – Finalize the DEP Web-based StoryMap.

4.1.4 – Schedule and participate in focus groups, forums and workshops, as appropriate.

4.1.5 – Communications and Engagement Workgroup members will use the delivery tools developed to reach their respective constituents through mailings, newsletters, their respective websites, conferences, workshops, etc. about the importance of clean water and the goals of the Phase 3 WIP.

## **B. Funding and Resources**

### **1. Section 2, State Actions**

#### **a. Programmatic and Narrative Commitments**

2.2.1 – Pass legislation providing a funding source or combination of funding sources for the implementation of the Phase 3 WIP.

2.2.2 – Identify the process and develop specific procedures for the award of “block grants” to the lead planning teams for the implementation of the CAPs.

***b. Numeric Commitments***

***i. Agriculture***

22.1A – Investigate the incorporation of alternative manure treatment technologies and other potential strategies to address areas of excess manure nutrient generation and capital investment required for implementation of manure treatment systems.

***ii. Forestry***

2.2.1F – Maximize existing funding sources for riparian forest buffer implementation in Pennsylvania.

2.2.2F – Expand TreeVitalize and utilize other programs to facilitate community tree planting and maintenance.

2.2.3F – Create additional flexible funding options for riparian forest buffers.

2.2.4F – Ensure that riparian forest buffers are adequately maintained to ensure survival by developing a Maintenance funding source for NGOs to develop their own maintenance programs.

2.2.5F – Continue and increase urban tree canopy grants to communities and non-governmental organization partners.

2.2.6F – Leverage existing funding sources for stream and wetland restoration.

2.2.7F – Develop funding opportunities for turf conversion programs.

2.2.8F – Continue to implement stream restoration, emphasizing creditable, load-reducing projects. Pair stream restoration projects with tree planting BMPs whenever possible. Identify areas that may have a high cost-to-benefit ratio for load reductions for legacy sediment removal and associated ecosystem restoration.

***2. Section 3, Countywide Actions***

3.2.1 – 3.2.5:

- Seek staff resources: utilize staged approach as an incremental approach to scaling of resources and coordination of planning efforts. The staged approach rolls out in two phases over 18 months. Phase 1 uses the additional time to focus efforts on the eight higher loading Tier 1 & 2 counties (54% of

PA's nitrogen and 42% of PA's phosphorus loads). This approach allows for additional outreach to Tier 3 and 4 counties before their planning starts.

## **C. Expanding Capacity and Technical Assistance**

### **1. Section 2, State Actions**

#### **a. Programmatic and Narrative Commitments**

2.3.1 – Implement a pilot of the “One-Stop-Shop” concept in the two Tier One counties of Lancaster and York counties. The pilot would be done through an Request for Proposals process where applicants would describe how these services would be effectively provided to serve the needs of both the agriculture and urban communities.

#### **b. Numeric Commitments**

##### **i. Agriculture**

2.3.1A – Initiate implementation of Pennsylvania's Agriculture Conservation Stewardship Program.

2.3.2A – Work with third parties, integrators and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.

2.3.3A – Implementation of Animal Waste Management Systems.

2.3.4A – Develop web-based and in-person training for Manure Management and Agriculture Erosion and Sediment planning.

##### **ii. Forestry**

2.3.1F – Increase technical assistance available to landowners interest in implementing riparian forest buffers.

2.3.2F – Increase Urban Forestry technical assistance available to communities and citizens.

2.3.3F – Create a turf conversion technical assistance program.

2.3.4F – Provide informed technical assistance for stream and wetland restoration projects to ensure they are completed in an adequate, reportable manner.

2.3.5F -- Look into feasibility of expanding the PFBC Stream Restoration Initiative, implementing stream restoration projects resulting in load reductions with

habitat co-benefits, to counties in the southcentral region of the state, starting with one or more of the four pilot counties to include Adams, Franklin, Lancaster and York.

**iii. Stormwater**

2.3.1S – Complete revisions to the Pennsylvania Stormwater BMP Manual.

**D. Reporting and Tracking Progress**

**1. Section 2, State Actions**

**a. Programmatic and Narrative Commitments**

- 2.4.1 – Pass legislation to revise Pennsylvania’s Right to Know Law to allow for additional confidentiality of landowner records.
- 2.4.2 – Develop a planning and prioritization tool for use in the development and refinement of the CAPs.
- 2.4.3 – Release a request for proposals for a contractor to begin the pilot project for the use of Lidar and remote sensing technology to identify BMPs installed for the control of stormwater as part of development activities.
- 2.4.4 – Continue enhancements to PracticeKeeper.
- 2.4.5 – Finalize the revised draft Pennsylvania BMP Verification Program Plan and receive EPA’s approval of the plan.

**b. Numeric Commitments**

**i. Agriculture**

- 2.4.1A -- Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.
- 2.4.2A – Expand reporting of Dairy Precision Feeding.
- 2.4.3A – Expand reporting of Enhanced Nutrient Management,
- 2.4.4.A – Expand reporting of Grassed Buffers.

**ii. Forestry**

- 2.4.1F -- Work with the EPA Bay Program Partnership to enhance the existing crediting protocols for legacy sediment improvement projects in the Chesapeake Bay Model.
- 2.4.2F – Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 2.4.3F – Celebrate successful implementation and maintenance of forestry BMPs through reporting successful efforts.

**iii. Stormwater**

- 2.4.1S – Collect MS4 BMP data using the new reporting system for electronic submission for annual reports.
- 2.4.2S – Initiate and collect stormwater BMP data from ESCGP inspections.

**iv. Wastewater**

- 2.4.1W – Explore the feasibility of developing a GIS based online monitoring and reporting program that municipalities can use to report on-lot system operation and maintenance

**2. Section 3, Countywide Actions**

- 3.4.1 -- Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.2 -- Update reductions in the County Planning Progress template upon completion of each county plan.
- 3.4.3 -- Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

## **E. Compliance**

### **1. Section 2, State Actions**

#### **a. Programmatic and Narrative Commitments**

- 2.5.1 – Pass the Fertilizer Bill to achieve the identified nutrient reductions on urban and agriculture lands.
- 2.5.2 -- Review, consider, and potentially incorporate revised Phosphorus Index into planning requirements for land application of biosolids

#### **b. Numeric Commitments**

##### **i. Agriculture**

- 2.5.1A – Implement NPDES Concentrated Animal Feeding Operation Program Delegation.
- 2.5.2A – Complete complaint follow up for CAFO and non-CAFO facilities.
- 2.5.3A – Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
- 2.5.4A – Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.

##### **ii. Stormwater**

- 2.5.1S – Complete the Pollutant Reduction or Total Maximum Daily Load Plan Reviews for the 2018 MS4 permits.
- 2.5.2S – Develop the 2023-2028 MS4 Permit.
- 2.5.3S – Develop the Industrial Stormwater Permit.
- 2.5.4S – Develop the 2019-2024 Construction Stormwater Permit.

### **2. Section 9, Climate Change**

- 9.3.1 – Complete the Penn State Study, *Climate Change Impacts on Pennsylvania's Watershed Management Strategies and Water Quality Goals*.



The Progress and Reporting Template includes the above action steps and further details such as to responsible parties, performance targets, completion dates and resources.

DRAFT

## SECTION 8. ACCOUNTING FOR GROWTH

### I. IMPACT OF SECTOR GROWTH IN PENNSYLVANIA

Pennsylvania's Phase 3 WIP relies on the sector growth projections provided by the Chesapeake Bay Program's Chesapeake Assessment Scenario Tool (CAST). CAST has built-in sector growth projections based on a land use model that uses a combination of USDA Census of Agriculture data, land use analysis using one meter by one-meter high resolution land use GIS, county level construction data, and other attributing data to best predict the land use change by sector. The projected changes to land use accounted for in CAST are only projections. These numbers will change when new data, like the 2017 USDA Census of Agriculture, is released to the public. As new information becomes available, it will better inform the current growth projection that is accounted for in the model.

Figure 8.1 below shows the projected change in sector growth between 2017 and 2025. Pennsylvania's agriculture sector is projected to lose 33,429 acres in total. The natural sector is projected to lose 443 acres. The developed sector is projected to increase by 33,872 acres, due to loses in natural and agricultural lands.

**Figure 8.1 Pennsylvania's Projected Growth to 2025**

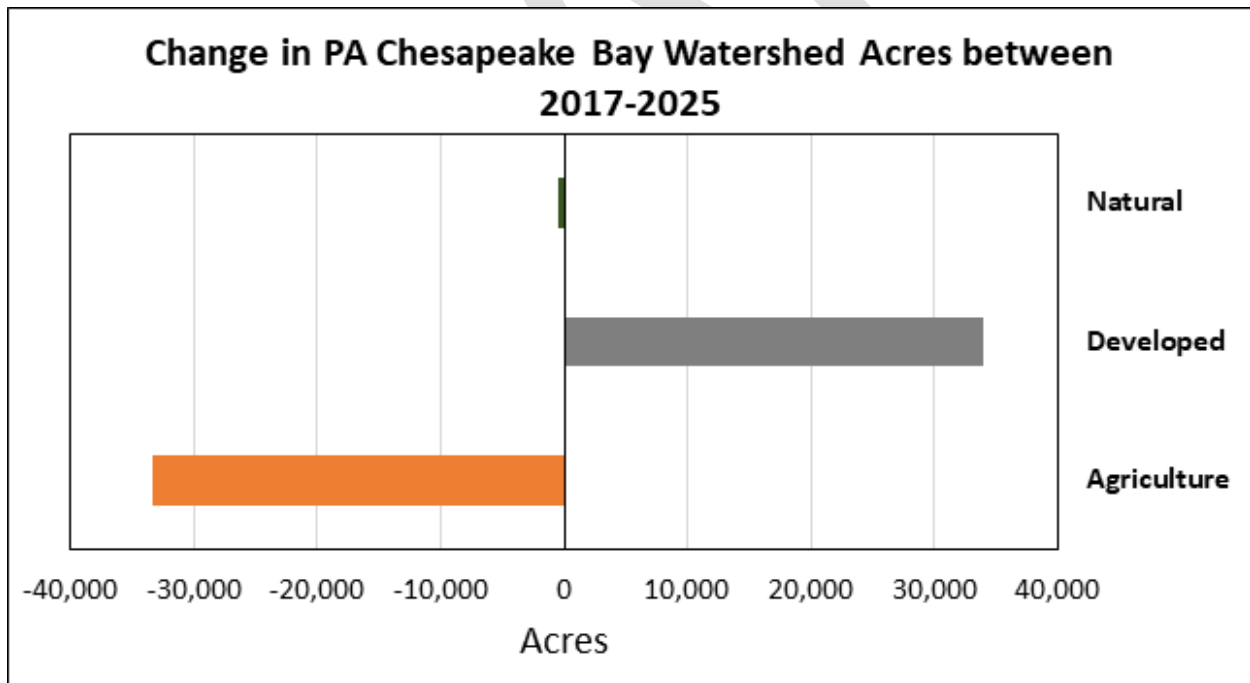


Figure 8.1 above represents the broad sector land use change and does not account for important land use change within each sector. While the total sector land use change is important in understanding sector growth, it only represents a small portion of the growth outlook. Figure 8.2 is a more specific sector breakdown.

**Figure 8.2 Specific Sector Land Use Change Breakdown**

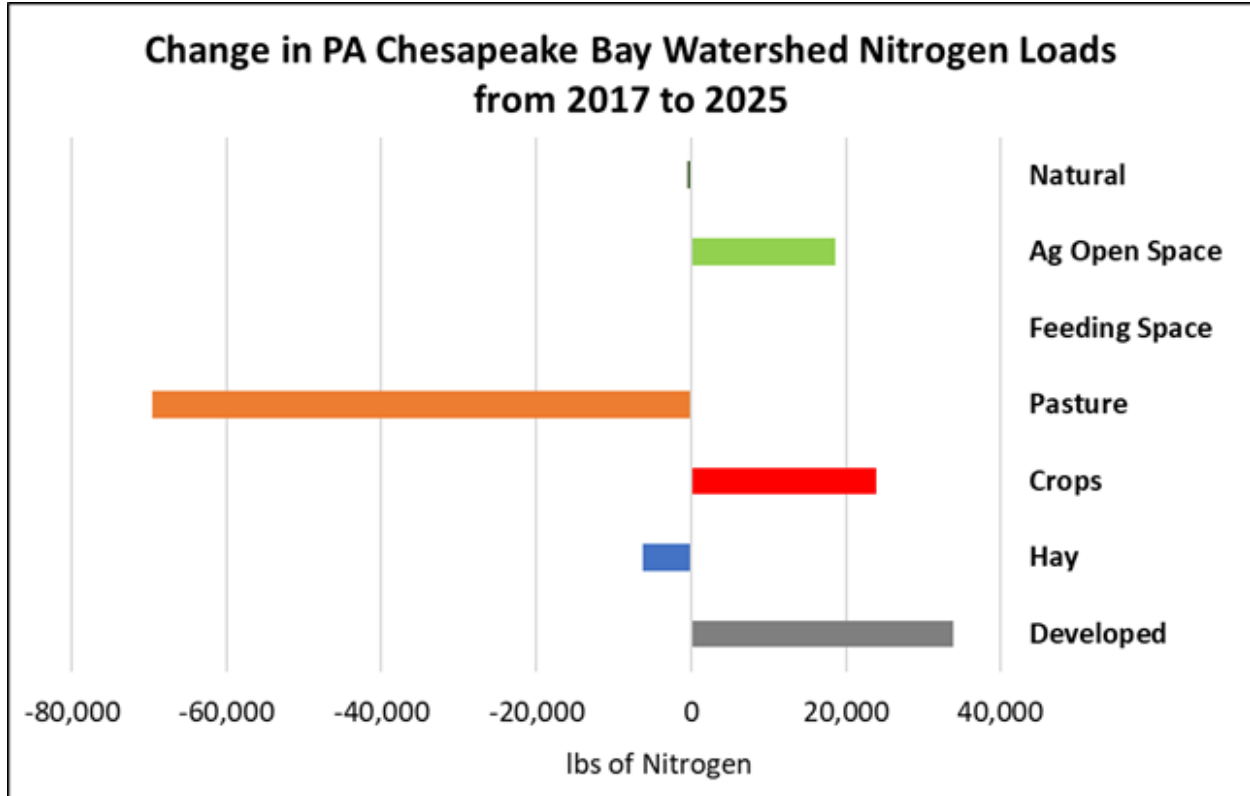


Figure 8.2 above shows the projected change in load source growth between 2017 and 2025. Pennsylvania is projected to experience a large shift in load sources within the agriculture sector between 2017 and 2025. Pasture land is projected to decrease by 69,562 acres. Hay land is also projected to decrease by 6,187 acres. Agriculture open space, which includes meadows is projected to increase by 18,621 acres. Feeding space is projected to increase by 155 acres. Cropland is projected to increase by 23,851 acres. Natural land is projected to decrease by 443 acres. Developed land is projected to increase by 33,871 acres.

The projected load source differences between 2017 and 2025, do not account for the differences in loading rates. Each of these variations in load sources attribute various loading rates for nitrogen and phosphorous. To see how the nitrogen load is affected based on sector growth, please see Figure 8.3.

**Figure 8.3 Changes in Nitrogen Load Due to Sector Growth**

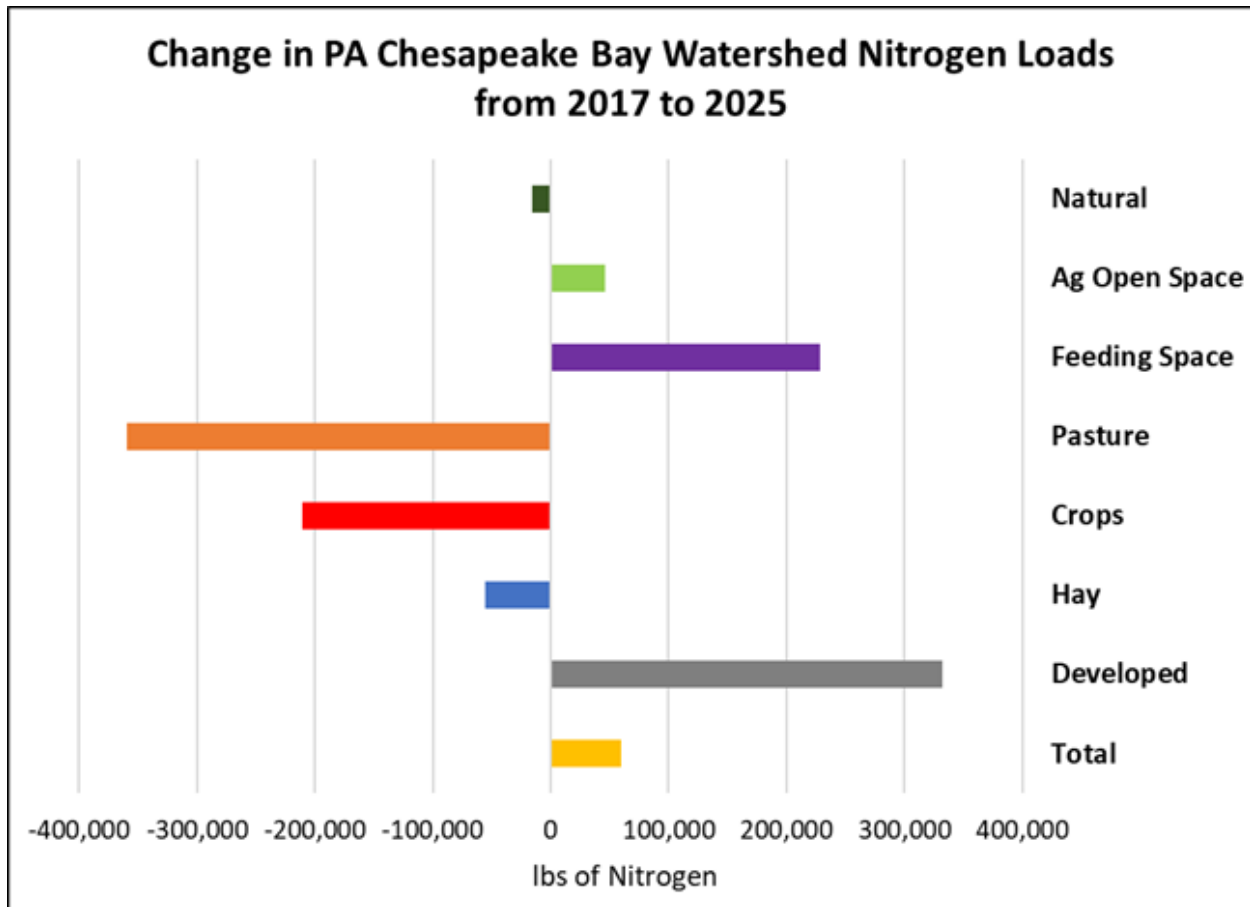


Figure 8.3 displays the difference in nitrogen loading rates from Pennsylvania to the Chesapeake between 2017 and 2025. In total Pennsylvania is projected to gain 59,891 lbs of annual nitrogen loading and gain 21,838 lbs of annual phosphorous loading, due to sector growth. The agriculture sector is projected to lose 376,225 lbs of nitrogen annually and gain 8,228 lbs of phosphorous annually between 2017 and 2025. The developed sector is projected to gain 332,114 lbs of nitrogen annually and gain 9,938 lbs of phosphorous annually between 2017 and 2025. The natural sector is projected to lose 15,961 lbs of nitrogen annually and gain 3,672 lbs of phosphorous annually between 2017 and 2025.

In the agricultural sector the largest differences in loading rates occur due to the switch of load sources between 2017 and 2025. Agriculture open space, which includes meadows gained 46,147 lbs of nitrogen annually. Feeding space increased its annual nitrogen load by 228,165 lbs. Pasture land decreased its nitrogen loading rates annually by 360,062 lbs. Cropland also decreases its annual loading rate of nitrogen by 210,430 lbs. Hay decreased its annual nitrogen loading rate by 55,241 lbs.

Pennsylvania will have a shift in the land use between 2017 and 2025 due to projected sector growth that is included in (CAST). The sector growth projection shrinks

agriculture lands and increase the size of developed lands, resulting in an increased nitrogen load delivered to the Chesapeake Bay between 2017 and 2025.

## **II. PENNSYLVANIA’S STRATEGY TO ADDRESS SECTOR GROWTH**

### **A. Introduction**

Forests, wetlands, and other natural areas significantly improve and protect water quality by absorbing rainfall, reducing storm water runoff, and helping to recharge groundwater aquifers. Conserving working lands provides significant values well beyond protecting and improving water quality. Working lands like farms and forests are deeply rooted in Pennsylvania’s cultural heritage, contribute significantly to the Commonwealths’ rural economy, and provide valuable products to society. Forests provide clean water, wood products, tourism and recreation opportunities, habitat, climate mitigation, and provide the backdrop to our aesthetic landscape.

### **B. Planning for Growth**

After several years of dialogue, the Chesapeake Bay Program agreed to a framework for “crediting” land conservation actions, programs, and policies as part of the Phase 3 WIP. Opportunities to receive “credit” for land conservation include land acquisition by agencies and municipalities, conservation easements, and planning and zoning to limit conversion of forests to commercial and residential development. A recent publication titled *“Sustaining and Improving Forest Land through Comprehensive Plans”* provides advice to local governments in fully considering forests in comprehensive planning.

Pollution reduction “credits” will be calculated based on the change in magnitude and patterns of future land use and development resulting from implementing conservation programs and policies. For example, if future growth is managed in a way to conserve forests in a county, the resulting pollutant loading will be less than if the forest had been developed for commercial or residential uses.

The Chesapeake Bay Program’s framework for land conservation includes:

- Conserving and protecting wetlands
- Conserving and limiting development in riparian areas
- Modernizing local planning and zoning to conserve critical forests and habitats
- Preserving farmland as part of a holistic approach to conserving working lands

## **1. Pennsylvania's Land Conservation Scenario**

Pennsylvania's approach to land conservation consists of four main components:

### **a. Forest Conservation**

Forest conservation of working lands, park lands, and other natural areas by agencies and land trusts: the commonwealth and its conservation partners have a tremendous history of conserving important forests and natural areas, resulting in over 4 million acres of State Forests, State Parks, State Game Lands, the Allegheny National Forest, and many local parks open for public use. Local land trusts have helped to conserve thousands more acres by facilitating conservation easements with private landowners. Additionally, state agencies hold conservation easements which to help keep working lands in private ownership. Continuing these approaches, the goal for 2025 is an additional 20,000 acres of forest conservation annually for the years 2019 through 2025. This is a statewide goal that will be prorated to counties in the Chesapeake Bay watershed.

### **b. Private Forests**

Acknowledging private working forests with forest management plans. Private forest landowners across the commonwealth have worked with natural resource professionals to develop management plans covering approximately 33,000 acres of private forests. Understanding that these landowners have a basic intent to keep these lands forested, this amount of forest will be excluded from development in Pennsylvania's land conservation scenario. This exclusion is for planning purposes only. Information on these owners' and their properties is not available and these lands are not subject to any development restrictions. Additionally, for the scenario, trends for future management plan adoption will be assumed to follow recent trends on a county basis and will form the basis for future estimates of forest management plan development. As such, Pennsylvania's land conservation scenario will acknowledge the small portion of forest properties managed under guidance of a forest management plan.

### **c. Wetlands**

Jurisdictional wetlands are excluded from development in the scenario.

### **d. Farmland**

Preserving farmland according to Pennsylvania's nation-leading Farmland Preservation Program. Historical rates have averaged approximately 12,000 acres preserved annually. This annual rate will be assumed for the 2019-2025 WIP horizon. These acres will be excluded from development, in perpetuity.

## **2. Future Considerations**

In addition to the four components described above, the commonwealth, its partners, and local governments have other tools available to promote long-term land conservation. While not currently included in Pennsylvania's land conservation scenario, additional tools include:

### **a. Riparian Areas**

Conserving and limiting development in riparian areas. These areas along streams are sensitive and critical to habitat and protecting local water quality.

### **b. Local Planning and Zoning**

Modernizing local planning and zoning to conserve critical forests and habitats. Examples include increasing urban densities and growth in urban areas versus rural areas, managing sewer service area expansions, avoiding growth on soils unsuitable for septic systems and increasing infill and redevelopment. A model available for localities includes the Chapter 102 permit, when triggered, the permittee must manage 20% of the existing impervious area as if it were a "meadow in good condition," which decreases the post construction stormwater runoff generated from the project site when compared with the existing developed condition. The intent of this provision is to provide some stormwater controls on property that was previously developed with little or no stormwater BMPs. This "retrofit" stormwater runoff requirement can result in a net reduction of Chesapeake Bay pollutants of concern. Additionally, street tree ordinances and shade tree commissions help to retain critical tree canopy in communities. A recent publication titled "*Sustaining and Improving Forest Land through Comprehensive Plans*" provides advice to local governments in fully considering forests in comprehensive planning.

### **c. County Level Land Conservation**

Engaging in county-level land conservation efforts as part of continued WIP development and implementation. Since this portion of the WIP was finalized toward the end of the planning process, there should be future efforts to engage counties and local governments on land conservation efforts as a part of the milestone and review process for the WIP and future implementation.

## SECTION 9. CLIMATE CHANGE AND CLIMATE RESILIENCY

### I. BACKGROUND

#### A. Estimated Impact Due to Climate Change

The Chesapeake Bay Program Partnership (Partnership) relayed preliminary modeling results of climate change in 2025 in the form of nutrient load projections as part of the Midpoint Assessment completed in July 2018. These preliminary results are summarized below in Table 9.1 for nitrogen and Table 9.2 for phosphorus.

**Table 9.1 – Climate Change Impacts by State (in millions of pounds) for Nitrogen**

Jurisdiction	1985 Baseline	2013 Progress	Climate Change	Phase 3 Planning Target
NY	18.71	15.44	0.400 (3.8%)	11.59
PA	122.41	99.28	4.135 (5.7%)	73.18
MD	83.56	55.89	2.194 (4.8%)	45.30
WV	8.73	8.06	0.236 (3.7%)	8.35
DC	6.48	1.75	0.006 (0.3%)	2.43
DE	6.97	6.59	0.397 (8.5%)	4.59
VA	84.29	61.53	1.722 (3.1%)	55.82
<b>Basinwide</b>	<b>331.15</b>	<b>248.54</b>	<b>9.09 (4.6%)</b>	<b>201.25</b>

**Table 9.2 – Climate Change Impacts by State (in millions of pounds) for Phosphorus**

Jurisdiction	1985 Baseline	2013 Progress	Climate Change	Phase 3 Planning Target
NY	1.198	0.710	0.014(2.9%)	0.606
PA	6.282	3.749	0.141 (4.7%)	3.073
MD	7.495	3.942	0.114 (3.2%)	3.604
WV	0.902	0.617	0.019 (3.9%)	0.456
DC	0.090	0.062	0.001 (0.8%)	0.130
DE	0.225	0.116	0.006 (5.1%)	0.120
VA	14.244	6.751	0.193 (3.0%)	6.186
<b>Basinwide</b>	<b>30.44</b>	<b>15.95</b>	<b>0.489 (3.4%)</b>	<b>14.173</b>

The existing Planning Targets are in the last column. The estimated additional reductions to mitigate the additional impact due to climate change are shown in Column 4. For example, Pennsylvania’s estimated additional reduction is 4.135 million pounds of nitrogen and 0.141 million pounds of phosphorus.

The Partnership also committed to the following strategy to address climate change between now and 2025:

- By refining the climate modeling and assessment framework, continue to sharpen the understanding of the science, the impacts of climate change and any research gaps and needs.



- Develop an estimate of pollutant load changes (nitrogen, phosphorus and sediment) due to 2025 climate change conditions.
- Develop a better understanding of BMP responses; including new, enhanced and climate-resilient BMPs.
- In March 2021, the Partnership will consider results of updated methods, techniques, and studies and refine estimated loads due to climate change for each jurisdiction.
- The Principals Staff Committee agreed that in September 2021, jurisdictions will account for additional nutrient and sediment pollutant loads due to 2025 climate change conditions in a Phase 3 WIP addendum and/or two-year milestones beginning in 2022.
- Finally, in developing the narrative strategy, the Partnership approved guiding principles that will be considered, described below.

## **B. Partnership Guiding Principles**

The following are guiding principles, approved by the Partnership, for consideration by the jurisdictions in the development of Climate Resiliency Strategies:

### **1. Capitalize on Co-Benefits**

Maximize BMP selection to increase climate or coastal resiliency, soil health, flood attenuation, habitat restoration, carbon sequestration, or socio-economic and quality of life benefits.

### **2. Account For and Integrate Planning and Consideration of Existing Stressors**

Consider existing stressors such as future increase in the amount of paved or impervious area, future population growth, and land-use change in establishing reduction targets or selection/prioritizing BMPs.

### **3. Align with Existing Climate Resiliency Plans and Strategies Where Feasible**

Align with implementation of existing greenhouse gas reduction strategies; coastal/climate adaptation strategies; hazard mitigation plans; floodplain management programs; DoD Installation Natural Resource Management Plans (INRMPs); fisheries/habitat restoration programs, etc.

#### **4. *Manage For Risk and Plan For Uncertainty***

Employ iterative risk management and develop robust and flexible implementation plans to achieve and maintain the established water quality standards in changing, often difficult-to-predict conditions.

#### **5. *Engage Federal and Local Agencies and Leaders***

Work cooperatively with agencies, elected officials, and staff at the local level to provide the best available data on local impacts from climate change and facilitate the modification of existing WIPs to account for these impacts.

## **II. PROGRAMMATIC COMMITMENTS**

Like every state in the country, Pennsylvania has already begun to experience adverse impacts from climate change, such as flooding, heat waves, and drought. Based on the overwhelming scientific evidence, those harms are likely to increase in number and severity unless aggressive steps are taken to reduce emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases.

Pennsylvania's 2015 Climate Change Impacts Assessment and the United Nation's Intergovernmental Panel on Climate Change recognize that, based on decades of research and evidence, greenhouse gases (GHGs) from human activities are causing long-term changes in climate, as well as increasing the likelihood and intensity of significant weather events. In fact, Pennsylvania is expected to continue to experience higher temperatures, changes in precipitation, sea level rise, and more frequent extreme events and flooding over the next century due to climate change.

Since the early 20th century, temperatures have already increased by more than 1.8 °F. If GHG emissions are not curtailed significantly, Pennsylvania is projected to be approximately 5.4 °F warmer by 2050 than it was at the end of the 20th century. Similarly, average annual precipitation has increased by approximately 10 percent over the past 100 years and, by 2050, it is expected to increase by an additional 8 percent, with a 14 percent increase during the winter season.

These impacts could alter the many fundamental assumptions about climate that are intrinsic to the commonwealth's infrastructure, governments, and businesses. For example, bridges are designed for certain flooding return intervals, energy systems are designed for certain temperature ranges, farmers plant crops suited to historical climate conditions, and communities are planned around historical floodplains. If not properly accounted for, changes in climate could result in more frequent road washouts, higher likelihood of power outages, shifts in economic activity, among other impacts. It is estimated that events such as these have cost governments, citizens, and businesses in the United States more than \$1.1 trillion in the last 30 years.

Climate change can also affect vital determinants of health such as clean air, safe drinking water, sufficient food as well as secure shelter. This can include impacts from increased extreme weather events such as heat, droughts, and floods, wildfire, decreased air quality, and illnesses transmitted by food, water, and disease carriers such as mosquitoes. The World Health Organization expects climate change to cause around 250,000 additional deaths globally per year between 2030 and 2050, with additional direct damage costs to health to be estimated around \$2 to \$4 billion per year by 2030. GHGs must be reduced very quickly if these impacts are to be avoided.

In 2015, DEP estimated GHG emissions from all sources in Pennsylvania to be 256.05 million metric tons of CO<sub>2</sub> equivalent (MMTCO<sub>2</sub>e), after including forestry and land use sinks. Industrial sources (31%), transportation (21%) and in-state energy production (32%) accounted for 84% of CO<sub>2</sub> emissions. The remaining sources include residential (7.2%), commercial (3.9%), agriculture (2.7%), and waste management (4.2%) sectors. Including consideration of land use sinks, GHG emissions in 2000 totaled 299.19 MMTCO<sub>2</sub>e, so emissions have been reduced by 14.4%.

## **A. Current Action Strategies**

Pennsylvania has continued to bear the impacts of climate change caused by manmade emissions of GHGs, while developing several initiatives to reduce emissions. These initiatives include:

### **1. Executive Order 2019-01**

In January 2019, Governor Wolf signed Executive Order 2019-01 which stated that Pennsylvania shall strive to reduce net GHGs 26 percent by 2025 from 2005 levels, and 80 percent by 2050 from 2005 levels, among other initiatives and goals including:

- a. Collectively reduce overall energy consumption by 3 percent per year, and 21 percent by 2025 from 2017 levels.
- b. Procure renewable energy to offset at least 40 percent of the Commonwealth's annual electricity use.
- c. Implement a state-wide benchmarking strategy and platform for energy and water consumption.
- d. Establish a state-wide Governor's Sustainability Council and/or interagency workgroup dedicated to the implementation of leadership actions listed in the Climate Action Plan, as well as actions in department-level plans.
- e. Incorporate climate change considerations into decision making processes and criteria. For example, add climate change resilience as a prioritization factor for new capital projects.

- f. Consider ENERGY STAR certification for existing buildings, and Architecture 2030, LEED, net-zero designs, and climate resilience design guidelines to drive higher performance in new construction and major renovation projects in public buildings.
- g. Implement emissions reduction and climate resilience activities in public facilities, including distributed generation, backup power generation, water efficiency, climate resilient vegetation, and proper tree maintenance.
- h. Replace 25 percent of the state passenger car fleet with battery electric and plug-in electric hybrid cars by 2025.
- i. Conduct more training, education, and outreach on energy efficiency, clean energy, climate resilience, and related skills for facility managers and the facility management workforce.

## **2. *Climate Change Act of 2008***

DEP is working under Pennsylvania's Climate Change Act of 2008 to develop strategies to reduce and offset GHG emissions and adapt to the impacts of climate change. An updated Climate Action Plan was released in early 2019.

The updated Plan includes nearly 100 actions that government, businesses, and citizens can take to both mitigate and adapt to climate change. The analysis team modeled 15 of those actions, including actions such as increasing the alternative energy portfolio standards (AEPS), investing in renewable energy generation, increasing energy conservation and energy efficiency, and more.

Using all 15 actions, the analysis team aimed at reducing GHG emissions 26% from 2005 levels by 2025 and 80% by 2050. The Department found that even if the 15 key actions were implemented, GHG emissions in Pennsylvania would only be projected to decrease 21% from 2005 levels by 2025 and 36% by 2050.

This finding further emphasizes the need for more ambitious and quick climate action from all Pennsylvanians, including government, businesses, and citizens. It is clear that actions expected to significantly reduce GHG emissions need to be enhanced in order to ensure human activities do not cause irrevocable climate change.

## **3. *Pennsylvania's Alternative Energy Portfolio Standard (AEPS)***

Pennsylvania's alternative energy portfolio standard (AEPS) enacted in 2004, administered by the Public Utility Commission (PUC) in cooperation with DEP, requires that 18% of electric power come from alternative and renewable sources; including 8% from renewable resources like solar and wind, by 2021. The standard has helped to

grow the clean energy industry, while providing clean energy options to Pennsylvania businesses and homeowners.

#### ***4. Finding Pennsylvania's Solar Future***

"Finding Pennsylvania's Solar Future" is a 2017-2019 statewide planning project led by DEP's Energy Programs Office with a goal of increasing solar generation to 10% of Pennsylvania's energy portfolio by 2030. The stakeholder effort modeled and developed 15 strategies to achieve that goal, and the Final PA Solar Future Plan concludes that the goal is technically and economically achievable. The modeling used in the plan also predicts that GHG emissions from the electricity sector will decrease by nearly 10% by 2030, if the goal is achieved.

#### ***5. Methane Emission Controls***

DEP is implementing methane emission controls on natural gas production, compression, processing and transmission facilities through the Governor's Methane Reduction Strategy. The comparative impact of methane on climate change is more than 72 times greater than CO<sub>2</sub> emissions on a 20-year timeframe.

#### ***6. Emissions Reduction Initiatives***

DEP is working to reduce emissions from vehicles and other mobile air pollution sources through several initiatives, including the Driving PA Forward suite of grants and rebates and the Alternative Fuels Incentive Grant (AFIG) program. In addition, DEP formed the Drive Electric PA Coalition, which developed an Electric Vehicle Roadmap for Pennsylvania.

#### ***7. Energy Efficiency***

Pennsylvania's 2008 energy efficiency law requires the state's major electricity distributing companies to meet savings targets established by the PUC. Since 2009, the Commonwealth has saved over 8.8 million megawatt hours of electricity usage resulting in \$6.4 billion in savings.

#### ***8. Climate Change Adaptation and Mitigation***

DCNR's Climate Change Adaptation and Mitigation Plan outlines 123 actions to make the commonwealth more resilient to climate change. Staff members from across DCNR's bureaus participated in a rigorous process to determine and prioritize DCNR's greatest climate change vulnerabilities and identify strategies to address them. The plan includes recommendations for dealing with higher temperatures, flooding, more extreme weather events, changes in outdoor recreation, range shifts for wildlife and plant species, and an increase in invasive species. DCNR is beginning to implement the adaptation strategies in state parks and forests, including a pilot project that includes Caledonia, Pine Grove Furnace and Kings Gap state parks and the 85,000-acre

Michaux State Forest. Activities there are focused on addressing flooding issues, planting trees adapted to future climatic conditions, eliminating unnecessary dirt roads, control of invasive species, relocating and hardening trails damaged by flooding, fuel mitigation to reduce the likelihood of catastrophic wildfire and more.

### **III. PHASE 3 WIP IMPLEMENTATION: BEST MANAGEMENT PRACTICE (BMP) EVALUATION**

#### **A. Evaluation and Implementation of BMPs**

As mandated by Pennsylvania's Climate Change Act of 2008, DEP plans to conduct a study of the potential impacts of global climate change on Pennsylvania over the next century. Previous studies were conducted by the Pennsylvania State University (Penn State) and presented to DEP in 2009, 2013 and 2015.

In 2019, the Penn State team will update the prior reports through three in-depth studies of climate change impacts and adaptations in high priority areas for the commonwealth; agriculture, infrastructure, and water quality.

The following three topics will be studied:

- Implications of climate change for planning, policies, and practices to achieve Pennsylvania's obligations under the 2011 Chesapeake Bay TMDL
- Climate change impacts on Pennsylvania livestock production and livestock production impacts on water quality
- Resilience of Pennsylvania's critical infrastructure to extreme weather and climate events

The first, designed specifically to help with further enhancement of the Phase 3 WIP, is described below.

#### ***1. Climate Change Impacts on Pennsylvania's Watershed Management Strategies and Water Quality Goals***

Many BMPs, such as cover crops and forested riparian buffers, have been designed and managed using climate data from the 20th century. Thus, as climate continues to change, one expects the suitability and effectiveness of existing BMPs to change throughout the state. For example, as intense precipitation becomes more frequent, cover crops are likely to be less effective at reducing soil erosion and forested riparian buffers are likely to experience short-circuiting through the development of gullies and ditches. Furthermore, forested riparian buffer systems are likely to see increased invasive vegetation coverage and decreased sapling success with greater annual fluctuations in groundwater levels.

In addition, because climate change will impact drivers of water quality throughout the Chesapeake Bay watershed, local and countywide planning associated with the Phase 3 WIP should also account for changing conditions due to climate.

This study aims to answer the following questions and provide recommendations for management actions and research needs to better inform Pennsylvania on decisions related to meeting water quality goals under a changing climate:

- What impact will a changing climate have on the proposed tiered approach in Pennsylvania's Phase 3 WIP for local and countywide planning goals?
- What potential impact will projected 21st century climate change have on the suitability and effectiveness of water quality driven BMPs (e.g., forested riparian buffers and cover crops) across the different landscapes and ecoregions of Pennsylvania?
- What changes in policies, new recommendations or changes to current management practices (e.g., buffer site selection, frequency of invasive vegetation control efforts, etc.) might Pennsylvania adopt increase the effectiveness of BMPs in Pennsylvania as the climate continues to change? This work will draw on existing climate projections for Pennsylvania and recent scientific research and literature on the potential impacts of climate change on the effectiveness of current BMPs specific to the landscapes and land use patterns of Pennsylvania.

## SECTION 10. CONCLUSION

The Pennsylvania Phase 3 WIP demonstrates reasonable assurance through a comprehensive, integrated framework of federal, state, local collaboration in a variety of regulatory programs and voluntary initiatives. The Phase 3 WIP is founded on, and reasonable assurance is demonstrated in large measure through, the intensive “bottom-up” local engagement process undertaken since the 2017 milestones.

Development of the Phase 3 WIP is just the first step in this final phase of TMDL implementation, to be followed by a series of further planning and implementation activities necessary to restore and maintain the health of the Chesapeake Bay and restoration of local waters. Future activities will include implementation of practices; bi-annual tracking and reporting of implementation for evaluation of milestone progress; and refinement of the Chesapeake Bay model. Federal, State and local coordination and partnership in these activities is vital.

To ensure sufficient progress that will achieve the 2025 targets, and to avoid possible consequences if progress is not sufficient, Pennsylvania will continuously evaluate technical issues regarding the pace of implementation. Pennsylvania will also evaluate feasible implementation rates and share this information with the Pennsylvania partnership and stakeholders in advance of developing milestones.

Pennsylvania has heard many concerns about the total cost. The way to begin to address those concerns is to demonstrate progress. If immediate implementation is not possible, partners are urged to make progress on programmatic milestones such as securing new revenue sources. For example, consider establishing authorization for a stormwater utility fee, even if the fee is not implemented immediately. Establish voluntary programs for reforestation, signup commitments to use less lawn fertilizer, subsidize rain barrels and rain gardens, and provide incentives for re-development.

Pennsylvania is very fortunate to have many partners and stakeholders that have made significant commitments to the Phase 3 WIP process and to Chesapeake Bay and local waters restoration efforts.

At the same time, DEP recognizes the need to track and report progress, and to be prepared for the possibility that progress will be delayed in some areas. If reporting indicates that milestones are not being meant, DEP will work with the identified responsible parties to overcome obstacles and get back on schedule.

Throughout this document concerns about the Bay Watershed Model were raised. Many concerns about the Bay Watershed Model are concerns about the BMPs input to the model, especially concerns about voluntarily implemented BMPs and regulatory programs that were not captured in the model input. It will be up to the Pennsylvania Partners and stakeholders to work between now and 2025 to assure that all the implementation, both urban and agricultural, is accurately inventoried and reported so it can be credited properly.



During the Phase 3 WIP planning process, as the Chesapeake Bay Program presented data and information to the Phase 3 WIP Steering Committee and county pilot partners, Pennsylvania became more aware of discrepancies between what is on the ground and what is being reported by the Chesapeake Bay model. Pennsylvania recognizes that this is due to challenges it has historically had with collecting and reporting data, as well as challenges with Pennsylvania's data fitting properly into the Chesapeake Bay model. Going forward, Pennsylvania welcomes continued discussions with the Bay Program Partnership on these reporting challenges as we continue to adaptively manage the program together to accurately reflect real world circumstances beyond the model, so that resources and efforts are tailored most effectively to achieve local and Chesapeake Bay cleanup goals.

With the establishment of the TMDL, the need for consistent and broad-ranging BMP data became critically important to attain adequate yearly progress. These data sources and systems include permit programs, grant and cost-share awards, and special efforts to collect and report BMPs that have not been previously accounted for or are implemented outside of government oversight. Each December 1<sup>st</sup>, Pennsylvania reports these BMPs to the EPA Chesapeake Bay Program Office. There have been growing pains in developing this capacity while also working with limited funding. Since 2010, improvements in data collection through programs and new data sources has been steady. Improving the data management protocols and the capability to document progress was one of six priorities identified as part of the 2016 Pennsylvania Restoration Strategy announced by Governor Wolf to accelerate progress. The results have shown that with each refinement of the Bay Watershed Model, Pennsylvania is able to demonstrate increased reductions.

It is also important to note that currently, Pennsylvania still does not receive full credit for many currently implemented practices, particularly through permit programs, grant and cost-share awards. Improvements in data collection around these practices are being addressed in this Phase 3 WIP at both the state and local level. Additionally, DEP is evaluating its permitting requirements to facilitate a smooth process for those that seek to implement BMPs and these relevant programs be aligned with the priorities in the WIPs development to meet the Chesapeake Bay TMDL. As part of that effort, DEP has identified the need for more timely responses when state and federal partners have a role in the permit process and recommend shorter review times should be evaluated by state and federal counterparts.

Pennsylvania commits to have practices and controls in place by 2025 necessary to achieve the final Phase 3 WIP phosphorous and nitrogen. Pennsylvania in conjunction with the Partnership will utilize an adaptive management approach to achieve our collective desired outcome. The two-year milestones and bi-annual progress reporting will allow for the assessment of the implementation progress and targeted adjustments to programs and priorities to ensure the practices and controls called for in the Phase 3 WIP are achieved by 2025.

APPENDIX 1  
**STEERING COMMITTEE AND WORKGROUP MEMBERS**

A special thank you to all the members of the Phase 3 WIP Steering Committee and Workgroup Members. Without their dedication and support, the development of this plan would not be possible.

Steering Committee

- Department of Environmental Protection, Chair – Secretary Patrick McDonnell
- Department of Agriculture -- Secretary Russell Redding
- Department of Conservation and Natural Resources -- Secretary Cindy Dunn
- State Conservation Commission -- Karl Brown, Executive Secretary
- Chesapeake Bay Commission – Representative Garth Everett
- Susquehanna River Basin Commission – Andrew Dehoff, Executive Director
- Interstate Commission of the Potomac River Basin – Carlton Haywood, Executive Director
- Pennsylvania Infrastructure Investment Authority – Brion Johnson, Executive Director
- Workgroup Co-Chairs (Listed Below)
- Nicki Kasi and Kristen Wolf, DEP Chesapeake Bay Program Office, State Staff to the Committee

Workgroups:

a. Agriculture Workgroup

Co-chairs:

- John Bell, Senior Government Affairs Counsel, Pennsylvania Farm Bureau
- Greg Hostetter, Deputy Secretary, PA Department of Agriculture
- Doug Goodlander, DEP Bureau of Clean Water
- Matt Royer, Director, Penn State University Agriculture & Environment Center, Representative of the PA in the Balance Steering Committee
- State Staff Coordinator: Jill Whitcomb, DEP Bureau of Clean Water

Members:

- Karl Brown, State Conservation Commission
- Bill Chain, Chesapeake Bay Foundation
- Andrew Flinchbaugh, York County, Crops, Produce/Nursery and Swine
- David Graybill, Juniata County, Small Dairy Operation, Poultry
- James Harbach, Clinton County, Large Dairy Operation
- Jeff Hill, Lancaster County Conservation District
- James Junkin, Franklin County, Turkeys and Swine, Crops
- Jennifer Reed-Harry, Penn Ag Industries
- Jennifer Schuler, Bell and Evans

- Chris Sigmund, TeamAg
- James Van Blarcom, Bradford County, Dairy and Swine

b. Communications and Engagement Workgroup

Co-chairs:

- Katie Hetherington-Cunfer, former Director, DEP Office of External Affairs
- Marcus Kohl, Regional Director, DEP Northcentral Regional Office
- Jayne Sebright, Executive Director, Center for Dairy Excellence
- State Staff Coordinators: Nicki Kasi and Kristen Wolf, DEP Chesapeake Bay Office

Members:

- Kevin Sunday, Director of Government Affairs, Pennsylvania Chamber of Business and Industry
- Penny McCoy, Executive Director, Pennsylvania Rural Water Association
- Elizabeth Hinkel, President, Pennsylvania Corn Growers Association
- Carly Dean, Project Manager, Chesapeake Conservancy
- Mary Gattis, Private Citizen, former Local Government Advisory Committee Coordinator, Alliance for the Chesapeake Bay
- Jenna Mitchell, Pennsylvania State Director, Alliance for the Chesapeake Bay
- Dan Zimmerman, Warwick Township Manager
- Kelly Donaldson, Communications Lead, PA Sea Grant
- William Zeiders, Director of Digital Media and Marketing, PA Farm Bureau

c. Forestry Workgroup

Co-chairs:

- Katie Ombalski, Woods and Water Consulting, formerly with ClearWater Conservancy
- Matthew Keefer, Assistant State Forester, Department of Conservation and Natural Resources
- State Staff Coordinator: Teddi Stark, DCNR Riparian Forest Buffer Coordinator

Members:

- Molly Cheatum, Chesapeake Bay Foundation
- Ryan Davis, Alliance for the Chesapeake Bay
- William Elmendorf, Penn State University Extension
- Matthew Ehrhart or Lamonte Garber, Stroud Water Research Center
- Andrew Louza, Pennsylvania Land Trust Association
- Roger Rohrer, R Farm, Strasburg, PA
- Alan Sam, State College Borough
- Lori Yeich, Department of Conservation of Natural Resources
- Jacqui Bonomo, PennFuture

d. Funding Workgroup

Co-chairs:

- Representative Garth Everett, Delegate, Chesapeake Bay Commission
- Brion Johnson, Pennvest
- Marel King, PA Director, Chesapeake Bay Commission
- State Staff Coordinator: Nicki Kasi, DEP Chesapeake Bay Office

Members:

- Jeff Clukey, House Appropriations Committee
- Michael Coates, Governor's Budget Office
- John Dawes, Bay Funders Network Representative
- Brian Eckert, Pennsylvania Department of Community and Economic Development
- John Guyer, Senate Appropriations Committee
- Peter Hughes, Red Barn
- Billy Joraskie, Senate Appropriations Committee
- Natalie Krak, Department of Agriculture
- Ritchie LaFaver, House Appropriations Committee
- Bob Lamb, PennVest Financial Advisor
- Megan Lehman, DEP Williamsport Office
- Jenn Cotting, Environmental Finance Center
- Sarah Nicholas, Department of Conservation and Natural Resources
- John Raymond, Governor's Budget Office
- Joe Sweeney, Water Science Institute
- Naomi Soon Young, Center for Regional Analysis

e. Local Area Goals Workgroup

Co-chairs:

- Lisa Schaefer, Director of Government Relations, County Commissioners Association and Co-chair of the Chesapeake Bay Local Area Planning Target Action Team
- Davitt Woodwell, President and CEO, Pennsylvania Environmental Council
- Steve Taglang, DEP Bureau of Clean Water
- State Staff Coordinator: Kristen Wolf, DEP Chesapeake Bay Office

Members:

- Harry Campbell, Chesapeake Bay Foundation
- Carol Collier, The Academy of Natural Sciences of Drexel University
- Nate Dewing, Bradford County Conservation District
- Matt Ehrhart, Stroud Water Research Center
- Bill Fink, Country View Family Farms
- Adrienne Gemberling, Chesapeake Conservancy, Susquehanna University Natural Sciences Center

- Kara Kalupson, MS4 Coordinator, Rettew
- Pam Shellenberger, York County Planning Commission
- John Thomas, Hampden Township Board of Commissioners
- Chris Thompson, Lancaster County Conservation District

f. Stormwater Workgroup

Co-chairs:

- Felicia Dell, Director, York County Planning Commission
- Sean Furjanic, DEP Bureau of Clean Water
- State Staff Coordinator: Lee Murphy, DEP Bureau of Clean Water

Members:

- Paul Bruder, Attorney, Rhoads and Sinon
- Mike Jeffers, Kinsley Properties, Developer and Consultant
- Teddie Kreitz, Municipal Consultant, Keller Engineers
- Jeremy Miller, MS4 Governmental Representative-Large, Hampden Township
- Seth Noll, MS4 Governmental Representative-Small, Yoe Borough
- Liz Ottinger, EPA Region 3
- Renee Reber, Chesapeake Bay Foundation
- Daryl St Clair, Pennsylvania Department of Transportation
- Brian Seipp, Center for Watershed Protection

g. Wastewater Workgroup

Co-chairs:

- John Brosious, Deputy Executive Director, Pennsylvania Municipal Authorities Association
- Jay Patel, DEP Bureau of Clean Water
- State Staff Coordinator: Brian Schlauderaff, DEP Bureau of Clean Water

Members:

- Bernard R. Biga, Director of Operations, Wyoming Valley Sanitary Authority
- Brian Book, Director of Energy and Environmental Engineering, Rettew
- John Brossman, Manager/Engineer, Lower Allen Township Authority
- Ed Ellinger, Director of Water & Wastewater Service Group, Herbert, Rowland & Grubic, Inc.
- Shannon Gority, Chief Executive Officer, Capital Region Water
- Steve Hann, Principal, Hamburg, Rubin, Mullin, Maxwell & Lupin
- Mike Kyle, Executive Director, Lancaster Area Sewer Authority
- Cory Miller, Executive Director, University Area Joint Authority
- Wayne Schutz, Executive Director, Derry Township Municipal Authority
- Wendy Walter, Director of Compliance, Safety, and Security, Williamsport Sanitary Authority
- R. Timothy Weston, Partner, K&L Gates

## APPENDIX 2 SUMMARY OF LOCAL ENGAGEMENT

### I. WIP KICKOFF AND LISTENING SESSION

On June 5, 2017, some 240 people from academia; local, state and federal government agencies; county conservation districts and county planning offices; environmental groups, industry associations; law firms, engineering firms, private consultants and other private industry; federal and state legislative offices, and the media participated in the public kickoff and listening event for Phase 3 WIP planning. Following this summit, sixteen people provided their input online.

The goals for this initial public comment period and the listening session included the following:

- Exploring how Pennsylvania's Phase 3 WIP will be developed and how participants may be involved.
- Ensuring that everyone who has concerns and ideas has an opportunity to provide those concerns and ideas early in the process.
- Making that input the most useful for the Phase 3 WIP Steering Committee and seven workgroups that will be developing the Phase 3 WIP.

Participants identified 32 topics for discussion and action about the challenges of cleaning up Pennsylvania's streams, rivers, and lakes over a five-hour period of the listening session. These topics include:

- 1A - Role of Citizen Science
- 1B - PA in the Balance
- 1C - Human Capital
- 2A - Funding and Financing
- 2B - Dedicated Funding
- 2C - Continuity in Nutrient and Sediment Reduction Estimates
- 3A - Acid Mine Drainage and Abandoned Mine Lands
- 3B - Forest Fragmentation and Stormwater
- 3C - Build on Ag Enforcement
- 4A - Asset Management to Prioritize Green Stormwater Infrastructure
- 4B - Roadside Drainage Management
- 4C - Riparian Forest Buffer Innovations
- 5A - Nitrogen Use Efficiency
- 5B - Ag Waste Remediation Technology
- 5C - Incorporating Environmental Education into the PA WIP 3
- 6A - Stakeholder Involvement throughout WIP 3 Process and Beyond
- 6B - Local Goal Setting
- 6C - Overcoming Regulatory Barriers
- 7A - Conservation Technical Assistance
- 7B - How to Interest the Public in Urban Stormwater Pollution

- 7C - Enforcing Compliance with Existing Regulations
- 8A - Integrated Planning Prioritization
- 8B - Improving Soil Health to Meet Water Quality Goals
- 8C - Individual Responsibility
- 9A - Biggest Bang for the Buck Statewide Decision Making
- 9B - Incentivize Low Impact Development in Private Development
- 9C - Efficient Delivery of Technical Assistance to Local Governments
- 10A - Retaining High-Value Forests in Strategic Locations
- 10B - Agriculture Messaging
- 10C - Role of State (Federal Agencies)
- 11B - Local Water Quality Monitoring
- 11C - Eels, Mussels, and Water Quality

This invaluable expertise and first-hand experience was summarized and categorized for use by the Phase 3 WIP steering committee and work groups. Table A2.1 is the categorization of the topics from the listening session, Table A2.2 the written comments.

**Table A2.1 - Listen Session Topics for Phase 3 WIP Steering Committee Workgroups**

Topic	Agriculture	Forestry	Funding	Local Area Goals	Stormwater	Wastewater
1A	x	x				
1B	x					
1C	x	x	x	x	x	x
2A	x		x		x	
2B	x	x	x	x	x	x
2C	x	x			x	
3A		x				
3B		x			x	
3C	x					
4A		x			x	
4B	x	x			x	
4C		x				
5A	x					
5B	x					
5C				x		
6A	x	x	x	x	x	x
6B	x	x	x	x	x	x
6C					x	x
7A	x					
7B					x	
7C	x					
8A	x			x	x	

Topic	Agriculture	Forestry	Funding	Local Area Goals	Stormwater	Wastewater
8B	x				x	
8C				x		
9A	x	x	x	x	x	x
9B					x	
9C					x	
10A		x			x	
10B	x					
10C					x	
11B					x	
11C				x		

**Table A2.2 - Written Comments for Phase 3 WIP Steering Committee Workgroups**

Commenter	Agriculture	Forestry	Funding	Local Area Goals	Stormwater	Wastewater
Comment 1					x	
Comment 2	x				x	
Comment 3	x	x			x	
Comment 4	x		x	x	x	
Comment 5	x				x	
Comment 6	x	x				
Comment 7	x		x	x		
Comment 8				x		
Comment 9				x	x	
Comment 10	x		x			
Comment 11	x	x	x	x	x	x
Comment 12	x		x	x		
Comment 13			x	x		
Comment 14	x	x	x	x	x	x
Comment 15	x	x	x		x	
Comment 16		x	x		x	



## **II. BUILDING A COMMUNITY CLEAN WATER TOOLBOX SESSION: PHASE 3 WIP LOCAL PLANNING PROCESS**

On April 10, 2018, the Local Area Goals Workgroup and DEP conducted an all-day session to expand local engagement and seek feedback on the draft local planning process. Invitees included academia, local government officials, environmental groups, industry and sector association representatives, other state and federal government agencies, private consultants and engineering firms and other representatives who have the potential of having a role to play in the development of one of the Countywide Action Plans (CAPs), with a focus on the four pilot county CAPs.

The purpose of the meeting was to:

- Increase stakeholders' knowledge of the Phase 3 WIP development process.
- Answer stakeholders' questions regarding roles and responsibilities in the Phase 3 WIP development process; and, more specifically the development of the CAPs.
- Engage stakeholders in designing the planning process to meet the local planning goals and the development of the CAPs.
- Provide an opportunity to identify key stakeholders to develop action steps at the local level.

The key outcome of the meeting was to finalize a Community Clean Water Toolbox that will assist county leaders in the development of the CAPs to meet the local planning goals.

During the morning session, participants heard from and responded to each of six of the seven workgroups that have worked over the past year to develop the Phase 3 WIP local planning process. (The Communications and Engagement Workgroup was created after this session was held.)

- Agriculture
- Forestry
- Funding
- Local Area Goals
- Stormwater
- Wastewater

Attendees participated in a round robin series of workgroup/toolbox carousel stations where workgroup chairs provided an overview of their workgroup's mission, work accomplished to date, what comes next, and their sector's role in addressing overall water quality needs. Participants asked clarifying questions and provided feedback to the workgroups.

In the afternoon session, participants were asked to provide feedback on the draft Community Clean Water Toolbox.

### **III. PENNSYLVANIA BEST MANAGEMENT PRACTICE VERIFICATION PROGRAM PLANNING SUMMIT**

On August 30, 2018, over 60 people who have different roles in the tracking and reporting of best management practices (BMPs) met for five hours to review and discuss ways to enhance and improve the current methods of accomplishing this for the purpose of reporting progress to the EPA Chesapeake Bay Program Office. The stated goal of the Summit was to develop components of a revised Pennsylvania BMP Verification Program plan for Pennsylvania for incorporation into the Phase 3 WIP.

In doing so, the following three questions were posed:

1. What are the best methodologies to use to meet the verification requirements for each priority BMP?
2. Who can meet the qualifications and standards to provide the verification considering that each method will need to include some amount of onsite verification?
3. How do we get the verification done?

Breakout groups focused on BMP verification for both stormwater and agriculture. Components of a draft BMP Verification Program Plan were shared with participants for review following the meeting.

### **IV. OTHER FORUMS, FOCUS GROUPS AND ROUNDTABLES**

On February 5-8, 2019, the *Pennsylvania in the Balance* Conference was focused in providing input to the Agriculture Workgroup on their recommendations for the Phase 3 WIP. Over 100 participants were invited to offer ideas about agriculture's role in the final development and implementation of the Phase 3 WIP.

The Pennsylvania delegation of the Local Government Advisory Committee to the Chesapeake Executive Council (LGAC) continues to host Local Government Watershed Forums within Pennsylvania's Chesapeake Bay Watershed. The purpose of these Forums is to increase the awareness and understanding of elected officials who serve as leaders in watershed protection and restoration. The dialogues are facilitated by LGAC members, with support from the LGAC Coordinator.

The last seven roundtables, held in 2018, were coordinated with DEP and focused specifically on informing local officials about their role in developing and implementing the Phase 3 WIP and identifying challenges local officials face complying with regulatory requirements and implementing voluntary programs. The first three roundtable discussions were held in the Spring of 2018. These roundtables focused on a general overview of the Phase 3 WIP and the co-benefits can be achieved from the implementation of BMPs that are also necessary for the successful achievement of the

Phase 3 WIP. The 122 people who participated in this series of workshops were asked to rank the twelve co-benefit priorities from a list developed by the Chesapeake Bay Program partnership. Priorities from most important/relevant to least were: Healthy Watersheds, Stream Health, Wetlands, Protected Lands, Toxic Contaminants, Climate Resiliency, Fish Habitat, Forest Buffers, Tree Canopy, Public Access, Brook Trout, Underwater Grasses.

The other four of the roundtable discussions were held during the Fall of 2018 as the four pilot CAPs took shape. These took place in four different regions in the watershed (South-Central Regions 1 and 2, Northeast, North-Central). Their purpose was to gather information about different communities' resource gaps (staffing, technical assistance, funding, etc.), and identify what it is localities needed to more fully participate in watershed protection and restoration.

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